Wages differentials in association with individuals, enterprises and territorial characteristics

L'associazione tra differenziali retributivi e caratteristiche individuali, di impresa e territoriali

S. De Santis, C. Freguja, A. Masi, N. Pannuzi, F. G. Truglia[1]

Abstract The availability of new databases integrated by ISTAT allows to draw a territorial map of the private sector employment at the census level, with reference to wage levels and characteristics of individuals and enterprises. The purpose of this paper is to provide a representation of wages and of the most significant variables, referring to individuals, enterprises and territory, mainly contributing to determine wages. After having identify the main factors, it is possible to study the joint distribution of enterprise and worker main characteristics on different areas of the Country, revealing, sometimes unexpected, profiles, which may also help the implementation of local policies. The analysis is conducted on private sector employees, representing three-quarters of the employees and more than half of job positions, and it is focused on unilocalised enterprises with less than 50 employees and with dependent workers, amounting to 1 million 404 thousands enterprises and 7 million 847 thousand job positions.

[1]   Stefano De Santis, ISTAT, sdesantis@istat.it

Cristina Freguja, ISTAT, freguja@istat.it

Alessandra Masi, ISTAT, masi@istat.it

Nicoletta Pannuzi, ISTAT, pannuzi@istat.it

Francesco Giovanni Truglia, ISTAT, truglia@istat.it.

Abstract *La disponibilità di nuove basi dati integrate dall'ISTAT consente di tracciare una mappa territoriale dell'occupazione del settore privato a livello censuario, con riferimento ai livelli salariali e alle caratteristiche dei singoli lavoratori e delle imprese. Lo scopo di questo articolo è fornire una rappresentazione dei salari e delle variabili, riferite a individui, imprese e territorio, che principalmente contribuiscono a determinare la distribuzione dei salari. Dopo aver identificato i principali fattori, è possibile analizzare la distribuzione congiunta delle caratteristiche principali dell'impresa e dei lavoratori in diverse aree del Paese, rivelando profili, a volte inattesi, che possono anche aiutare l'attuazione delle politiche locali. L'analisi è condotta sui dipendenti del settore privato, che rappresentano i tre quarti dei dipendenti e più della metà delle posizioni lavorative, e si focalizza sulle imprese unilocalizzate con meno di 50 addetti e con dipendenti, pari ai 1 milione 404 mila imprese e 7 milioni 847 mila posizioni lavorative.*

Key words: wage differentials, municipalities spatial analysis, inequalities.

1. Premise

Wages play a key role in determining labour supply; at the same time, labour costs are fundamental drivers for business location choices, along with a mix of factors affecting productivity levels in host areas (infrastructures, human capital, legality, business environment, orientation of productive specialization, etc.).

The analysis of wages differentials is notoriously complex, both because multiple factors act simultaneously, and because the available information often is quantitatively and qualitatively inadequate (Porcari et al., 2007).

This paper aims to provide a detailed and comprehensive representation of wages and of the most significant variables, referring to individuals, enterprises and territory, mainly contributing to determine wages distribution.

The analysis is conducted only on private sector employees: they represent three-quarters of the total number of employees (77%) and more than half of job positions (56%); however, it should be pointed out that in the short term the analysis can be extended to self-employed and public servants.

The traditional information asset, represented by ISTAT's social and economic surveys, is today enhanced with an important piece of information coming from the integration of both administrative and statistical data sources. In particular, all administrative sources on labour market can be linked, exploiting the fact that each source is LEED (Linked Employer-Employed Data) and allows to study the joint distribution of enterprise and worker main characteristics (ISTAT, 2016).

The information allows the definition of new aggregates in a statistically consistent way and great detail. It is always possible to add information for unplanned dimensions of analysis (e.g. information collected by survey at both employer and employee levels) and to deepen relationships or association structures.

For this reason, the data bases - obtained from administrative data suitably corrected and integrated - are "statistical products" themselves.

2. Data information

This paper counts on the availability of statistical registers obtained from multiple sources, conveniently integrated at micro-data level: the ASIA statistical register and the "information system on employment"; the RACLI thematic register, extension and part of the aforementioned "information system on employment"; the Extended register Frame-SBS[2].

The first register presents a three-level information structure: enterprise, employee, and employment relationship. At the enterprise level, the statistical register of active enterprises integrates information from public and private administrative sources, and statistical sources; it represents the main source for business demography, the basis for all the ISTAT surveys on enterprises (it identifies the reference population for sampling designs and weighting systems) and it is also used for National Accounts estimates.

At the levels of employee and its employment relationship, the ASIA-Employment archive - derived from the employment database (DB-Occupazione) and annually updated after the updating of the active enterprises register - allows to build the different occupational profiles and to produce wide information on main demographic characteristics of employees and employment relationships.

RACLI is a thematic register on the labour market and an extension of the information system on employment, with reference to wages and inputs of labour. It represents the main innovation within the structural statistics on labour costs and it is mainly based on social security sources.

Finally, Extended Frame-SBS is the register for annual economic data on all active enterprises, based on administrative data integrated with the main surveys on enterprises. This database provides a detailed and multidimensional mapping of enterprises for structural and dynamic analysis of production equipment.

3. Preliminary results

In 2014, the Italian private enterprises are 4 million and 359 thousand, for a total of 4 million 721 thousand local units and 16 million 189 thousand employees. 78% of these enterprises work in the services sector and hires 67% of the total employees. The Italian enterprises system is characterizes by having more small or micro enterprises than the EU average: 95.4% have less than 10 employees and, all together, they employ 46.3% of the total private dependent labour force.

Job positions in the active enterprises correspond to: i) 11.3 million of dependent workers, ii) almost 5 million of independent, iii) 345 thousand of external and iv) 175 thousand of temporary workers. Among the dependent workers, 3 out of 4 occupy a full-time position and 9 out of 10 have a permanent contract.

---

[2]   Data are available for 2011-2014 years and, referring to each individual job position, can be aggregated, for example, at the municipal level, allowing statistically significant estimates.

Our analysis is focused on unilocalised enterprises of the private sector with less than 50 employees and with dependent workers, amounting to 1 million 404 thousands enterprises[3]. They represent about one third of private enterprises: the enterprises with dependent employees amount to 1 million 463 thousands and, among them, 1 million 404 thousands have local units only within the municipality of registration[4]. In these companies, the job positions are 7 million 847 thousands.

The wages map (Figure 1- first map[5]) highlights the existence of several extended areas with wages average levels higher than the national mean (HH clusters). It follows the evidence that enterprises with higher value added are also those paying with higher wage levels and that their territorial distribution appears to be somewhat outlined (Cardinaleschi et al., 2015).

More than a fifth (21.9%) of the total municipalities (7,856[6]) belongs to HH extended areas and they are mainly concentrated in the North of Italy: in Lombardia, Emilia Romagna, Veneto and Bolzano they represent about half of the region municipalities (respectively 56.7%, 55.4%, 49.3% and 46.6%). On the other hand, less than a fifth (18.5%) of the municipalities belongs to LL areas, but the share reaches 79% in Calabria, 61% in Campania and represents almost half of the municipalities in Sicilia (47.8%), Puglia (46.3%) and Basilicata (45.4%). Quite small is the number of municipalities representing a point of discontinuity, because they have values of wages higher (1.4%) or lower (1.7%) than the contiguous municipalities; the share of isolated municipalities is only 0.2%.

The wages map is quite similar to the labour cost map (Fig.1-third map). The areas with higher values (19.6% of the municipalities) are mainly in Lombardia (53.3% of the region municipalities), Emilia-Romagna (48.2%) and, above all, Bolzano (92.2%). In the Centre-South there are almost exclusively large areas with labour costs lower than the average (19.5% of the municipalities): Calabria, Campania, Puglia and Sicilia present the highest share of municipalities belonging to the LL cluster (73.1%, 66.2%, 58.8% and 56%).

Also the second map (added value per employee) show a similar profile, even if the LL areas seem to be less wide than in the other two maps. It highlights the existence of several extended areas with high value added per employee (cluster HH),

---

[3]   Waiting for the availability of the Frame territorial extension (Barbieri et al. 2017), the analysis is restricted to unilocalised active enterprises with less than 50 employees and with dependent employee. They represent about 33% of the total: on 4.264 thousands active enterprises, 4.240 thousands have less than 50 employees; they decreases to 1.463 thousands if only enterprises with dependent employees are considered; finally, 1.406 are unilocalised (not having local units outside the municipality of registration).

[4]   It refers to the legal address municipality.

[5]   By the Moran index, the municipalities can be clustered as follows (in addition to the cluster of municipalities not giving a significant contribution to global autocorrelation and to the cluster of municipalities not confining with other municipalities - minor islands): 1. High-High (HH)- contiguous units with values of the variable x (wage level) higher than the mean; 2. Low-Low (LL) - contiguous units with values of the variable x lower than the mean; 3. High-Low (HL) - units with values of the variable x higher than their contiguous units; 4. Low-High (LH) - units with values of the variable x lower than their contiguous units. The first two clusters are composed of homogeneous units (referring to the variable of interest), while the last two clusters concern abnormal cases or *enclaves* (Anselin, 2002).

[6]   The municipalities' number is lower than the total because in some municipalities there are not active enterprises; moreover other 20 municipalities are excluded from the first map because they represent outliers in consequence of their negative values for the value added per employee.

that contain about a fifth (19.5%) of the municipalities. These areas represent almost half of the region municipalities in Lombardia (49.1%), Emilia Romagna (44.3%) and Veneto (40.6%) and the share rises to 92.2% in Bolzano.

Figure 1: High/low wages (first map), value added per employee (second map) and labour cost (third map). Years 2014
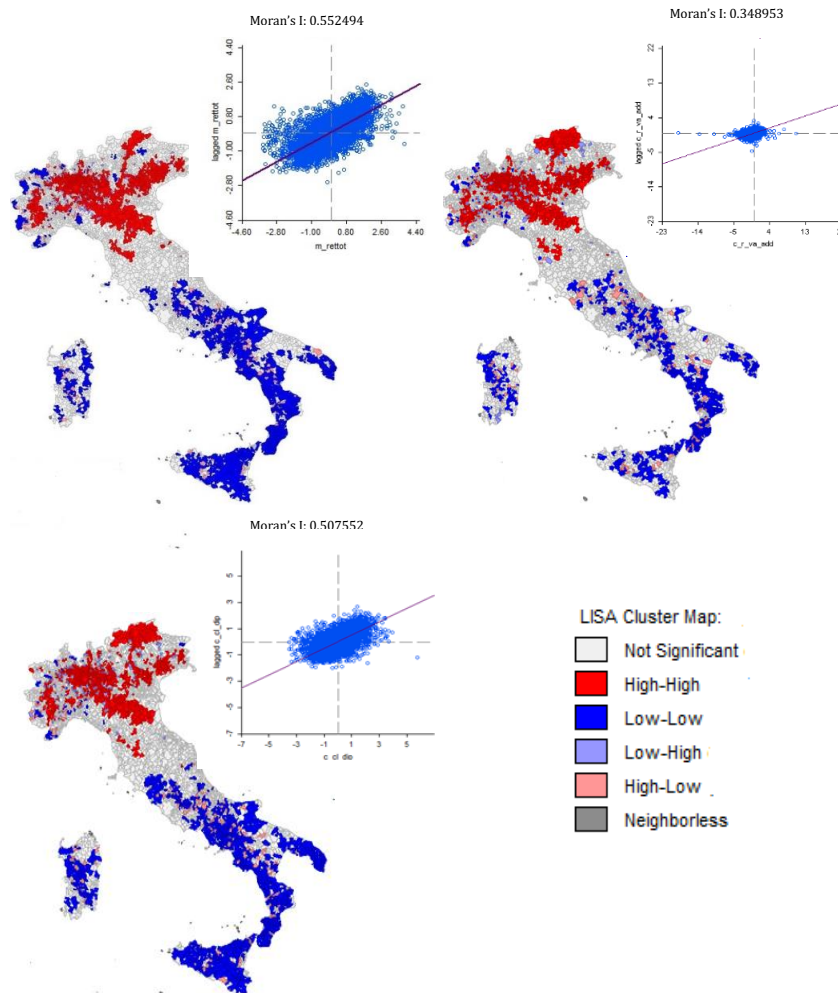
On the other hand, the extended areas with value added per employee lower than the average include over one-tenth of the total municipality (12.2%). They represent about one-fifth of Lazio's municipalities, a fourth in Campania, Puglia, Sicilia and Sardegna and more than 40% in Molise; the share reaches 60.7% in Calabria.

Small is the number of municipalities representing a point of discontinuity: 1.6% those having a values added per employee higher than the contiguous municipalities

and 2.2% those having a lower value; the share of isolated municipalities stays at 0.2%. Obviously, for all the considered maps the extended areas with values higher/lower than the average do not necessarily present the same levels.

This kind of analysis can be useful in policies implementation. Just to give an example, it can support the European Structural and Investment Funds design, taking into consideration Classification of municipalities according to degree of remoteness (De Santis et al., 2017). Less than one fourth of the analysed municipalities (22.3%) are in Peripheral or Ultra-peripheral areas [7]", but the share decreases to 2.7%, 4.1% and 4.5% among the HH cluster, considering the wages, the cost of labour and value added per employee respectively. For the LL municipalities, the share reaches 47.6%, 40.7% and 48.2%.

After having individuated areas with wages, labour cost and productivity levels higher or lower than the mean, it is possible to study the enterprises and their employees, contributing to clarify the mechanisms underlying the relationship between local wage differentials, salary rigidity and economic performance.

In order to identify the factors that mainly contribute to determine wage levels in Italy, a regression model can be estimated. Exploiting the information asset coming from the integration of different sources, it is possible to study the joint distribution of enterprise and worker main characteristics on different areas of the Country.

Such a detailed view of the territory and of the distribution of different segments of workers reveals particular, sometimes unexpected, profiles, supporting the definition and the implementation of local policies that are recognized as a crucial option within the broader context of regional policies.

Some references

1. Anselin, L.: Under the Hood. Issues in the Specification and Interpretation of Spatial Regression Models, Regional Economics Application Laboratory (REAL),University of Illinois (2002)
2. Barbieri, G.A., Faramondi, A., Truglia, F.G.: La stima del valore aggiunto a livello territoriale fine: nuovi sviluppi nell'ambito delle statistiche strutturali, Nuova Serie W.P. n. 16, Certet (2017)
3. Cardinaleschi, S., De Santis, S., Shenkel, M., Truglia, F.G.: Un'approccio geostatistico all'analisi dei dati di bilancio – un'analisi panel-spaziale dell'efficienza delle imprese italiane. Arcavarcata di Rende (2015)
4. De Santis, S., Freguia, C., Masi, A., Pannuzi, N., Truglia, F.G.:Wages Differentials and Their Determinants: a Spatial Analysis. Paper presented at the International Conference on Inequality, Trends in inequality: social, economic and political issues. 2-4th November 2017, Bologna (2017).
5. ISTAT: I differenziali retributivi nel settore privato. Anno 2014. Statistiche report, 30/12 dicembre (2016)
6. Porcari, S., Devicienti F. (eds.): Differenziali salariali regionali e performance economica "Monografie sul Mercato del lavoro e le politiche per l'impiego", n. 5 ISFOL – RP(MDL) (2007)

---

[7]   http://www.agenziacoesione.gov.it/it/arint/Cosa_sono/index.html