

## EDITORIAL

### SKILLS AND HIGHER EDUCATION

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This special issue of *Statistica Applicata-Italian Journal of Applied Statistics* is dedicated to two particularly relevant aspects in today's socio-economic debate regarding higher education. A first group of papers investigates the effects of Human Capital (HC) and non-cognitive skills (NCS) on graduate knowledge and employability. A second group of papers discusses the national and international mobility of Italian graduates, also in connection to their NCS.

#### 1. HC, NCS, AND HIGHER EDUCATION

The first studies to explore the concept of HC appeared in the seventeenth century. Sir William Petty (1690) considered labour to be the "father of wealth," and argued to include its measure in the assessment of national wealth. For Adam Smith (1766), the acquired and useful abilities of members of a society also had to be included in the idea of capital.

However, the concept of HC changed radically in the second half of the twentieth century. Schultz (1959, 1961), Becker (1962, 1964) and Mincer (1958, 1974), from the University of Chicago introduced the model of rational choice in HC investment: the individual 'quantity' of HC is the result of the voluntary investment in acquiring skills and abilities made by the individual or by his/her family. Becker (1962,1964) suggested different sources of HC: on-the-job-training and education in school and university are the principal ways in which HC can be fostered.

Schultz's and Becker's approach opened the problem of measuring the value of acquired HC using the investment in education. HC was traditionally estimated

in literature through either a retrospective method or a perspective method. The first method (Kendrick, 1976; Eisner, 1985) is based on a microeconomic approach, and represents a measure of the cost of 'producing' a human being. This method is inadequate, because it does not take into account social costs, such as public investments in education, and does not consider the actual effects of the investment in HC on a household's income and wealth.

In the second approach, (Jorgenson and Fraumeni 1989, 1992), HC can be defined in a macroeconomic perspective as the present actuarial value of an individual's expected income related to his/her skills, acquired abilities, and education, weighted by the survival probability and net of maintenance costs (personal living expenses). This income-based approach is also inadequate, because it does not fully take into consideration the HC investment in education, and other investments.

A third method, the educational attainment macroeconomic approach (World Bank, 1995; United Nations, 2002; Wößmann, 2003), measures HC through variables of educational attainment (i.e., schooling, educational investment costs) and macroeconomic educational investments (i.e., educational infrastructures, educational expenditure per student, etc.), (see also Barro and Lee, 1996; Hanushek, 1996; OECD, 1998; Wößmann, 2003). The educational attainment method only provides a macroeconomic estimate of HC.

The OECD (1998) report offers the most modern definition of HC, designating it as "the knowledge, skills, competencies and attributes embodied in individuals that are relevant to economic activity." This definition suggests that HC is a multifaceted phenomenon, indirectly measurable by a set of attributes. This, in turn, implies that HC can be measured as a microeconomic individual-latent variable, starting from observed variables concerning both investment in general education and monetary returns during the life cycle.

Today, ample evidence indicates that personality characteristics, termed 'noncognitive skills' (Heckman and Kautz, 2012; Kautz et al., 2014; OECD, 2015) or 'soft-skills' and 'character skills' (Heckman and Kautz, 2012; Heckman et al., 2014; Kautz et al., 2014; OECD, 2015), also influence knowledge and job outcomes. To clarify these terms, it is useful to specify what is meant by Cognitive (CS) and Non Cognitive Skills (NCS). The traditional definition and estimation of HC presented above is strictly related to the measurement of CS, defined as those innate and acquired abilities and academic competences used to process information and solve abstract problems (OECD, 1998). They are usually measured with various forms of intelligence tests. On the other hand, NCS connote the idea that personality traits together make up the profile of the person, rather than being

isolated features of his/her behaviour (Luthans et al., 2004; Folloni and Vittadini, 2010).

Significantly, several authors affirm that NCS appear malleable to school and university attendance (Heckman and Kautz, 2012; Heckman et al., 2014; Kautz et al., 2014; OECD, 2015). Even though NCS are difficult to quantify, a wide literature reports their effects on acquired knowledge, health, risky behaviours, depression, employment and unhappiness, also using quantitative measures (West et al., 2016). Particularly, the field of personality psychology in the last thirty years can be used to describe and measure NCS. The so-called "Big Five" model identifies five distinct personality dimensions, usually indicated with the acronym OCEAN: Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism. Each of these dimensions indicates a cluster of mutually-related personality facets (Heckman and Kautz, 2012, Heckman et al., 2014; Kautz et al., 2014; OECD, 2015). They synthetically delineate the characteristics of personality which describe the possibility (or impossibility) of a real and effective relation with reality (Folloni and Vittadini, 2010).

Yet several authors suggest that NCS cannot be reduced to the Big Five traits. Attitudes and values, in fact, are other crucial aspects of NCS. They can be defined as "Psychological Capital," a concept that goes beyond human capital and is connected to capacities of confidence, hope, optimism, and resilience. It is measurable, open to development, and manageable for more effective work performance (Luthans et al., 2004; 2007, 2008). "Self-perceptions," including self-concept of ability (which refers to how the individual values his/her past performance on a task) and "self-efficacy" (Judge and Bono, 2001) (which measures his/her expectations about future performance), are also essential forerunners in the development of NCS. Another construct related to NCS is the "locus of control" (Avey et al., 2010, 2011), which defines the extent to which individuals believe they can exert some control over the factors affecting them. Finally, another two aspects that can be considered part of NCS are motivation, concerning the reasons that push people to engage with tasks, and learning personal orientation, the belief and propensity of individuals to increase their own ability (Youssef and Luthans, 2013).

Given these definitions, how, why, and to what extent do different aspects of NCS determine knowledge and the employability of graduates? A few studies answer these crucial questions, which still need to be broadly studied under the socio-economic and statistical profile.

In their study, "Development of Two Scales for Measuring Academic Psychological Capital and Locus of Control in Fresh Graduates," Egidio Robusto, Roberta Maeran, Daiana Colledani, Pasquale Anselmi, and Manuela Scioni propo-

se a new way to measure the psychological capital and locus of control of new graduates. Examining the effect of psychological capital and locus of control, they found a direct and significant relationship with the occupational status of respondents, and with their entrepreneurial disposition.

The paper "Psychological Capital and Locus of Control as Determinants of Graduate Employability Beyond Human and Social Capital," by Luigi Fabbris and Marco Fornea, discusses the dimensions of psychological capital and locus of control and their influence on graduate employability. They demonstrate how psychological factors can explain graduate employability more accurately than does just an examination of the traditionally-measured effects of human capital and social resources.

The paper "The Value of the Personal Skills of New Graduates in the Recruitment Process: A Conjoint Analysis Case Study in Lombardy," by Paolo Mariani, Andrea Marletta and Mariangela Zenga, gathers information about procedures used to inform entrepreneurs' choice in hiring practices, based on the personal characteristics of graduates in the recruitment process by the human resource assistant. The analysis shows differences in layering factors, suggesting that for distinct subsets, certain competencies are more valued than others.

In the study, "Educational Qualifications Yields as Employment Risk: An Empirical Analysis on the Horizontal Inequality," Ivano Bison, Maria Michela Dickson, Giuseppe Espa, and Flavio Santi analyse horizontal inequalities not only in socio-economic terms but also on personal skills, tendencies, and preferences. The authors demonstrate that these initial differences among university students explain a larger portion of the inequalities in the labour market, both in terms of wages and in terms of employment risk.

Finally, the paper "Online Job Vacancies in the Italian Labor Market," by Ilaria Vannini, Daniela Rotolone, and Cristian Di Stefano, analyses online job vacancies that take into account personal characteristics such as autonomy, availability, dynamicity, result-orientation, ability to speak and persuade, and vision, linked to NCS. The authors demonstrate a methodology that is able to analyse internet job recruitment in a more nuanced way than is possible through standardised job descriptions.

## **2. MIGRATION AND HIGHER EDUCATION**

The second topic explored in this special issue dedicated to higher education is the phenomenon of graduates who migrate for work, which is often linked to the non-valorisation of their HC and NCS by local job markets.

In a series of empirical studies and modelling of European youth migration

phenomena, Triandafyllidou (2012, 2015) suggests that, given the existing imbalance of employment and unemployment in different EU member states, the phenomenon of young people migrating to work in states where they can find jobs matching their qualifications and aspirations, could be considered a redistribution of the different countries' labour markets. This redistribution helps the crisis-weakened countries to decrease the pressure on the labour market. At the same time, highly-qualified migrants have a positive impact on the shortage of skilled labour and the ageing society of North-Western Europe. Recently, an historical perspective notes that the mobility of higher-skilled HC is strongly connected with the specific historical time of the economic development of the target area and its contextualization in geo-global level. HC can therefore be seen "on the move" in relation to specific geographical horizons typical of the historical period we are living in and of the phase of global economic development in place (Chiswick and Meller, 2010).

However, each individual's story, as well as their innate and acquired NCS, have resulted in different levels of propensity to mobility. Indeed, their youth background, social class of origin, training choices, learning experiences and, more generally, NCS altogether, determine their propensity to migrate and, at the same time, influence business results that could be obtained. It is a typical problem of bias generated by a self-selection mechanism.

In some cases, migration is a temporary phenomenon and people only stay in the host country for a short period of time. This case can be considered profitable for both countries, as the brain drain is tempered. Young and highly-skilled circular/temporary migration from Southern Europe can be seen as a chance through which Europe grows together and European integration is carried further. Therefore, the high-skilled individuals who do not permanently emigrate, have to be investigated, taking into account the relationship of their NCS, and the choice of temporarily going abroad to work.

In this context, the paper "Motivations to Mobility of University Students of Campania in South-North Migration Perspective," by Francesco Santelli, Concetta Scolorato, and Giancarlo Ragozini, analyses the migration flows of university students from Campania who move to other regions to complete their higher education. The authors show that the personal motivations connected to students' NCS determine their forced-type, anticipatory, "university prestige" migrations.

Massimiliano Giacalone, Demetrio Panarello, and Raffaele Mattera present the study, "Education and Migration: The Mobility Dynamics of Italian Graduates," where they show that graduates' migration dynamics have changed after the new worldwide financial crisis. The authors demonstrate that not only family background and economic factors, but also life experience and NCS explain the graduates'

willingness to move, above all from southern Italy.

In the last paper of this thematic issue, "Italian Graduate and International Mobility: A Potential Outcome Model Applied to AlmaLaurea Data," Furio Camillo, Giorgio Vittadini, and Sara Binassi argue that in order to investigate and correctly measure the monetary benefits obtained when graduates migrate, we have to assess their individual characteristics. Socio-economic backgrounds, learning experiences, as well as their life stories and NCS also contribute to their propensity to migrate, and have an impact on the possible outcomes.

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