E-COMMERCE AND JOBS:
Heading towards job cuts

Assessing the situation and
outlook for non-food retail
and service sectors in europe

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Key findings

Every job created thanks to e-commerce in the non-food retail sector in a large company has led to the **DESTRUCTION OF 6 JOBS** in small and medium-sized enterprises

Between 2009 and 2018, e-commerce **DESTROYED 80 000 MORE JOBS** than it created in France and Germany and **43 000** in Spain.

E-commerce has led to **114 000 JOBS BEING DESTROYED** in the non-food retail sector in France between 2009 and 2018.

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* For every job created in a large company in the non-food retail sector thanks to e-commerce, 6 are destroyed in smaller companies.

E-commerce, relentless growth

Online sales and the web presence of European companies have not stopped growing over the last 10 years. According to Eurostat, the number of companies with more than 10 employees who have a digital presence rose from 13% to 20% between 2008 and 2018 in the EU-28.

At the same time, the percentage of turnover that these companies earned online increased from 12% to 18%. If we focus on the retail sales (*Business-to-consumer – B2C*) of companies with more than 10 employees in the distribution sector (excluding automotive), the trend is also positive.

In 2019, online B2C sales represented 7% of the turnover achieved (versus 4% in 2013) and the number of companies who engaged in online sales rose to 29%, an increase of 10% compared to 2013.

Figure 1.

Digital distribution in the EU

% companies

% turnover

Legend:
- B2C companies with an online presence
- B2C online sales

Source: Eurostat

These figures, in particular those related to the share of sales completed online, are coherent with those provided by independent research centres such as the *Centre for Retail Research* (CRR). They estimated that in 2019, 10% of all sales were carried out online in 11 European countries[1], an increase of 5 points since 2012[2].

The size of the e-commerce market varies depending on the estimate, given that geographical and sectoral boundaries differ from one research centre to another. However, the growth of the market is confirmed unanimously and seems to have at least doubled between 2013 and 2019. According to Eurostat data, the market was worth around 244 billion euros in the distribution (excluding automotive) sector alone in 2018, compared to 108 billion euros in 2013, which represents an increase of 125%. RetailX / EuroCommerce valued the European B2C market at around 636 billion euros[3] in 2019 compared to 307 billion euros in 2013. Conversely, the CRR valued it at around 249 billion euros in 2020 (compared to 124 billion euros in 2013[4]) with a more limited scope – they counted the United Kingdom, Germany, France, Spain, Italy and the Netherlands and excluded online gambling, restaurants, the automotive sector and financial services. When looking at the figures on a national scale, it comes as no surprise that, despite the differences in the estimates, the largest markets are also the leading economies of the European Union.

The extent of the disparities between countries can be explained, in particular, by the scale of penetration of digital technologies and the habits of consumers, which evolve at a different pace in each country due mainly to cultural but also demographic factors.

Younger people are naturally more inclined to embrace new technologies and/or don't have the same attachment as their elders to local businesses.

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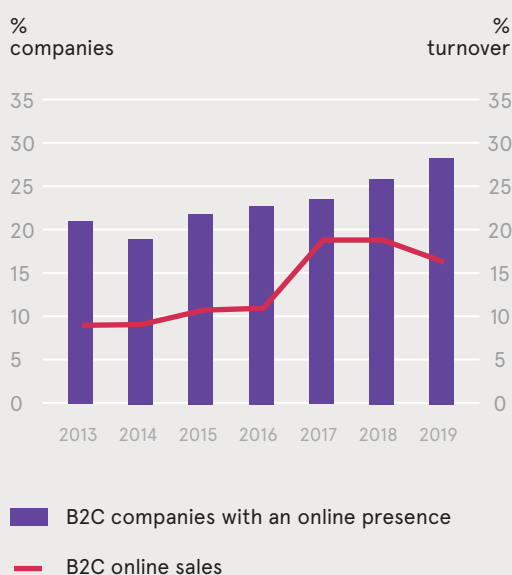
1. United Kingdom, France, Germany, Italy, Spain, Belgium, Netherlands, Poland, Austria, Switzerland, Sweden
2. https://www.retailresearch.org/online-retail.html
3. https://retailx.net/product/europe-2020/
4. https://www.eurocommerce.eu/media/ 159952/2018.07.02%20-%20Ecommerce%20report _annex.pdf
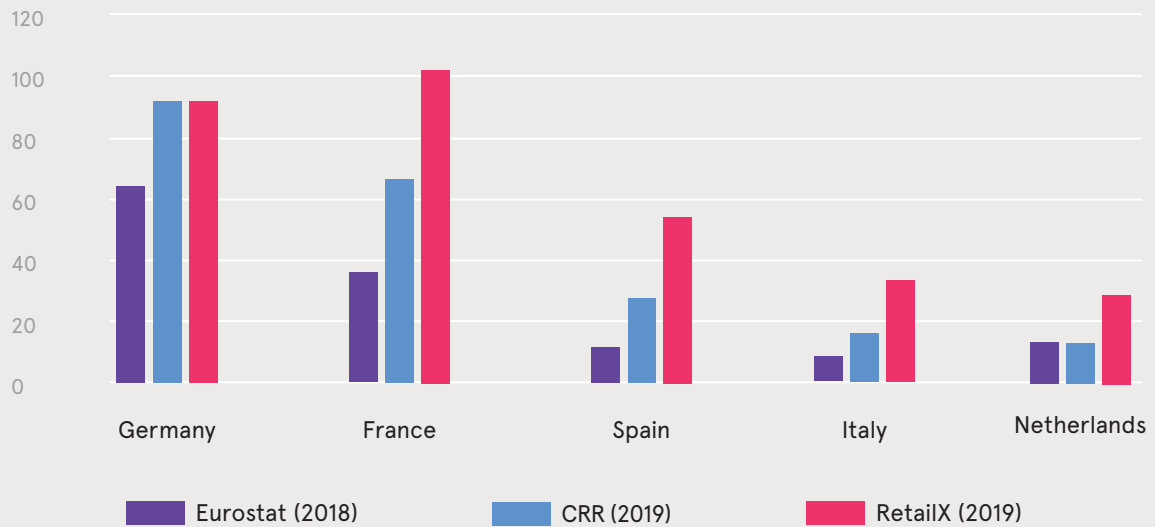
Figure 2.

E-commerce markets in Europe

Bn€

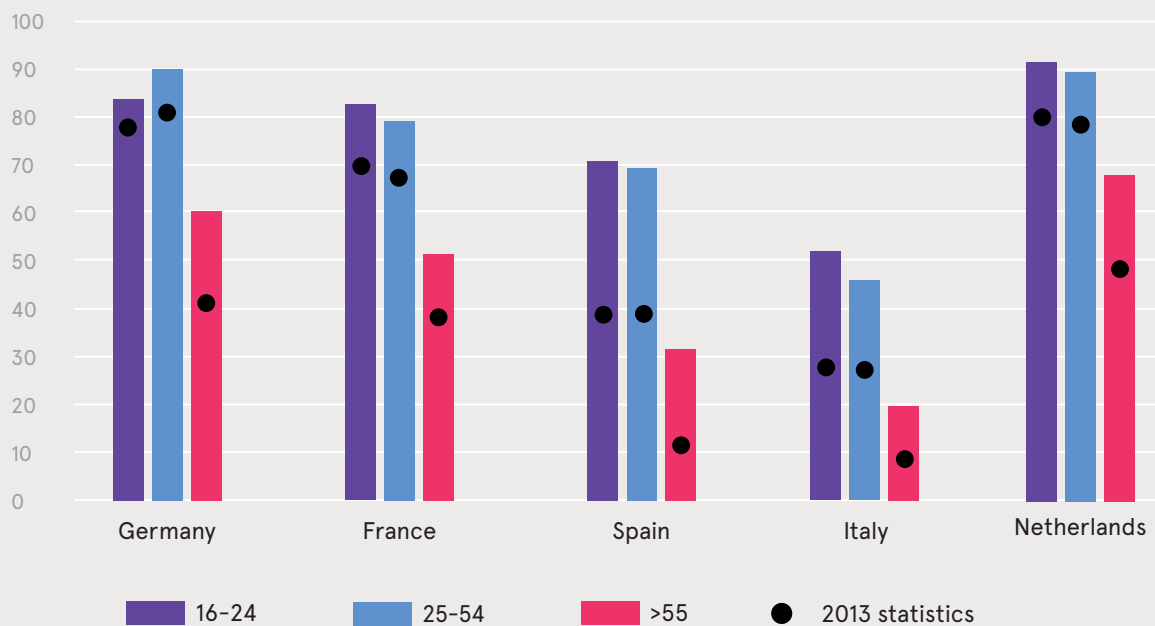
Eurostat (2018)	CRR (2019)	RetailX (2019)

Figure 3.

Online purchases in the last 12 months

% population

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16–24	25–54	>55	2013 statistics

What does this mean for jobs?

The rise of e-commerce has transformed the value chain in traditional distribution that we have had until now.

As with all innovation, the digitalisation of businesses is believed to bring about "creative destruction", as theorised and shared by Schumpeter. By completely or substantially decreasing any physical presence, digital trade reallocates productive resources and redistributes work in an unprecedented way. As a result, a large number of sales points and the subsequent staff are no longer needed. However, unlike traditional shops, e-commerce requires more delivery drivers, logistics coordinators and manpower as well as services of an intellectual nature to design, implement and manage the digital platform and customer service department. In short, rather than creating jobs in shops, e-commerce creates jobs both upstream and downstream of the consumer's purchase.

Figure 4.
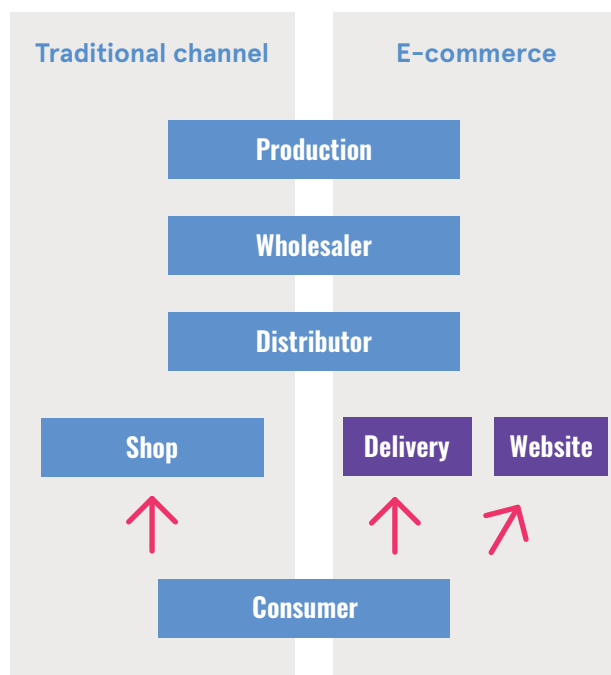
Nevertheless, alongside these implied effects, the rise of e-commerce has been the source of a number of issues for quite a few years and industry players have been subject to criticism. In addition to reallocating productive resources and jobs in particular, it seems that the sector can function with fewer resources on the whole – in other words, it destroys jobs as the number of consumers using it rises. In the United States, experts and journalists even call it the *retail apocalypse*, to describe the phenomenon of the chain reaction of bankruptcies and the disappearance of traditional retail companies. The iconic brand Sears, founded in 1886, made headlines when it was placed under administration in 2018.

But beyond these symbolic cases, we can legitimately question the impact that the digitalisation of businesses will have on jobs on a broader scale.

The question of the impact of e-commerce on jobs is particularly important in light of the crisis we are currently experiencing. The high unemployment rate in a large number of European economies calls for targeted action by authorities to support sectors which provide the most jobs and, to do this, we must identify them.

Furthermore, health restrictions have placed a large number of traditional retail businesses in difficulty. They are requesting state aid in order to be able to handle the situation. In particular, small businesses seem to be the hardest hit by the growth of e-commerce.

Finally, we should note that the current crisis could also accelerate the shift in buying behaviour of European consumers. A certain number of consumers made the switch to e-commerce during the lockdowns implemented across the continent, notably in the south of Europe[5].

UA range of research studies carried out on this topic have come to diverse conclusions. For example, Balsmeir and Woerther (2019) showed that digitalisation in Switzerland has had a positive impact on skilled work, a negative impact on low-skilled work and, as a whole, that the general impact was slightly positive. Biagi and Falk (2017) maintained that e-commerce and digitalisation had not led to

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5. *"Coronavirus: Southern Europe discovers digital shopping"*, Financial Times, 20th March 2020

any jobs being destroyed in 10 European countries between 2002 and 2010. Americo and Veronico (2018) identified a negative impact on retail jobs when studying a sample of 35 European countries between 2007 and 2016.

Recently published expert studies and reports indicate that in the United States, the effects of the boom of e-commerce have been very bad for employment, but that the trend could continue, with almost 500 000 jobs to be destroyed by 2025 according to Euler Hermes[6]. Analysts at the Swiss bank UBS estimate that around 100 000 retail businesses will close their doors by 2025[7].

In the rest of this study, we will adopt an econometric approach to evaluate the impact of e-commerce on employment in the retail sector, the wholesale sector as well as a number of service sectors in seven European countries. The net effect on employment will then be calculated by combining these estimates and data gathered about e-commerce. We will then create forecasts, taking into account a range of economic scenarios.

Our modelling approach

The empirical model we used is inspired by the work of Biagi and Falk (2017) and derived from a CES-type (*Constant Elasticity of Substitution*) production function with three factors: work, capital and intermediate goods. The cost of final and intermediate goods and work are considered exogenous in the short term. Capital is considered to be almost constant over the same time frame. The optimal labour-demand equation, derived from the first order, can thus be expressed as such:

$$L = \; v^a T^{1-\sigma} Y^{(1-\sigma+v\sigma)} \alpha \, WP^{-\sigma} \;\; (1)$$

where v, σ and α are variables, L denotes the level of employment, Y the added value at constant price, WP the real wage and T the level of technology. Over the duration of this study, the evolution of this last factor is considered constant at level λ. Thus, the pace of technological change can be expressed with the following: $T = T_0 e^{-\lambda t}$.

As expressed by Van Reenen (1997), production is approximated using the variation in capital and investment in intermediate goods. By applying the logarithmic form to equation (1) and adding an error term, labour demand can be expressed with a log-linear static function of the real wage, capital and intermediate goods at a constant price, and technological change:

$$lnL_{icst} = \beta +_1 lnK_{icst} + \beta_2 lnI_{icst} + \beta_3 lnWP_{icst} + \beta_4 \lambda_{icst} + \varepsilon_{icst} \;\; (2)$$

Where i, c, s, et t represent the industry type, country, company size and year respectively. L corresponds to the level of employment, K to real capital, I to intermediate goods, WP to the real wage, and λ to the pace of technological change. ε is the error term in line with standard normal distribution.

Technological change is linked to innovation and the circulation of new technologies throughout the industries and countries taken into consideration. This includes the increase in the use of e-commerce. In order to incorporate these effects, the equation specifying labour demand is completed with the addition of indicators measuring these changes. A set of fixed effects – countries, industries, company sizes and years – are thus added to equation (2) as well as a variable measuring the use of e-commerce, E.

The function of short-term labour demand can thus be expressed with the following:

$$lnL_{icst} = \alpha_0 + \breve{\beta}_1 lnK_{icst} + \breve{\beta}_2 lnI_{icst} + \breve{\beta}_3 lnWP_{icst} + \breve{\beta}_4 E_{ict} + \delta_c + \delta_i + \delta_t + \delta_s + \mu_{icst} \;\; (3)$$

Where δ_c, δ_i, δ_s et δ_t are fixed effects per country, industry, company size and year respectively. These effects capture the institutional, economic, sectoral and technological differences in labour demand which cannot be explained by wage fluctuations, stock of capital and the growing use of e-commerce.

6. "*Retail in the U.S.: Towards destructive destruction*", Euler Hermes, 22nd January 2020
7. "*100 000 retail stores could close by 2025, accelerated by COVID-19, analysts say*", USA Today, 21st April 2020

Data and scope of the study

The model is an estimate based on a sample of seven member states of the European Union (Germany, Finland, France, Spain, Italy, the Netherlands and Portugal) during the period from 2009 to 2018. The data used is extracted from two sources provided by Eurostat, the European Union's statistics body.

The first set of data are structural business statistics (SBS)[8] which describe the structure, behaviour and performance of economic activities, at the most detailed activity level (hundreds of economic sectors). Most of the data were collected by national statistics institutes (NSI) using statistical surveys, business registers and varied administrative sources. For example, a large proportion of these data was gathered by INSEE in France and Destatis in Germany.

The main useful SBS data covers variables linked to the input of labour, goods and services, and capital. These data are provided in terms of country, year and industry and grouped together based on the statistical classification of economic activities (NACE) adopted by the EU[9]. In the context of this study, the activities concerned correspond to retail and wholesale trade (NACE Rev 2. G46 and G47 respectively), with the exception of businesses selling cars and motorbikes, food products, drinks, tobacco and fuel, as well as those linked to raw agricultural products and live animals. The study also covers certain service activities which can be directly affected by household and individual use of e-commerce, including: passenger and freight transport (NACE Rev 2. H), accommodation (NACE Rev 2. I55), publishing and telecommunication services (NACE Rev 2. J58 and J61) as well as the insurance and financial sectors (NACE Rev 2. H). One of the benefits of using annual business statistics is that they are broken down by size class of employment in each country, year and NACE sector. This allows us to study the effects of e-commerce in relation to the size of the company.

For each country, year, industry and company size category, four SBS variables are used to calculate equation (3) :

· **Employment** (L) is measured by the number of employees, defined as any person holding an employment contract with an employer and receiving financial compensation in return.

· **Capital** (K) is measured by net investment in new or old material goods during the reference period. Immaterial goods and financial assets are excluded.

· **The real wage** (WP) is measured by the cost of staff, taking into account the salary paid to employees and social security costs, divided by the number of employees.

· **Intermediate goods** (I) include the net value of the purchase of goods and services used during the production process, with the exception of fixed capital assets.

In order to assess the impact of the variable measuring e-commerce on employment, this study relies on a second database provided by Eurostat: the use of new technologies by individuals. These data are collected annually by NSI on the basis of household surveys carried out using a model questionnaire created by Eurostat.

In particular, this statistical survey allows us to gather information regarding the number of households who have ordered goods and services online during the current year. Furthermore, this information is broken down for each country and year by age category and type of goods purchased online. The types of goods defined by this study are as follows: household items (toys, furniture etc, with the exception of electronic devices); the purchase of films and music; electronic devices; computer equipment; clothing, shoes and sports equipment; books, newspapers and magazines; telecommunication services; insurance and financial services; holiday accommodation; transport; travel planning and other.

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8. The exact content of these data is available on the Eurostat website.
9. NACE classification available on the Eurostat website.

Given that this goods classification system is different to that used to categorise the sector-specific data regarding employment, wages and other inputs presented in the previous section, a great deal of work was put into reconciling the data upstream in order to create a correspondence between each of the NACE industries and a goods category as established by the household survey.

Once this correspondence system was established, the data linked to business activities were then aggregated and merged with the information linked to household use of e-commerce in order to develop a set of data which would allow us to calculate equation (3).

Substantial differences in the impact on the retail sector

Across the various retail sectors, the results reveal that e-commerce had a slight negative impact on employment. The calculated elasticities suggest that an increase of one point in the number of households shopping online reduces employment by 0.04% across all off the EU countries studied during the period from 2009 to 2018 (Table 1), with a cushioning effect of 0.2% in France. Italy experienced a positive impact, no doubt linked to the scarce use of e-commerce in the country. Finland and the Netherlands were also affected positively, albeit to a lesser extent.

However, these aggregated effects conceal significant differences between sectors and company sizes. Across the seven countries, we noted that the relationship between e-commerce and employment is strongly negative for small-sized enterprises (Table 2).

Table 1.

Elasticity of employment in relation to e-commerce in the retail sector per country, 2009-2018

COUNTRY	ELASTICITY
Finland	0,5%
France	–0,2%
Germany	–0,1%
Italy	2,7%
Netherlands	0,2%
Portugal	–0,6%
Spain	–0,6%
TOTAL	**–0,4%**

Source : authors' calculations

Table 2.

Elasticity of employment in relation to e-commerce in the retail sector per company size, 2009-2018

COMPANY SIZE	ELASTICITY
Between 0 - 1 employee	–2,5%
Between 2 - 9 employees	–1,0%
Between 10 - 19 employees	–0,6%
Between 20 - 49 employees	–0,6%
Between 50 - 249 employees	–0,2%
Over 250 employees	0,4%

Source: authors' calculations

Conversely, the rise in household use of e-commerce has had a positive impact on the growth of employment in companies with more than 250 employees.

As such, when the number of households using e-commerce rises by one point, employment in micro-enterprises (0-1 employee) drops by 2.5% and, conversely, increases in large companies by 0.4%.

Analysis on a per country or per sector basis of the retail industry also results in a more mixed table than the overall results. Employment in some non-food sectors and countries seems to suffer more from the increasing number of individuals making purchases online than in others (Table 3). While the computer equipment retail sector seems to experience job losses as e-commerce grows in all of the EU countries studied, with the exception of Finland, the electronic device sector has seen new job creations, with the exception of Germany and France. Furthermore, while employment across all retail sectors is negatively affected by the growth of e-commerce in France, most sectors in Finland and Italy have benefited from it (with the exception of books, newspapers and magazines and computer equipment, respectively).

Every job created thanks to e-commerce in the non-food retail sector in a large company has led to the destruction of 6 jobs in small and medium-sized enterprises

Job destructions in the retail sector in France

If we cross-reference the sectors analysed with company sizes, detailed estimates for France reveal that employment across retail sectors has been negatively affected by the development of individual online buying behaviour, with the exception of large companies (with more than 250 employees) in the sectors related to electronic devices, household items and unclassified product categories (Table 4).

By combining these estimated elasticities with the figures demonstrating the increase in the number of households buying these different goods categories online between 2009 and 2018 and those regarding the level of employment per sector, we can estimate the number of jobs that have been destroyed or created by the development of e-commerce.

According to these estimates, the increase in the number of households buying goods online destroyed around 121,000 jobs in small companies (with fewer than 20 employees) in the retail sector in France between 2009 and 2018 and 9,000 jobs in medium-sized businesses (between 20 and 249 employees). Conversely, it has fostered the creation of around 16,000 jobs in large companies (with more than 250 employees) in the sector. In short, **every job created thanks to e-commerce in the non-food retail sector in a large company has led to the destruction of 6 jobs in small and medium-sized enterprises**.

In total, the growing use of e-commerce by French households has destroyed more than 114,000 jobs across the different branches of the retail sector considered by this study between 2009 and 2018 (Table 5). These losses represent 16.8% of the number of jobs in the retail sector in 2018.

Table 3. **Elasticity of employment in relation to e-commerce in the retail sector, per sector and country, 2009-2018**

Country	Books, newspapers & magazines	Clothing, shoes & sports equipment	Computer equipment	Electronic devices	Films & musics	Household items	Other
Finland	-0.1%	0.4%	2.6%	2.0%	2.1%	2.1%	9.7%
France	-2.4%	-1.3%	-2.6%	-0.3%	-5.7%	-0.7%	-1.2%
Germany	-0.6%	-0.4%	-0.5%	-0.4%	-1.0%	-0.6%	0.5%
Italy	3.2%	2.3%	-6.3%	4.8%	5.6%	1.2%	7.2%
Netherlands	-5.9%	-0.2%	-5.9%	0.5%	-2.0%	-0.1%	-0.9%
Portugal	1.0%	-1.4%	-1.1%	3.8%	4.5%	0.3%	5.6%
Spain	1.5%	-0.8%	-0.6%	2.6%	-5.7%	-0.1%	-0.5%

Source: authors' calculations

Table 4. **Elasticity of employment in relation to e-commerce in France, per goods category and company size, 2009-2018**

Company size*	Books, newspapers & magazines	Clothing, shoes & sports equipment	Computer equipment	Electronic devices	Films & musics	Household items	Other
0 – 1	-5,4%	-2,3%	-4,3%	-11,1%	-9,9%	-3,7%	-5,0%
2 – 9	-3,4%	-2,0%	-2,7%	-1,5%	-7,0%	-2,1%	-3,4%
10 – 19	-2,2%	-1,3%	-1,1%	-1,2%	-5,0%	-0,9%	-1,2%
20 – 49	-1,9%	-1,2%	-2,5%	-0,6%	-5,0%	-0,6%	-0,9%
50 – 249	-2,4%	-0,8%	-1,6%	-0,3%	-5,9%	-0,8%	-0,2%
> 250	-1,0%	-0,2%	-0,5%	1,8%	-3,9%	0,4%	1,4%

*According to number of employees | Source: authors' calculations

Table 5. **Resulting balance of jobs in the retail sector due to e-commerce in France, 2009-2018**

Company size*	Books, newspapers & magazines	Clothing, shoes & sports equipment	Computer equipment	Electronic devices	Films & musics	Household items	Other
0 – 1	-869	-15 934	0	-538	-7	-5 342	-16 566
2 – 9	-930	-34 971	-659	-385	-9	-6 483	-28 856
10 – 19	-187	-5 302	0	-68	-2	-1 043	-2 780
20 – 49	-171	-3 383	0	-31	-2	-670	-1 584
50 – 249	-209	-2 232	-33	-15	-2	-770	-321
> 250	-510	-2 748	0	765	-9	3 217	15 215
TOTAL	**-2 876**	**-64 571**	**-692**	**-272**	**-32**	**-11 090**	**-34 893**

*According to number of employees | Source: authors' calculations

A predominantly positive impact on the wholesale sector in France

As opposed to the retail sector, the results of our calculations reveal that the surge in e-commerce has had a predominantly positive impact on employment in the wholesale sector in the seven EU countries studied between 2009 and 2018. The estimates reveal that an increase of one point in the number of households buying goods online raises the number of jobs in the wholesale sector by 0.4% across the various goods categories and seven countries in this study.

Once again, we identified differences between the branches analysed and the various sizes of company. Across the seven EU countries studied, growth in consumer use of e-commerce reduced the number of jobs available in small companies in particular (Table 6). However, employment in medium-sized companies (between 10 and 249 employees) and large companies (more than 250 employees) in the wholesale sector benefited from the situation.

In France, the number of jobs created in large companies (with more than 250 employees), linked to the rise of e-commerce, largely compensated for the job destructions in SMEs (Table 7) in most sectors. **But for every 3 jobs created in these companies, 1 job was lost in another company**. In total, the overall effect on employment was positive with more than 32,000 jobs being created, representing 17% of jobs in the categories of the wholesale sector taken into account in this study.

For every 3 jobs created in these companies, 1 job was lost in another company

Table 6.

Elasticité de l'emploi au e-commerce dans le commerce de Wholesale par taille d'entreprises, 2009-2018

COMPANY SIZE	ELASTICITY
Between 0 - 1 employee	–1.1%
Between 2 - 9 employees	–0.2%
Between 10 - 19 employees	0.4%
Between 20 - 49 employees	0.7%
Between 50 - 249 employees	0.9%
Over 250 employees	1.1%

Source: authors' calculations

Table 7. **Resulting balance of jobs in the wholesale sector due to e-commerce in France, 2009-2018**

Company size*	Clothing, shoes & sports equipment	Electronic devices	Household items	Other
0 – 1	−1 022	50	−78	104
2 – 9	−4 644	−969	−3 857	−1 764
10 – 19	−2 294	−226	−1 537	−574
20 – 49	−3 050	−326	−1 794	−781
50 – 249	−2 556	734	−18	52
> 250	3 857	3 170	37 255	12 908
TOTAL	−9 709	2 433	29 971	9 946

According to number of employees | Source: authors' calculations

Table 8. **Resulting balance of jobs in the retail sector due to e-commerce in Germany, 2009-2018**

Company size*	Books, newspapers & magazines	Clothing, shoes & sports equipment	Computer equipment	Electronic devices	Films & musics	Household items	Other
0 – 1	−549	−4 720	−332	−260	−15	−5 632	−11 542
2 – 9	−735	−19 232	57	317	−20	−10 502	−9 770
10 – 19	−59	−4 310	75	229	−3	−748	16 100
20 – 49	−160	−5 520	59	148	−4	−1 810	12 772
50 – 249	−167	−3 024	139	205	−5	−1 140	10 246
> 250	−459	−36 833	−200	840	−12	−2 437	76 161
TOTAL	−2 130	−73 639	−202	1 480	−59	−22 268	93 967

According to number of employees | Source: authors' calculations

Table 9. **Resulting balance of jobs due to e-commerce in the retail industry in Spain, 2009-2018**

Company size*	Books, newspapers & magazines	Clothing, shoes & sports equipment	Computer equipment	Electronic devices	Films & musics	Household items	Other
0 à 1	1 851	−4 181	251	3 485	−8	−4 202	−4 951
2 à 9	447	−2 518	108	1 736	−3	−1 641	−2 970
10 à 19	5 325	−10 191	1 004	12 118	−8	−28 558	−35 699
20 à 49	809	−1 309	675	2 817	−2	−647	−1 191
50 à 249	494	−968	650	2 479	−3	−287	−939
> 250	4 809	−1 372	1 549	7 942	−6	−700	4 809
TOTAL	13 734	−20 538	4 237	30 577	−31	−36 035	−40 941

According to number of employees | Source: authors' calculations

What is the impact on retail and wholesale companies in Germany and Spain?

Our calculations reveal that the rise of e-commerce in Germany has had a much weaker impact on employment in the retail trade than in France. On a similar scale[10], only 3 000 jobs were directly destroyed in the sector in Germany between 2009 and 2018, representing 0.2% of the number of workers in 2018. While e-commerce destroyed jobs as a whole in retail companies in France, with the exception of the largest firms (with more than 250 employees), German medium-sized companies benefited from the creation of new jobs, which reduced the overall impact. **In Germany, for every job created in a large non-food retail company, one job was destroyed in other companies in the sector**.

In Spain, 49 000 jobs in the retail sector can be directly attributed to the growth in individuals making purchases online (Table 9), which represents 7.8% of workers in 2018 in the sectors of goods categories that we included in this study. Unlike France, where the differences between job creations and destructions were linked to the size of company, these differences are intersectoral in Spain.

In Spain, like in France, we observed job creations in the wholesale sector linked to the growth in households buying products online. However, in Spain, the resulting balance is lower than in France: 6 000 jobs were created (compared to 32 000). These losses are led by the clothing and household item sectors which were more than compensated for by the creation of jobs in the electronic device and other unclassified sectors.

Conversely, the impact in Germany was remarkably negative in the wholesale sector, with almost 76 000 jobs destroyed between 2009 and 2018. In Germany, job destructions were observed across all branches of the sector and, with only a few exceptions, all sizes of company. These results are hardly surprising if we take into account the fact that trade and value chains are organised in a very different way from country to country. We can especially highlight the high proportion of job losses in SMEs in the wholesale

sector in Germany, compared to France where very large companies predominate, or the low level of concentration of distribution (when compared with France, Spain and other European countries).

In total, in terms of wholesale and retail companies, France and Germany both have a resulting balance of more than 80 000 job destructions compared to almost 43 000 in Spain.

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10. For coherence purposes, the retail sale of medicines and medical equipment online has been excluded as the sale thereof is forbidden in France.

Some services were not spared

To study the impact of the development of e-commerce on consumer habits, only the services that households can purchase online were analysed for the purposes of this study. However, the available data regarding service providers were less detailed. As a result, the calculations couldn't be done for each sector and country per company size, so the results are expressed at the sectoral level only on a country per country basis.

Aside from the telecommunications sector, we observed clear job losses in all service categories studied across the seven EU countries in our study (Table 10). In France, we counted almost 70 000 job destructions, representing 7.2% of employment in 2018 across the four service sectors we considered in this study. In absolute and relative terms, the transport and travel planning sectors were the most affected by the increase in French households'

online purchasing habits (with 33 000 jobs destroyed between 2009 and 2018, the equivalent of 20.4% of the level of employment in the sector in 2018).

For all of the service sectors, the resulting balance of job destructions linked to e-commerce was significantly lower in Germany and the Netherlands than in France with "only" almost 5 000 jobs lost between 2009 and 2018. In our sample, Spain suffered the most as a result of the rise of e-commerce in terms of job numbers in market services, with more than 200,000 jobs destroyed. This high figure can notably be explained by the digitalisation of a certain number of tourist services upon which many jobs rely in Spain.

Figure 5. Comparison of resulting job numbers

Thousands of jobs

Source: authors' calculations

**Table 10.** **Resulting balance of jobs linked to e-commerce in the service sector, 2009-2018**

Country	Holiday rentals	Telecom	Insurance and financial services	Travel
Germany	–26 774	56 880	–31 604	–4 159
Spain	–74 788	–4 206	–97 948	–31 366
Finland	–2 205	–880	–5 210	–2 763
France	–21 891	–3 254	–11 853	–32 847
Italy	–6 778	–13 290	16 697	–8 957
Netherlands	–11 897	2 760	5 448	–1 280
TOTAL	**–144 333**	**38 009**	**–124 470**	**–81 371**

Source: authors' calculations

The question of freight remains

As mentioned in the introduction, the theory assumes that the digitalisation of commerce reallocates jobs towards the whole of the logistics sector in particular. Job creations in the transport of goods sector are legitimately expected.

However, the estimates carried out for this study do not allow us to confirm that e-commerce has had a significant impact on the transport of goods, notably road freight. The absence of a meaningful result could be due to (i) effects or practices not covered by the data (notably due to the use of posted workers) and/or (ii) explanatory reasons which are not included in the model.
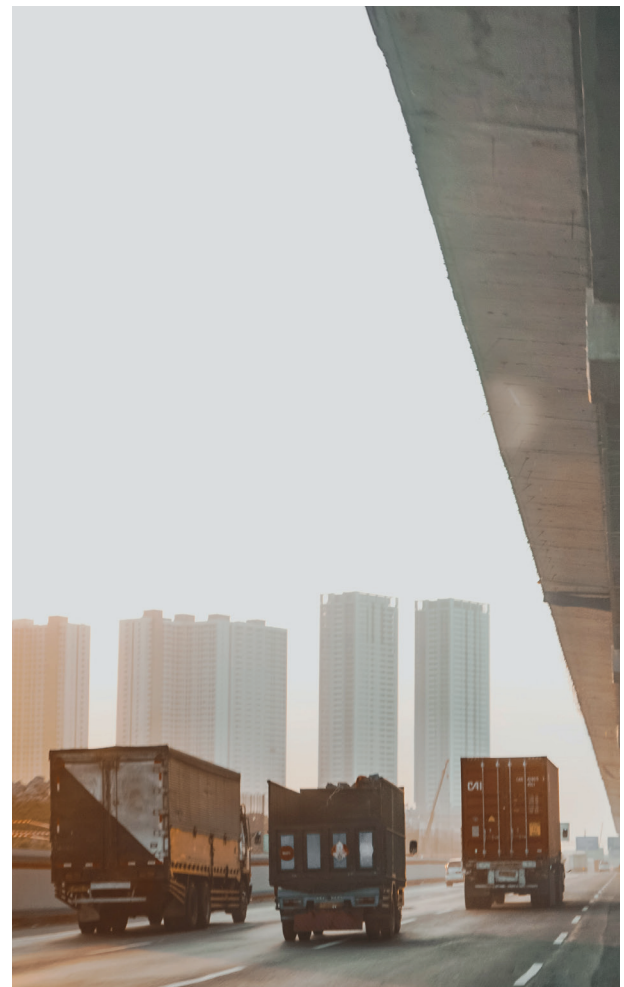
Further destructions by 2028

Most importantly, this study concludes with projections for future job creations and destructions related to developments in the individual use of e-commerce in the various aforementioned sectors.

This forecasting exercise should be considered "all things being equal". Changes in the behaviour of companies and individuals and any external shocks could alter the relationships identified during the period from 2009 to 2018 on which these calculations are based.

As an example, any technology shocks which could have an impact on the link between e-commerce and employment, perhaps altering the use of robotisation for example, cannot be considered here.

Two scenarios concerning the development of online purchasing habits are studied here. In the first scenario (S1), which we could call the median scenario, the online buying habits of 35-44 year olds are generalised across the rest of the population. This scenario corresponds to a gradual growth of e-commerce, in line with the increase observed over the last ten years in European countries. The second scenario (S2) explores a more rapid acceleration in online purchasing habits over the coming years, in this case generalising the consumption habits of 25-34 years old across the whole of the population. This phenomenon could rightly be called into question after the initial months of the Covid-19 crisis which led to many consumers taking the leap on digital channels, even if they had little previous experience.

In both cases, these hypotheses are particularly justified by the fact that data concerning the online buying habits of individuals, used for these calculations, are drawn from a survey of a range of individuals between the ages of 16 and 75. However, the number of online purchases made by 55-75 year olds draws the average down significantly. The forecasts are thus calculated using the range of individuals aged 35 to 44 years old (or 25 to 34 years old) purchasing items online and that of the whole of the population in 2018.

In our median scenario (S1), the non-food retail sector could experience the loss of almost 39 000 jobs by 2028 in France, representing roughly 5.6% of the number of employees in 2018 in the product categories studied. **The clothing, shoes and sports equipment sector will be the worst hit**, with around 23 500 jobs lost (representing 11% of jobs in the sector in 2018). Spain would see almost 29 000 jobs destroyed (representing 4.1% of employees in the non-food retail sector in 2018), while Germany would have a positive balance with more than 9 000 jobs created (0.6% of the workforce in 2018), mainly in the sector of electronic devices.

Job loss estimates between 2009 and 2018 linked to the development of e-commerce in the retail sector in Germany contrast with the projections for job creations. This can be explained by the fact that sectors which benefit from the rise of e-commerce have only seen a slight increase in household purchases made online between 2009 and 2018 (the electronic device sector for example) but with growth prospects among the different generations which are much higher. Conversely, the clothing sector is destroying jobs in the industry but due to the much higher growth of online purchasing in the sector between 2009 and 2018, the future rate of development will be much slower.

The wholesale sector, on the other hand, could gain 24 000 jobs in France, representing 12.5% of the number of jobs in 2018 in the goods categories studied here. While the household item sector (toys, furniture etc.) would come out on top, with the creation of 25 000 jobs representing 28% of employment in the sector, the wholesale industry for clothing, shoes and sports equipment would suffer (-3 500 jobs, -9%). Compared with France, Germany would record clear job losses across the whole of the wholesale sector. These losses would amount to 56 000 jobs, representing roughly 16% of employees in the sectors studied.

Across the service sectors taken into consideration, job destructions due to e-commerce would amount to 32 000 in France, 118 000 in Spain and 52 000 in Germany. In the rest of the seven EU countries we analysed, job losses due to reservations being made online would mainly affect the holiday rental, travel planning and transport sectors. Only the telecommunications sector would see a limited negative impact.

According to the first scenario, **job losses across all of the sectors considered are expected to reach 46 000 in France, 98 000 in Germany and 152 000 in Spain in the next ten years** (Figure 6).

According to the second scenario (S2), **the impact would be more severe in France and Germany with 87 000 and 127 000 jobs destroyed respectively. For Spain,** the impact would be slightly less significant than in the first scenario with **118 000 jobs lost in total**[11].

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11. For the same reasons as in scenario S1

Figure 6. Scenario predictions for 2028

Thousands of jobs

Retail Wholesale Services ● Total

References

Americo, A., Veronico, A. (2018), "The Effect of E-commerce on Employment in Retail Sector", *mimeo*, Università degli Studi di Torino

Balsmeier, B., Woerter, M. (2019) "Is this time different? How digitalization influences job creation and destruction". *Research policy* 48(8)

Biagi, F., Faulk, M. (2017) "The impact of ICT and e-commerce on employment in Europe." *Journal of Policy Modeling* 39(1), 1-18.

Schumpeter, J. A. (1934), *The Theory of Economic Development. An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*. Harvard University Press: Cambridge, MA.

Credits

Caution

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