

Government Size and Human Development: Quadratic Regression Approach

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Abstract

This paper uses quadratic regression model to study whether a non-linear relationship between government size and HDI exists in Iran. The results indicate that a nonlinear relationship exists between government size and HDI. We have used “government consumption expenditure share in GDP” as the government size variable. Results indicate that when the government size is smaller than the regime, HDI is promoted under expanding government expenditure, but if the government size is larger than the regime, then the HDI decreases.

Keywords: Human Development, Government Consumption Expenditure

1. Introduction

Discussion of the role of government in the economy frequently focuses on GDP and/or GDP growth as the criterion for “good government.” Following the work of Davies (2006_2009), we alter the focus of the discussion by utilizing social development as the criterion for good government. I use the United Nations Development Programmer’s Human Development Index (HDI) as the measure of social development. While per-capita GDP is correlated with, though does not directly measure, longevity and education, the HDI directly measures per-capita income, longevity, and education. Further, while GDP measures productivity in the aggregate, the HDI reflects the types of goods and services that constitute GDP.

Human development is the prerequisite of long-term and constant growth, and any country needs a threshold of human development to attain economic growth. This is what distinguishes human development from human capital in growth models; since modifications in human capital is necessary for economic growth while the level of human development determines the direction of constant growth for society. As a result government policies should improve human development which is necessary for constant growth.

Armey (1995) popularized the existence of an optimal size of government as depicted by the Armey curve. Whereas the Laffer (2004) curve illustrates the existence of a tax rate that maximizes tax revenue. Barro (1990-1991) revealed that large government size result in the decline of economic growth. Diamond (1998) proud that in development countries, government size has a positive effect on economic growth, but for developed countries it has a negative one. Heitger (2001) declare that an increase in government size lead to an increase in consumption ultimately, an increase in economic growth. Folster & Henrekson (2000) came up with the conclusion that for developed countries there is a negative correlation between government size and economic growth. Niloy Bose (2003) suggested that for developing countries, current expenditure has no effect on growth; however, government expenditure investment has a positive effect on growth. Antony Davis (2009) stated that for countries with low income, an increase in the consumption expenditure of government causes an increase in HDI and for all the selected countries 13 present of the investment expenditure leads HDI to its maximum while 17 present of the consumption expenditure makes the HDI maximum. The UNDP shows growth goals with different economic, social and political indices. Development is for humankind; as a result, if an economy is developed while the people of the nation make no benefit from it, the development will indeed be worthless.

Before 1970's economic development was calculated regarding the per capital income. With such an index, economic growth was considered the axis of growth. The basic drawback of this view is its lack of attention to the concept of justice in possessing equal opportunities. Due to this drawback, development scholars defined human development which underpins basic requirements. The concept of human development is generally based on Aristotle's logic declared two thousand years age, wealth is not what we pursue, because it is just used to obtain what we want. This view has its roots in Amortises capabilities view which includes ``the ability of a person to have different choices and attaining similar welfare``. In fact human development maintains this basic view that the improvement of human communities cannot be we rely worked out by per capital income, but the prerequisite of a better life is the development of talents and sanity as well as having higher income.

The human development index is a criterion for human development. This was first declared by the UNDP in 1990 which was comprised of:

- 1) Longevity which is estimated by life expectation at birth:

$$\text{Life Expectancy Index (LEI)} = \frac{\text{Life Expectancy} - 25}{85 - 25} \quad (2-1)$$

- 2) Availability of education which includes the level of adult's literacy with the coefficient of 2/3 and the commutative level of registry in all learning levels with the coefficient of 1/3:

$$\text{Education Index (EI)} = \left(\frac{2}{3}\right)(\text{Adult literacy rate}) + \left(\frac{1}{3}\right)(\text{Gross enrollment ratio}) \quad (2-2)$$

- 3) Acceptable and standard living which is estimated by per capita gross domestic product according to purchasing power party:

$$\text{GDP Index (GDPI)} = \frac{\ln(\text{GDP}) - \ln(\text{Minimum GDP})}{\ln(\text{Maximum GDP}) - \ln(\text{Minimum GDP})} \tag{2-3}$$

The human development index is then calculated as the average of the three mentioned indices:

$$\text{HDI} = \left(\frac{1}{3}\right)(\text{LEI}) + \left(\frac{1}{3}\right)(\text{EI}) + \left(\frac{1}{3}\right)(\text{GDPI}) \tag{2-4}$$

Index calculations are based on a priori standards of what constitutes “maximum” and “minimum” attainable levels. As these standards can change over time, HDI figures are not directly comparable across publication years. To achieve consistency across time, for each publication year, the UNDP recalculates the HDI for all countries from the inception of the HDI to the current year using the current year’s index calculations.

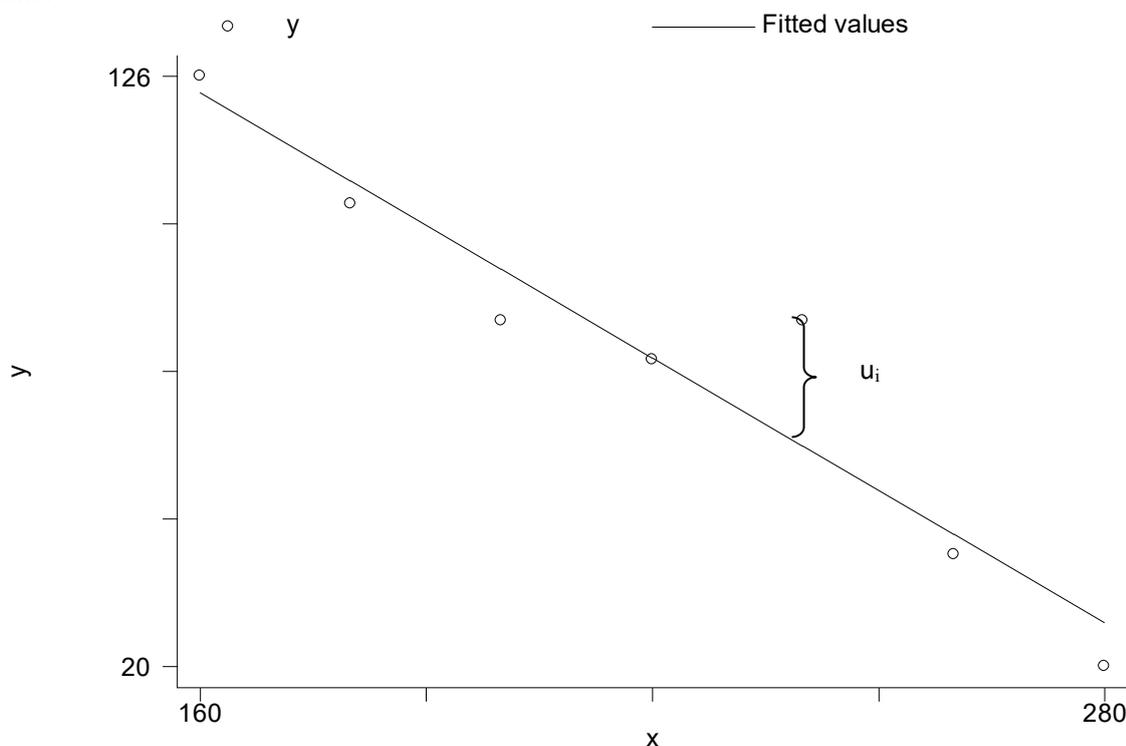
2. Model Specification

We have used the following model for considering the effect of government size on human development indicator (HDI):

$$\text{HDI} = C(1) + C(2)GS + C(3)GS^2 + e_t \tag{1}$$

Regression (1) is a traditional linear economic growth model. **The Ordinary Least Squares (OLS) regression procedure will compute the values of the parameters β_1 and β_2** (the intercept and slope) that best fit the observations.

We want to fit a straight line through the data, from our example above, that would look like this:



Obviously, no straight line can exactly run through all of the points. The vertical distance between each observation and the line that fits “best”—the regression line—is called the error. The OLS procedure calculates our parameter values by minimizing the sum of the squared errors for all observations.

2-1.Data Description

The recent socio-economic history of Iran has been subject to the past and political-strategic volatility of the region. Iran has not experienced a relatively free market economy due to the share of oil revenue at large. We have intended to use the annual data from 1959 to 2005 available on the Website database of the Central Bank of Iran (CBI).¹

Table 1- Basic Statistic about Government Size during 1959-2006

Year	GSC(%)
1960	0.0472
1965	0.0613
1970	0.0771
1975	0.1597
1980	0.0886
1985	0.0507
1990	0.0435
1995	0.0696
2000	0.0439
2005	0.0909
2006	0.0932
Mean	0.0697
Stn. Dev	0.0303
Min.	0.0284
Max.	0.1632

Source: Computed based on the data from CBI.

3. Empirical Results

This paper uses quadratic regression model to study whether a non-linear relationship between government size and HDI exists in Iran.

Table 2- HDI and Government Size

Variables	Coefficient	P-Value
Interception	0.87	0.06
<i>GS</i>	0.43	0.02
<i>GS</i> ²	-0.28	0.03
R²	0.74	

¹ . The web site of central bank of Iran. (2009). www.cbi.ir

Results indicate that the threshold government size is 0.15. If government size less than 0.15, government size has a positive impact on HDI. If the government size more than 0.15, government size has a negative impact on HDI.

4. Conclusion

Human development is the prerequisite of long-term and constant growth, and any country needs a threshold of human development to attain economic growth. This is what distinguishes human development from human capital in growth models; since modifications in human capital is necessary for economic growth while the level of human development determines the direction of constant growth for society. As a result government policies should improve human development which is necessary for constant growth.

We have used the quadratic regression model for considering the effect of government size on human development indicator (HDI). Results indicate that the threshold government size is 0.15. If government size less than 0.15, government size has a positive impact on HDI. If the government size more than 0.15, government size has a negative impact on HDI.

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