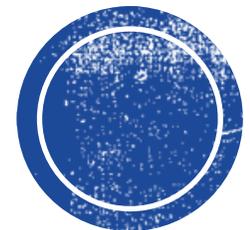




Logistics

Greece

Sectors in focus



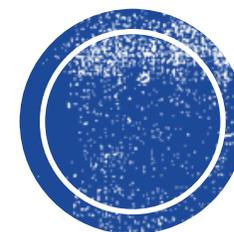
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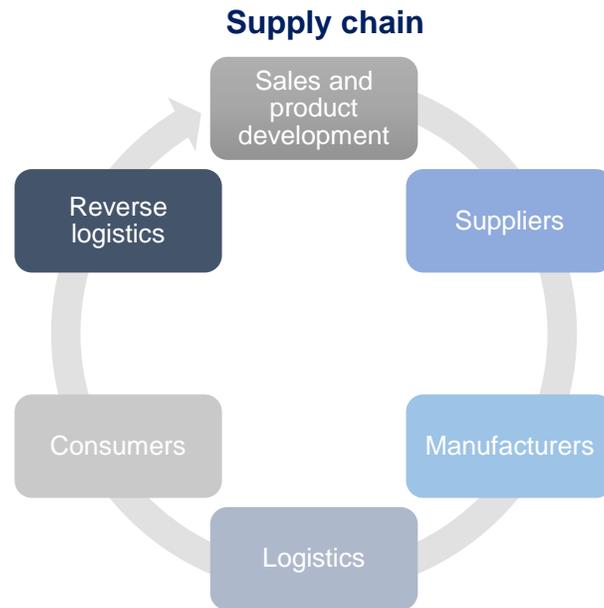
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- **Logistics is the process of organizing and executing transportation and storage of goods from one point (origin) to another (consumption).** The purpose of logistics is to timely and cost-effectively meet customer needs.
- **Logistics is part of the supply chain, the channel of distribution which begins with the supplier of the materials and extends through the manufacturers to the retailers and ultimately to consumers and back.**
- **Reverse logistics is the part of the supply chain which functions backwards.** It refers to how businesses reuse their products and materials and move them from the end users back to their seller or producer.
- **Logistics are subsectors of transportation and storage in the NACE Rev. 2 standard classification.** The GVA of transportation and storage in Greece accounts for 7.5% of total GVA, the 5th highest share among EU-27 countries, indicating the importance of the sector for the Greek economy.
- **The nine subsectors of logistics account for 74% of the GVA of transportation and storage and 67% of its turnover.** Thus, the logistics subsectors make for nearly 5.5% of all economic activities' GVA.
- **Relative to its neighbor Balkan and Mediterranean Sea countries,** Greece is a major logistics hub, ranking 6th in 2018 in terms of performance, before Cyprus and Turkey and after France, Spain, Italy, Slovenia and Israel.
- **The volume of goods handled in 2020 in the main Greek ports was the 7th largest among EU countries,** although a 7.7% decrease was recorded compared to 2019. Piraeus is the largest Mediterranean port and the fifth largest in Europe in terms of volume of containers.
- **The National Strategy Plan for Transport introduced in 2019 by the Ministry of Infrastructure and Transport was the basis for transport infrastructure and services development to promote competition in the sector.**
- **Thriasio Logistics Centre is a large investment project undertaken by the ETVA Industrial Parks and Goldair Consortium,** including the design and construction of the first logistics park in Greece and the development of warehouses and supporting buildings facilities.
- **It is estimated that by 2023, total investments of EUR 150 mn of an area of over 300,000m² will be launched for the development of new logistics facilities of modern standards.**
- **The multi-facility and multi-country shutdown due to the pandemic,** although it severely impacted transportation and storage, it also underlined the crucial role of logistics as a safeguard of the continuous functioning of the Single European Market.
- **Retail and wholesale trade suffered great losses in turnover but contained employment losses due to early measures taken for those employed in closed stores.** However, a positive side-effect of the pandemic was the strengthening of e-commerce.
- **The EC 2020 Sustainable and Smart Mobility Strategy includes a 90% reduction target in transport related GHG emissions by 2050,** via reducing the sector's dependence on fossil fuels and increasing the number of zero-emissions vehicle, offering alternative transport choices and applying the appropriate pricing policies to reflect the environmental impact.
- **Transportation and storage GHG emissions accounted for 10.6% of total emissions of economic activities in Greece in 2019,** decreased by 13% cumulatively during the period 2010-2019.
- **Logistics experienced fast changes in the last decade driven by continuous technological breakthroughs,** especially in information technology, robotics, digitalization and the Internet of Things (IoT).
- **Logistics providers in Greece can support certain industries with visibility, value-added delivery and significant cost reductions,** although the efficiency of the logistics industry depends also on the coordination of players and the quality and width of infrastructure.
- **The logistics sector played and will continue to play a crucial role in battling the pandemic,** by strongly supporting the inclusive, safe and sustainable movement, storage and flow of COVID-19 vaccines globally and in Greece.

Logistics as part of transportation and storage





Third-party logistics (3PL)

- When a firm sends directly its goods to the point of sale or owns transportation assets to send its goods from one location to another, the logistics process is incorporated in the operations of the firm.
- A third-party logistics provider or 3PL provider offers outsourced logistics services which include any service linked to the management of storing or shipping items, such as packaging, crating and boxing, inventory management, freight forwarding and transportation. A shipper or 3PL user is the owner or supplier of the shipped commodities.
- A company can outsource the whole supply chain management, including other logistics services, to third parties, called fourth-party logistics providers (4PL).
- When the outsourced services include further logistics solutions into a full supply chain network, by means of innovation and the use of cutting-edge technologies, then the provider offers fifth-party logistics (5PL).

The logistics sector promotes the efficient operation of other economic activities, linking firms to markets, as the backbone of complex and expanded supply chains in the era of globalization.

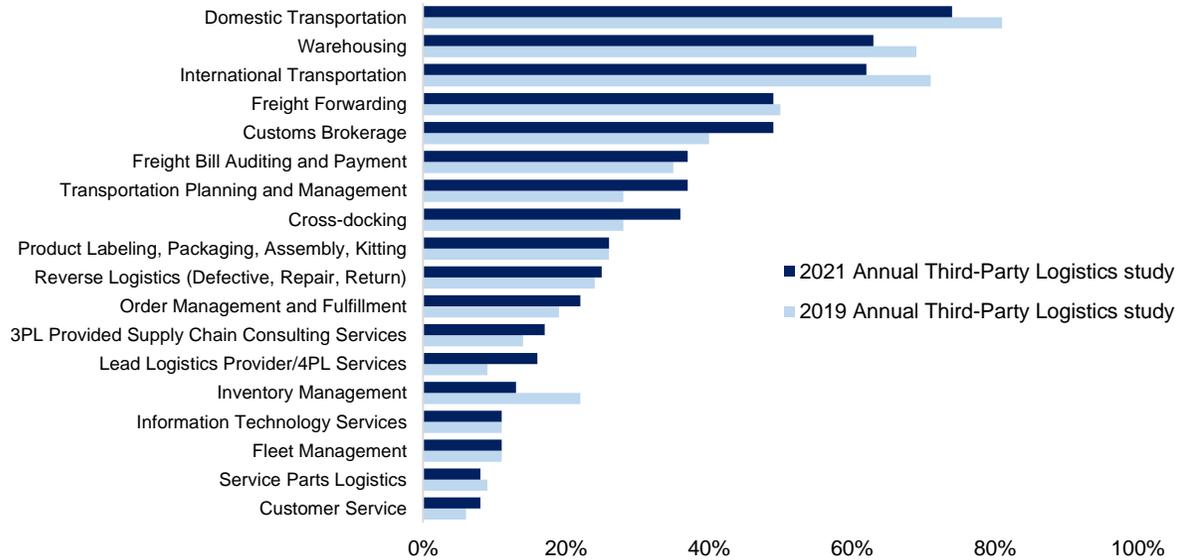
Description of logistics

- Logistics is the process of organizing and executing transportation and storage of goods from one point (origin) to another (consumption). The purpose of logistics is to timely and cost-effectively meet customer needs.
- Logistics is part of the supply chain, the channel of distribution which begins with the supplier of the materials and extends through the manufacturers to the retailers and ultimately to the consumers and back (reverse logistics).
- Thus, logistics is the backbone of the supply chain, covering a wide range of operations, from raw materials' purchase through products' delivery to the final consumer.
- The European Commission defines logistics as the set of services that includes planning, organisation, management, execution and monitoring of a company's material, goods and information flows, from purchasing, production and warehousing, to added value services, distribution and reverse logistics.
- An efficient and competitive logistics sector can contribute to economic growth by reducing importing and exporting costs, creating economies of scale and containing economic fragmentation.
- Since 2000, logistics have expanded strongly thanks to the digital transformation of logistics companies in transport, storage and delivery.

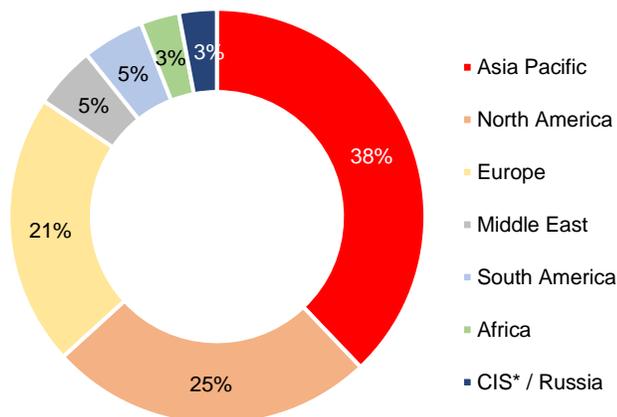
Reverse logistics

- Reverse logistics is the part of the supply chain which functions backwards and refers to how the businesses reuse their products and materials.
- It means moving products from the end users back to their seller or producer. The goods can then be recycled, repaired, replaced or refurbished at their point of production and thus generate additional customer value.

Outsourced logistics services



Geographical distribution of the 3PL world market



*Commonwealth of Independent States
Source: 2021 and 2019 Annual Third-Party Logistics Study

Shippers usually choose to outsource more operational and tactical activities to 3PL providers rather than strategic and customer related services.

- The Third-Party Logistics Study that takes place every year on a global level, reveals that there is a high percentage of companies (shippers) that outsource certain logistics services to 3PL providers, mainly those related to domestic and international transportation and storage.
- In the 2021 Annual Third-Party Logistics Study, 74% of shippers, from 81% in the 2019 Survey, responded that they outsourced domestic transportation.
- Those who outsourced international transportation reached 62% in the 2021 study (from 71% in 2019), because of changes in international commerce that have affected negatively the volume of specific products.
- Customers outsourcing warehousing were also contained to 63% in the 2021 study, down by 6 p.p. relative to 2019, while those that outsourced freight forwarding remained at the same levels with those of 2019 (49%).
- In the 2021 study, the logistics services the least outsourced were those that are more strategic and less operational for the shippers, such as inventory management, information and technology services, fleet management, service parts logistics and customer service.
- Regarding IT-based services, the 2021 study underscores the necessity for 3PL providers to have a wider range of services, such as transportation management scheduling, planning and sourcing, in order to more successfully serve their customers.
- In the 2019 study, large revenue increases were reported for 3PL providers globally for 2017, especially in the Commonwealth Independent States (+17.5% from 2016) and South America (+13.9%).
- The regions with the largest shares of the 3PL world market in the 2019 Survey were those of Asia Pacific (38%), North America (25%) and Europe (21%).

Levels of the sectors' classification	Classification of sectors (NACE Rev. 2)	Sectoral description*
Section	H	Transportation and storage
Division	H49	Land transport and transport via pipelines
Group	H491	Passenger rail transport, interurban
Group	H492	Freight rail transport
Group	H493	Other passenger land transport
Group	H494	Freight transport by road and removal services
Group	H495	Transport via pipeline
Division	H50	Water transport
Group	H501	Sea and coastal passenger water transport
Group	H502	Sea and coastal freight water transport
Group	H503	Inland passenger water transport
Group	H504	Inland freight water transport
Division	H51	Air transport
Group	H511	Passenger air transport
Group	H512	Freight air transport and space transport
Division	H52	Warehousing and transportation support activities
Group	H521	Warehousing and storage
Group	H522	Support activities for transportation
Division	H53	Postal and courier activities
Group	H531	Postal activities under universal service obligation
Group	H532	Other postal and courier activities

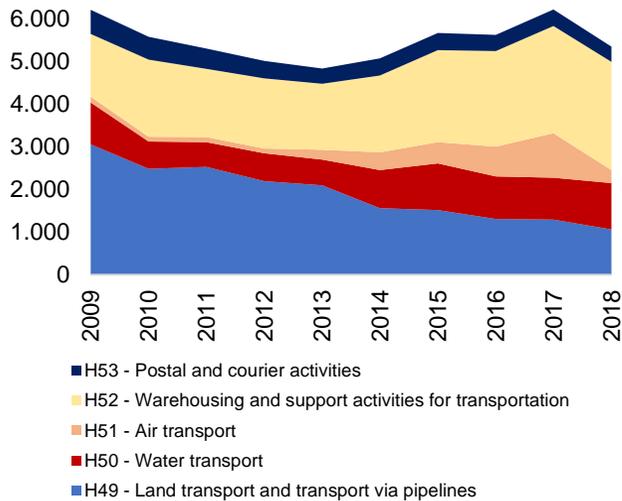
* The blue lines and letters indicate the logistics sectors of the various transportation and storage divisions

- According to estimations (Stochasis, Third-Party Logistics, 2020) in Greece:
 - 46% of 3PL services pertain to the food, beverages and tobacco sector,
 - 18% to electrical-electronic devices,
 - 11% to pharmaceutical and medical products,
 - 8% to industrial products and
 - 17% to other products, such as vehicles and spare parts, clothing and footwear, furniture-household equipment.

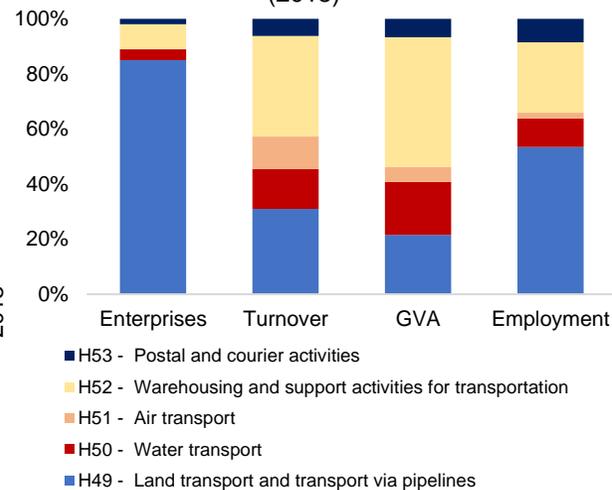
Logistics are subsectors of transportation and storage in the NACE Rev. 2 standard classification.

- In the NACE Rev. 2 standard classification of Eurostat and ELSTAT, which provides sectoral division, transportation and storage is Section H, and it includes five additional sectors (or divisions).
- These sectors are the following:
 - Land transport and transport via pipelines (sector H49)
 - Water transport (sector H50)
 - Air transport (sector H51)
 - Warehousing and transportation support activities (sector H52) and
 - Postal and courier activities (sector H53).
- These five sectors are further divided into smaller subsectors (or groups), nine of which comprise the logistics sector. These are the following:
 - Freight rail transport (subsector H492)
 - Freight transport by road and removal services (subsector H494)
 - Transport via pipeline (subsector H495)
 - Sea and coastal freight water transport (subsector H502)
 - Inland freight water transport (subsector H504)
 - Freight air transport and space transport (subsector H512)
 - Warehousing and storage (subsector H521)
 - Support activities for transportation (subsector H522) – which include service activities incidental to land, water and air transportation, cargo handling and other transportation support activities.
 - Other postal and courier activities (subsector H532).

GVA in the sectors of transportation and storage in Greece (in mn EUR)



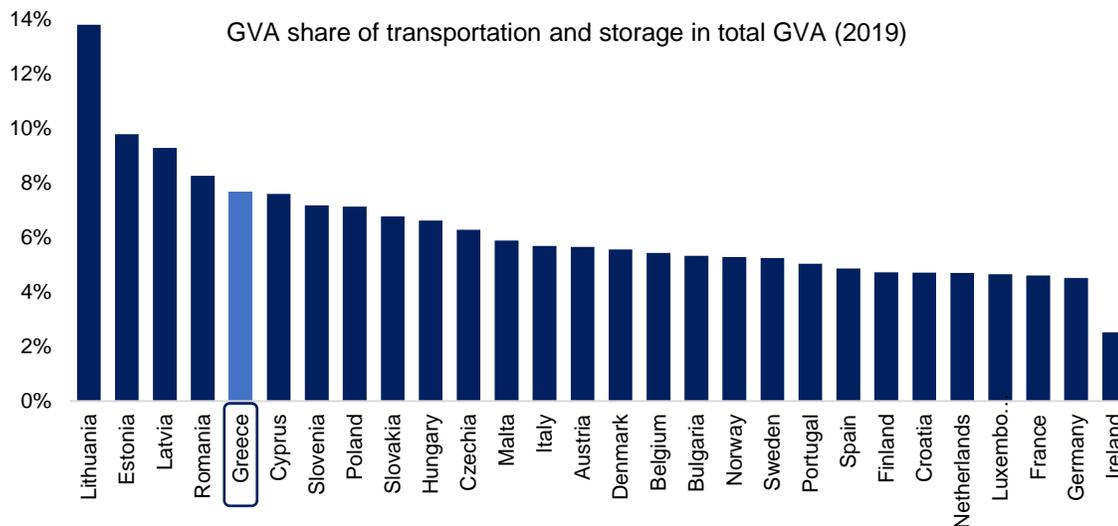
Basic figures in the sectors of transportation and storage in Greece (2018)



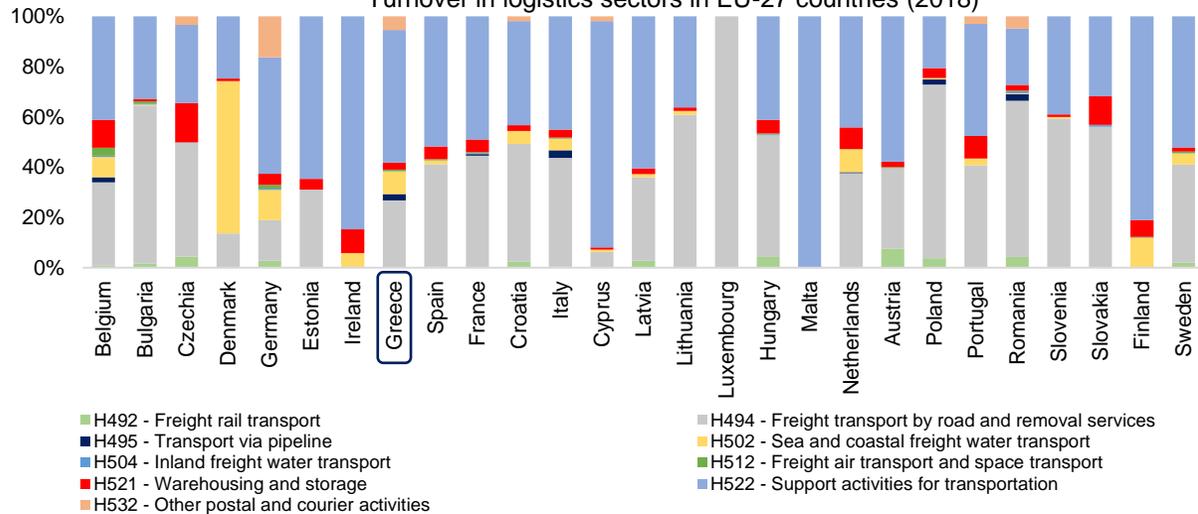
Transportation and storage GVA in Greece accounts for 7.5% of GVA of economic activities (2019), the 5th highest share among EU-27 countries, indicating the importance of the sector for the economy.

- Transportation and storage in Greece counts nearly 59,700 enterprises and 184,755 employed persons (2018). Its GVA (at factor cost) stood at EUR 5.7 bn (current prices) and its turnover at EUR 14.8 bn (current prices) (2018). Transportation and storage GVA was reduced by 14% in 2009-2018.
- The largest fall among its basic sectors was recorded in the GVA of land transport and transport via pipelines (-65%), the largest sector in terms of enterprises and employment. Land transport and transport via pipelines accounted for 54% of enterprises (50,800 firms) of transportation and storage, 85% of persons employed (98.9 th.), 22% of GVA and 31% of total turnover.
- Warehousing and support activities for transportation consist the largest sector of transportation and storage in terms of turnover and GVA (36% and 47% respectively in 2018), exhibiting a GVA cumulative increase of 72% terms in the period 2009-2018 (current prices).
- Air transport in Greece has a share of 12% of turnover and 5% of GVA of transportation and storage, while water transport accounts for 19% of GVA and 15% of turnover.
- Postal and courier activities is the smallest sector of transportation and storage, with a share of 6% and 7% respectively in terms of turnover and GVA, 2% of the number of enterprises and 9% of the persons employed.
- Gross fixed capital formation in transportation and storage fell by 19% cumulatively during the period 2009-2019 (in chain linked volumes 2015). Land transport and transport via pipelines exhibited the largest fall (-56%), followed by postal and courier activities (-48%) and water transport (-33%).
- On the other hand, air transport and warehousing and support activities for transportation recorded increases over the same period in terms of gross fixed capital formation.

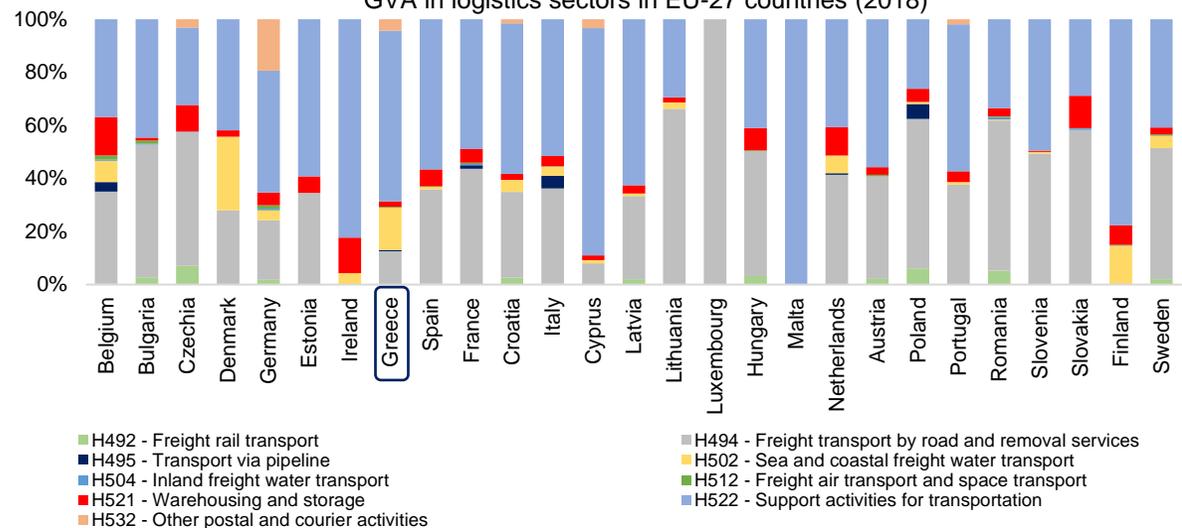
GVA share of transportation and storage in total GVA (2019)



Turnover in logistics sectors in EU-27 countries (2018)



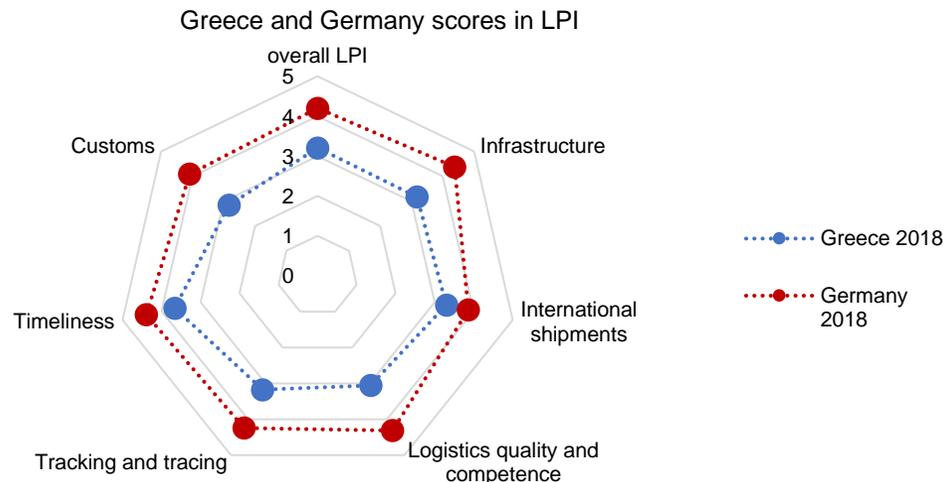
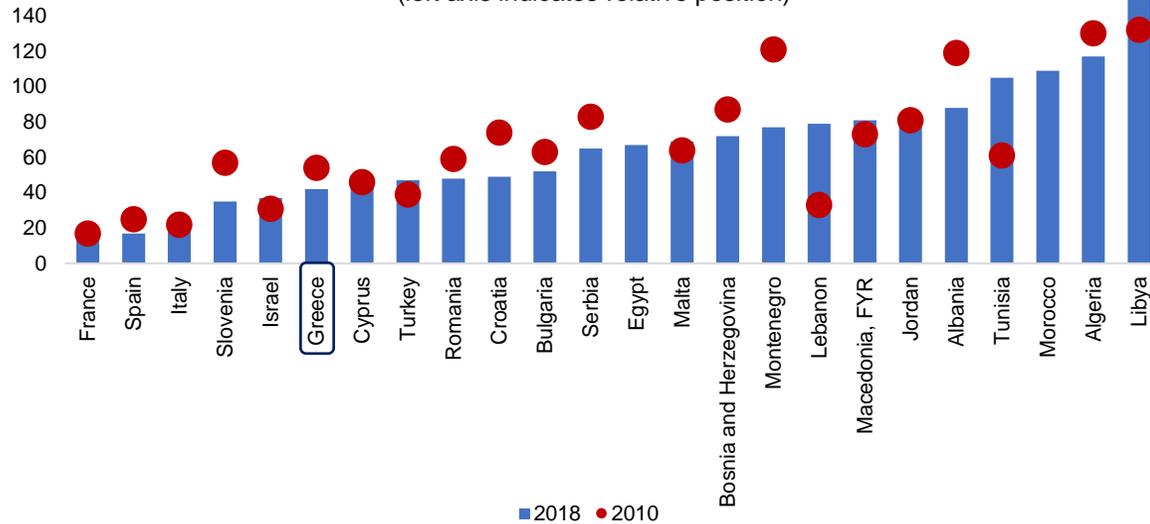
GVA in logistics sectors in EU-27 countries (2018)



Logistics subsectors account for nearly 74% of transportation and storage GVA, 67% of its turnover and for nearly 5.5% of all economic activities GVA.

- The nine subsectors of logistics account for 74% of the GVA at factor cost of transportation and storage and 67% of its turnover. The logistics subsectors make for nearly 5.5% of all economic activities GVA (2019).
- Support activities for transportation have the largest share among the nine logistics subsectors in terms of turnover in most EU-27 countries. In Cyprus and Malta, they account for 90% and 100% of all logistics subsectors' turnover, while in Latvia, Estonia, Finland and Ireland for more than 60% (2018).
- The second largest logistics subsector in terms of turnover is freight transport by road and removal services, which accounts for 100% of turnover in Luxembourg, 69% in Poland, 63% in Bulgaria and 62% in Romania.
- In Greece, support activities for transportation account for 53% of turnover of logistics subsectors, very close to Sweden and Spain (52%), while freight transport by road and removal services pertain to 27% of total turnover.
- Moreover, in Greece, sea and coastal freight water transport account for 9% of turnover, other postal and courier activities for 5%, warehousing and storage and transport via pipeline for 3% each, and freight air transport and space transport for 1%.
- As with turnover, in terms of GVA, freight transport by road and removal services, as well as support activities for transportation have the largest shares among the logistics subsectors in most EU countries.
- In Greece, 64% of logistics subsectors' GVA comes from support activities for transportation, 16% from sea and coastal freight water transport, 12% from freight transport by road and removal services, 4% from other postal and courier activities, 2% from warehousing and storage and 1% from transport via pipeline.

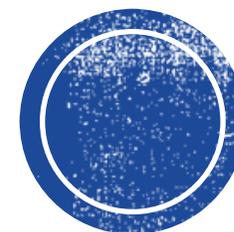
Greece and neighbor competitive countries in LPI position in 2018 and 2010
(left axis indicates relative position)

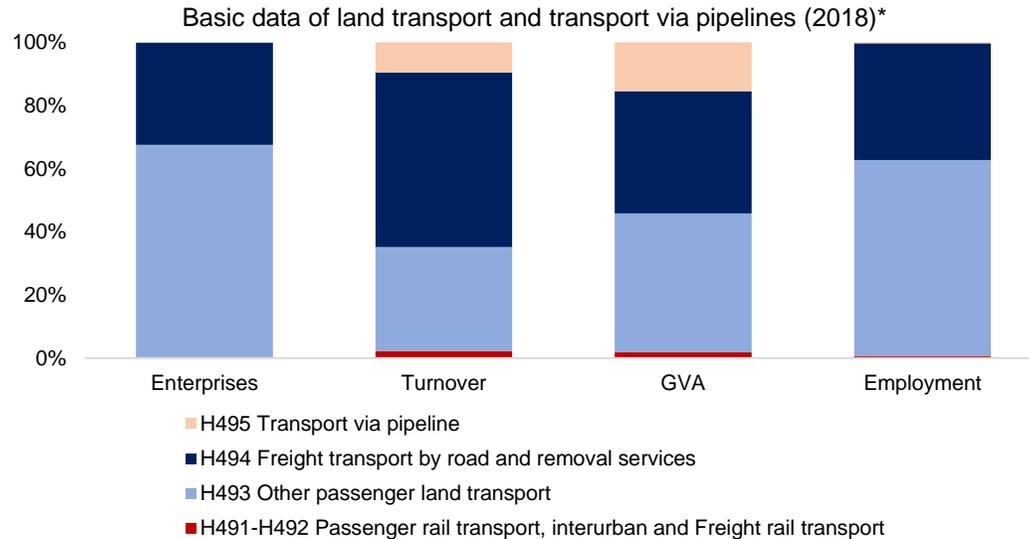


The performance evaluation of the logistics sector is critical for upgrading the sector's services in a fast-changing global environment.

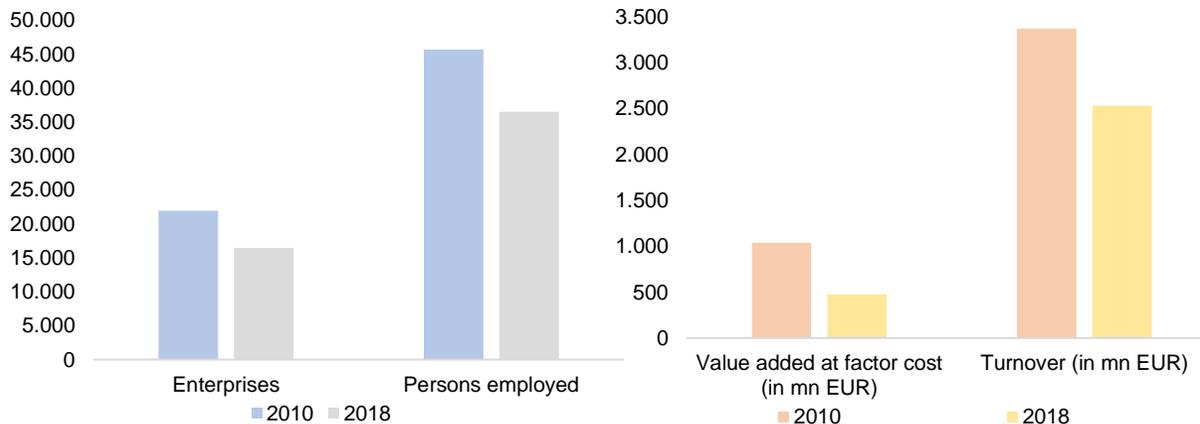
- The World Bank launches the biennial Logistics Performance Index (LPI), which benchmarks logistics performance in 167 countries, identifying policies and strategies that contribute to the improvement of logistics services.
- LPI constitutes of 6 variables: customs, infrastructure, international shipments, logistics quality and competence, tracking and tracing, and timeliness.
- Greece ranked 42nd on a global scale in 2018, scoring 3.2/5, 5 positions up compared to 2016 and 12 positions up compared to 2010, indicating an improvement since the beginning of the previous economic crisis. Germany ranked 1st in 2018, followed by Sweden, Belgium, Austria and Japan.
- Relative to its neighbor Balkan and Mediterranean Sea countries, Greece is a major logistics hub, ranking 6th in 2018 in terms of performance, before Cyprus and Turkey and after France, Spain, Italy, Slovenia and Israel.
- In the six variables that comprise the index, Greece in 2018 ranked:
 - 47th in customs related parameters, which include the efficiency of the clearance process, such as the speed, simplicity and predictability of formalities by border control agencies (score: 2.84).
 - 38th in trade and transport related infrastructure quality, which includes ports, railroads, roads and information technology (score: 3.17).
 - 35th in the ease of arranging competitively priced shipments (international shipments) (score: 3.30).
 - 48th in the competence and quality of logistics services, such as transport operators and customs brokers (score: 3.06).
 - 45th in the ability to track and trace consignments (2018 score: 3.18).
 - 42nd in timeliness of shipments in reaching destination within the scheduled or expected delivery time (score: 3.7).

Logistics: subsectors figures





Freight transport by road and removal services (subsector H494)



* Due to the lack of data for the subsectors H491 and H492, their shares have been found by abstracting other sectors shares from total

Source: ELSTAT, Eurostat

The logistics subsectors of land transport and transport via pipelines are a) freight transport by road and removal services, b) transport via pipeline and c) freight rail transport.

Subsector of freight transport by road and removal services

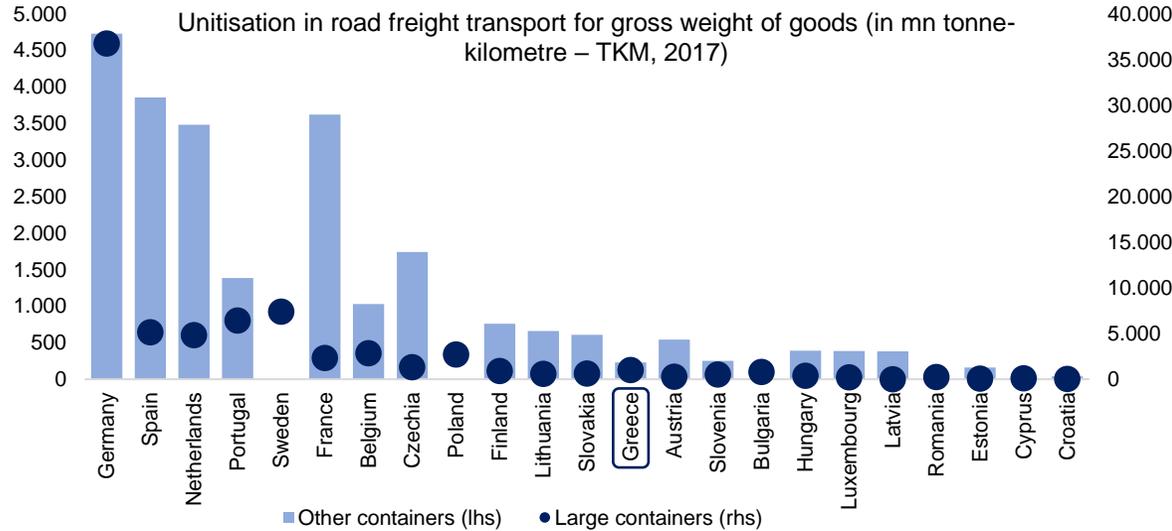
- In 2018, there were 16,484 enterprises (2010: 21,954 enterprises) in the subsector, accounting for 32% of enterprises in land transport and transport via pipelines, with 36,542 employed persons (2010: 45,713).
- The GVA of the sector consisted 39% (2018) of land transport and transport via pipelines GVA, having fallen by 9.3% cumulatively in 2018 compared to 2010, to EUR 476 mn.
- A cumulative decrease by 3.5% was also recorded in turnover, reaching EUR 2,531 mn in 2018, accounting for 55% of turnover in land transport and transport via pipelines.

Subsector of transport via pipeline

- Greece had the second lowest length of pipelines (53 kilometers) and the smallest volume of refined oil products (581 th. tonnes) in 2019 among 17 European countries (for which there are available data).
- Transport via pipeline had only 10 enterprises in 2018 (2014:8), employing 245 people (2014: 277), with a GVA of EUR 191 mn in 2018, accounting for 15% of total GVA in land transport and transport via pipelines.
- Its turnover cumulatively was increased by 22.1% in 2018 compared to 2014 (no available data for 2010), to EUR 437 mn, consisting 10% of total turnover in land transport and transport via pipelines.

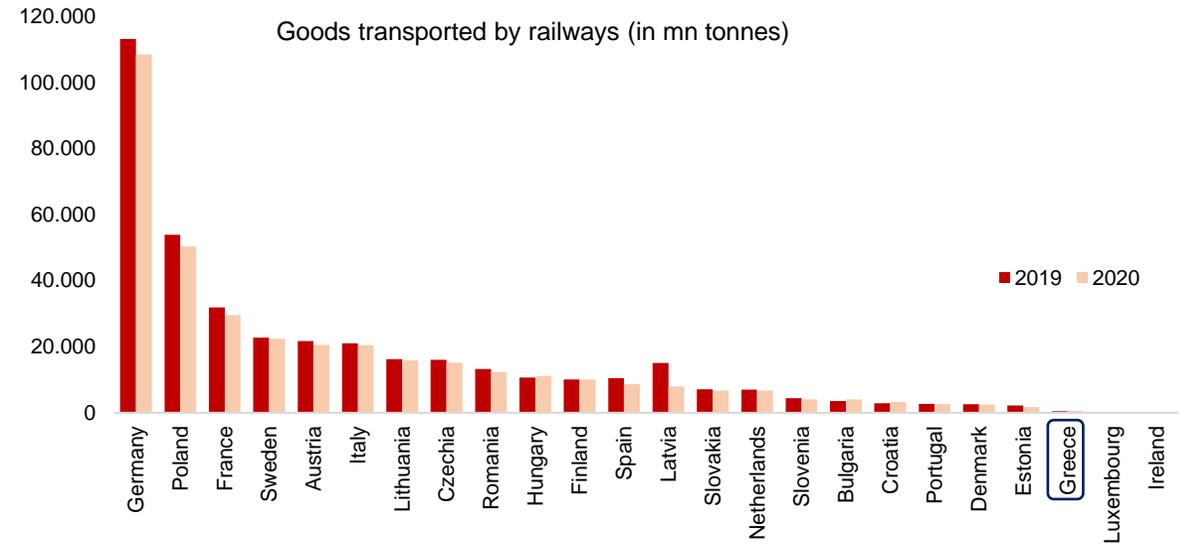
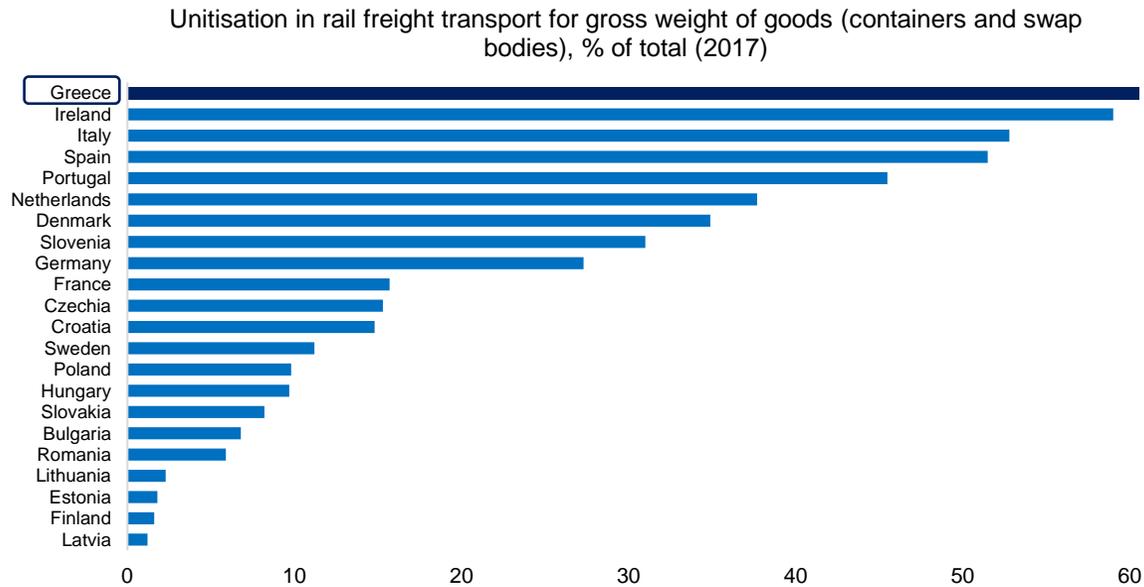
Subsector of freight rail transport

- The sector operated only 5 enterprises (2016), with very few employed people.
- Its GVA stood at EUR 0.4 mn, with a minor share in the GVA of land transport and transport via pipelines.

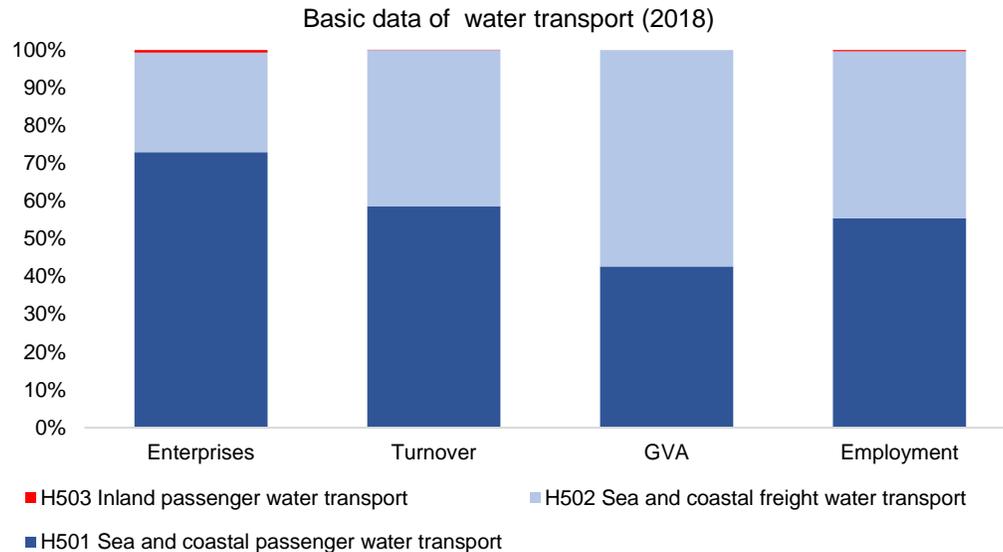


Unitisation makes freight suitable for its transportation via various modes.

- Unitisation expresses goods transported in standardized transport units (i.e., Intermodal Transport Units – ITUs) as a share of total goods transported.
- ITUs comprise containers, swap bodies and other standardized packaging (in terms of size), which can be moved with simple equipment (e.g., cranes).
- In terms of large containers and in mn tonne-kilometer – TKM in road freight transport, Greece ranked 10th in 2017 (1,015 TKM) among 23 European countries for which there are available data (average: 3,293 TKM).
- In rail freight transport, Greece exhibited the highest unitization in containers (61%), among EU countries (2017), standing considerably higher than the European average (23%).
- Goods transported by railways in 2020 presented the third lowest volume in Greece among European countries after Ireland and Luxembourg, although contrary to most of the other countries, they registered an increase by 13% yoy.



Source: Eurostat



Freight water transport held a share of 57% (2018) of water transport GVA, 44% of its employment, 41% of its turnover (41%) and 27% of its enterprises.

Subsector of sea and coastal freight water transport

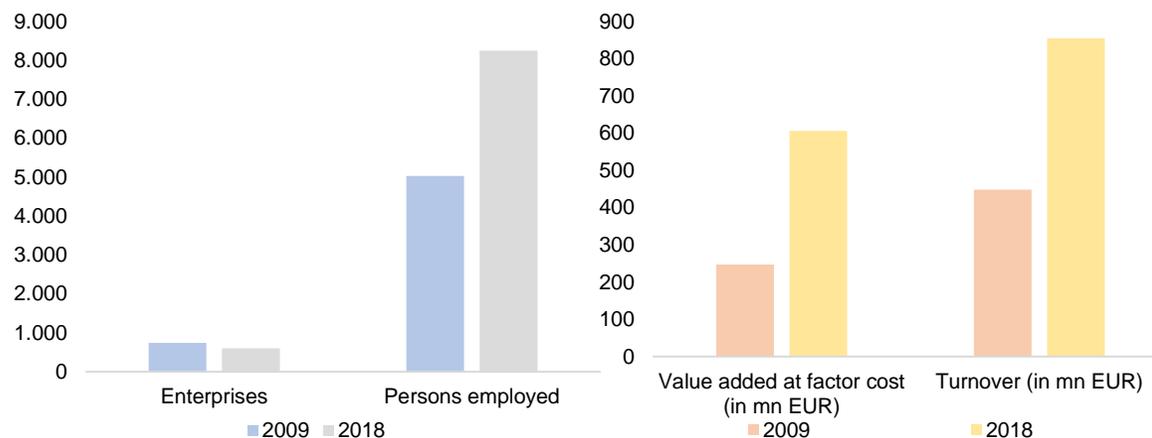
- Sea and coastal freight water transport is important for the transportation of goods between the mainland of Greece and its islands, but also for Europe.
- Greece has the longest shorelines and is the continent's maritime interface with the Far East via the Suez Canal.
- Sea and coastal freight water transport comprised 599 enterprises in 2018, compared to 741 enterprises in 2009, consisting over ¼ of total enterprises in water transport.
- Employment rose markedly to 8,241 people in 2018, from 5,023 people in 2009, accounting for almost half (44%) of total water transport employment.
- An increase by 10.5% in 2018 was also recorded in terms of GVA (to EUR 605 mn in current prices), compared to 2009, which consisted 57% of total water transport GVA.
- Similarly, turnover rose by 7.5% cumulatively in 2018 compared to 2009 (current prices), reaching EUR 855 mn, with a share of 41% in water transport turnover.

Subsector of inland freight water transport*

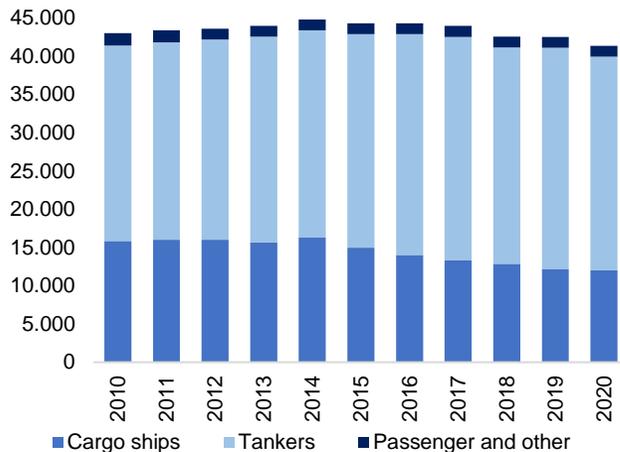
- Greece has limited activities in inland freight water transport, since there is no inland waterway system, unlike the extensive inland waterways networks in northern European countries, like the Netherlands and Germany, which play an important role in their transportation networks.
- Only 6 enterprises operated in 2018, with very few employed persons.

* Inland freight water transport refers to transport in rivers, lakes, canals and waterways

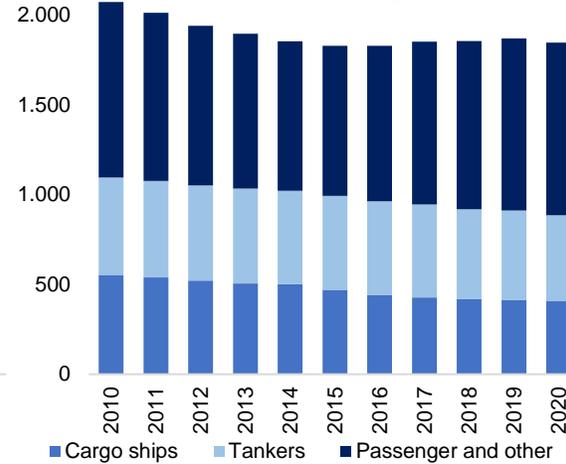
Sea and coastal freight water transport (subsector H502)



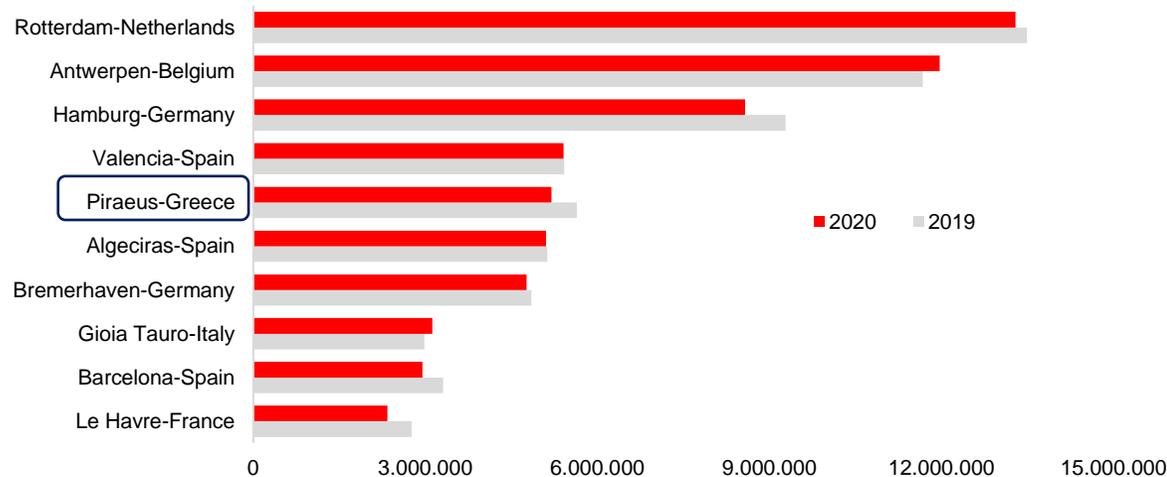
Capacity of Greek merchant ships ≥100 gross tonnage (GRT), by category



Number of Greek merchant ships ≥100 GRT, by category



Top 10 EU-27 ports in volume of loaded and empty transported containers to/from main ports (in TEU – twenty foot equivalent unit)



Source: ELSTAT

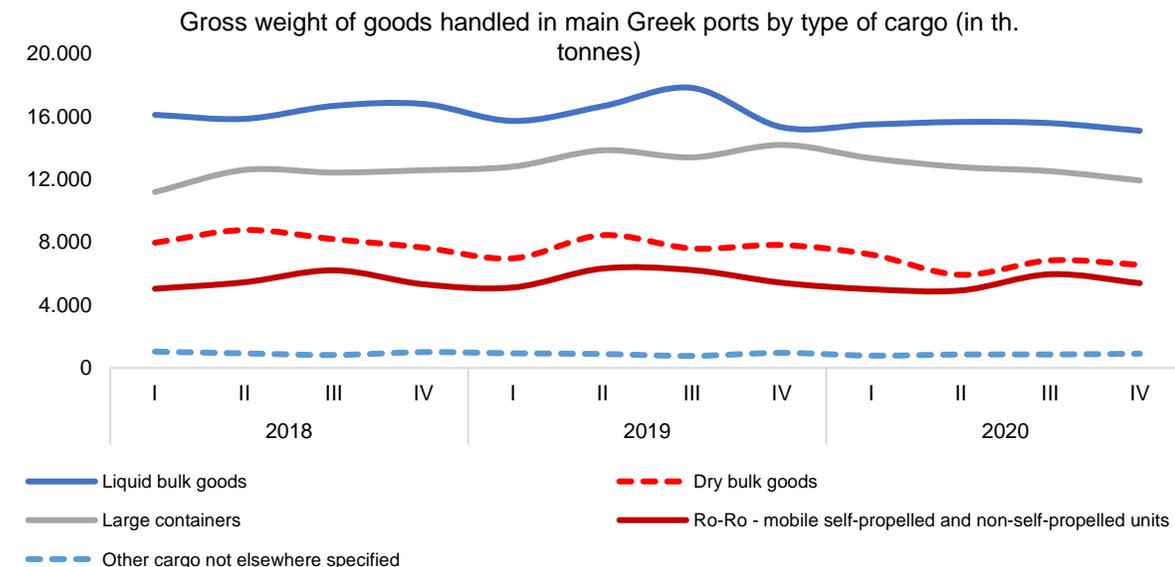
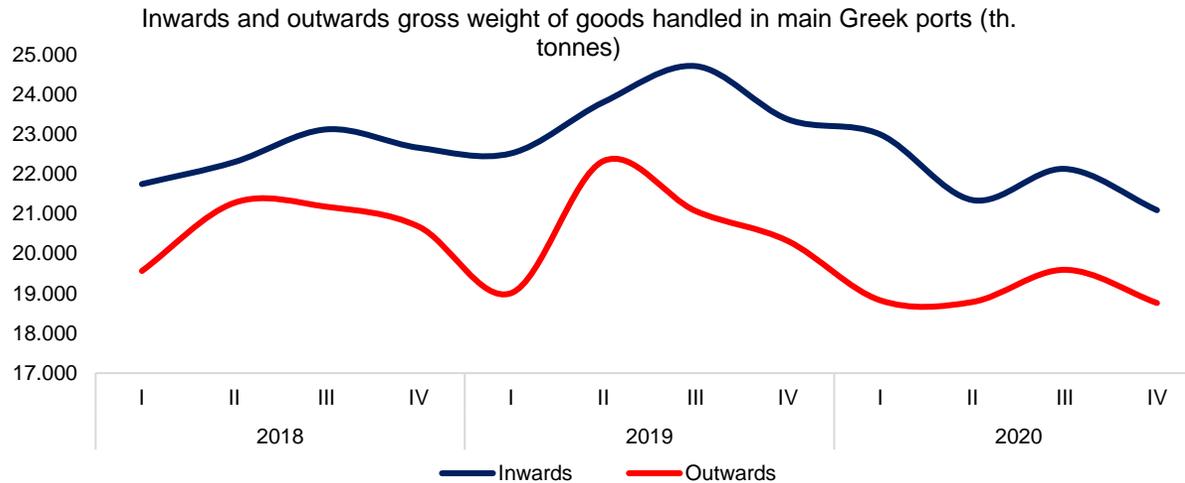
Piraeus is the largest commercial port in the Mediterranean sea in volume of transported containers, also ranking 5th in 2020 among EU-27 ports.

Greek merchant ships

- The Greek merchant fleet ranks 1st in the world and it includes ships under different country flags, i.e., not only ships under the Greek flag.
- Greek merchant ships, i.e., ships under the Greek flag, were equal to 1,848 in 2020 (2010: 2,074).
- 52% of the Greek merchant ships were passenger and other ships (fishing, tugs, drilling, exploration), 26% tankers (oil chemical, LNG, LPG, non-inflammable) and 22% cargo ships (dry bulk carriers, container ships, specialized carriers, Ro-Ro).
- The largest decrease in the number of ships in 2020 relative to 2010 was registered in cargo ships (406 from 552), followed by tankers (480 from 543), while passenger and other ships recorded a small reduction (963 from 979).
- The capacity of Greek merchant ships stood at 41,347,933 GRT in 2020, decreased by 2.7% since 2010.
- In 2020, 68% of the capacity corresponded to tankers (2010: 59%), 29% to cargo ships (2010: 37%) and 3% to passenger and other ships (2010: 4%).

Greek main ports

- Piraeus ranked 1st in the Mediterranean Sea in 2020 in the volume of loaded and empty transported containers and 5th (4th in 2019) among EU ports. The port of Rotterdam in the Netherlands ranked 1st in 2020.
- 5 out of more than 25 Greek commercial ports (Piraeus, Thessaloniki, Heraklion, Patras, Igoumenitsa) have a strategic interest and are included in the trans-European transport network (TEN-T) as key maritime interfaces of the Orient/East-Med corridor.
- These 5 ports have transshipment facilities for the road network connection, while Piraeus and Thessaloniki have connections to the railway network.

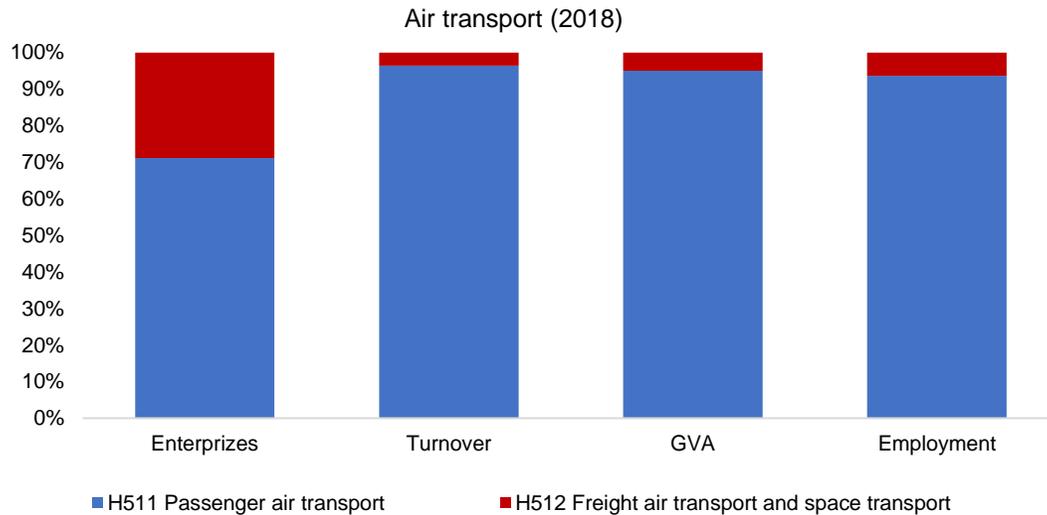


Source: Eurostat

The volume of goods handled in 2020 in the main Greek ports was the 7th largest among EU countries, although a 7.7% decrease was recorded compared to 2019.

- Regarding the weight of goods, outwards* gross weight decreased by 8% yoy in 2020, whereas inwards* gross weight of goods declined by 7% in 2020 compared to 2019.
- With respect to the goods handled per type of cargo, dry bulk, which refers to ores, coal, agricultural products (e.g., grain, soya, tapioca) and other dry bulk goods, fell markedly in Q2 2020 (by 30% yoy) and by 14% yoy in 2020.
- The second highest yoy reduction in 2020 (-7.7%) was recorded in Ro-Ro mobile units, which are divided to mobile self-propelled (e.g., road goods vehicles, passenger cars, motorcycles) and mobile non-self-propelled units (e.g., unaccompanied road goods trailers, agricultural and industrial vehicles).
- Similarly, liquid bulk, which consists of liquefied gas, crude oil, oil products and other liquid bulk goods, decreased by almost 6% yoy in 2020.
- Moreover, the weight of goods in large containers, i.e., freight units divided in those of 20 feet (ft), 40 ft, >20 ft and <40 ft, and >40 ft, decreased by nearly 7% yoy in 2020.
- A smaller annual fall by 4% in 2020 was registered for other cargo, which consists of forestry, iron and steel products, and other general cargo.
- 42% of loaded goods, i.e., goods placed on a merchant ship, were transported in containers, 33% being liquid bulk and 16% dry bulk. The volume of loaded goods fell by 5% yoy in Q4 2020.
- 48% of the unloaded goods, i.e., those that are taken off a merchant ship, were liquid bulk, while 33% were goods transported in containers. The volume of unloaded goods fell by 9% yoy in Q4 2020, with the largest decrease being that of containers (-16%) and the smallest that of Ro-Ro (-2%).

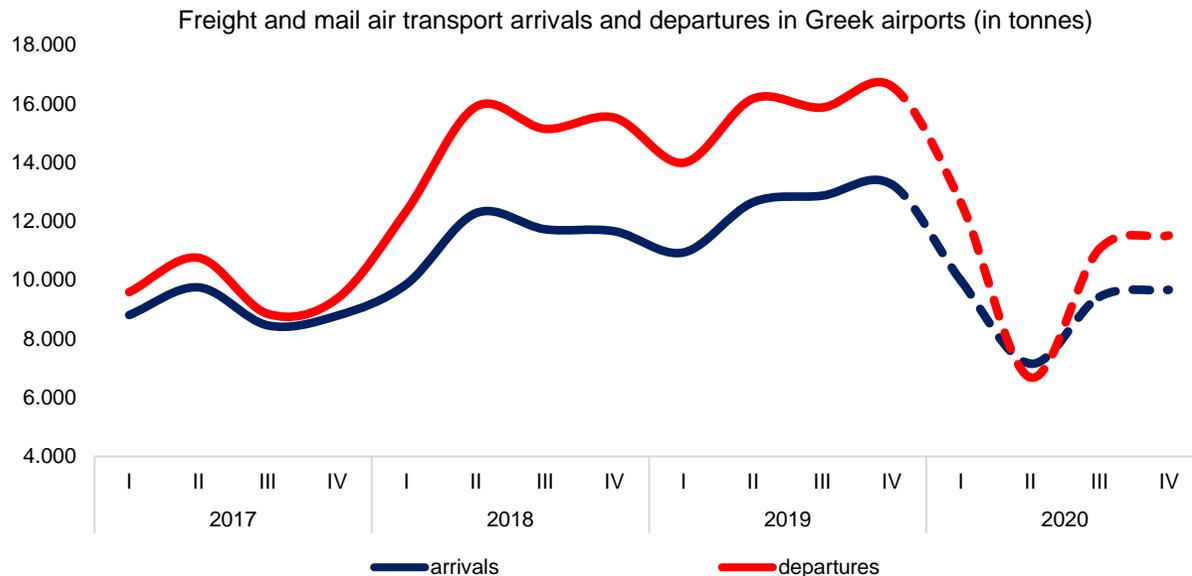
* Inwards goods arrive at a port and outwards goods leave a port.



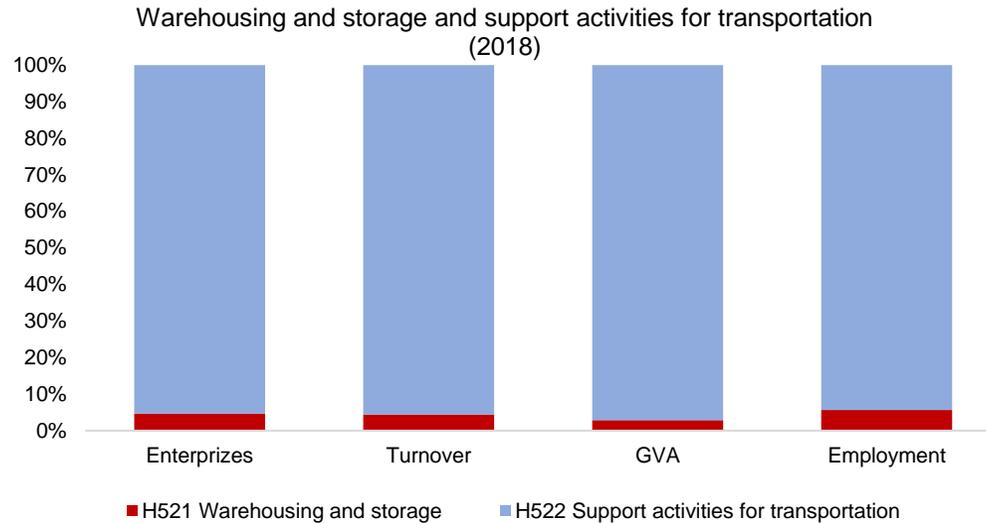
Freight air transport has a very small share in air transport, contrary to the dominant passenger air transport, which holds 96% of total turnover, 95% of GVA, 94% of employment and 71% of enterprises (2018).

Subsector of freight air transport and space transport

- There are 45 airports in Greece, 15 of which international.
- Eleftherios Venizelos Athens International Airport has emerged as an important logistics hub in Southeastern Europe, as it is the central transfer point for the connection of Europe with Middle East and Far East.
- Freight air transport enterprises in Greece amounted to 18 in 2018, having more than tripled since 2009 (5 enterprises), consisting 29% of air transport enterprises. There are no space transport enterprises in Greece.
- At the same time, employment, although very limited, accounted for 6% of total air transport employment.
- Similarly, GVA increased cumulatively by 27.2% in 2018 compared to 2009, to EUR 14 mn (CAGR), holding a share of 5% of air transport GVA.
- A rise by 17.5% was also recorded in turnover, reaching EUR 61 mn in 2018, accounting for 4% of air transport turnover.
- Although it strongly grew in 2017-2019, total volume in freight and mail on board followed a sharp downward trend in 2020 due to the coronavirus crisis, recording a 53% decline in Q2 and a 31% fall yoy in 2020, the 5th largest decrease among EU-27 countries (average of -35%).
- Although freight and mail arrivals and departures offset their losses in Q3 and Q4 2020, the yoy percentage change was still negative but milder compared to Q2 2020.
- In specific, the volume of freight and mail air transport arrivals in Greece fell significantly by 43% in Q2 2020 and by 27% yoy in 2020, with that of departures being even sharper in Q2 (-59%), but milder in 2020 (-33%).



Source: ELSTAT, Eurostat

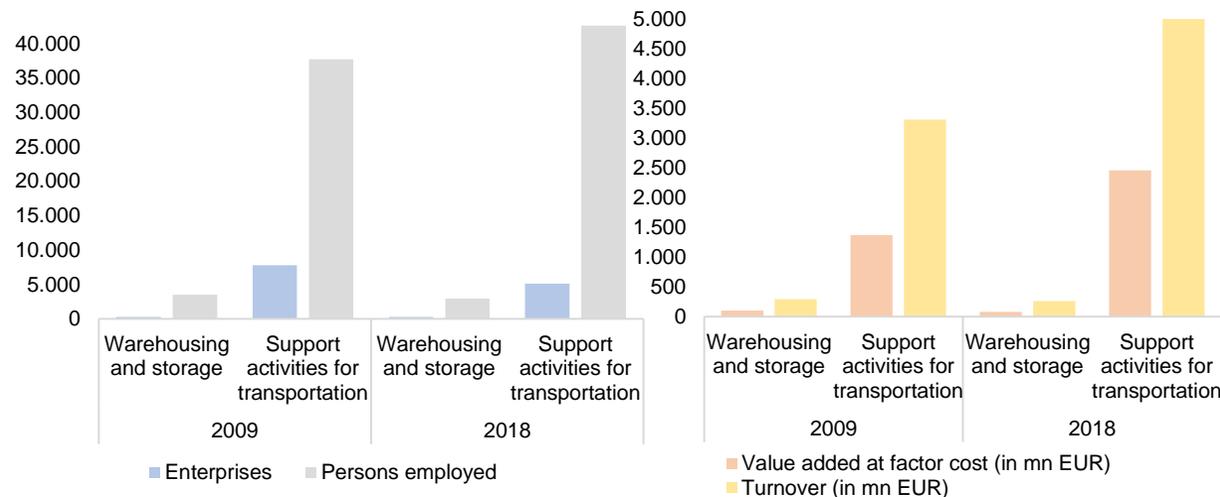


Out of the two logistics subsectors of warehousing and storage and support activities for transportation, support activities for transportation produce higher added value and turnover and have a larger share in employment.

Subsector of support activities for transportation

- Support activities for transportation include activities supporting the transport of passengers and freight, such as the operation of parts of the transport infrastructure (i.e., airports, harbors, tunnels, bridges) or activities related to handling freight before, after or between transport segments.
- In 2018, 5,119 enterprises operated in the sector (2009: 7,762), accounting for 95% of enterprises in warehousing and storage and support activities for transportation.
- The employed increased to 42,584 persons in 2018, from 37,699 in 2009, comprising 94% of total employment.
- Its GVA rose by 6.7% in 2018 compared to 2009, reaching EUR 2,455 mn, consisting 97% of warehousing and storage and support activities for transportation GVA, while a cumulative increase by 4.7% was also recorded in its turnover during the same period (current prices).

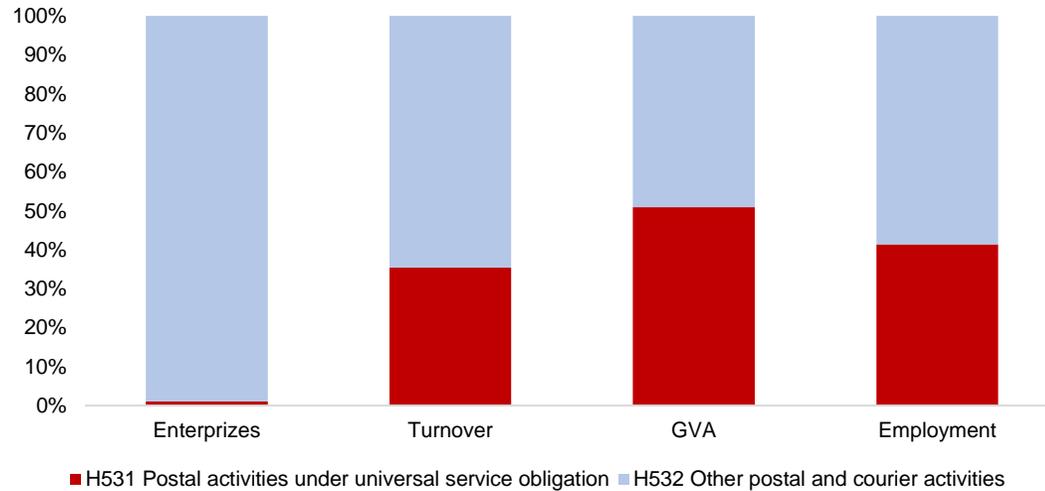
Warehousing and storage (subsector H521) and support activities for transportation (subsector H522)



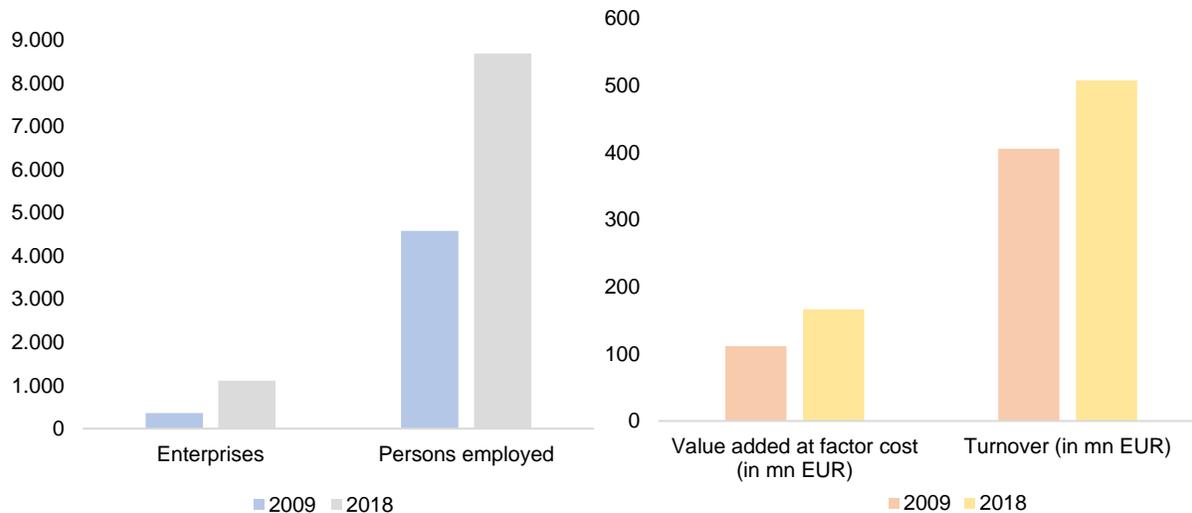
Subsector of warehousing and storage

- Warehousing and storage include the operation of storage and warehouse facilities for all kinds of goods (i.e., grain silos, general or refrigerated warehouses, storage tanks).
- The subsector has a small share of enterprises (5%), persons employed (6% or 2,918 persons in 2018), GVA (3%) and turnover (4%) in warehousing and storage and support activities for transportation.
- Its GVA fell cumulatively by 2.5% in 2018 compared to 2009, while its turnover decreased by 1.4% in 2018.

Postal and courier activities (2018)



Other postal and courier activities (subsector H532)



Source: ELSTAT, Eurostat

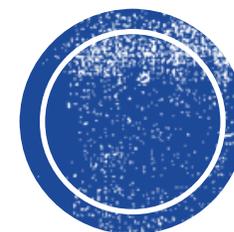
Other postal and courier activities, a logistics subsector, hold the largest shares of the enterprises, turnover, employment and GVA in postal and courier activities.

Subsector of other postal and courier activities

- Other postal and courier activities include pickup, sorting, transport and delivery (domestic or international) of letter-post and (mail-type) parcels and packages by companies operating outside the scope of universal service obligation*, as well as home delivery services.
- There has been a gradual development towards market liberalization for postal and courier services, with parcels and express services markets now fully open to competing operators, with internationally known enterprises competing against local competitors for the courier business.
- In Greece, 1,113 enterprises operated in 2018, markedly more than in 2009 (364 enterprises), consisting the vast majority (99%) of total postal and courier activities.
- At the same time, employment amounted to 8,681 people in 2018, significantly higher compared to that of 2009 (4,579 people), accounting for more than half (59%) of employment in postal and courier activities.
- Furthermore, the subsector recorded an increase by 4.5% in GVA terms in 2018 compared to 2009, which amounted to EUR 166 mn, consisting almost half (49%) of postal and courier activities GVA.
- Similarly, turnover increased by 2.5% compared to 2009, to EUR 507 mn in 2018, accounting for almost 2/3 (65%) of postal and courier activities turnover.
- It is worth mentioning that the sector of postal and courier activities increased their turnover during the pandemic due to the rise of e-commerce.

* Universal service providers in most EU member states operate as a monopoly and have exclusive rights within the postal market. On the other hand, private companies dominate the express services market, providing letter and parcel services to the business-to-business, direct mail and business-to-private markets.

Regulatory framework and investment activity of logistics



The development of logistics began in early 1990's in Greece, when companies active in transportation and renting storage areas expanded their operations in warehousing storage and delivery.

Regulatory framework

- Regulations on the development of logistics and in particular on transport, warehousing, goods' loading/unloading, and establishment/operation of trade centres were constituted in Greece in the early 2000's.
- The National Strategy Plan for the development of the logistics sector was introduced in 2013 by the Ministry of Infrastructure and Transport and the Ministry of Development and Investments. Its 2017 update focused on:
 - Facilitating the procedures of transit freight management
 - Simplification of customs' procedure
 - Upgrade of the Athens International Airport to an international logistics hub
 - Creation of agro-logistics centres
 - Application of logistics in the National Health System
- Law 4302/2014 regulated issues regarding the sector in the context of the 2013 National Strategy Plan for its development, allowing the logistics firms to combine warehousing, storage and transport operations and logistics parks to be established.
- Transport services with management of the supply chain sector was included in the 4399/2016 Greek investment Law, which also recognized the Greek logistics sector as one of the nine strategic sectors for the development of the country's economy.
- The National Strategy Plan for Transport was introduced in 2019 by the Ministry of Infrastructure and Transport. It was the basis for transport infrastructure and services development in order to promote competition in the sector. The plan included infrastructure projects in:
 - Road transport: construction of new (>500 km) and upgrading of existing roads

- Rail transport: emphasis on the TEN-T network, reconstruction (Athens-Patra), modernization (Thessaloniki-Eidomeni-North Macedonia)
- Water transport: New ports (Patra, Igoumenitsa, various islands)
- Air transport: New Heraklion airport and airports upgrading (Thessaloniki, Paros, Chios, Syros, 14 regional airports commissioned to Fraport)
- The Partnership Agreement (ESPA/NSRF) 2021-2027 supports investments in transport infrastructure (roads, ports, airports, railway) and transport fleet with EUR 2.3 bn (around 12% of total EUR 20 bn funds).
- The Trans-European Transport Network (TEN-T) policy, invests EUR 26 bn in European infrastructure projects (railway, road, port, airport, multimodal infrastructure) including the Orient/East-Med corridor which passes through Greece.
- The Next Generation CEF (Connecting Europe Facility) II supports targeted transport infrastructure investment. The 2014-2020 CEF granted EUR 574.9 mn to Greek transport projects.
- Investments in logistics parks are treated as fast-track investments.

Free trade zones

- Free trade zones are special areas near ports or airports for the storage of imported goods, with beneficial customs conditions, such as the suspension of import duty, VAT or excise duties, until goods are released into free circulation.
- In Greece, there are five free trade zones, located in Piraeus port, Thessaloniki port, Heraklion port, Platigiali-Astakos Etoloakarnanias and Boeotia. Goods of foreign origin can be transferred into these zones without payment of custom duties or other taxes and remain duty free if trans-shipped or re-exported.

Various investments are ongoing in the Greek logistics sector regarding infrastructure, while many warehousing and transportation projects are undertaken, amid a strong interest also recorded for future investments.

Greece as a major logistics hub with increasing warehousing activity

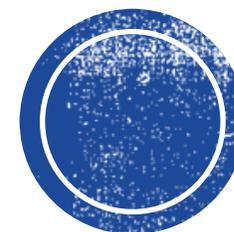
- The Piraeus port is majority owned by China COSCO Shipping (67% of shares), the 3rd larger container ship company. The port's container part is made up of 3 terminals, with a total capacity of nearly 7 m TEUs (Twenty Feet Equivalent Unit) and a cargo terminal with a 180,000m² storage area.
- In the Piraeus port, Huwai has established a pilot distribution centre and ZTE Corp has developed a logistics centre.
- Rosco, the Greek Rail company of TRAINOSE, which supports railroad systems and repairs railway wagons, was acquired in 2019 by the Italian company Ferrovie dello Stato Italiane, which has committed to start developing part of the Greek railway system.
- Thriasio Logistics Centre is a large investment project undertaken by the ETVA Industrial Parks and Goldair Consortium, consisting of the design and construction of the first logistics park in Greece, with a total interface of 235,000m² including warehouses and supporting buildings facilities.
- Apart from the buildings and warehouses, the Thriasio project includes the construction of a new road and railway network within the park (Thriasio II), aiming at supplying the warehouses, the first such combination in Greece.
 - Although the railway conjunction was completed in April 2021, the concession contract for the private freight centre is not activated, as it was signed without competition clearance by the EC.
- Thessaloniki port was privatized in March 2018. Plans for the development of the Gonos logistics centre near the port of Thessaloniki are undertaken.
- The upgrade of the Athens-Thessaloniki section is delivered in 2021, with the running time from Athens to Thessaloniki being reduced to 3-3½ hours, while major investments for the renovation and further development of 14 regional airports were also completed in January 2021.

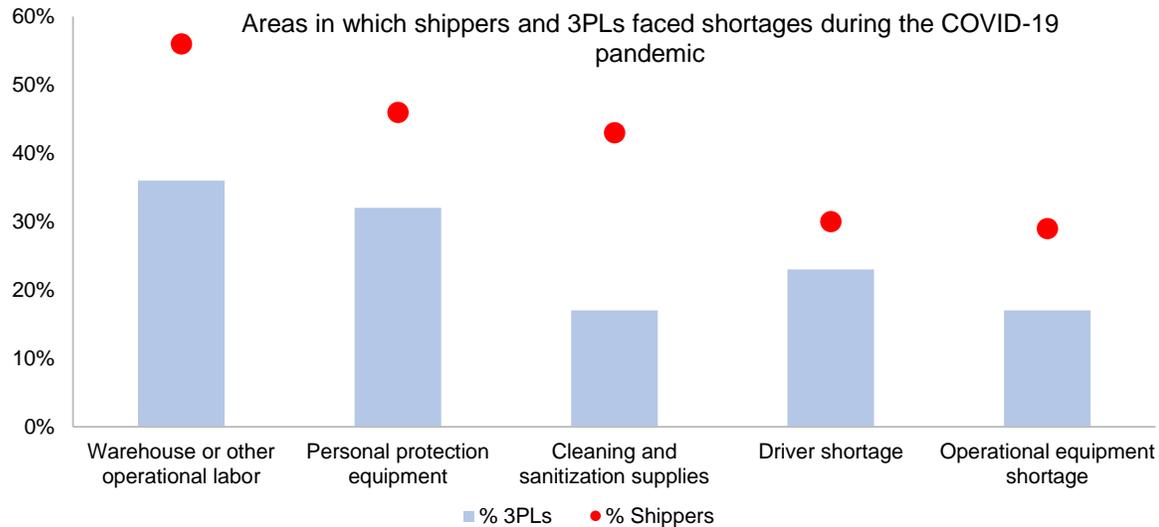
- It is estimated that by 2023, total investments of EUR 150 mn of an area of over 300,000m² will be launched in Greece for the development of new logistics facilities of modern standards.
- Companies active in the real estate market are also looking for investment opportunities in warehouse logistics and the field of modern storage and distribution facilities in the coming years.
 - In parallel with the classic model of large central warehouses, smaller warehouses (omni - channelling) that serve the needs for high-speed deliveries in the city, with intermediate distribution points (last mile logistics) are being developed.
 - There was a significant activity in this market last year with new lease agreements for warehouses between 500-2,000m² with competitive returns compared to other real estate investments in urban areas or on the outskirts of cities.

Market structure and investment attractiveness

- ICAP (October 2019) identifies the first ten 3PL key players in terms of turnover to hold 51%-56% of total turnover of 3PLs in Greece.
 - These firms include Diakinisis Logistics Services, Foodlink Group, Orphee Beinoglou International Transports, Goldair Cargo SA, Makios Logistics, PAEGAE SA, Kuehne+Negel, Piraeus Container Terminal SA, Synergy in supply chain SA, Transcombi Express Ltd.
- According to the EY Attractiveness Survey (July 2020), 12% of foreign direct investment in 2017-2019, was allocated in Greece for transport and logistics (EU average: 6%), the 4th largest after agri-food sector (17%), digital technology (15%) and enterprises services (14%).
- 19% of foreign investors are willing to invest in supply chain/logistics in Greece, more than double compared to the European average.

The effect of COVID-19 pandemic on logistics, transportation and trade



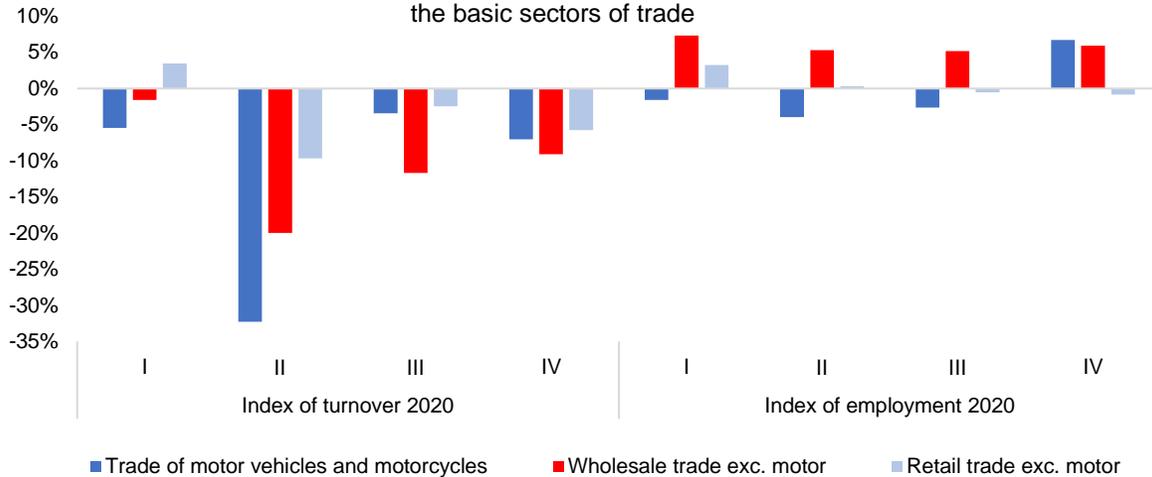


- Disrupted operations due to the pandemic are evident in the shortages experienced by shippers and 3PL providers, according to the 2021 Third-Party Logistics Study on the effects of COVID-19.
 - Shippers seem to have faced more shortages compared to 3PLs: 56% of them confronted shortages with warehouse or other operational labour (36% of 3PLs), 46% had shortages of personal protection equipment (32% of 3PLs) and 43% had shortages of cleaning and sanitization supplies (17% of 3PLs).
 - Shippers and 3PL providers agree that the pandemic disrupted operations, with 60% of shippers reporting that their supply chain operations, excluding corporate or administrative shutdowns, were decreased by $\frac{1}{4}$.
 - Moreover, 15% of respondents replied that the pandemic increased their operations and 6% that saw total supply chain shutdowns.

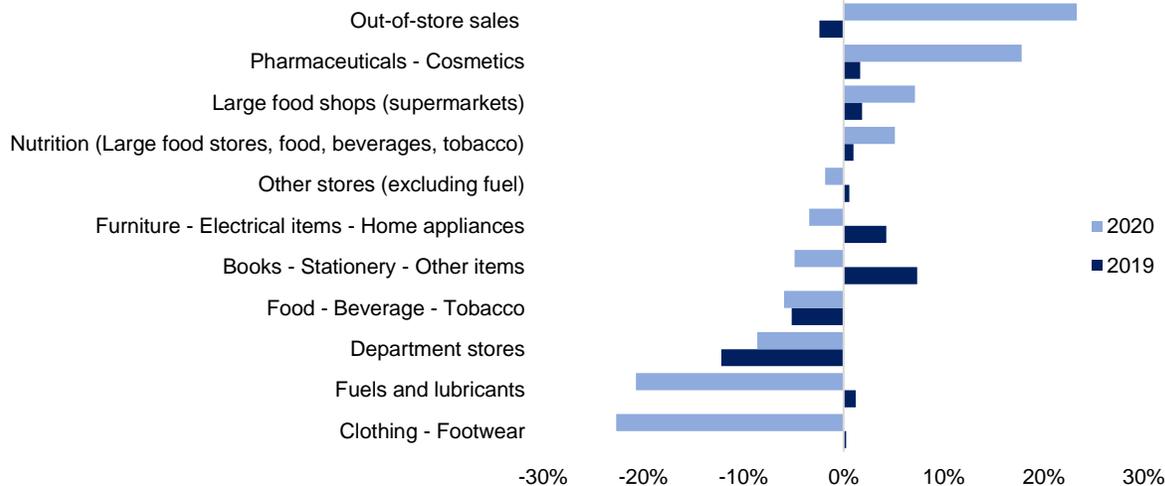
The multi-facility and multi-country shutdown due to COVID-19, although it severely impacted transportation and storage, it also underlined the crucial role of logistics as a safeguard of the continuous functioning of the Single European Market.

- The spread of COVID-19 pandemic in Europe caused border closures, lockdowns and social distancing in warehouses, resulting in disruptions in all modes of freight transport services and movement of goods, long waiting times for freight vehicles at borders and stopping of cargo flights.
- Logistics witnessed a heavy decline caused by lower demand, supply chains disruption and travel restrictions after the COVID-19 outbreak, amid shortages of containers and a significant contraction in freight transport in automotive logistics, air cargo volumes and cargo volumes of maritime shipping.
- On the other hand, in certain industries such as food and healthcare, logistics performed better. CEP (Courier, Express and Parcel) companies presented an all-time high due to record sales on e-commerce, with growth in this market expected to continue in the following years.
- The European Commission adopted various measures and guidelines since March 2020 to ensure the continued operation of supply chains and transport of all goods so as to not jeopardize their availability.
- The EC provided additional guidance to name internal border-crossing points of the TEN-T network as green lane border crossings (green lanes) (March 2020). Green lanes should be open to all freight vehicles and passing through them could not exceed 15 minutes, including checks and screenings.
- Measures were adopted for all transport modes in 2020, including the extension of validity date of certain certificates, licenses and other authorizations, the temporarily postponement of security checks and the extension of contracts.
- Moreover, the EC 2020 Sustainable and Smart Mobility Strategy ensured the resiliency of the transportation system against future crises, given that the pandemic crisis underscored its vital role for the economy.

The pandemic effect: y-o-y % of turnover and employment index (2015=100) in the basic sectors of trade



Turnover index in sectoral groups of retail trade (yoy % change, seasonally adjusted data, base year 2015=100)

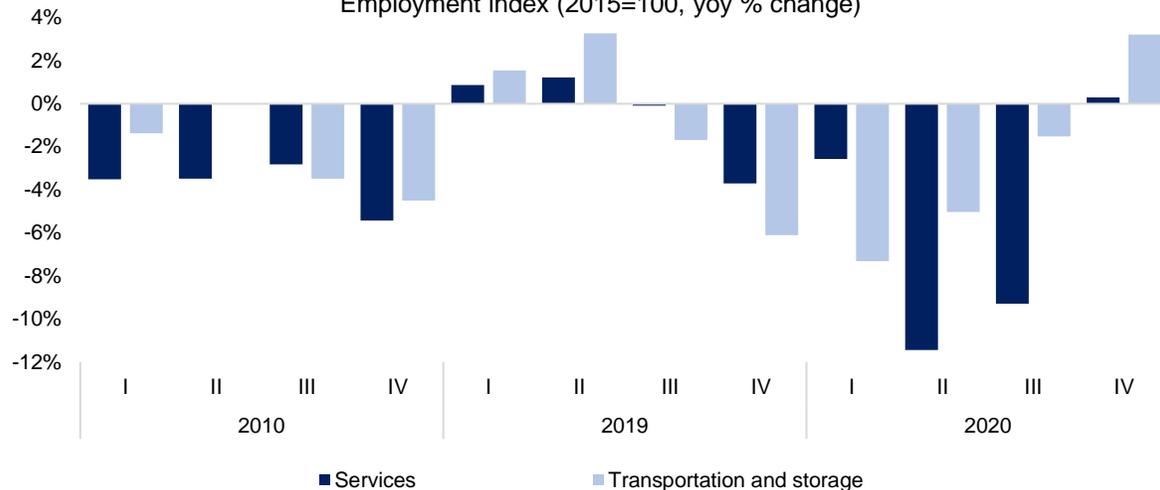


Source: ELSTAT, Eurostat

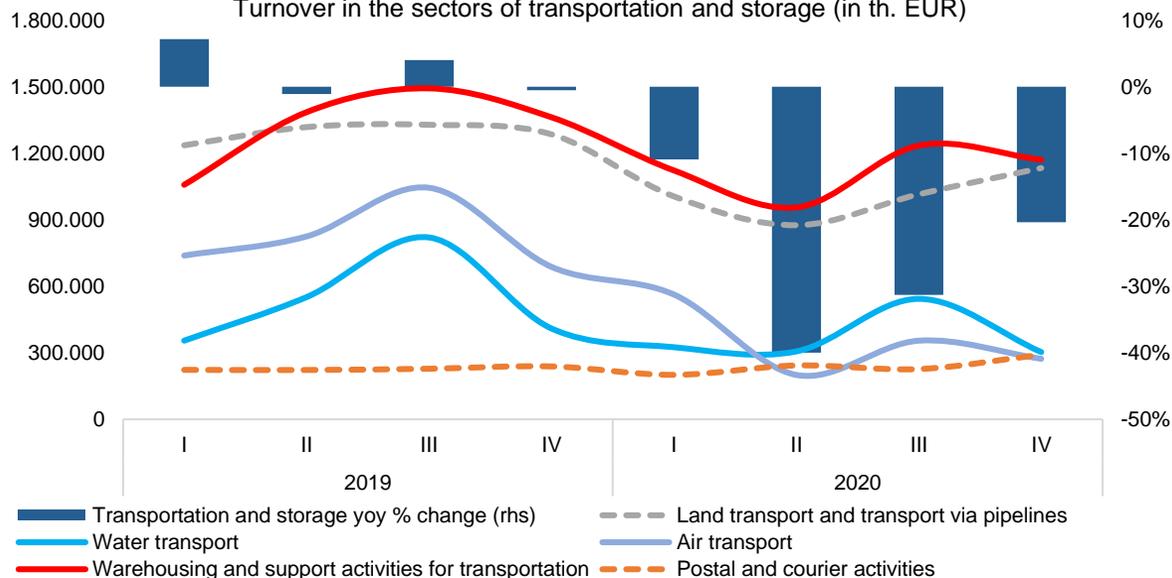
Retail and wholesale trade suffered great losses in terms of turnover but contained employment losses due to early measures taken for those employed in closed stores. However, a positive side-effect of the pandemic was the strengthening of e-commerce.

- Retail and wholesale trade, as well as trade of motor vehicles and motorcycles, suffered great losses after the breakout of the COVID-19 pandemic.
- Turnover of motor vehicles and motorcycles trade started falling in Q1 2020 yoy, while in Q2, it recorded a sharp annual drop by 32%. In Q3 and Q4, it decreased less, by 3% and 7% yoy respectively.
- Wholesale trade (excl. motor vehicles) recorded a large drop in Q2 2020 yoy, reaching -20%, with a milder subsequent annual decrease in the next two quarters at -12% and -9% respectively.
- Retail trade in terms of turnover recorded a fall of 10%, 2% and 6% in Q2, Q3 and Q4 2020 respectively, after a 3% increase in Q1. The turnover index fell significantly in sectors such as fuels-lubricants and clothing-footwear, but the decrease was partly counterbalanced by large increases in out-of-store sales, large food stores and pharmaceuticals-cosmetics.
- The milder fall in trade turnover in the second half of 2020 reflects the gradual success of the fiscal measures that were applied for the sectors that were mostly hurt after the first lockdown in March 2020.
- The positive effect of the measures, such as the EUR 800 grant per month to the employees of closed companies due to the pandemic, is also evident in the employment index, which recorded positive yoy growth rates in 2020, especially in wholesale trade (excl. motor vehicles).
- The lockdowns, although they sharply affected various stores that remained closed for a long period of time, they positively impacted on e-commerce. It is estimated that about 6 out of 10 internet users made purchases online via e-commerce in 2020, while revenues increased by 43%, at EUR 10.7 bn.

Employment index (2015=100, yoy % change)



Turnover in the sectors of transportation and storage (in th. EUR)

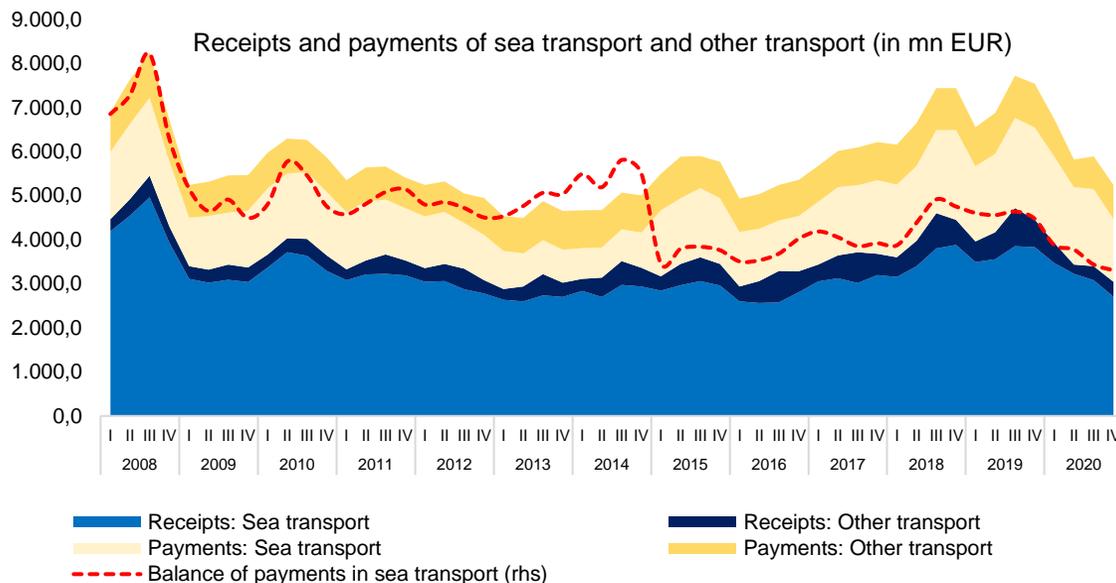
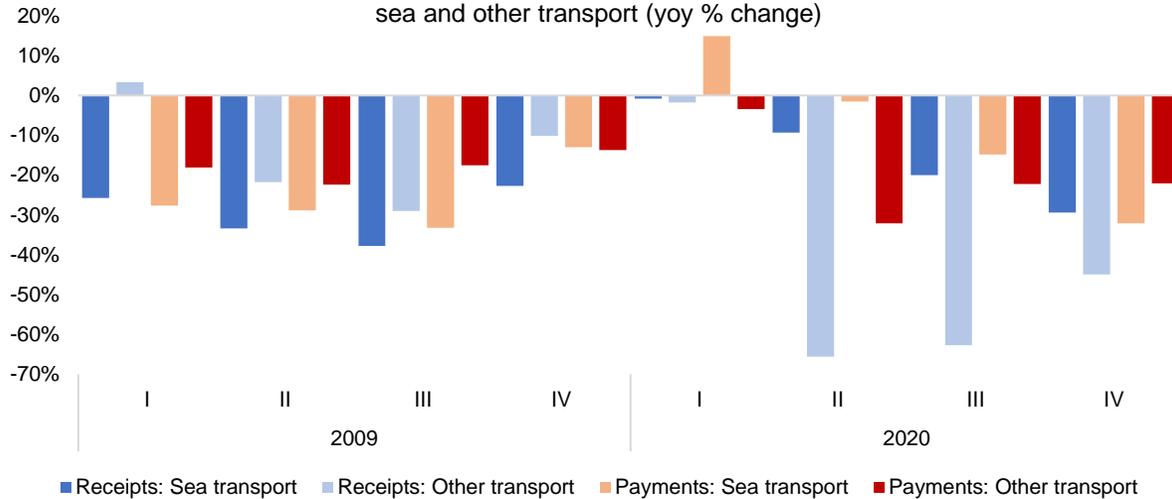


Source: ELSTAT, Eurostat

The effect of the pandemic in transportation and storage is evident in the sharp fall of both turnover and employment, especially in Q2 and Q3 2020, with air transport being the mostly hurt sector.

- The impact of the pandemic on employment is more pronounced in services, compared to retail and wholesale trade. The fall of the employment index in services in Q1, Q2 and Q3 2020 was equal to -3%, -11% and -9%. However, in Q4 2020 the employment index rose slightly by 0.3%
- In terms of turnover, services documented a 26% fall on average for 2020, with the largest drop being recorded in Q2 (-41%).
- Transportation and storage was among the sectors of services that were mostly hurt by the pandemic and the subsequent lockdowns. The index of employment of the sector tracked a fall of -7%, -5% and -2% in Q1, Q2 and Q3 2020 respectively. However, in Q4 2020 the employment index of the sector increased by 3%.
- Turnover in transportation and storage dropped by 27% on average in 2020, with the decrease being mostly pronounced in Q2 and Q3 (-40% and -31%).
- Turnover in warehousing and support activities for transportation fell on average by 15% in 2020 relative to 2019 and consisted 36% of total turnover of transportation and storage.
- Air transport recorded the largest yoy fall of turnover in 2020 (-58%), among all other sectors of transportation and storage. In Q2 2020 only, air transport turnover fell by 76%.
- Land transport and transport via pipelines, the second largest subsector in terms of turnover, documented a decrease equal to 22% in 2020 relative to 2019, whereas water transport's turnover fell by 31% on average.
- Postal and courier activities was the only transportation and storage sector, and among the few in services, that saw an upsize in their turnover (5% on average in 2020), since e-commerce purchases were increased significantly due to the lockdowns.

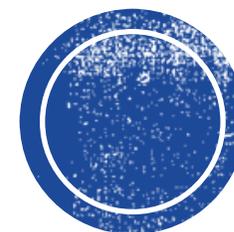
The 2009 crisis effect and the 2020 pandemic effect in receipts and payments of sea and other transport (yoy % change)

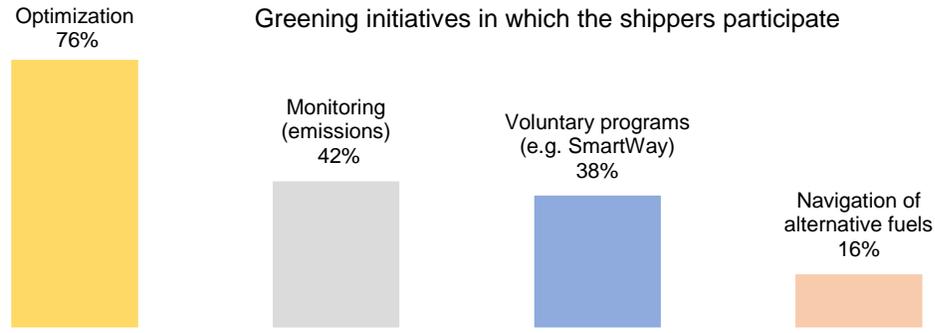


Balance of payments in sea transport, which reflects international shipping transactions conducted within or outside the domestic banking system, lost 1/5 of its value yoy during Q1 2020, as a result of the pandemic restrictions on transportation.

- During 2020, COVID-19 significantly affected the balance of payments in sea and other transport.
- The balance of payments in sea transport remained positive, although it had been significantly and gradually decreased since the beginning of the previous economic crisis in 2009.
- In 2020, the balance of payments was reduced by 21% yoy relative to 2019, as a result of the COVID-19 restrictions.
- Contrary to the 2009 crisis, the 2020 pandemic crisis had a much larger negative effect on other transport receipts and payments and a milder effect on receipts and payments of sea transport.
- Sea transport receipts were reduced by 1%, 9%, 20% and 29% in Q1, Q2, Q3 and Q4 2020 respectively, whereas receipts of other transport recorded significantly larger falls (-2%, -66%, -63% and -45% respectively).
- Sea transport receipts constitute a large fraction of total receipts of balance of payments and accounted for 62% of total receipts in Q1 2020, 70% in Q2, 42% in Q3 and 53% in Q4 2020. Their higher share in Q2 2020 derived from the large fall in total receipts.
- Sea transport payments on the other hand documented an increase of 15% in Q1 but fell by 2% in Q2, 15% in Q3 and 32% in Q4 2020 respectively, while the payments of other transport were reduced by 3%, 32%, 22% and 22% in the four quarters of the year respectively.

Environmental policies, new technologies and digitalization





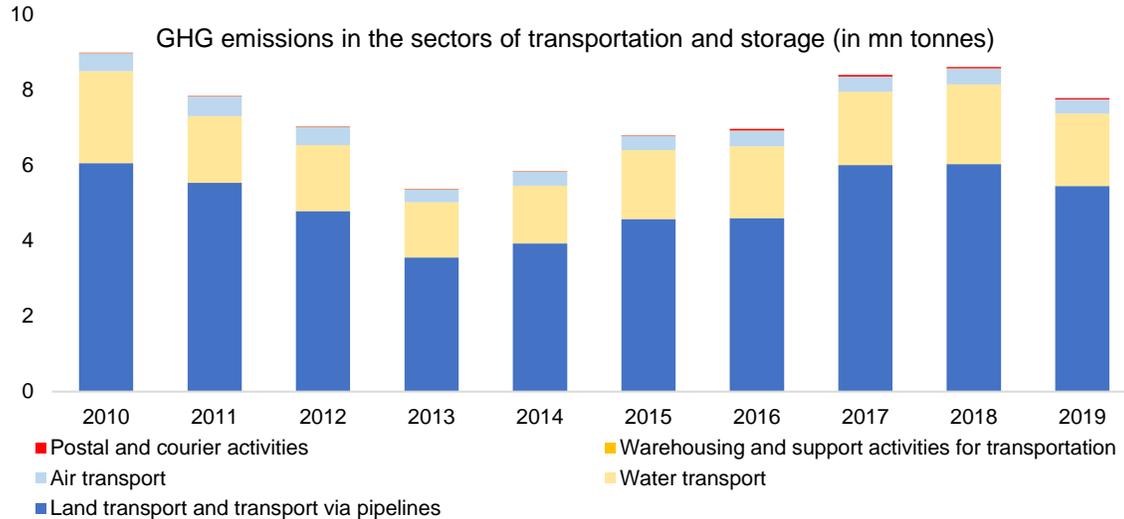
Logistics companies greening efforts and actions to reduce GHG emissions

- Environmental sustainability within the supply chain is gaining ground, with various greening efforts and initiatives undertaken from all actors.
- The 2020 Third-Party Logistics Study indicates that the driving forces behind sustainability efforts are regulatory requirements, the perception of the public and cost savings.
- The integration of greening processes in the supply chain is made by participating in optimization, including route planning and load consolidation (76% of respondents), by tracking and reporting carbon emissions (42%), by participating in voluntary environmental protection programs (38%) and by trying out more environmentally friendly, alternative fuels.
- The logistics company DB Schenker, present also in Greece, is among those that aim to reduce CO₂ emissions by ½ by 2030 compared to 2006, in order to become completely carbon-neutral and use only renewable energy by 2050.
- Lufthansa and DB Schenker agreed to promote environmentally friendly practices, via the a) removal of fossil fuels' use from airfreight transport and b) sustainable aviation fuel research and use, to ensure the adequacy of alternative fuels such as SAF (synthetic kerosene, currently produced from biomass) in the future. In November 2020, the first CO₂ emissions neutral flight of Lufthansa Cargo flew from Frankfurt to Shanghai.

Source: 2020 Third-Party Logistics Study

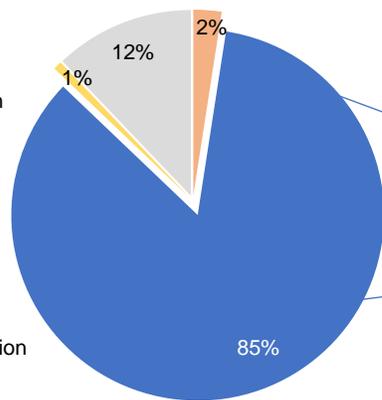
The greening of the transport sector and the reduction of carbon emissions should be a top priority for every actor of the supply chain.

- The decarbonization of the logistics sector is urgent since the progress to cut down CO₂ emissions is slow, while growth in freight continues. The Environmental Protection Agency has warned on global freight transport emissions that by 2050 will surpass the passenger vehicle emissions.
- Restrictions on the level of freight movement, the shift of freight to lower carbon transport modes and the improvement of vehicle loading are necessary.
- The EC 2020 Sustainable and Smart Mobility Strategy targets, following the European Green Deal's sustainable mobility, include a 90% reduction in transport related GHG emissions by 2050, via:
 - Reducing the sector's dependence on fossil fuels by increasing the number of zero-emissions cars, lorries and aircrafts
 - Offering alternative choices by increasing rail freight traffic and transport by inland waterways and short sea shipping
 - Applying the appropriate pricing policies to reflect the environmental impact
- Efforts to replace the shipping industry traditional fuels with front runner fuels (liquid hydrogen, liquified natural gas or LNG, methanol and ammonia).
- The decarbonization of transport modes requires sufficient funding:
 - The next generation Connecting Europe Facility-CEF II 2021-2027, with a transport budget of EUR 27.2 bn (from EUR 24.1 bn in 2014-2020) will continue to support smart, sustainable and safe mobility.
 - The European Structural and Investment Funds, with a total of 70 mn funds for transport in 2014-2020, out of which EUR 39 bn are channeled towards low-emission mobility.
 - The research program Horizon 2020, which provides EUR 6.4 bn for low-carbon mobility projects.

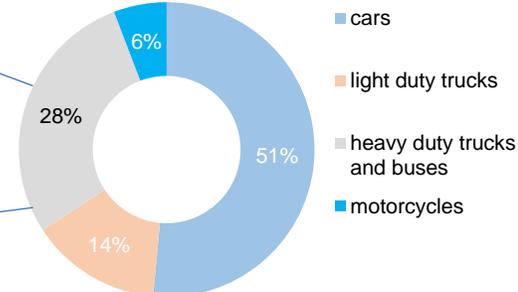


GHG emissions from fuel combustion in transport categories in Greece, 2018

■ domestic aviation
■ road transport
■ railways
■ domestic navigation



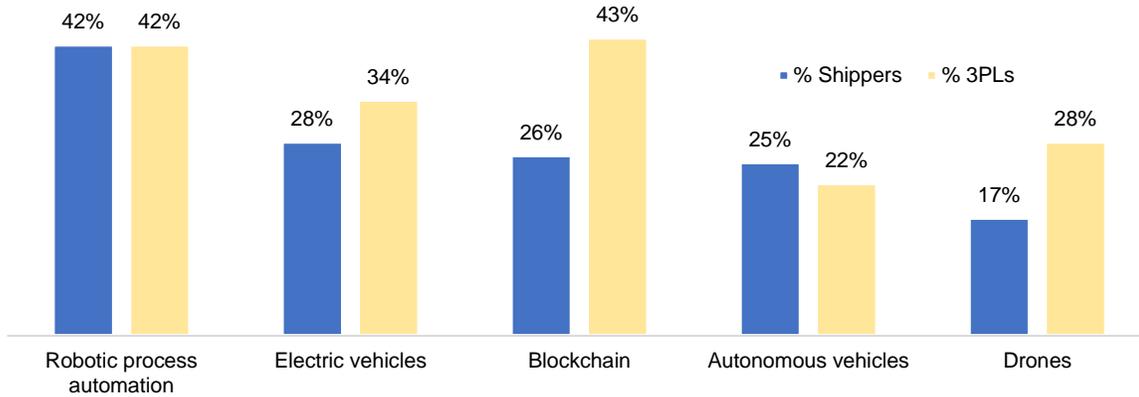
GHG emissions from fuel combustion in road transport per vehicle in Greece, 2018



The most energy consuming sector of transportation and storage is land transport and transport via pipelines, exhibiting the largest share in greenhouse gas (GHG) emissions, although reduced since the 2009 Greek economic crisis.

- Transportation and storage GHG emissions accounted for 14.5% of total emissions of economic activities in the EU-27. In Greece, this share stood at 10.6% (2019) (7.8 mn tonnes), after electricity, gas, steam and air conditioning supply (41%), manufacturing (25%), agriculture and forestry/fishing (11.2%).
- GHG emissions of transportation and storage in Greece decreased by 1.6% annually during the period 2010-2019 (0.8% in the EU-27) and by 13% cumulatively (7% in the EU-27), recording the 4th highest fall after those of Cyprus (-37%), Belgium (-27%) and Estonia (-25%).
- 70% of polluting emissions from transportation and storage came from land transport and transport via pipelines (2019), 25% from water transport and 5% from air transport.
- GHG emissions of land transport and transport via pipelines were contained in Greece by 10% cumulatively during the period 2010-2019, those of water transport by 22% and those of air transport by 19%.
- Warehousing and support activities for transportation produce almost zero emissions, as a non-energy consuming sector, while postal and courier activities increased their share 0.5% from zero in 2010.
- Regarding GHG emissions by source sector, 75% comes from energy, which includes fuel combustion in transport, 14% from industrial processes and product use, 9% from agriculture and 5% from waste management.
- The vast majority of GHG emissions from fuel combustion per transport category comes mainly from road transport (85%), with half of the produced emissions originating from cars, 28% from heavy duty cars and buses, 14% from light duty trucks and 6% from motorcycles.

Expected technology investments over the next three years by shippers and 3PLs



- The 2021 Annual Third-Party Logistics Study reveals that 96% of 3PL providers and 93% of shippers state that the supply chains are evolving from linear chains to complex networks.
- Moreover, 3PLs are widely using mobile technology, such as smartphones, tablets, wearables and other handheld devices. On the other hand, the majority of shippers use technology for supply planning (89%), demand planning (83%), sales/operations (78%) and capacity planning (61%) and they also utilize dashboards and related tools in their operations for real-time access.
- 48% of shippers have systems to organize and access real-time data for reporting purposes, while 45% of them state that they collect real-time data across more than half of their supply chains.
- According to the 2021 Third-Party Logistics Study, 3PL providers are planning to invest in leading technologies over the next three years, such as robotics automation (42%), electric and autonomous vehicles (34%), blockchain (43%) and drones (28%).

Source: 2021 Third-Party Logistics Study

Logistics experienced fast changes in the last decade driven by continuous technological breakthroughs, especially in information technology, robotics, digitalization and the Internet of Things (IoT).

New technologies in the logistics chain

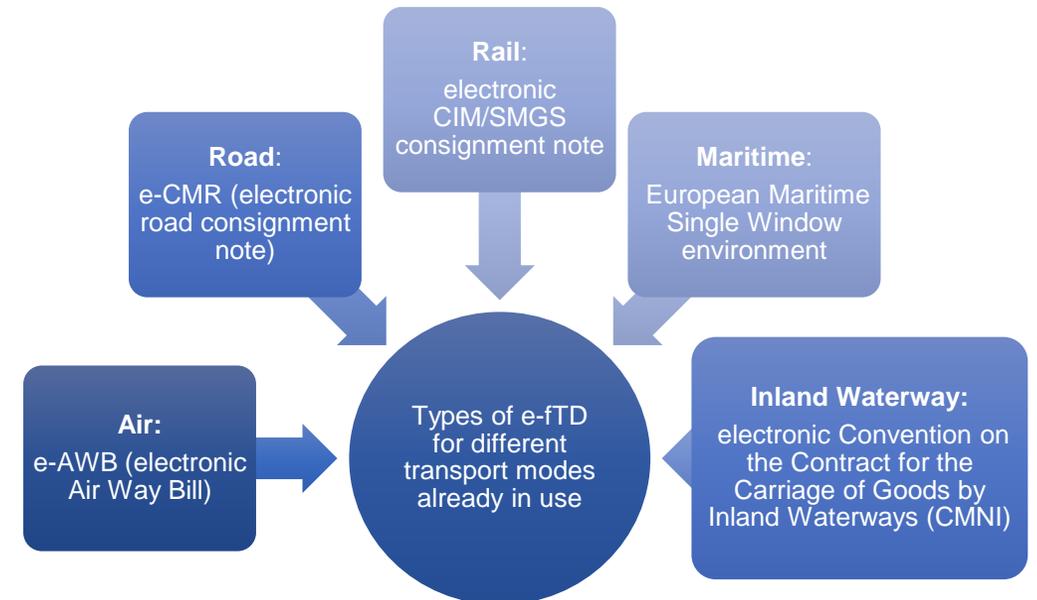
- Robotics and automation, which allow for autonomous forklifts and robots programmed to pick products quickly and at a low cost.
- Transportation Management Systems (TMS) that have shifted from terminal-based installs to cloud-based platforms and include route scheduling and optimization, freight auditing, payment processing and carrier management.
- Artificial Intelligence (AI), which includes intelligent and efficient use of big data to drive cost-effective supply chain management, reduction of human intervention to increase efficiency in delivery and warehousing and intelligent predictive analysis of vast amounts of data collected over time.
- IoT, which enables multiple physical objects to connect to the internet and exchange data, by promoting higher adoption of mobile apps used in inventory management, barcode scanning, fleet management, shipment tracking, order management and customer service.
- Data Analytics, significantly helpful for digitalization, which include real-time data updates created through a data bank on routes and progression reports, as well as data-enabled intelligence, allowing access to reliable data.
- Blockchain, which constitutes a database of an ever-growing list of records known as blocks, helping to transfer information under a stable time stamp.
- Greening technologies to reduce polluting emissions as part of the operations in the supply chain and efficiency gains that can be obtained through a) automation (autonomous vehicles or platooning technology), b) alternative fuels (natural gas, innovations for fuel efficiency) and electrification (electric vehicles, commercial heavy-duty electric vehicle charging stations) and c) route, network or mode of transport optimization (electronic logging devices, telematics, real time visibility, converting truckloads to rail).

The European Commission (EC) considers the digitalization and the use of information and communication technologies (ICT) in transport and logistics as being of vital importance for the European economy and its competitiveness.

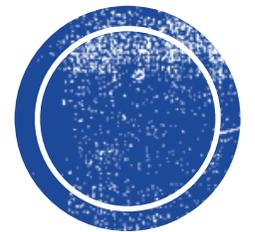
European Commission 2015 Digital Transport and Logistics Forum (DTLF)

- The Forum focused on the formulation of policy and technical recommendations regarding the digitalization of the transport and logistics sector.
- It aimed at the full-scale digital interoperability and data exchange in a shared, secured and trusted transport and logistics dataspace, by removing technical, operational and administrative barriers in transport modes.
- DTLF consisted of representatives from EU member states and stakeholders from transport and logistics sectors and has worked on the acceptance of digitalized transport documents for each transport mode, i.e., of the e-fTD or electronic freight transport documents.
- Among the DTLF actions was the establishment of corridor freight information systems that look into shared data within the logistics networks, by forming an EU federated network of platforms and a data sharing environment for business and public sector use, until the end of 2023.
- According to DTLF, the advantages in better exploiting available data and the use of information and communication technologies (ICT) in the transport and logistics sector are numerous:
 - Enhanced choice of transport services by using online platforms including available services in all transport modes.
 - Improved transport management by using real-time information on delays and incidents.
 - Lower administrative cost by handling tasks online.
 - Lower warehousing costs and efficient inventory management.
 - Enhanced safety and damage prevention of goods using on-board alert

- systems in dangerous areas and intelligent cargo informing on goods condition, safety and damage prevention.
- Higher security thanks to more and better data on goods, vehicles and security controls.
- Improved maintenance of vehicles and infrastructure, using information sent by vehicles and infrastructure components.
- Lower CO₂ emissions, as a result of improved efficiency of logistics, but also of transport optimization and higher load factors.



Policy recommendations and SWOT analysis



Logistics providers in Greece can support certain industries with visibility, value-added delivery and significant cost reductions, although the efficiency of the logistics industry depends also on the coordination of players and the quality and width of infrastructure.

Expansion of logistics services to meet customers needs

- Apply a well-managed forward deployment program to decrease cost and risk of warehouse inventories and optimize delivery from distribution hubs to individual locations, offering maximum customer value.
- Develop greater visibility into inventories to establish deliveries and make the application of reverse logistics easier.
- Contribute to lower cost and shipping time and improved delivery accuracy and efficiently manage shipments for on-time delivery of valuable items.
- Develop databases of the most frequently ordered goods and manage inventories to meet ongoing demand.
- Logistics services by Greek 3PL providers can be further expanded to medical device industries, food industry, retailers and field service operations.
- 4PL or 5PL providers can manage more complex and demanding supply chain systems with multiple players and resources (e.g., in e-commerce), by using technologies and innovations to increase visibility and operational discipline across the players of the supply chain.
- Logistics companies must consider new shopping patterns, as they also serve B2C customers and make progress on digitalized consumption patterns and adopt new technologies to deal with the increased customization in manufacturing, aiming to meet customers' needs.
- Required cooperation and coordination of various parts and enterprises by using information technology to reduce costs, decrease inventories and increase shippers' flexibility and response times to demand.
- Improvement of freight efficiency intermodalism of items that require multi-transport modes for high value-added products international trade.

Environmentally sensitive policies

- Investments in reverse logistics and the development of secondary markets of used products, and in new, green technologies that support environmental sustainability.
- More truck manufacturers should invest in electric vehicle technologies, the adoption of renewable natural gas and greener, diesel-based technologies, with advanced engines and automated vehicle technologies.
- Increase of the commercial heavy duty electric vehicle charging stations with high-speed charge facilities: Greece lags in infrastructure of electric charging stations, which are a prerequisite for the wide use of electric vehicles.

Adaptation to disruptions in supply chains caused by the pandemic

- The pandemic called for adapting services to meet variations in demand and uncertainties caused by the pandemic, such as a) new safety protocols, b) alternative modes of transport, c) companies adapting to demand offering for example no contact delivery options, d) increased dedicated air cargo capacity, e) increased cargo inspections and cross border control protocols, f) technology and e-commerce increase, g) shortening of supply chains and h) adaptation to changes in fuel prices, which affected prices in transportation and storage.
- The logistics sector played and will continue to play a crucial role in battling the pandemic, by strongly supporting the inclusive, safe and sustainable movement, storage and flow of COVID-19 vaccines globally and in Greece.
- Operational delays led to delivery delays and higher freight rates, but companies that used e-commerce saw increased activity. Consumers used online shopping, a trend that is continued in the post-COVID-19 era and thus will require quick delivery necessitating solutions, such as alternative storage.

Strengths

- Strategic geopolitical position that favors the development of a cross-border transportation and logistics hub between Western Europe and Asia.
- Expanding presence of big, international logistics companies in Greece.
- Significant sector, with high valued added for the Greek economy.
- Piraeus is the largest Mediterranean port and the fifth largest in Europe in terms of volume of containers.
- Transport quality and trade-related infrastructure.
- Ease of arranging competitively priced international shipments.
- National Strategy Plans that set the necessary context for the development of the sector.
- Ongoing investment interest by both foreign and domestic companies.

Opportunities

- Acceleration of investments in logistics parks, islands' ports, road and rail network and connection with ports and warehousing logistics projects.
- Expansion of rail freight transport.
- More green investments to lower carbon emissions (e.g., electric vehicle technologies).
- Extensive implementation of new technologies and digitalization (e.g., IoT, AI, Data Analytics, Blockchain, Robotics).
- Cooperation and coordination of various players by using IT technology, so as to reduce costs, decrease inventories and increase shippers' flexibility.
- Further development of e-commerce.
- Exploitation of the NSRF 2021-2027 and CEF II investment funds.

Weaknesses

- Limited investment activity in rail network, ports and airports and use of rail freight transport, due to the underdeveloped rail network.
- Lack of organized logistics parks.
- Delays in the completion of investments.
- Limited efficiency of the clearance process at customs.
- High usage of fossil fuels in transportation.
- Large share of GHG emissions from fuel combustion in transport, the majority of which comes from road transport.
- Lag in infrastructure of electric charging stations.
- Contained use of digitalization and new technologies that support the efficiency and cost reduction of the supply chain.

Threats

- COVID-19 pandemic and the negative impact on trade, transportation and storage called for various adaptations in supply chains.
- Dependence of logistics companies on the activities of retailers and manufacturers.
- Potential market inefficiencies due to fragmentation of the market.
- Absence of land-use plans at a country level that could facilitate the development of logistics parks.
- Potential increases in fuel prices that could have a negative impact on transportation performance.
- Absence of cost-effective plans and options for clean and green transport modes.



Articles and reports

- Alpha Bank, Weekly Bulletin 30/03/2021.
- European Commission
 - A European strategy for low-emission mobility, 20.7.2016
 - The Digital Transport and Logistics Forum
 - Connecting Europe Facility 2021-2027, June 2020
 - Connecting Europe Facility (CEF)-Transport grants 2014-2020, June 2020
 - Enhanced surveillance report, Greece, May 2020
 - Fact-finding studies in support of the development of an EU strategy for freight transport logistics, January 2015
 - Guidelines for border management measures to protect health and ensure the availability of goods and essential services, 16.3.2020
 - Sustainable mobility, The European Green Deal, December 2019
- European Logistics Platform
 - CEF II supporting smart, sustainable and safe mobility, 4 December 2019
 - Logistics connecting the world, 2020
 - Logistics in transition, 25 September 2019
 - The European Green Deal and logistics in time of recovery, 7 July 2020
- Ernst and Young
 - Attractiveness Survey, Greece, July 2020
 - Greece, International freight centre, April 2021
 - How to build resilient supply chains in times of crisis, 11 November 2020
- ICAP
 - Third-Party Logistics, October 2019
 - Transport services, October 2019
- KPMG, COVID-19 supplier management response, April 2020
- Law 4302/2014, ΦΕΚ 225/Α/08.10.2014
- Ministry of infrastructures and transport
 - Council for the development and competitiveness of logistics, 22.9.2017
 - National strategy plan for the development of the Greek logistics sector, 2013, 2017
 - National transport plan for Greece, June 2019
 - The strategy of the European Union for logistics

- Orosimo Software, Prepare the future, believe in tomorrow
- Partnership Agreement for the Development Framework (ESPA/NSRF) 2021-2027, Ministry of development and investments, January 2021
- PWC
 - The future of the logistics industry, September 2016
 - Transport and logistics barometer, January 2021
- STOCHASIS, Third Party-Logistics, September 2020
- The Digital Transport and Logistics Forum
 - Enabling organizations to reap the benefits of data sharing in logistics and supply chain, June 2018
 - Towards paperless transport within the EU and across its borders, 2018
- The Greek shipping estimation model, Methodological note, Bank of Greece, October 2018
- The World Bank
 - Connecting to compete 2018, The logistics performance index and its indicators
 - Greek logistics, Unlocking growth potential through regulatory reform and complementary measures, November 2013
 - The impact of COVID-19 on logistics, June 2020
- Annual 3PL Study 2019, 2020, 2021

Databases

- Bank of Greece
- Hellenic Statistical Authority, ELSTAT
- Eurostat

Websites

- https://ec.europa.eu/commission/presscorner/detail/en/ip_20_2329
- https://ec.europa.eu/transport/media/news/2020-04-29-coronavirus-package-measures-support-transport-sector_en
- https://ec.europa.eu/transport/news/2020-03-27-exceptional-measures-inability-comply-legislation_en
- https://ec.europa.eu/transport/themes/sustainable_en
- <https://government.gov.gr>
- <https://inspire.ec.europa.eu/codelist/EconomicActivityNACEValue/H.53.20>
- <https://logisticsinsights.agility.com/COVID19/covid-19->

- [vaccines-on-the-horizon/
https://logisticsinsights.agility.com/COVID19/4-big-logistics-challenges-of-covid-19-and-how-to-overcome-them/](https://logisticsinsights.agility.com/COVID19/4-big-logistics-challenges-of-covid-19-and-how-to-overcome-them/)
- <https://www.dtlf.eu>
- <http://www.elalog.eu>
- <https://www.e-nomothesia.gr/kat-epikheireseis/nomos-4399-2016-phek-117a-22-6-2016.html>
- <https://www.enterprisegreece.gov.gr/>
- <https://www.espa.io/espa-2021-2027-se-poious-tomeis-katanomi-poroi-ependyseis-20-dis/>
- <https://www.ilme.gr>
- https://www.imerisia.gr/epiheiriseis/9248_i-ellada-gemizei-logistics-poiio-megaloi-paiktes-ependyoyn
- <https://www.managedoutsource.com/blog/how-digitization-is-transforming-the-logistics-industry/>
- <https://www.mckinsey.com/industries/travel-logistics-and-transport-infrastructure/our-insights/global-freight-flows-after-covid-19-whats-next>
- <https://www.metaforespress.gr/aeroporika/πράσινης-εμπροευματικής-αεροπορικ/>
- <http://www.mindev.gov.gr>
- <http://www.naftemporiki.gr/Premiumservices/archive/story/2444921>
- <https://www.ot.gr/2021/04/26/naytilia/rota-gia-to-ydrogono-vazoun-oi-naytiliakes/>
- <https://www.pcdc.com.gr/free-zone/>
- <https://www.ship-technology.com/news/Inq-hydrogen-fuel-shipment-imo-targets/>
- <https://www.statistics.gr/documents/20181/6b9f98db-3561-7f2b-fe8b-73d99b603322>
- <https://www.yme.gov.gr>

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