

## **THE BRAIN WASTE IN ITALY: QUANTIFICATION AND CHARACTERISTICS OF OVER-QUALIFIED EMPLOYMENT<sup>1</sup>**

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**Abstract.** Overqualification describes an employment situation where an employee's education exceeds job requirements. This mismatch between acquired skills and what is necessary to perform a certain occupation is an important indicator of labour market inefficiencies, with potential repercussions both at the individual level (in terms of job satisfaction, motivation and professional development) and at the collective level (in terms of optimal utilisation of human capital). The analysis is based on the data made available by the 2021 edition of the Permanent Population and Housing Census, which will be compared with those from the 2011 General population Census in order to provide an evolutionary picture of the phenomenon over the decade considered. The study aims to capture the changes that have taken place from a quantitative perspective, i.e. in terms of the incidence and distribution of overqualified employment, also with reference to the socio-demographic characteristics of the people involved. For a more detailed understanding of the issue, specific indicators have been developed to describe its incidence in relation to gender, age and citizenship. The analysis have been carried out with a high geographical detail, down to the NUTS3 level, in order to detect any local inequalities to also support the definition of targeted policies on the territory.

### **1. Introduction**

In recent years, the Italian labour market has shown signs of recovery, as evidenced by both a decline in the unemployment rate and an increase in employment. However, despite this growth, the employment rate for the entire population aged 15 years and over remains below the OECD average, as does that of university graduates, which, although rising, remains below the mean of the most advanced countries.

It is nevertheless undeniable that holding a university degree provides a clear employment advantage over a high school diploma. In 2024 (Istat, 2024), in the 15–89 age group, the employment rate for high school graduates stood at 57.8%,

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<sup>1</sup> Sections are attributed as follows: section 1 to Simone De Angelis and sections 2, 3 and 4 to Valeria Quondamstefano

whereas for graduates or postgraduates it was over fifteen percentage points higher, at 73.4%.

Investing in education thus continues to represent a decisive factor for improving job opportunities and reducing the gap with the rest of Europe. However, the Italian labour market also exhibits significant contradictions: in recent years, there has been an increase in the number of highly educated workers employed in positions that do not require such qualifications. This phenomenon reflects a vertical skill mismatch — a misalignment between the qualifications held and those required — which differs from horizontal mismatch, where a worker is employed in a qualified position that does not match their field of study (Brandi *et al.*, 2017).

In the 1970s, some economists hypothesized that the increasing enrollment in tertiary education in developed countries would generate an oversupply of graduates that the labour market would be unable to absorb. In 1976 was coined the term overeducation to describe this situation (Freeman, 1976). However, these predictions were not borne out: already at the end of Fordism, and later in the 1980s with the rise of automation and IT-driven production processes, the demand for skilled labour expanded. The labour market responded to any temporary oversupply of qualified workers by further developing knowledge-based industries.

The prolonged economic crisis that began in 2007–2008, accompanied by a sharp reduction in the availability of venture capital for investments in high-growth sectors, disrupted this self-regulation mechanism. This has pushed many highly educated individuals to accept any type of job to avoid long periods of unemployment. As a result, overqualification is now a widespread and growing phenomenon.

The causes are not to be found solely in an excess supply of graduates relative to demand but also in other structural factors. In seminal work *Human Capital* (Becker, 1964) analysed the relationship between education, training and earnings, arguing that investment in skills improves not only individual economic outcomes but also collective welfare. Human capital, in fact, consists not only of formal education but also of general and job-specific work experience.

In Italy, the weak integration between the education system and businesses is considered one of the main factors behind both the difficult labour market entry for young people and the high incidence of overqualification. To address this issue, both the Jobs Act and the education reform known as “*La Buona Scuola*” (Law 107/2015) introduced measures to strengthen on-the-job training pathways, integrating them into the curricula of schools and universities.

In addition to the quality of education, the economic context must also be considered. A recent OECD report (OECD, 2018) highlights that, despite improvements in employment rates, productivity in Italy remains unsatisfactory. This is attributed to relatively low skill levels, weak demand for advanced skills from

firms and limited use of available skills. The report describes Italy as being “trapped in a low-skill equilibrium,” a situation in which a low supply of skills is accompanied by low demand from businesses. While some large firms compete successfully on global markets, many others — often small or medium-sized and family-owned — exhibit low levels of managerial, minimal investment in technologies and productivity-enhancing work practices, and limited incentives to invest in human capital.

The OECD identifies a central cause in the Italian business structure: 85% of Italian firms — employing about 70% of the total workforce — are family-owned, mostly small or medium-sized, and operate in medium- or low-technology sectors. These firms generally do not prioritize hiring highly qualified personnel but rather focus on minimizing labour costs to remain competitive.

A more recent framework, the career mobility theory (Sicherman, Galor, 1990), posits that individuals initially accept jobs below their qualification level in order to acquire work experience and job-specific human capital, ultimately facilitating upward career mobility through promotions or transitions to positions requiring higher skills. From this perspective, overqualification would represent a physiological and temporary stage, reflecting a deliberate strategy among younger workers who accept the first available job but continue searching to improve their position, either within the same company or elsewhere. However, as will be shown in the following empirical analysis, current data do not seem to fully support this interpretation.

This study, therefore, aims to explore the phenomenon of overqualification, defined as the condition in which an individual is employed in a job that requires a lower level of education than they possess. This misalignment between acquired skills and job requirements represents a significant indicator of labour market inefficiencies, with potential negative consequences both at the individual level (in terms of satisfaction, motivation, and career development) and at the collective level (in terms of human capital wastage, lower productivity, and inefficient public spending on education).

## **2. Data source and criteria of selection**

To study the phenomenon of overqualification between 2011 and 2021, microdata from the 15th Population and Housing Census (2011) and the Permanent Population and Housing Census (2021) were considered. The Permanent Census collects information on occupations according to the ISCO 08 COM classification (10 categories relating to large occupational groups). Of these 10 categories, the first six requiring the lowest level of education were selected for analysis. For each

individual, their level of education and occupation were considered. If the profession requires a lower level of education than that possessed by the individual, then that individual is classified as overqualified. Specifically, regarding education, the following levels were included: Bachelor's degree or first-level academic diploma, Higher Technical Diploma, University Diploma; Master's degree or second-level academic diploma (including the former Academy and Conservatory programmes); and Research Doctorate (PhD) or advanced research academic diploma. As for employment, the categories of occupation examined were: Manual and unskilled labor (Farm hand, Custodian, Construction worker, Domestic assistant, Dishwasher, Usher, Porter, Hospital attendant, Refuse collector, Stablehand); Operation of manufacturing systems, machinery and assembly lines, driving vehicles (Forklift operator, Assembler of electric devices, Truck driver, Taxi driver, Automatic loom operator, Rolling mill operator, Oil mill operator); Skilled labour (Bricklayer, Mechanic, Heating system installer, Shoemaker, Tailor, Carpenter, Blacksmith, Upholsterer); Plant cultivation and/or animal breeding (Farmer, Fruit grower, Stockman, Fish farmer, Reforester, Gardener, Fisherman); Retail sales and services (Shopkeeper, Police officer, Hairdresser, Cook, Waiter, Flight attendant, Baby sitter, Nanny, Salesperson); and administrative support (Secretary, Postal service counter worker, Switchboard operator, Administrative assistant, Service counter staff). An example of overqualification could be a graduate working as a farm hand.

### 3. Overqualification in Italy: a descriptive analysis

In 2011, the total number of overqualified workers was 993,206, representing 22.3% of the employed with a high level of education (4,446,437 individuals). By 2021, this number had increased to 1,731,747, accounting for 29.9% (5,791,999 individuals). This meant that between 2011 and 2021, there was therefore an absolute increase of 738,541 overqualified workers, corresponding to a relative growth of +74.4%.

The presence of overqualified workers is particularly high in the more industrialized provinces and metropolitan cities with greater employment potential. In 2011, 271,865 overqualified workers (accounting for 27.4% of the total) resided in Rome, Milan, Turin, Naples and Bologna. By 2021, this number had increased to 490,522, representing 28.3% of all overqualified workers in these same metropolitan cities (Table 1). The overqualification rate is defined as the percentage ratio between the number of overqualified individuals (numerator) and the total number of highly educated workers (denominator).

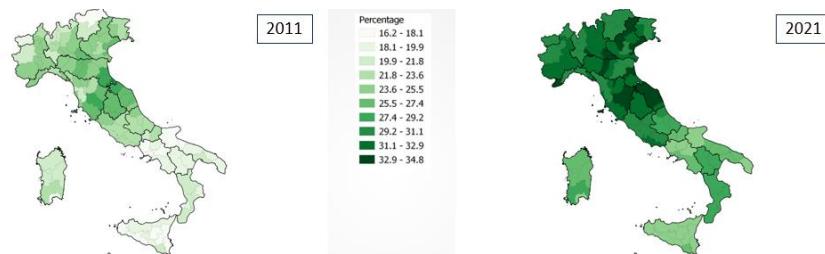
**Table 1 – First 10 Provinces/Metropolitan Cities with Highest level of overqualification – Years 2011-2021.**

Provinces/Metropolitan cities	Absolute Value	Percentage	Provinces/Metropolitan cities	Absolute Value	Percentage
Rome	100,049	10.1	Rome	169,483	9.8
Milan	75,117	7.6	Milan	149,570	8.6
Turin	38,975	3.9	Turin	69,295	4.0
Naples	30,894	3.1	Naples	57,724	3.3
Bologna	26,830	2.7	Bologna	44,450	2.6
Florence	21,809	2.2	Florence	37,395	2.2
Padua	18,941	2.0	Brescia	34,730	2.0
Brescia	18,496	1.9	Padua	32,667	1.9
Genoa	17,275	1.9	Bergamo	31,251	1.8
Venice	16,490	1.7	Monza and Brianza	30,132	1.7

Source: Elaborations on data from Permanent Population and Houses Census (PPHC), Istat

Figure 1 shows that in 2011, the provinces with the highest overqualification rates were Rimini (29.6%), Ravenna (28.3%), and Siena (28.0%). In contrast, the lowest rates were observed in Bolzano/Bozen (16.2%), Agrigento (16.5%), and Cagliari (16.7%). By 2021, the areas most affected by overqualification were Mantua (34.8%), Prato (34.7%), and Macerata (33.8%), while the lowest rates were recorded in Enna, Messina, and Agrigento (24.0%).

**Figure 1 – Overqualification rate: Provincial breakdown – Years 2011-2021.**



Source: Elaborations on 15<sup>th</sup> Population and Houses Census (PHC) and PPHC data, Istat.

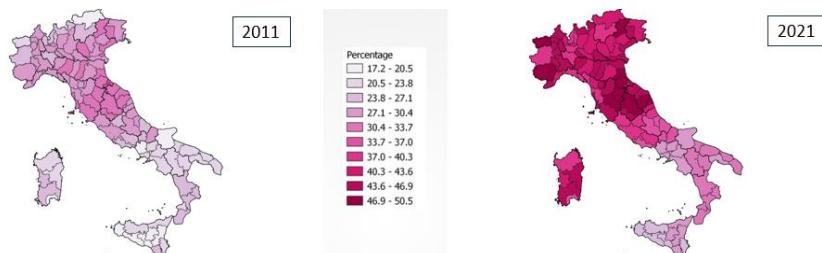
### 3.1. Overqualification of certain disadvantaged categories: women, young people and foreigners

In 2011, the overqualified females were 630,567, representing 63.5% of the total amount of overqualified workers (993,206 individuals). By 2021, this number had risen to 1,029,156, accounting for 59.4 per cent of the total overqualified (1,731,747 persons). This meant that between 2011 and 2021, there was therefore an absolute

increase of 398,589 overqualified workers, corresponding to a relative growth of +63.2%.

As can be seen from Figure 2, in 2011 the highest levels of females overqualification were recorded in the provinces of Rimini (35.4%), Ravenna (33.7%), and Pesaro-Urbino (33.2%), whereas the lowest levels were found in Agrigento (17.2%), Foggia (18.7%), and Bolzano/Bozen (19.3%). By 2021, the phenomenon was most pronounced in Arezzo (50.5%), Belluno (50.3%), and Siena (49.3%), while it remained comparatively limited in Agrigento (25.1%), Caltanissetta (25.6%), and Siracusa (26.4%).

**Figure 2 – Overqualification rate: female breakdown – Years 2011-2021.**



Source: Elaborations on 15<sup>th</sup> PHC and PPHC data, Istat.

An analysis of the population by age group reveals that overqualification decreases progressively with age (Table 2).

**Table 2 – Overqualified workers by age group – Years 2011-2021.**

Age group	Overqualification Rate (%)	Overqualification Rate (%)
	Year 2011	Year 2021
15-29	38.1	41.5
30-34	29.4	36.4
35-39	24.7	33.4
40-44	20.8	31.5
45-49	17.3	27.3
50-54	14.0	25.0
55-59	11.2	21.6
60-64	9.8	19.1
65 and over	6.2	13.4
Total	22.3	29.9

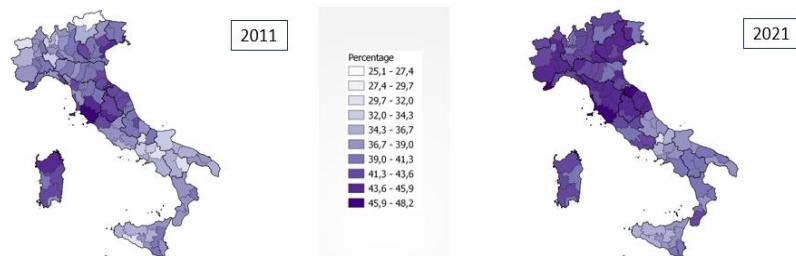
Source: Elaborations on 15<sup>th</sup> PHC and PPHC data, Istat.

In 2011, the share of underemployed university graduates dropped below 25% starting from the 35–39 age group. By 2021, however, this threshold was not reached

until the 55–59 age group. This trend suggests that overqualification became a more structural and persistent phenomenon over the decade 2011–2021, with individuals who were underemployed in 2011 likely remaining in the same condition in 2021.

The most critical situation in both years under analysis was observed among young individuals aged 15–29 entering the labour market, who faced the highest incidence of overqualification, highlighting persistent structural barriers to adequate job matching at labour market entry. As shown in Figure 3, in 2011, the overqualification rate among 15–29-year-olds was highest in Grosseto (48.2%), Venice (45.2%), and Gorizia (45.1%), and lowest in Bolzano/Bozen (25.1%), Agrigento (30.5%), and Isernia (30.7%). A decade later, in 2021, the highest rates remained in Grosseto (47.0%), Pesaro-Urbino (46.9%), and Livorno (46.5%), while the lowest rates have been recorded in Isernia (31.8%), Enna (35.5%), and Agrigento (35.7%). These findings suggest that, despite some regional variation, overqualification among young entrants has remained a widespread and enduring phenomenon over the past decade.

**Figure 3 – 15-29 years olds Overqualification Rate: Provincial Breakdown -Years 2011-2021.**



Source: Elaborations on 15<sup>th</sup> PHC and PPHC data, Istat.

The overqualification also affects foreign workers<sup>2</sup>. In 2011, there were 160,126 overqualified foreigners in Italy, representing 16.1% of the total overqualified workers (993,206). By 2021, this number had increased in absolute terms to 211,669 individuals (an increase of 51,543). However, in relative terms, in ten years their share decreased to 12.2%, marking a decline of 3.9 percentage points.

When looking at provincial data (Figure 4), in 2011, foreign overqualification was most widespread in Caserta (80.9%), Reggio di Calabria and Naples (80.7%), while the lowest rates were observed in Bolzano/Bozen (43.4%), South Sardinia (47.0%), and Oristano (48.5%). By 2021, the highest figures were recorded in

<sup>2</sup> Foreign nationals, who obtained their highest qualification abroad, must select the corresponding qualification in Italy.

Ragusa (81.4%), Reggio di Calabria (78.2%), and Grosseto (77.7%); the lowest remained in Isernia (56.2%), Trieste (59.6%), and Turin (60.7%).

**Figure 4 – Foreign Overqualification Rate: Provincial Breakdown – Years 2011-2021.**



Source: Elaborations on 15<sup>th</sup> PHC and PPHC data, Istat.

#### 4. Conclusions and next steps

Between 2011 and 2021, overqualification — reflecting a significant waste of human capital — has become even more pronounced.

From a territorial perspective, overqualification is more prevalent in provinces and metropolitan cities with higher employment potential, particularly in Northern and Central Italy. Data from the 2021 Census, when compared to 2011, reveal an increased disadvantage for women, young people, and foreign citizens.

It is interesting to observe, on 2021, that the provincial distribution of overqualification among women and young people largely reflects the general pattern observed at the national level. In fact, the provinces recording the highest incidence of overqualification are predominantly located in central and northern Italy—areas traditionally characterized by more dynamic labor markets and higher levels of educational attainment. A few notable exceptions emerge, however, such as Naples and Bolzano, where the rates deviate from this general trend.

In contrast, the phenomenon of overqualification among foreign workers displays a markedly different geographical pattern, being more widespread in the southern provinces and on the islands. This divergence may be linked to structural factors such as limited employment opportunities, labor market segmentation, and the concentration of migrants in low-skilled sectors, which tend to offer fewer opportunities for the full utilization of educational and professional skills.

The greater incidence of overqualification among women is associated with several structural factors, including persistent gender inequality in the labour market,

their concentration in low-paid or part-time jobs, limited access to leadership roles, and challenges in balancing work and family responsibilities.

Among young workers, the higher rates of overqualification are mainly linked to limited work experience despite high educational attainment, high competition for qualified positions, mismatches between academic training and labour market needs, difficulties accessing high-skilled entry-level jobs and a greater willingness to accept any employment in order to gain experience.

For foreign workers, overqualification is driven by multiple barriers, such as problems in the recognition of educational qualifications obtained abroad, language obstacles that limit access to skilled positions, regulatory or bureaucratic hurdles in achieving job equivalency, length of stay in Italy, and the need to accept any available job to ensure economic survival or residency stability.

Future steps in the analysis will include a detailed examination of overqualification by economic activity sector, as well as by status in employment, distinguishing between employees and self-employed workers. Additional studies will consider the type of employment, including disparities in working hours and contract types. An in-depth study of large municipalities (more than 150,000 usual residents) will also be conducted to better understand urban dynamics. In addition, the combined effects of various socio-demographic and labour market factors on the probability of overqualification will be identified and quantified through multivariate analysis techniques.

## References

BRANDI M.C., CARUSO M.G., DE ANGELIS S., MATROLUCA S. 2017. L'evoluzione del mercato del Lavoro degli immigrati laureati: il fenomeno della "overeducation" dai censimenti del 2001 e 2011, *International Journal of Migration Studies*, Vol. LIV, No. 206, pp. 181-213.

BECKER G. S. 1964. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, New York: National Bureau of Economic Research.

FREEMAN R., 1976. *The Overeducated American*. New York: Academic Press.

ISTAT, 2024, Istat databrowser.  
[https://esploradati.istat.it/databrowser/#/it/dw/categories/IT1,Z0500LAB,1.0/LA\\_B\\_OFFER/LAB\\_OFF\\_EMPLOY/DCCV\\_TAXOCCU1/IT1,150\\_915\\_DF\\_DCC\\_V\\_TAXOCCU1\\_2,1.0](https://esploradati.istat.it/databrowser/#/it/dw/categories/IT1,Z0500LAB,1.0/LA_B_OFFER/LAB_OFF_EMPLOY/DCCV_TAXOCCU1/IT1,150_915_DF_DCC_V_TAXOCCU1_2,1.0)

OECD, 2018. *Skills Strategy Diagnostic Report: Italy 2017*, Paris: OECD Publishing. <https://doi.org/10.1787/9789264298644-en>

SICHERMAN N., GALOR O. 1990. A Theory of Career Mobility, *Journal of Political Economy*, Vol. 98, No.1, pp. 169-192. <https://doi.org/10.1086/261674>