

Effect of Language in Economic Growth Emphasizing English language

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Abstract: *This paper aims to analyze the effect of language on economic growth. Linear regression models with ordinary least squares method have been used for the analysis in which the dependent variable of Gross Domestic Product (GDP) per capita is decided according to real price and independent variables are Living languages Count, Diversity Index and average of IELTS overall scores. For control variables, we use different continent such as Africa, Asia, Latin and South America and European countries as dummy variables. The cross-country data of this research are provided and calculated in a sectional manner according to the information and statistics of the World Bank, IELTS Researchers and Ethnologue site for the year 2012. The results of this research are demonstrative of the positive and negative statistically meaningful influence of the all variables of this study on the economic growth.*

Keywords: *Economic growth, Language, Economic wide country studies*

Classification JEL: *O40, Z10, O50*

Introduction

The part that language might play in economic growth has long intrigued scholars from various disciplines. However, no clear story has emerged from the investigations published to date, and the empirical evidence remains inconclusive (Nettle,2000). The very existence of such a link is not self-evident, and most economic analyses, including those in the field known as development economics, tend to assume language away on the grounds that the economic processes at hand, being universal, transcend linguistic variables. It is only in recent years that 'culture', which, as an explanatory variable, had largely been relegated to the fringes of development economics as merely contextual, has been allowed to drift back near the center of the field. Typical recent examples include work by Nobel laureate George Akerlof (Akerlof and Kranton,2000) on the relationship between economics and identity, or the study of the role played by religiosity in economic growth (Barro and McCleary,2003).

The distinct question of whether languages differ from one another in the ways in which they affect development, and then if one particular language, such as English, influences development in specific ways, can only be addressed in a second stage, after the previous set of questions has been dealt with. In this study, we develop an approach connecting 'language' as

an independent and ‘growth’ as a dependent variable, with a special emphasis on English.

We define ‘growth’ in a mainstream sense, focusing on relatively macro-level indicators, even if the methodology is, in the main, rooted in applied micro economics. Our chief indicator of growth is GDP per capita. However, our main concern is on establishing the plausibility and magnitude of a link between language on the one hand, and growth on the otherhand. There are many ways to define economic growth. In the empirical work that follows, we adopt the simplest convention of confining our attention to GDP per capita.

Since the mid-1960s, however, a small field of specialization has emerged, under the label of “economic of language” precisely to explore these neglected questions. Much of this literature studies the effect of language skills on labor income or proposes economic approaches to the selection design and evaluation of language policies (see Vaillancourt, 1985, Lamberton, 2002 or Grin, 1996, 2003, 2010 for surveys). However, the subfield of development economics has traditionally paid little attention to language, although linguists have often suggested that language must play some part in development (for a recent discussion, see Seargeant and Earling, 2011), sometimes in its capacity as a tool for communication, but more frequently as a key element of culture (Chaudenson and de Robillard, 1990; Abou and Haddad, 1997). Let us begin by briefly considering the strand of literature that examines the effects of ethnic, linguistic or cultural ‘fragmentation’ on economic performance, such as Easterly and Levine (1997), Lian and Oneal (1997) or Alesina and La Ferrara (2005). Typically, these authors use an aggregate measure of ethnic, linguistic or cultural diversity, such as the Greenberg index of diversity¹ and examine its statistical relationship with GDP per capita. Upon finding a negative relationship, they conclude that societal multilingualism is detrimental to economic performance.

While acknowledging that language barriers may restrict international trade, Noguera and Siscart (2003) conclude that this effect is considerably weaker than asserted by other authors in earlier work; Ku and Zussman (2008) use data that on second-language skills showing that acquiring a foreign language (in their case: English) ‘can mitigate the impact of historically determined language barriers’. However, given the empirical evidence that we present below, we believe that we have uncovered a central fallacy in the arguments of those who hold that diversity is necessarily a fetter on economic growth and development.

The aim of this study was to analyze the effect language on the economic growth of the countries, where the dummy variable of the Africa, Asia, Latin and South America and European countries is also used as a control variable.

¹. The diversity index proposed by Greenberg in 1956 often called the ‘A-index’ in the literature is equal to one minus what economists call the Herfindahl index.

Data and Analysis Method

Data

In the current study the gross domestic product per capita has been calculated for 2012 year in real price based on the World Bank information². The GDP per capita has been used as a dependent variable in the regression. The number of the countries participated in the estimation of regressions was 72 according to the availability of information and data. The data regarding the Living languages Count, Diversity Index and average of IELTS overall scores, was obtained from the information and statistics of the World Bank, IELTS Researchers and Ethnologue site for the year 2012. Four dummy variables have also been used in this study by region countries such as Africa, Asia, Latin and South America and European countries.

Analysis Method

In order to measure the Language in this study, Living languages Count, Diversity Index and average of IELTS overall scores indices have been used in linear regression models with sectional data and ordinary least squares method that are shown as follows:

$$Q_i = \alpha + \beta_1 LLC_{1i} + \beta_2 DI_{2i} + \beta_3 I_{3i} + \beta_4 D_1 + \beta_5 D_2 + \beta_6 D_3 + \beta_7 D_4 + u_i(1)$$

Where, Q_i = LN GDP per capita in real price for the i th country, LLC_{1i} = LN Living languages Count for the i th country, DI_{2i} = LN Diversity Index for the i th country, I_{3i} = average of IELTS overall scores for the i th country, D_1 = dummy variable for African countries, D_2 = dummy variable for Asian countries, D_3 = dummy variable for Latin and south American countries, D_4 = dummy variable for European countries.

Given that in many studies based on cross-country data heteroskedasticity problem occurs, in the current study White test has been used, in Eviews program, in order to identify the occurrence of heteroskedasticity, which is one of the methods for heteroskedasticity identification. This test uses a secondary regression in which, in addition to the model variables, the squares and productions of the independent variables are also used and the F-statistic is also extracted. If F-static probability is smaller than 5%, the hypothesis of the non-existence of heteroskedasticity is disproved. This test was run for the model that the hypothesis was proved in equation (1). In other words, the heteroskedasticity problem was not found in the equation. In the current study, in addition to the foregoing test, Wald test was also used for the insertion of limitation on the regressions coefficients. In this test, by replacing zero for the coefficient of each variable its presence or its absence is approved. In equation (1) given the F-statistics and χ^2 the Wald test result that is below 5%, the hypothesis of the zero equivalence of all the coefficients is

². <http://www.world-bank.org/data/wdi2010/index.htm>

disapproved in the equation. In other words, the presence of all of the variables in the regression equation is approved.

Results

The results of this research are represented as two separated descriptive and analytic results in the following.

Descriptive Results

The descriptive information concerning the under study samples and the coefficients used in equation (1) have been shown in Table 1.

Table1. The descriptive information of the coefficients used in equation (1)

| Variables | Equation (1) | | | |
|---|--------------|-------|----------|----------|
| | Max | Min | Average | Std. |
| GDP per capita In us dollars | 153042 | 343 | 20838.31 | 25880.56 |
| Living languages Count | 707 | 2 | 64.40 | 117.47 |
| Diversity Index | 0.97 | 0.004 | 0.40 | 0.29 |
| Average of IELTS overall scores | 6.9 | 4 | 5.9 | 0.67 |
| Dummy variable for African countries | 1 | 0 | 0.19 | 0.39 |
| dummy variable for Asian countries | 1 | 0 | 0.20 | 0.40 |
| dummy variable for Latin and south American countries | 1 | 0 | 0.19 | 0.39 |
| dummy variable for European countries | 1 | 0 | 0.41 | 0.49 |

As the information in table 1 shows the average of African countries and Latin and South American countries is 19 percent in equation (1). The average of Asian countries is also 20 percent and the average of European countries is also 41 percent. As data of 72 countries show the mean Living languages Count is 64.40, the average GDP per capita is 20838.31, and the average of Diversity Index and IELTS overall scores is 0.40 and 5.9, respectively. The maximum amount of per capita GDP in 2012 is 153042 belonging to Monaco. The minimum amount of per capita GDP is 343 belonging to Niger. The maximum Living languages Count is 707 related to

Indonesia and its minimum is 2 belonging to Bermuda and Iceland. The maximum amount of Diversity Index is 0.972 belonging to Cameroon and its minimum is 0.004 for Rwanda. The maximum amount of IELTS overall scores is 6.9 belonging to Malaysia and Bulgaria and its minimum is 4 for Mongolia.

Analytic Results

The estimation results of equation (1) have been shown in table 2.

Table 2. The estimated results of equation (1), dependent variable: LN GDP per capita

| variables | Estimated coefficients |
|---|------------------------|
| LN Living languages Count | -0.486** (-0.092) |
| LN Diversity Index | 0.064** (0.381) |
| LN average of IELTS overall scores | 3.326** (0.130) |
| Dummy variable: | 7.091** |
| African countries | (1.015) |
| Asian countries | -1.931* (-0.341) |
| Latin and south American | 0.745** (0.127) |
| European countries | 0.584** (1.547) |
| Interaction effects among variables: | -0.742* |
| Dummy variable of African countries * LN average of IELTS overall scores | (-0.144) |
| Dummy variable of Asian countries * LN average of IELTS overall scores | 0.746* (0.156) |
| Dummy variable of Latin and south American countries * LN average of IELTS overall scores | 0.50* (0.011) |
| Dummy variable of European countries * LN average of IELTS overall scores | 0.388* (0.091) |
| Dummy variable of African countries * LN Living languages Count | -0.752** (-0.142) |
| Dummy variable of Asian countries * LN Living languages Count | -0.089** (-0.017) |
| Dummy variable of south American countries * LN Living languages Count | 0.341** (0.064) |
| Dummy variable of European countries * LN Living languages Count | 0.052** (0.010) |

| | |
|----------------|-------------------|
| | 0.485 |
| Adjusted R^2 | 0.343 |
| F -statistic | 3.425*** |
| N | 72 |
| Intercept | 2.534* (0.124) |

***Meaningfulness probability at 1% level, **meaningfulness probability at 5% level, *Meaningfulness probability at 10% level

a- The numbers inside brackets represent the β coefficient for each variable- The numbers inside parentheses represent the t-statistic for each variable

As shown in Table 2, estimated results of this study are as follows: The language variables, is shown in this model has created a statistically significant effect on economic growth. So that a 1% increase in Living languages Count, assuming all other conditions remain constant causes 0.48 % decrease in economic growth. When the living language count is more, nation unity is in danger in one country. And possibility of disintegration and the declaration of independence by every nation are more too. This work just increase expenses and decrease the economic growth.

There is a statistically significant positive effect of Diversity Index on economic growth. So that a 1% increase in Diversity Index, assuming all other conditions remain constant, caused 0.06 % increase in economic growth. Every language due to one culture, then more language causes more culture. Diversity in culture increase social capital, and the last increase economic growth.

There is a statistically significant positive effect of average of IELTS overall scores on economic growth so that a 1% increase in average of IELTS overall scores, assuming all other conditions remain constant causes 3.32 % increase in economic growth. We know English is the international language and every more person that learn it knowledge exchanged be easier in the world, and causes to increase education. Then education is the one of effective variables on the economic growth.

In this study, four dummy variables for Africa, Asia, Latin and South America and Europe are used. Dummy variable coefficient for Asian countries is negative and statistically significant at the 10% level, calculated as -1.93. Dummy variables coefficient for African, Latin and South American and European countries is 7.09, 0.74, 0.58 respectively, which is positive and statistically significant at the 5% level. Multiplicative coefficient (interaction) of dummy variable of African countries * average of IELTS overall scores is 0.74, which is negative and significant at the 10% level. The interaction coefficient of the dummy variables of Asian, Latin and South American and European countries * average of IELTS overall scores is 0.74, 0.50, 0.38 respectively, which is positive and significant at the 10% level. In this study we see average of IELTS overall scores in Asian, Latin and South American and European countries increase

GDP per capita, the result can show, movement to the economic growth started in this areas even it reach to consolidation phase in Europe. Every little movement to the front, in this areas, increase economic growth, but basic effective variables on economic growth still doesn't equilibrate in African countries. Although average of IELTS overall scores grow up in African countries, other original variables are prior, such as government income, health, technology and ...

Interactive coefficient of dummy variables of African and Asian countries * Living languages Count is 0.75, 0.08 respectively which is negative and significant at the 5% level. The interaction coefficient of the dummy variables of Latin and South American and European countries * Living languages Count is 0.34, 0.04 respectively, which is positive and significant at the 5% level. Living language multiplicity decreases the GDP in Asia and Africa but increases the GDP in America and Europe. These results could be indicative of hadn't any harmony in the languages. And cultures are far from of each other in African and Asian countries, then they didn't reach to high growth. But economic and political stability happen in American and European countries and languages of this area are closer to each other, then increases of living language count can raise the economic growth.

Conclusion

In this paper, the effects of language on economic growth of 72 selected countries have been examined in 2012. The results show that, Diversity Index and average of IELTS overall scores in all countries had positive and significant impact on economic growth. But Living languages Count in all countries had negative and significant effect on economic growth. With use of dummy variables we had different results, for example the variable of IELTS overall scores in Asian, Latin and South American and European countries had positive and significant impact on GDP per capita, but this variable in African countries had negative and significant effect on GDP per capita. However, variable Living languages Count in Latin and South American and European countries had positive and significant impact on GDP per capita, but this variable in African and Asian countries had negative and significant effect on GDP per capita.

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