Chapter 10
Comparison of Input and Output Indicators in Measuring Human Capital:
An Analysis at Provincial Level for Turkey

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ABSTRACT

Despite the intensive research on human capital, the debate regarding its measurement is ongoing. In this context, the objective of the present study is to underline the distinction between input and output indicators in human capital measurement, which has not attracted sufficient attention, and to present the importance of indicator selection by explaining the findings obtained. To that end, separate indexes will be developed for input and output indicators to measure the level of human capital for Turkey, and it will be analyzed whether the two index groups developed exhibit significant differences between provinces. In accordance with the purpose of this study, index estimations are made using the PCA method with the 2013 data of 81 provinces in Turkey. Province-based estimations demonstrate that the index values estimated by the input and output indicators produce significantly different conclusions. Therefore, selecting appropriate indicators according to the purpose of the study will enable the analyses to produce more accurate policy implications.

INTRODUCTION

Because human capital is a multi-dimensional concept, it is difficult to find an appropriate single indicator to represent it as a whole. Studies in the relevant literature focus on the dimension of education and often use the indicators of enrollment rate or average years of schooling as proxies. Although education has a key role in the formation of human capital, focusing merely on a single proxy results in the omission of other dimensions of human capital, which may make it more difficult to see the actual effect of human capital. Thus, it would be more appropriate to create a composite indicator from indicators that

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reflect the sub-dimensions of human capital and to use it as a proxy for human capital (Fraumeni, 2008; Dreger, Erber & Glocker, 2009; Furceri & Mourougane, 2010).

An important consideration related to human capital is that the variables used in measuring the level of human capital are categorized as input and output indicators. Input indicators include indicators such as investments that aim to enhance the level of human capital. Although input indicators are a good fit for representing the investment in the level of human capital, they might not fully reflect the current level of human capital. Output indicators are indicators that reflect the current level of human capital, in other words, the level that has been realized rather than the level expected to be realized. However, many studies select indicators without paying attention to this distinction. In empirical studies, the dataset selected significantly affects the results of the study. Numerous studies have remarked that analysis results vary depending on indicator used for measuring human capital.

In this context, the objective of the present study is to underline the distinction between input and output indicators, which has not attracted sufficient attention, and to present the importance of indicator selection by explaining the findings obtained. To that end, separate indexes will be developed for input and output indicators to measure the level of human capital for Turkey, and an analysis will be conducted regarding whether the two index groups developed exhibit significant differences between provinces. Because the education and health policies of countries have intrinsic differences, the appropriateness of cross-country comparisons should be debated further on this subject. It is thought that cross-regional analyses will be appropriate because countries have unitary policies regarding, e.g., education and health. In accordance with the purpose of this study, index estimations are made using the PCA method with the 2013 data of 81 provinces in Turkey.

The study is structured as follows: The introduction section explains the importance of the subject, the objective of the study. The second section briefly summarizes the development of the concept of human capital in the economic literature. The third section summarizes the relevant literature on the measurement and definitions of human capital. The fourth section gives brief information about principal component analysis (PCA), which is the empirical methodology employed in the study. The fifth section presents the indicators, discusses the main findings, and attempts to develop proposals in line with these findings.

BACKGROUND

The Importance of Human Capital

For a long time, the concept of human capital did not draw the attention it deserves in the economic literature. One of the underlying reasons it was overlooked was that before and during the initial phases of the Industrial Revolution, the basic qualities of the labor force were sufficient for the conditions of production at the time. Under those conditions, which could be described as primitive, there was no need to address matters related to the quality of labor. Additionally, labor was relatively homogenous in terms of quality as almost all labor was rural and low skilled in that period. Thus, studies in the economics literature long considered labor quantitatively and did not take into account the quality of labor (Folloni & Vittadini, 2010). However, there were a few significant studies on the importance of the quality of labor in that period, although they did not draw much attention.

It was Petty (1690) who first emphasized the economic importance of human beings in the 17th century, although he never used the term human capital. Petty (1690) regarded labor as the father of wealth,