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Index of Economic Freedom, Religion and Female Literacy in Sub-Saharan Africa

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Abstract: Because female literacy contributes to the economic condition in sub-Saharan Africa, it is important to examine the role of index of economic freedom and religion on female literacy. By index of economic freedom, we mean an index that measures the extent to which individuals are free to engage in voluntary transactions. Using cross-sectional data of 33 sub-Saharan African countries, this paper examines: (a) the impact of index of economic freedom on female literacy, and (b) the influence of religion on female literacy. Using ordinary least squares (OLS) regression analysis, the study found that the index of economic freedom was positively related to female literacy at a 10 percent significant level. Religion was found to be negatively related to female literacy at a 1 percent level of significance.

Keywords: Economic freedom; Religion; Female literacy; Sub-Saharan Africa.

1. Introduction

Female literacy has always been a global phenomenon, especially in sub-Saharan Africa. Although female literacy has improved somewhat in some sub-Saharan African countries, there are still large numbers of Africans residing in rural regions that cannot read. According to Meier and Rauch (2005), significant disparities in educational opportunities persist both in enrollment numbers, which capture educational flows, and in average years of schooling, which captures the stock of education among the public. According to Okpala and Okpala (2009), this disparity is more pronounced among rural residents because of the lack of educational opportunities that exist, especially for women in many sub-Saharan African nations. A lasting observation about female literacy in any country is that it does help in the transformation of people from being passive citizens to active people. According to Psacharopoulos (1991), education increases the opportunity cost to a woman staying at home and induces her to participate in the labor market. This makes it possible for her to contribute to the overall growth of the economy. An average educated female worker is more aware of employment opportunities elsewhere, and may be more willing to migrate.

Human capital theory has given economic researchers the basic framework for studying and analyzing the demand for education from the viewpoint of social and private rate of returns. Mincer (1962) and Becker (1964) were the first to analyze the subject. According to Psacharopoulos (1991), the economic impact of literacy to any society can be observed from both the micro and the macro levels. Actions taken in any society to improve literacy rates are regarded as investments that do contribute to the empowerment of human capital. This contribution could be for the individual or for the country at large. In a simplified form, the rate of return to investment in literacy rate R can be specified as

$$R = (Y_{ed} - Y_{ue}) / (N(Y_{ue} + C_t));$$

where Y_{ed} and Y_{ue} refer to the mean income of workers who are educated and uneducated respectively. N is the number of years of schooling that it takes for someone to become literate, and C_t is the annual cost of keeping someone in school. Returns on investment in education related activities are much more extensive in developing nations than are observed in advanced nations. This is especially noteworthy if the extended family system exists, which is usually the case in most sub-Saharan Africa exists. When a family member acquires more financial assets, he helps other less fortunate members of the extended family.

From a macro point of analysis, investments in education do result in economic growth, measured in terms of the Gross Domestic Product (GDP). A standard production function can be expressed as $Y = K^\alpha (AL)^\beta$; Where Y represents the overall output of the economy. K represents the stock of both human and physical capital, A and L are the productivity of labor and labor respectively. The contributions of K and L can also be further expressed as:

$$G_y = (W_k \cdot G_k) + (W_L \cdot G_L) + F,$$

Where G_y is the growth rate of total output; G_k and G_L are growth rates of capital stock and labor force respectively; W_k and W_L are the returns to capital and shares in total income of wages respectively; and F is the rate of change in total factor productivity, which improves with education.

There is a broad recognition that female education is extremely essential to the overall economic and social development of any society. These broad improvements are usually referred to as externalities – which include improved self-confidence that can lead to empowerment and self-esteem. Evidence shows that education improves the productivity and health care of the poorest person. According to Browne *et al.* (1991), education is the key to the overall progress of human-centered development. When the focus is solely on educating men, the associated failure with female illiteracy reduces the potential benefits of educating men. Education should be the priority of all, especially the education of women, because of their roles in household production activities.

Because female literacy contributes tremendously to the overall sub-Saharan economy, it is important not only to re-examine the role that religion may play on female literacy, but also to examine the impact that the index of economic freedom (IEF) will have on female literacy. By (IEF) we are referring to the degree by which the policies and institutions of a given sub-Saharan African nation are supportive of economic freedom. This study is motivated by the overwhelming importance of the implications that female literacy have on the economy. Given these facts, the paper will try to focus and answer two very important research questions: (a) What is the role of religion on female literacy, and (b) How will the degree of economic freedom in sub-Saharan Africa impact female literacy rates development.

2. Methodology/Data

To address the research questions, the study used a cross-sectional data of 40 sub-Saharan African countries. The data used in this study was obtained from two separate sources. The first data source was from the Free the World.com, a web site for Economic Freedom Network. The second data sources were from CIA World Facts Book, 2014 volume, and UNESCO Institute for Statistics 2015. The paper uses the Ordinary Least Squares (OLS) regression methods of analysis to answer the research questions. Cross tabulation analysis was also employed to highlight some unique and major characteristics of the data.

2.1. Dependent Variable

Female Literacy (FL): This entry includes a definition of female literacy and Census Bureau percentages for females only. All rates are based on the most common definition - the ability to read and write at a specified age. Information on female literacy, while not a perfect measure of educational results, is the most valid and easily available for international comparisons. Low levels of female literacy, and education in general can slow down the level of economic development of a country, especially in our current rapidly changing, and technology-driven world.

Table-1. Sub-Saharan Countries by Literacy Rate (2015)

Country	Overall Literacy Rate	Female Literacy Rate	Country	Overall Literacy Rate	Female Literacy Rate
Benin	38.4%	27.3%	Botswana	88.5%	88.9%
Burkina Faso	36.0%	39.3%	Burundi	85.6%	83.1%
Cameroon	75.0%	68.9%	Central African Rep.	36.8%	24.4%
Chad	40.2%	31.9%	Congo	79.3%	72.9%
Congo, Demo. Rep.	77.3%	66.0%	Cote d'Ivoire	43.1%	32.5%
Equatorial Guinea	95.3%	92.0%	Eritrea	73.8%	65.5%
Ethiopia	49.1%	41.1%	Gabon	83.2%	81.0%
Gambia	55.5%	47.6%	Ghana	76.6%	71.4%
Guinea Bissau	59.9%	48.3%	Kenya	78.0%	74.9%
Lesotho	79.4%	88.3%	Liberia	47.6%	32.8%
Madagascar	64.7%	62.6%	Malawi	65.8%	58.6%
Mali	38.7%	29.2%	Mauritius	88.6%	86.2%
Mozambique	58.8%	45.4%	Namibia	81.9%	84.5%
Niger	19.1%	11.0%	Nigeria	59.6%	49.7%
Rwanda	70.5%	68.0%	Senegal	55.7%	43.8%
Sierra Leone	48.1%	37.7%	South Africa	94.3%	93.1%
South Sudan	31.9%	25.3%	Sudan	75.9%	68.6%
Swaziland	87.5%	87.5%	Tanzania	80.3%	75.9%
Togo	66.5%	63.3%	Uganda	73.9%	66.9%
Zambia	63.4%	56.0%	Zimbabwe	86.5%	84.6%

Source: UNESCO Institute for Statistics, 2015

Table 1 illustrates the sub-Saharan female literacy rates for 2015. The figures were collected by UNESCO Institute for Statistics (2015). As shown on Table 1, Niger recorded the lowest female literacy rate of 11 percent, while South Africa had the highest literacy rate of 93.1 percent. The global literacy rate for all people aged 16 and above was 86.3%; 90% for males and 82.7% for female. The global literacy rate for all males in developed nations was 99.2% (2013), while sub-Saharan Africa was 64% (2015). Over 75% of the world's 781 million illiterate adults are found in South Asia, West Asia and sub-Saharan Africa; and women represent almost two-third of all illiterate adults globally (World Factbook. CIA, 2015).

2.2. Explanatory Variables

IEF: This is an annual data that is compiled by the Economic Freedom Network, representing factors that make a nation economically free. It is a collection of 42 government policies that impact economic freedom. According to Gwartney and Lawson (1996), an IEF should measure the extent to which rightly acquired property is protected and individuals are engaged in involuntary transactions. The IEF is very important because economic rights are the basic and fundamental rights needed for political and civil freedoms. These include freedom to engage in careers that one chooses, regardless of sex, race or ethnicity. These rights are the prerequisite for economic growth and development.

The index ranges from 1 to 10. A high (10) represents a nation with a high degree of economic freedom, and a low (1) represents a nation with a low degree of economic freedom. Historical observation do indicate that nations that are economically advanced do have a high degree of economic freedom, while the non-free nations are generally underdeveloped. Political and civil liberties are found to be considerably higher in economically free nations than in nations that have economic freedom challenges. It is quite reasonable to assume that nations with high degree of economic freedom will also be willing to accommodate the career aspirations of women. For all to participate actively in the economic and political process, the country should have policies that will not impede the choices that women make. Because of these conclusions, we believe that the IEF will impact female literacy positively.

Percentage of the Population that is of Muslim Faith (REL): Due to the inconclusive results from previous studies, we are not quite sure how this variable will impact female literacy in sub-Saharan Africa (see, (Okpala and Okpala, 2006;2009)). The effect of religion on female literacy rate depends largely on whether a given religion encourages, or impedes female career choice. If the actions or teachings of a given religion encourages female career aspirations, one will expect a positive effect. On the other hand, if it impedes the career choice of women, then the prediction will be a negative effect.

3. Result

Table 2 illustrates the descriptive statistics of all the variables used in this study. From this analysis, the minimum IEF of 4.35 was observed in Zimbabwe, while the maximum index for sub-Saharan Africa was observed in Mauritius. It is interesting to note that Mauritius also recorded a high female literacy rate of 86.2 percent. It is also interesting that South Africa that had the highest (93.1 percent) female literacy rate in sub-Saharan Africa, also recorded the lowest percentage of population practicing the Muslim religion.

Table-2. Descriptive Statistics

Variables	Minimum	Maximum	Mean	Std. Dev.
FL	11.0	93.1	57.54	4.167
IEF	4.35	7.9	6.123	0.138
REL	0.001	94.8	26.24	4.77

Note: FL – Female Literacy Rate; IEF – Index of Economic Freedom, and REL – Percentage of the Population that is of Muslim Faith.

OLS regression was performed to analyze the effects and significance of each of the explanatory variable in explaining female literacy rates among sub-Saharan Africa. The regression model used in analyzing the relationship is shown below as follows:

$$FL_i = \beta_1 + \beta_2 IEF_i - \beta_3 REL_i + \mu_i$$

where β 's represent the coefficient estimates and μ_i represents the stochastic term. The regression result is illustrated on Table 3. The result do show that the IEF do impact female literacy rates positively. It is also important to note that this impact is statistically significant at the 10 percent level. This means that sub-Saharan African nations with a high degree of economic freedom generally have a much higher female literacy rates than those with lower degrees of economic freedom. This confirms our initial prediction that nations that have a high degree of economic freedom will also have their women counterpart more economically and politically involved in daily decision making. For these women to have the skills and abilities necessary to gainfully participate economically and politically in the affairs of the state, the political institutions should have policies that will not impede on their career aspirations. On the role of religion in explaining changes in female literacy rates, this paper found a strong negative relationship between religion and female literacy rates in sub-Saharan Africa. The percentage of the population that is of the Muslim faith was found to have a negative effect on female literacy rates at a 1 - percent significance level.

Table-3. OLS Estimates of Index of Economic Freedom and the Role of Religion on Female Literacy.

Explanatory Variables	Coefficient Estimates
Constant	39.447
IEF	5.925 (1.95)**
REL	-0.692 (7.87)*
R-Square	0.698
Adj. R-Square	0.678
F-Statistic	34.696

Note: t-statistics are given in parentheses.

*Statistically significant at the 1% level.

** Statistically significant at the 10% level.

4. Conclusion

Female literacy contributes to the overall economy, through the returns associated with household productive activities. According to Lind (1997), the individual empowerment effects associated with literacy is quite powerful, especially when dealing with male dominated society of Africa. Using OLS regression analysis, the IEF was found to be positively related to female literacy at a significant level of 10 percent. The percentage of the population that is of the Muslim faith was found to be negatively related with female literacy rates at a 1 percent significance level.

5. Implications

Government should play a vital role in the improvement of female literacy rates in sub-Saharan Africa because of the positive impact that it can have on growth in the GDP, especially in household production activities. Policy makers should implement policies that will enhance economic freedom.

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