

Human resource indicators for strategic decisions on modern public research institutions

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Research subject and theoretical framework

Research institutions play a central role in modern national system of innovation in order to support current economic growth patterns. As these institutions are social entities that have been changing their organization by an institutional adaptation to environmental pressures caused by global economic downturn, it is interesting to analyze their structure by a demographic perspective in order to forecast the organizational behaviour and evolutionary change of their research personnel. The purpose of this paper is to analyze the internal demography of public research organizations, focusing the Italian public research bodies.

In fact, a main line of demographic research on organizations is called as internal organizational demography. Pfeffer (1983) defines demography as “the composition, in terms of basic attributes such as age, sex, educational level, length of service, race and so forth of the social unit under study...the demography of any social entity is the composite aggregation of the characteristics of the individual members of that entity”. Pfeffer also advances a number of specific theoretical prepositions about the causes and consequences of demographic phenomena in organizations. In particular, he focuses on the properties of demographic distributions of persons in the focal organization, especially the length of service (LOS) distribution of members of the organization. The heterogeneity in the LOS distribution should affect organizational outcomes, such as turnover. However, organizations are constructed social entities, not biological organisms. This fundamental feature of organizations has main implications for certain aspects of organizational demography. Some approaches of human and biological demography can be borrowed, others require to be accommodated to social nature of organizations.

Methodology

The elementary unit of the demography of organizations is the employee, i.e. researcher and technician. The dynamic nature of research personnel is represented by some graphs whereas, it is important to synthesise the research personnel trends by some indices such as average age of units, average age of hiring, number of hiring and an important index called index seniority (ISr):

$$ISr = \frac{Employees_{over50}}{Employees_{30-35}} \times 100$$

After that, the living function called lx and the retirement function dx , are represented as well as their curves respectively.

Main results

The main lessons learned by this demographic analysis applied to Italian CNR are:

- The greater number of research personnel operates in the Central part and North of Italy and it is older than South Italy and Islands;
- The average age of hiring is about 35 year over 1995-2004 for researchers, an old age considering that the high potential of researchers is when they are younger;

- Men personnel are older than female one, as well as technicians are an older population in comparison with researchers.
- In general, the number of hiring is lesser than retirement, except the 2001-2004 period;
- Current trend of research personnel is declining: in 1995 it was 7,451 units employees, whereas in 2005 is 6,945 research units. This declining trend is mainly due to -18.15% over 1997-2005 and -24.70% of administrative;
- Lexis points indicate the highest number of retirement within the research personnel of CNR: researchers have the Lexis point after the 2030, whereas technicians at 2015.

This internal demographic analysis based on some human resources indicators provides main results for modern public management in order to understand and predict the evolutionary and strategic change of the public research organizations over time.

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