

The manual, communicative and quantitative abilities of native and foreign workers according to their level of education in Italy

Le abilità manuali, comunicative e quantitative dei lavoratori nativi e stranieri in base al loro livello di istruzione in Italia

Camilla Pangallo¹, Oliviero Casacchia² e Corrado Polli³

Abstract Many studies address the labour market consequences of immigration flows. A branch of them argues that native workers respond to immigration by specializing in jobs where they have a comparative advantage, thus protecting themselves from labour market competition and possible wage losses. In order to examine this dynamic in the Italian labour market, we analysed the characteristics of jobs in Italy in terms of skills and tasks performed. The results show that foreigners hold more manual jobs, while natives hold jobs with more communicative and quantitative content.

Abstract Molti studi affrontano le conseguenze sul mercato del lavoro dei flussi migratori. Secondo alcuni i lavoratori nativi, per proteggersi dalla competizione sul mercato del lavoro e possibili perdite salariali, rispondono all'immigrazione specializzandosi in lavori dove hanno un vantaggio comparativo. Al fine di studiare questa dinamica sono state esaminate le caratteristiche dei lavori svolti in Italia in termini di abilità e compiti effettuati. Dai risultati emerge che gli stranieri svolgono professioni più manuali mentre i nativi svolgono professioni con maggiore contenuto comunicativo e quantitativo.

Key words: foreigner workers in Italy, specialization activities, level of education, abilities.

¹ Camilla Pangallo, La Sapienza Rome University, Rome, Italy; camillapangallo@uniroma1.it

² Oliviero Casacchia, La Sapienza Rome University, Rome, Italy; oliviero.casacchia@uniroma1.it

³ Corrado Polli, INAPP, Rome, Italy; c.polli@inapp.org

1 Background and Object

In recent decades, increasing migration flows have influenced labour market dynamics in most developed countries. Several studies have investigated the relationships between immigrant flows, workers' income and educational qualifications; Peri and Sparber (2011) argue that “...when the proportion of foreign workers with high educational level increases in the U.S., native workers choose jobs with less analytical and more communicative content”. Zavodny (2014) emphasize that the jobs held by immigrants are more physically laborious than jobs held by U.S. natives. In other research, Peri and Sparber (2009) emphasize that “... foreign-born workers specialize in occupations intensive in manual-physical labour skills while native pursue jobs more intensive in communication-language tasks”. Other authors [2] suggest that native workers respond to immigration by specialising in occupations requiring skills in which they have a comparative advantage. Few studies however have examined the differences between the foreign and native components in terms of requirements and characteristics of workers and work in Italy. In this paper, the Italian and foreign employed population in 2019 in Italy were analysed by detecting both specific information regarding the characteristics and requirements of the worker, their profession, and some socio-demographic data. The analyses refer to a period before the traumatic effect of the pandemic due to SARS-COV-2; for this reason, it does not reflect the impact of Covid-19 related changes on employment flows and outcomes.

2 Data and Methods

The data used for the analysis were those of the Survey on Italian Occupations (ISTAT and INAPP, 2013), provided by INAPP at a level of detail equal to 3 digits and the micro-data for public use of the Labour Force Survey-RCFL (ISTAT, 2019). The Survey on Italian Occupations (ICP) describes, with high analytical detail, all the professions existing in the Italian labour market, with particular reference to the content of the work performed and the organizational context in which the work takes place [3]. The ICP, borrowed from the Occupational Information Network (O*NET) survey, adopts the US conceptual model, the *content model*, which provided the basis for the creation of the contents of the questionnaire. The questionnaire is formulated by translating the one from the O*NET survey and, where necessary, adapting it to the Italian situation.

We have built an integrated database to simultaneously detect both specific information regarding the characteristics and requirements of the worker and the profession, and socio-demographic data of the workers, through statistical matching between the Sample Survey on Professions (INAPP, 2013) and the Labour Force Survey (ISTAT, 2019). We have also developed two methods for the construction of composite indicators, which allow us to analyze the world of professions in Italy in terms of workers' skills and work activities. The first methodology has referred to

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the study by Peri and Sparber (2009) and the eight indicators (one Manual, two Communicative, three Quantitative, one Interactive and one Analytical) represent a weighted average value for each profession. The second method is the one proposed by Autor, Levy and Murnane (2003), and, in this case, the five indicators (Non-Routine Analytical Tasks, Non-Routine Interactive Tasks, Routine Cognitive Tasks, Routine Manual Tasks, Non-Routine Manual Tasks) were obtained using principal component analysis. The methodology developed by Autor, Levy and Murnane (2003) used the information present in the Dictionary of Occupational Titles (DOT), subsequently, Warman and Worswick (2015) incorporated the method proposed by the three authors to the data of the O*NET database as the latter has over time replaced the DOT; for this reason, in this work, the composite indicators were obtained with the variables suggested in Warman and Worswick's (2015) study.

Furthermore, in order to make the indicators constructed using the two methodologies described above comparable, composite indicators designed by Autor, Levy and Murnane (2003) were constructed, adopting the mathematical method used by Peri and Sparber (2009).

3 Results

The world of professions has been analyzed in terms of both the attitudes and skills of the worker and the activities and styles of work, according to sex, level of education, and citizenship.

This paragraph presents some of the main results relating to the indicators obtained by applying the methodology of Peri and Sparber (2009). In this case, the "Manual" and "Communicative" indicators are considered because they represent the most interesting results and for which the greatest differences have emerged between Italian and foreign workers. The comparison is between the Italian and foreign employed populations from developing countries; the employed of developed countries were excluded from the study as the results obtained are similar to those of Italian employed people. The analysis was carried out separately by sex and level of education: the workers without a school certificate or in possession of an elementary or middle school certificate are included in the low qualification group, while the workers with a university degree were in the high qualification group. Graduated workers have been excluded in this part of the analysis to highlight the differences between less-educated and highly educated workers.

As shown in Table 1 for employed men, the Italians with low educational qualifications engage in activities with a moderate manual content (the score is 27,71), which is higher than that observed for Chinese (22,81) and those employed in Latin America and Oceania (27,47), but lower than all the others.

Table 1: *Employed men: manual and communicative indicators by educational level and citizenship. Years 2019 (RCFL) and 2013 (ICP).*

Citizenship groups	Manual indicator		Communicative indicator		Relative difference between low and high levels of education ¹	
	Low level of education	High level of education	Low level of education	High level of education	Manual indicator	Communicative indicator
Italy	27,71	10,47	57,63	68,83	90,3%	17,7%
Developing countries:						
EU	33,46	23,11	45,04	53,59	36,6%	17,3%
Not- EU Eastern Europe	34,30	23,65	43,80	51,73	36,8%	16,6%
Asia (excluding China)	27,78	16,66	43,04	58,05	50,0%	29,7%
China	22,81	16,93	50,05	61,26	29,6%	20,1%
North Africa	31,65	21,50	44,63	51,16	38,2%	13,6%
Sub-Saharan Africa	28,95	17,56	44,65	56,30	49,0%	23,1%
Latin America and Oceania	27,47	20,84	43,94	54,52	27,5%	21,5%

Own elaboration on ISTAT-INAPP data.

Italian workers with high educational qualifications carry out activities - as expected - with a minimum manual content (10,47). Furthermore, it is observed that Italians with both low (57,63) and high (68,83) educational qualifications carry out more communicative occupations than all other groups of foreigners. The relative differences by educational qualification in exercising activities characterized by high manual skills are high in the case of Italians (90,3%), much more moderate for the other groups. Conversely, the differences in the degree of education when it comes to activities characterized by high levels of communicativeness are more limited for Italians (17,7%), and the same is true for the other groups of foreign workers, except Asians (almost 30%).

Regarding employed women, Italian women with low educational qualifications as well as foreign women work in occupations with a moderate manual content. The same result was found for men, although the differences by citizenship are even smaller in the case of women. Italian women workers with high qualifications also work in occupations with low manual content, showing lower values than all other groups of foreign workers; again, the result is very similar to that seen for men.

The second type of indicators (Autor, Levy and Murnane) also show greater differences between Italian and foreign workers in terms of content of manual and non-manual occupations, and the study was analysed further by adopting Peri and Sparber's Manual, Communicative and Quantitative indicators.

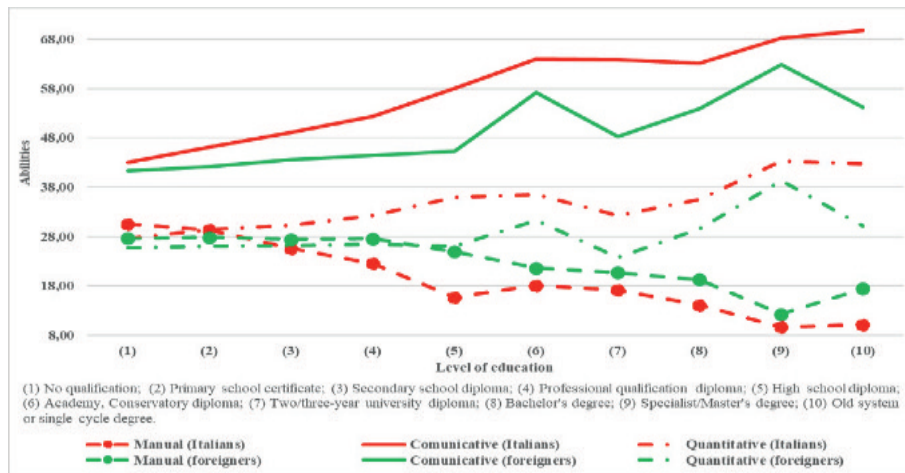
¹ Relative difference between low and high levels of education relative are calculated considering the average between the two values as denominator.

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Data from the Survey on Italian Occupations (INAPP) confirms how the use of the attitudes and skills contained in the various occupations varies according to the level of education of employees; it is possible, using this database linked to the Labour Force Survey, to also test the hypothesis of a variation in this use according to citizenship.

Figure 1 shows the value of manual, communication, and quantitative skills by educational qualification for Italian and foreign workers. Communication and quantitative skills tend to increase with higher educational qualifications, while the use of manual skills decreases.

Figure 1: Average abilities of Italian and foreign employed people in Italy by the level of education. Years 2019 (RCFL) and 2013 (ICP).



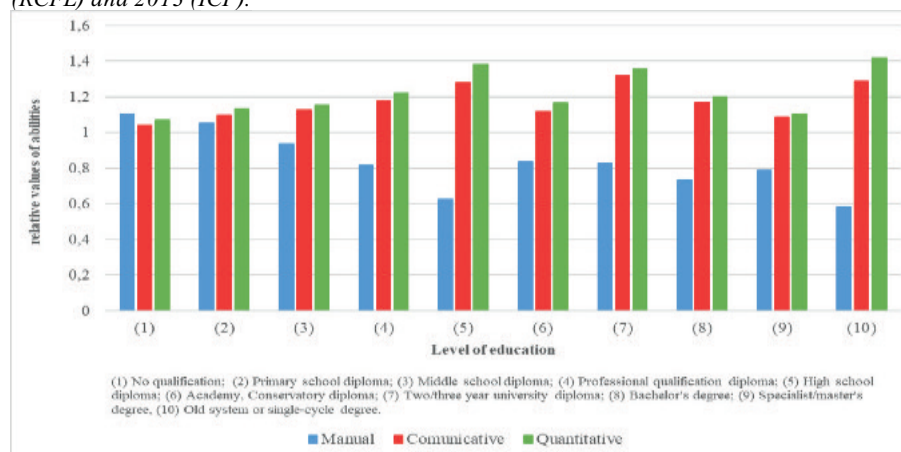
Own elaboration on ISTAT-INAPP data.

Employed people with high educational qualifications are unsurprisingly employed in jobs with high communication content. In some cases, however, there is also a high level of manual work: for example, workers in professions such as health technicians have a manual indicator value of 21,12 (6th decile) and a communication indicator value of 63,56 (7th decile) and doctors have a manual indicator value of 18,69 (5th decile) and a communication indicator value of 73,43 (10th decile). The professions with greater communication skills held by workers with university degrees are, for example, university lecturers (86,92) and researchers and technicians with university degrees (84,52). Educated workers in highly quantitative professions are Engineers and related professions (62,70) and quantitative, physical, and chemical science technicians (63,07). Native workers show an advantage in communication and quantitative skills, foreign workers an advantage in manual work.

Absolute skill levels have to be converted into relative values in order to obtain the comparative advantage in terms of skills of native workers over foreigners (Figure 2). The intensity of communicative and quantitative skills is higher for Italians at practically all levels of education: Italians show a systematic comparative advantage in communicative and quantitative skills compared to manual skills. Italians also show even higher levels of quantitative skills than communicative

skills, which is an unexpected result. Immigrants present a comparative advantage in manual work compared to other skills at all levels of education with the exception of the 'no qualification' category.

Figure 2: Ratio between the average abilities of Italian and foreign workers. Years 2019 (RCFL) and 2013 (ICP).



Own elaboration on ISTAT-INAPP data.

4 Conclusion

Thus, the results obtained in this work would seem to confirm part of the conclusions of Peri and Sparber's studies: in Italy, foreign workers would be complementary to native workers because they specialize in different tasks having different skills.

References

1. Autor, D. H., Levy, F., & Murnane, R. J. (2003). The skill content of recent technological change: An empirical exploration. *The Quarterly Journal of Economics*, 118(4), 1279-1333.
2. Gu, E., & Sparber, C. (2017). The native-born occupational skill response to immigration within education and experience cells. *Eastern Economic Journal*, 43(3), 426-450.
3. INAPP, Nota metodologica Indagine campionaria sulle professioni, 2013.
4. Peri, G., & Sparber, C. (2009). Task specialization, immigration, and wages. *American Economic Journal: Applied Economics*, 1(3), 135-69.
5. Peri, G., & Sparber, C. (2011). Highly educated immigrants and native occupational choice. *Industrial Relations: a journal of economy and society*, 50(3), 385-411.
6. Warman, C., & Worswick, C. (2015). Technological change, occupational tasks and declining immigrant outcomes: Implications for earnings and income inequality in Canada. *Canadian Journal of Economics/Revue canadienne d'économique*, 48(2), 736-772.
7. Zavodny, M., (2014). Do Immigrants Work in Worse Jobs than U.S. Natives? Evidence from California, IZA Discussion Papers, No. 8327, Institute for the Study of Labor (IZA), Bonn.