

Estimating Human Development Index of Iranian Provinces and Investigating its Impact on Economic Growth Using Fuzzy Logic

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Abstract:

For the United Nations, the overriding goal is to improve the quality of human life. Accordingly, the Human Development Index has been introduced by this organization as a measure of quality of life. The Human Development Index is a pure composite index that measures the average success of a country on three basic benchmarks of development: health, health, education and economic welfare. In this paper, the human development index (without oil) for the provinces of Iran in 2005, 2010 and 2015 based on the United Nations method. According to the results, the highest and lowest human development indices of provinces in 2005, 2010 and 2015 were 0.733, 0.751 and 0.769 for Tehran province and 0.595, 0.539 and 0.631 for Sistan and Balochistan province, respectively. After Sistan and Baluchistan, the provinces of Kurdistan, North Khorasan, Kohgiluyeh and Boyer Ahmad, and Lorestan have the lowest human development index among Iran's provinces. The data show that the average human development of provinces in the country has increased by 3% between 2005 and 2010, while it has decreased to 0.5% between 2010 and 2015. Another result of this study is the impact of human development on the economic growth of provinces using Fuzzy Mamdani method. Implementation of the second and third laws of the fuzzy rules has shown the positive impact of human development index on economic growth as the output of the provinces fuzzy system. An examination of the components of human development indicators shows that the most important factor in the slowdown in human development is the negative growth of provincial per capita income between 2005 and 2015. In the meantime, the per capita income of the provinces has fallen by an average of about 20%. Careful examination of

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the findings shows that the provincial education index is a strong point of provincial human development index as it has increased from 0.577 in 2005 to 0.736 in 2015, which indicates that good developments have taken place in recent years and that education has been constantly improving. Given that the pace of improvement in human development has been modest in the years 2010-2015, it is necessary for national planners to focus on investing in education and health, which are important components of development. Also, to improve the living conditions of the provinces with low human development indexes and more poverty and deprivation, more attention should be paid to investing in education and health in these areas to increase per capita income and employment, which would reduce poverty and deprivation measures that can ultimately lessen regional and inter-provincial inequality in the country. It is also conceivable that during the past three decades the government and development planners have identified various underprivileged and underdeveloped areas in line with the findings of this paper. However, despite the authorities' attention to these areas, no significant change has been observed in the socio-economic status of these provinces, perhaps due to a one-dimensional look at the issue of development and making blind investments in these areas. Another result of this study is the impact of human development on the economic growth of provinces using Fuzzy Mamdani method. According to fuzzy rules designed in MATLAB software, the impact of human development index on economic growth of provinces is determined. Implementation of the second and third laws of fuzzy rules has shown the positive impact of human development index on economic growth as the output of the provinces fuzzy system. Careful examination of the findings shows that there is little to no relationship between human development and economic growth prior to the level of human development, while there is clearly a positive relationship afterwards.

JEL classification: O15, I15, I25, P30

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