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**Workpackage WPB**

**Implementation – Online Job Vacancies**

**Report on Outputs:**

**Supplementary indicators for official statistics from OJAs: the Italian case**

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# **Supplementary indicators for official statistics from OJAs: the Italian case**

OJAs could offer a significant enrichment for the official job vacancy indicator required by EU Regulations, despite their coverage and representativeness limits.

The official statistics on job vacancies as required by the EU Regulations and regularly transmitted to Eurostat by Member States, regards the national job vacancy rate (defined as the ratio between the job vacancies and the sum of vacant and occupied job positions), disaggregated by NACE Rev. 2 economic activity sections and on a quarterly basis.

The official MS job vacancy rates are not required by the Regulations broken down by other characteristics of the vacant job position, such as the geographical area/region where the vacant post is located and the profession required.

However, these kind of characteristics are considered as particularly useful by current and actual stake-holders, and even if the production of job vacancy indicators broken down by these two characteristics is not required as obligatory by the current EU Regulations, Eurostat already invites Member States to disseminate and transmit these data. For some Member States these data are already available in the Eurostat online datawarehouse. Furthermore, the possibility to make obligatory the production of job vacancy statistics broken down by region and profession once a year in one of the survey waves should be discussed by the Task-force on the Review of EU legislation in the field of Business Based Labour Market Indicators (LMI), whose works are currently in progress.

OJAs have the main advantage of providing information high detailed in terms of the characteristics of the job positions.

Moreover, for the production of job vacancy rate the majority of EU Member States use either a representative average of job vacancies collected at specific reference dates during the quarter or a single specific reference date.

The EU Regulations on job vacancy statistics consider the collection on a continuous basis and the average based on specific reference dates as the preferred methods to have an information on the vacant job positions representative for the quarter as a whole: “MS shall provide data on the number of job vacancies and the number of occupied posts that can be considered representative for the reference quarter. The preferred methods to achieve this are data collection on a continuous basis or the calculation of a representative average of data collected for specific reference dates” (EC Reg. No 19/2009 implementing the JV frame Regulation EC No 453/2008).

A continuous collection method implies a significant improvement in the collection costs and in the response burden for the enterprises. From the enterprise side in fact, it would imply having a kind of register in which keeping the account of all vacancies opened and closed during the reference period.

OJAs are available on a daily, weekly and monthly basis, not only at one or at more than one specific reference dates in quarter. They have the advantage of capturing the vacancy flows that is all the vacancies opened and closed during a reference period, instead of only the vacancy stock at specific reference dates.

The vacancy stocks takes only into account the vacancies that survived at a specific date, without reporting the movements of vacancies before that date.

Additional information at higher frequencies than those of the JVS can be derived from the OJAs and gives useful insights into the dynamics within the quarter of the labour demand expressed by the online recruitment process.

This annex includes:

1. an explorative comparison, based on the Italian data, between the OJAs and the JVs by calculating the online job advertisement rate using the same definition of the job vacancy rate.

Furthermore, other preliminary descriptive analysis have been carried out, which exploit the detailed and higher frequency information included in the OJAs and suggest different use in which the OJAs can complement and enrich the current official JV information.

1. analysis of the daily OJAs data in order to evaluate the representativeness of job vacancies data at specific reference dates;
2. use of monthly OJAs data to indirect compute a monthly basis JV official indicator from the quarterly ones;
3. analysis of the daily OJAs broken down by geographical area/region and the profession required data in order to study changes over time over this dimension.

OJA rate *vs* JV rate official indicator: the Italian case

As widely discussed in several reports, job vacancies advertised on job portals by enterprises represent a different concept with respect to EU Regulations definition of job vacancy. They are characterized by different coverage and representativeness limits. They do not represent all existing job vacancies because not all job vacancies are advertised on-line and job portals are not necessarily totally covered. Furthermore, OJAs data might not only miss many jobs, but also not be representative of the overall job vacancies.

Keeping in mind that OJAs are not an exhaustive measure of the labour demand, this section shows a first attempt to compute the OJA rate based on the same definition of the EU Regulation, in order to make an explorative comparison with the quarterly national official JV rate (*JVrq*):

where *JV* and *JP* are, respectively, the estimated number of job vacancies and occupied job position on the basis of the quarterly Istat survey on job vacancies and hours worked (VELA).

The OJA rate (*OJArq*) has been computed on a quarterly basis, from the third quarter 2018 to the fourth quarter 2019, and covering the same NACE Rev. 2 economic activity sections (from B to S, excluding the public sector) as the Italian JV rate.

[1]

where is the quarterly average of monthly sum of *OJAs.*

Some preliminary evidence comes out from the analysis broken down by economic activity sector (Figure 1a-1c), such as the quite similar levels of the rates in Industry, with differences between the two rates, which do not exceed 0.5 percentage points. This should partly due to the important role of very big enterprises in the Italian industry sector, which, in general, use advertising on job portals as main recruitment channel. On the other hand, in the services sector higher differences between the two rates are observed. For example, OJA rate is once and a half the JV one in the Q42019. The higher differences in this sector should depend on the relevant role in the Italian service sector of small enterprises, which may prefer to make use of more informal recruitment channels.

Figure 1a: OJAs vs JV rates: Italy, Total Economy (NACE Rev. 2 economic activity sections from B to S, excluding O)



Figure 1b: OJAs vs JV rates: Italy, Industry (NACE Rev. 2 economic activity sections from B to F)



Figure 1c: OJAs vs JV rates: Italy, Industry (NACE Rev. 2 economic activity sections from G to S, excluding O)



Figure 1 also show the changes with respect to the same quarter of the previous year, even if the period available is too short to make a comparison on the dynamic of the two rates. Taking into account the two sectors separately, it seems that the absolute differences between the year on year changes of the two rates are smaller in the Industry sector than in the Service one.

Representativeness of the job vacancy stock at specific reference dates

OJAs daily distribution during the quarter can give useful insights on the representativeness of the vacancy stock at the specific reference dates used in the current job vacancy surveys.

In particular, OJAs can show whether, and to what extent, the single reference date used is representative for the quarter, since the flow of vacancies opened and closed during the quarter cannot be fully captured from a single specific stock. It is especially true during very peculiar period, such as the COVID-19 emergency months, when the single reference dates used in the official surveys fell during the enterprise total lockdown.

Therefore, it is worthwhile analysing the OJAs daily distribution in order to define the best reference dates of the job vacancy official survey collection, or at least, in order to better know the limits of the currently used reference dates.

Figure 1 shows the Italian daily OJAs distribution during the fourth quarters of 2019. The Italian job vacancy official survey collects vacancies at the last calendar day of the quarter.

There is no a clear evidence of a defined OJAs daily pattern during each month. In addition to this, the “best capturing dates” during the quarter are difficult to be detected and there is not a strong signal supporting a change from the currently used reference date to another single one date for the Italian vacancy survey. It should be better moving from the last calendar day of the quarter to an average over several single dates; but the significant negative impact in the implementation costs for the survey and enterprise response burden need to be take into account.

However, preliminary evidence arises of:

1. intense flows of vacancies within the month;
2. different vacancy patterns over each month;
3. different monthly average numbers of OJAs within the quarter.

These results highlight the need to improve the representativeness of the quarterly JV rate, based on the vacancies stocks collected only at a specific reference date of the quarter.

Figure 1a: OJAs daily distribution during the four quarters of 2019: the Italian case, first quarter 2019



Figure 1b: OJAs daily distribution during the four quarters of 2019: the Italian case, second quarter 2019



Figure 1c: OJAs daily distribution during the four quarters of 2019: the Italian case, third quarter 2019



Figure 1d: OJAs daily distribution during the four quarters of 2019: the Italian case, fourth quarter 2019



From a quarterly to monthly basis JV indicator

The high frequency detailed information from OJAs can also be used to indirectly extend the frequency of the JV official indicator from a quarterly basis to a monthly one. This is another helpful use of the OJAs, taking into account the difficulties both in implementing a vacancy survey on a continuous basis and in changing the currently used reference date or extending it to more dates.

EU Regulations requires the job vacancy rate on a quarterly basis. In Istat, as already mentioned, for the computation of the vacancy rate, data on job vacancies refer to the last calendar day of the quarter. Daily information on OJAs provides valuable insight into vacancy flows during the quarter. The monthly average number of OJAs could be used to estimate the vacancy rate on a monthly basis (*JVrm* ), as follows:

[2]

Since there is no evidence of a clear daily pattern in the months, we preferred to use the monthly and the quarterly average of OJAs instead of the number of OJAs on a specific day (e.g. last day of the month or the quarter). Job vacancy rate is one of the principal European economic indicators (PEEIs), the primary source of information used to analyse and monitor short-term cyclical economic developments within the EU Member States, the euro area and the individual EU countries (ESSnet Big Data II, Methodological framework for processing online job adverts data for Official Statistics V.2, p. 10). Therefore, a monthly job vacancy rate, indirectly derived from the OJAs, can be used to better understand the dynamics of the economic cycle within the quarter, also in relation to other monthly indicators.

A first attempt of estimating a monthly vacancy rate, only for the Italian case, from the third quarter of 2018 to the fourth quarter of 2019 has been carried out. The exercise has been based on the monthly OJAs data over the months July 2018-December 2019 and on the current not seasonally adjusted job vacancy rate quarterly estimates, derived from the Italian official survey (Figure 2).

*Figure 2: From a quarterly to a monthly basis job vacancies rate estimates: the Italian case*

Table 1 shows the vacancy rate changes (percentage points differences), calculated comparing the vacancy rates to the same period, month or quarter, of the previous year. It is interesting to note, for example, that the growth in the vacancy rate in the third quarter of 2019 (+0.1) is mainly due to the growth in the vacancy rate in September 2019 with respect to September 2018 (+0.6).

*Table 1: Year on year change in the job vacancy rate (percentage points difference): the Italian case*

|  |  |  |  |
| --- | --- | --- | --- |
| **Quarter** | **Month** | **Change in monthly JVR** | **Change in quarterly JVR** |
| **Q3-2019** | 7/2019 | 0 | 0.1 |
| **Q3-2019** | 8/2019 | -0.2 | 0.1 |
| **Q3-2019** | 9/2019 | 0.6 | 0.1 |
| **Q4-2019** | 10/2019 | 0.1 | 0 |
| **Q4-2019** | 11/2019 | -0.1 | 0 |
| **Q4-2019** | 12/2019 | 0 | 0 |

The quarterly OJAs by profession and geographical area

A possible enrichment of OJAs could be the computation of the online job vacancies rate by professional figure (Isco level 1). It is essential to know the number of jobs positions broken down by professional figure, placed at the denominator of the rate computation. Jobs positions by professional figure are not available in the Italian job vacancy survey (VELA), since it is provides job positions by NACE Rev 2. economic activity sections. Therefore, job positions by profession have been derived from other Istat sources, and extracted from the I.stat database for the quarters of interest. They differs from job positions used for the computation of the official job vacancy rate and for the exercise of computing an OJA rate showed in this annex Job positions by profession available from the other sources also includes jobs in the sectors not observed in the vacancy survey (that covers sections B-S, excluding O) and self-employed workers. For this reason, job positions by professional figure have been recalculated by redistributing the number of job- positions used for the computation of the official vacancy rate derived from the VELA survey, according to the percentage distribution of job positions by professional figure (derived from other sources, Table 2).

*Table 2: Percentage distribution of employees by Isco level 1 and quarter*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Isco level 1** | **Q3-2018** | **Q4-2018** | **Q1-2019** | **Q2-2019** | **Q3-2019** | **Q4-2019** |
| Clerical support workers | 11.2 | 11.0 | 11.6 | 11.6 | 11.1 | 11.2 |
| Craft and related trades workers | 14.8 | 14.9 | 14.7 | 14.5 | 14.3 | 14.6 |
| Elementary occupations | 11.1 | 11.3 | 10.8 | 10.7 | 11.2 | 11.1 |
| Managers | 2.7 | 2.8 | 2.6 | 2.6 | 2.7 | 2.6 |
| Plant and machine operators, and assemblers | 8.0 | 8.1 | 8.0 | 8.1 | 8.4 | 8.0 |
| Professionals | 14.3 | 15.0 | 15.2 | 15.2 | 14.6 | 15.3 |
| Service and sales workers | 19.8 | 19.0 | 19.1 | 19.4 | 19.9 | 19.1 |
| Technicians and associate professionals | 18.0 | 17.9 | 18.1 | 18.0 | 17.9 | 18.0 |
| **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |

Indicating with the percentage of job positions in the professional figure *j* in the quarter *q* (values in Table 2) and with the estimate of the number of job positions obtained from the vacancy survey for the total economy in quarter *q* we compute the number of job positions useful for the computation of the job vacancy rate, as:

[3]

In this way, the vacancy rate by professional figure *j* in quarter *q* can be calculated as follow:

[4]

where is the number of online job advertisement for professional figure *j* in quarter *q*.

The resulting *OJA* rates by professional figure are shown in Table 3.

It is interesting to note that the OJA rate for "Managers" is higher than the average of the other professional figures.

*Table 3: Italian OJAs quarterly rate by Isco level 1*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Isco level 1** | **Q3-2018** | **Q4-2018** | **Q1-2019** | **Q2-2019** | **Q3-2019** | **Q4-2019** |
| Clerical support workers | 1.4 | 1.7 | 2.3 | 1.3 | 1.7 | 2.2 |
| Craft and related trades workers | 1.0 | 1.2 | 2.1 | 1.1 | 1.3 | 1.4 |
| Elementary occupations | 1.4 | 1.3 | 2.8 | 1.6 | 1.7 | 1.7 |
| Managers | 3.2 | 4.4 | 6.0 | 3.7 | 4.8 | 6.5 |
| Plant and machine operators, and assemblers | 1.0 | 1.1 | 1.8 | 1.0 | 1.1 | 1.2 |
| Professionals | 1.7 | 2.2 | 3.2 | 1.9 | 2.9 | 3.7 |
| Service and sales workers | 1.0 | 1.0 | 1.5 | 0.9 | 1.1 | 1.2 |
| Technicians and associate professionals | 1.5 | 2.0 | 2.9 | 1.5 | 2.0 | 2.4 |
| **Total** | **1.3** | **1.6** | **2.5** | **1.4** | **1.8** | **2.2** |

Differences in percentage points of the OJA rate by professional figure compared to the same period of the previous year have been calculated, only for the third and fourth quarter of 2019 (Table 4), due to the very short period available. These differences are of particular interest describing changes over time of the characteristic of labour demand in terms of profession required. Both in the third and fourth quarter 2019, online job vacant positions for Managers and Professionals increase significantly.

*Table 4: Italian OJAr year on year differences, by Isco level 1*

|  |  |  |
| --- | --- | --- |
| **Isco level 1** | **Q32019 Q32018** | **Q42019 Q42018** |
| Clerical support workers | 0.3 | 0.5 |
| Craft and related trades workers | 0.3 | 0.2 |
| Elementary occupations | 0.3 | 0.4 |
| Managers | 1.6 | 2.1 |
| Plant and machine operators, and assemblers | 0.1 | 0.1 |
| Professionals | 1.2 | 1.5 |
| Service and sales workers | 0.1 | 0.2 |
| Technicians and associate professionals | 0.5 | 0.4 |
| **Total** | **0,5** | **0,6** |

Similarly, starting from the distribution of job positions by territorial division, it is possible to calculate the online vacancy rate by geographical area (Table 5-7). In this case, the online vacancy rate for the total national territory does not correspond to that showed in the first section of this annex, as it was not possible to detect the geographical area for all job advertisements. Both in the third and fourth quarter 2019, online job vacant positions located in North - West and North - East of Italy show an increase higher than the average one.

*Table 5: Percentage distribution of employees by geographical area and quarter*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Geographical area** | **Q32018** | **Q42018** | **Q12019** | **Q22019** | **Q32019** | **Q42019** |
| North - West | 30.0 | 30.5 | 30.7 | 30.1 | 29.9 | 30.5 |
|  | 22.7 | 22.5 | 22.7 | 22.6 | 22.5 | 22.6 |
| Centre | 21.3 | 21.4 | 21.4 | 21.2 | 21.4 | 21.0 |
| South | 17.6 | 17.5 | 17.2 | 17.8 | 17.8 | 17.5 |
| Islands | 8.4 | 8.2 | 8.1 | 8.4 | 8.4 | 8.3 |
| **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |

*Table 6: Italian OJAs quarterly rate by geographical area and quarter*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Geographical area** | **Q32018** | **Q42018** | **Q12019** | **Q22019** | **Q32019** | **Q42019** |
| North - West | 1.5 | 1.8 | 2.8 | 1.6 | 2.1 | 2.6 |
| North - East | 1.6 | 2.0 | 3.1 | 1.7 | 2.2 | 2.6 |
| Centre | 1.0 | 1.2 | 1.7 | 0.9 | 1.3 | 1.6 |
| South | 0.7 | 0.9 | 1.2 | 0.6 | 0.9 | 1.1 |
| Islands | 0.5 | 0.6 | 0.8 | 0.4 | 0.6 | 0.6 |
| **Total** | **1.2** | **1.4** | **2.2** | **1.2** | **1.6** | **2.0** |

*Table 7: Italian OJAr year on year differences by geographical area*

|  |  |  |
| --- | --- | --- |
| **Geographical area** | **Q32019 Q32018** | **Q42019 Q42018** |
| North - West | 0.6 | 0.8 |
| North - East | 0.5 | 0.7 |
| Centre | 0.3 | 0.5 |
| South | 0.1 | 0.2 |
| Islands | 0.1 | 0.0 |
| **Total** | **0.4** | **0.5** |