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THE IMPACT OF THE EXPRESS INDUSTRY ON THE EU ECONOMY

OCTOBER 2020

european express association

Delivering a competitive Europe

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AUGUST 2020

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FOREWORD

In the name of the European Express Association (EEA), it is my pleasure to introduce this 2019 study on the Impact of the Express Industry on the EU Economy which aims to provide a clear picture of the size, scope and direct and indirect impact of the express delivery sector in the European Union. We consider this to be an essential component of a continued dialogue between our sector and policy makers given the importance of the express industry for the European Union's trade and economy.

As it has been the case with previous studies on the footprint of the express sector, the EEA has decided to rely on Oxford Economics to deliver this new edition, which builds upon similar methodologies as those used for previous reports. It should be noted that the study and related survey presented herein were performed in 2019, which explains the inclusion of the UK as an EU Member State.

Since the introduction of express delivery service in Europe in the mid-1980s, the sector has experienced significant growth in revenue and employment, outpacing EU GDP growth. More importantly, express delivery services, combining time definite transportation services, customs brokerage services with end-to-end traceability and predictability of shipments, have become an integrated part of local, regional and global B2B supply chains in multiple industries. With the rise of ecommerce, express delivery operators have also experienced significant growth in the B2C segment.

Express delivery operators have the largest dedicated air and road networks, are among the largest customs brokers and rely on the use of advanced global IT infrastructure to support the transfer of shipment data with customers and authorities. With such an extensive coverage, the express industry is core to expanding trade, helping to build nimble supply chains and connecting EU citizens and businesses to domestic and more remote markets within record time. As our activities are subject to many forms of legislation, regulation and policy initiatives, we constantly strive to ensure seamless border processes and address barriers to trade.

Express operations also adhere to high aviation security standards and constantly re-invent and adapt their network and delivery operations to meet the evolving needs of global trade and local mobility requirements. Today, the express industry directly employs 330,000 employees in the EU, its annual contribution to EU GDP is estimated to be €69 billion and the sector contributes €24 billion of tax revenue to EU Member States.

At the time when the EEA commissioned Oxford Economics for this publication, the world was far from imagining that one of the most severe pandemics in modern history would suddenly hit the world in 2020, striking individuals, societies and trade with unprecedented short-term and long-term effects, yet difficult to wholly apprehend. The Covid-19 outbreak illustrates how state economies depend upon each other. While the outbreak is not yet overcome, "recovery" and "resilience" now appear to be two major poles in the strategies that most political leaders envision for the future.

In this context, the essential role of our industry and employees has been recognized as express delivery services ensured that time-critical shipments such as medical supplies and personal protective equipment, but also pieces for urgent repairs, inputs into global supply chains or other high value goods and shipments, reach their destinations in a safe and timely fashion. As most EU Member States recommended or required their citizens to stay home to prevent the spread of the virus, the contribution of our sector to e-commerce and to B2C home deliveries has been critical. This will continue being the case as people and economies enter the rebuilding phase and work towards improving their resilience to existing and future challenges, whatever they are.

In this regard, Climate Change stands as one of the most significant challenges of our time for the transport industry, but it also opens a field of opportunities to improve ways of operating and contributing to a brighter future for Society. With the EU Green Deal, the European Union is committed to paving the way to a more sustainable world. The Express Industry is keen to join the collective effort to achieve this ambition.

Stephanie Meyer - Van Breukelen

Chair EEA

EXECUTIVE SUMMARY

"Express delivery is the most important service for our company. Without this, we cannot imagine working in stiff competition."

Large food & beverages manufacturer, Croatia

The core business of the express industry is the provision of door-to-door transport and delivery of next-day or time-definite shipments, domestically and across the globe. Express delivery operators are often referred to as "integrators" as they provide their domestic and business customers with an integrated delivery service from end to end: organizing collection, providing tracking information and handling customs clearance where shipments cross international borders.

We estimate that the European express industry supported a total of 1.1 million jobs in the EU28[1] in 2018.

1,100,000

Jobs supported in the EU28 in 2018 by the industry's activities, including via its supply chain and consumer spending impacts.

This is the sum of the 330,000 employees working directly for the sector within the European Union; those employed indirectly to support the sector's supply chain spending, and induced employment supported as a result of the industry and supply chain employees spending their wages. The total figure is just under the overall number of people employed in Lithuania in 2018,[2] or comparable to the total population of Estonia.[3]

On the same basis, the European express industry is estimated to have supported a GDP contribution of €69 billion across its direct, indirect and induced impacts.

As a result of this economic activity, the sector is estimated to have contributed to the generation of €24 billion of tax revenues for the governments of the EU28 nations.[4] This is a similar magnitude to the contribution to the EU budget of Germany in 2018.[5]

The express industry plays a critical role in Europe's internal market and external trade.

In 2018, the three largest global integrators (DHL, FedEx and UPS) made 280 million intra-EU cross-border express deliveries, with operations across every country in the EU28.

Intra-EU trade is of increasing importance to Europe's economy. Over the past decade, the value of all goods traded between EU28 countries has grown faster than the economy as a whole — at 5.4% per year against 2.9% for EU28 GDP (both in nominal terms).[6]

The Express industry also facilitates the EU's trade with the rest of the world, connecting European businesses with more than 90% of the world economy

[1] The study and related survey were performed in 2019, hence the inclusion of the UK as an EU Member State.
[2] Eurostat, employment by sex, age and occupation dataset.
[3] Eurostat, population on 1st January dataset.
[4] Largely labour income tax, social security contributions and corporation tax, as well as other taxes on products and production.
[5] European Union Europa website, *About Germany*
[6] Eurostat figures.

€69 billion

Total contribution to EU28 GDP by the express industry in 2018.

within 24 to 72 hours.[7] We surveyed EU28 companies[8] that use express delivery services: more than half (52%) reported that one of the main reasons they use express deliveries is to better serve more distant markets, and 74% reported that the range of delivery is important to them.

Express delivery services also make customs clearance simpler for customers: a quarter (25%) of surveyed express delivery-using firms report that this feature of the industry's services is of particular importance to them.

Rapid delivery is important for supporting the supply chains of EU businesses.

€24 billion

Tax revenue generated by the sector through direct, indirect and induced impacts.

Of our surveyed firms, 84% reported that the speed of express delivery is important to them, while 64% indicated that the main reason they use express delivery services is because their customers require products urgently. In part, this is due to products being time-sensitive—28% report this being a chief reason for using express deliveries.

Express delivery forms an integrated part of modern manufacturing and business.

Our business survey revealed that a vast majority (86%) of companies believed they would be negatively affected if express delivery services were unavailable. In the manufacturing sector, 98% believe they'd be negatively affected.

For many European businesses, the loss of international express delivery would harm their sales. Nearly three quarters of respondents (73%) in the survey indicated that orders could be lost as they could no longer access some markets—the average loss to sales reported was 13%.

Production would also be affected. Approximately half of firms stated that without access to express delivery services they would need to expand their own transportation capabilities and their inventory storage capacity, while a quarter would need to relocate some of their operations.

A further impact of a loss of access to express delivery services is through the requirement to arrange for customs clearance. Only one third of firms surveyed currently employ customs clearance experts: the same number report that they would need to hire this expertise if they did not have access to express delivery services.

[7] Oxford Economics, The Economic Impact of Express Carriers in Europe, 2012

[8] We undertook a survey of European businesses that use the industry to send shipments, targeting logistics and supply chain managers at 1,000 businesses of all sizes and sectors across the EU28.

1. WHAT IS THE EXPRESS DELIVERY INDUSTRY?

"To save our time, finances and also to ease customer pressure, use of express delivery is a necessary part of our business."

Very large retailer, France

This report, commissioned by the European Express Association (EEA), demonstrates how the express delivery industry creates value for the EU28[9] economy through several channels, including: (i) the operational activity of the industry itself, such as the employees working directly for express delivery firms; (ii) the impact of procurement spending in the industry's supply chain; and (iii) the impact of employee spending in other sectors.

The industry's economic footprint extends far beyond these "core" impacts, also helping to boost the economy through numerous longer-term "catalytic effects", including:

- improving supply chain efficiency by making "just-in-time" inventory management possible;
- connecting customers and suppliers in distant locations with a door-to-door service not otherwise possible;
- boosting overall economic growth by supporting trade across the globe; and
- helping to utilise transport infrastructure 24/7.

To contextualise this impact, the report first explains what the express delivery industry is.

1.1 WHAT DOES THE EXPRESS DELIVERY INDUSTRY DO?

The express delivery industry provides door-to-door transport and delivery of next-day or time-definite shipments across the globe.[10]

The largest express delivery operators are often referred to as "integrators", referring to the ability of these companies to offer an integrated service across all stages of delivery. This includes organising collection, providing tracking information and proof of delivery and, where shipments cross borders, handling customs clearance and any necessary payment of duties and taxes. Integrators maintain control over all aspects of the distribution process, providing benefits such as offering the possibility of changing the destination and addressee in-transit.

The economic impacts calculated in this report are based on data individually provided by the integrators—DHL, FedEx and UPS—on their respective express delivery activities, excluding freight.

[9] EU28 countries are Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

[10] Time-definite shipments typically incur a transit time of less than 1 day within Europe, and between 2 to 5 days for extra-EU shipments, depending on distance.

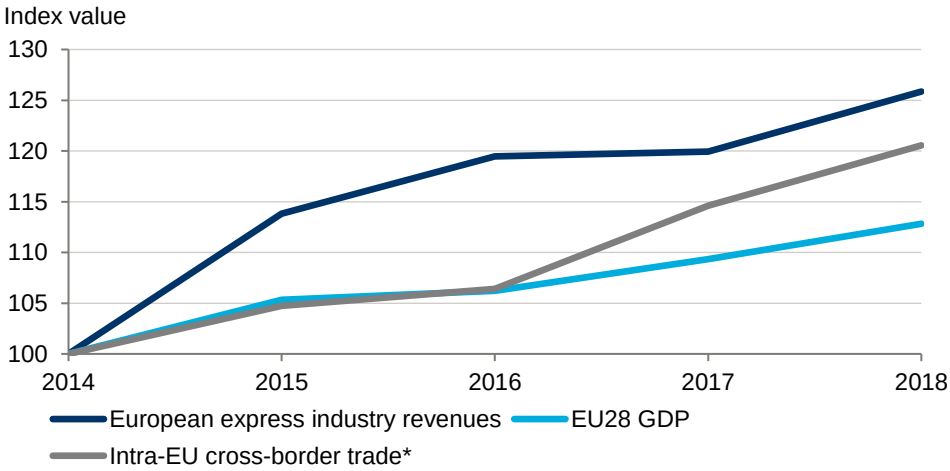
1.2 DEVELOPMENT OF EXPRESS DELIVERY SERVICES IN EUROPE

Express delivery services were introduced to Europe in the mid-1980s, having initially been developed in the USA. At that time, the requirement of European companies for time-definite, guaranteed delivery could not be met by either postal services or freight forwarders.[11]

Typically, the types of shipments transported by express delivery services are items that are high-value and low-weight, such as electronic components, high-tech products, apparel, automotive parts, medical devices and pharmaceutical products. For example, goods imported into the EU28 by air in 2018 accounted for less than 1% of the total tonnage of imports, but approximately 21% of the value of EU28 imports from the rest of the world.[12]

As cross-border business relationships become ever more important to the European economy, trade between EU countries has grown faster than nominal GDP in recent years, at 4.8% a year compared to a 3.1% average between 2014 and 2018 (Fig. 1). Helping to facilitate this upward trend in cross-border trade, the European express industry has grown even more rapidly with revenues rising by an average of 5.9% each year between 2014 and 2018.

Fig. 1. Growth in European express industry revenues, EU28 GDP and intra-EU cross-border trade, nominal terms, indexed to 2014 = 100



Source: EEA, Eurostat, Oxford Economics
* Sum of goods imports and exports

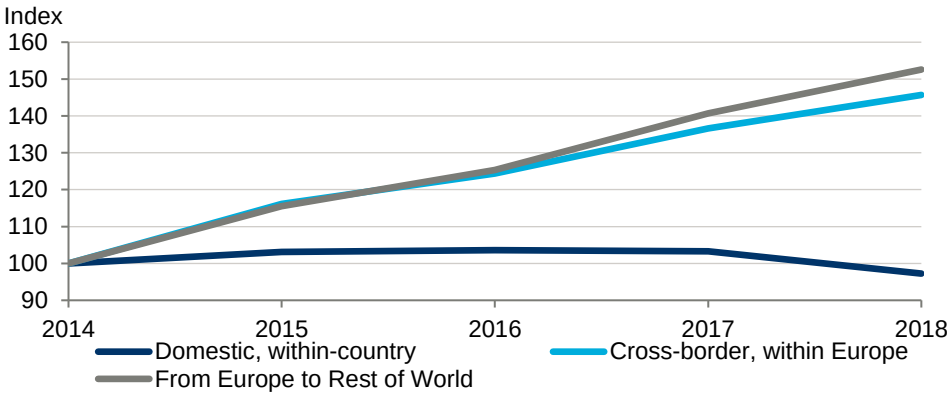
Indeed, cross-border express industry shipments within Europe grew by nearly 50% in the five years to 2018, significantly faster than domestic express industry shipment numbers, which remained broadly flat (Fig. 2). This rapid expansion took cross-border EU shipments from 31% of the European express industry's deliveries in 2014 to 39% by 2018. Shipments from Europe to the rest of the world also saw rapid growth over that time period but from a smaller starting point, rising from 8% of total shipments in 2014 to 10% in 2018.

[11] Oxford Economics, The Economic Impact of Express Carriers in Europe, 2011

[12] Analysis of Eurostat database *EXTRA EU trade since 1999 by mode of transport* (table reference DS-022469)

Across each of these destination categories, in 2018 the three largest integrators delivered more than 700 million shipments originating within the EU28.[13] These included "time definite" deliveries (delivered by a specific time), "deferred" deliveries (a lower-cost service with less-strict time guarantees), and a small share of the same-day market.

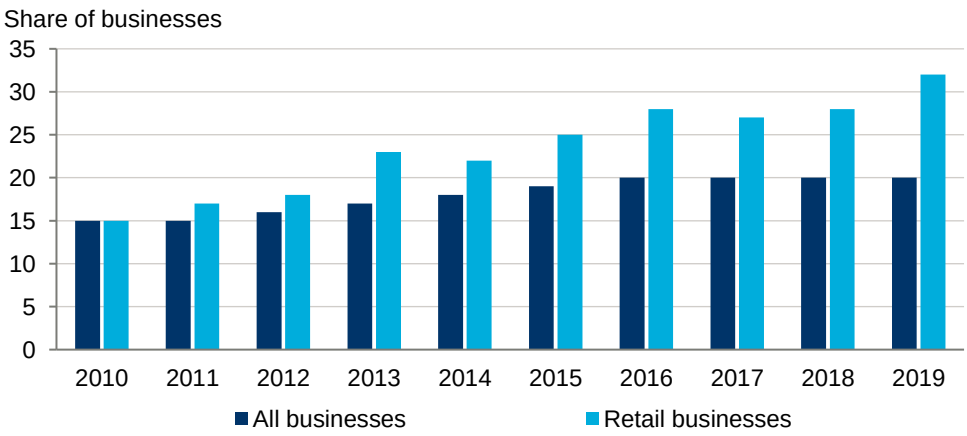
Fig. 2. Growth in express industry shipments by destination, indexed to 2014 = 100



Source: EEA, Oxford Economics

Online purchases by consumers are a key factor in the rise of cross-border trade, for both intra-EU and international imports and exports. The 2019 European e-commerce market is estimated to be worth more than €600 billion in sales terms in 2019, roughly double its size in 2013.[14] The share of all EU28 businesses with e-commerce sales rose over the last ten years, but among retailers this share has doubled from 15% in 2010 to 32% in 2019.

Fig. 3. Share of businesses (10 or more employees) with e-commerce sales, EU28



Source: Eurostat

Cross-border sales are also an increasingly important part of the e-commerce landscape: more than one in every five adults in the EU28 (21%) bought

[13] Including deliveries

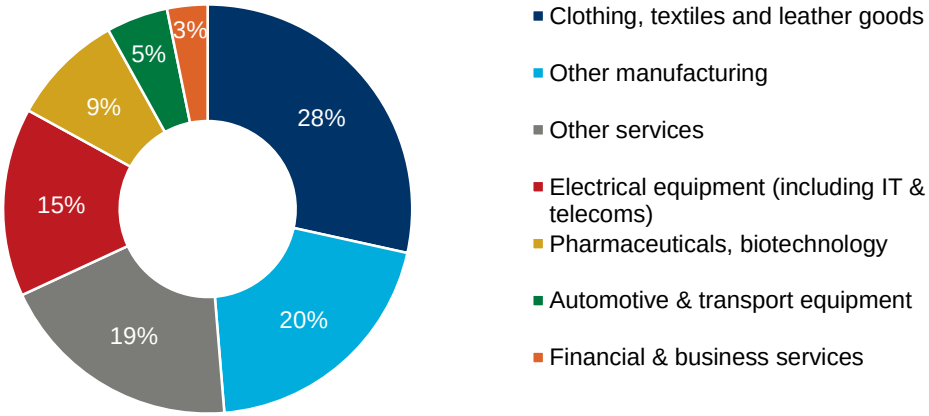
[14] Ecommerce Foundation, *European Ecommerce Report,* 2018 and 2019

something online from other EU countries in 2018, highlighting the extent to which countries in the bloc are becoming more economically linked. This proportion has more than doubled from 8% a decade before. The share of adults making an online purchase from outside the EU has quadrupled over the same time period, from 4% in 2008 to 16% in 2018.

Of the shipments delivered by the express industry, according to industry data approximately a quarter (28%) are for clothing, textile and leather products, largely composed of business-to-business shipments such as between suppliers and retailers. A further 20% of shipments are for other manufactured products such as industrial, construction and agricultural equipment, as well as consumer goods such as furniture (Fig. 4).

Fig. 4. The express delivery industry's client sectors, 2018

Share of total number of shipments

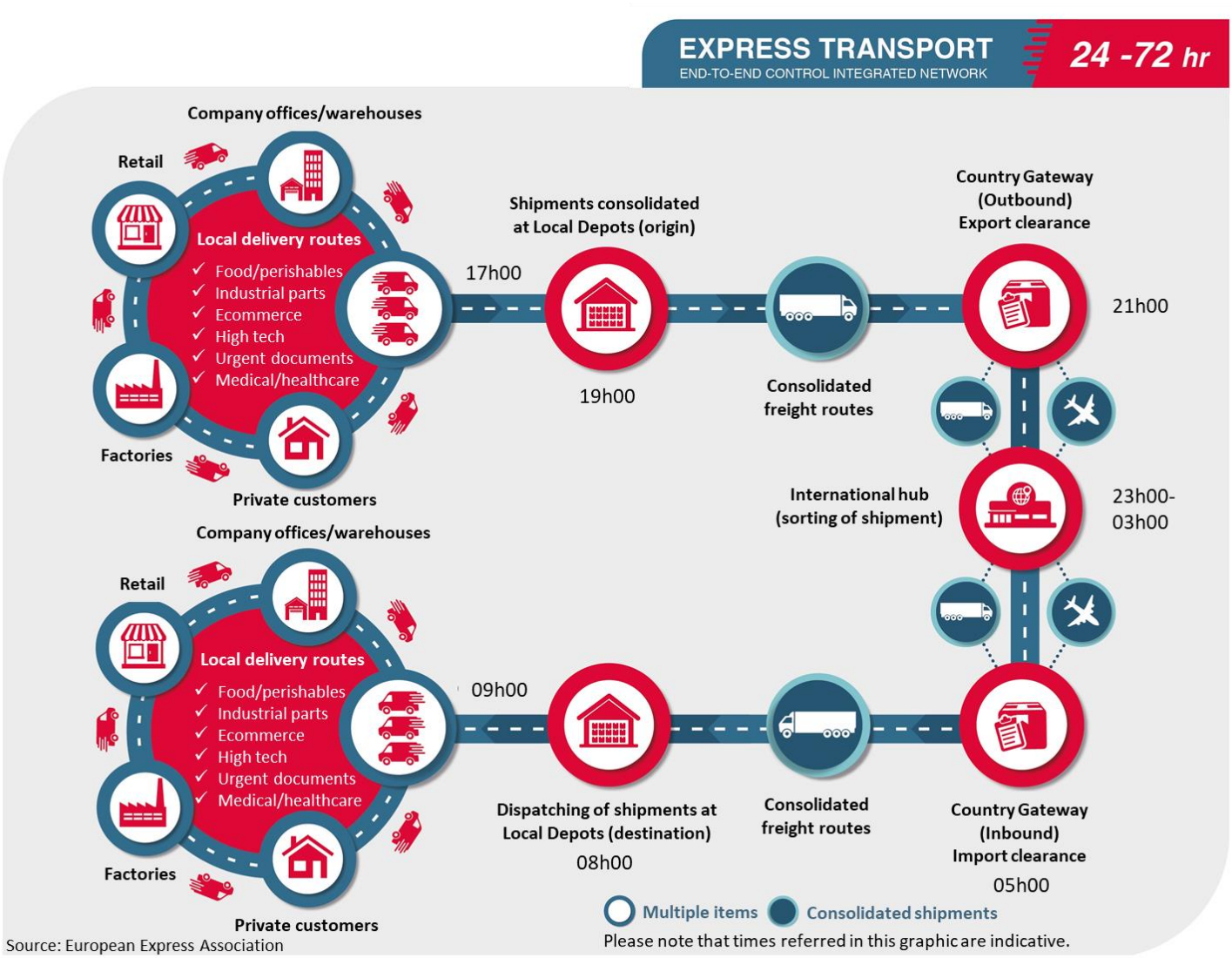


Source: European Express Association, Oxford Economics
* Includes agriculture, construction, consumer goods, food & beverages and furniture sectors.
** Includes education, logistics, public sector and retail sectors.

1.3 OVERVIEW OF AN EXPRESS DELIVERY

To meet the requirements of businesses in Europe, the express delivery industry relies on overnight transport to make full use of the down-time from when a company hands over its shipment late in the working day to delivery to the recipient early the following day. This is illustrated in the figure below.

Fig. 5. The key stages of a typical international express delivery



Source: European Express Association

Express delivery transportation is achieved through multimodal solutions including the use of large lorries; smaller vans; wide-body, medium-sized and smaller aircraft, as well as last-mile delivery modes including on-foot delivery. For urban distribution, express industry optimises pick-up and delivery route planning for maximum efficiency.

1.3.1 The importance of overnight delivery to business and the economy

Night flights are integral to the functioning of the express sector: it would be impossible to achieve next-day time definite deliveries for goods that must be transferred across larger distances, such as across Europe, without night-time

flying. An estimated 28% of the flights operated by, or for, the European express industry took place at night, rising to 44% for intra-European flights.[15]

As illustrated in the results of our survey, one of the express industry's underlying benefits is extended geographical access to intra-European and distant markets for traders. EU exporters and importers are connected with over 90% of the world's economy within 72 hours thanks to express carriers and their ability to operate night flights.[16]

Next-day delivery services allow companies to hand over shipments to express delivery firms at the end of their own working day, ensuring that the items stand still for a minimum amount of time. Without them, the goods would have to be stored overnight before being transported the next morning, at the earliest, generating extra storage and transportation costs.

Reducing lead times in this way helps to increase efficiency, including the inventory carrying costs associated with holding stock for longer: the total cost of warehousing alone is estimated at 2.5% of the sales value for all retail and consumer goods, and higher for more sensitive products such as chemicals.[17] Longer delivery times can lower the value of goods being shipped: macroeconomic research suggest that every extra day that a good spends in transit amounts to a cost of 0.6-2.3% of its value to the business.[18] And there are perishable products that must be shipped by the next morning, or they hold no value at all.

Beyond this however, next-day delivery services (which require shipments above certain distances to be flown at night) have important "catalytic" effects. Previous work by Oxford Economics[19] found that the "most important contribution that the express industry makes to the economy is through its impact on the capabilities and competitiveness of other sectors of the economy", with night flights facilitating this impact with regards to next day delivery.

[15] Based on operator data. The definition of night time here varies by operator from 22:00-05:00 to 23:00-06:00.
[16] Oxford Economics, The Economic Impact of Express Carriers in Europe, 2011
[17] McKinsey & Company, *Lean and mean: How does your supply chain shape up?*, 2010
[18] David Hummels and Georg Schaur, *Time as a Trade Barrier*, 2012
[19] Oxford Economics, The Economic Impact of Express Carriers for UK plc, 2006

2. THE IMPORTANCE OF EXPRESS DELIVERIES TO BUSINESSES

"The adoption of the express delivery platform allows us to expand our opportunities."

Large finance & insurance firm, Cyprus

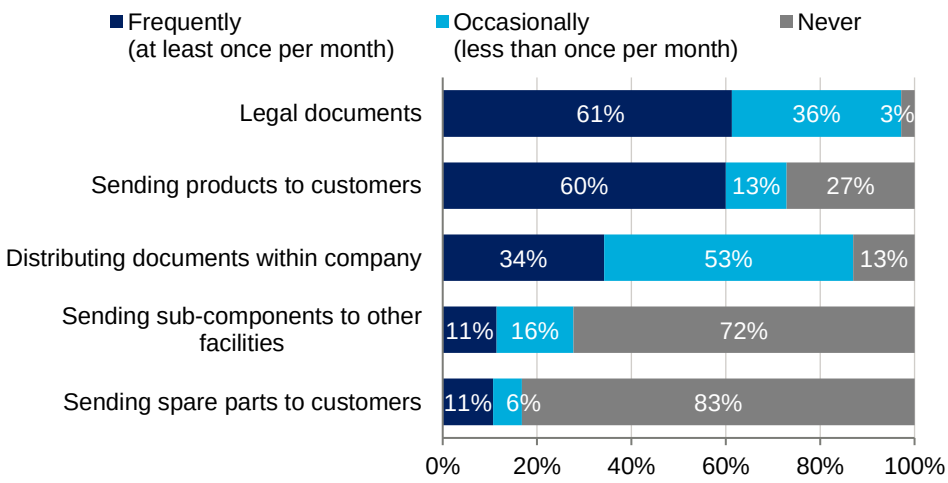
To gather insight into the importance of express deliveries to businesses, we undertook a survey of European businesses that use the industry to send shipments. We surveyed logistics and supply chain managers at 1,000 businesses of all sizes and sectors across the EU28.[20] The survey results highlight the scale and importance of the European express industry: **more than three-quarters of respondents (77%) stated that express delivery is "very" or "vitally" important to their business**.

Further emphasising the impact of the industry, a third of respondents reported that their business would be "significantly negatively impacted" if express services were not available, with a total of 86% expecting some negative impact on their business.

2.1 HOW DO BUSINESSES USE EXPRESS DELIVERY SERVICES?

More than six out of 10 express service customers that responded to the survey reported using express deliveries to send out products to customers at least once per month, with a similar figure for sending out legal documents.[21]

Fig. 6. How often does your business use express delivery services for different shipment types? Respondents could give multiple answers.



Source: Oxford Economics survey of EU28 logistics managers
1000 respondents

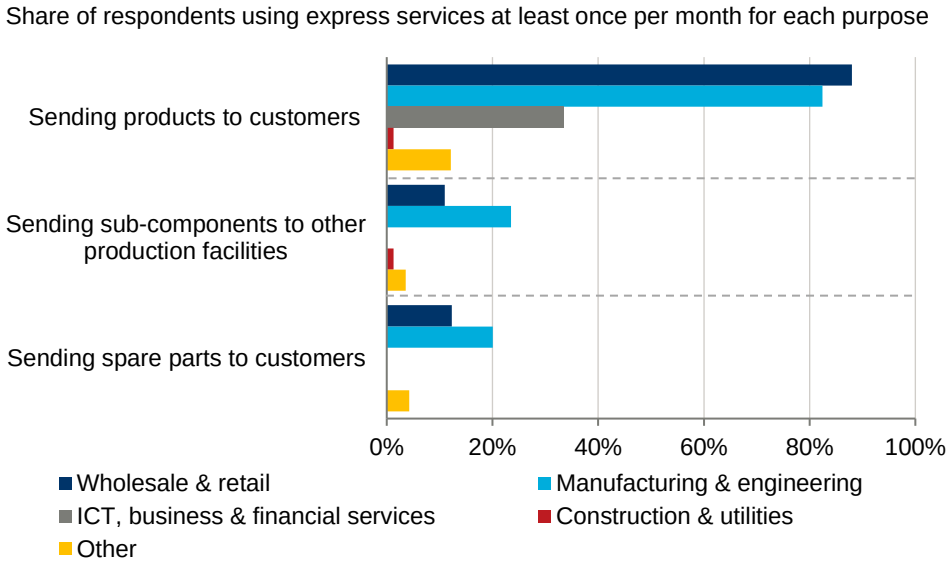
[20] Our survey ran from Sept 25th to Nov 8th 2019. The first question established how much the respondent's organisation used express delivery services. Those not using the sector were filtered out of our survey results until a total of 1,000 businesses were surveyed.

[21] These figures refer to the frequency with which express delivery is used. "Frequently" is defined as at least once a month

Looking at the usage split across different industries, our survey shows that 88% of wholesalers and retailers use express delivery services to send products to customers at least once per month. Retailers meanwhile report that nearly a quarter of their domestic sales (23%) are transported using express delivery, highlighting the importance of these services. Express delivery is also an enabler of selling abroad: retailers report that 11% of intra-EU sales are done through express delivery, and 5% of sales to outside the EU.

Manufacturing and engineering firms that participated in the survey were also frequent users of express delivery for sending products to customers: 82% do this at least once per month. Approximately one in five businesses in this sector also use express services to send sub-components to other production facilities and spare parts to customers—more than any other industry (see Fig. 7).

Fig. 7. Industry split of frequency of express delivery service usage for different shipment types

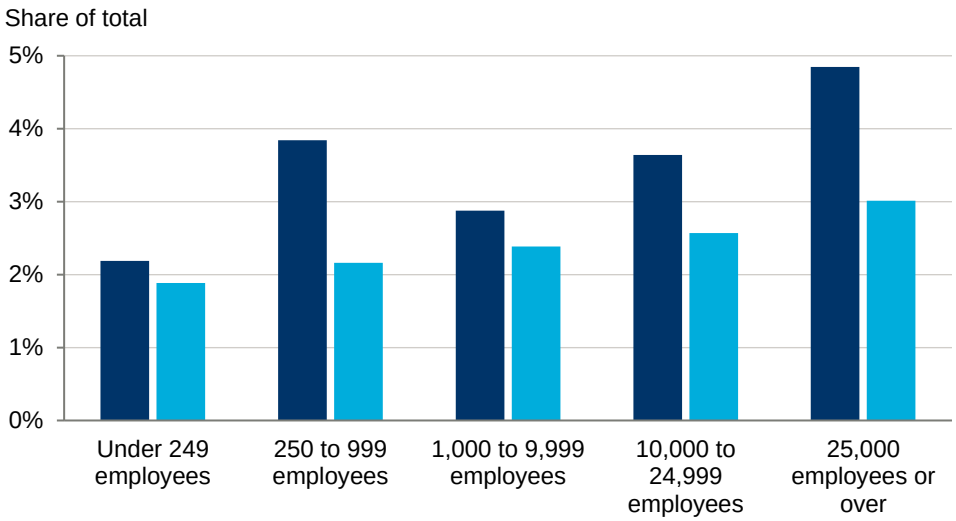


Source: Oxford Economics survey of EU28 companies
1000 respondents

Companies in ICT, business and financial services meanwhile were much more frequent users of express delivery services for sending legal documents: 85% of these businesses do this at least once per month. More than 7 in 10 (71%) construction and utilities firms also made use of express delivery services for sending legal documents at least once per month.

Larger firms in the survey were more likely to use express delivery services for their overseas sales and input purchases: 4.8% of sales outside the EU for very large businesses (over 25,000 employees) were sent using express delivery services. This compares to just 2.2% for firms with less than 250 employees.

Fig. 8. What proportion by value of sales and input purchases outside the EU are transported using express delivery services? (split by firm size)



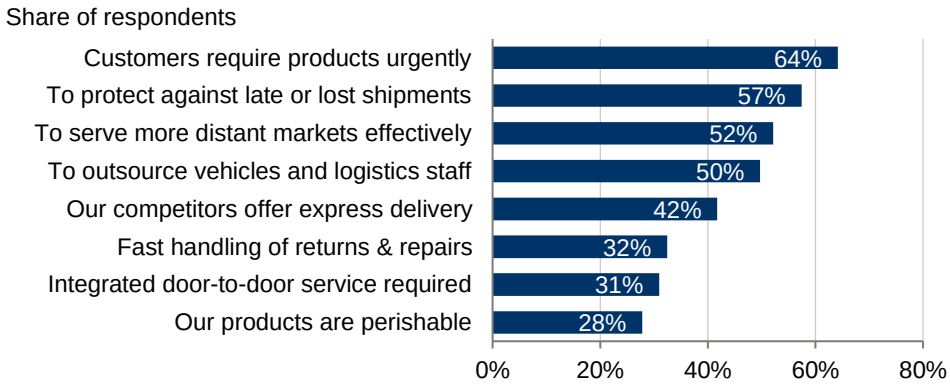
Source: Oxford Economics survey of EU28 businesses
1000 respondents

2.2 WHY DO BUSINESSES CHOOSE EXPRESS DELIVERY SERVICES?

Customers urgently requiring products was the most commonly cited reason for using express delivery, cited by nearly two thirds (64%) of firms that use express delivery for customer shipping.

However, businesses also gave a range of other reasons for using the industry, including protecting their reputation against lost or late deliveries, and the ability to boost exports by serving distant markets more effectively (see Fig. 9). Delivering perishable products before they expire is an important factor for nearly three in ten firms.

Fig. 9. What are the main reasons your organisation uses express delivery for its sales?[22] Respondents can select multiple answers.



Source: Oxford Economics survey of EU28 businesses; 740 respondents

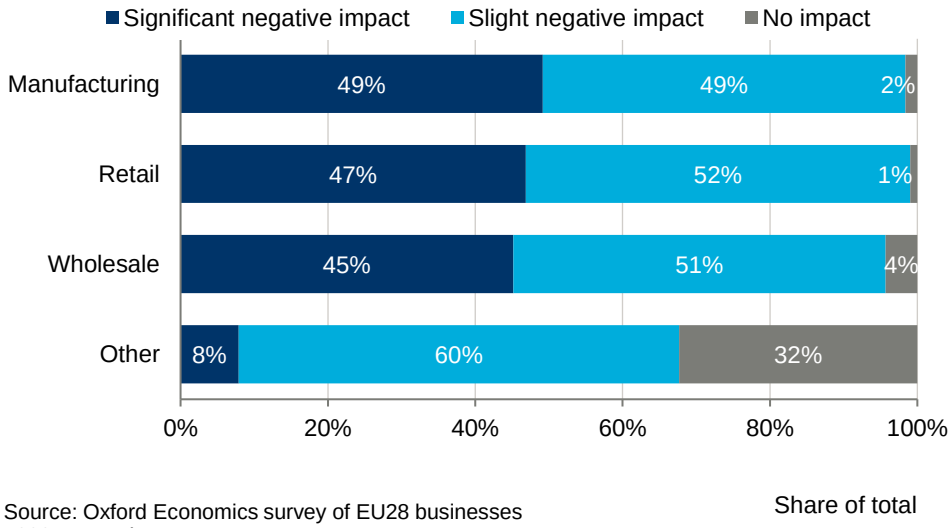
2.3 WHAT IMPACT WOULD LOSING ACCESS TO EXPRESS DELIVERY SERVICES HAVE?

The vast majority (86%) of European businesses surveyed stated that their operations would be negatively impacted if the express industry's services were not available.

Manufacturers would be the hardest hit if express delivery services were not available: **98% expect a negative impact.** However, the wholesale and retail sectors are close behind, due to their need for express deliveries to send products to customers.

[22] Sample is all those businesses that use express deliveries for sales.

Fig. 10. If express delivery services were not available, what impact would it have on your business? (split by sector)



Source: Oxford Economics survey of EU28 businesses
1000 respondents

Breaking these responses down, the largest expected impacts would be on market access. Nearly three quarters of surveyed firms (73%) report that they would expect to lose access to selling in some markets. On average, these businesses estimated that 13% of their sales would be at risk from losing market access. An even greater share, 88%, report that they would lose access to buying inputs from some markets without the use of express delivery services.

The next largest impact is around logistics: approximately 30% responded that the need to increase their own inventory storage and transportation capabilities would very significantly affect their business.

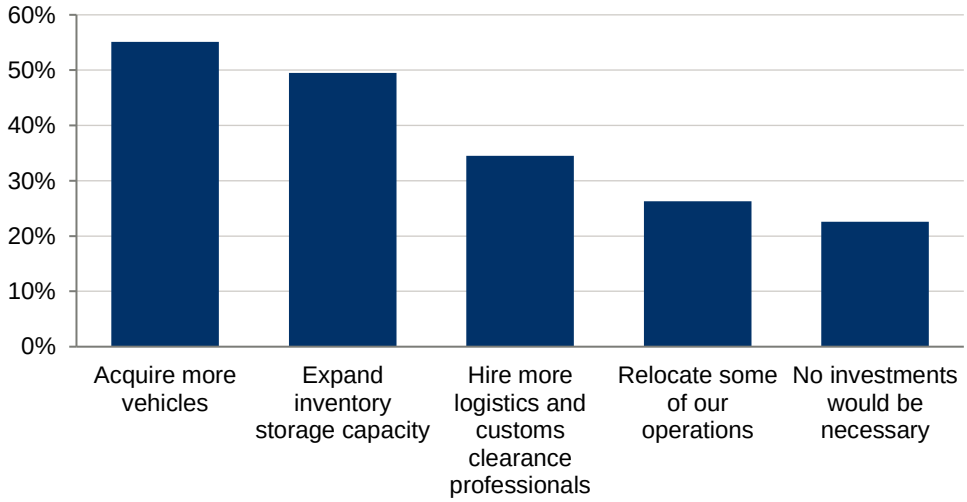
More than a third of all surveyed firms (35%) stated that they would need to increase internal resources related to logistics and customs clearance if they could not use the express delivery sector to provide this specific expertise. Of these businesses, nearly half (46%) report that the ability of the express industry to deal with customs clearances is important to them.

In response to a loss of access to express delivery services, 55% of firms responded that they would invest in acquiring more vehicles, and 50% state that they would invest in inventory storage capacity. Just 23% believed that no investments would be necessary to deal with the change in operating circumstances.

This highlights how the express delivery industry helps to consolidate supply chains, centralising the capital equipment required for logistics into specialised operators, potentially with efficiency benefits.

Fig. 11. If you had no access to express deliveries, what type of investments would your business have to make, if any?

Share of respondents



Source: Oxford Economics survey of EU28 businesses
1000 respondents

3. THE ECONOMIC IMPACT OF THE EUROPEAN EXPRESS INDUSTRY

"We need express delivery services for its range as its services cover all kinds of delivery locations."

Small financial services firm, Germany

We now turn to the economic footprint of the European express industry: the total number of jobs it supports across the EU28, its Europe-wide contribution to GDP, and the tax revenues it generates. Our analysis of the industry's total economic impact in 2018 encompasses its three core channels of impact:

- **Direct**, relating to the activity of the express delivery businesses themselves;
- **Indirect**, activity as a result of the industry's supply chain spending; and
- **Induced,** the impact of wage-related spending of the industry's employees and those of its suppliers.

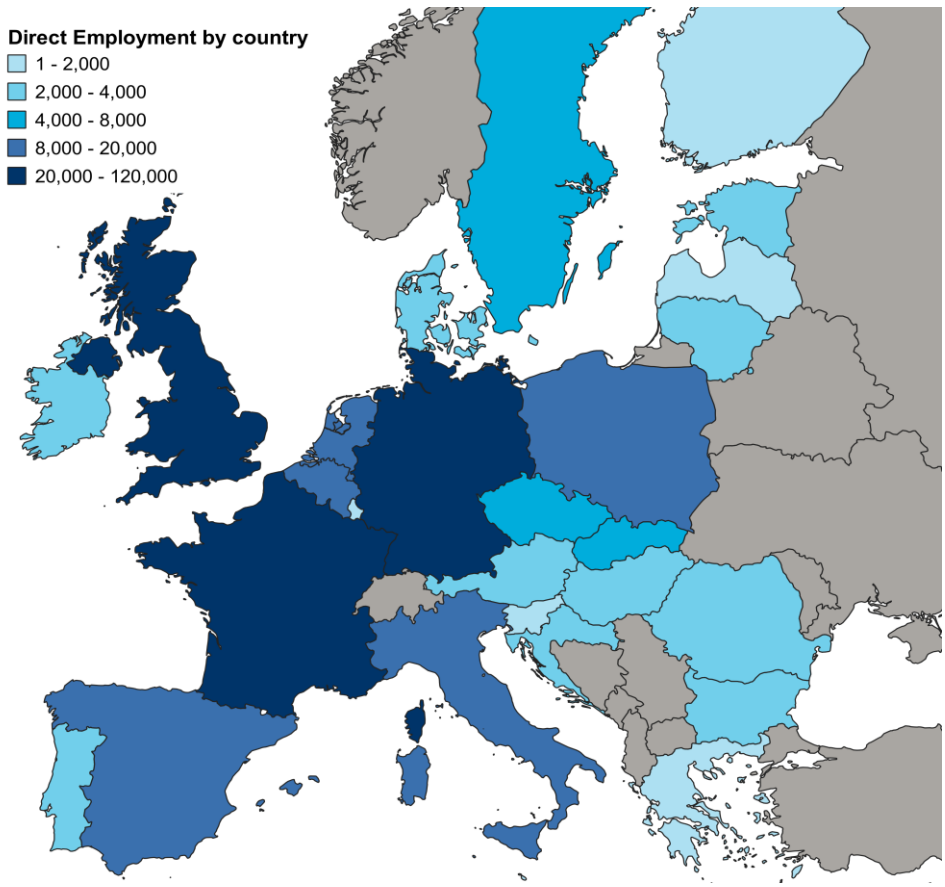
For a more detailed explanation of our methodology, see Appendix I.

3.1 EMPLOYMENT CONTRIBUTIONS IN THE EU28

3.1.1 Direct industry employment in the EU28

In 2018, an estimated 330,000 employees worked directly for the European express industry. While Germany had the largest share, with 31% of the total, the United Kingdom and France also had significant shares at 18% and 14% respectively.

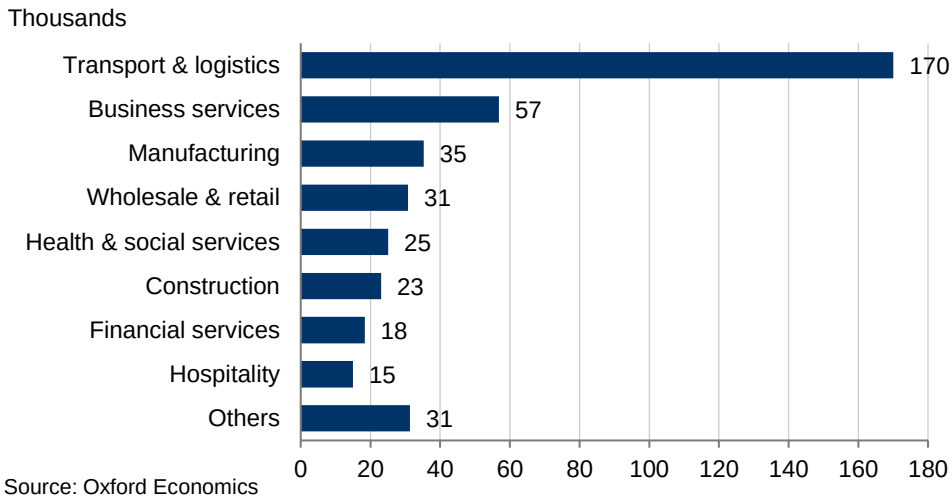
Fig. 12. Estimated direct employment by EU28 country, 2018



3.1.2 Indirect employment supported in the EU28 through supply chain spending

On top of its direct employees, the express industry supports jobs indirectly through its spending in the supply chain. In 2018, we estimate that total indirect employment supported by the industry was 410,000. The transport and logistics sector alone supported almost half (42%) of the total.

Fig. 13. Indirect employment by industry (EU28 total)

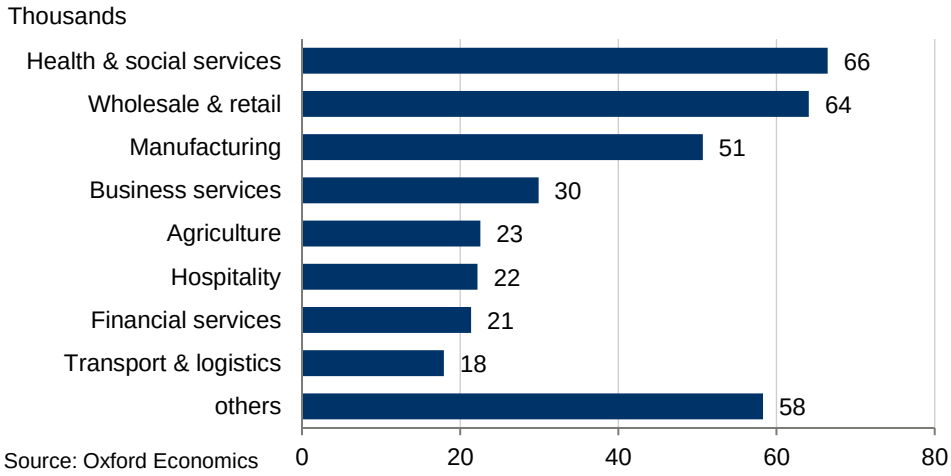


Source: Oxford Economics

3.1.3 Induced employment supported in the EU28 through worker spending

The final contribution to employment is supported by the wage spending of employees in the express industry and its supply chain. In 2018, we estimate that total induced employment supported by the industry was 350,000. More than half of the induced employment impact of the express industry was in the wholesale and retail, manufacturing and health and social services sectors together.

Fig. 14. Induced employment by industry (EU28 total)



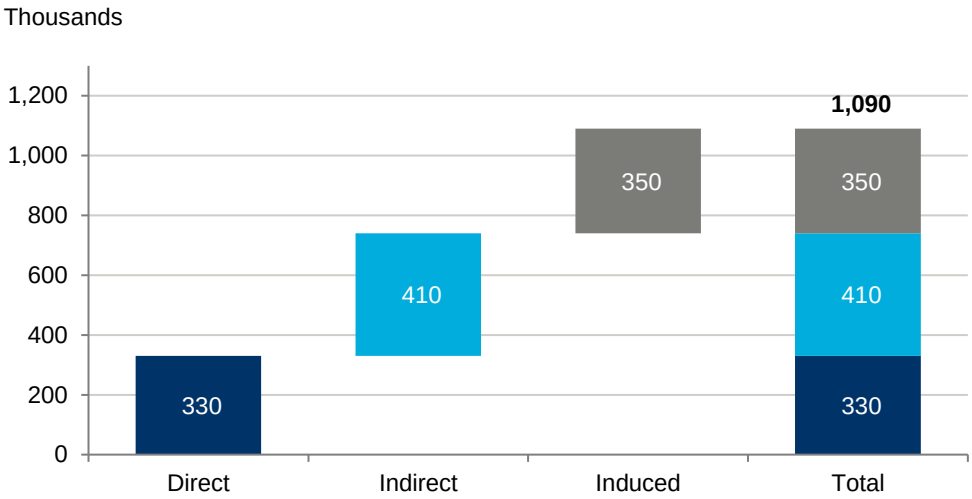
Source: Oxford Economics

3.1.4 Total employment contribution in the EU28

In 2018, the European express industry supported an estimated 1.1 million jobs across the EU28 countries. This is just under the total number in employment in Lithuania, or the total population of Estonia.[23]

Of those, some 330,000 were employed directly by the express industry, while a further 410,000 were employed throughout the industry's supply chain. The consumer spending generated by the wage payments of those direct and indirect employees supported a further 350,000 jobs in the EU.

Fig. 15. EU28 employment supported by European express industry, 2018



Source: Oxford Economics

[23] Eurostat employment and population estimates.

3.2 CONTRIBUTION TO GDP

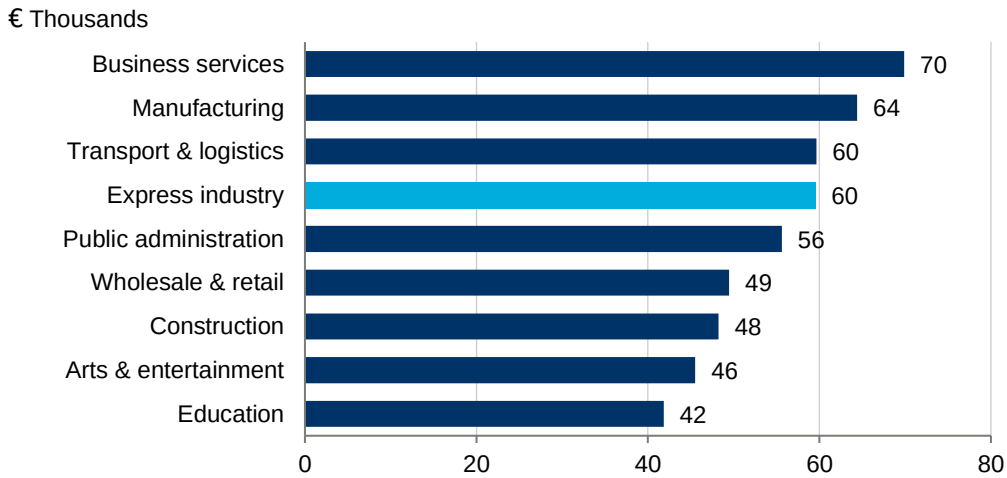
We calculate express delivery services' contribution to GDP by estimating the "gross value added" (GVA) generated by the industry. This is estimated using the "income approach" to calculating economic accounts and is the sum of the industry's earnings before interest, tax, depreciation and amortisation (EBITDA) and gross employment costs.

3.2.1 Direct industry contribution

The direct contribution of the European express industry in 2018 was €20 billion, comprised of €15 billion in employee compensation and €5 billion in profit. To put this into perspective, the express industry had a similar direct GDP impact to the total telecommunications equipment manufacturing industry in the EU28.[24]

We calculated that each worker directly employed by the express industry had an average GDP contribution of €60,000, ahead of other industries such as wholesale and retail and the construction sector.

Fig. 16. Average labour productivity (GVA per worker) in the European Express Industry versus other industries across the EU28, 2018



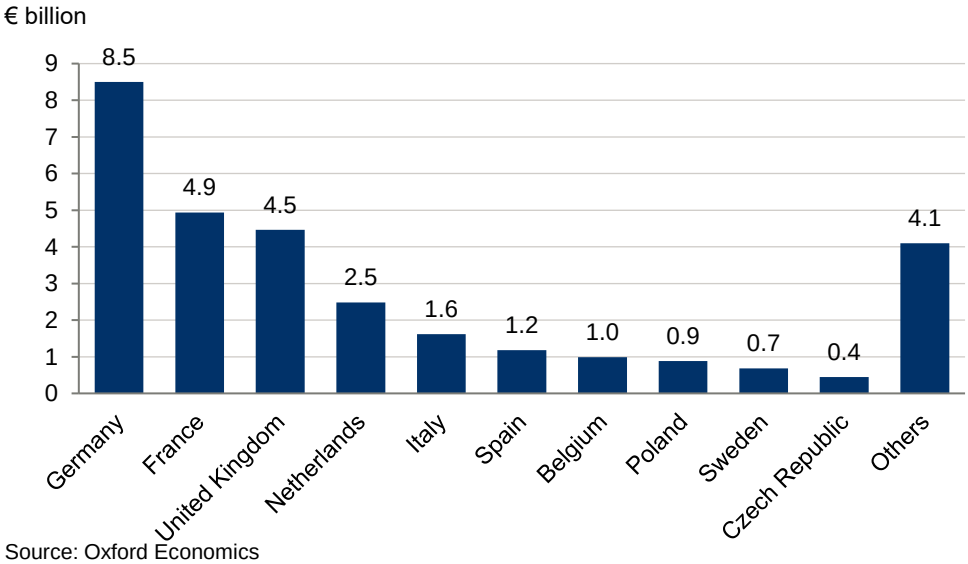
Source: Oxford Economics

3.2.2 Supply chain contribution to GDP

On top of its direct contribution, the express industry contributes to GDP indirectly through its spending in the supply chain. In 2018, we estimate the total indirect GDP contribution for the industry was €25 billion. This indirect impact was particularly pronounced in Germany, France and the United Kingdom, where most of the express industry's procurement spending took place.

[24] 2018, Oxford Economics industry estimates.

Fig. 17. Estimated procurement spending by top 10 countries

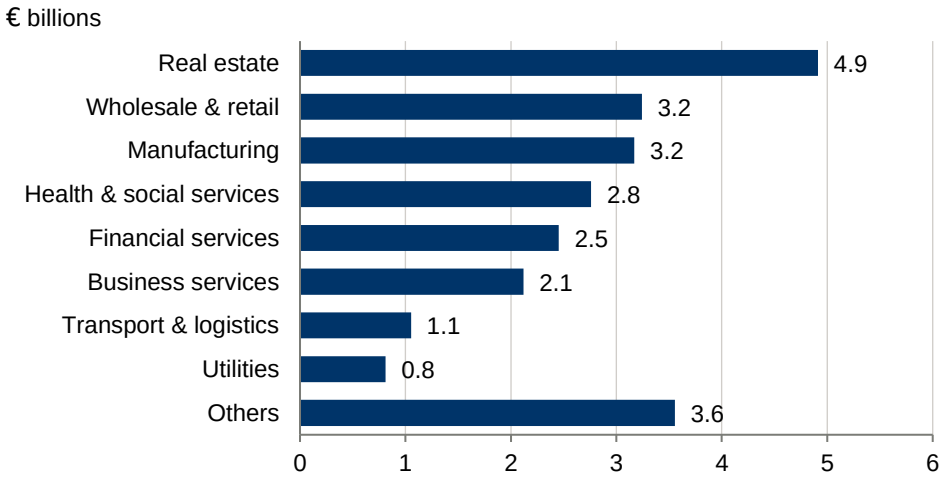


Source: Oxford Economics

3.2.3 GDP supported through worker spending

The final contribution to GDP is supported by the wage spending of employees in the express industry and its supply chain. In 2018, we estimate that total induced GDP supported by the industry was €24 billion.

Fig. 18. Induced GDP by industry, EU28 total



Source: Oxford Economics

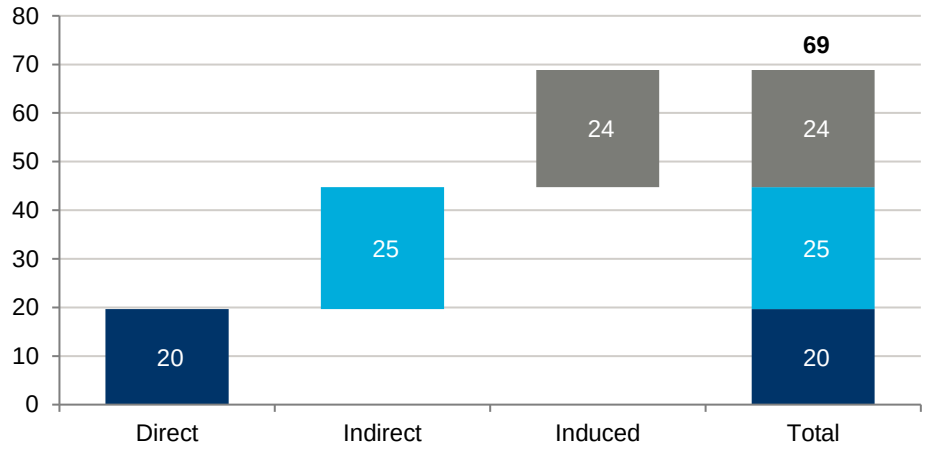
3.2.4 Total GDP contribution

In 2018, the European express industry contributed an estimated €69 billion to the GDP of the EU28 countries. This total is between the 2018 GDP results for Luxembourg (€60 billion) and Slovakia (€90 billion).[25]

The industry directly supported €20 billion in GDP and the sector's economic activity had a €25 billion indirect impact through its supply chain spending. Furthermore, the consumer spending supported by the European express industry and its suppliers' wage payments had a further €24 billion induced impact on GDP.

Fig. 19. Total EU28 GDP contributed by European express industry, 2018

€, billions



Source: Oxford Economics

3.3 TOTAL TAX CONTRIBUTION

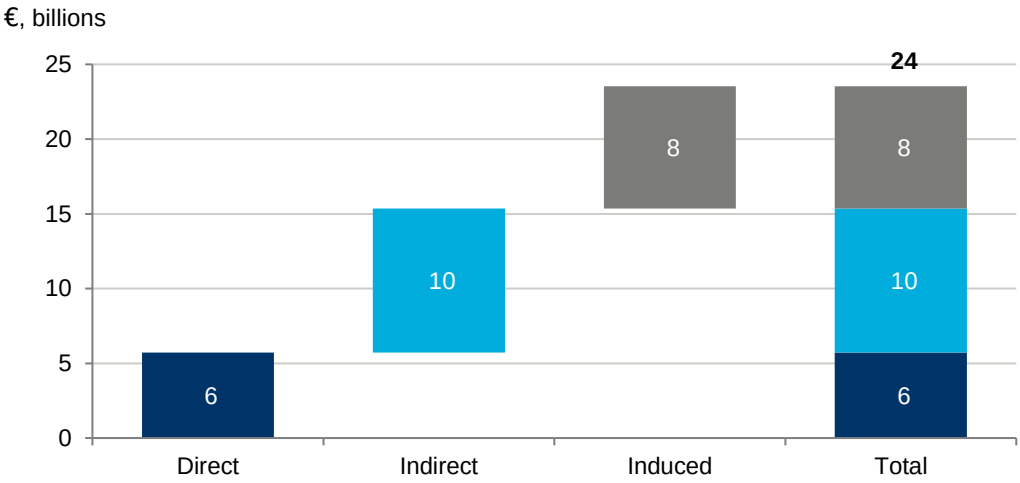
In 2018, we find that in total, the European express industry contributed an estimated €24 billion to the tax of the EU28 countries. This is roughly equal to the 2018 contribution to the EU budget of Germany.[26]

Out of this total contribution figure, the express industry contributed €6 billion directly, €10 billion through its supply chain spending and €8 billion through its induced impact.

[25] Eurostat national GDP estimates.

[26] European Union Europa website, *About Germany*

Fig. 20. Total EU28 tax contributed by express industry, 2018

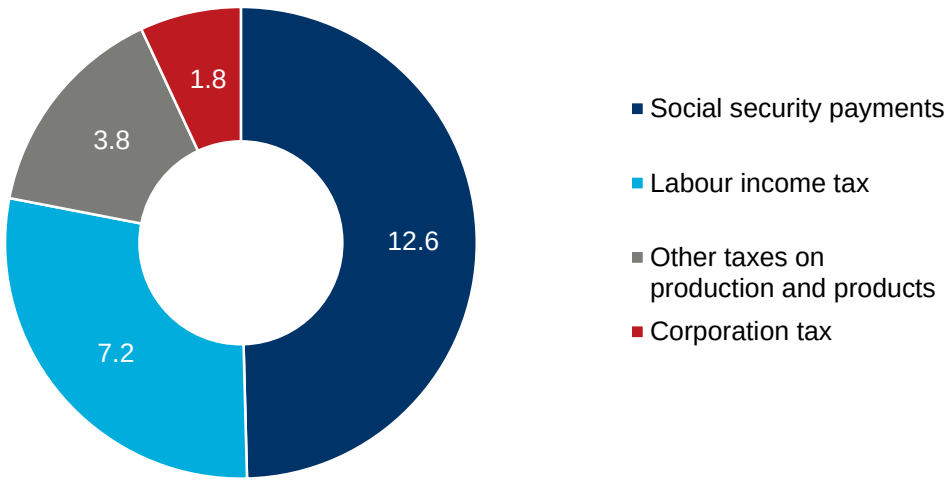


Source: Oxford Economics

The total tax contribution to the EU28 of the express industry, its supply chain and associated employees can be broken down into four broad categories: social security payments, labour income tax, corporation tax, and taxes on production and products. In 2018, taxes levied on labour represented most of the overall tax contribution: social security payments (from both employers and employees) on their own represented half of the total, while labour income tax payments represented a further quarter.

Fig. 21. Total estimated tax revenue contribution by type, 2018

€ billions



Source: Oxford Economics

3.4 GROWTH IN ECONOMIC CONTRIBUTION

The European express industry has seen rapid growth in recent years. In part this is due to robust growth at the three major integrators, as well as an even faster expansion among the rest of the industry.

In Oxford Economics' previous iteration of this study, the direct economic contribution in GVA terms was calculated at €10.3 billion for 2010, or €11.3 billion after inflating to 2018 prices. Comparing this to the €20 billion estimated for 2018 gives an average annual growth rate of 7.2%[27] in real terms, significantly faster than the overall EU GDP growth rate of 1.6% over the same period.

Express industry employment in the EU28 has seen similarly buoyant growth. Oxford Economics previously estimated direct employment for the industry at approximately 270,000 employees in 2010, compared to 330,000 jobs in 2018. This represents average annual direct industry employment growth of 2.4%, again much more rapid than the 0.8% growth seen across the entirety of the EU over the same period.

[27] Calculated as a compound annual growth rate.

CASE STUDY: IMPROVING ENERGY EFFICIENCY IN THE EXPRESS INDUSTRY

By enabling the rapid shipment of packages, the express industry plays an increasingly important role in the global economy. But this boost in economic activity and trade comes at a cost: the overall global transportation sector is responsible for 14% of world greenhouse gas emissions.[28] To improve its sustainability, the express industry is therefore taking steps to decouple the increase in demand for its services from growth in greenhouse gas emissions.

Since almost all of its emissions come from the operation of aircraft and ground vehicles, most of these strategies focus on improving transportation efficiency—whether by optimising the routes used, incentivising drivers to develop behaviours that maximise fuel efficiency, or increasing the use of less-polluting modes of transportation. Furthermore, the industry is working to introduce newer, more energy efficient vehicles; by increasing the share that run on alternative fuels including electricity, natural gas, and biofuels; and by incorporating advanced technologies such as driver assistance systems.

These strategies have already had a significant impact on the industry's "CO2 intensity" (emissions per unit of revenue). In 2018, Deutsche Post DHL Group reported achieving a 33% efficiency gain compared to 2007 levels, with an objective to increase this to 50% by 2025 and to reduce logistics related emissions to net zero by 2050.[29] In 2018, FedEx avoided more than 2.7 million metric tons of CO2-equivalent from fuel and energy saving and has contributed to a 37% reduction in CO2 emissions intensity on a revenue basis across the enterprise since 2009.

EEA members are increasing the express industry's energy efficiency through measures including:

- The Smart Electric Urban Logistics project (run jointly by UPS and various cities in the UK and EU) has stimulated technological solutions that enable an increasing number of electric vehicles to be charged simultaneously in the same location.[30] UPS also recently invested in UK-based electric van maker Arrival to accelerate the electrification of its delivery fleet.
- FedEx's Fuel Sense programme helped the company avoid more than 912,000 tonnes of CO2e[31] in the 2018 financial year, by promoting fuel-saving behaviours in its aviation team—including a system that enables dispatchers to identify the minimum flight speed needed for packages to arrive on time, thus minimising fuel usage.[32]
- By 2025, Deutsche Post DHL Group wants to reduce local air pollution emissions by operating 70% of its own first and last mile services with clean pick-up and delivery solutions, including the use of bicycles and electric vehicles. In 2019, its fleet already had 13,000 vehicles with alternative drive systems; 10,800 of these vehicles were StreetScooters – the electric delivery vehicle designed and manufactured by Deutsche Post DHL Group.[33]

The express industry aims to capitalise on the growth of alternative fuels and increased digitalisation to achieve its greenhouse gas reduction goals. On the ground, electric vehicles will comprise an increasing share of express delivery fleets, while in the air, the development of sustainable aviation fuels has the potential to greatly reduce transportation emissions. Meanwhile, new opportunities for efficiency through better route planning and streamlined operations are arising out of the development of new data collection and processing technologies.

[28] IPCC, Climate Change 2014: Mitigation of Climate Change, 2014
[29] DHL, Strength Through Diversity: Corporate Responsibility Report 2018
[30] UPS, Creating Our Tomorrow, Sustainably: 2018 Corporate Sustainability Progress Report
[31] CO2 equivalent. Converts other gases to the equivalent amount of CO2.
[32] FedEx, Multiplying Opportunities: 2019 Global Citizenship Report.
[33] Deutsche Post DHL Group, Corporate Responsibility Report 2019

4. EXPRESS DELIVERY, INTERNATIONAL TRADE AND ECONOMIC GROWTH

"It is important for our company to deliver our products to far-flung areas."

Large capital equipment manufacturer, Finland

Beyond its impact as an economic sector, there are unique advantages provided by the express industry to the wider economy. A reliable express delivery industry helps to make trade faster and more efficient, helping to boost the amount of trade between countries. Higher levels of trade in turn stimulate economic efficiency and growth.

In this chapter, we explore these relationships and assess how the express delivery sector's ability to facilitate international trade helps to support GDP growth.

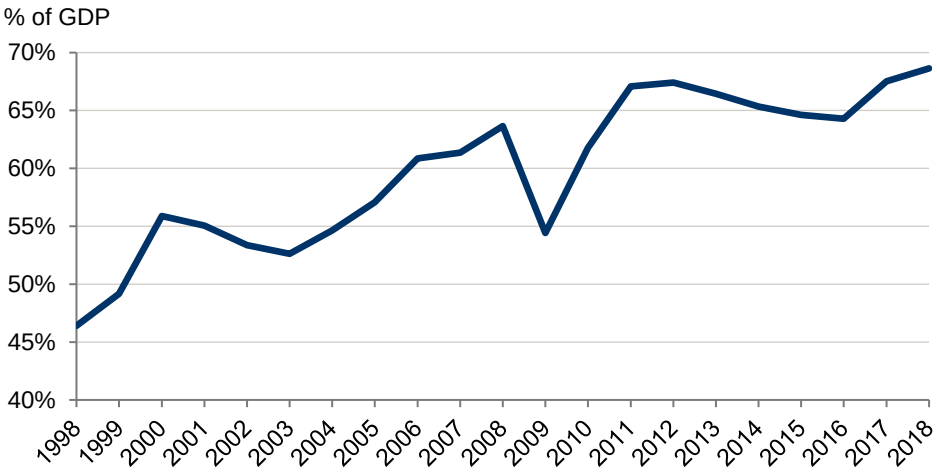
4.1 INTERNATIONAL TRADE IS INCREASINGLY IMPORTANT TO THE EU

"The usage of express delivery is very influential in competing within our sector and maintaining better customer relationships."

Medium-sized wholesaler, Belgium

International trade is an increasingly important feature of both the global and EU28 economies. Total imports and exports have been growing faster than GDP: the total value of EU28 international goods trade as a share of GDP has climbed sharply in recent decades, as shown in Fig. 22.

Fig. 22. EU28 goods trade as a share of GDP



Source: World Bank Development Indicators

Our survey further highlights how a well-functioning express industry is an important enabler of international trade, with a significant proportion of firms, including small and medium-sized exporters, using express deliveries to access wider sales markets and global supply chains.

4.2 EXPRESS DELIVERY AND EU GDP GROWTH

An increase in a country's trade with the outside world has a cascade of effects throughout its economy. Greater openness to trade can improve productivity by providing access to global export markets and supply chains, as well as forcing domestic industries to compete with international competitors.

Previous work by Oxford Economics[34] found that a 10% increase in a country's trade openness (total imports and exports as a share of GDP) results in a 1% increase in that country's GDP over the long run (at least five years).

Growth in international trade itself relies in part on more efficient, modernised customs procedures to make it easier, faster, and cheaper for exporters and importers moving their shipments through country borders. To measure the quality of national customs institutions, Frontier Economics developed a score called the Customs Capability Index (CCI), which is a national score against 10 measures of efficient customs operations.[35] Using a simple econometric framework, an increase of one point on the CCI was associated with a 4.4% increase in a country's trade in goods over the long run.[36]

Importantly, the study found that express delivery services are a necessary feature for this impact to be realised: up to two-thirds of the impact are directly facilitated by international express deliveries, as a key transporter of time critical goods requiring a predictable door-to-door service.

Combining the estimates for the impact of the quality of customs administrations on trade, and trade on GDP, we have constructed a scenario to explore the impact of a change in the efficiency of the EU's customs procedures.

In 2016, the European Commission introduced the Union Customs Code (UCC), which is a framework for customs rules and procedures that aims at a paperless and fully automated customs union. As of the start of 2020, work in implementing the required electronic systems stood at approximately 60% complete.[37] However, the express industry has pointed out that:

- The IT systems supporting the UCC implementation are at widely different stages of readiness across the Member States.

[34] Oxford Economics, Assessing the Economic Implications of Brexit, 2016

[35] Frontier Economics, *Express Delivery and Trade Facilitation: Impacts on the Global Economy,* March 2015. A report prepared for the global express association. The criteria are as follows, with a score of 0, 0.5 or 1 assigned against each: electronic customs; 24/7 automated processes; customs personnel working hours fit for commercial needs; inspection at operator's facility; no delays from other agencies; consular trade documents not required; third-party customs broker not required; minimum valuation regime in place ("de minimis regime"); simplified procedures under de minimis regime; threshold for informal clearance procedures.

[36] The regression used included the World Bank's Ease of Doing Business Index and LPI Infrastructure Index as controls. More precisely, they found a one-point increase in the CCI was associated with a 5.0% increase in a country's exports and a 3.7% increase in its exports, for a 4.4% increase in trade overall. We used these differential effects on exports and imports in this work. Note that these coefficients reflect a percentage increase in the current amount of trade, not a specific increase in trade as a percentage of GDP. For more information on this, see Appendix III.

[37] European Commission, report on progress in developing UCC electronic systems, December 2019

- Other legislative developments will be impacting trade across borders, such as the legislation removing the “de minimis” for VAT and replacing it with an individual customs declaration for each shipment.
- Access to simplified customs processes has become more difficult.

To highlight the scale of the impact on the European economy from increased frictions at the border, we model the effect of an arbitrary small reduction in the CCI for each country in the EU28. We reduce the CCI by 0.5 points for each country, to represent goods being processed more slowly on their way into or out of the Customs Union. To reflect the long-term nature of this effect, we assume that the effect of this increase is realized over a five-year period.

This reduction in efficiency is linked to a smaller volume of trade. Once the effect of the decrease in the CCI is fully realised after five years, this would be expected to result in a decrease in the overall trade openness of the EU28 of 0.5%. This is equivalent to a reduction of approximately €90 billion in national imports and exports across the EU28.[38]

This decline in trade reflects more difficulty in accessing wider markets and supply chains, Our modelling suggests that, once fully realised in the long run, these disadvantages could cost the EU28 economy approximately €11 billion a year in GDP, equivalent to a loss of 0.06% of total GDP. This is the equivalent of reducing average EU28 labour productivity by €44 a year, from a projected €70,300 in 2024. The lost amount of investment in fixed assets associated with this level of decrease in GDP reaches €2.2 billion a year by 2024.

As described above, this negative impact would be felt in large part through the express industry, as international delivery operations become more time consuming and less efficient.

[38] All figures presented here are in 2018 prices.

5. CONCLUSION

"Importing and exporting our products to different nations have become easier and faster thanks to express deliveries."

Very large chemicals manufacturer, Italy

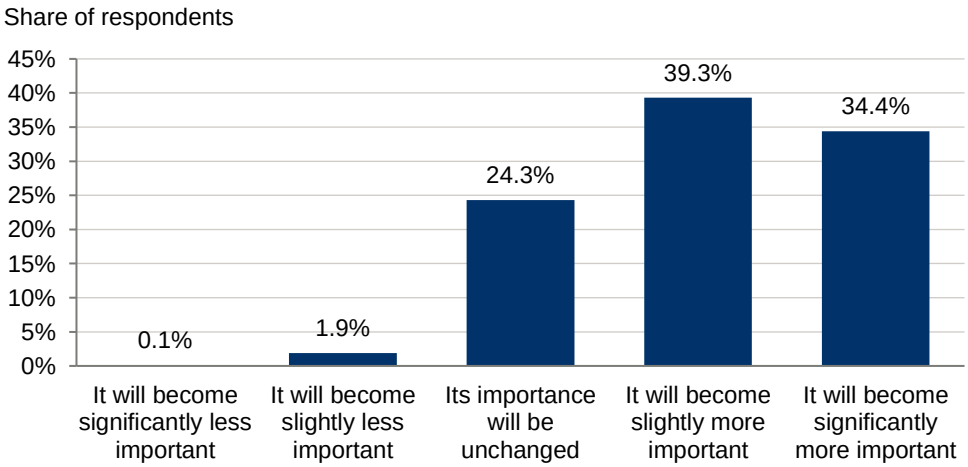
The European express industry is a vital part of the EU28 economy, through its scale as an employer and generator of economic activity, and in particular through the way it facilitates intra-European and international trade, resulting in greater supply chain efficiency. A third of firms that use express delivery services described them as "vital" to their business in our survey and 86% predicted a significant negative impact if they could not access these services.

Through direct, indirect and induced impacts, we estimate that the industry supported 1.1 million jobs in 2018, contributing €69 billion to the EU28's GDP and generating €24 billion in tax revenues. By comparison, the direct GDP impact of the express industry on its own (€20 billion) is similar to the GDP contribution of the EU28 telecommunications equipment manufacturing industry.

As well as being an economic sector in its own right, the express industry's key impact is through facilitating the efficient running of other businesses' supply chains and trading activities. Firms that use the industry to sell to a wider variety of markets estimate that they would lose 13% of their sales if they could not access express delivery services. Trading between nations helps to boost overall country GDP, and as such, strengthening the institutions that help provide efficient transfer of goods across borders would support economic growth across the continent.

Looking ahead, the significance of the sector is only likely to grow further. Almost three quarters (74%) of businesses currently using express delivery expect the importance of these services to rise over the next five years. In contrast, virtually no respondents expected their reliance on the express industry to diminish in the foreseeable future.

Fig. 23. How do you expect your organisation's reliance on express delivery services to change over the next five years?



Source: Oxford Economics survey of EU28 businesses
1000 respondents

APPENDIX I: OUR ECONOMIC IMPACT METHODOLOGY

The impact of the European express industry's operations is assessed using a standard means of analysis called an economic impact assessment. This involves quantifying the impact of the industry through three channels:

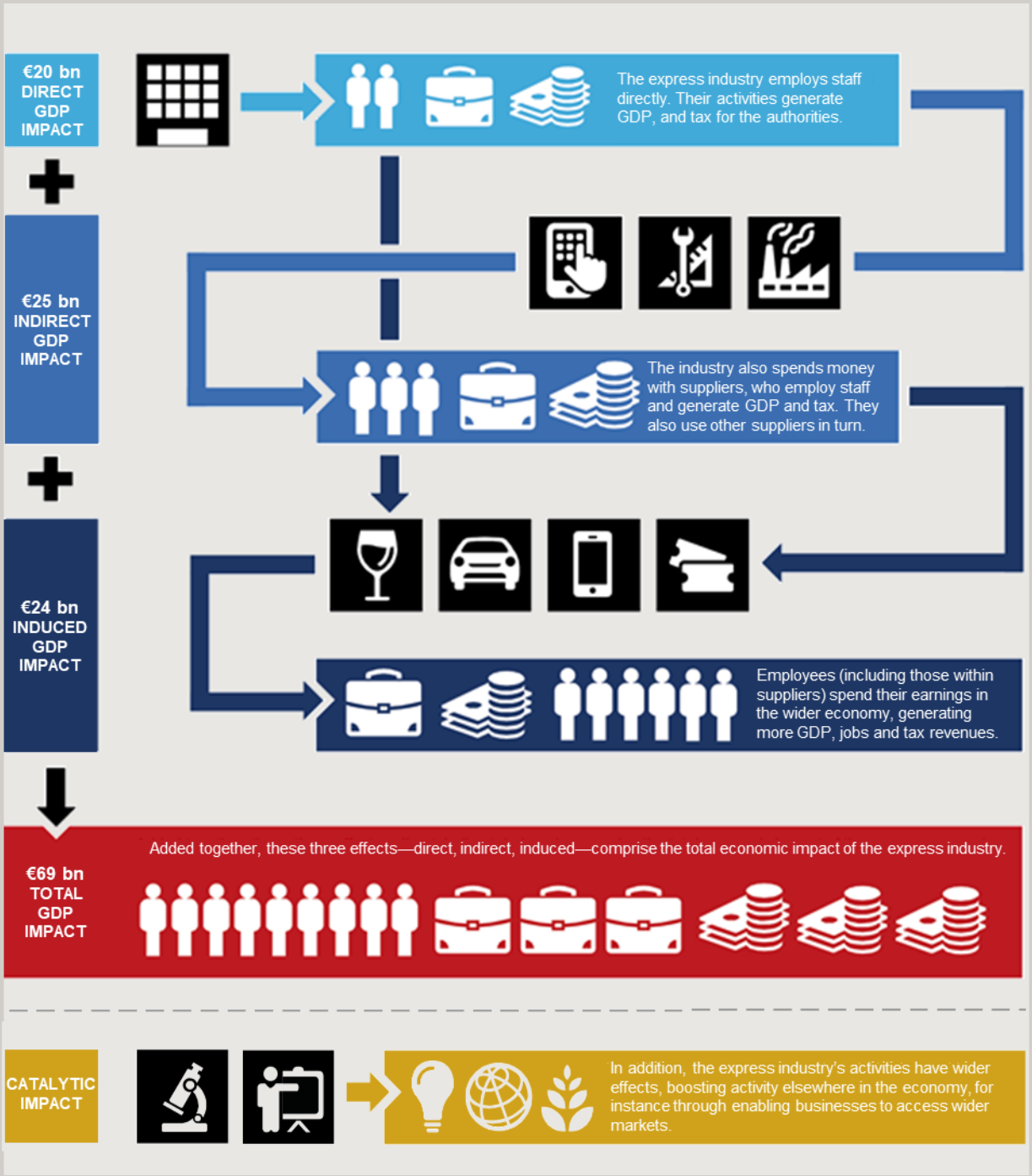
- The **direct impact** relates to the operational expenditure that the express industry undertakes running its own activities. It encompasses the economic activity and employment generated at its sites across the EU28;
- The **indirect impact** is the economic activity and employment stimulated along its supply chain by the express industry's European and global operations' procurement of inputs of goods and services from European suppliers;
- The **induced impact** comprises the wider economic benefits that arise from the payments of wages by the industry and the firms in its supply chain to their own employees, who spend their earnings in retail, leisure and other outlets. It includes the economic activity stimulated in these outlets' supply chains.

The sum of these channels makes up the total of the European express industry's expenditure impacts (see Fig. 24 for a graphical depiction).

The results are presented on a gross basis. They therefore ignore any displacement of activity from other industries. Nor do they consider what the resources currently used by the industry or stimulated by its expenditure could alternatively produce in their second most productive usage. The economic contribution is measured using three metrics:

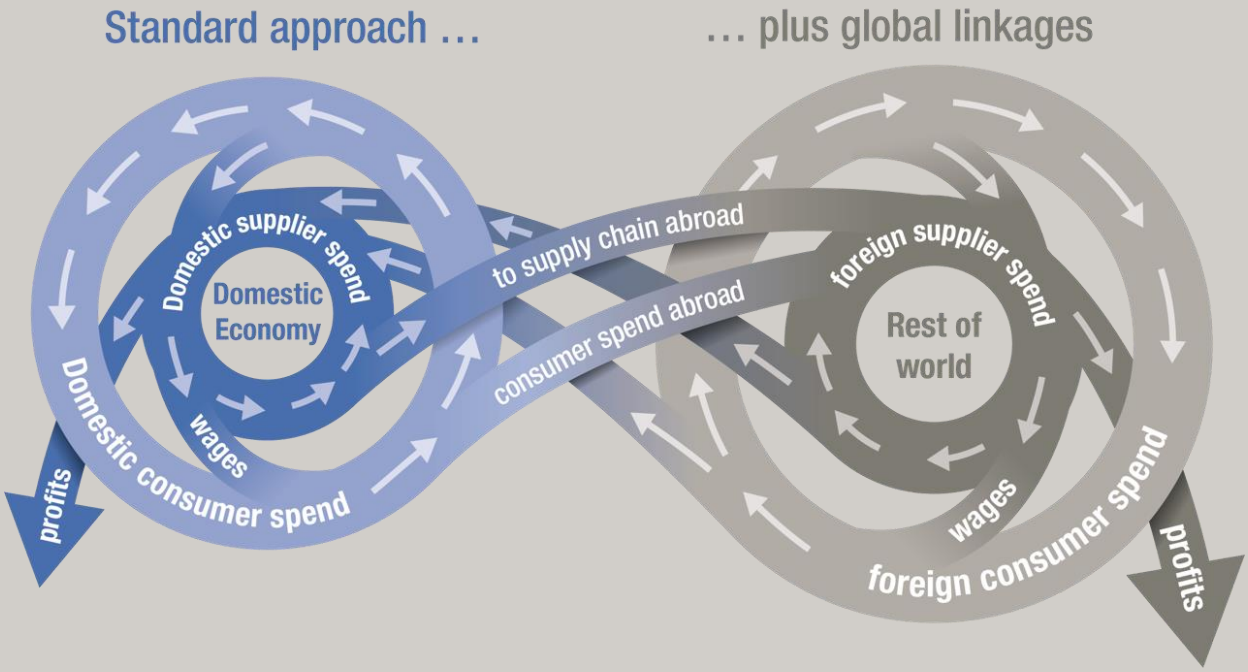
- **GDP**—or more specifically, the gross value added (GVA) contribution to GDP. In simple terms, this is the sum of the industry's total gross employment costs plus their earnings before taxation (EBITDA).
- Employment measured on a headcount basis.
- Tax revenue flowing to the national governments.

Fig. 24. Schematic of the European express industry's economic contribution to the European economy



While many economic impact studies assess these effects based only on spending that occurs within a particular country of interest, this pan-EU28 report goes further by considering the linkages between each of the individual countries. This is a more comprehensive approach that is suited to companies with a footprint across a whole region, such as members of the European Express Association, and highlights the international nature of its supply chain (as illustrated in Fig. 25).

Fig. 25. Our Global Impact Model captures how the European express industry's contribution spans economies



Please note, the methodology used to calculate the indirect and induced economic contributions in this report has been improved since the previous iteration of this report. For instance, the new method takes better account of cross-border flows and has a more comprehensive approach to estimating the impact of worker spending (the induced impact).

DATA SOURCES AND ASSUMPTIONS FOR THIS STUDY

The previous section sets out Oxford Economics' general approach to economic impact modelling. Bespoke adjustments to these techniques have been made to allow for European Express Association data. These include the following:

Data sources: Express industry data

The starting point for estimating the economic impact of the European express industry was data collected from the three full members of the EEA: DHL, FedEx and UPS. We sent a questionnaire to representatives from these three companies, asking for financial and HR data. This included market share, employment headcounts, employment costs, profits, revenue, tax and procurement spending by category.

Employment data is provided split by country. We apply this distribution to other variables such as profits, taxes and supply chain spending to estimate the regional variation of these metrics. Where full detail, for instance for different types of taxes, is not provided by one company, we use information provided by the other companies as proxies to calculate estimates.

Data sources: National statistics

The main input into our EU28 economic model is the OECD's Inter-Country Input-Output tables.[39] These tables estimate how the world's major economies and industries interact with each other in a single year. Each country's economy is split into 36 industries that are defined by the ISIC Revision 4 classification.

Approach

We calculate the GVA of the EEA full members as the sum of their gross employment costs and their EBITDA. We estimate the GVA, employment headcount, employment costs, taxation and supply chain spending of the European express industry by scaling up the figures from the EEA members based on their provided market share data.

We then input the estimated industry supply chain spending into our model to calculate the indirect effects. This data, plus estimated employment costs are inputted into the model to calculate the induced effects.

[39] OECD, Inter-Country Input-Output (ICIO) Tables, 2018. Tables are available for all years between 2005-2015.

APPENDIX II: SURVEY DETAILS

Survey of logistics managers was conducted by Unimrkt Research and ran from 25th September to 8th November 2019. A total of 1,000 respondents were reached, with minimum counts in each EU28 market. The survey questions were as follows:

1. **Where is your business located?**
2. **In which economic sector does your business operate?**
3. **How many staff are employed by your organisation?**
4. **How important are express delivery services for your organisation?**
5. **For what sort of packages does your company use express delivery services?**
   a. Legal documents
   b. Sending products to customers
   c. Sending spare parts to customers
   d. Sending sub-components to other production facilities
   e. Distributing documents within the company (e.g. board papers, contracts, etc).
   f. Other, please specify
6. **What proportion of your sales for each sales type (domestic, EU, outside EU) are transported using express delivery?**
7. **What proportion of your purchased inputs for each type (domestic, EU, outside EU) are transported using express delivery?**
8. **What are the main reasons your organisation uses express delivery for its sales?**
   a. Our customers require our products urgently for their business
   b. Our products are perishable
   c. So that we do not have to maintain our own fleet of vehicles and logistics staff
   d. We can serve customers in more distant markets, and export more effectively
   e. Late or lost deliveries would be harmful to our reputation
   f. It permits fast handling of returns, repairs and complaints
   g. Our competitors offer express delivery of their goods
   h. We need to deliver our sales using an integrated door-to-door service
   i. Other reason, please specify

9. **Why does your organisation require express delivery for its purchases, or internal deliveries?**
   a. We operate a Just-In-Time inventory system
   b. We have critical inputs that are perishable
   c. We require the ability to track shipments during delivery
   d. We urgently require spare parts for short-notice repairs
   e. It allows us to produce build-to-order products
   f. We can access inputs from wider geographies than is possible with alternative delivery methods
   g. We require urgent transport of physical documents
   h. We need to obtain our inputs using an integrated door-to-door service
   i. Other reason, please specify
10. **What features of express delivery are important for you? Select all that apply.**
   a. Speed of delivery
   b. Range of delivery
   c. Time-definite receipt of shipments
   d. Tracking of items en route
   e. Customs clearance, for shipments to/from non-EU markets
   f. Other reason, please specify
11. **If express delivery services were not available, what kind of an impact would it have on your business?**
   a. Significant positive impact
   b. Slight positive impact
   c. No impact
   d. Slight negative impact
   e. Significant negative impact
12. **If express delivery services were not available, how significantly would the following outcomes affect your business?**
   a. Interruptions to production would be more frequent
   b. We would have to outsource some (or all) of our production
   c. We would have to increase our capacity to store inventories
   d. We would lose sales, as we could not serve customers in certain markets
   e. We would not be able to access inputs from certain markets
   f. We would have to expand our own transportation capabilities
   g. We would have to relocate some (or all) of our business units
   h. We would have to arrange for customs clearance services
   i. It would have other consequences
13. **If you had no access to express deliveries, what type of investments would your business have to make, if any?**
   a. Acquire more vehicles
   b. Hire more logistics and customs clearance professionals
   c. Expand inventory storage capacity
   d. Relocate some of our operations
   e. Other investments, please specify
   f. No investments would be necessary
14. **Does your business employ anyone with knowledge of the customs and clearance procedures, in nations where your organisation imports or exports goods?**
15. **How do you expect your organisation's reliance on express delivery services to change over the next five years?**
   a. It will become significantly more important

b. It will become slightly more important
c. Its importance will be unchanged
d. It will become slightly less important
e. It will become significantly less important

The split of respondents is given in the following tables by country and size of firm.

Fig. 26. Number of respondents to survey split by country

Country	No. respondents	Country	No. respondents
United Kingdom	91	Romania	30
France	84	Portugal	24
Germany	79	Hungary	22
Netherlands	79	Slovak Republic	21
Spain	76	Luxembourg	20
Italy	75	Greece	20
Austria	40	Croatia	17
Ireland	39	Bulgaria	16
Sweden	39	Cyprus	10
Denmark	37	Estonia	10
Finland	37	Slovenia	9
Poland	36	Lithuania	9
Belgium	34	Latvia	8
Czech Republic	31	Malta	7

Fig. 27. Number of respondents to survey split by size of firm

Size of firm	No. respondents
Under 50 employees	3%
50 to 249 employees	20%
250 to 999 employees	27%
1,000 to 9,999 employees	34%
10,000 to 24,999 employees	8%
25,000 employees or over	7%

APPENDIX III: MODELLING THE IMPACT OF TRADE OPENNESS

In Chapter 4, we assessed how trade openness impacts GDP. Here, we provide additional detail on the methodology used.

In a 2015 analysis, Frontier Economics measured the relationship between a country's ***customs capability*** and its trade with other countries, measured as the sum of exports plus imports as a share of GDP.[40] Customs capability refers to the institutional practices a country's customs services use when processing shipments into and out of the country. Efficient customs procedures, which are associated with an efficient and well-functioning express delivery market, can help stimulate trade by making it easier, faster, and cheaper for exporters and importers to process their shipments through international borders.

The relationship between customs capability and trade

To measure customs capability, Frontier developed a score called the **Customs Capability Index (CCI)**. The CCI is defined as the sum of 10 measures of efficient customs operations. For each measure a score of 0, 1, or in some cases 0.5, is assigned to each country based on its customs policies. The 10 areas are:

- **Electronic customs**. Do customs accept and process data electronically?
- **24/7 automated customs processing**. Is automated processing available around the clock?
- **Adapted working hours**. Are working hours of customs personnel adapted to commercial needs?
- **Inspection at operator facility**. Do customs inspect and release goods at the operator's facility or require their transfer to another facility?
- **Other agency inspections do not cause delays**. Do non-customs agencies cause delays to releasing shipments?
- **Consular trade documents not required**. Is a document such as a consular invoice or other trade document required?
- **Third-party customs broker not required**. Does clearance require the involvement of a third-party customs broker?
- **De minimis regime**. Does the country have a *de minimus* regime in place at all?
- **If de minimis, simplified procedures**. Where a de minimis regime exists, are customs procedures simplified?
- **Threshold for informal clearance procedures**. Is there a threshold for informal clearance procedures?

Frontier Economics also studied the relationship between a country's CCI score and its trade openness, which is defined as:

Trade openness = (Total exports + Total imports) / GDP

[40] Frontier Economics (March 2015). "Express Delivery and Trade Facilitation: Impacts on the Global Economy." A report prepared for the global express association.

Using a simple econometric framework, they found that, in the long-run, an increase of 1 point on the CCI index was associated with a 4.4% increase in a country's trade in goods (i.e. excluding trade in services, which are assumed to be insensitive to customs processes).[41]

For the purposes of our work, we assume that an improvement in the CCI only affects a country's goods trades with other countries outside the European Union.

The relationship between trade openness and GDP

An increase in a country's trade openness with the outside world will have a cascade of effects throughout its economy. Greater trade openness may help foster innovation and improve productivity by allowing countries to specialize and thereby realize their competitive advantage, by providing access to global export markets and global supply chains, by forcing domestic industries to compete with international competitors, and by exposing domestic businesses to new technologies and business practices from the rest of the world, among other channels.

Oxford Economics has recently explored the relationship between a country's trade openness and its productivity and economic output (GDP) as part of our research on the economic impacts of Brexit.[42] As part of that work, Oxford Economics estimated a cross-country panel regression model of the effects of trade openness on a country's Total Factor Productivity (TFP), a measure of overall efficiency that translates directly into increased GDP. Note that this modelling used advanced econometric techniques specifically to attempt to establish the causal relationship of higher trade openness on GDP.[43]

In this work, Oxford Economics found that a 10% increase in a country's trade openness resulted in a 1.0% long-run increase in a country's GDP.

[41] Their OLS regression included the World Bank's Ease of Doing Business Index and LPI Infrastructure Index as controls. More precisely, they found a one-point increase in the CCI was associated with a 5.0% increase in a country's exports and a 3.7% increase in its exports, for a 4.4% increase in trade overall. We used these differential effects on exports and imports in this work. Note that these coefficients reflect a percentage increase in the current amount of goods trade, not a specific increase in goods trade as a percentage of GDP.

[42] Oxford Economics (2016). "Assessing the Economic Implications of Brexit."

[43] See Oxford Economics (2016). "Assessing the Economic Implications of Brexit: Technical Appendix."

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