

AGEING AND FUNCTIONALITY IN THE PUBLIC ADMINISTRATION EMPLOYMENT: A CASE STUDY FOR THE ITALIAN MUNICIPALITIES¹

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Abstract. This contribution deepens the theme of functionality and performance of a key segment of Italian Public Administration represented by municipalities. In the current historical phase, the importance of cities is reiterated by the National Recovery and Resilience Plan (PNRR), since these entities hold investments for just under 30 billion euros and should demonstrate planning ability, high efficiency, and effectiveness.

The first main aim of the paper is to analyze characteristics, trends, and outcomes of ageing workers on staff in the municipal administrations located in the Italian communes, a phenomenon related to a series of critical demand variables (demographic structure), service delivery (organizational models, digitalization), efficiency of provided services, degree of effectiveness associated with performance and citizen satisfaction.

A multisource and integrated approach is carried out based on the following official statistics: Public Institution Census survey conducted by Istat; Personnel indicators gathered by the Annual Account of Economic and Finance Ministry; Financial Statement Indicators gathered by municipalities.

The Input/Outcome model is applied, in which resources (input) should measure performance (output) and change (outcome), identifying dimensions and indicators to study the phenomenon of ageing and contraction in public sector occupancy.

A multidimensional analysis at the Italian level is carried out referring to municipalities classified by territorial localization, demographical dimension, and urbanization rate. Some personnel classification variables (such as age, gender, qualification) and balance sheet indicators have been elaborated to evaluate short term output and medium-long term outcome in municipal administrations. The results of this study highlight areas in which reactions to demographical and technological transformations in terms of organizational strategies reach critical values and those ones in which advantages could be found.

Some diachronic indicators are compared according to age, gender, and qualification for employment in the municipal administration at the commune level. Some data about qualification will allow to discover educational mismatches (cases where local administrations are covered by undereducated or overeducated personnel).

¹ The paper has been jointly written by all the authors but § 2 and 3 can be attributed to A. P. M. Mirto, § 4 to F. Gaudio, while § 1 and 5 to all the authors. MEF (Ministry of Economy and Finance) data have been processed by D. Maiolino and F.P. Rizzo. Maps in ArcGis have been created by F. P. Rizzo.

1. Introduction

To face the challenges of public administration, it is necessary to react to the demographic and technological changes in recent years with a new organizational strategy. Public Administration (PA) action deals with the development of the quality of human capital, aiming at the enhancement and strengthening of the knowledge and skills of employees (Inapp, 2021). In the light of growing ageing of the workforce employed in PA, it is necessary to reorientate personnel management policies in line with the definition of training.

Municipalities, the main beneficiaries of administrative functions as closer to citizens and more suitable to meet their needs, have a crucial role in using PNRR resources (CDP, 2022). As underlined by the European Commission, the administrative capacity of the Italian public sector must be strengthened to improve offered services and public investments (European Commission, 2021). Since 2008, policies to contain public expenditure have led to blocking of turnover, generating a decrease in number of employees; today percentage of public workers in total employment in Italy is lower than the OECD average (OECD, 2021).

Misalignment between available skills and those required by the production model for new generations (digital, ecological, and inclusive) is crucial evidence in public administration employment (Inapp, 2021).

The paper deals with the theme of functionality of employment in municipal administrations within Italian public sector, analysing and integrating different official sources (par. 2). The general framework of the input/outcome model helps to interpret the input component in which employment municipal data are represented.

Organizational municipal performance is a set of expected results of the administrations as a whole or the organizational units (PCM, 2017). It allows us to measure how the organizations, aware of the state of resources (health of administrations), uses the same in a rational way (efficiency) to provide services adapted to user expectations (effectiveness), ultimately to create public value, that is to improve the level of the social and economic well-being of the users (impact).

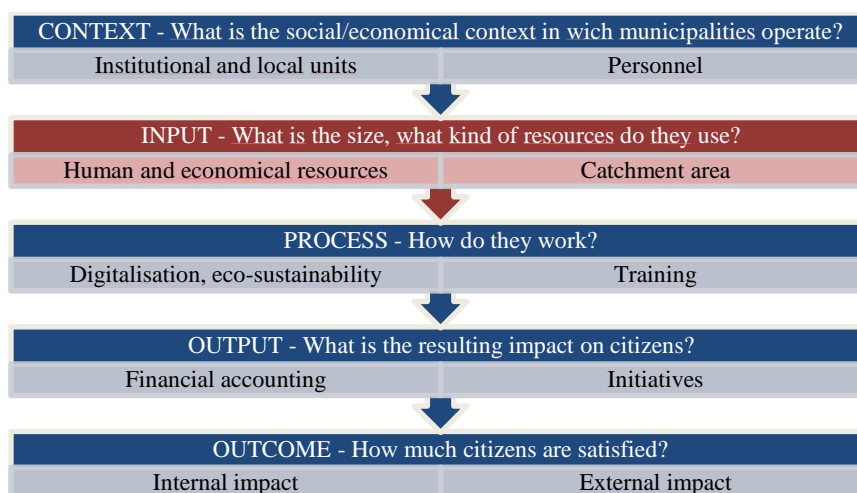
The main preliminary hypotheses of this paper refer to the contraction of public administration during the last decade, in terms of local units, personnel, and a number of atypical workers (Centro Studi innovazione nella PA, 2022; Istat, 2022). This reduction determines an increase of senior component as well as a reduction of new generation. Ageing in personnel is explained by the reduction of dependents, because of the high presence of senior component (OCPI, 2022 and 2019). Training is a crucial lever of the quality of human resources and shows great gaps between territories growing in the North and declining in the South and Islands.

An exploratory diachronic analysis has been carried out according to graphical and cartographical modules in 2021 and 2011 (par. 3). Finally, a composite index to evaluate municipal staff functionality by dimensions (ten elementary indicators) has been processed through Comic software (par. 4).

2. General framework and main sources

Input/Outcome model is applied as general framework to represent the functionality of municipal institutions (OCSE, 2021, Zamagni et al. 2015, Gori and Vittadini, 1999).

Figure 1 – Conceptual framework: main indicators and official sources.



Source: Elaborations on OCSE model.

Considering contextual information makes it possible to understand the major institutional differences and similarities among municipalities, and thereby helps to identify comparators for benchmarking purposes.

Input dimensions refer to the resources used by governments in their production function, as well as how they are mixed; on these resources analysis herein presented will be focused.

Process refers to the public management practices and procedures undertaken by the local governments to implement policies. These indicators quantify and qualify resources of the administration (human, economic-financial, instrumental, tangible and intangible) and assess the level of *administrative health*.

The dividing line between outputs and outcomes identifies outputs that refer to the amount of goods and services produced by the governments, while outcomes show the effects of policies and practices on citizens and businesses. A professional capable, and responsive public service is a key driver of citizens' trust in public institution (OECD, 2019).

Table 1 – Characters of the main statistical sources on municipality data.

SOURCES	KEY INDICATORS	MODEL COMPONENT	SPACE AND TIME
Public Institution Census survey - Istat	Local units, institutions, and personnel	Context	2017 and 2020, municipal level
	Activity volume/resources Obstacles to the digitization process Type of information security measures Participation training, IT training Sustainable behavior, social or environmental report	Process	
	Smart working impact Predicting minimum number of workers in attendance Digital channels available for users to use services	Outcome – internal impact	
Annual Account - Ministry of Economy and Finance	Staff with seniority > 20 and < 5 years Staff over 60 and under 40 years Replacement index of human resources Staff with low/high education Temporary staff Female staff	Input – Human resources	2010 and 2020, municipal level
Municipal Balance Sheet – Istat	Personnel Cost Administrative surplus (deficit) in relation to current revenue Incidence of capital transfers on capital expenditures	Input – Economical Resources	2011 and 2021, municipal level
	Spending rigidity Degree of dependence on central and local government	Output – Financial accounting	
Multipurpose Survey - Istat	Citizens' trust in municipal administrations Degree of user satisfaction with some services rendered by municipal administrations	Outcome – external impact	2020, regional level

The main official statistical sources exploited for the analysis of all model components are:

- *Istat Census on Public Institutions* - 2020 and 2017 data (referred to activities and organisation of institutional units, functionality of certain services, training

- indicators, health and safety indicators, ICT, sustainability and transparency, tasks performed by local units, recipients of services provided by local units);
- *Balance sheets of public bodies* (revenue and expenditure, profit and loss account and balance sheet, budgetary indicators and staff data of institutional units);
 - *Ministry of Economy and Finance (MEF) – Annual Account*: some indicators related to seniority, education, age, type of contract personnel on staff in municipal administrations;
 - *Istat multipurpose survey on families*: the degree of satisfaction of users of some services provided by the PA (use of some means of transport, satisfaction with some aspects of the service, users length of line and judgment on time of services);
 - According to the common European quality criteria and data availability some indicators have been selected and calculated for the Italian municipalities and a synchronic analysis has been referred to the demographical dimension, urbanization rate and spatial localization.

The degree of urbanization classifies entire territory of a country along an urban-rural continuum and combines the population size density thresholds to capture three mutually exclusive classes: cities, towns and semi-dense areas, and rural areas. The population classifies the municipalities in three classes chosen in this paper: under 5,000 inhabitants, 5,000-20,000 inhabitants and >20,000 inhabitants.

3. Main findings: descriptive analysis of elementary indicators

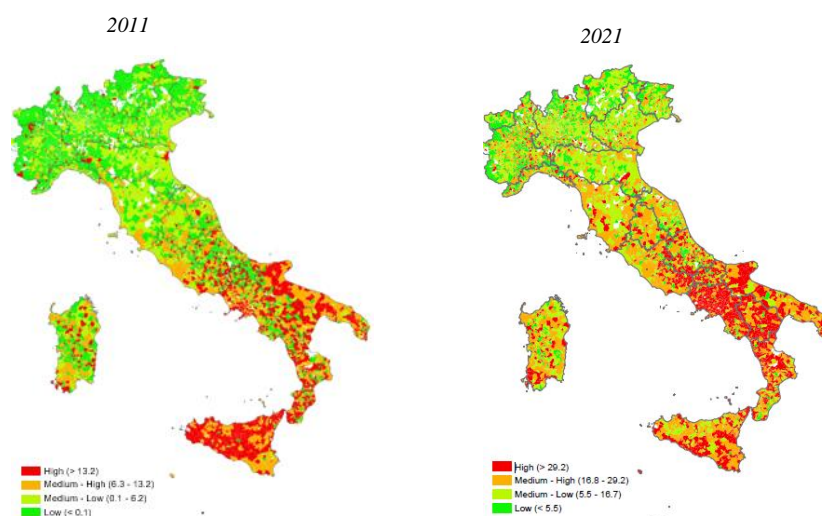
As mentioned before, personnel are the main resource of the public organizations; with ageing of population and increasing automation of process routine becomes greatly important anticipate strategic problems (European Commission, 2017). Specific opportunities for organizational development through the human resources include to plan its staff for improving its performance by engaging people with the right skills, to allow mobility within and between institutions for sharing know-how and developing flexibility and responsiveness, to manage learning networks and intergenerational learning, to implement recruitment policies, promotion and development based on competences and importance of lifelong learning.

Through the analysis of the main elementary municipality indicators, referred to the personnel on staff in municipal administrations, the following main outlines emerge².

² The MEF data referred to 2021 and 2011 are provisional and could be revised in future studies.

In 2021 the share of employees over 60 years old has increased in comparison to 2011 (from 7.3% to 21.4%, Fig. 2), especially referring to the southern region (except to Sicily) and more in the municipal administrations than in the other institutions (Istat, 2021).

Figure 2 – *Old age employees on staff in municipal administrations in Italian communes - 2011 and 2021(% values).*



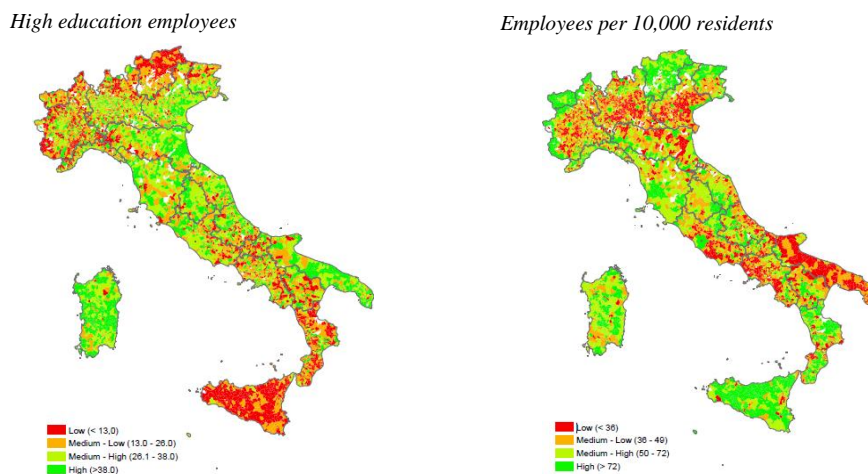
Source: Elaborations on MEF data.

The high education level (at least a bachelor's degree) seems to be critical in those areas where the number of employees per resident is higher (Fig. 3); it is increased especially in the Centre (from 21.7% to 35.1%); on the contrary the number of employees per 10,000 residents is decreased especially in the Centre (from 75 to 64 per 10,000 residents).

In 2021 trained employees have increased greatly in comparison to 2011 (also for presence of e-learning), especially in the northern regions (from 101.2% to 141.6%), more in the municipal administrations than in the overall institutions.

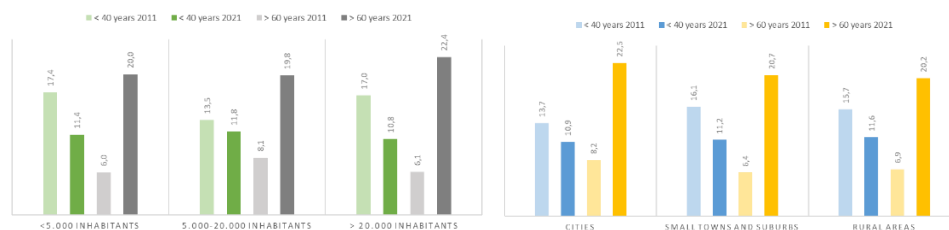
In the last decade, the average age of employees has increased by about 4 years. In some sectors, such as the municipal administrations, ageing was more pronounced at around 6 years (Aran, 2013); the share of senior component increases and young component decreases in all the classes by demographical dimension of the municipal administrations (Fig. 4); the share of employees over 60 increases in all urbanized and non-urbanized areas, on the contrary the young component decreases.

Figure 3 – Employees on staff in municipal administrations: % high education employees and employees per 10,000 residents in Italian communes – 2021.



Source: Elaborations on MEF data.

Figure 4 – Young and old age employees on staff in municipal administrations per demographical dimension and degree of urbanization of Italian communes - 2011 and 2021(% values).



Source: Elaborations on MEF data.

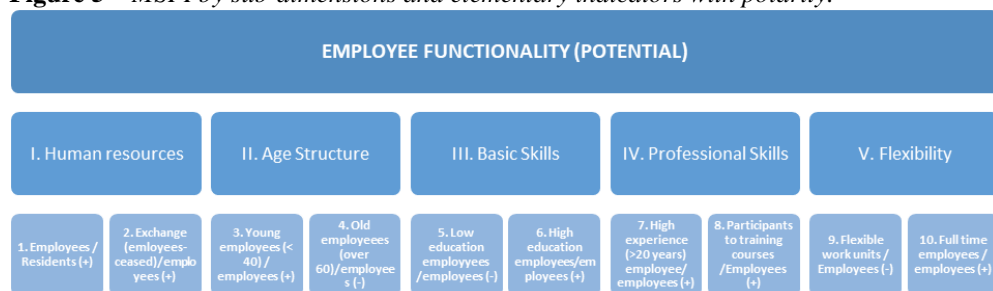
4. A composite index for municipality human resource

Ten elementary low correlated indicators have been selected to build a composite Municipal Staff Functionality Index (MSFI), linked to the quality and level of human resources (Fig. 5). It has been processed by Comic Software³ selecting, according to the methodological choices, AMPI – Adjusted Mazziotta-Pareto Index (Mazziotta,

³ For further details see the Composite Indices Creator - <https://www.istat.it/it/metodi-e-strumenti/metodi-e-strumenti-it-per-la-produzione-statistica/analisi/strumenti-di-analisi/comic>.

Pareto, 2020 and 2017, OECD 2008, Alaimo, 2022). Referring to the formative approach, the elementary measures have been selected following a logic of causality with respect to the phenomenon of interest - a low level of mutual correlation between these measures was confirmed⁴. The municipality distribution by quartiles shows more critical areas in the southern regions, especially in 2021⁵.

Figure 5 – MSFI by sub-dimensions and elementary indicators with polarity.



In 2021, in the I quartile there is a higher share of employees per resident (62.4% versus 56.0% in the IV quartile), but with a less stable (ind. 9) and a lower share of full-time employees (ind. 10). In addition to a more stable and balanced composition in terms of age, the municipalities in the IV quartile also have a higher level of (formal) skills of their employees, both due to more than double incidence of tertiary degrees (38,2% in the IV quartile versus 14.0% in the I quartile) and very small share of those below secondary school graduation (10.0% in the IV quartile versus 33.5% in the I quartile).

The level of education appears to be generally increasing, but more pronounced in the "virtuous" municipalities. Here, the specific professional skills are also visibly more robust, both in terms of field experience (47.1% in the IV quartile versus 36.3% in the I quartile) and more frequent use of in-service training activities (144.3% in the IV quartile versus 31.7% in the I quartile⁶). Finally, the municipalities in the IV quartile are characterized by a lower incidence of the atypical forms of employment such as flexible work contracts (in the IV quartile 4.6% versus 9.6% in the I quartile) and full-time work (91.7% in the IV quartile versus 53.9% in the I quartile) reporting a low, decreasing or at most stable incidence.

⁴ The values of correlation index were found to be systematically below or at most close to +/-0.35: this results in a level of correlation contained within acceptable thresholds.

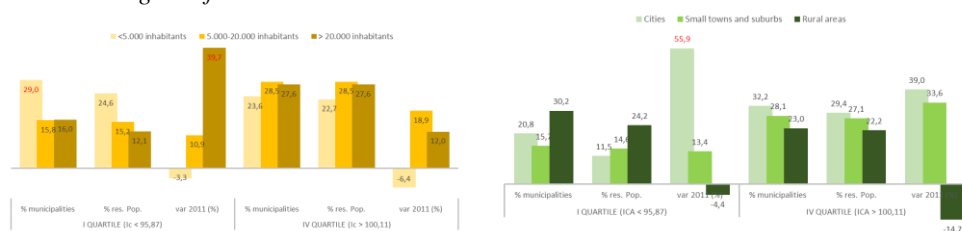
⁵ It was compiled on 7,593 municipalities, a largely majority statistical base and substantially identical for the two years and average for Italy relative to base year was considered as benchmark, which was given a value of 100.

⁶ The value refers to in-service training and may be greater than 100 because participation in training activities during a year may be repeated for each employee.

These functional profiles tend to take on different connotations with reference to the socio-territorial classification variables herein considered: population scale; urbanization; geographic localization.

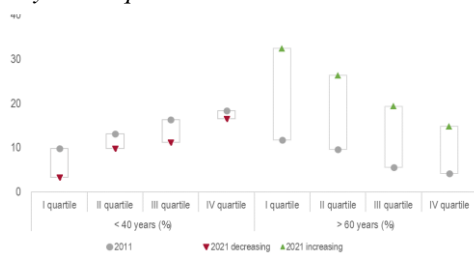
Referring to the first two factors-which delineate strongly interrelated typologies⁷-seems to highlight a level of functionality in terms of size and composition (biographical, skill set, professional) of workforce, which tends to decline especially in the smallest and less urbanized realities (Fig. 6). Just under a third of these cases-where, however, about 1 to 4 Italians will reside in 2021, and thus present a potentially significant demand for municipal services-are in the I quartile, with a visibly higher frequency in medium-large municipalities and with an urban connotation. The latter are relatively more present in the IV quartile, that is, in the most virtuous component of employee functionality.

Figure 6 - Municipalities and population in the I e IV quartile for MSFI by dimension and degree of urbanisation. 2021 and % var. 2021/2011.



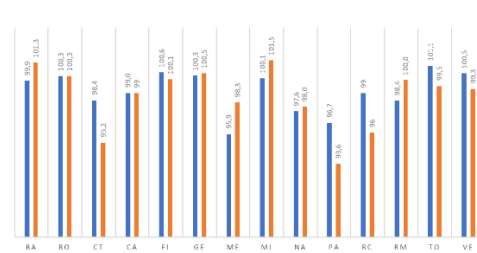
Source: Elaborations on MEF data.

Figure 7 – Young and old age employees by MSFI quartiles – 2011 and 2021



Source: Elaborations on MEF data.

Figure 8 – MSFI in metropolitan cities – 2011 and 2021



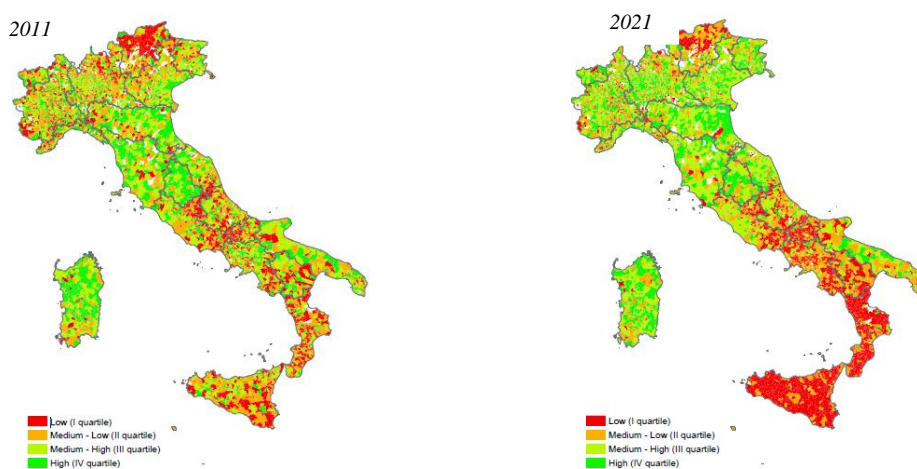
⁷ In general, the two variables are significantly correlated: as population size increases, so does the degree of urbanization. About 85% of municipalities with a population of less than 5 thousand fall into the rural area classification, slightly more than 76% of the 5-20 thousand class fall into the grouping of small towns or suburbs, and more than one-third of the higher size fall into the grouping of densely populated areas.

Prevalence in the I quartile of old age component above all in 2021 (32.4%); relevance in the IV quartile of young component in the decade (18.3%, Fig. 7).

In 2021 MSFI for metropolitan areas shows the highest value in Milan (101.5) and the lowest one in Palermo (93.6), while in 2011 Torino has the highest value (101.5) and Palermo again the lowest (96.7, see Fig.8).

The highest percentage of municipalities belonging to the I quartile is in the southern area (49.4%, Fig. 9); on the contrary the highest percentage of municipalities belonging to the IV quartile is in the North (34.1%). Calabria and Sicily show the most critical by far, both in terms of composition and trend. Lazio region has a structure very similar to the South, while the Sardinia is closer to the virtuous cases in the North-Center. The regions of so-called Third Italy (Center-North-East), report very virtuous profiles; an exception is the case of Trentino Alto Adige, which is worthy of further study (Putnam, 1993). The Alto Adige area is influenced by a moderate value of some indicators like full time employees (linked may be to seasonal workers) that demonstrates the model should be adapted to different realities with some adjustments (on the contrary in Sicily critical value of the indicator could be influenced by increasing presence of socially useful workers).

Figure 9 – MSFI by municipality - 2011 and 2021.



Source: Elaborations on MEF data.

The representations plastically render the image of persistence and strengthening of traditional dualistic pattern of territorial gaps in Italy, with the South lagging far behind on this front as well. This pattern tends to become more pronounced in the most recent phase, when there is a shift from a "patchy" to a broader and "tendentally

systemic" spread of the problematic situations outlined by the functionality indicator in these territories, in contrast to a positive trend in the North-Centre (Istat, 2023).

5. Final perspectives

The level of demographic and technological change stimulates an acceleration in building an advanced PA model, capable of responding to the growing demand for qualified services from the community. It is essential to rethink roles and professional profiles, systems of assessment of skills in a perspective more oriented to soft and transversal skills (Inapp, 2021).

The ability to carry out a transformation induced by increasing digitalization encounters an obstacle in current demographic structure of public employment; ageing of employees is a widespread phenomenon within the municipal administrations: it characterises the picture with a predominance of cohorts of over 60 years matched with a very thin presence of young cohorts, both in urbanised and rural areas, in big cities and small towns, in every territorial context but especially in the South.

The reduction of financial resources destined to training has damaged the quality of human capital, while the practices of seniority management to favour circulation of intergenerational learning are still not very widespread.

Ultimately, the municipalities in the southern areas - although characterized by a broader demand for important public services (urban planning, waste, civil protection, social services, local police, etc.), and not specifically attended to by the cohesion policies of recent years - typically present weaker staffing levels, perhaps thicker but with a lower degree of progressively older and with relatively weak basic and in-service skills. Whether and how much these aspects affect activities and outcomes, persisting over time, will be the subject of subsequent investigations aimed at further enhancing official statistical production in the sector.

Another crucial issue to deepen is possibility to explore the other model components (process, output, and outcome) for evaluating segment of municipal administrations as well as other institutions belonging to public administration sector. So MSFI could be considered a potential functionality index since the model does not cover variables of process and outcome. The subsequent implementation of a similar outcome measure in the design phase may enable a more complete assessment of the weight of employees on the effectiveness and efficiency of the municipal administrations.

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