



Drivers of Logistics Performance

A Case Study of Turkey



**Corporate Partnership Board
Report**

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International Transport Forum

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Executive Summary

Good logistics performance is an essential component of stimulating economic development. This report explores the drivers of, and barriers to, logistics performance through a case study of Turkey's trade and transport sector. Firstly, it explains the importance of logistics performance. Next, it reviews the Logistics Performance Index (LPI) used to assess trade and transportation facilitation friendliness of countries. It then discusses Turkey's performance against each dimension of the LPI, highlighting the country's challenges and achievements. Lastly, the report uses this understanding to propose and categorise a series of general policy actions available for improving logistics performance.

What we found

[Turkey's customs clearance has improved as a result of a decrease in the variability of clearance times](#)

Simplification and automation of customs procedures, increased productivity gains due to improved IT capability, and investment in improved management and human resources capability have all contributed to this improvement.

[Substantial road investment appears to have helped improve Turkey's infrastructure performance in the World Bank's Logistics Performance Index \(LPI\).](#)

International freight forwarders are the direct assessors of logistics performance in the LPI methodology. Given their activities are closely linked to the road freight industry, any improvement in road infrastructure is likely to be reflected directly in the LPI.

[Turkey's road-dominated transport system results in high transport costs](#)

High energy costs represent one of the greatest obstacles for road transport and trade more broadly. Due to relatively low labour costs, fuel may account for over half of total freight, especially for long distance carriage.

[Under-developed connections to port hinterland constrain Turkey's LPI performance](#)

Freight-handling capacity at Turkish ports is still constrained by underdeveloped hinterland transport facilities and connections between international ports and manufacturing sites.

[Turkey's logistics performance is predominantly bolstered by the development of the private sector](#)

While Turkey's government has made significant efforts to improve logistics performance, chambers of commerce and industry associations also take active roles in the development of the sector and the improvement of service quality.

[External factors and political risks increase shipment costs and decrease on-time performance](#)

Rerouting due to political instability and war in neighbouring countries has been one of the major reasons for delays in delivery times. Any uncertainty, especially in the border crossings, creates unpredictable circumstances and delays, increases transactional costs and can lead to the loss of business opportunities.

Policy insights

Policy actions creating the highest improvement in the logistics performance vary for different income levels

For low-income countries, progress in logistics performance is typically driven by improvement in infrastructure and reforms within customs and other border agencies. For middle-income countries, the focus moves to development of logistics services with growing demand for outsourced logistics. In more sophisticated logistics environments, the “low hanging fruit” has largely been reaped. The new generation of reforms is more complex, involves many stakeholders, and takes time. In addition, demand for environmentally and socially sustainable logistics grows as the income level of a country increases.

Reducing the variability of customs clearance time is an important element for improving the efficiency of border crossing procedures

Appropriately designed policies improve the efficiency of customs procedures and reduce variability. Even though objectives, implementation capacities, and resource availability differ greatly across countries, there is a core set of policies which can improve customs performance. These include simplification and automation of customs procedures, efficient risk management, optimal use of information and communications technologies, effective partnership with the private sector, and increased cooperation and transparency.

Capacity management plays a vital role in infrastructure efficiency

Most transport facilities operate with low utilisation rates. Yet, they still suffer from capacity constraints due to high demand variability. In this context, there are other strategies for improvement that may be less costly and more efficient than capacity expansion. Better management of existing infrastructure, through proactive oversight and scheduling, as well as management of vulnerable parts of the capacity, can be a cost-effective way to improve infrastructure efficiency.

Intermodal transport systems, including good access to roads, terminals and seaport channels, are fundamental for a high-quality transport infrastructure

A policy focus on modal complementarity should ensure that each mode competes based upon its inherent characteristics. Cost savings and quality improvements in intermodal connections and handling are vital instruments for enhancing the competitiveness of intermodal transport. Along with efficient port operations, focus on interfaces such as well-functioning port-hinterland connections is essential in maintaining competitive transport networks.

A successful logistics industry is essential in providing high quality logistics services

Numerous government actions may help the private sector develop logistics competencies. For example, promoting competition, setting quality standards, supporting professional organisations, regulating business certification, and ensuring standardisation of operations all contribute to better logistics services.

Resilience-improving policies and investments are necessary

The private sector deploys risk-management strategies to maximise resilience and minimise disruption of external events. Governments should also play a role in ensuring increased resilience of the logistics networks to external and extreme shocks. It is necessary for the public and private sector to work together, sharing data and information, to enable organisations to better understand and quantify logistics risks. This will improve network risk visibility, and in turn, will facilitate the development of proactive and effective actions.

Introduction

This report examines the drivers of, and barriers to, logistics performance through a case study of Turkey's trade and transport sector.

The work for this report was carried out in the context of a project initiated and funded by the International Transport Forum's Corporate Partnership Board (CPB). CPB projects are designed to enrich policy discussion with a business perspective. They are launched in areas where CPB member companies identify an emerging issue in transport policy or an innovation challenge to the transport system. Led by the ITF, work is carried out in a collaborative fashion in working groups consisting of CPB member companies, external experts and ITF researchers.

The principal authors of this report were Dilay Celebi of the International Transport Forum and Lauri Ojala of the Turku School of Economics with substantial inputs provided by Jari Kauppila who also edited the final report. The report benefitted from valuable inputs provided by José Viegas.

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The project was coordinated by Philippe Crist and Sharon Masterson of the International Transport Forum.

1. Importance of logistics performance

Well-functioning logistics, both domestically and internationally, is a necessary precondition of national competitiveness (Arvis, et al., 2014). Global production networks depend on transport operations. This dependency affects a wide array of value-added activities along supply chains, from suppliers of raw materials to the end-user, as well as the recycling of materials after use.

Physical, administrative and informal restrictions are big obstacles to the movement of goods and international trade. Removing these barriers would have a greater impact on economic growth and competitiveness than removing tariffs. According to a recent estimate by Ferrantino et al. (2013), the combined impact of improving border administration, and upgrading transport and communications infrastructure would increase global Gross Domestic Product (GDP) by 4.7%, six times more than what would result from a complete and worldwide elimination of tariffs.

In other words, trade and transport facilitation are at the core of stimulating economic development. There is also a strong reciprocity between the two: trade and transport facilitation fosters logistics performance, and better logistics supports growth, enhances competitiveness and enables investments. Political decisions and implemented policies have both direct and indirect effects on the attractiveness of a region or country in terms of business location decisions. A country is attractive when it has the aptitude to attract the foreign investors. In this sense, the volume of foreign direct investment (FDI) present in a territory is a good indicator of its attractiveness. Transportation systems are considered as a production factor and as one of the key determinants of facility location decisions. Transport infrastructure has a significant impact on the productivity and the cost structure of private firms (Haughwout, 2001). Empirical studies show that foreign direct investment is attracted to areas where transportation systems are more efficient (Saidi & Hammami, 2011).

A sustained improvement calls for policymakers and private stakeholders to implement comprehensive reforms. To move products to market efficiently and reliably, countries need to reduce trading costs and adopt policies to support trade, thereby helping to improve trade competitiveness.

Even good physical connectivity does not compensate for poor service delivery. Infrastructure development has been essential in assuring connectivity and access to trade and transport gateways. Yet countries have been more successful with certain types of infrastructure. ICT infrastructure quality, in particular, has improved rapidly across the world. Conversely, rail infrastructure inspires general dissatisfaction. Ratings for other types of infrastructure vary by region (Arvis, et al., 2014).

Transport services are delivered by logistics providers that operate under very different global environments. Usually, the quality of logistics services is better perceived by customers and users of the network than the quality of the corresponding physical infrastructure. This appears to be the case in air and maritime transport. Railroads, on the other hand, tend to receive low ratings throughout the world for both services and infrastructure. It can be inferred then that operational excellence cannot be replaced with good physical 'hardware' alone.

Reliability of operations is a major concern for traders and logistics providers alike and predictability of supply chains is becoming ever more important. Efficient border crossing is essential in eliminating avoidable delays and enhancing predictability in the clearance process. Coordination among relevant government agencies will play a major role in these efforts, including the need to introduce best practices in automation and risk management. According to The World Bank's Logistics Performance Index (LPI), customs agencies tend to obtain higher LPI ratings than other related agencies - such as sanitary and phytosanitary control agencies and agencies enforcing standards.

More generally, logistics performance is strongly associated with the reliability of supply chains and the predictability of service availability. Supply chains are becoming more and more complex, as they often span many countries. Comprehensive reforms and long-term commitments from policymakers and private stakeholders will be essential to keep up with the changing world.

Supply chain sustainability concerns among shippers and logistics providers appear to grow in line with complexity. In the LPI 2014, for example, about 37 per cent of respondents shipping to OECD countries recognised a demand for environmentally friendly logistics solutions, compared with just 10 per cent for low-income destinations (Arvis, et al., 2014). Industry practices are fast-changing for these services. Governments will need to make long-term policy-changes that allow the industry to remain competitive while they adapt to cope with new requirements.

The quality of services is driving logistics performance, especially in emerging and richer economies. Here, the development of services such as third party logistics providers, trucking and forwarding remains a complex policy area. In logistics-friendly countries, shippers already outsource much of their logistics – especially transport and warehousing operations – to third party providers. Instead, these logistics users tend to focus on their core business while orchestrating the more complex supply chains issues of aligning their sourcing and production to market demand.

Supply chains are becoming ever more complex, and there are no easy gains available for policymakers. Most middle and high income-countries have recognised a growing need for consistent policy actions to tackle the complexity in their trade and logistics preconditions. The notion of “low hanging fruit” for more developed countries to pick up is no longer true. The necessary reforms involve many stakeholders and are often slow to implement. Furthermore, they are sometimes fragile due to governance weaknesses or lack of political continuity. Successful reforms also depend on detailed, accurate data involving information sharing among stakeholders. In summary, countries that have successfully introduced far-reaching changes have combined regulatory reform with investment planning, inter-agency coordination, and incentives for operators (Reis & Farole, 2012).

2. The approach to assess logistics performance

In order to understand the drivers of logistics performance better – or to look “behind the LPI” – this report identifies key factors that affect logistics performance, national competitiveness, and related policy actions in a suitable case country.

Turkey provides the basis for a very fruitful case study for a number of reasons. Turkey is an upper-middle income country that has witnessed rapid economic growth and export expansion over the past decade, combined with a keen attention to related policy actions. In addition, Turkey has shown a rather coherent development in the LPI on several accounts. Furthermore, Turkey’s scores from the first LPI in 2007 to the fourth one in 2014 have a rather narrow confidence interval (CI), which facilitates analysis over time.

The case study for this report was carried out in two phases¹. The first phase examined the quality of logistics services and the physical and procedural bottlenecks present in Turkey (including those in infrastructure, regulations, transport and logistics services, and border crossing and customs clearance procedures) It also studied how these factors contribute to competitiveness in international trade for the country..

The World Bank’s Logistics Performance Index (LPI) was used as the starting point for the assessment of logistics performance.² Since its first publication in 2007, the LPI has significantly enhanced the dialogue between policymakers and the private sector as they determine priorities in trade and transportation facilitation.

The first phase was conducted through desk research to gather background information from both published reports and statistical data sources. It covered the collection and analysis of information on Turkey’s trade and logistics performance by reviewing background data on the structure of foreign trade, the level of activity at the major international gateways and land borders and performance of the logistics sector. The findings of this research provided a starting point for the analysis, including discussions of the highlights and prominent outcomes.

The second phase of the case study focused on a qualitative assessment of the implementation status of trade and transport policy environment through a survey. This survey was followed by a series of meetings with national experts, policymakers, associations, and selected companies involved in trade and logistics services. This phase provided a way to assess the impact of policy components on national freight transport and logistics performance, on the basis of the LPI.

Approximately 100 people from the public and private sector dealing with trade logistics attended a series of meetings held in Istanbul and Ankara in the middle of 2014. The meetings were organised in cooperation with the International Transporters’ Association (UNTA), Association of International Forwarding and Logistics Service Providers (UTIKAD) and The Union of Chambers and Commodity Exchanges of Turkey (TOBB). In addition, over ten interviews were conducted with representatives from the logistics industry and related associations.

¹ The process resembles the one outlined by Arnold, et al. (2010).

² In addition to the Logistics Performance Index (LPI), a number of other indices provide useful information on logistics performance in the context of national competitiveness. See Annex for a more comprehensive list.

Logistics Performance Index (LPI)

The World Bank's Logistics Performance Index (LPI), also known as the "Connecting to Compete" report, provides the most comprehensive international comparison tool to measure the trade and transport facilitation friendliness of countries. Understanding the components of trade and logistics performance can help countries improve their freight transport efficiency and identify their areas of weakness and strength in comparison to competitors. The "Connecting to Compete" report has been published in 2007, 2010, 2012 and 2014³.

The LPI has two main parts: the International LPI, where up to 166 countries are benchmarked against each other, and the Domestic LPI, which provides an insight on a set of logistics conditions within each country.

The International LPI looks at six dimensions that capture the most important aspects of countries trade logistics performance, where each dimension is rated on a 5-point scale (Arvis, et al., 2014):

- Customs; efficiency of the customs clearance process
- Infrastructure; quality of trade and transport-related infrastructure
- International Shipments; ease of arranging competitively priced shipments
- Logistics Quality; competence and quality of logistics services
- Tracking and Tracing; ability to track and trace consignments
- Timeliness; frequency with which shipments reach the consignee within the scheduled or expected time

The Domestic LPI provides information on particular aspects within respondents' countries of work, including imports/exports, lead times, supply chain costs, customs clearances and the percentage of shipments subjected to physical inspection.

The overall index is calculated by analysing the six dimensions listed above. None of these independently guarantee a good level of logistics performance, and their inclusion is conditioned to empirical studies and extensive interviews carried out with specialists in international freight transport.

Allowing for comparisons across 166 countries, the LPI is used by companies to identify challenges and opportunities related to a country's transport infrastructure, logistics competence, and availability of tools and resources for efficient management of their supply chains.

The LPI score or LPI rank targets have started to show up in strategic development plans of economies. Shortly after publication of the 2007 LPI report, Indonesia's government officials launched a wide-reaching public private dialogue on transport and logistics issues in the country. This process led to the preparation of an action plan focusing on trade costs in its major ports, and the particular challenges faced by a country made up of over 10,000 islands. Although a number of issues still remain to be resolved, these initial reforms helped to improve the country's LPI rank from 75th in 2010 to 59th in 2012 and eventually to 53rd in 2014.

The compilation of the index is done primarily through an on-line survey that has been responded to by approximately 1 000 professionals in international freight forwarding. It is important to know that evaluations

³ The LPI reports and the aggregated data can be found at: <http://lpi.worldbank.org>.

in the International LPI come from respondents outside the country being evaluated. Thus, the responses reflect a country's "logistics friendliness" as it is perceived by logistics professionals from abroad.

It is equally important to understand that the LPI relies on freight forwarders' perception of performance along the six pragmatic dimensions. As such it remains a subjective, rather than an objective, assessment of logistics performance.

The LPI is a survey, and as such the methodology is subject to sampling error and anchoring bias (which is the act of basing a judgment on a familiar reference point). Benchmarking countries in their geographical or economical reference set may create a perception of inferior or superior performance - a country in a successful anchoring group may be perceived as performing worse than another with a similar performance, only because of their different reference sets. Environmental and geographical constraints create a second potential source of bias. The LPI reflects the perspective of the global private sector on how countries are globally connected through their main trade gateways. So it might not fully capture changes at the country level. For example, a low LPI score might reflect access problems outside the country for landlocked countries and small-island states (Arvis, et al., 2012).

Countries at similar performance levels may have substantially different ranks, especially in the middle and lower country income ranges. To account for potential sampling error and the LPI's limited domain of validity, LPI scores are calculated with approximate 80 per cent confidence intervals over the standard error of LPI scores across all respondents (Arvis, et al., 2014). These confidence intervals must be examined carefully to determine whether a change in score or a difference between two scores is statistically significant.

Countries that have been evaluated by a small number of respondents, such as Sweden, Norway, Bahrain, New Zealand, and Ethiopia tend to have large confidence intervals between upper and lower bounds of LPI scores. These may translate into approximately 20 rank places between the upper and lower rank bounds. For example, Finland's decline from ranking 3rd in 2012 to 24th in 2014 remains within confidence intervals of the two years. Thus, it is statistically not significant and cannot be interpreted as a valid change in its logistics performance.

Hence, the LPI scores and, in particular, the LPI ranks need to be interpreted with caution as do not provide ready answers to questions usually posed by policymakers such as "how" or "why". For this purpose, more detailed investigations are needed in order to see "behind the LPI".

Behind the LPI: Understanding policy actions

Logistics operations consist of coherent and interlocking sets of processes where policy support is essential. Identifying the obstacles that affect logistics competitiveness and taking necessary actions to alleviate them requires a comprehensive analysis of policy impacts.

This section provides an overview of policies and key interventions that affect trade and logistics performance. It covers a set of issues, associated with the six key dimensions of the LPI, that affect trade and logistics regulations, procedures, and operations that can be implemented to improve logistics performance systems.

Figure 1. **Relating the six LPI indicators to policy actions**

Arvis et al. (2014) map the six LPI dimensions to two main categories. The first category relates to main inputs to the supply chain (customs, infrastructure, and quality of logistics services). The second category involves service delivery performance outcomes, namely timeliness, ease of arranging international shipments, and tracking and tracing. In our approach, we implement a more holistic point of view.

Logistics systems usually involve complex combinations of sequential activities. So, poor performance in one dimension might be related to inconsistency among policy actions targeting other dimensions. For example, government restrictions on logistics services may enhance logistics quality but might increase shipment costs. Therefore, a policy program encompassing overall logistics performance improvement has a greater chance of yielding effective and sustainable results than partial reforms.

The efficiency of customs and other border agencies

The customs clearance component of the LPI measures the efficiency and effectiveness of customs dispatch procedures in terms of speed, simplicity and predictability. Improvements in customs clearance performance are tied to overall trade policy environment. Even though the objectives, implementation capacities and resource availability differ greatly across countries, policies targeting customs performance basically cover:

- efficient risk management
- optimal use of information and communications technology
- effective partnership with the private sector, including programs to improve compliance
- increased cooperation with other border control agencies
- transparency through information on laws, regulations, and administrative guidelines.

Simple, transparent, and harmonised trade policies reduce administrative complexities, increase predictability, and reduce the incentives for market-distorting behaviour and corruption.

Over the past 20 years, average tariffs have been cut in half in developing countries and non-tariff import barriers have been sharply reduced. A number of customs administrations have improved their operations. Yet, too many still operate inefficiently. This adds considerable costs to trading activities while, at the same time, undermining the growth potential of national economies. For many developing countries, reduction of trade barriers has not necessarily led to substantial trade integration.

Globally, customs efficiency is one of the two lagging components of the LPI in 2014, especially in low-income and lower middle-income countries, even after they have made the fastest progress in this dimension (Arvis, et al., 2014). Customs and other border agencies, including improvements of transit regimes, represent areas where policymakers can adopt comprehensive reforms. Customs efficiency, therefore, needs to be examined in the context of trade policy reform.

The quality of trade and transport infrastructure

This sub-dimension measures the quality of a country's transport and telecommunications infrastructure. Infrastructure development is essential for assuring basic connectivity and access to gateways. A low overall LPI performance often results from poor scores for infrastructure. Poor transport and telecommunications infrastructure isolates countries and thus inhibits their participation in global production networks.

Remoteness is an important determinant of the real costs of trade and a country's ability to participate fully in the world economy. The average landlocked country has transport costs 50% higher than the average coastal economy. However, improving the infrastructure of the landlocked economy to the top quintile reduces this disadvantage by 12%; and improving the infrastructure of the transit economy reduces the disadvantage by a further 7% (Limao & Venables, 2001).

Improvements in customs administration, tracking and tracing, and logistics competence tend to enhance trade for countries at all levels of development. In the case of infrastructure, however, the impact on trade appears to be the highest in middle-income countries.

Korinek and Sourdin (2011) argue that improvements in port infrastructure do not seem to affect trade in lower-income countries at all. This is possibly due to the existence of strong barriers in other LPI dimensions. Another factor at play may be asymmetric trading patterns that favour imports over exports; empirical evidence shows that improvements in infrastructure are particularly trade-enhancing for exporters (Martí, et al., 2014). High income countries also benefit somewhat less than middle income countries from improvements in infrastructure, possibly because they have already undertaken the most necessary investments. This finding may suggest that some countries experience diminishing returns from further infrastructure improvements.

The infrastructure dimension of the LPI covers both physical and telecommunications infrastructure. However, perceived differences in the quality of infrastructure are strongly linked to the quality of the roads and maritime facilities, which are the two major modes of freight transport. There exists a strong positive relation between a country's LPI score and the quality of their freight transport related infrastructure, particularly their port and road quality (Celebi, et al., 2014).

Keeping transport infrastructure in good condition and providing the framework to develop physical infrastructure are core responsibilities of governments. Superior transport infrastructure also supports intermodal transport systems, including access roads to terminals and seaport channels. Most intermodal facilities operate with low overall utilisation rates, but tend to suffer from occasional capacity constraints due to highly variable transport demand. Flexible systems, better resource allocation, peak flow management

and higher utilisation of existing physical infrastructure all provide avenues for improving the transport infrastructure related logistics performance.

Ease of arranging competitively priced shipments

This dimension gives an estimate of the country's performance in arranging shipments at competitive prices. Availability of competitively arranged shipments is a significant factor in sourcing decisions and in turn has an impact on national competitiveness. Hausman et al. (2013) estimate that a 1% reduction in the 'distance' measure, which can be interpreted as shipping costs, increases trade by 1.4%. Similarly, a 1% reduction in the total trade-related processing cost would be associated with a 0.5% increase in bilateral trade (Hausman, et al., 2013).

Shipping costs – i.e. the LPI's indicator relating to the ease of arranging competitively priced shipments – is often the weakest LPI component of top performers and tends to lower overall LPI scores in high income countries. This may be related to macroeconomic factors, which generally make services more expensive and can make it hard to arrange low-priced shipments (Arvis, et al., 2014). In the last decade, this component of the LPI has gained more importance due to competition between freight carriers and shipping agents in response to stronger export dynamics, providing charters and services at increasingly competitive prices (Martí, et al., 2014).

This development is noteworthy for policymakers since the LPI score relating to 'international shipments' does not directly respond to public policies. Instead it is determined by the intervention of the private sector, which behaves according to market conditions. Yet government policies play an important role in promoting economic efficiency in the freight transportation sector. For example, landside congestion at ports can be reduced through the development of cost-effective infrastructure to improve access, just as introducing scheduling systems based on advanced tracking technologies can reduce queuing.

In addition to constructing, operating, and maintaining infrastructure, governments regulate various aspects of the freight transportation sector. Governments also impose rules relating to safety, environmental and economic performance across all modes of transport, as well as regulating the sector in general (e.g. access to markets and mergers and acquisitions must be done in accordance with competition legislation). The government needs to encourage competition in the supply of transport services where the market is large enough to support competition. A large and growing part of this regulation is transnational, outside economic unions such as the European Union. In other words, the scope of national decision-making is narrowing.

Competence and quality of logistics services

The LPI's indicator relating to competence and quality of logistics services measures the overall competence of the logistics services provided by parties within the logistics system. Achieving logistics excellence requires continuous improvement in reliability, responsiveness and well-functioning support services. The dedicated investments in logistics operations and adoption of continuous monitoring and recognised quality standards are mainly done by the private sector.

Quality of logistics services plays an important role in facilitating the transport of international trade in goods. The LPI results reveal that the quality of services indicator drives logistics performance in both emerging and developed economies (Arvis, et al., 2014). Analysis of the impacts of trade logistics in a given country's trade by income category indicates that competence seems to impact trade flows by a similar magnitude regardless of the country's level of development. Improving logistics services (like third-party logistics, trucking, and freight forwarding) is typically a complex task for policy-making, with few success stories so far (Korinek & Sourdin, 2011). However, it can be seen that in "logistics friendly" countries, manufacturers and traders

outsource logistics to third party providers (who arguably benefit from economies of scale and are generally technically better at delivering these services), thus allowing companies to focus on their core business.

Various government actions can help the private sector develop its logistics competencies. These include increasing managerial capacity, setting quality standards developed by professional organisations, regulating business certification and ensuring standardisation of operations. Moreover, increasing logistics competence requires new labour force skill sets and more highly educated employees. Improved human resources are a key factor when it comes to LPI performance in the competence and quality of logistics services. Human resource development in logistics is often both a public and a private sector responsibility. To secure an adequate workforce to meet future labour needs in the logistics industry, decisive political efforts are necessary in the logistics industry (International Transport Forum, 2014).

Ability to track and trace consignments

Traceability is a product of the logistics sector as a whole, since all parties in the supply chain contribute to this component. Since most stakeholders benefit significantly from improved tracking and tracing, it can be regarded as one of the priority areas for future investments in trade logistics (Korinek & Sourdin, 2011).

The development of information and communications technologies (ICT) provides a convenient way of improving LPI tracking and traceability performance by enabling cost-efficient gathering, organisation and distribution of information at a global level. This includes information on products, services and trade regulations. Several companies use the Internet as an exchange mechanism for planning the supply chain with their partners. Major freight transport service providers provide information on their services, schedules and rates that can be easily accessed by their clients.

However, adequate traceability of shipments is still a major problem in most developing countries. This is partially due to a lack of understanding of how to manage new technology and adjust logistics procedures. Though it is clear that information sharing creates benefits to the supply chain as a whole, many companies start by optimising their internal processes before paying attention to their external relations.

One of the major barriers confronting companies in the uptake of advanced ICT systems is the high investment risk, which imposes uncertainties and affects the willingness of the private sector to invest. This is especially true if there is uncertainty surrounding governments' communications policy and spectrum allocation. Hence, policymakers need to keep up with the rapid development of ICT and develop a stable communications framework that is conducive to logistics planning by the private sector (OECD, 2002).

Timeliness of shipments in reaching destination

The timeliness of shipments in reaching destination measures the reliability of shipment delivery times. Delivery times depend on the nature of the product, planning and supply chain management, logistics services, and distance to customers and suppliers. Long lead time is not a problem if delivery is predictable and demand is stable. However, if there is uncertainty about future demand, long lead time is costly, even if the customer knows exactly when the merchandise will arrive. It has been estimated that a 1% reduction in exporter's processing time could increase bilateral trade by 0.4%, while a 1% reduction in the variability of shipping times could be associated with a 0.2% increase in bilateral trade (Hummels, 2001). In addition, the impact of an extra day spent getting across borders has a significantly greater negative impact on trade flows compared with an extra day spent at sea delivering a container of goods (Korinek & Sourdin, 2009). These results indicate that the time spent at the border and the cost of getting containers across borders has a strong impact on trade.

While the length of the lead time affects trade volumes, time variability mainly affects the efficiency of logistics systems. The more variable the delivery time, the more buffer stocks are needed. Thus, even if

average lead times are low, a high rate of variability can render a supplier uncompetitive and can be more damaging than having long, but predictable, lead times (ITF/OECD, 2010). This impact is even higher in large and complex supply chains, due to the phenomenon known as the “bullwhip effect”, which is the amplified variability of demand on upstream levels of the supply chain.

There is ample evidence that appropriately designed liberalisation and introduction of competition in these sectors can improve efficiency (including timeliness), reduce costs and expand service access to users (OECD, 2006).

3. Overview of Turkey's trade and transport

Economy and trade

Turkey is an upper-middle-income country with a large population and a diversified economy. It is the world's 17th largest economy (the 6th largest in Europe) and 22nd largest exporter by value. Its economy grew with an average annual real gross domestic product (GDP) rate of 4.9% between 2008 and 2013. Over the last two years, it has had the highest real growth GDP of any OECD country and it is projected to maintain its position with an annual growth rate of 4.2% between 2014 and 2030 and 2.3% from 2031 to 2060 (OECD, 2014a).

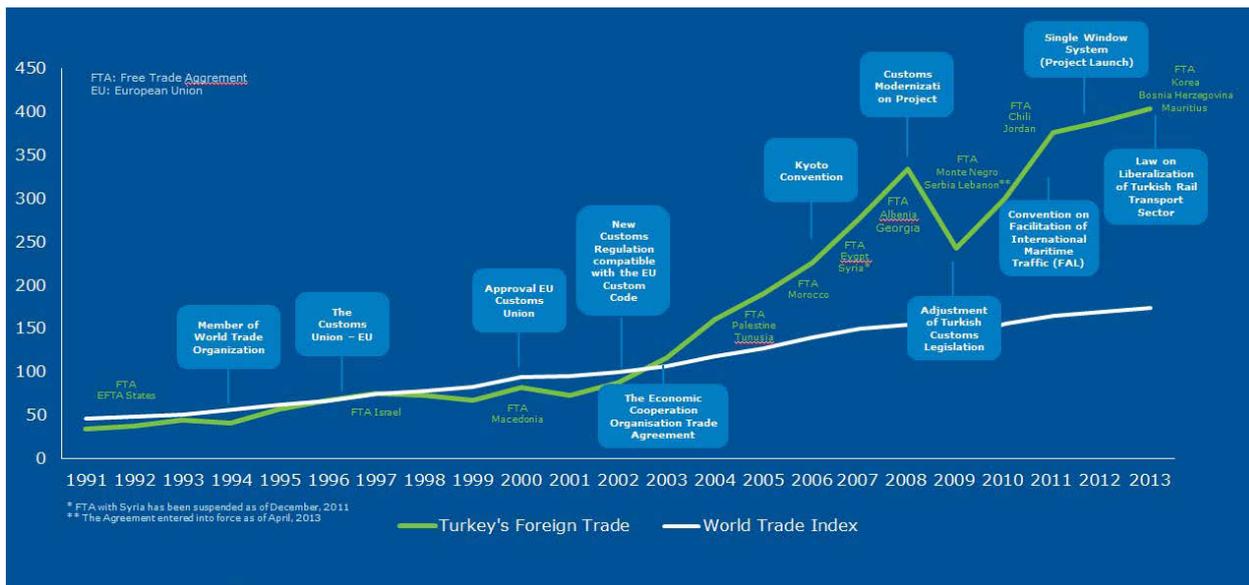
Turkey is an important centre for international trade because of its geographical position on a traditional trade route between Asia and Europe. Recent economic and political developments throughout neighbouring regions – the Balkans, the Black Sea, the Mediterranean Basin, the Caucasus, Central Asia and the Middle East – have contributed to Turkey's importance as an international hub.

Turkey's export performance has been strong since 2012, and the country's exports have become more globally competitive. The total volume of Turkey's foreign trade has increased by nearly 5 times over the past 10 years, from USD 67 billion to USD 334 billion. Turkish exports are expected to grow more than 5% from 2013 to 2017, while import growth is projected to exceed 9.5% during the same period (TR Prime Ministry Investment Support and Promotion Agency, 2013). The country plans on tripling its exports by 2023 and becoming one of the world's 10 largest economies with an ultimate goal of reaching USD 500 billion in exports (World Bank, 2014a).

Figure 2 illustrates the growth of Turkey's foreign trade with major policy developments. The most significant development in Turkey's foreign trade policy is the establishment of the Customs Union (CU) with the European Union for manufactured goods. This is considered a pioneering effort and the CU is seen as a major instrument of integration for the Turkish economy into global markets (World Bank, 2014b). Under the EU Customs agreement, Turkey was required to harmonise its legal framework with EU norms concerning trade. Turkey completed this process for both exports and imports by 2002 and continues to update these regulations as they evolve. The EU Customs Union constitutes the legal basis for Turkey's free trade agreements (FTA). However, Turkey is not obliged to adopt the identical content of the FTAs as signed by the EU. Currently, Turkey has 17 non-EU FTA partners, which have a share of 9.5% in export markets and 4.5% in imports (Deloitte, November, 2014).

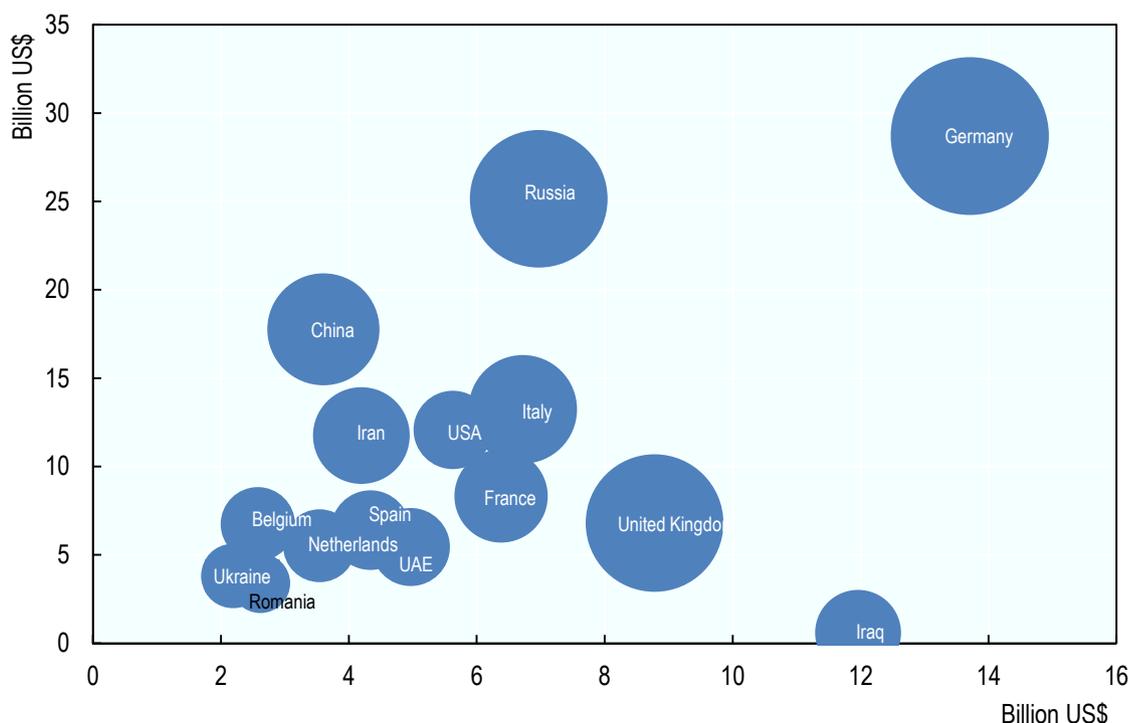
However, the global economy is changing and the CU is not necessarily able to meet all future challenges. There are number of issues with the implementation of the CU, including those related to logistics, such as road transport permits for transit. Turkey has undertaken comprehensive reforms of its road transport sector with participation in the TIR system and ECMT Multilateral Quota. In the EU, however, road transport agreements limit the number of Turkish vehicles able to carry goods in the area, hampering the free movement of goods and impeding transit traffic (World Bank, 2014b).

Figure 2. Turkey's foreign trade with major trade policy developments



Source: Data compiled from Turkey's Ministry of Economy.

Figure 3 tracks Turkey's total merchandise trade with major trade partners by imports (y-axis) and exports (x-axis). Each trading partner is represented by a separate circle, the size of which indicates bilateral trade as a percentage of Turkey's total trade volume. Turkey's biggest trading partner is Germany with nearly USD 30 billion dollars in imports and almost USD 14 billion dollars in exports. Other main export destinations include Iraq, United Kingdom, the Russian Federation, Italy, and France. Nearly 40% of Turkey's imports come from the EU, and over 50% of exports go to the EU. In addition to being major trading partners, European Union countries accounted for nearly 70% of total foreign direct investment (FDI) flows into Turkey between 2005 and 2010 (Turkish Statistical Institute, 2014). Recently, more geographically remote trading partners have been targeted based on the need to diversify export markets and to reach out to countries with large or potentially expanding domestic markets.

Figure 3. **Distribution of Turkey's total merchandise trade in 2013**

Source: Based on UNCTAD data.

The regional distribution of trade is uneven within Turkey. While EU countries account for the majority of exports originated from western cities such as Istanbul (51%), Izmir (61%) and Bursa (78%), landlocked Anatolian cities do not substantially benefit from access to the EU market. For example, even though Konya creates 2.1% of Turkey's total GDP, only 33% of the exports in the region are destined for EU markets, due to high costs of inland transportation. Indeed, more competitive transportation and logistics services will be crucial for future growth (OECD, 2014b). Turkey recently launched several logistics projects to stimulate regional trade and increase the accessibility of landlocked Anatolian manufacturers to European markets with low transportation costs and high traceability (See Section 4).

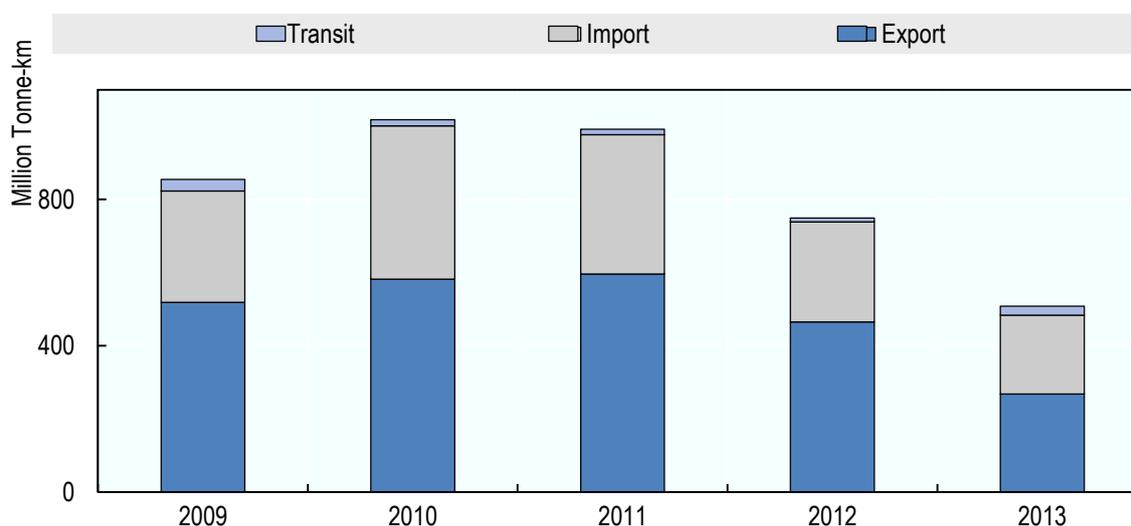
Transport and logistics in Turkey

Road transport is the primary mode of domestic freight transport in Turkey, accounting for about 85% of total inland freight, measured in tonne-kilometres (ITF/OECD, 2015). Despite the importance of roads, the quality of interprovincial roads was considered inadequate until recently. In response, large-scale public investments initiated in 2002 aimed to improve the quality of the country's road infrastructure. These investments tripled the number of four-lane expressways between 2003 and 2012, while the supply of other roads remained essentially unchanged. As a result, the share of four-lane expressways in Turkey increased from 12% to 35% of all roads by length over that period (Cosar & Demir, 2014). This had a measurable impact on the quality of Turkey's road infrastructure and Turkey's score in the World Economic Forum's *Global Competitiveness Index* increased from 3.7 in 2006-2007 to 4.9 in 2013-2014 for the quality of their road infrastructure (World Economic Forum, 2013).

Over the last decade, railways have been enjoying significant and sustained investment in Turkey, with major investment in high-speed lines, rail-led solutions to freight and distribution, and urban rail transport networks

in major cities across the country. However, despite the intensive investments and the increase of trade between Turkey and neighbouring countries, there is a substantial decline in the volume of international trade related railway transport (Figure 4). The rail freight share of total freight transport only accounts for around 5% of total inland freight today (ITF/OECD, 2015).

Figure 4. **Turkey's international freight transport by rail**



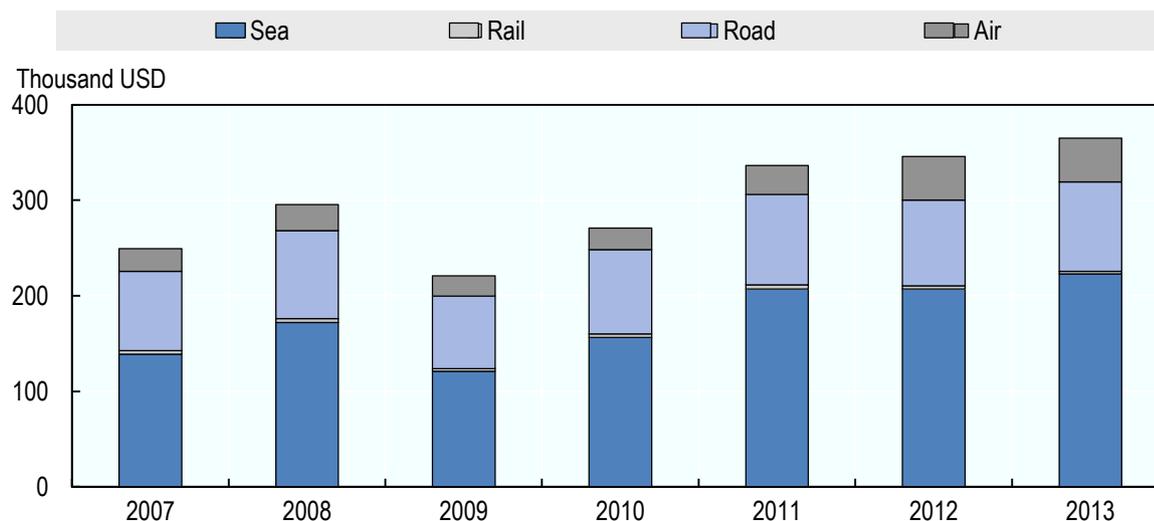
Source: Turkish Statistical Institute, Summary Statistics on Transportation.

Turkey has committed to a further rail investment of USD 45 billion up until 2035 (TR Prime Ministry Investment Support and Promotion Agency, 2013) and the Ministry of Transport, Maritime and Communication aims to achieve a better balance of transport modes by 2023, by increasing the share of rail in domestic freight transport to 15% (from 5%) and decreasing the road share to 60% (from 85%) (Turkish Ministry of Transport, Maritime and Communication, 2013).

The Turkish State Railway (TCDD), acting as an independent body under the Ministry of Transport, Maritime and Communication in Turkey, has been responsible for managing railway infrastructure and operations for all long-distance and cross-border freight and passenger trains. In 2013, a new rail liberalisation law entered into force. Broadly based on the European Union model, the law separates infrastructure management from operational service delivery and provides open track access for freight operators that might want to compete with TCDD's freight operator. This restructuring also allows private companies to construct new infrastructure and run trains on public tracks.

Maritime transport dominates Turkey's foreign trade and has experienced the fastest growth between 2007 and 2013. In 2013, maritime transport accounted for 86% of Turkish foreign trade by volume, followed by road transport (11%) and railways (1%). In terms of value, the share of maritime transport was 50%, road 36%, air 10% and railways 1% (See Figure 5). Sea transport is projected to remain the dominant transportation mode for international trade in 2025, measured in tonne-kilometres. The average share of rail transport is estimated to remain at around 1% between 2010 and 2025, according to ITF's baseline projections (Martinez, et al., 2014).

Figure 5. Turkey's international trade by mode of transport



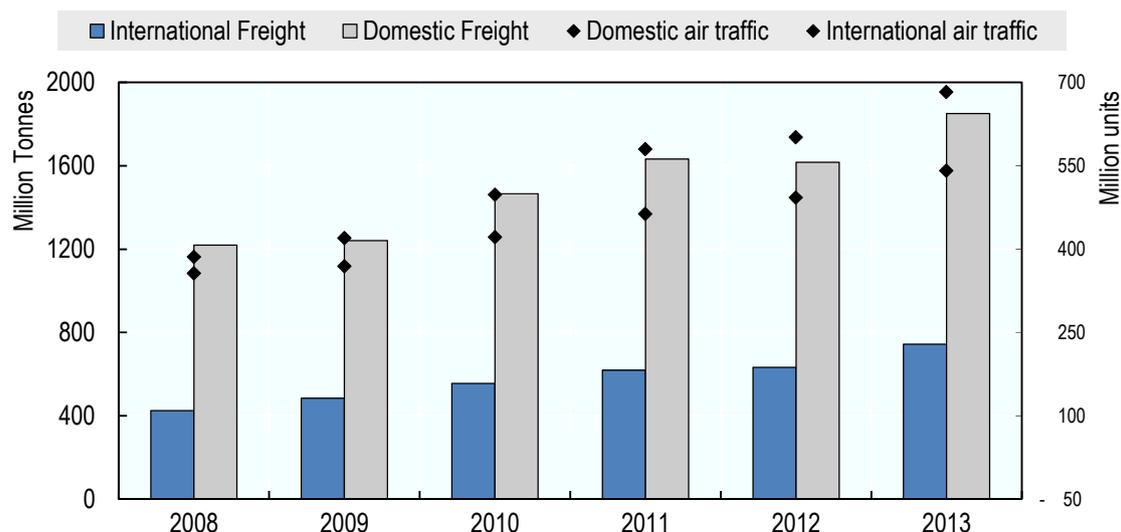
Source: TurkStat, Summary Statistics on Transportation.

According to calculations by industry experts, Turkish container port capacity today is 12.3 million TEUs/year (7 million on the Marmara coast, 3.2 million on the Mediterranean, 1.6 million on the Aegean, and 0.5 million on the Black Sea), with a utilisation rate of less than 60%. Current plans to build new container terminals and expand existing ones will bring the total capacity of public ports to 19.6 million TEUs/year and that of private ports to 10.2 million TEUs (Port Finance International, 2013). Despite sufficient capacity of terminal facilities for loading and unloading containers, port infrastructure of Turkey still suffers from poor connections to high-quality roads and railways. Delays caused by these poor connections are especially problematic for the transport of perishable goods.

Ports and berthing facilities in Turkey are owned and operated by three different groups: state owned companies, municipalities and private companies. Major ports are owned and operated by the Turkish State Railways (TCDD) or Turkish Maritime Organisation (TDİ). The Turkish ports sector has undergone extensive privatisation since the late 1990's. Between 1997 and 2003, 13 small ports were privatised, followed by privatisation of 4 larger ports in the last decade. Privatisation of 13 major ports is scheduled for the near future.

Turkey has undergone a significant development of its civil aviation sector during the last five years and aviation is now Turkey's fastest growing transport sector. Figure 6 gives an overall picture of the international and domestic air market in Turkey. Air freight transportation has grown by 61% between 2008 and 2013. The main cause of this is the liberalisation of the sector and economic growth in Turkey. Currently, there are more than 80 companies actively operating in Turkey's air transport sector. Nonetheless, Turkish Airlines is still the leading carrier with around 50% market share both in domestic and international flights.

Figure 6. Aviation market in Turkey



Source: TurkStat, Summary Statistics on Transportation.

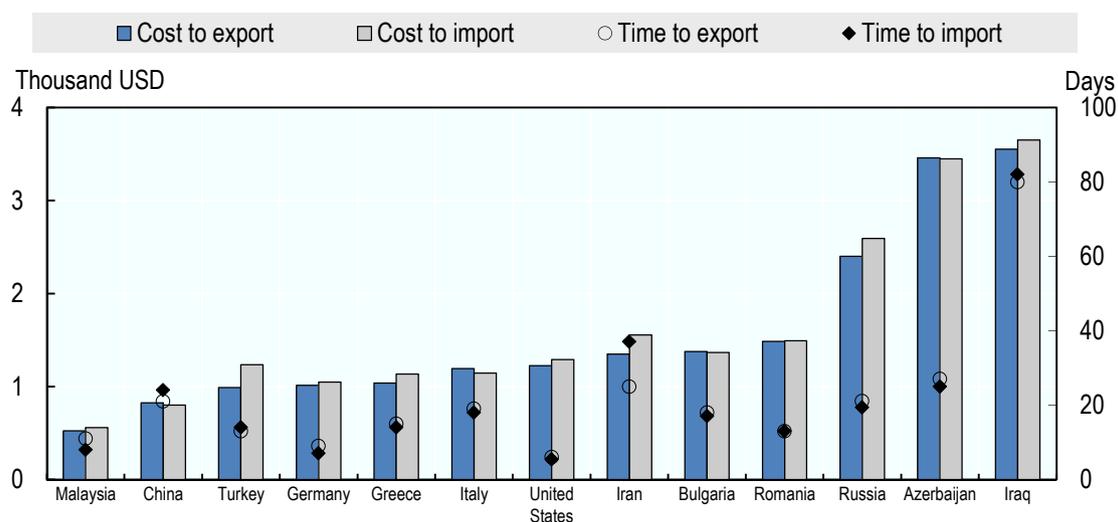
Turkey has an extensive network of chambers of commerce and industry associations. The Istanbul Chamber of Commerce is involved with export initiatives, and communicates with the central government in Ankara. The Union of Chambers and Commodity Exchanges of Turkey (TOBB) also finances the building of new Turkish border crossing points. Other trade associations, such as the Turkish Freight Forwarders and Logistics Service Providers Association (UTIKAD), Turkish Exporters Assembly (TIM), and the International Transporters Association (UND) are strong promoters of the logistics industry and support the development of transportation infrastructure and services.

The Turkish logistics market has grown by 20% in the last 5 years, reaching an estimated size of USD 80-100 billion, and is forecast to reach USD 100-140 billion by 2017 (TR Prime Ministry Investment Support and Promotion Agency, 2013). Double digit growth rates in the industry have attracted many international players, mostly within joint ventures. Turkish logistics performance is primarily bolstered by the development of the private sector, which has evolved significantly in the last decade. It constitutes a growing number of international companies with overseas offices and the industry has experienced a transition from independent logistics service suppliers to integrated logistics service providers. The Turkish logistics industry in a wide sense accounts for 7-8% of total GDP. Most manufacturing companies run their logistics operations in-house without extensive use of third-party logistics (3PL) providers. It is estimated, that almost 75% of logistics activities in Turkey are covered by in-house resources (Iskan & Klaus, 2013).

The efficiency of customs operations or procedures and border administration play an especially important role in delivering high-quality logistics performance. As international trade volumes expand over time, the need to streamline customs procedures to prevent time delays or border bottlenecks takes on greater importance. Turkey has recently increased the number of automated customs procedures, reduced the number of required trade documents, improved customs administration and negotiated border cooperation agreements. As a result, readying goods for transport in Turkey takes on average only half as long and costs

less than half than it does in the Europe and Central Asia (ECA) region⁴ – where it takes on average 25 days and costs on average USD 2 100, respectively (Arvis, et al., 2014). The cost and time of shipping a standardised cargo of goods by sea transport is presented in Figure 7. The left axis illustrates the cost in thousand USD and right axis provides customs clearance times in terms of days. Even though Turkey performs better than its neighbouring countries in terms of time and cost of shipping, the country still underperforms compared to countries such as Malaysia and Greece.

Figure 7. **Time and cost of shipping a standardised cargo of goods by sea transport in 2014**



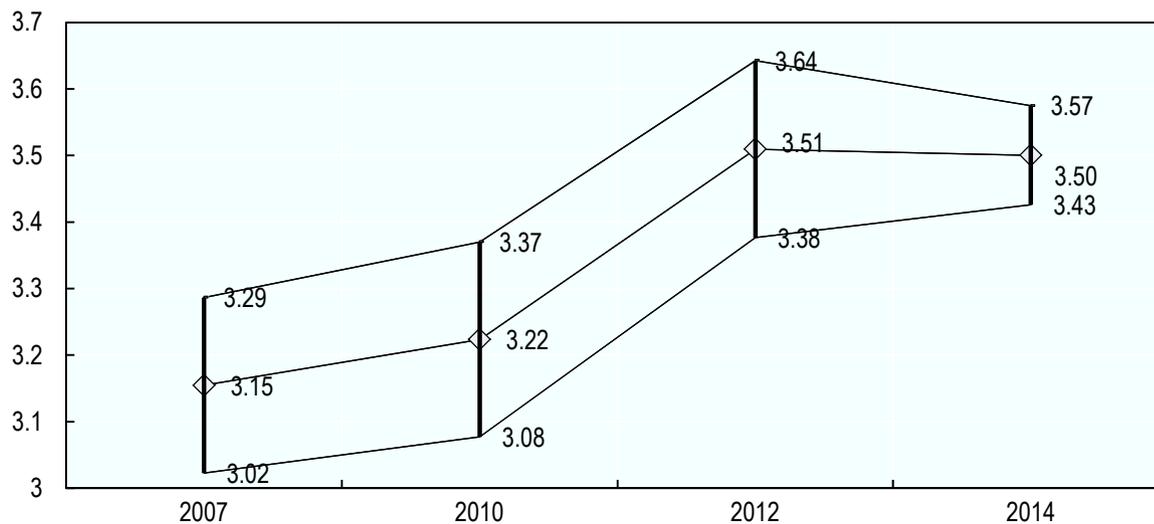
Source: (Arvis, et al., 2014).

Turkey in the LPI

The World Bank's Logistics Performance Index (LPI) places Turkey in a relatively good position. Figure 8 presents Turkey's LPI scores with confidence intervals from 2007 to 2014. In 2014, Turkey was ranked number 30 among 160 countries, with a score of 3.50. This gave Turkey the third highest ranking of the upper-middle-income (UMI) economies, after Malaysia and China. It also ranked ahead of 13 EU countries, including Bulgaria, Greece, and Poland. Despite the significant increase (9%) in its overall LPI score from 2010 to 2012, almost no change is observed between 2012 and 2014, resulting in a slight decrease in Turkey's LPI ranking. Yet, the confidence interval of the score narrowed, which refers to a higher certainty and increased statistical significance for the performance estimates.

⁴ The World Bank region ECA excludes EU countries and e.g. Norway and Switzerland.

Figure 8. Overall LPI score for Turkey 2007-2014 with confidence intervals

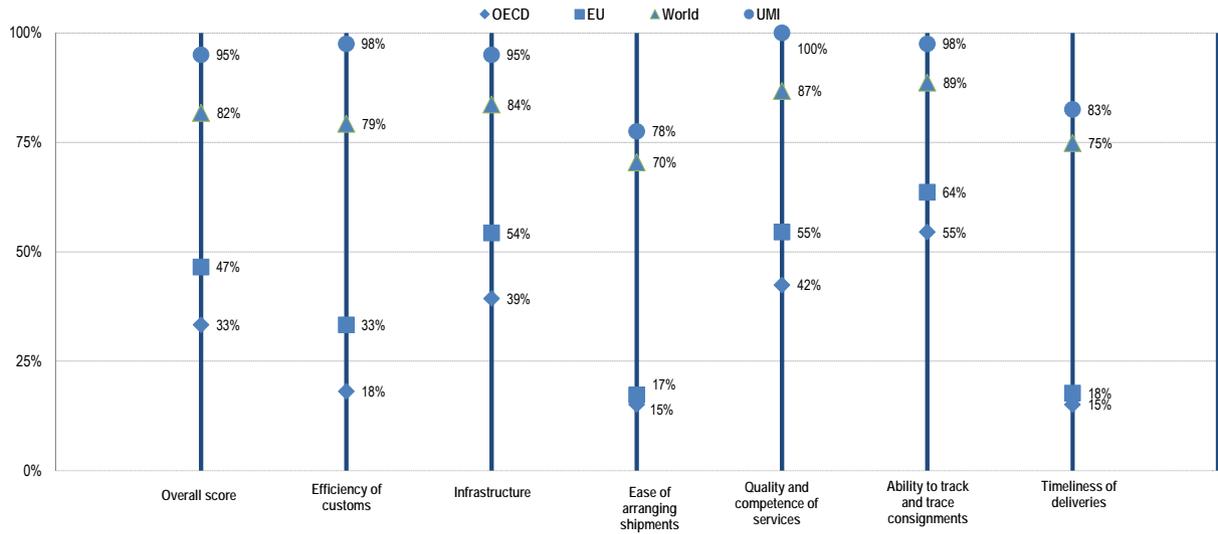


Source: (Arvis, et al., 2014).

Note: min. = 1, max. = 5.

The strengths and weaknesses in Turkey's relative performance are revealed by more detailed analysis of the six dimension of the LPI. Figure 9 displays the percentile ranking of Turkey against the world, OECD, EU, and upper-middle-income economies for the overall LPI score and its six sub-components. Overall, Turkey performs well in comparison with other upper-middle-income economies and the world at large, ranking in the upper quartile of countries. However, in comparison with the EU and OECD countries, Turkey's logistics performance generally fluctuates between the lowest and the second lowest quartile. Turkey performs rather well in quality of logistics services and tracking and tracing, but less well in timeliness and competitively priced shipments.

Figure 9. LPI percentile ranking of Turkey compared with reference groups



Source: (Arvis, et al., 2014).

Notes: Vis-à-vis selected peer groups: Upper-middle-income countries UMI (N = 41), World (N = 160), OECD (N = 34) and EU (N = 28).

The increase in Turkey's overall LPI score between 2010 and 2012 was largely driven by improvements in indicators such as customs, infrastructure, and tracking and tracing capability. Trends for the individual dimensions of the LPI in 2007-2014 are presented in Figure 10. The absolute scores for timeliness and ease of arranging shipments have declined over the last two years, while customs and tracking and tracing performances have shown the greatest improvements. Trends in the scores have been reflected to rankings as well.

Figure 10. **LPI scores for Turkey by dimension 2007-2014**



Source: (Arvis, et al., 2014).
 Note: min. = 1, max. = 5.

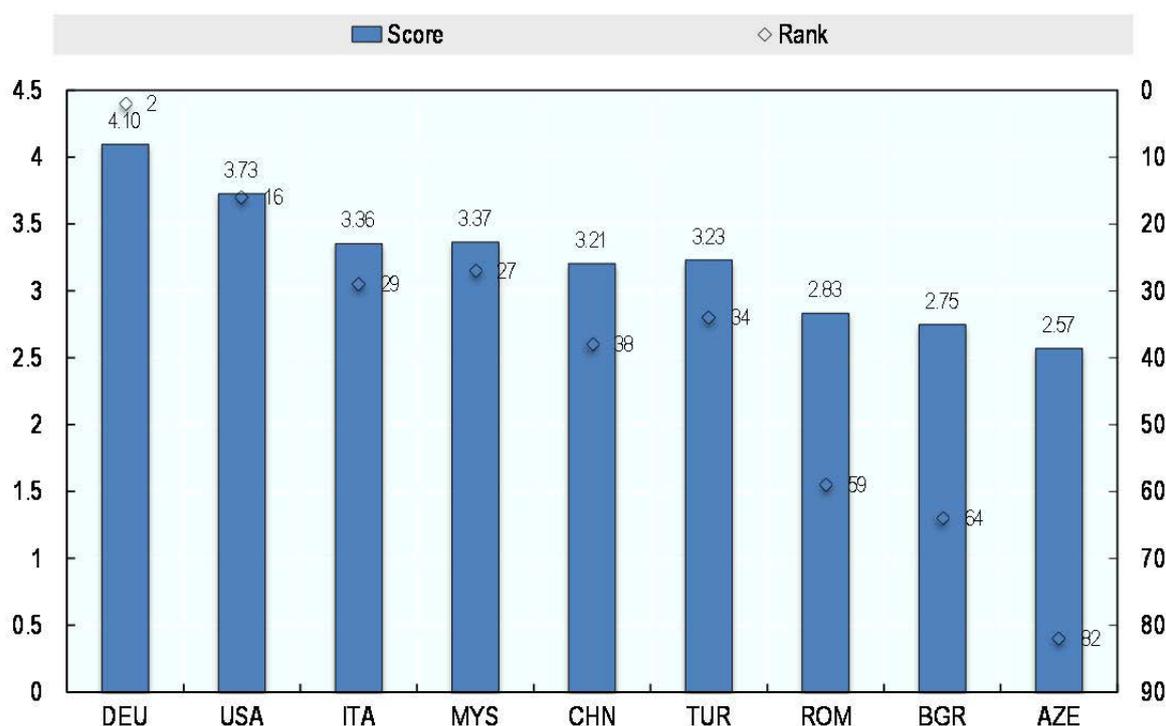
4. Behind the LPI: Drivers and barriers of Turkish logistics performance

This chapter applies the methodology described in Chapter 2 to identify key policy actions that affect logistics performance and national competitiveness in Turkey. In order to assess Turkey's comparative performance, we compare its results with a peer group comprising Germany, United States, Italy, Malaysia, China, Romania, Bulgaria, and Azerbaijan. This group includes countries in the same income group, countries with geographical proximity, world trade leaders and the top performer in LPI.

The efficiency of customs and other border agencies

The efficiency of customs and border clearance is measured in terms of speed, simplicity and predictability. The efficiency of customs clearance was one of Turkey's two lagging LPI components in 2014, although the country made significant progress in this dimension after 2010. On a comparative basis, Malaysia is the only country in the upper-middle-income economies performing better than Turkey in this LPI sub-dimension (Figure 11).

Figure 11. LPI customs clearance scores of selected countries



Source: (Arvis, et al., 2014).

Notes: Peer Group Scores (left-hand axis; 1 = min; 5 = max.) and country ranks (right-hand axis).

The 2014 domestic LPI results indicate that the main determinant of the performance difference between Malaysia and Turkey is the efficiency of processes in clearance and delivery of shipments (Table 1). Malaysia significantly lags in transparency of customs clearance procedures. However, all respondents evaluated the country's efficiency of customs clearance processes as high or very high both for imports and exports.

Generally Turkey outperforms most of its regional competitors. On the Asia-Europe trade corridor, among the countries in the region, only Greece (which primarily benefits from EU membership) has a higher customs score than Turkey.

Table 1. **Customs process efficiency**
(respondents answering “often” or “nearly always”, in %)

	Turkey	Upper Middle Income	Europe/Cent. Asia	Malaysia	Germany
Transparency of other border agencies	52	65	77	67	70
Transparency of customs clearance	53	69	80	33	80
Expedited customs clearance for traders with high compliance	70	60	81	67	80
Clearance and delivery of imports	74	75	93	100	80
Clearance and delivery of exports	90	81	91	100	85

Source: (Arvis, et al., 2014).

Reform and automation of customs procedures

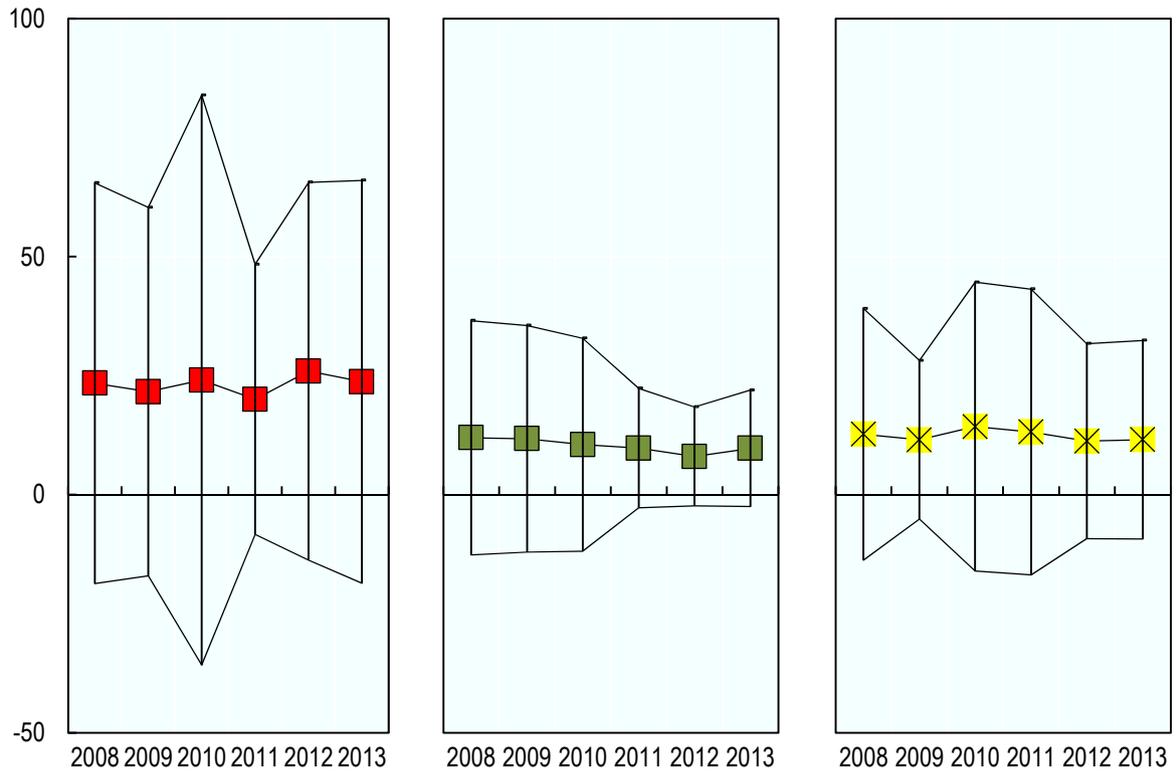
After adopting a new customs law in 2009, Turkey accelerated regulatory harmonisation with the EU and the implementation of modern techniques. With regard to international co-operation, Turkey has signed a considerable number of bilateral agreements on police and customs cooperation and mutual assistance, including protocols on exchanges of pre-shipment information. In December 2012, Turkey joined the Convention on Common Transit. This reduced problems in transit zones and allowed Turkish carriers to transport goods in Europe and in the European Free Trade Association (EFTA) countries using the same electronic processes as other carriers. Turkey has also made significant reforms in the ways it discovers and processes suspected contraband by improving operations in its customs laboratories and starting to standardise goods classification schemes. However, conflicts still arise from the use of different classification schemes by different authorities. These slow down trade and contribute to unreliability and poor customs performance.

Even though average clearance times haven't changed significantly, Turkey's customs clearance has improved as a result of a decrease in the *variability* of clearance times. Simplification and automation of customs procedures, increased productivity gains due to improved IT capability, and investment in improved management and human resources capability have all contributed to this improvement. Turkey experienced a decline in their customs clearance performance score in 2010. However, as a result of reforms, its customs clearance score increased from 2.82 to 3.23 between 2010 and 2014.

Reduced variability of clearance times

Figure 12 illustrates average customs clearance times (hours) within one standard deviation range for red and yellow channels. The changes in the coefficient of variation are also presented in Table 4. Despite increasing trade volumes, border crossing variability has been reduced in all channels from 2010 to 2014. These numbers provides evidence supporting the importance of variability in clearance times on customs score. Successful implementation of build-operate-transfer (BOT) schemes in construction and operation of border gates has also contributed to improvement of customs clearance procedures.

Figure 12. **Border crossing times (mean and variance) in hours**



Source: Turkish Ministry of Customs and Trade.

Table 2. **Turkey's mean customs clearance times**
(with coefficient of variation [CV] in hours)

			2008	2009	2010	2011	2012	2013
Exports	Red Channel	Mean	23.4	21.6	24.1	20.0	25.9	23.7
		CV	1.8	1.8	2.5	1.4	1.5	1.8
	Green Channel	Mean	11.9	11.8	10.5	9.8	8.0	9.7
		CV	2.1	2.0	2.1	1.3	1.3	1.3
	Yellow Channel	Mean	12.7	11.5	14.3	13.2	11.2	11.6
		CV	2.1	1.4	2.1	2.3	1.8	1.8
Imports	Red Channel	Mean	50.3	33.6	41.7	49.5	45.0	66.0
		CV	1.6	1.4	1.6	1.4	1.3	1.3
	Green Channel	Mean	26.8	18.7	10.5	18.3	16.2	17.5
		CV	2.1	2.2	2.1	1.6	1.5	1.5
	Yellow Channel	Mean	33.1	30.7	36.8	31.7	28.5	34.6
		CV	2.0	1.8	1.1	1.8	1.5	1.6

Source: Turkish Ministry of Customs and Trade.

Increased utilisation of computerised border clearance systems

The computerisation of customs offices and the automation of customs procedures is one of the key factors in improvement of the customs-related LPI score. By the end of 2011, legislative arrangements concerning paperless declarations were implemented, e-signature/m-signature for customs declarations were made compulsory, 100% of customs transactions were computerised and paperless customs declaration procedures were introduced in all customs offices in Turkey.

All automated customs offices are now connected with each other and to central headquarters via local area and wide area networks. In the last five years, existing customs automation systems were further developed to work in sync with other external systems and to allow external access for traders and foreign trade actors. As of January 2012, all custom offices in Turkey started to use the New Computerised Transit System (NCTS), which is a system of electronic declaration and processing that enables traders to submit community transit declarations electronically. The system reduces the costs incurred with the paper-based system of declaring goods. NCTS also reduces time spent waiting at customs by sending declarations electronically in advance of shipments. The system significantly contributes to increased efficiency of transit operations, prevention and detection of fraud and acceleration of transit transactions.

With a new set of legislations and actions implemented recently, a further increase in efficiency of customs clearance procedures is expected to come. In March 2012, the Turkish government launched the single-window system, providing a centralised platform to streamline and simplify the operation of customs and other government agencies involved in border control. Under the single-window system, all required documentation and information needed for the import or export operation is submitted by the trader to a single application point. The system coordinates border control procedures, such as port transactions, customs transactions, technical controls and licensing, through an integrated management system. Single window implementation has been divided into two phases due to the complexity of the system. In the e-document phase, traders can apply to related public institutions via electronic or paper based methods. These institutions then send data relative to the traders to customs electronically. A registration number is assigned to each application and its status can be checked electronically. The e-application process is currently in its pilot phase. Full implementation will take place after an adoption process including software development,

review of current legislation and training sessions for both public officials and traders. Future plans include the incorporation of additional services and new features in relation to international data exchange.

An Authorised Economic Operator (AEO) programme was launched in January 2013 to enhance security through granting recognition to reliable operators and encouraging best practice at all levels in the international supply chain. Turkey has started negotiations with the EU, Korea and the United States to sign Mutual Recognition Agreements (MRA) to increase the benefits of the system.

Although the technical and operational conditions for the introduction of 'one-stop' controls at border gates are, in many cases, satisfactory and have achieved the improvements described above, there is still no single systemic window allowing visibility of all systems. Information exchange between services occurs on an ad-hoc basis and is not yet institutionalised. There is a process underway for database integration which will include databases from the Customs, Ministry of Interior, Ministry of Foreign Affairs, Land Forces and Coast Guard.

Integrating activities of border management agencies

Another obstacle to efficient management of customs clearance processes is the lack of co-ordination between the government departments and agencies involved in controlling cross-border transactions. Despite recent improvements, border crossing variability is still an issue, especially during peak seasons, resulting in long delays. This is partly related to insufficient infrastructure. It is also due the multiplicity and diversity of data and document requests by different agencies (sometimes uncoordinated), increasing transaction costs and the risk of making mistakes.

According to "Doing Business" (World Bank, 2013) on average eight documents are required for export and import operations in Turkey. Yet, according to a study conducted by the Ministry of Trade and Customs in 2011, 330 different documents are used in customs transactions and 94% are collected from institutions other than the customs administration. Similarly, only 1.5 days of the average time recorded for imports are spent in customs agency. The remaining days are spent for collection of the documents from other public and private institutions, laboratory inspections and other supporting processes. The complicated and rigorous customs controls and elevated fines that serve to thwart the corruption of a few actors' places high time and money costs on all others.

Improvement of border facilities

Around 40 per cent of Turkey's foreign trade is conducted through the country's land border crossing point (BCPs). Modernising inefficient and ineffective (BCP) has become one of the most important issues in the country's reconstruction policies. However, these policies have not been realised for some time due to a lack of financing.

A private institution, the Customs and Tourism Enterprises (GTI), established by The Union of Chambers and Commodity Exchanges of Turkey (TOBB) in 2005, is undertaking the modernisation of BCPs, including the actual border gates. This is done using the 'build-operate-transfer' model in a partnership between TOBB and government and public institutions. Modernisation of five BCPs is already completed, and the reconstruction and renovation of five new points is still ongoing.

The "Build" stage covers modernisation of physical border gates, reconstruction of the physical and telecommunications infrastructure, building supporting facilities, and providing the advanced technological equipment. In the "Operation" stage, GTI operates only the commercial areas; food and beverage stores, banks, souvenir shops, gas stations and duty-free stores, and also assists cleaning and maintenance services. Any administrative processes and procedures such as customs clearance and travel documents inspection are

undertaken by government institutions and bodies. At the end of the concession period, the modernised facilities will be transferred back to the public sector in the “Transfer” stage.

As a result of this modernisation, waiting times at the borders have been substantially reduced, queues shortened and vehicle and passenger passing time sped up by a factor of four. The technical improvements that accompanied the modernisation of BCP infrastructure have also made an effective contribution to security and control over smuggling and human trafficking.

Figure 13. **Location of the modernised border gates in Turkey**



Source: <http://www.gtias.com.tr>.

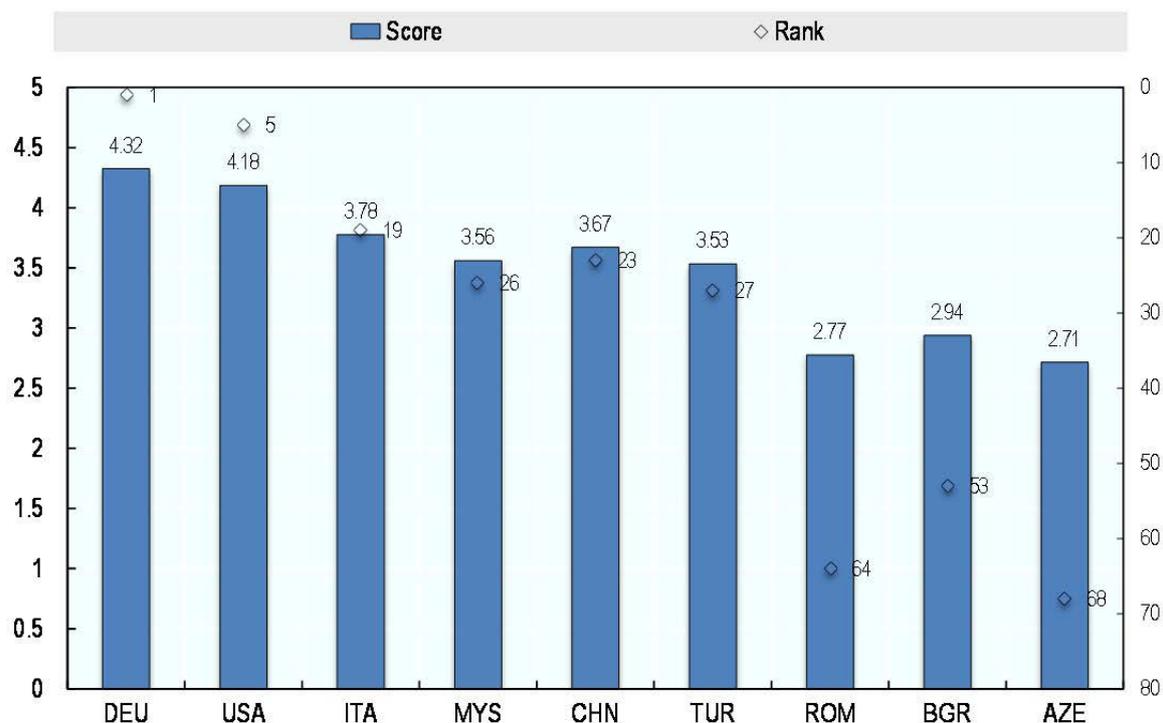
The quality of trade and transport infrastructure

Infrastructure development is essential for assuring basic connectivity and access to gateways. Surrounded by four seas on three sides, Turkey is geographically advantaged with easy access to Eastern Europe, Central Asia, the Middle East and North Africa. However, inland connections are relatively underdeveloped due to the hilly landscape and poor infrastructure in remote areas.

In World Economic Forum’s global competitiveness index for 2013-2014, Turkey is ranked 27th out of 144 countries for its transport infrastructure. In particular, the country benefits from reasonably developed road and air infrastructure, according to WEF. Maritime and rail transport infrastructures rank below average, with a ranking of 63rd in ports and 52nd in quality of rail infrastructure (World Economic Forum, 2013).

As shown in Chapter 3, Turkey’s LPI score in quality of trade and transport infrastructure has significantly improved since 2007. Both public and private infrastructure investments in the last ten years have greatly improved the logistics services provided in the country. Many new airports have been built, dual carriageways have spread across the country, the high-speed train network has started to reach major cities and the capacity of Turkish ports has been increased. The Turkish government has set challenging targets to be achieved by 2023 for further development of transportation and logistics infrastructure.

Figure 14. LPI quality of trade and transport infrastructure scores of selected countries



Source: (Arvis, et al., 2014).

Notes: Peer Group Scores (left-hand axis; 1 = min; 5 = max.) and country ranks (right-hand axis).

The 2014 domestic LPI results for the quality of trade and transport related infrastructure (e.g. ports, roads, airports, information technology) are presented in Table 3. Turkey's performance is noticeably above the average for upper-middle-income countries (UMI) in three areas: warehousing, road and port infrastructure.

Table 3. LPI Domestic quality of trade and transport related infrastructure
(respondents answering "above average", in %)

	Turkey	Average UMI	Europe/Cent. Asia	Malaysia	Germany
Ports	88	38	25	67	100
Airports	84	44	33	100	100
Roads	88	29	30	100	100
Rail	39	22	26	100	100
Warehousing	97	55	26	100	100
Telecom and IT	94	59	40	100	100

Source: (Arvis, et al., 2014).

Note: UMI = Upper Middle Income.

Construction of new transport links

Table 4 gives an overall view of Turkey’s transport infrastructure. Restrictive constraints on the port capacities are mainly related to the hinterland areas and connections to other transport modes. Many ports are located in or near cities. Limited availability of land in the hinterland areas and congestion in connections prevents port areas from being able to satisfy capacity extension requirements.

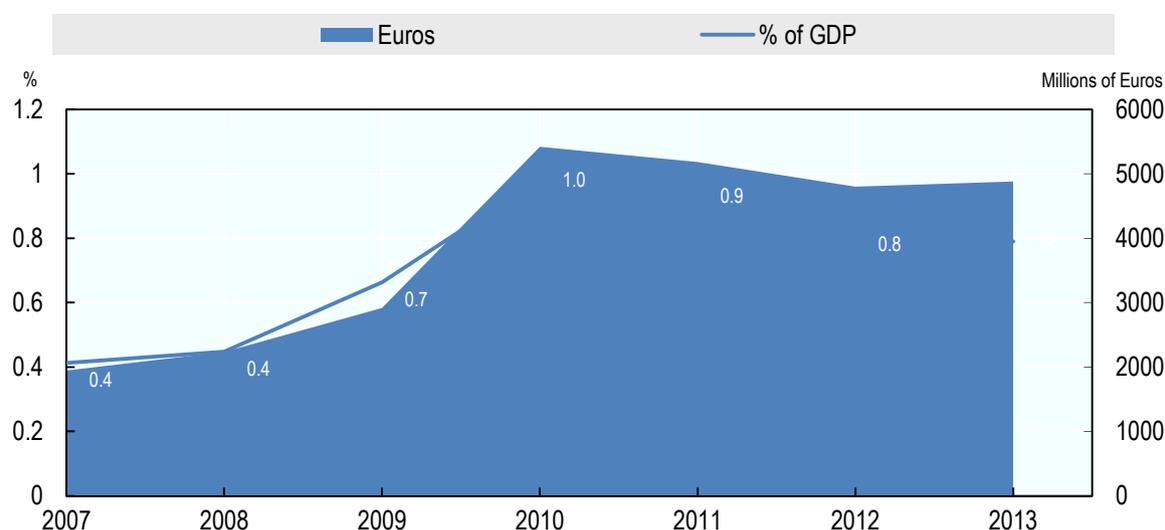
Table 4. **Transportation Infrastructure in Turkey**

Infrastructure type	Turkey 2013
Airports	52 (21 international)
Highways	65 623 km
Railways	9 718 km
Seaport capacity	12.5 million TEUs
Air Freight Transport	2.6 million tons/year
Rail Freight Transport	11 million tons-km/year
Seaport Freight Transport	390 million tons/year
Road Freight Transport	268 million ton-km/year

Source: Turkish Ministry of Transport, Maritime and Communication.

Massive road investments have played a crucial role in increasing Turkey’s infrastructure performance. As Figure 14 illustrates, the percentage of road investment in GDP has doubled in the last 5 years with investments totalling nearly 5 billion Euros in 2013. International freight forwarders are the direct assessors of logistics performance in the LPI methodology and, as they constitute almost 60% of the road freight industry, any improvement in road infrastructure is likely to be reflected directly in the LPI.

Figure 15. **Road Investment and GDP in Turkey**



Notes: In million Euros (right-hand scale) and percentage of GDP (left-hand scale).

Increased private sector participation to provide and maintain transport related infrastructure

The improvement in the infrastructure score also results from strategic actions taken to increase the competitiveness of transport infrastructure and to promote private sector participation in infrastructure development projects (Table 5). The Build-Operate-Transfer (BOT) model has been used extensively for raising road network quality and for developing modern road infrastructure between important industrial centres in Turkey. Logistics connectivity has been improved by the construction of several new motorways and bridges through the BOT model. Similarly, various airports in Turkey have been developed and operated under Transfer of Operating Rights (TOR) model.

Table 5. **Public-Private partnership projects (PPP) in transport in Turkey 2014**

Sectors	Ongoing		Completed	
	Value (Million USD)	Number	Value (Million USD)	Number
Airports	538	2	12 580	8
Roads	8 000	3	195	18
Ports	73	1	2 278	3
Border Gates	22	1	197	7

Sources: Turkish Ministry of Development and <http://ppi.worldbank.org/>.

Currently, a number of ports are being expanded and new container terminals are being built in Turkey. Already, Turkey ranked 21st out of 155 countries in UNCTAD’s Liner Shipping Connectivity Index.⁵ However, the country’s container capacity is expected to triple by 2023, if all current expansion and construction projects are carried out.

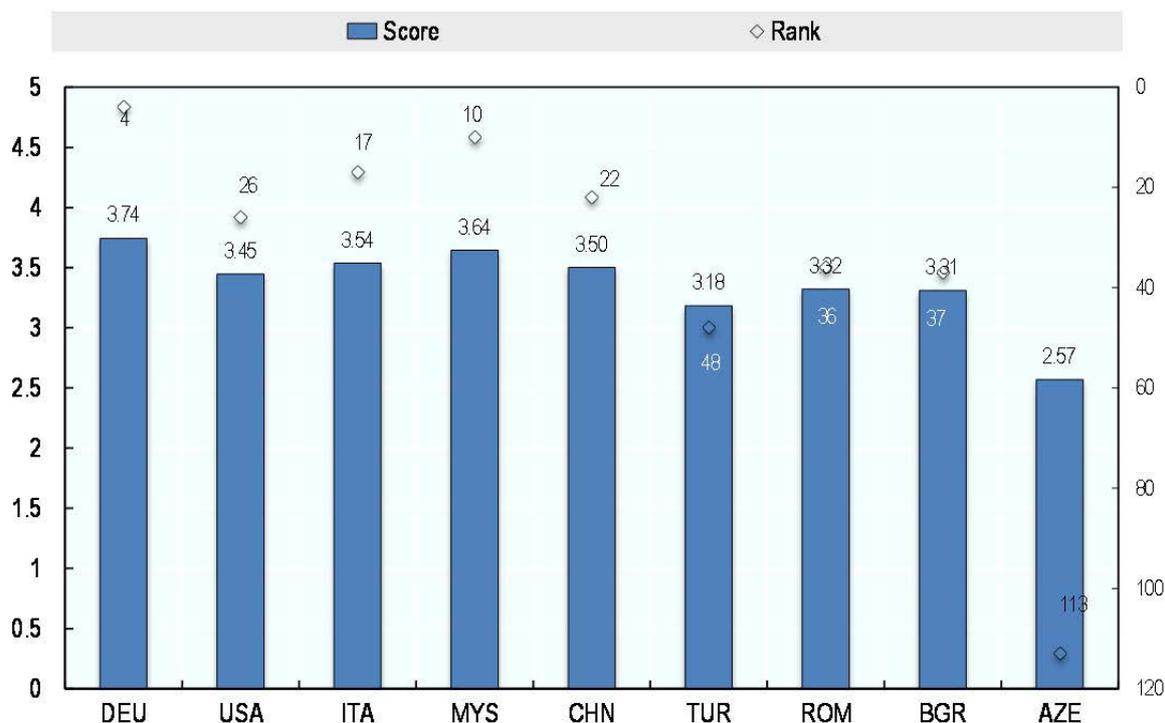
Despite the intense infrastructure investments and capacity enhancement efforts in maritime transport, the freight handling capacity of Turkish ports is still restricted by inadequate hinterland transport facilities and connections between international ports and manufacturing sites. As port hinterland access is limited, increased throughput causes delays to the movement of goods and increased variability in handling times. The Turkish maritime industry also suffers from lack of a standardised system to provide seamless communication between ports and other port related institutions. Due to lack of a system for online data exchange, most of the operations are still paper-based (Keceli, 2011).

Ease of arranging competitively priced shipments

The ease of arranging shipments is the weakest LPI dimension for Turkey. There has been only limited improvement over time since 2007. On this subcomponent Turkey ranks 48th out of 160 countries, and 10th out of 41 UMI economies (Figure 15).

⁵ See <http://unctadstat.unctad.org/TableViewer/tableView.aspx?ReportId=92>.

Figure 16. LPI ease of arranging competitively priced shipments in selected countries



Source: (Arvis, et al., 2014).

Notes: Peer group scores (left-hand axis; 1 = min; 5 = max.) and country ranks (right-hand axis).

The macroeconomic factors generally make services more expensive and may make it hard to arrange low priced shipments in high income countries (Arvis, et al., 2014). Table 6 presents the typical charge for a 40-foot dry container or a semi-trailer when exporting and importing a full load in selected countries. The data illustrates that shipping charges in Turkey are as high as in the high-income economies, despite being a middle-income country. This places Turkey at a disadvantage compared to its regional competitors, particularly over land supply chains.

Table 6. Typical shipping charge for a 40-foot dry container (USD)

	Port		Land	
	Export	Import	Export	Import
Germany	675	892	1 129	1 326
United States	921	769	1 293	944
Italy	647	647	1 316	1 456
China	494	683	683	514
Turkey	759	767	1 165	1 196
Romania	866	707	500	500
Bulgaria	600	600	508	454

Source: (Arvis, et al., 2014), Appendix 3.

Note: Port – from the point of origin to the port of loading. Land – From the point of origin to the buyer's warehouse.

Facility utilisation rates and operational charges related to logistics services are relatively low in Turkey in comparison to the EU and elsewhere. For example, Turkish port service charges are much lower than charges incurred in other major ports around the globe. However, this cost advantage is eroded by longer times spent at the ports due to delays and longer and complicated import procedures (TUSIAD , 2012).

Turkey's heavily road dominated transport system results in high costs related to maintenance, congestion, negative environmental impacts and road safety. High energy costs represent one of the greatest obstacles for road transport and trade.

The 'international shipments' sub-dimension of the LPI does not directly respond to public policies, but is determined by actions by the private sector operating under market constraints. Government policies, nonetheless, play an important role in promoting economic efficiency in the freight transportation sector.

Turkey's logistics performance is bolstered by the development of the private sector. The Union of Chambers and Commodity Exchanges of Turkey's (TOBB) has been one of the leading actors in the country's private sector-led transformation. For example, the Grand Anatolian Logistics Organisation's BALO project, pioneered by TOBB, provided low cost connections between landlocked areas and European markets, through higher utilisation of rail and waterways allowing for movement of large volumes of commodities over longer distances at lower unit costs (see Box 1).

Box 1. Grand Anatolian Logistics Organisation's Project (BALO)

To increase the accessibility of Anatolian manufacturers to European markets, Turkey initiated a combined railway project to transport goods from Anatolia to Europe in 2013. The Great Anatolian Logistics Organisation (BALO), established with the goal of increasing Turkey's share in terms of international railway transport and developing environment friendly and economic transport modes, has partners from Union of Chambers and Commodity Exchanges (TOBB), commodity exchanges, and organised industry zones and Association of International Forwarding and Logistics Service Providers (UTIKAD).

The BALO project aims to facilitate Anatolian trade to and from Europe by reducing freight transportation costs while increasing service quality. According to the scheme, the container freights of Anatolian exporters are brought to Bandirma port by block trains. From Bandirma they travel to Tekirdag by container ships and are then shipped to European harbours and final destinations under a cooperation agreement established with the Austrian Railways. With a capacity of 1 200 tonnes per train, as of 2014, three block trains depart per week. The project cuts transportation costs by up to 50% and decreases the cost difference between western and eastern regions by USD 125-200 per container. To increase the traffic performance, BALO also provides an online tracking system which allows real time monitoring of the freight cargo on the route.

BALO recently signed the Memorandum of Agreement (MoA) with the Viking Train Project that has operated combined transportation through Lithuania, Belarus and Ukraine since 2003, in order to export Turkish shipments through this line. The line provides a connection between the Baltic region's container sea network and the transport systems of the Black Sea, Mediterranean Sea and Caspian Sea. The objective of the Viking Train MoA is to provide efficient and low cost shipments to Eastern Europe by railway, via the Turkish ports of Samsun and Derince. The shipments coming back from the same route are distributed in Anatolia or are shipped on to the Middle East and Central Asia.

Promoting low-cost transport modes

To strengthen combined and intermodal transport and decrease the country's dependence on road transport, authorities recently approved the law on the liberalisation of the Turkish railway transport which has opened doors to private investment. The law also allows international investors to enter into the Turkish railway sector. Government incentives for the railway sector are expected to speed up the privatisation process. For example, the government expanded the definition of "large scale investments" to include the manufacturing

of locomotives and rolling stock. This qualification means that manufacturers can now benefit from a number of incentives such as low corporate taxes, social security support, and land allocation. Expected impacts include improved quality of rail transport services and increased availability of competitively priced shipments.

More generally, high energy costs represent the single greatest obstacle for road transport and trade. Particularly for long distance destinations, diesel accounts for over 60% of total freight costs. Given high domestic energy costs, companies are seeking low-cost practices such as using fuel-efficient trucks or intermodal transport.

The internationalisation of the Turkish transport sector is growing through the entry of large European and Asian logistics groups into the Turkish market, generally via the acquisition of Turkish companies. Turkish logistics providers are also becoming larger, growing both nationally and internationally. Market entry has been made easier to attract FDI and the sector has welcomed several leading international firms over the years. This has elevated competition and led to the inward transfer of technology and expertise.

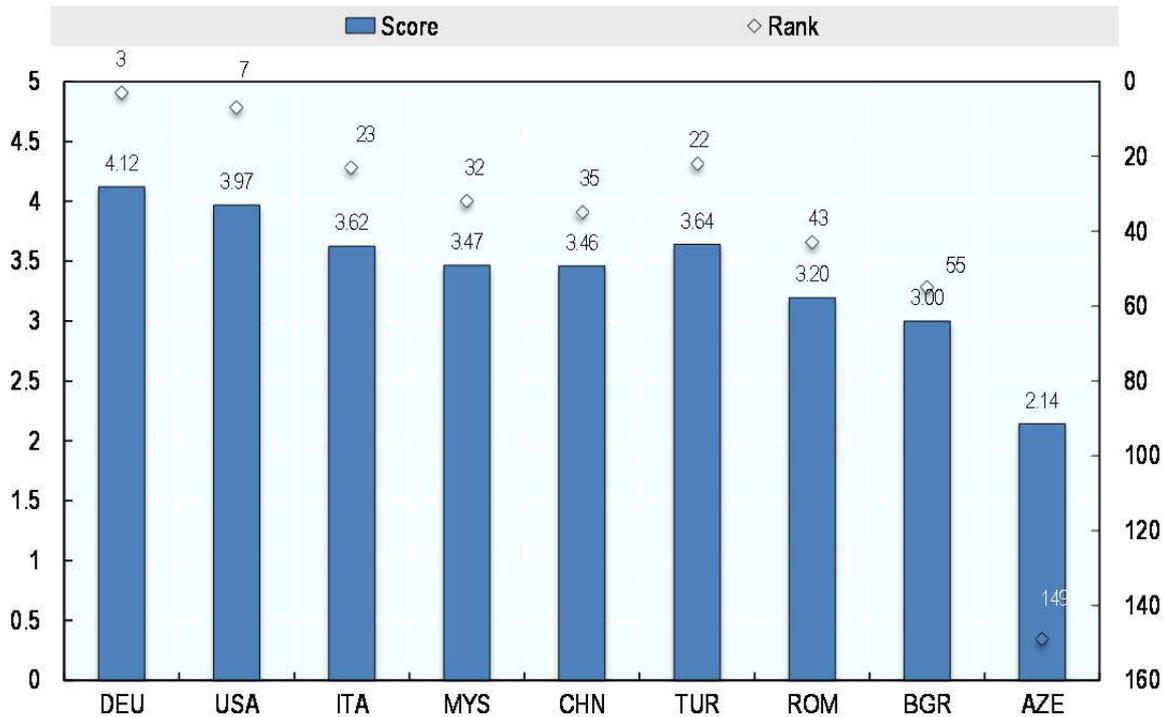
Though Turkey has introduced important regulatory reforms in road, air and maritime transport and launched significant infrastructure investments to promote rail, maritime and air transport, these actions often focus only for the specific single transport mode concerned. Large international companies use intermodal transport for creating a competitive advantage rather than relying purely on one mode of transport. However, the sector is highly fragmented and many smaller logistics firms lack the profit margins and upfront capital required to purchase fuel-efficient vehicles. Similarly, the main obstacle to more generic use of intermodal transport is the lack of intermodal equipment. More than 90% of semi-trailers cannot be loaded onto standard intermodal trains by cranes. At present, no financial and administrative incentives such as tax reduction and subsidy schemes exist to support intermodal transport.

Moreover, there is no national legal framework or provision that regulates national and international intermodal transport or facilitates the transition to lower-cost transportation modes. There is a need for a comprehensive intermodal transportation strategy and framework (ITF/OECD, 2009). The Turkish Ministry of Transport Maritime and Communication is planning to solve this problem through the EU Twinning Project of Strengthening Intermodal Transportation in Turkey, with the goal of preparing intermodal transportation legislation that is harmonised with the EU legislation.

Competence and quality of logistics services

The competence and quality of logistics services category of the LPI measures the overall competence, quality and operational excellence of the logistics and transport operations. Turkey's performance on this dimension is relatively high and has improved by 12% from 2010 to 2014.

Figure 17. LPI Quality of logistics services in selected countries



Source: (Arvis, et al., 2014).

Note: Peer group scores (left-hand axis; 1 = min; 5 = max.) and country ranks (right-hand axis).

Supporting logistics industry and private sector

There is an especially large and diverse pool of internationally-oriented global service providers in Turkey offering transportation, bonded warehousing, fiscal representation and value-added logistics services at competitive rates. Table 7 presents the percentage of respondents evaluating a selected country's quality of logistics services as high or very high. Turkey scores very high for road and maritime transport operations as well as freight forwarding services, but the quality of rail transport operations and supporting services such as customs and inspection agencies lag behind regional and country peer averages.

Table 7. **LPI competence and quality of services**
(respondents answering “high” or “very high”, in %)

	Turkey	Upper Middle Income	Europe & C. Asia	Malaysia	Germany
Road	81	48	61	33	90
Rail	20	21	44	0	68
Air transport	70	60	66	67	94
Maritime transport	83	66	80	100	84
Warehousing and distribution	77	66	77	67	90
Freight forwarders	81	73	81	100	85
Customs agencies	55	55	69	67	85
Quality inspection agencies	47	44	61	33	85
Health/SPS agencies	33	43	59	0	76
Customs brokers	55	61	78	67	80
Trade and transport associations	68	52	58	0	78
Consignees or shippers	61	49	68	33	84

Source: (Arvis, et al., 2014).

Turkey’s logistics performance is primarily bolstered by the development of the private sector. As noted earlier, the sector is getting more internationalised through the entry of large European and Asian transport and logistics groups into the Turkish transport market, primarily via the acquisition of Turkish companies. Turkish logistics providers are also becoming larger, growing both nationally and internationally. Market entry has been facilitated to attract FDI and the sector has also welcomed several leading international firms over the years. This has increased competition, and also led to the inward transfer of technology and expertise.

Chambers of commerce and industry associations take active roles in the development of the sector and the improvement of service quality. Several successful projects, such as the build-operate-transfer approaches for the modernisation of border gates (see Section 2) and the BALO project (see Box 1) have been carried out by these associations. Also in this context, the International Transporters Association (UNDTA) offers consultancy, certification and training services for its members on a wide range of topics such as legislations, insurance, finance, institutionalization, and safety and security.

Supporting human resources and skill development in logistics and transport

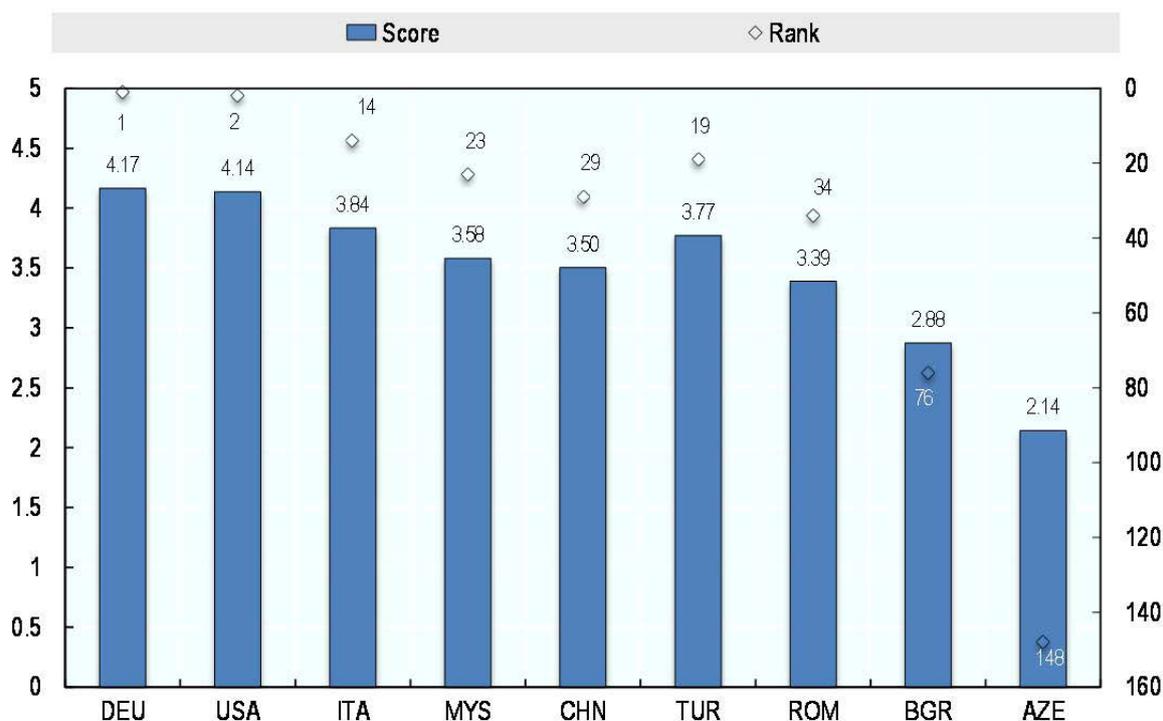
Despite the high growth of the logistics industry, the availability of skilled work force in the sector is scarce, leading to inadequate management, especially at the tactical and strategic levels. The Turkish logistics sector generally suffers from poor organisational skills, lack of leadership, lack of alignment between positions and skills and lack of sufficient research and development activities. The transport and logistics industry appears highly unattractive to workers due to its poor image, extreme working conditions, low pay scale and lack of clearly defined career path. Incentives to support professional training and higher education in areas of logistics and transport are scarce. The most immediate requirement for skill development is in the technical and middle management levels.

Ability to track and trace consignments

It is important to identify the exact location and the route of each consignment up to its delivery to the end customer. Traceability is a product of the logistics sector as a whole, since all parties in the supply chain contribute to this component.. Improved traceability creates more reliable distribution channel processes, provides a better risk management system and helps improve internal and external business.

Ability to track and trace shipments is Turkey's strongest point in the LPI; the country's performance on this dimension has shown a consistent and remarkable improvement since 2010. Turkey has improved its relative ranking in this area from 56th in 2010 to 19th overall in the most recent edition of the LPI and is performing better than many high income economies (Figure 17).

Figure 18. LPI Tracking and tracing in selected countries



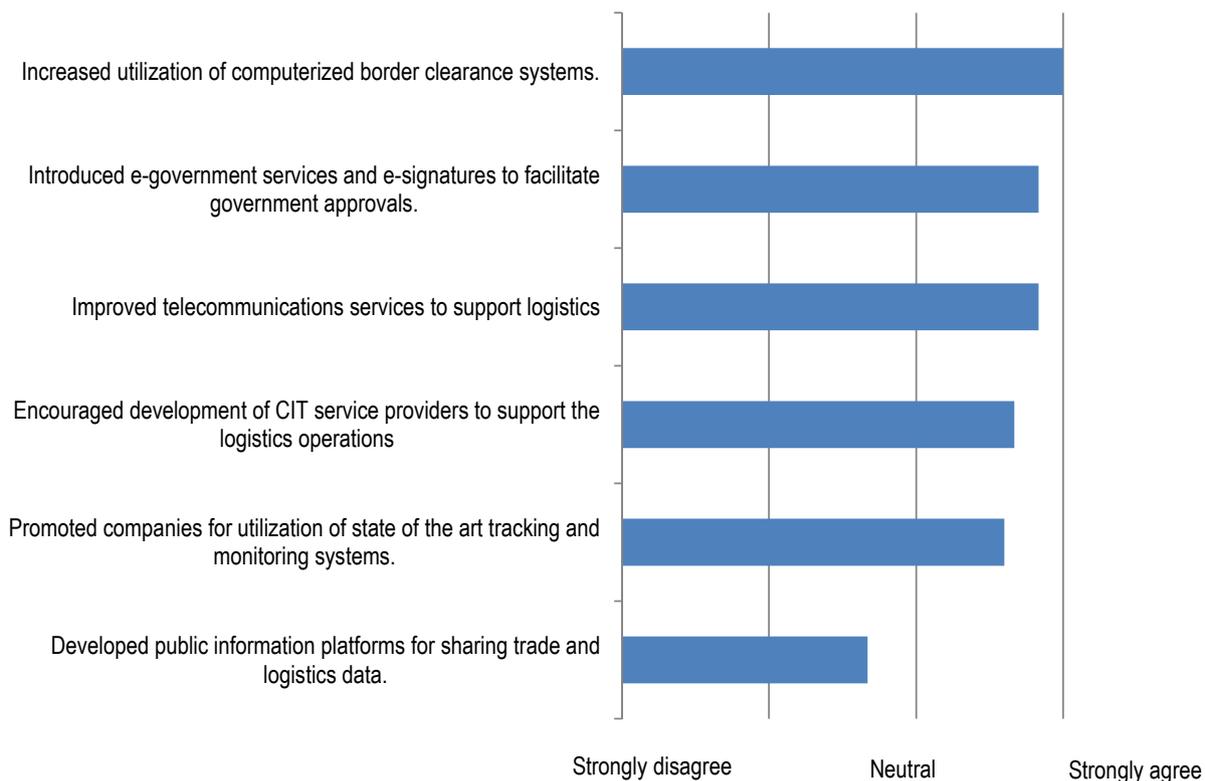
Source: (Arvis, et al., 2014).

Note: Peer group scores (left-hand axis; 1 = min; 5 = max.) and country ranks (right-hand axis).

Promoting utilisation of ICT in logistics services

As noted in Section 2, improvement in tracking has been made possible by the widespread use of information and communication technologies (ICT) in public and private institutions. ICT provides a convenient way of improving tracking and tracing by enabling the gathering, organisation and re-distribution of information regarding products, services and trade regulations. Figure 18 shows that LPI respondents' highlight the use of ICT in rating this sub-dimension.

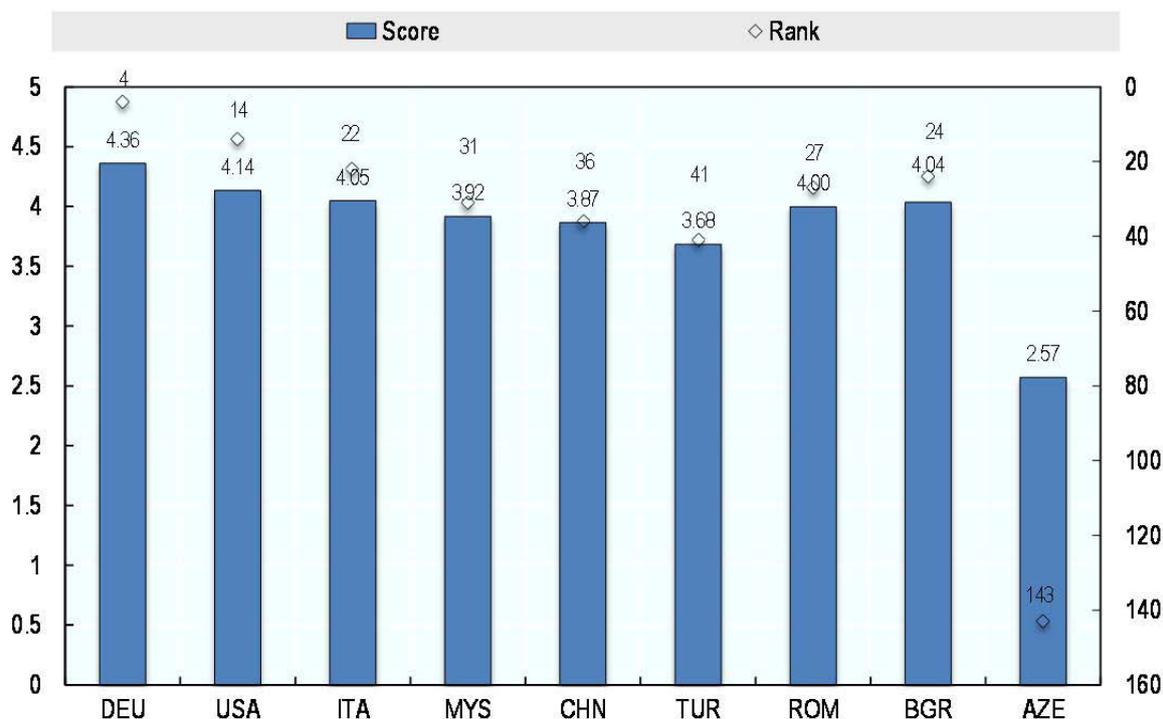
However, the high investment risk of advanced ICT systems is a barrier to uptake, particularly if there is uncertainty surrounding governments' communications policy and spectrum allocation. Therefore, policymakers must keep up to date with ICT as it develops, and create a stable communications framework that enables logistics planning by the private sector (OECD, 2002).

Figure 19. **LPI Respondents' assessment of Turkey's use of ICT for tracking and tracing**

Source: (Arvis, et al., 2014).

Timeliness of shipments in reaching destination

Measuring timeliness of shipments in reaching destination captures the reliability of shipments in terms of delivery times. Shipment times depend on various factors including the type of product, planning and management, logistics services and distances. They can also be disrupted by political risks or weather conditions. Turkey's performance in this area is relatively low in comparison with the score of regional competitors. The score has experienced a significant decrease since 2010.

Figure 20. **LPI Timeliness of shipments in reaching destination in selected countries**

Source: (Arvis, et al., 2014).

Notes: Peer group scores (left-hand axis; 1 = min; 5 = max.) and country ranks (right-hand axis).

Table 8 gives the average time measures for selected countries in terms of export and import lead times recorded in the Domestic LPI report, and trade times, recorded by the World Bank's *Doing Business* report. The latter also includes waiting times between procedures, for example, during unloading of the cargo.

Table 8. **Trade lead times for selected countries**

	Export Lead Time*		Import Lead Time*		Time to Export**	Time to import**
	Port	Land	Port	Land		
Germany	1	2	2	3	9	7
USA	2	2	3	3	6	5
Italy	1	2	1	1	19	18
Malaysia	1	1	-	-	11	8
China	2	3	2	2	21	24
Turkey	2	2	2	3	13	14
Romania	2	2	-	1	13	13
Bulgaria	1	1	1	1	20	17

Sources: (World Bank, 2015) and (Arvis, et al., 2014).

Notes: * Time taken to complete trade transactions (days) (Arvis, et al., 2014)

**Time necessary for a procedure starts from the moment it is initiated and runs until it is completed (days)

Timeliness of the shipments mainly is an indicator of supply chain reliability. A long lead time is not necessarily a problem if delivery is predictable and demand is stable. However, if there is uncertainty about future demand, long lead time is costly. Table 9 details possible causes of delay that are not directly related to how domestic services and agencies perform in benchmark countries. Delays in Turkey are rarely caused

by compulsory warehousing or criminal activities. Of the five LPI delay categories, maritime transshipment has the highest percentage of respondents who often or always experience delays.

Table 9. **Sources of major delays**
(respondents answering “often” or “nearly always”, in %)

	Turkey	Upper Middle Income	Europe/Cent. Asia	Malaysia	Germany
Compulsory warehousing/transloading	6	46	38	0	15
Pre-shipment inspection	13	60	49	0	20
Maritime transshipment	33	54	59	33	21
Criminal activities	3	40	40	33	11
Solicitation of informal payments	10	53	64	33	5

Source: Arvis et al., 2014.

Reducing transport network system vulnerability

The need to reroute shipments due to political instability and war in neighbouring countries has been one of the major reasons for delays in delivery times. In addition, the current practice of differentiated access rules for infrastructure and markets leads to the use of sub-optimal routes, some of which are limited by capacity restrictions. This results in increased delivery times and shipment costs.

Turkish trucks are directed to use the rolling highway (Ro-La) rail lines from Slovenia and Italy in order to transit through Austrian territory. Ro-La operations requires truck trailers to be loaded onto specially adapted rail wagons and is often used to alleviate crowding on constrained road corridors – as in the case of trans-mountain passages. In 2012, 90% of the trucks carried on the Slovenia-Italy Ro-La lines were carrying a Turkish plate. Due to capacity constraints in those lines, transporters often experience long waiting times during peak hours.

Any uncertainty in the border crossings creates unpredictable circumstances and delays, increased transactional costs and can even lead to the loss of business and opportunities. On a daily basis, such unpredictable circumstances can be the result of multiple and contradictory documentation requirements or lengthy inspection procedures by agencies that include customs, immigration, health and sanitary authorities, police and other security agencies. However, certain external events, when combined with existing network vulnerabilities, have the potential to cause widespread, systemic disruptions with high impacts, such as natural disasters, wars, political disputes, or government imposed legal restrictions.

For example, a transit permit crisis that closed the border between Turkey and Bulgaria for almost two weeks created a truck queue awaiting border crossing over 10 kilometres long. Transporters immediately turned to alternative routes to transport goods to Europe, yet the absence of one of the major and cheapest transit options created significant losses for Turkish hauliers. Similarly, the number of Turkish trucks crossing the Syrian border has decreased by 87% after the free trade agreement between the two countries was suspended and Syria imposed prohibitive duties on fuel and freight. As a response, new trade routes to the Middle East have been created where cargo ships travel between the port of Mersin and Egypt.

Estimating the potential impact of LPI improvements for Turkey

Korinek and Sourdin (2011) suggest that improvements in general logistics quality have a stronger trade-enhancing effect on exports as compared to imports. On the average, for every 10% increase in the LPI of a typical exporter, bilateral imports increased by nearly 70%, holding fixed the influence of the remaining determinants of trade. Conversely, for every 10% increase in the LPI of a typical importing country, bilateral

imports increase by 54%. Based on these results, if Turkey's logistics services were on a par with Malaysia's (the top performer in upper-middle income economies) its imports would have the potential to increase by 14% on average and its exports by 18% (all else being equal). These numbers rise to 31% for imports and 40% for exports if Turkey would improve its logistics performance to the level of average high-income OECD countries, based on our estimates.

These correlations should be interpreted in terms of their association rather than causality. While improvements in logistics contribute to international trade, a growing economy will have a similar effect on logistics performance through better means for the improvement. Still, these calculations provide an insight on the development of international trade in parallel to logistics performance.

Indeed, similar magnitudes of the effects may be estimated for the other dimensions of the LPI such as tracking and tracing, infrastructure and logistics competence. A 10% increase in the quality of the infrastructure as measured by the LPI, could result in more than a 50% increase in seaborne trade. This means that if Turkey manages to improve its LPI score on infrastructure to the level of high-income OECD countries' average score, growth in exports could be around 30%. A 12% improvement in the indicator for the quality of customs procedures, which is sufficient to reach the average of high-income OECD countries, is estimated to result in an increase in bilateral exports of close to 48% for seaborne trade. Moreover, reaching the top performer's (Germany) LPI score level in tracking/tracing or logistics competence could potentially increase exports by 52% and 55%, respectively. On the other hand, to be able to reach the targeted export value of USD 500 billion in 2023, Turkey would need to improve its overall LPI score to 4.15 (from 3.5 today) in the next 10 years, according to estimates based on logistics performance alone.

5 Checklist of policy actions to improve logistics performance

Irrespective of the level of economic development of countries, trade logistics reforms should be implemented as coherent packages. In order to be successful, they also require sustained, long-term attention.

Furthermore, there is neither a standard solution nor specific institutional arrangements for countries to implement these reforms. Policy-making in this area is complex, as the responsibility is shared among several governmental entities in charge of transport policies and investment, commerce, industry, and customs and border management. Perhaps not surprisingly, no country has a ministry for logistics.

This means that a collective framework, including the representation of the private sector, should be established to enable consistent implementation. Some countries, such as Canada, the Netherlands, China, Finland, Germany, Malaysia, and Morocco, have introduced councils or similar coordination mechanisms that have been used for this purpose. A number of others, such as Chile and Mexico, are currently establishing national logistics observatories that are also beneficial for this purpose.

The agenda and leadership of logistics reforms naturally depends on national circumstances. In advanced and emerging economies, ministries responsible for transport issues have typically been in charge of the coordination. Here, the environmental issues have increasingly entered the agenda. In developing countries, the agencies in charge of commerce and economic development have typically had a significant role in promoting the facilitation and logistics agenda. Irrespective of the leadership, the complementarities between hard and soft interventions, such as those between transport infrastructure and the operational environment for logistics, need to be considered.

Also the input of academia and relevant research institutes should be utilised when designing a comprehensive approach to develop services, infrastructure, and efficient logistics, and to implement consistent policies in the field of transport and logistics.

Based on the analysis done, a tentative checklist has been prepared, suggesting policy areas for reform associated with the six LPI components. It builds on the results of desk research, which covers policy toolkits, industry reports, benchmarking studies and academic papers, and is supported by analysis of the issues and views of industry experts, policymakers, associations, and selected companies involved in trade and logistics services.

In short, improving national logistics performance, accelerating trade and moving towards the top performers in the LPI requires extensive co-operation and collaboration among the private sector, governments and international organisations in many areas both at the international, national and local level.

Table 10. **Tentative checklist of policy actions and associated LPI components**
(with an indication of their applicability from to low-income to high-income countries)

Efficiency of the clearance process	<p>Improve border facilities</p> <p>Simplify and shorten border crossing procedures</p> <p>Reduce corruption and unofficial payments in customs clearance</p> <p>Coordinate activities of customs and other border agencies</p> <p>Increase utilisation of computerised and automated clearance systems</p> <p>Promote cross-border cooperation in monitoring and clearing cargo</p> <p>Introduce a single point of entry for information used in clearing cargo</p> <p>Introduce risk management programs to expedite clearance</p> <p>Improve trade security (e.g. scanners, secure supply chains)</p>	<p>Low-income</p> <p style="text-align: center;">↓</p> <p>High-income</p>
Quality of trade and transport related infrastructure	<p>Develop and manage domestic freight corridors</p> <p>Develop and manage international freight corridors</p> <p>Upgrade existing transport links</p> <p>Support private sector participation in transport infrastructure provision</p> <p>Develop logistics hubs (e.g. distribution centres; intermodal facilities)</p> <p>Improve planning of logistics facilities in urban areas</p> <p>Introduce commercial management in port and airport operations</p> <p>Improve accessibility of rural areas</p> <p>Develop sufficient hinterland connection (and parking space) for (urban) ports</p> <p>Establish dry ports and inland clearance facilities</p>	<p>Low-income</p> <p style="text-align: center;">↓</p> <p>High-income</p>
Ease of arranging competitively priced shipments	<p>Reduce market entry & exit barriers in the logistics sector, incl. FDI</p> <p>Improve telecommunications services to support logistics</p> <p>Facilitate the movement of goods within a country (e.g. tax incentives)</p> <p>Stimulate multi-modal transport where appropriate</p> <p>Simplify trade and infrastructure tariffs</p> <p>Reduce the no. of controlled commodities and certification requirements</p> <p>Create incentives to support investments in logistics services</p>	<p>Low-income</p> <p style="text-align: center;">↓</p> <p>High-income</p>
Competence and quality of logistics services	<p>Create incentives to upgrade transport fleet</p> <p>Allow increased scale of logistics service providers (Mergers & Acquisitions)</p> <p>Encourage integration of logistics services for trade and distribution</p> <p>Develop, implement and support training programs for logistics industry</p> <p>Promote development of mechanisms for industry self-regulation</p> <p>Allow introduction of new technologies for tracking and security</p> <p>Support higher education in areas of logistics and transportation</p> <p>Introduce modern supply chain management techniques</p>	<p>Low-income</p> <p style="text-align: center;">↓</p> <p>High-income</p>
Ability to track and trace consignments	<p>Improve telecommunications services to support logistics</p> <p>Promote utilisation of state of the art tracking and monitoring systems</p> <p>Introduce online systems for real time clearance monitoring</p> <p>Introduce e-government services and e-signatures for government approvals</p> <p>Develop public information platforms for sharing trade and logistics data</p>	<p>Low-income</p> <p style="text-align: center;">↓</p> <p>High-income</p>
Timeliness of shipments in reaching destination within the scheduled or expected delivery time	<p>Simplify/avoid operations which cause delays in transportation</p> <p>Decrease variability of transport and handling times</p> <p>Decrease waiting times in border crossings</p> <p>Shorten operations required for border crossings</p> <p>Improve management of handling operations in ports</p> <p>Increase efficiency of logistics operations by novel management practices</p>	<p>Low-income</p> <p style="text-align: center;">↓</p> <p>High-income</p>

ANNEX: Examples of available trade and competitiveness indices

- Logistics Performance Index by The World Bank:
www.worldbank.org/lpi
- Doing Business Report 2015 by The World Bank:
<http://www.doingbusiness.org/reports/global-reports/doing-business-2015>
- World Bank's Overall Trade Restrictiveness Index (OTRI):
<http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:22574446~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html>
- OECD Services Trade Restrictiveness Index (STRI):
<http://www.oecd.org/tad/services-trade/services-trade-restrictiveness-index.htm>
- Enabling Trade Index 2014:
<http://www.weforum.org/reports/global-enabling-trade-report-2014>
- Global Competitiveness Index 2014-2015:
<http://www.weforum.org/reports/global-competitiveness-report-2014-2015>
- World Competitiveness Report:
www.imd.ch/research/publications/wcy/upload/scoreboard.pdf
- Corruption Perceptions Index 2014:
<https://www.transparency.org/cpi2014>
- Liner Shipping Connectivity Index by UNCTAD:
<http://unctadstat.unctad.org/TableViewer/tableView.aspx?ReportId=92>
- Air Connectivity Index by The World Bank authored by Jean-Francois Arvis & Ben Shepherd:
<http://elibrary.worldbank.org/doi/book/10.1596/1813-9450-5722>
- Global Connectedness Index 2014:
http://www.dhl.com/content/dam/Campaigns/gci2014/downloads/dhl_gci_2014_study_high.pdf

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Drivers of Logistics Performance

A Case Study of Turkey

This report discusses the importance of logistics performance and assesses this performance in the context of national competitiveness, following the composition of The World Bank's Logistics Performance Index. Countries can significantly improve their ability to trade competitively in international markets by implementing efficient policies. Based on qualitative and quantitative data on the logistics performance in Turkey we draw broader policy insights for the improvement of logistics performance. The report finally suggests an approach that could be used in assessing trade logistics performance in middle and high income countries.

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