Public Education's Contribution to Economic Growth in Iran: an Application of ARDL model

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Abstract

This paper used the data from the period 1966-2014 to study empirically the role of public formal education on Iran's economic growth in the short and long terms using auto regressive distributed lag model (ARDL). The econometric findings indicate the significant, positive impact of Public education on economic growth in Iran in short-term and long-term, and it also reveals that long-term impact is greater than that of short-term. The impact of human capital on economic growth is less than the effect of physical capital.

Keywords: Iran, economic growth, public Education, ARDL.
Introduction

Accumulation of factors of production including physical capital and human resources can affect a country's economic growth. Many economic experts believe that human capital is an expression of investment in human potential for growing people capabilities. And with the help of items such as public education, work factor obtains higher degrees of skills and abilities that impact on the amount of savings and wage rates. But questions like: How does education help the growth? How important is it? And what is its significance? They are all remaining. While the lack of trained personnel may limit growth, but it is not clear that increasing those trained helps the growth, it is also unclear that what kind of education (public, technical, unofficial, etc.) is the best type of education to help growth. In general, in countries with higher levels of income, educational status has a higher level. But we cannot assert that education is the reason helping to achieve higher levels of productivity and income. Education is both a capital goods and consumer goods. People with more income, demand more education, but it is not clear if this education helps the growth or not. Some studies have shown that education can have either no effect or even a negative one on economic growth. In this article it has been tried to answer the following questions:

Does formal public education have a positive effect on economic growth in Iran? what is the size of effect?

This study mainly investigates the causality between public education and economic growth in Iran during the period 1966 to 2014 and has been organized as follows. First section presents the importance of the topic in the economic literature. Second section presents a review of theoretical foundations of the subject and the literature of experimental studies. Third section will introduce data, research methods and empirical results and discuss the obtained results of this model estimation in the fourth section, summary and some concluding results of the study will be presented.

The theoretical framework

The relation between human capital and economic growth has been a topic of debate for economists. The concept of human capital has been the subject of discussion by economists in 1960s, when the models of Solow (1956) and Swan (1956) were used (Khan, 2011). Human capital reflects on increasing the production by human capability via training human resources (Beyengju, 2002). Romer (1990) suggests that education is important because the knowledge spillovers will lead to economic growth. The New Growth Theories, also known as endogenous growth theories modified the contribution of Uzawa (1965) which resulted in inclusion of few measures in form of school enrollment, education expenditures and educated labour into the theory of economic growth. Therefore, investment in human capital and Human capital accumulation might advance growth through assisting technology adaption, enhancing the employment opportunities, development of political stability and reducing poverty level.

Many studies, including Romer (1990) Mankiw(1992) Benhabib and Spiegel (1994) Barro and Sala(1995) confirmed the fundamental role of human capital in economic growth. In contrast, there are other empirical studies which indicate the insignificance impact of education, and
even in some cases we see the negative effect on economic growth. We can mention studies such as Lau, Jamison and Louat (1991) Islam (1995) and Pritchett (1996). Some studies interpreted ignoring the quality of human capital in the conducted studies as the source of this difference. Among such studies we can note those conducted by Hanushek and Kim (1995), and Barro and Lee (1997). Another group of studies, including the research conducted by Bils and Klenow (1998) interpreted the channel of impact of education on economic growth as a weak channel, and in fact, they considered economic growth the reason for human capital development (Zaranezhad, Ansari, 2009).

Review of literature

Walters and Rubinson (1983) with 3 variables capital, labor and education and also using the production function as Cobb-Douglas, showed that education is an important factor for production. Diamond (1989) investigated the data of 38 developing countries and showed that education had negative effect on growth. Lau et al (1991) showed that education didn’t have significant effect on economic growth in some developing countries. Krueger and Lindahl (1991) divided countries into three groups regarding education levels, found a positive statistically significant link between education and growth only for the countries having the lowest level of education, but high level of education Weakened the growth rate. Mankiw, Romer & Weil (1992) using data from the period 1960-1985 showed that by inserting human capital in the model, the explanatory power of the model is improved. According to the studies conducted by Pritchett (1996), and Ben Habib & Spiegel (1994), countries with higher human capital also have faster growth rates. Cheng & Hsu (1997), showed that in Japan, human capital is the reason for economic growth, while the latter is also the factor contributing to growth in human capital. Kewka et al (2000) showed that public education had significant effect on economic growth of Tanzania during 1965-96. Asterious and Agiomirgianakis (2001) investigated the relationship between economic growth and education in Greece during 1960-94 and showed a long-term positive relation between economic growth and enrollment rate. Barro (2002) showed that the number of years of education at secondary school and higher levels for men of 25 years of age has a significant effect on economic growth. Beraldo et al, (2003) by using data from OECD countries showed that the effect of expenditures of education on economic growth was not statistically significant. Rivera and Curias (2004) by using data of Spain showed that government expenditure in education didn’t have significant effect on economic growth of Spain. Baldacci et al, (2007) by using data of 118 developing countries showed that education expenditures increased the rate of economic growth. Li and Huang (2009) showed that education had positively significant effect on economic growth of China. Bloom et al, (2009) showed that education of labor force had positive significant effect on economic growth of China and India during 1960-2000. Narayan et al, (2010) by using data of five southeast Asian countries during 1974-2007 showed that education expenditures had positive effect on economic growth. Tamang (2011), Concluded that there is a long-term relationship between the educational expenditure and economic growth in India, and the impact of human capital on economic growth is less than the effect of physical capital. The study of Laabas and Weshah (2011) showed that education quality had positive effect on economic growth of developing and developed countries. Neagu (2012) showed that education had positive effect on economic growth of Romani. Hanushek (2013) showed that labor force education in developing countries had positive effect on economic growth. Salehi (2002) showed that educational years and expenditures had positive effect on economic growth in Iran during 1966-1996. Yavari and Saadat (2003) showed that a mutual
relationship exists between human capital and economic growth without oil revenues. But regarding economic growth with oil revenues, there is a one-way relationship from economic growth to human capital and the opposite condition is not true. Nili and Nafisi (2004) have shown that by increasing the distribution of years of employees’ education, the economic growth reduces. Sadeghi and EmadZadeh (2004) concluded that in order to achieve economic growth, in addition to make an investment in physical capital, investments in human capital are also required. Almasi et al., (2008) by Johansen method showed that the long-term effect of education on economic growth of Iran was more than physical capital during 1971-2005. Zara Nejad and Ansari (2008) studied the Granger causality between economic growth and the cost of higher education, and showed that in Iran the mentioned variables are not the reason for one another. Almasi and Sepahban (2009) showed that there was a mutual relationship between literacy rates of adults and economic growth in Iran. Mahdaviet al., (2010) showed that during 1961-2001, there was a mutual relationship between human capital and economic growth. Ahmadi Shad Mehri et al.,(2010) by using ARDL method showed that education had positive effect on economic growth of Iran during 1978-2005. Komeijaniet al, (2012) by using ARDL method, showed that education had positive effect on economic growth in Iran. Haji Khodazadeetal, (2013) by using Uzawa–Lucas’s Growth Model, showed that education had positive significant effect on economic growth. Burza and Burza (2013) studied the investment in human capital in form of education and economic growth from 1997 to 2011, 12 nations of the European Union have been taken. The result is also found to be significant in those economies. Naderi (2014) by using a VAR model showed that the effect of educational investment on economic growth is approximately twice the effect of physical investment. Pegkas (2014) showed causal relationship between secondary level of education and economic growth in Nigeria while primary education remained ineffective.

Data, methods and empirical results

This study employed the data from 1966 to 2014 which is long enough to get accurate relationship between education and economic growth. The data (GDP and physical capital) collected from the Statistical Center of Iran and the Central Bank of Iran. Since the information related to education of employees is collected only from available data during the census years, therefore, the generalization method was used, in order to obtain the variable time series and it is assumed that the variable has gone through a linear path in the gap between the two censuses. Also, the capital stock time series has been estimated by considering the amount of capital stock in 1958 and the investment growth rate. All variables are log-transformed and Microfit4.1 software was utilized to carry out the analysis of the data.

Model Specification

Auto-Regressive Distributed Lags (ARDL) Method was offered to determine the co-integration relationship between variables. The most important characteristic of this method is considering short-term responses among the variables. It also presents a non-biased estimation of long-term coefficients. In this method two types of equations are estimated as to examine the co-integration relationship between variables.
ARDL method can encompass enough lags for the process of producing data in a General-to-specific framework. First of all stationarity levels of time series was searched by Augmented Dickey Fuller (ADF) unit root test was implemented. By definition a stationary time series is one whose statistical properties such as mean, variance, autocorrelation, etc are all constant over time. Then by the help of the unit root test, with selecting the optimal number of variables, dynamic model is estimated. And by Schwarz Bayesian criterion, the optimal number of lags in the model is determined. Using the co-integration test of Banerjee, Dolado, and Mestre, long-term model coefficients are estimated (if co-integration relationship between variables is not rejected). Finally, by estimating the error correction model, we will also study the structure of short-term dynamic model. It should be noted that understanding and analysis of the method consist of three dynamic, long term equations and error correction. The overall shape of the model is as follows:

Based on the theory, the effect of education was studied by using Augmented Aggregate Production Function (APF) Growth Model. APF model is being shown as follows:

\[ Y_t = A_t K_t^\rho L_t^\gamma \]  

(1)

In this function \( Y_t \) is total production that is measured by GDP, \( L \) is labor force, \( K \) is physical capital stock and \( A \) represents total factor productivity that is a function of exogenous variables, such as human capital:

\[ A_t = f(HC_t, K_t) = HC_t^\delta K_t^\gamma \]  

(2)

In this function, total factor productivity (At) is a function of human capital (HCt) and other effective factors. Human capital is including education (HC) that is considered as following:

\[ HC_t = g(LPUBED_t) = LPUBED_t^{\alpha} \]  

(3)

Where LPUB ED is the proportion of employees with public education. By replacing the equations (2), (3) in equation (1), we have:

\[ Y_t = C_{\alpha} HC_t^\delta K_t^\gamma L_t^\rho = C_{\alpha}^{\alpha} LPUBED_t^{\alpha} K_t^\gamma L_t^\rho \]  

(4)

By getting logarithm of equation (4), the equation is explicated as:

\[ \ln GDP_t = c + \beta_1 \ln LPUBED_t + \beta_2 \ln K_t + \beta_3 \ln LEX PUB_t + \beta_4 DRVWR + u_t \]  

(5)

Where \( \ln GDP \) is GDP logarithm; \( \ln LPUBED \) is the logarithm of employees with public education level (elementary, junior high school, senior high school); \( \ln LEX PUB \) is logarithm of employees. In this model, labor force includes total of labor force except for employees with public education. In order to avoid collinearity problem and to view the effects of the labor force with the level of public education, labor force was divided into two parts and was placed in the model. Labor force includes total of illiterate labor force and the labor force with higher education levels (LEX PUB) and second part includes only the workforce with public education (LPUB ED). \( u_t \) is disturbance term. Parameters \( \beta_i, i = 1,...,6 \) indicate the elasticity of GDP to explanatory variables. It can be said that model parameters are positive. DRVWR is Dummy variable during the Islamic revolution and imposed war (for the years 1978 to 1987 and other years a zero), its expected.
that this variable to have a negative effect.

**Unit Root (Stationarity) Test**

Adopting traditional techniques in econometrics is based on the assumption of variables being Stationary. And it is necessary to make sure that variables are Stationary before estimating model equations. For this purpose, the augmented unit root tests of Dickey Fuller have been used. The table 1 shows the ADF test’s results in level data.

### Table 1: The quantity results of Augmented Dickey-Fuller (ADF)

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF statistic</th>
<th>critical level %5</th>
<th>T=Trend</th>
<th>C=constant</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGDP</td>
<td>-1.97</td>
<td>-3.54</td>
<td>T</td>
<td>C</td>
<td>I(1)</td>
</tr>
<tr>
<td>lk</td>
<td>-2.78</td>
<td>-3.54</td>
<td>T</td>
<td>C</td>
<td>I(1)</td>
</tr>
<tr>
<td>LL PUB ED</td>
<td>-2.076</td>
<td>-3.54</td>
<td>T</td>
<td>C</td>
<td>I(1)</td>
</tr>
<tr>
<td>LLEXPUB</td>
<td>-3.51</td>
<td>-3.54</td>
<td>T</td>
<td>C</td>
<td>I(1)</td>
</tr>
</tbody>
</table>

Source: Researcher calculations

The Table 1 shows the Augmented Dickey-Fuller (ADF) test’s results in 5% significance and level data. In the level data, ADF statistic is smaller than critical table values. Then, all the variables in level value are not stationary, indicating unit root.

### Table 2: Results of the Unit Root Tests (First Differences)

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF statistic</th>
<th>critical level %5</th>
<th>T=Trend</th>
<th>C=constant</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGDP</td>
<td>-8.39</td>
<td>-2.94</td>
<td>-</td>
<td>C</td>
<td>I(0)</td>
</tr>
<tr>
<td>lk</td>
<td>-4.61</td>
<td>-2.94</td>
<td>-</td>
<td>C</td>
<td>I(0)</td>
</tr>
<tr>
<td>LL PUB ED</td>
<td>-6.03</td>
<td>-2.94</td>
<td>-</td>
<td>C</td>
<td>I(0)</td>
</tr>
<tr>
<td>LLEXPUB</td>
<td>-4.68</td>
<td>-2.94</td>
<td>-</td>
<td>C</td>
<td>I(0)</td>
</tr>
</tbody>
</table>

Source: Researcher calculations

The Table 2 shows when the first order difference of the series has been taken, they became stationary. Result of the ADF unit root test indicates that in the first difference data the t-values are greater than the critical values so that we reject the null hypothesis. So, all series were determined as I(1).

Based on non-stationary variables in the level and stationary at level 1, the following Auto-Regressive Distributed Lags (ARDL) is presented:

\[
\ln GDP_t = \theta_0 + \sum_{i=1}^{S} \alpha_i \ln GDP_{t-i} + \sum_{j=0}^{n_1} \theta_{1j} \ln K_{t-j} + \sum_{j=0}^{n_2} \theta_{2j} \ln L PUB_{t-j} + \sum_{j=0}^{n_3} \theta_{3j} \ln L EXPUB_{t-j} + u_t \quad (6)
\]

Where, \( \theta_0 \) represents intercept and \( \alpha_i \) denotes \( i \) lagged dependent variable coefficients and \( \theta_{ij} \) explanatory and lagged variables coefficients. In estimation of this model, at first the maximum number of lag is selected. As the data are annual, the number of the lags is 1 or 2.

**Auto-Regressive Distributed Lag (ARDL) Approach to Cointegration**

Since the series are stationary and do not have a unit root in the first difference data, In this section, the effects of public Education on economic growth in the format of long-run
equilibrium relationship as well as short-term dynamic relationships are studied. And the results of determining the optimal number of variables, diagnostic tests, the existence of co-integration relationship and long-term relationships between the variables and the results of error correction model are provided. Due to the limited time period of study, in order to use ARDL model the number of proper lags for model variables are determined based on Schwartz Bayesian criterion. Microfit 4.1 was applied in this regard.

Short Term Analysis

The results of estimation of dynamic short-term model are shown in Table 3. Accordingly, the best model is where we attribute one lag to variable LK and rest of the variables are not attributed any lags.

Table 3: The results of estimation of dynamic short term model

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Coefficients</th>
<th>Standard Error</th>
<th>T-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGDP(-1)</td>
<td>0.29</td>
<td>0.028</td>
<td>10.36</td>
</tr>
<tr>
<td>LLLPUB ED</td>
<td>0.216</td>
<td>0.042</td>
<td>5.14</td>
</tr>
<tr>
<td>LLEXPUB</td>
<td>0.14</td>
<td>0.016</td>
<td>8.75</td>
</tr>
<tr>
<td>LK</td>
<td>0.362</td>
<td>0.228</td>
<td>1.58</td>
</tr>
<tr>
<td>LK(-1)</td>
<td>0.31</td>
<td>0.065</td>
<td>4.77</td>
</tr>
<tr>
<td>DRYWR</td>
<td>-0.084</td>
<td>0.019</td>
<td>-4.42</td>
</tr>
<tr>
<td>R-Squared:</td>
<td>0.97</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D.W:</td>
<td>1.997</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Researcher calculations

According to the above results, we can understand that short-term model of the study has been obtained with one lag for dependent variable (economic growth) and also with one lag for variable capital stock and without lag for other variables; the results indicate that all variables are significant in the short-term.

In the short term, with increase in all independent variable, economic growth rises as well. The interesting thing is that in the short term the greatest impact on economic growth belongs to the lag in variable capital.

The elasticity of GDP with respect to public education is 0.216. This means that a one percent increase in public education will encourage economic growth by about 0.216.

The coefficient of determination shows that in the short term, 97 percent of the dependent variable is explained by the independent variables, which shows relatively high degree of explanatory of the model. Durbin-Watson statistic coefficient (1.997) also reflects the lack of constant autocorrelation of residuals.
Diagnostic tests

The diagnostic tests results in table 4 showed no specification errors, normality of the residuals, structural stability of the model and homoscedasticity and the model for lGDP qualifies all the diagnostic tests.

<table>
<thead>
<tr>
<th>Test statistics</th>
<th>LM test</th>
<th>F Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistics</td>
<td>(prob)</td>
</tr>
<tr>
<td>Serial-correlation</td>
<td>0.0023</td>
<td>0.942</td>
</tr>
<tr>
<td>Functional form</td>
<td>2.192</td>
<td>0.063</td>
</tr>
<tr>
<td>Normality</td>
<td>0.572</td>
<td>0.784</td>
</tr>
<tr>
<td>Heteroscedasticity variance</td>
<td>0.7548</td>
<td>0.534</td>
</tr>
</tbody>
</table>

Source: Researcher calculations

The model is free from the problems of Serial Correlation, and Heteroscedasticity. F calculation statistics compared to critical F of table at significance level 5% showed that explanation of the model statistically is not rejected. Investigation of the differentiating statistics of the main items of the regions is estimated to be sure of the validity and reliability of the estimated parameters.

Co-integration test

After estimating the dynamic equation to ensure the existence of long-term relationship (regression not being spurious), Banerjee, Dolado and Master test must be done. For conducting this test, we should deduct the coefficient for the lagged dependent variable from one, and then divide it by its standard deviation. If the absolute value of the amount of computational statistics is larger than the values of Banerjee, Dolado and Master Table, null hypothesis based on no long term relation is rejected, which suggests existence of long-term relationship. In other words, if the total of coefficients of the lagged dependent variable is smaller than one, dynamic model will tend towards long-term equilibrium model. So for co-integration test, the below hypothesis is required:

\[ H_0 : \sum_{i=1}^{p} \alpha_i - 1 \geq 0 \]

\[ H_1 : \sum_{i=1}^{p} \alpha_i - 1 < 0 \]

Given that according to the Schwarz - Bayesian criterion, the optimal number of lags of the dependent variable is one (p=1). Null hypothesis and alternative hypothesis in relation to the following model is like below:
Null hypothesis: $H_0: \alpha_i - 1 \geq 0$

Hypothesis: $H_1: \alpha_i - 1 < 0$

The statistical t quantity required for the above test is calculated as follows:

$$
\frac{\sum_{i=1}^{p} \hat{\alpha}_i - 1}{\sum_{i=1}^{p} S\hat{\alpha}_i} = \frac{0.29 - 1}{0.028} = -35.42
$$

Since the obtained statistic, in terms of absolute value, is higher than the critical value provided by Banerjee, Dolado, and Mestre, therefore, Hypothesis H0 is rejected and we conclude that a Long-run equilibrium relationship is established between the variables of the model, and Long-term relationship between the degree of economic growth and independent variables is not false. After testing the co-integration and ensuring a long-term relationship, long-term coefficients and error correction model can be interpreted.

**Estimation of long-term economic growth**

Now knowing that a Long-run equilibrium relationship exists between the variables of the model, we estimate the long term coefficients, which can be seen in the table 5.

The long-term function of the economic growth developed based on labor force with public education. The Coefficients of the long-term function of economic growth factors relating to the function of economic growth model estimated using time series data from 1966 and 2014 by ARDL are as follows:

**Table 5: The results of estimation of model in long-term**

<table>
<thead>
<tr>
<th>Title</th>
<th>Explanatory variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LEX PUB</td>
</tr>
<tr>
<td>Estimated Coefficients</td>
<td>0.145</td>
</tr>
<tr>
<td>Standard Error</td>
<td>0.037</td>
</tr>
<tr>
<td>T-Statistic Value</td>
<td>3.92</td>
</tr>
</tbody>
</table>

Source: Researcher calculations

According to the obtained results, we can see that sign of all the estimated coefficients is in accordance with the theoretical foundations. As the results show, in the long term, the effect of capital stock is higher than the other variables, and this shows the enormous influence of this variable. So in the long term, with one percentage increase in capital stock, we will see 0.412
percent increase in economic growth.

The Impact of labor factor (LEXPUB) on national income and economic growth in Iran during the period was positive and statistically significant, which necessitates paying more attention to the issue of employment of Labor force. So in the long term with 1 percentage increase (decrease) in employment of labor, we will have (0.145) Percentage increase (decrease) in GDP.

The impact of human capital(Public education) is positive and statistically significant. Coefficients obtained indicate that with 1 percentage increase (decrease) in Human Capital(Public education), we will have (0.24) Percentage increase (decrease) in the economic growth. One percent increase in work force variable with public education, will result in 0.24 percent increase in economic growth.

Coefficient of dummy variable of revolution and imposed war was negative, and it reveals that in the period of imposed war, economic growth was reduced by as much as 0.21, and In the absence of war, a decrease related to this perspective is not realized in economic growth. Based on the above results, we can understand that a country's capital stock plays an important role in the economic growth and after that the labor force with public education is the most effective.

Error correction models

In the following in order to study the Short-term dynamic of variables and showing the speed of adjustment toward long-run equilibrium among the variables of the model by using the ECM, the model is estimated.

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Coefficient</th>
<th>StandardError</th>
<th>T-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLPUBED</td>
<td>0.196</td>
<td>-0.035</td>
<td>5.6</td>
</tr>
<tr>
<td>DLK</td>
<td>0.31</td>
<td>0.121</td>
<td>2.56</td>
</tr>
<tr>
<td>DLK1</td>
<td>0.41</td>
<td>0.047</td>
<td>8.72</td>
</tr>
<tr>
<td>DLEXPUB</td>
<td>0.18</td>
<td>0.062</td>
<td>2.9</td>
</tr>
<tr>
<td>DRVWR</td>
<td>-0.16</td>
<td>0.054</td>
<td>-2.96</td>
</tr>
<tr>
<td>ECM(-1)</td>
<td>-0.56</td>
<td>0.076</td>
<td>-7.37</td>
</tr>
</tbody>
</table>

R-Squared: 0.79  D.W: 2.01

Source: Researcher calculations

The results show that all error correction model variables are significant. As can be seen, the coefficient of error correction term is significant. Error correction term is estimated to equal -0.56, which represents a relatively high speed of adjustment. And it states that each year 56 percent of the imbalance in a periodregarding dependent variable is adjusted in the next period. In other words, for complete adjustment, which is the result of a policy or a change in
the independent variables of the model, almost 1.3 year will be necessary.

**Policy Implication and Conclusion**

In this paper, the effect of employed human resources with public education on Iran's economic growth for the years 1966 to 2014 was studied. In the present study, Auto-Regressive Distributed Lag (ARDL) Approach with distributed lags was simultaneously used to estimate long-term and short-term model coefficients. By this study we examined the short-term and long-term effect of labor with public education on economic growth. It was clear that they are 0.216 and 0.24 respectively. The short and long-term effects of education on economic growth of Iran was less than physical capital effect during the period. The adjustment Speed of model error for the manpower trained at the public level on Iran's economic growth in Iran is equal to 56%. So it can be concluded that public education has a positive effect on economic growth, and allocating sufficient funds for public education in addition to being the duty of the government based on the constitution, is considered an action towards achieving the country's economic growth rate. It is clear that state resources should be sufficient to provide public education services.
References


