24 February, 2021

COVID-19 pandemic in Portugal: Regional Economic Activity

E-invoice 2019 – 2020 (March to December)

COVID-19: How has the pandemic affected regional economies in 2020 ?

In the framework of a protocol signed between the two entities, Tax and Customs Authority transmits monthly information to Statistics Portugal obtained through the E-invoice system (E-fatura). This information allows the evaluation of the economy behaviour from a regional perspective in the period from March (beginning of the pandemic economic effects) to December 2020 (last month available) compared to the same period in 2019. Some of the main findings:

- Between March and December of 2020, there was, in Portugal, a homologous decrease of 14.3% in the invoicing value and, recording values above the national average, the Algarve (-27.4%), Região Autónoma da Madeira (-21.6%) and Área Metropolitana de Lisboa (-18.2%) stood out. In Portugal and in all NUTS 2 regions, this contraction was more intense from March to July (-18.9% in Portugal), than in the period from August to December (-9.8%). More than 70% of the decrease recorded in Portugal from March to December 2020 was due to the reduction in the invoicing value in AML and AMP.

- From March to December 2020, the invoicing values of the Accommodation activities and Arts, entertainment, sports and recreation activities represented less than half of the invoiced amount in the same period of 2019. In 21 out of the 25 NUTS 3 sub-regions, the Accommodation activities were also the branch with the highest homologous contraction in the invoicing value. In contrast, in 13 sub-regions, the Information and Communication branch scored the most positive performance.

- In the period under analysis, only six sub-regions, all from the Norte region, including the AMP, registered, simultaneously, COVID-19 confirmed cases per 100 thousand inhabitants higher than the national average and a reduction in the invoicing value lower than the country's average. On the opposite side, Algarve, Região Autónoma da Madeira, Alentejo Litoral and AML scored rates of COVID-19 confirmed cases below country's average but a contraction of invoiced values relatively more pronounced (see figure 9)

The results presented seek to portray the different dynamics of economic activity at regional level in the context of the COVID-19 pandemic, based on anonymized E-fatura information provided by the Tax and Customs Authority (AT) to Statistics Portugal, under a protocol signed between the two entities. The analysis explores the taxable amount recorded in the E-fatura for the period March to December 2020 by year-on-year comparison with March to December 2019, structured up to the NUTS 3 level according to the economic activity of the issuer (see technical note at the end of the press release).

This initiative is part of the development framework of the **National Data Infrastructure (IND)** at Statistics Portugal, which aims to take advantage of the integration of data from several sources and with potential utility to produce official statistics with greater granularity and frequency. In addition to the significant enrichment at the statistics production level, it also allows simplification of reporting obligations to Statistics Portugal, by citizens and enterprises.

This information is integrated in StatsLab – Statistics in development in Statistics Portugal website which includes projects for new statistical products that have not yet been fully completed, and yet their results already contain information that may provide useful information for economic and social analysis.

Between March and December of 2020, there was, in Portugal, a homologous decrease of -14.3% in the invoicing value and Algarve and Região Autónoma da Madeira stood out with decreases higher than -20%

Between March and December 2020, the taxable amount in the E-invoice, in Portugal, decreased by -14.3% compared to the same period in the previous year. At the regional level, the NUTS 2 regions of Algarve (-27.4%), Região Autónoma da Madeira (-21.6%) and Área Metropolitana de Lisboa (-18.2%) stood out with decreases higher than the national average [Figure 1].

The analysis of the year-on-year growth rate of invoicing value for the two five-month periods - March to July and August to December 2020 - reveals, at the national level, a sharper decrease in the invoicing value in the months from March to July (-18.9%) - a period that covered the confinement phase associated with the first States of Emergency to deal with the COVID-19 pandemic - followed by an improvement in this rate in the period from August to December (-9.8%).

The NUTS 2 regions followed the recovery trend observed at a national level, highlighting the Algarve, which despite being the region of the country with the lowest year-on-year rates of invoicing value in the two periods of five months under analysis, was also the region where this rate recorded the greatest recovery between these two periods: -35.8% between March and July and -19.1% between August and December, corresponding to a decrease of 16.7 p.p. [Figure 2].

Figure 1: Year-on-year growth rate of invoicing value, NUTS 2 and Portugal, March to December, 2020
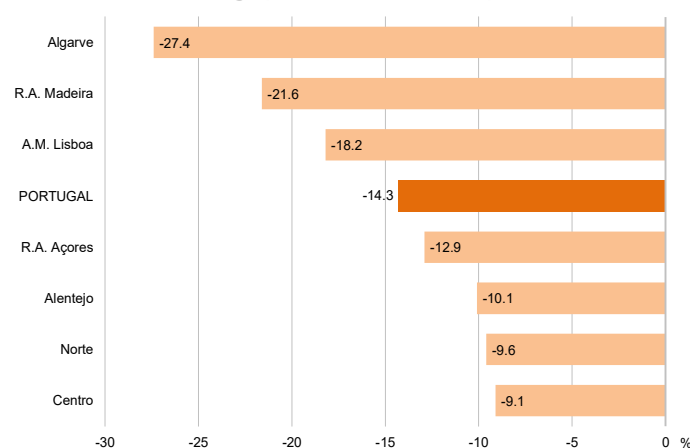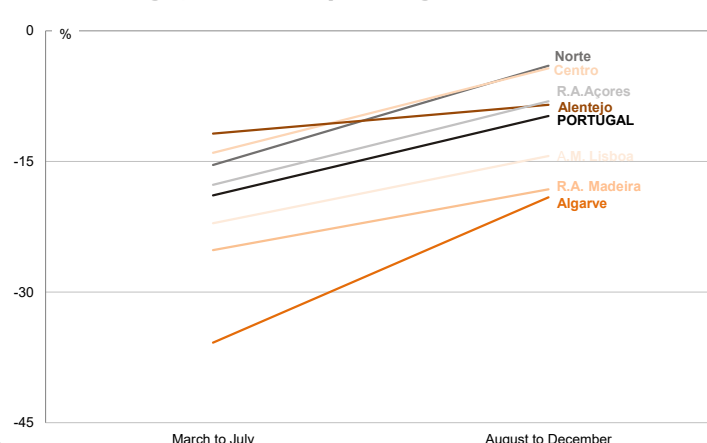
Figure 2: Year-on-year growth rate of invoicing value, NUTS 2 and Portugal, March to July and August to December, 2020

The analysis of the year-on-year growth rate of invoicing value at the NUTS 3 level for the period from March to December 2020, showed the sub-regions of Algarve (-27.4%), Região Autónoma da Madeira (-21.6%), Área Metropolitana de Lisboa (-18.2%) and Alentejo Litoral (-17.4%) with reductions higher than the national average (-14.3%).

Terras de Trás-os-Montes (-0.6%), Beira Baixa (-5.1%), Lezíria do Tejo (-6.2%), Viseu Dão Lafões (-7.0%) and Ave (-7.2%) stood out for scoring less severe levels of contraction among the country's 25 sub-regions, with year-on-year growth rates higher than -7.5% [Figure 3].

Considering the weight of the invoicing value of each NUTS 3 sub-region in the value invoiced in Portugal from March to December 2019, it is observed that the Área Metropolitana de Lisboa concentrated almost half (47.2%) of the value invoiced at the national level, followed by the Área Metropolitana do Porto which represented about 16.4%. Região de Aveiro (3.5%), and Cávado (3.1%) also stood out with weights above 3%. The remaining 21 NUTS 3 sub-regions accounted together less than 30% of the invoicing value registered in Portugal between March and December 2019 [Figure 4].

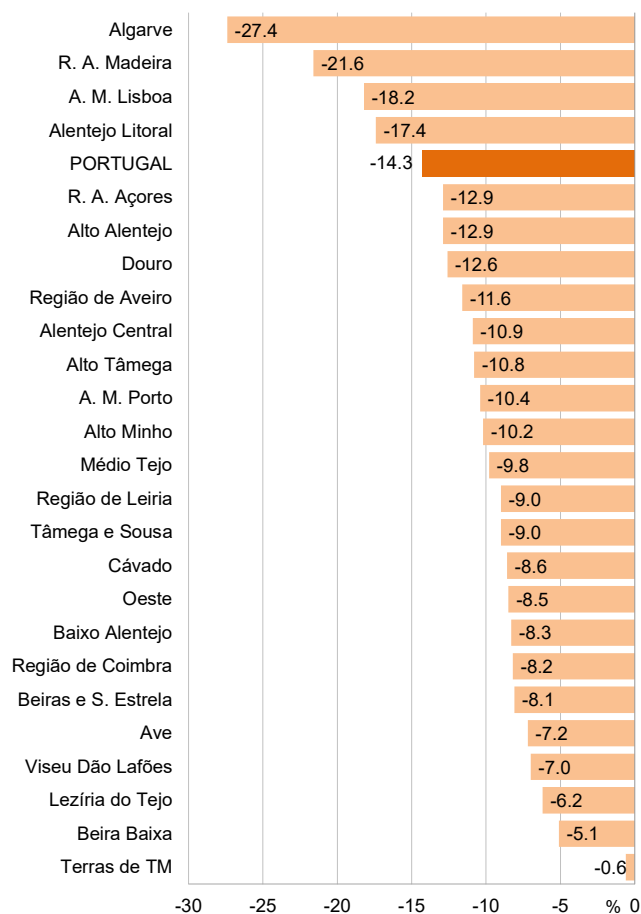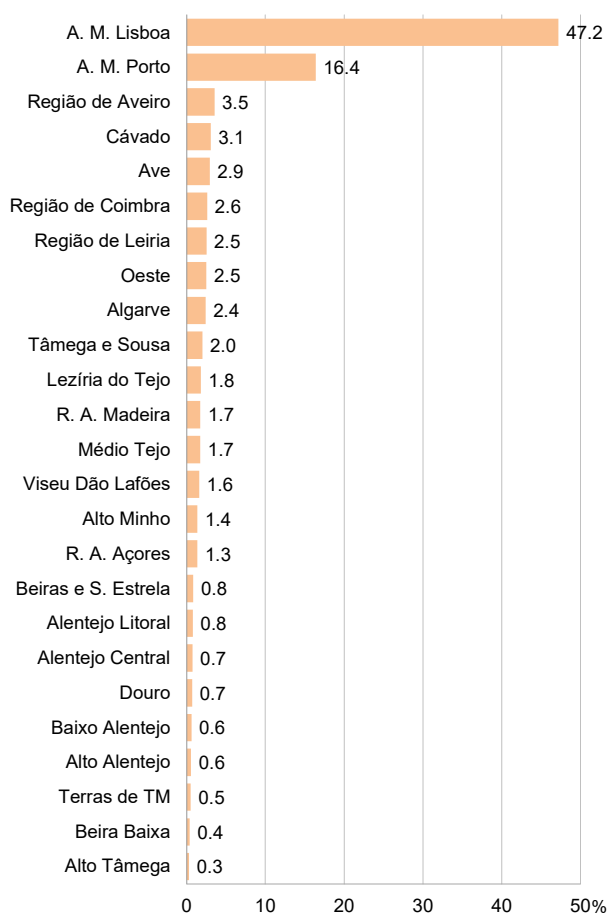**Figure 3: Year-on-year growth rate of invoicing value, NUTS 3 and Portugal, March to December, 2020**

Figure 4: Regional structure of the invoicing value, NUTS 3, March to December 2019

Weighting the year-on-year growth rate of invoicing value of each NUTS 3 sub-region by their respective weight in the total amount in Portugal, it can be concluded that more than 70% of the total contraction recorded from March to December 2020 (-14.3%) was due to the reduction in the metropolitan areas of Lisboa (-8.6 p.p.) and Porto (-1.7 p.p.).

From March to December 2020, the invoicing values of the Accommodation Activities and Arts, entertainment, sports and recreation activities represented less than half of the invoiced amount in the same period of 2019

Considering 36 branches of economic activity from the aggregation into 39 branches (A39)[1],, in the period between March and December 2020, only five activity branches scored year-on-year increases in invoicing value: CF – Manufacture of basic pharmaceutical products and pharmaceutical preparations (+18.1%), MB – Scientific research and development (+10.5%), JC – Computer programming, consultancy and related activities; information service activities (+7.7%), JB – Telecommunications (+3.9%) and F – Construction (+2.9%). Note, however, that, apart from Construction (4.8%), the remaining activity branches that scored positive year-on-year growth rates accounted individually with less than 1.5% for the overall invoicing value from March to December 2019 (CF: 0.4%; JB: 1.4%; JC: 1.4%; MB: 0.1%).

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[1] Within the scope of this analysis, branches K - Financial and insurance activities, T - Activities of households as employers of domestic personnel and undifferentiated goods and services production of households for own use and U - Activities of extra-territorial organizations and bodies were not considered.

The remaining economic activity branches recorded decreases, especially Accommodation activities (-66.5%, I55) and Arts, entertainment, sports and recreation activities (-50.6%, branch R) - where the invoicing value from March to December 2020 represented less than half of the amount invoiced in the same period in 2019.The Food and beverage service activities (-42.5%, I56) also stood out with a reduction in invoiced volume of more than 40%. These three economic activity branches represented together 4.7% of the total amount invoiced in Portugal, between March and December 2019.

Also noteworthy are the activities of wholesale and retail trade; repair of motor vehicles and motorcycles (G), which accounted for 37.6% of the total value invoiced in Portugal between March and December 2019, with a year-on-year decrease of -11.2% in the same period of 2020 [Figures 5 and 6].

Figure 5: Year-on-year growth rate of invoicing value, by activity branch (A39), Portugal, March to December 2020
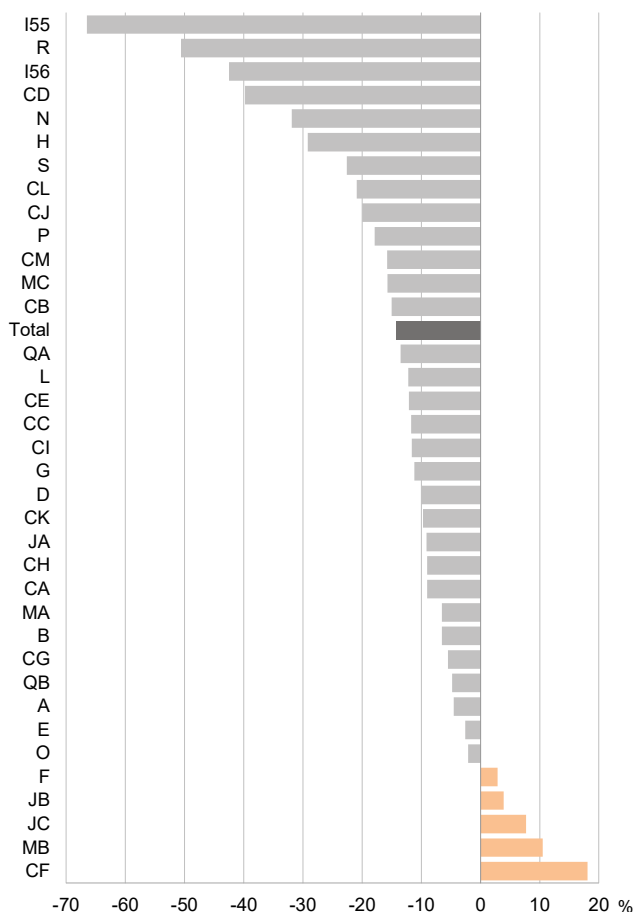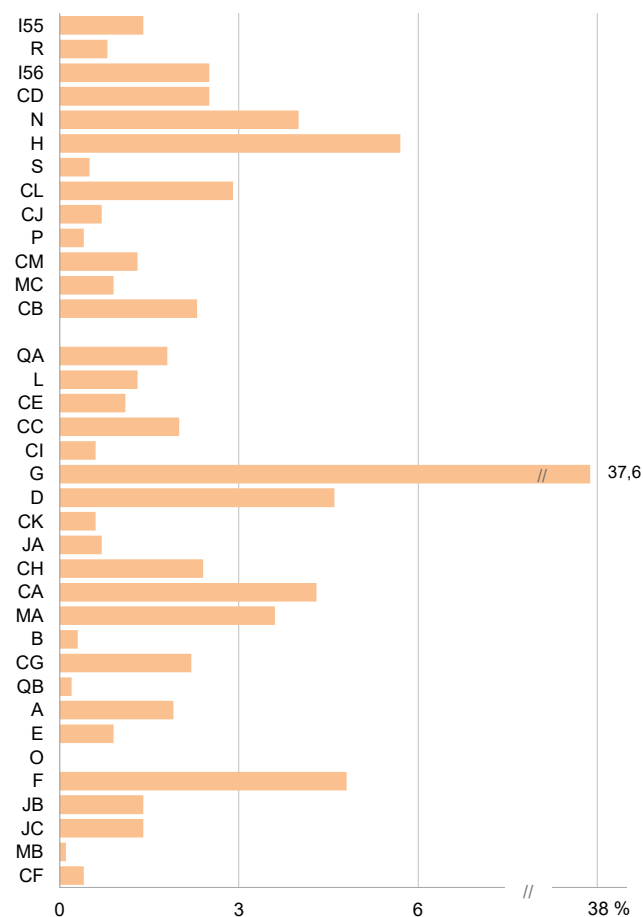
Figure 6: Sectoral structure of the invoicing value, by activity branch (A39), Portugal, March to December 2019

Note: A - Agriculture, farming of animals, hunting and forestry; B - Mining and quarrying; CA - Manufacture of food products, beverages and tobacco products; CB - Manufacture of textiles, wearing apparel and leather products; CC - Manufacture of wood and paper products, and printing; CD - Manufacture of coke, and refined petroleum products; CE - Manufacture of chemicals and chemical products; CF - Manufacture of basic pharmaceutical products and pharmaceutical preparations; CG - Manufacture of rubber and plastics products, and other non-metallic mineral products; CH - Manufacture of basic metals and fabricated metal products, except machinery and equipment; CI - Manufacture of computer, electronic and optical products; CJ - Manufacture of electrical equipment; CK - Manufacture of machinery and equipment n.e.c.; CL - Manufacture of transport equipment; CM - Manufacture of furniture; other manufacturing; repair and installation of machinery and equipment; D - Electricity, gas, steam, cold and hot water and cold air; E - Water collection, treatment and distribution; sewerage, waste management and remediation activities; F – Construction; G - Wholesale and retail trade; repair of motor vehicles and motorcycles; H - Transportation and storage; I55 – Accommodation; I56 - Food and beverage service activities; JA - Publishing, audiovisual and broadcasting activities; JB – Telecommunications; JC - Computer programming, consultancy and related activities; information service activities; L - Real estate activities; MA - Legal and accounting activities; activities of head offices; management consultancy activities; architecture and engineering activities; technical testing and analysis; MB - Scientific research and development; MC - Advertising and market research; other professional, scientific and technical activities; veterinary activities; N - Administrative and support service activities; O - Public administration and defence; compulsory social security; P – Education; QA - Human health; QB - Social work activities; R - Arts, entertainment, sports and recreation activities; S - Other service activities.

Weighting the year-on-year growth rate of invoicing value in each branch of economic activity (A13)[2] by their respective weight in total invoiced amount, it can be concluded that the total contraction recorded from March to December 2020 (-14.3%) was mainly due to wholesale and retail trade; repair of motor vehicles and motorcycles activities (-4.2 p.p., branch 4G) and industrial activities (-4.0 p.p., branch 2), which together accounted for 57.2% of the total reduction [Figure 7].

In nine out of the 25 NUTS 3 sub-regions, industrial activities branch contributed more than half to the year-on-year contraction in invoicing value

In the NUTS 3 sub-regions with the highest year-on-year contraction in invoicing value - Algarve and Região Autónoma da Madeira – the Accommodation Activities (branch 4I55) have contributed the most, accounting for more than ¼ of this decrease.

In 14 out of the 25 NUTS 3 sub-regions of the country, the industrial activities (branch 2) contributed the most to the year-on-year decrease in the value invoiced in these regions. From this group, in nine sub-regions more than an half of the year-on-year decrease in the region's total value invoiced resulted from the contraction of this branch: Ave (-5.6 p.p. of -7.2%), Alentejo Litoral (-12.3 p.p. of -17.4%), Região de Aveiro (-8.0 p.p. of -11.6%), Viseu e Dão Lafões (-4.3 p.p. of -7.0%), Tâmega e Sousa (-5.2 p.p. of -9.0%), Alto Minho (-5.6 p.p. of -10.2%), Beira Baixa (-2.7 p.p. of -5.1%), Cávado (-4.4 p.p. of -8.6%) and Beiras e Serras da Estrela (-4.1 p.p. of -8.1%).

Similarly to the country, in the remaining nine sub-regions, the reduction in the branch 4G - Trade had the greatest impact on the year-on-year change in the invoiced value scored from March to December 2020 [Figure 7].

Figure 7: Year-on-year growth rate of invoicing value and main negative contributions of the activity branches (A13), Portugal and NUTS 3, March to December 2020
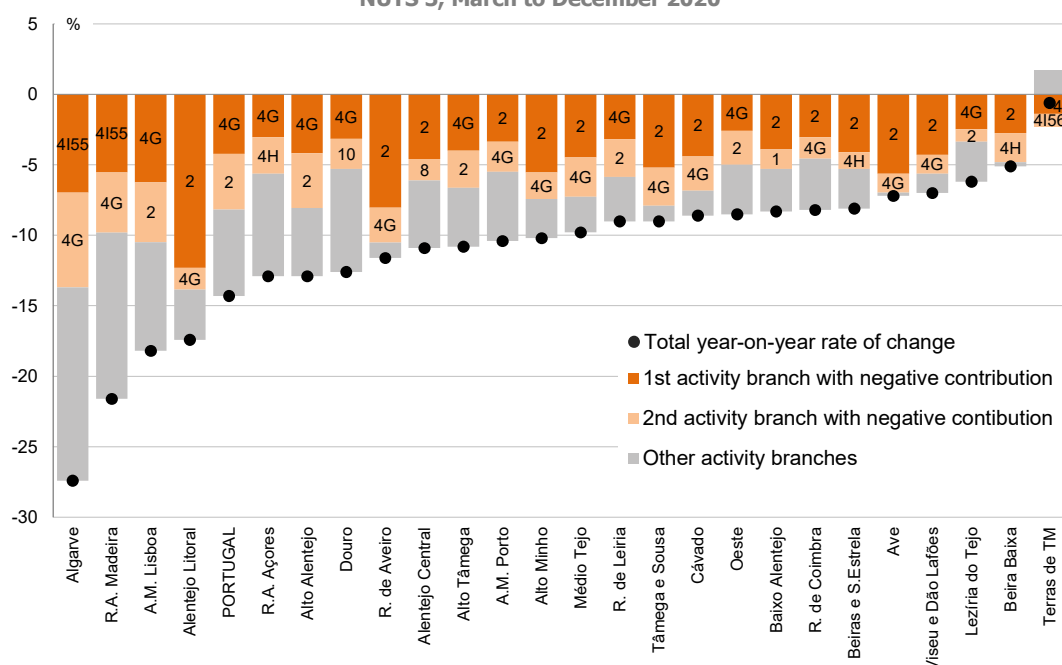
Note: Branch 1 – Agriculture, farming of animals, hunting and forestry; Branch 2 - Mining and quarrying; manufacturing; electricity, gas, steam and cold air; water collection, treatment and distribution; sewerage, waste management and remediation activities; Branch 4G – Wholesale and retail trade; repair of motor vehicles and motorcycles; Branch 4H – Transportation and storage; Branch 4I55 – Accommodation activities; Branch 4I56 – Food service activities and similar; Branch 8 – Consultancy, scientific and technical activities; administrative and support service activities; Branch 10 – Arts, entertainment, sports and recreation activities and Other service activities.

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[2] Based on the aggregation to 10 branches of the National Accounts, it was decided to disaggregate the branch 4 - Wholesale and retail trade; repair of motor vehicles and motorcycles; Transportation and storage; Accommodation and food service activities and similar, into: 4G - Wholesale and retail trade; repair of motor vehicles and motorcycles, 4H - Transportation and storage, 4I55 - Accommodation activities and 4I56 - Food service activities and similar.

In 21 out of the 25 NUTS 3 sub-regions of the country the Accommodation Activities were the branch with the highest homologous contraction in the invoicing value and in 13 sub-regions the Information and Communication branch scored the most positive performance

Considering the economic activities aggregation into 13 branches, in 21 out of the country's 25 NUTS 3, the Accommodation activities (4I55) represented the branch with the largest year-on-year decrease in invoiced value. The Região Autónoma dos Açores (-74.7%), Área Metropolitana do Porto (-74.5%), Região Autónoma da Madeira (-73.3%), Médio Tejo (-72.5%) and Área Metropolitana de Lisboa (-72.4%) stood out from this group, performing decreases higher than -70%. Note, however, that in the Autonomous Regions of Madeira and Açores, this activity represented 7.6% and 3.0% of the invoicing value from March to December 2019, respectively, while in the remaining three sub-regions this weight did not exceed 1.2%. Also noteworthy is the Algarve, where Accommodation activities (branch 4I55) represented 11.9% of the region's total invoiced value from March to December 2019 – the highest weight among country's 25 sub-regions – and which performed, in the period from March to December 2020, a year-on-year decrease in invoicing value of -58.5%.

Between March and December 2020, the Arts, entertainment, sports and recreation activities and other service activities (branch 10) scored the highest year-on-year decrease in the invoicing value in the sub-regions of Douro (-63.9%), Beira Baixa (-48.4%) and Alto Tâmega (-45.1%). The weight of this branch in the sectoral structure of these sub-regions – obtained based on the invoiced value from March to December 2019 – was higher than the country total (Douro: 3.3%; Alto Tâmega: 2.0% and Beira Baixa:1.8% vs. Portugal: 1.3%).

In the sub-region of Alentejo Litoral (-30.4%), branch 2 - Mining and quarrying; manufacturing; electricity, gas, steam and cold air; water collection, treatment and distribution; sewerage, waste management and remediation activities scored the largest decrease in the year-on-year growth rate of invoicing value, representing about 40.6% of invoicing from March to December 2019.

In the other hand, in 13 out of the 25 NUTS 3 sub-regions of the country, Information and communication activities (branch 5) scored the most positive performance, recording invoicing levels above those scored in the same period of the previous year, with the sub-regions of Beira Baixa (+37.6%) and Beiras e Serra da Estrela (+31.3%) standing out with rates above +30%. Note, however, that, except from Área Metropolitana de Lisboa (5.8%), the weight of this branch in the overall invoiced value of these sub-regions did not exceed 2.8% from March to December 2019, a value slightly lower than the country's: 3.5%.

The Real estate activities (branch 7) scored the highest year-on-year growth rate of invoicing value in seven NUTS 3 sub-regions, the Construction (branch 3) in four NUTS 3 sub-regions and, in the sub-region of Viseu Dão Lafões, the Agriculture, farming of animals, hunting and forestry activities (branch 1) registered the most positive year-on-year rate of change [Figure 8].

Figure 8: Year-on-year growth rate of invoicing value by activity branches (A13), Portugal and NUTS 3, March to December 2020
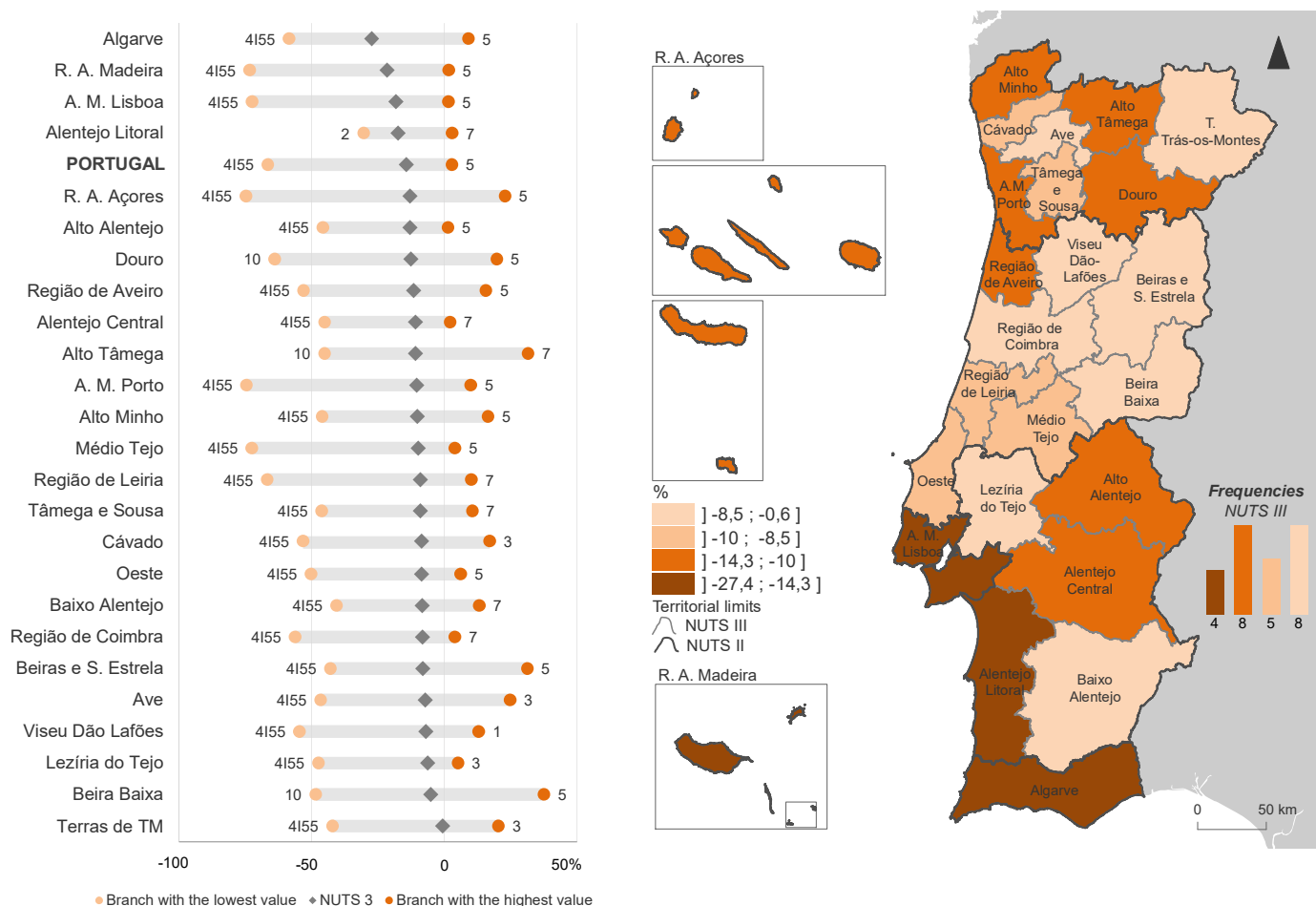
● Branch with the lowest value ◆ NUTS 3 ● Branch with the highest value

Note: Branch 1 – Agriculture, farming of animals, hunting and forestry; Branch 2 – Mining and quarrying; manufacturing; electricity, gas, steam and cold air; water collection, treatment and distribution; sewerage, waste management and remediation activities; Branch 3 – Construction; Branch 4I55 – Accommodation activities; Branch 5 – Information and Communication; Branch 7 – Real estate activities; Branch 10 – Arts, entertainment, sports and recreation activities and Other service activities.

Six sub-regions from Norte region – Ave, Tâmega e Sousa, Cávado, Área Metropolitana do Porto, Alto Tâmega and Terras de Trás-os-Montes – with less negative invoicing performance in the context of the pandemic

Figure 9, which relates the year-on-year growth rate of invoicing value between March and December 2020 and the number of confirmed cases of infection by SARS-CoV-2/ COVID-19 per 100 thousand inhabitants at the NUTS 3 sub-regions level, shows that the most common pattern of these indicators highlighted 15 out of the 25 NUTS 3 sub-regions for scoring a lower number of confirmed cases than the national average and, at the same time, a less pronounced year-on-year decrease in invoicing than the country.

In this context, six sub-regions of the Norte region stand out for scoring a year-on-year contraction in the invoicing value also lower than the country but performing a COVID-19 incidence rate higher than the national average ─ Ave (7 398), Tâmega e Sousa (6 982), Cávado (5 479), Área Metropolitana do Porto (5 430), Alto Tâmega (4 850) and Terras de Trás-os-Montes (4 157) –, thus suggesting that the effect of the pandemic was not felt so intensively in the decrease of the invoiced value in these sub-regions.

E-invoice Statistics – March to December 2020

On the opposite side, four sub-regions scored a lower number of confirmed cases per 100 thousand inhabitants than the national average but registered a year-on-year decrease in the invoicing value above the national value: Algarve (-27.4%), Região Autónoma da Madeira (-21.6%), Área Metropolitana de Lisboa (-18.2%), and Alentejo Litoral (-17.4%).

Figure 9: Confirmed cases of infection by SARS-CoV-2/ COVID-19 per 100 thousand inhabitants until 31st December 2020 and Year-on-year growth rate of invoicing value March to December 2020, Portugal and NUTS 3

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STATISTICS PORTUGAL
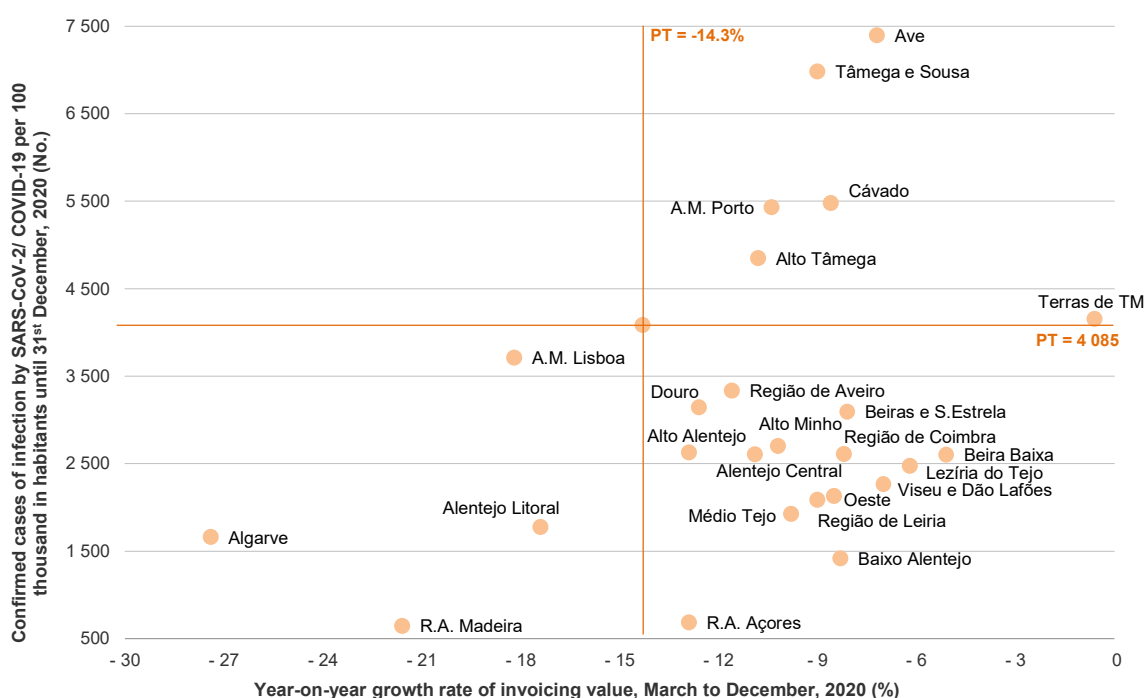
Shift-share decomposition of year-on-year growth rate of invoicing

Figure 10: Specialization coefficient of the invoicing value, NUTS 3, March to December 2020
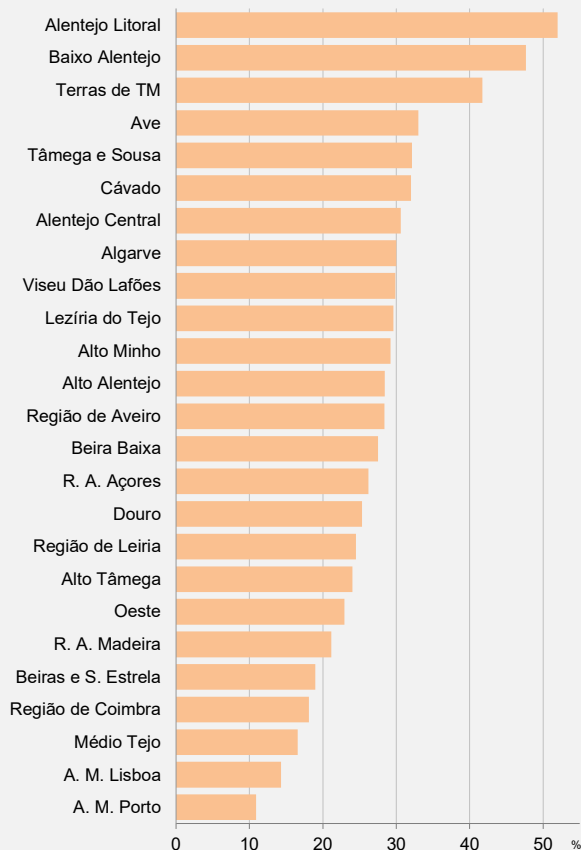
The Specialization coefficient (CE) measures the degree of concentration that a region has in relation to the economic activity sectors. If the CE is equal to 0, it means that the sectoral structure of the region under analysis is fully equivalent to the structure presented in the standard region; inversely, the closer the CE is to 100, the more specialized is the region productive structure in relation to that of the reference space (Statistics Portugal,2015) [3] which, in the present analysis, is Portugal.

The analysis of the Specialization coefficient (CE) of the invoicing value between March and December 2020 reveals that the sub-regions of Alentejo Litoral, Baixo Alentejo and Terras de Trás-os-Montes presented higher levels of specialization in relation to the economic activity structure in the country.

On the other hand, and scoring the lowest values in this indicator, the metropolitan areas of Porto and Lisboa, Médio Tejo, Região de Coimbra and Beiras e Serra da Estrela presented production structures more similar to the national pattern. It should be noted that the fact that sub-regional contribution to the national invoicing value is greater in the metropolitan areas of Lisboa and Porto (45.1% and 17.1% of the total invoicing value of the country, respectively) means that these sub-regions have a stronger influence on the national production structure and, therefore, tend to have lower specialization coefficients than the other NUTS 3 sub-regions [Figure 10].

The following figure presents the shift-share methodology results applied to the decomposition of the rate of change in the invoicing value for the period March to December 2019 and 2020. These results, distinguishing national and local effects, allow the identification of the main determinants and whether they are more associated with local competitive advantages, specialization in more dynamic (or less dynamic) branches, or simply reflect general economic performance. Most models express the evolution of a given economic variable as a function of three main factors (Statistics Portugal,2017)[4]:

- **General effect** – refers to the part of the local growth induced by the national growth dynamics, thus representing the growth in invoicing value that would be observed in the sub-region if all its branches grew at the same rate as the national economy.

- **Structural effect** – concerning the share of local growth induced by the fact that the degree of sectoral concentration favours those branches that grow more (or less) than the economy. Regions specialized in dynamic sectors will have a positive structural variation and vice-versa.

- **Regional effect** – or competitiveness effect, corresponds to the growth differential induced by the fact that in certain branches the region grows more rapidly (or less rapidly) than the national level. If this component is positive, the model points to the existence of regional comparative advantages.

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[3] Statistics Portugal (2015) Territorial Portrait of Portugal - 2013. Lisboa: Statistics Portugal.
[4] Statistics Portugal (2017) Regional Accounts 2015 and 2016 Po. Statistics Portugal Press Release, 15th December, 2017. Lisboa: Statistics Portugal.

Figure 11 shows the year-on-year growth rate of invoicing value in a referential which is based on the country's year-on-year growth rate (-14.3%, general effect) from which the deviations of the structural and regional effects (or competitiveness) for the 25 NUTS 3 of the country are shown. The results for the general effect are not presented since they correspond, for all the territorial units under analysis, to the value of the country's year-on-year rate of change.

The results show the differentiation into two types of sub-regions: regions with growth rates above the national reference and sub-regions with growth rates below the country's value.

In 18 out of the 21 NUTS 3 sub-regions, that registered year-on-year increase in the invoicing value above the national average, the evolution was due to both structural and regional effects. Alto Alentejo presented a positive structural effect – thus reflecting a greater specialization in sectors that grew at a higher rate than the national average – and a negative competitiveness effect. In contrast, in Terras de Trás-os-Montes and Região Autónoma dos Açores, the competitiveness factors offset the negative influence of the structural factor.

Between March and December 2020, four NUTS 3 sub-regions scored year-on-year growth rates of invoicing value below the national reference (-14.3%): Algarve (-13.2 p.p.), R.A. Madeira (-7.4 p.p.), A.M. Lisboa (-3.9 p.p.) and, Alentejo Litoral (-3.1 p.p.), this negative evolution was due to structural factors aggravated by losses in competitiveness.

Figure 11: Year-on-year growth rate of invoicing value and structural and regional factors, NUTS 3, March to December 2020
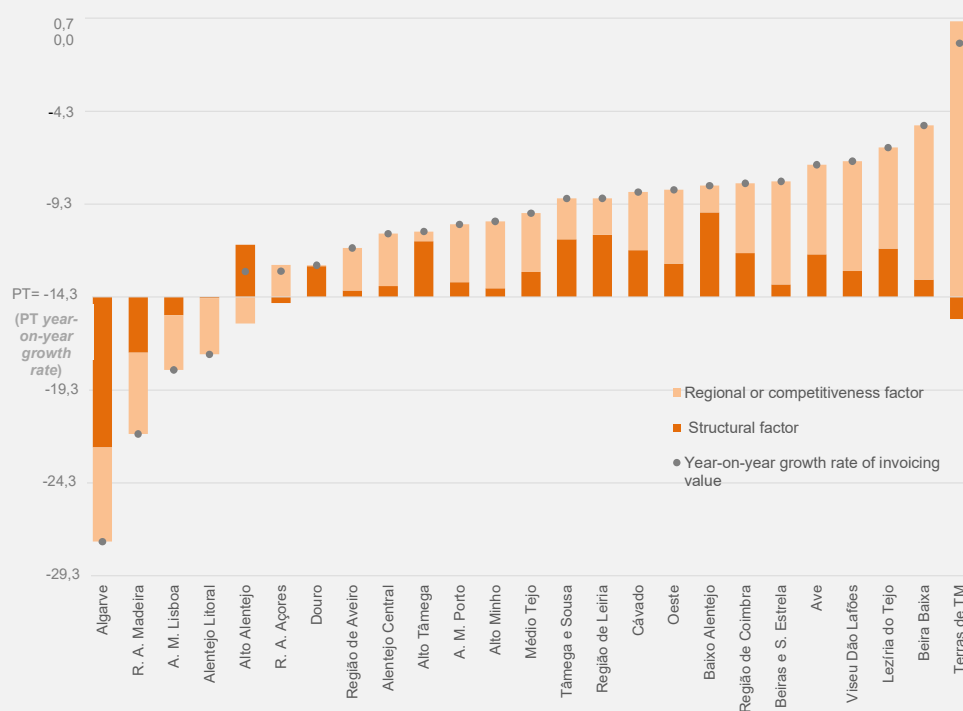
Technical note

Data

The results presented have national coverage and the observed statistical unit is the S11 and S14 institutional sectors entities that issue invoices regarding the value of sales and services registered in the E-invoice system, excluding entities with main activity on K, T and U branches.

E-Invoice can be defined as a mandatory reporting invoices system implemented by the Tax Administration as part of the administrative simplification and anti-fraud measures. Electronic transmission of the invoices issued by individuals or legal entities that have their head office or permanent establishment in Portuguese territory to the Tax and Customs Authority is mandatory. This administrative register includes all the invoicing recorded electronically by the issuer, whether or not the acquirer / buyer has requested an invoice from.

In the framework of a protocol signed between Tax and Customs Authority and Statistics Portugal, the Tax and Customs Authority monthly sends to Statistics Portugal anonymized information on the taxable amount aggregated by issuer and acquirer, month of invoicing and country of acquisition. Taxable amount corresponds to the value of the good or service without VAT. So, if the total value of an invoice is 20€, including VAT at 23%, the corresponding taxable amount will be 16.3€.

E-invoice information was subject of analysis and integrity and consistency treatments, namely, regarding the elimination of severe outliers and treatment of negative invoicing values between issuer-acquirer pairs, *i.e.* situations of values that comprise the cancellation of taxable amounts invoiced in a previous period, in each month. The temporal scope of analysis and treatment covered the period from October 2018 to December 2020.

The integration of this information with the Statistical Units File (FUE), by issuer, allowed to assign the location of the legal head office, the main economic activity code and the Institutional Sector (see classifications below). The reference universe of the released results comprises the taxable amount of issuers for which these three variables are registered in FUE (99.9% of the taxable amount after integrity and consistency treatment).

The results presented in this press release exclude the taxable amount associated with issuers from institutional sectors S12 - Financial corporations, S13 - General administration, S15 - Private non-profit institutions and from economic activities K - Financial and insurance activities, T - Activities of households as employers of domestic personnel and undifferentiated goods and services production of households for own use, and U - Activities of extra-territorial organizations and bodies, which together account for 8.8% in 2019 and 8.4% in 2020 of the taxable amount after integration of the E-invoice information with the FUE.

Classifications

Economic Activities

Were considered the Aggregations of 10 and 38 branches as defined in the European System of Accounts (ESA), with the following specific features:

    - Aggregation into 10 economic activities branches (A10): disaggregation of branch 4 - Wholesale and retail trade; repair of motor vehicles and motorcycles, into 4G - Wholesale and retail trade; repair of motor vehicles and motorcycles, 4H - Transportation and storage, 4I55 - Accommodation activities and 4I56 - Food service activities and similar **(A13)**.

    - Aggregation into 38 economic activities branches (A38): segmentation of branch I – Accommodation and Food service activities, into I55 – Accommodation activities and I56 – Food services and similar **(A39)**.

The economic activity branches in grey in A39 (K, T, and U) in the following table identify the activities not considered for the results under analysis in this press release, with an impact on the scope of issuers in branch 10 of A13 – Arts, entertainment, sports and recreation activities and other service – which is limited to Arts, sports and entertainment activities and other services.

A38	A39	A39 Description	A10	A13	A13 Description
A	A	Agriculture, farming of animals, hunting and forestry	1	1	Agriculture, farming of animals, hunting and forestry
B	B	Mining and quarrying	2	2	Mining and quarrying; manufacturing; electricity, gas, steam and cold air; water collection, treatment and distribution; sewerage, waste management and remediation activities
CA	CA	Manufacture of food products, beverages and tobacco products			
CB	CB	Manufacture of textiles, wearing apparel and leather products			
CC	CC	Manufacture of wood and paper products, and printing			
CD	CD	Manufacture of coke, and refined petroleum products			
CE	CE	Manufacture of chemicals and chemical products			
CF	CF	Manufacture of basic pharmaceutical products and pharmaceutical preparations			
CG	CG	Manufacture of rubber and plastics products, and other non-metallic mineral products			
CH	CH	Manufacture of basic metals and fabricated metal products, except machinery and equipment			
CI	CI	Manufacture of computer, electronic and optical products			
CJ	CJ	Manufacture of electrical equipment			
CK	CK	Manufacture of machinery and equipment n.e.c.			
CL	CL	Manufacture of transport equipment			
CM	CM	Manufacture of furniture; other manufacturing; repair and installation of machinery and equipment			
D	D	Electricity, gas, steam, cold and hot water and cold air			
E	E	Water collection, treatment and distribution; sewerage, waste management and remediation activities			
F	F	Construction	3	3	Construction
G	G	Wholesale and retail trade; repair of motor vehicles and motorcycles	4	4G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	H	Transportation and storage		4H	Transportation and storage
I	I55	Accommodation		4I55	Accommodation
	I56	Food and beverage service activities		4I56	Food service activities
JA	JA	Publishing, audiovisual and broadcasting activities	5	5	Information and communication
JB	JB	Telecommunications			
JC	JC	Computer programming, consultancy and related activities; information service activities			
K	K	Financial and insurance activities	6	6	Financial and insurance activities
L	L	Real estate activities	7	7	Real estate activities
MA	MA	Legal and accounting activities; activities of head offices; management consultancy activities; architecture and engineering activities; technical testing and analysis	8	8	Consultancy, scientific and technical activities; administrative and support service activities
MB	MB	Scientific research and development			
MC	MC	Advertising and market research; other professional, scientific and technical activities; veterinary activities			
N	N	Administrative and support service activities			
O	O	Public administration and defence; compulsory social security	9	9	Public administration and defence; compulsory social security; education; human health and social work activities
P	P	Education			
QA	QA	Human health			
QB	QB	Social work activities			
R	R	Arts, entertainment, sports and recreation activities	10	10	Arts, entertainment, sports and recreation activities and Other service activities
S	S	Other service activities			
T	T	Activities of households as employers of domestic personnel and undifferentiated goods and services production of households for own use			
U	U	Activities of extra-territorial organizations and bodies			

Institutional Sectors

Were considered the issuers from Non-financial corporations and Households institutional sectors.

SIN - 2nd level	Description SIN - 2nd level
S11	Non-financial corporations
S12	Financial corporations
S13	General corporations
S14	Households
S15	Non-profit institutions serving households

Shift-Share analysis

The Specialization coefficient (CE) is obtained through the following formula:

$$CE_j = \left(\frac{1}{2}\sum_{i=1}^{n}\left|\frac{X_{ip}}{X_p} - \frac{X_{ij}}{X_j}\right|\right) \times 100 \qquad (0 \leq CE_j \leq 100)$$

Where:

Xip : invoicing value of activity i (A39) in the standard region p (Portugal)

Xp : invoicing value of the considering activities in the standard region p (Portugal)

Xij : invoicing value of activity i (A39) in the region j (NUTS 3)

Xj : invoicing value of the considering activities in the region j (NUTS 3)

The EC was calculated based on 36 economic activity branches from the aggregation into 39 branches (branches K, T, and U were excluded).

Shift-share decomposition of the rate of change of the invoicing value between 2019 and 2020 was obtained through the following formula:

$$SS_j = EG_j + EE_j + ER_j$$

Where,

SS_j : Shift-share of year-on-year variation in the invoicing value in the region j (NUTS 3);

EG_j : represents the general effect of the year-on-year variation in the invoicing value in the region j (NUTS 3);

EE_j : represents the structural effect of the year-on-year variation in the invoicing value in the region j (NUTS 3);

ER_j : represents the regional effect of the year-on-year variation in the invoicing value in the region j (NUTS 3).

These three effects can be defined as follows:

$$EG_j = \sum_{i=1}^{36} [g_p \times X_{ji}(t-1)]$$

$$EE_j = \sum_{i=1}^{36} [(g_{pi} - g_p) \times X_{ji}(t-1)]$$

$$ER_j = \sum_{i=1}^{36} [(g_{ji} - g_{pi}) \times X_{ji}(t-1)]$$

Where,

X_{ji}: invoiced value in region j (NUTS 3) of the activity i (A39) in the year t-1 (2019);

g_p: National year-on-year growth rate of invoicing value;

g_{pi}: National year-on-year growth rate of invoicing value of the activity i (A39);

g_{ji}: Year-on-year growth rate of invoicing value in the region j (NUTS 3) of the activity i (A39);

The decomposition procedure into growth factors was based on 36 economic activity branches from the aggregation into 39 branches (branches K, T, and U were excluded).

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