Gross monthly earnings per employee

(Social Security and *Caixa Geral de Aposentações* – Data analysed by Statistics Portugal)

September 2019

Gross monthly earnings per employee have increased by 3.0% in the 3rd quarter of 2019, to €1,220

The gross monthly earnings per employee (per job) have increased by 3.0% in the 3rd quarter of 2019, compared to the same period of 2018, and the regular monthly earnings have increased by 2.8%, reaching €1,220 and €1,039 respectively. These data concern nearly 4.2 million of employees, corresponding to the Social Security's beneficiaries and the subscribers of *Caixa Geral de Aposentações*.

In real terms, taking into account the negative rate of change of the Consumer Price Index during the period under analysis, the gross monthly earnings per employee increased by 3.2% and its regular component increased by 3.0%.

In the last four years, the regular gross monthly earnings increased above the average (7.4%) in the sectors of tradable goods and services (11.3%) and of non-tradable market goods and services (7.9%). In the sector of non-market non-tradable goods and services, that includes the Public Administrations, the increased was 6.8%. In this sector, the regular gross monthly earnings is persistently above the economy level (about 28% in September 2019), largely due to sectors' differences in the composition of their human capital. It is important to stress that in the last two years it has been observed some convergence in the growth rates of the three sectors.

1. Introduction

Based on the data from the Monthly Statement of Earnings (DMR – *Declaração Mensal de Remunerações*) sent by enterprises to the Social Security, Statistics Portugal started in May the release of statistics on gross earnings from 2014 to the 1st quarter of 2019. Starting with this Press Release, the gross earnings statistics also include the data from the Contributive Relation (RC – *Relação Contributiva*) of *Caixa Geral de Aposentações* (CGA).[1] The combination of the two data sources give us the majority of the universe of employees in the economy. For this reason, the previously released data series were reviewed. These data concern around 4.2 million of employees (jobs).

The data received from CGA is final, contrarily to the data received from Social Security, which have a provisional character and continue to be statistically treated to minimize revisions, as described in the Technical note.

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[1] CGA is the Portuguese public servants retirement and survivor pensions funds. Up to 2005, all employees in the public sector made their social contribution to CGA. Since the end of 2005, all new employees in the public sector were integrated in the general public Social Security, as an employee in the private sector.

2. Gross monthly earnings per employee and its components

In September 2019 (quarter ended in September 2019)[2], the gross monthly earnings per employee recorded a year-on-year increase of 3.0% (Figure 1), increasing from €1,185 in September 2018 to €1,220 in September 2019. This change corresponds to a slightly acceleration, of 0.1 percentage points (pp), of the growth observed in June 2019 (2.9%).

In the first three quarters of 2019, the gross monthly earnings per employee increased by 2.6% compared to the same period of the year before.

Figure 1: Year-on-year change of gross monthly earnings per employee (total and regular)
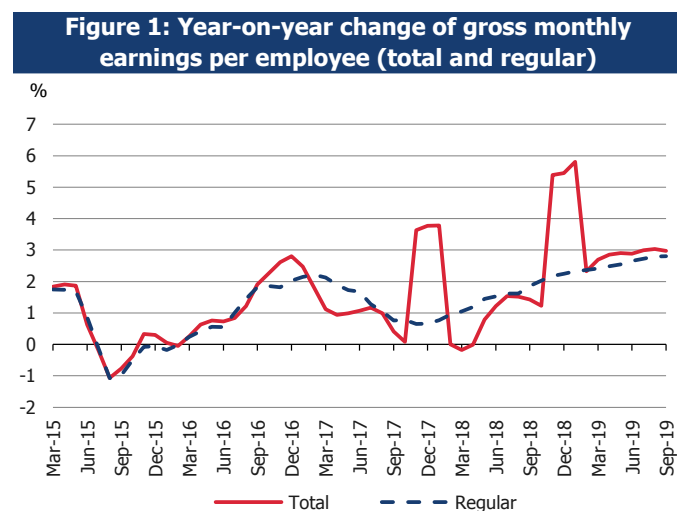
The regular gross monthly earnings per employee, which exclude, among other earnings components, the Christmas and Holidays allowances and, thus, have a less seasonal behaviour[3], showed a year-on-year

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[2] The monthly data analysed in this Press Release refer to moving quarters ended in the reference month. Unless otherwise stated, the rates of change correspond to year-on-year ones (compared to the same moving quarter of the previous year). The year-on-year change series of the indicators under analysis are shown in the tables in the Annex.

[3] For a more detail description of the earnings components included in the total and in the regular gross monthly earnings, see the Technical note.

increase of 2.8%), increasing from €1,011 in September 2018 to €1,039 in September 2019. This component has also registered a slightly acceleration compared to June 2019 (more 0.1 pp), continuing the acceleration trend started in December 2017.

In the first three quarters of 2019, the regular gross monthly earnings per employee increased by 2.9% compared to the same period of the year before.

The significant fluctuations registered in the end of 2017 and 2018 were due the changes in the payment of the Christmas allowances in the public sector (50% in November 2017, 100% in November 2018) whereas in the previous years they were paid in one-twelfth over the year.

In real terms, that is, taking into account the inflation effect measured by the Consumer Price Index (CPI), the total earnings registered a year-on-year increase of 3.2% (Figure 2) and the regular earnings recorded a year-on-year increase of 3.0% (Figure 3). Note that in the quarter ended in September 2019 the year-on-year change of the CPI was negative (-0.2%).
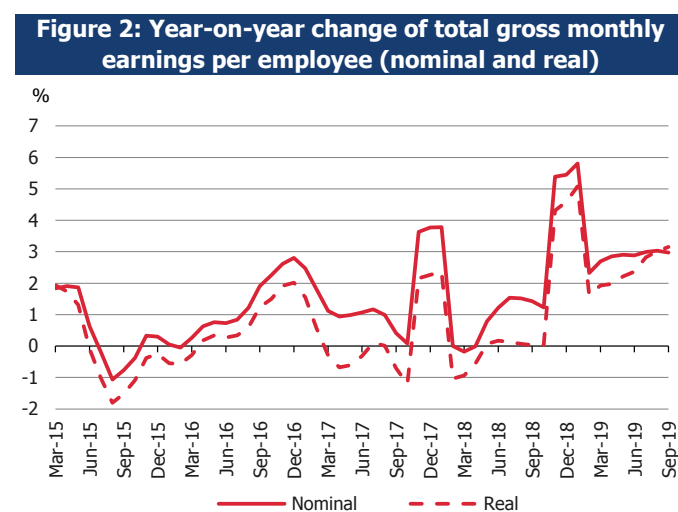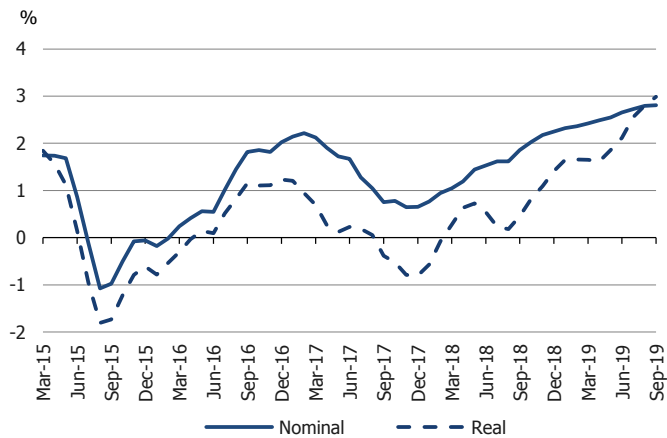

Figure 2: Year-on-year change of total gross monthly earnings per employee (nominal and real)

Figure 3: Year-on-year change of regular gross monthly earnings per employee (nominal and real)

slightly decrease (0.6%) and the *Arts, entertainment, sports and recreation activities* (R) recorded the smallest year-on-year growth (0.8%).

Figure 4: Year-on-year change of total gross monthly earnings per employee (NACE-Rev. 2) in September 2019

3. Gross earnings by economic activity

As stated in previous Press Releases, the earnings change substantially with the economic activity.[4] In September 2019, the total earnings varied between €813 in the *Accommodation and food service activities* (section I), and €2,652 in the activities of *Electricity, gas, steam and air conditioning supply* (D).

In turn, the regular earnings varied between €655 in the *Administrative and support service activities* (N), and €2,521 in the activities of *Electricity, gas, steam and air conditioning supply* (D).

Compared to the same period of 2018, the major change in total earnings were observed in activities of *Mining and quarrying* (B; 6.6%), followed by the activities of *Transportation and Storage* and *Administrative and support service activities* (H and N; both with 4.8%) (Figure 4).

On the other hand, the total earnings in *Electricity, gas, steam and air conditioning supply* (D) recorded a

Figure 5: Year-on-year change of regular gross monthly earnings per employee (NACE-Rev. 2) in September 2019

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[4] The economic activity designations can be found in Table 2 of the Annex.
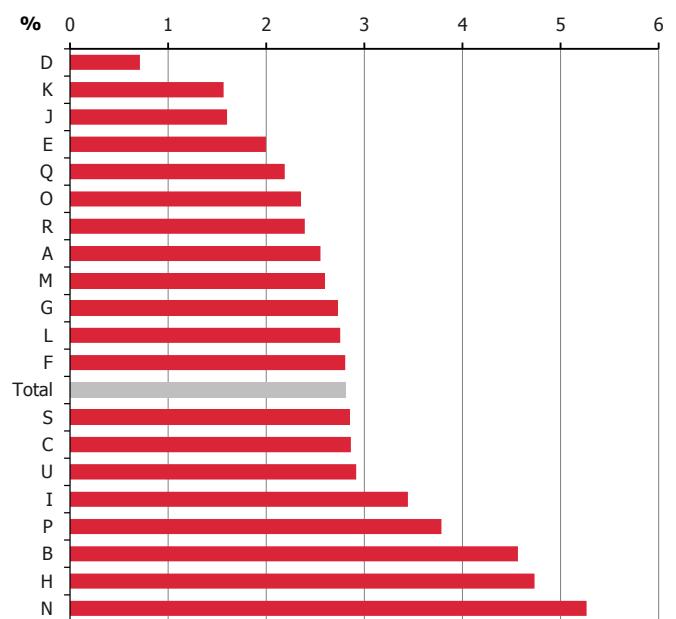
The larger changes of the regular earnings were observed in the *Administrative and support service activities* (N; 5.3%) and activities of *Transportation and Storage* (H; 4.7%), while the smaller change was registered in the activities of *Electricity, gas, steam and air conditioning supply* (D; 0.7%) (Figure 5).

4. Gross earnings by groups of economic activity according to the market and tradable nature of the goods and services produced

Besides the analysis of the evolution of gross earnings by economic activity, it is possible to make a complementary analysis by grouping economic activities, according to their market orientation and the tradable nature of the goods and services produced. Therefore, it allows monitoring the relationship between the exposition to competition (national and international) and the level and evolution of gross earnings.
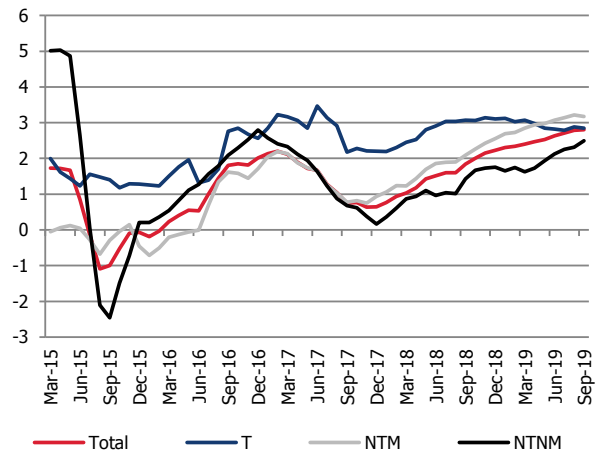
For the analysis we consider three sectors:

1. Sector of mainly tradable goods and services (sections A to C);

2. Sector of mainly non-tradable market goods and services (sections D to U, excluding O, Q and Q);

3. Sector of mainly non-tradable non-market goods and services (sections O, P and Q).

The sector with the smaller regular gross earnings, in September 2019, was the tradable goods and services (T), with an average of €945, followed by the non-tradable market goods and services (NTM), with €958 (both below the economy average; €1,039). The

sector of non-tradable non-market goods and services (NTNM) was the one, with, on average, higher regular gross earnings (€1,327 in September 2019, the equivalent to 27.7% more than the economy average).

The differences in the average regular gross earnings paid by enterprises in these three sectors, although high and persistent, have been decreasing (Table 3 of Annex). Between September 2015 and September 2019, the regular gross earnings recorded an increase of 7.4%. In the same period, only the T and NTM sectors registered higher growth rates, of 11.3% and 7.9%, respectively. On the other side, the NTNM sector observed the smallest growth of 6.8% (Figure 6).

Figure 6: Year-on-year change of the regular gross earnings per employee by groups of economic activity according to the market and tradable nature of the goods and services produced

Notes:
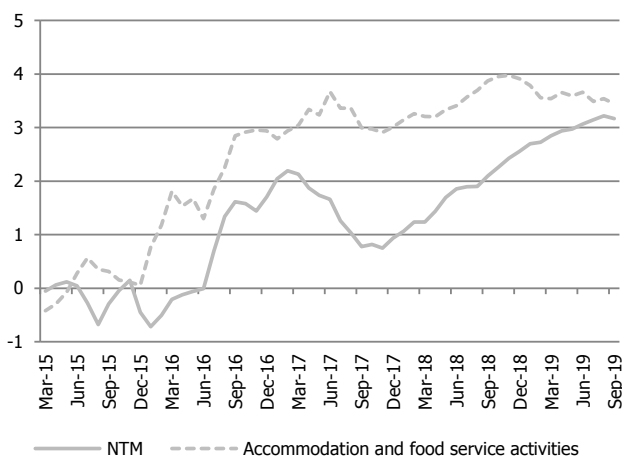T - 1. Sector of mainly tradable goods and services (sections A to C).
NTM - 2. Sector of mainly non-tradable market goods and services (sections D to U, excluding O, Q and Q).
NTNM - 3. Sector of mainly non-tradable non-market goods and services (sections O, P and Q).

In September 2019, compared to the same period of 2018, the T sector recorded an increase of the regular gross earnings of 2.8%, as in the whole economy, the

NTM sector an higher increase (3.1%) and the NTNM sector a lower increase (2.5%).

Among the economic activities of the NTM sector, the *Accommodation and food service activities* (section I) stands out with a higher earnings rate of change than the sector it belongs (13.8% against 7.4%) from September 2015 to September 2019 (Figure 7).

Note:

NTM - 2. Sector of mainly non-tradable market goods and services (sections D to U, excluding O, Q and Q).

In September 2015, the regular gross earnings of the *Accommodation and food service activities* was €604 and corresponded to 68.0% of the regular gross earnings of the NTM sector (€889). In September 2019, the regular gross earnings of the *Accommodation and food service activities* increased to 71.8% (€688) of the regular gross earnings of the NTM sector (€958).

Note that this economic activity was particularly dynamic over the analysis period, with the number of employees (jobs) increasing by 35.0% (against 20.9% of the NTM sector and 15.7% of the economy average).

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Table 1: Number of employees and gross monthly earnings per employee (total and regular)						
Portugal	**Quarter ended in the month**			**Year-on-year change**		
	Number of employees	**Total gross earnings**	**Regular gross earnings**	**Number of employees**	**Total gross earnings**	**Regular gross earnings**
	Thousands	**Euro**		**%**		
2019						
September	4,191.1	1,220	1,039	3.2	3.0	2.8
August	4,196.0	1,357	1,038	3.4	3.0	2.8
July	4,187.7	1,349	1,038	3.6	3.0	2.7
June	4,158.7	1,305	1,038	3.7	2.9	2.7
May	4,124.0	1,171	1,040	3.7	2.9	2.5
April	4,091.8	1,155	1,039	3.7	2.9	2.5
March	4,066.3	1,153	1,036	3.6	2.7	2.4
February	4,058.9	1,219	1,030	3.5	2.3	2.4
January	4,071.1	1,400	1,022	3.4	5.8	2.3
2018						
December	4,080.1	1,385	1,015	3.4	5.4	2.2
November	4,078.6	1,305	1,012	3.4	5.4	2.2
October	4,061.8	1,137	1,012	3.5	1.2	2.0
September	4,059.5	1,185	1,011	3.6	1.4	1.9
August	4,056.1	1,317	1,010	3.7	1.5	1.6
July	4,042.4	1,310	1,010	3.7	1.5	1.6
June	4,011.6	1,268	1,012	3.7	1.2	1.5
May	3,975.2	1,138	1,014	3.7	0.8	1.4
April	3,945.9	1,123	1,014	3.9	0.0	1.2
March	3,924.0	1,123	1,012	4.0	-0.2	1.0
February	3,921.3	1,192	1,006	4.1	0.0	0.9
January	3,936.1	1,323	998	4.2	3.8	0.8
2017						
December	3,945.9	1,314	993	4.3	3.8	0.7
November	3,944.2	1,238	991	4.3	3.6	0.6
October	3,926.1	1,123	992	4.2	0.1	0.8
September	3,920.0	1,168	992	4.3	0.4	0.8
August	3,911.4	1,297	993	4.8	1.0	1.0
July	3,898.1	1,290	994	5.3	1.2	1.3
June	3,868.0	1,253	996	5.6	1.1	1.7
May	3,833.0	1,129	999	5.4	1.0	1.7
April	3,798.0	1,123	1,002	5.2	0.9	1.9
March	3,772.9	1,125	1,001	5.0	1.1	2.1
February	3,766.0	1,192	997	4.8	1.8	2.2
January	3,776.6	1,275	991	4.6	2.5	2.1
2016						
December	3,783.9	1,266	987	4.4	2.8	2.0
November	3,782.6	1,195	984	4.3	2.6	1.8
October	3,769.2	1,123	985	4.1	2.3	1.9
September	3,760.1	1,163	985	3.8	1.9	1.8
August	3,733.4	1,285	983	3.2	1.2	1.5
July	3,701.8	1,276	981	2.6	0.8	1.0
June	3,663.6	1,240	980	2.2	0.7	0.5
May	3,636.5	1,118	982	2.2	0.8	0.6
April	3,611.7	1,113	983	2.2	0.6	0.4
March	3,594.3	1,112	981	2.4	0.3	0.2
February	3,594.7	1,170	975	2.3	0.0	0.0
January	3,610.3	1,244	970	2.4	0.0	-0.2
2015						
December	3,625.0	1,231	967	2.4	0.3	-0.1
November	3,627.6	1,164	967	2.5	0.3	-0.1
October	3,620.7	1,098	967	2.5	-0.4	-0.5
September	3,621.0	1,141	967	2.6	-0.8	-1.0

Source: Calculations by Statistics Portugal using the Social Security's Monthly Statement of Earnings (DMR) and the Contibutive Relation of the *Caixa Geral de Aposentações* (CGA).

Gross monthly earnings per employee – September 2019

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Table 2: Number of employees and gross monthly earnings per employee (total and regular) by economic activity (NACE-Rev. 2) in September 2019						
Portugal	**Quarter ended in the month**			**Year-on-year change**		
	Number of employees	**Total gross earnings**	**Regular gross earnings**	**Number of employees**	**Total gross earnings**	**Regular gross earnings**
	Thousands	**Euro**		**%**		
Total	**4,191.1**	**1,220**	**1,039**	**3.2**	**3.0**	**2.8**
A - Agriculture, forestry and fishing	87.6	820	694	1.5	3.0	2.6
B - Mining and quarrying	8.8	1,535	1,201	1.0	6.6	4.6
C - Manufacturing	698.2	1,200	939	0.9	3.2	2.9
D - Electricity, gas, steam and air conditioning supply	11.9	2,652	2,521	1.5	- 0.6	0.7
E - Water supply; sewerage, waste management and remediation activities	34.6	1,082	960	4.3	2.1	2.0
F - Construction	275.8	958	790	7.7	3.0	2.8
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	662.8	1,098	890	3.3	2.8	2.7
H - Transportation and storage	178.5	1,529	1,230	4.9	4.8	4.7
I - Accommodation and food service activities	322.2	813	688	5.9	3.8	3.4
J - Information and communication	118.0	1,939	1,635	9.7	1.9	1.6
K - Financial and insurance activities	84.6	2,208	2,088	1.4	1.4	1.6
L - Real estate activities	45.8	1,060	899	9.6	3.0	2.8
M - Professional, scientific and technical activities	182.6	1,432	1,207	8.1	3.1	2.6
N - Administrative and support service activities	337.9	815	655	0.9	4.8	5.3
O - Public administration and defence; compulsory social security	364.2	1,453	1,393	1.5	2.5	2.4
P - Education	269.2	1,751	1,649	- 0.1	3.4	3.8
Q - Human health and social work activities	375.2	1,189	1,033	3.8	2.4	2.2
R - Arts, entertainment and recreation	40.3	1,194	1,028	7.0	0.8	2.4
S - Other service activities	86.4	1,019	873	2.0	2.9	2.9
U - Activities of extraterritorial organisations and bodies	1.2	1,965	1,731	- 1.3	3.2	2.9

Source: Calculations by Statistics Portugal using the Social Security's Monthly Statement of Earnings (DMR) and the Contibutive Relation of the *Caixa Geral de Aposentações* (CGA).

Table 3: Regular gross earnings per employee by groups of economic activity according to the market and tradable nature of the goods and services produced

Portugal	Quarter ended in the month				Year-on-year change			
	Total	T	NTM	NTNM	Total	T	NTM	NTNM
	Euro				%			
2019								
September	1,039	915	958	1,327	2.8	2.8	3.2	2.5
August	1,038	916	958	1,318	2.8	2.9	3.2	2.3
July	1,037	916	959	1,314	2.7	2.8	3.1	2.3
June	1,038	916	960	1,312	2.6	2.8	3.1	2.1
May	1,039	915	962	1,314	2.5	2.8	3.0	1.9
April	1,039	913	962	1,310	2.5	3.0	2.9	1.7
March	1,036	911	959	1,307	2.4	3.1	2.8	1.6
February	1,030	902	953	1,302	2.3	3.0	2.7	1.7
January	1,021	894	944	1,294	2.3	3.1	2.7	1.6
2018								
December	1,015	889	937	1,291	2.2	3.1	2.6	1.8
November	1,012	889	932	1,290	2.2	3.1	2.4	1.7
October	1,012	890	931	1,297	2.0	3.1	2.3	1.7
September	1,011	890	929	1,295	1.8	3.1	2.1	1.4
August	1,009	890	928	1,288	1.6	3.0	1.9	1.0
July	1,010	891	930	1,285	1.6	3.0	1.9	1.0
June	1,012	891	932	1,285	1.5	2.9	1.9	1.0
May	1,014	889	934	1,289	1.4	2.8	1.7	1.1
April	1,014	887	934	1,288	1.2	2.5	1.4	0.9
March	1,012	884	932	1,286	1.0	2.4	1.2	0.9
February	1,006	876	927	1,280	0.9	2.3	1.2	0.6
January	998	867	919	1,273	0.8	2.2	1.1	0.4
2017								
December	993	862	914	1,269	0.6	2.2	0.9	0.2
November	991	862	910	1,268	0.6	2.2	0.7	0.4
October	992	863	910	1,276	0.8	2.3	0.8	0.6
September	992	863	910	1,277	0.7	2.2	0.8	0.7
August	994	864	911	1,275	1.0	2.9	1.0	0.9
July	994	865	912	1,272	1.3	3.1	1.3	1.2
June	996	866	915	1,272	1.7	3.5	1.7	1.6
May	1,000	865	918	1,275	1.7	2.8	1.7	1.9
April	1,002	865	921	1,276	1.9	3.1	1.9	2.1
March	1,001	862	921	1,275	2.1	3.2	2.1	2.3
February	997	856	916	1,272	2.2	3.2	2.2	2.4
January	991	849	910	1,268	2.1	2.8	2.0	2.6
2016								
December	987	843	905	1,267	2.0	2.6	1.7	2.8
November	984	844	903	1,264	1.8	2.7	1.4	2.5
October	985	844	903	1,268	1.9	2.8	1.6	2.3
September	985	845	903	1,268	1.8	2.8	1.6	2.1
August	983	839	902	1,264	1.4	1.7	1.3	1.8
July	982	838	901	1,257	1.0	1.4	0.7	1.6
June	980	837	900	1,252	0.5	1.3	0.0	1.3
May	983	841	903	1,251	0.6	2.0	- 0.1	1.1
April	983	839	904	1,249	0.4	1.8	- 0.1	0.8
March	981	836	902	1,246	0.2	1.5	- 0.2	0.5
February	975	829	896	1,242	0.0	1.2	- 0.5	0.4
January	970	825	892	1,236	- 0.2	1.3	- 0.7	0.2
2015								
December	967	822	890	1,233	- 0.1	1.3	- 0.5	0.2
November	967	822	891	1,233	- 0.1	1.3	0.1	- 0.7
October	967	821	889	1,239	- 0.5	1.2	0.0	- 1.5
September	968	822	889	1,242	- 1.0	1.4	- 0.3	- 2.5

Source: Calculations by Statistics Portugal using the Social Security's Monthly Statement of Earnings (DMR) and the Contibutive Relation of the *Caixa Geral de Aposentações* (CGA).

Notes:
T - Sector of mainly tradable goods and services (sections A to C).
NTM - Sector of mainly non-tradable market goods and services (sections D to U, excluding O, Q and Q).
NTNM - Sector of mainly non-tradable non-market goods and services (sections O, P and Q).

TECHNICAL NOTE

The statistics on "Gross monthly earnings per employee" published with this Press Release are the result of the calculations and analysis performed by Statistics Portugal on the information from the Monthly Statement of Earnings (DMR – *Declaração Mensal de Remunerações*) from Social Security (SS), following a protocol celebrated between Statistics Portugal and the *Instituto de Informática, I.P.*, and the Contributive Relation (RC – *Relação Contributiva*) of *Caixa Geral de Aposentações* (CGA). These statistics are stored in the StatsLab area of the Statistics Portugal website, where new statistical resources that give useful information for economic and social analysis are published.

The information received from the DMR includes the sum of earnings reported by enterprises to the SS by "Social Security Contributory Scheme" and "Earnings Components". The information received from the RC includes the sum of earnings of the subscribers of CGA by "Type of earnings". Despite the name differences, both the "Earnings Components" and the "Type of Earnings" refer to the earnings components paid to employees.

The **gross monthly earnings per employee** correspond to the ratio between the sum of the all earnings paid by the enterprises and the total number of employees in those enterprises. Hence, its evolution reflects changes in the amount of earnings paid (for example, the payment of bonuses, holiday allowances or overtime work), but also in the number of employees and its composition, namely in terms of non-observed characteristics in this dataset (part-time versus full-time workers; educational level; occupation; years of experience; hours worked; among others).

In the calculations by **enterprise's economic activity** (NACE-Rev. 2), the records where it was not possible to match the enterprise with its record on the enterprises' economic activity file compiled by Statistics Portugal (FUE – *Ficheiro de Unidades Estatísticas*) were excluded, which corresponds to 0.7% of enterprises and 0.1% of employees in 2018.

Each employee is counted as many times as the **number of jobs** reported to the Social Security and CGA. For example, an employee with two jobs in two different enterprises is counted twice. Therefore, the total number of employees corresponds to the total number of jobs. Besides, in the information from the SS besides employees, ship-owners, teachers that own educational institutions, members of statutory bodies, and domestic workers are also included.

In the figure below, it is presented the percentage distribution of total gross monthly earnings (volume) and the number of employees by economic activity sector (NACE-Rev. 2) in 2018.

Distribution of the total gross earnings (volume) and the number of employees by economic activity (NACE Rev. 2) in 2018
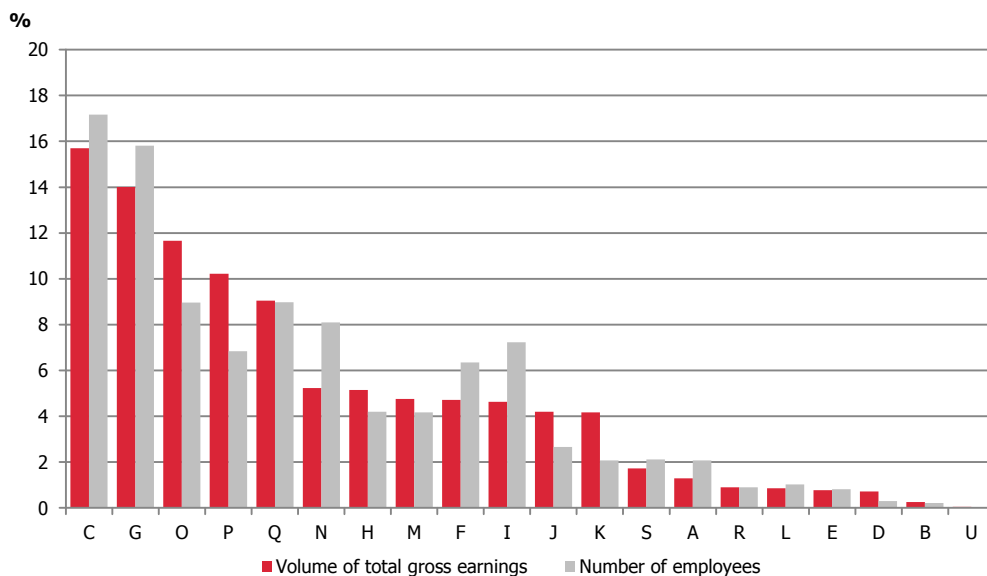
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Earnings components (SS): correspond to the classification of earnings of Social Security according to its nature, which cover the following:

- Transport and daily allowances
- Bonuses and other monthly benefits
- Commissions
- Compensations owed for termination of the employment contract
- Holiday allowance
- Fees for rendering services due to the accumulation of positions/duties
- Compensation in intermittent employment contracts
- Regular monthly allowances
- Christmas allowance
- Bonuses and other non-monthly benefits
- Base salary
- Meal allowance
- Overtime work
- Night-time work
- Regular non-monthly allowances
- Armed forces
- Variable earnings
- Paid untaken holidays
- Earnings statements corrections
- Temporary work in higher positions
- Promotions

Type of earnings (CGA): correspond to the classification of earnings of *Caixa Geral de Aposentações*, which cover the following:

- Base earnings
- Compensation in intermittent employment contracts
- Seniority payments
- Permanent earnings
- Bonuses and other monthly benefits
- Regular monthly allowances
- Variable earnings
- Transport and daily allowances
- Compensations owed for termination of the employment contract
- Night-time work
- Overtime work
- Meal allowance
- Commissions
- Fees for rendering services due to the accumulation of positions/duties
- Bonuses and other non-monthly benefits
- Holiday allowance
- Paid untaken holidays
- Christmas allowance

(continues)

Gross monthly earnings per employee – September 2019

Total gross monthly earnings

The total gross monthly earnings correspond to the sum of all gross earnings (before taxes and contributions to the SS or to CGA) paid by enterprises or institutions. It does not include the amounts exempted from tax withheld and contributions to the SS, for example, meal allowances up to €4.77 or €7.63, if paid in cash or meal cards. It includes all components of the variable "Earnings components" of SS and the variable "Type of earnings" of CGA.

Regular gross monthly earnings

The regular gross monthly earnings corresponds to the sum of all gross earnings (before taxes and contributions to the Social Security) paid by enterprises or institutions on a regular and monthly basis. It does not include the amounts exempt from tax withheld and contributions to the SS, for example, meal allowances up to €4.77 or €7.63, if paid in cash or meal cards. It only includes the components "Base salary", "Meal allowance", "Regular monthly allowances" and "Bonuses and other monthly benefits" of the variable "Earnings components" of SS and the components "Base earnings", "Seniority payments"; "Permanent earnings", "Bonuses and other monthly benefits" and ."Meal allowance" of the variable "Type of earnings" of CGA. In 2018, it corresponded to 81.6% of the total gross monthly earnings.

On year rate of change

The on year (year-on-year) change compares the level of the variable in the current quarter/month with that of the corresponding quarter/month of the previous year. This rate of change, considering a seasonal stable pattern, is not affected by this type of fluctuation, but may, however, be influenced by specific effects in a given quarter/month.

Annual rate of change

The annual change compares the level of the variable in the last year over the level of the variable in the previous year.

Revisions

The data base of DMR is in continuous updating, always existing some share of non-delivered earnings statements, mainly in the last 4 months. The information received from RC has a definitive character.

The information published with this Press Release that regards the last 3 reference months (moving quarters ended in those months) will be subject to revisions in the next months. These revisions result from the integration of data sent later by some enterprises to the SS.

This Press Release has for the first time information from two sources, the SS and the CGA. Therefore, the series of data released in previous Press Releases (since March 2014) were subject to revision.

(continues)

Answers' imputation to reduce the revisions level of the values published for the most recent months

In order to reduce the level of revisions of the values published for the most recent months, the DMR data were imputed in two situations: 1) of enterprises that are systematically late in sending the information; and 2) of enterprises that, also systematically, do substantial corrections the values reported in previous months.

In the first case, the detection process for missing enterprises only targets those with 10 or more employees. An enterprise is considered as missing if there was an answer in month m-1, but not in month m (m being the last reference month).

In the second case, it is considered that a company has made a substantial correction of the values already reported when the correction is worth €10,000 or more. The detection of these companies is ensured by a combination of two methods: an *ad hoc* criterion and through the supervised Machine Learning algorithm in the form of the Support Vector Machine (SVM).

A given enterprise meets the *ad hoc* criterion if it meets at least one of two conditions: (i) it has made at least 9 corrections in the past 12 months; or ii) it has made at least 3 corrections in the past 4 months.

The SVM algorithm allows the identification of enterprises that systematically correct information through an optimization process. In this procedure, we use a set of training data (records of enterprises that correct information and of enterprises that do not) to which the SVM algorithm is applied in order to obtain a classification model that maximizes the distinction between the two groups of enterprises, i.e., a model with maximum success rate (accuracy) in identifying enterprises that correct the information submitted previously. Although most enterprises are identified simultaneously by both methods (*ad hoc* and SVM), each allows identifying fringes of enterprises that the other does not. By using both, it is guaranteed that a greater number of enterprises are identified.

Once the enterprises that need imputation of answers are identified, the earnings volume is imputed by enterprise and earnings component. The imputation process is different according to the earnings component. For regular earnings components, such as "Bonuses and other monthly benefits", the "Base salary", the "Meal allowance" and the "Night-time work", the amount reported in the previous month is used. For non-regular components, such as the "Bonuses and other non-monthly benefits", the "Holyday allowance" and the "Christmas allowance", the values of the last year are used multiplied by the year-on-year change of the regular earnings of the previous month. For the remaining earnings components, the median values of the last 12 months are used, provided there are at least 6 observations. Otherwise, the value of the last month is used.

Due to rounding, the totals in tables and figures do not always match the sum of parts.

The present Press Release includes data received on 19 July 2019.

Next Press Release: 6 February 2020.