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Public Spending, Education and Poverty: A Cross Country Analysis

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ABSTRACT

This paper is an attempt to explore the Public Spending, Education and Poverty nexus in 20 Asian countries. The basic research objective was to empirically examine the impact of Educational Spending by the Public Sector on Poverty. To meet this objective, panel data was obtained for 20 Asian countries for time 1976-2017. Dependent variable is Poverty and major explanatory variables are Public spending on education which has been further split into three parts i.e. Public Spending on Primary Education, Public Spending on Secondary Education and Public Spending on Tertiary Education. Some control variables were also incorporated in analysis as determinants of Poverty like FDI, Unemployment, Trade openness, Gross capital formation, Inflation and Population growth. Fixed and Random Effects models were applied for empirical analysis and General to Specific Methodology was adopted where Insignificant variables are dropped one by one and the Model is re-Estimated. Hausman test was applied for model selection and it was concluded that Random Effect Model is more appropriate as compared to Fixed Effect Model for data. Results suggest that Public Spending on Education, significantly reduces Poverty in the panel countries while in control variables only FDI reduces Poverty in a significant way. If there is 1% increase in overall Public spending on Education, it would reduce Poverty by 0.227% and if Government increases Spending on Primary, Secondary and Tertiary Education by 1%, it will reduce Poverty by 0.855%, 0.403% and 0.396% respectively. Results further suggest that with an increase of 1% in FDI inflows to these countries, Poverty would decline by 0.089%. This study concluded that Government Spending on Secondary and Tertiary education contribute more towards Poverty reduction along with inward FDI flows. Current study suggests that Government should focus on Primary, Secondary and Tertiary Education and should diversify resources towards education on one hand and should also take steps to attract FDI on the other hand to achieve the ultimate goal of poverty alleviation.

1. Introduction

The 1990s defined a new method to alleviate poverty, emphasizing on strengthening the capabilities of the poor with intensively focusing on the non-income dimensions of poverty (World Bank, 1990).

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Government intervention in this regard was supposed to follow a two-fold strategy where, by promoting labor-intensive growth through investment in the human capital via allocating funds to primary health care, primary education and some targeted social spending in order to reduce poverty. High investment in in human capital was experienced by the East Asian economies (1st, universalizing primary education that is followed by, the increased availability of the secondary education along with the skill building programs) resonated quite well with this view as reported in (World Bank, 1993). In the same decade lately, emphasis was given to public investment in physical infrastructure as a means for reduction of poverty via facilitating market access and reducing the high transportation costs incurred by poor households (World Bank, 1994).

In 1990 The United Nations Organization (UNO) gave top priority to Poverty alleviation in its list that is comprised of Millennium Development Goals (MDGs) and it was the targeted to cut down the extreme poverty ($1.25 a day) rate of 1990 i.e. 47% around the world especially in developing countries to half by 2015. The objective was achieved by 2010 where extreme poverty came down to 22% and further in 2015 this ratio came down to 14% (UNO, MDGs report 2015). In 1990, around 1.9 billion people lived around the globe with $1.25 a day and what is called extreme poverty, and this number was brought down to 836 million by 2015. The number of people working in middle class living i.e. $4 a day or more was 18% in 1991 and has tripled in 2015 and this group shares now more than half of the work-force in the developing countries around the world (UNO report on MDGs 2015). Although, there has been some progress in poverty reduction but at the same time there is still people facing sever poverty in very high numbers globally and to achieve this target of ending extreme poverty would be quite difficult by 2030 with the global growth forecasts (WB 2015). In 1990 the world population lived on or less than 1.90$ a day was 35% and this ratio was brought down to 12.4% in 2012 and further declined to 10.7% in 2013. In 1990 according to an estimate 1.85 people billion lived on less than 1.90 US$ a day and with a 41.5% decrease, this number came down to 767 million in 2013 (UNO, MDGs report 2013). Poverty decline mostly occurred in regions of East Asia and the Pacific i.e. China and Indonesia, South Asia i.e. India and Sub-Saharan Africa (WB 2016).

Enhancing social welfare of the people is one of the main objectives of every government. One way to enhance social welfare is by spending on those things which people value more. Governments often spend on those public goods in which private sectors are underproductive. Most important public goods are education and health. Spending on these goods and services create some positive externalities including poverty reduction, economic growth, better society etc. Poverty reduction and investment in human capital are the ultimate objectives of any government. Fiscal policy of every government focuses on poverty reduction and economic growth. Governments make public spending on education to enhance economic growth which in turns to reduce the incidence of poverty. Thus, any fiscal policy aimed at reducing poverty leads to more productive spending such as spending on education and basic health care.

Rationale for public spending on education is that education can increase labor productivity, economic growth and reduce poverty. Another justification for public spending on education is based on the fact that education has social returns and these social returns are sometimes higher than

private returns to education. These social returns include lower crime rate, women empowerment, gender equality while public spending on health can be seen perspective that is based on diseases control and reduction during the most productive stage of life. Basic health services provided by the government can reduce the burden of diseases and thus improves the life style of the citizens. Both education and quality health conditions are important components of human capital formation.

The role of human capital in economic growth and poverty reduction got much attention since 1990s (Awan et al. 2011). Educational poverty and income poverty reinforce each other at both micro and macro level. Lower educational level means lower labor productivity, lower income and higher poverty. Consequently, fiscal policy aimed at reducing poverty leads to more public spending on education, health and other social sectors. However, some researchers question the existence of both higher public spending and higher poverty especially in developing countries. The nexus between public spending and poverty is needed to be studied very carefully. A number of studies are conducted to examine this link this is the main purpose of this study. In the current study we try to evaluate the effects of public spending (on education and health) on poverty reduction.

This paper is an attempt to explore the Public Spending, Education and Poverty nexus in Asian countries. The basic research objective was to empirically examine the impact of Educational Spending by the Public Sector on Poverty. These countries do not spend enough funds on education and other social services due to lack of resources and less attention towards such activities. Although, Asian continent achieved a remarkable economic progress in the recent years but still it is home to almost half of world's poorest people and that's why rendering poverty a key issue needs to be addressed. Asia is the largest continent area-wise as well as having 60% of world population but at the same time Asian countries are mostly developing ones. According to World Bank's report (2018), out of 783 million extremely poor living below the poverty line of US$1.9 a day, about 33% live in South Asia and 9% live in East Asia and the Pacific. In this context, current study is so significant to study these Asian economies regarding public expenditure on education and its impact on poverty reduction. Panel Data was obtained for 20 Asian economies due to unavailability of data or more missing observations for rest of countries, so these countries have been excluded from the analysis and it is limitation of this study.

2. Literature Review

Poverty alleviation one of the main objectives of fiscal policy. Every government tries to formulate its fiscal policy in such a way to improve the welfare of its citizens. Many researchers have carried out different studies in order to examine the welfare effects of public spending. These studies have mainly examined the effects of public spending on poverty reduction, income distribution and health status of the people. Using secondary data from SUSENAS, (Lanjouw et al. 2001) studied the role of public spending on education and health on poverty for Indonesia. They revealed that spending on primary education and primary health was pro-poor. Public spending on education and health was negatively related to poverty. They further revealed that education and health were also co-related with each other. Higher enrollment rates were positively related to good nutritional status of children. The role of mothers' education was more significant in this regard. Furthermore, they showed that non-poor benefited from educational spending at early stage however, over the time, poor people got more benefits from these spending.

A similar study was carried out by (Gupta et al. 2002). They examined the impact of public spending on education and primary health care on educational attainment and health status. Their results showed that increase in public spending on education had positive effect on gross secondary enrollment rate. Similarly, increase in public spending on health care decreased infant and child mortality rates and resulted a decline in poverty. Another study for Mozambique was conducted by (Rasmus et al. 2001). Using secondary data and applying non-behavioral benefit-incidence methodology they showed that public spending on education and health had poverty reducing effects for Mozambican population. They further documented that gender and regional imbalances in education and health were more significant than income-based differences. Aref A. (2011) examined the role of education in poverty reduction in the rural areas of Iran. The study was conducted to find the supply and demand sides factors responsible for low access to education and development goals. The study revealed that education improved labor productivity which in turn reduced poverty status of rural households. They further showed that although education reduced poverty however, poverty is multidimensional, and education can't solve all problems.

Some researchers have showed that different educational levels and experience have different effects on poverty reduction. One of the studies carried out by (Awan et al. 2011) examined the role of different levels of education on poverty reduction in Pakistan. The study used secondary data from Household Integrated Economic Survey (HIES). The results of their logit model showed that educational levels and experience had negative effects on incidence of poverty. They further showed that the poverty reducing effects of education was different for different levels of education.

Baldacci et al. (2003) studied the nexus between public spending on education and health care and selected social variables like poverty and others, for developing and transition economies. The study estimated latent variable model in order to show the impact of government spending on social variables. They concluded that public spending was an important determinant of social outcomes. The paper used more appropriate approach by estimating the social production function. Their results revealed that public spending had positive effects on improving social status of the masses. some researchers have questioned the co-existence of high public spending and poverty in some rural areas of developing and transition economies. These researchers have suggested some other measures to improve the efficiency of public spending. A study in this regard was carried out by (Sutherland et al. 2007). They assessed the potential to raise the efficiency of government spending in primary and secondary sectors of education. They examined the weak correlation between increased resource availability and student performance. Using cross-country data, the study identified a significant scope for improving public spending efficiency by moving towards best practice. Ablo and Reinikka, (1998) studied the role of budget allocation for education and enrollment rate in Uganda. They concluded that budget allocations might not matter when institutions or their control were weak. They further showed that not only increase in budget allocation, but balanced pattern of public spending was more important for enhancing school outcomes.

Education and public spending on education and health have poverty reducing effects. However, poverty is also considered as one the main hurdles in educational attainment. Both variables affect each other in negative direction. A study of (Brown & Park, 2002) carried out in rural areas of China to assess the effects of poverty and school quality on decision to invest in human capital. They showed that credit constraints were negatively related to educational investments and wealth was positively related to learning outcomes. They further showed that academically weak girls were more likely to dropout and women empowerment reduced early dropout. Similarly, school quality was also one of the important variables for investment in education. Based on the prior literature we have observed that only few studies have been conducted to examine the relationship between public spending and poverty status. These studies considerably differ in terms of data and methodology.

Most of the studies have been carried out by using cross-sectional data which provide only a snap shot of the situations. In cross-sectional data, most of the time we can't observe the dynamics of the fiscal policy. This study will use panel data set which contains more information than time series data and cross-sectional data. The current study tries to evaluate the effects of public spending (public spending on education) on poverty reduction.

3. Data and Methodology

3.1 Data and Variables Description

To explore the link between public spending on education and poverty, a panel data analysis has been carried out for 20 Asian countries. Dependent variable is Poverty for which Infant Mortality rate has been used as proxy due to unavailability of data for poverty. Infant Mortality rate has been used as proxy for poverty by many researchers like, [Ordóñez, 2012; Messner et. al, 2010; Reidpath & Allotey, 2003 etc.]. Main explanatory variable is Public spending on Education as % of GDP. This variable has been further split into three categories i.e. public expenditures on primary, secondary and tertiary education as % of total expenditures on education. Some control variables have also been incorporated in analysis as determinants of Poverty like FDI as net inflow, Unemployment annual rate, Trade openness (sum of exports and imports) as % of GDP, Gross capital formation as % of GDP, Inflation rate and Population growth rate. Data for all variables have been obtained for time 1976-2017 from World Development Indicators (WDI, the World Bank). Number of sampled Asian countries, descriptive statistics and correlation matrix have been presented in the appendices 1,2 and 3 respectively.

3.2 Econometric Methodology

Econometric model explains the relationship between Public spending on Education and its impact on Poverty while some control variables have also been incorporated as determinants of Poverty. Current study has the following econometric model comprised of equation 3.1 to be estimated empirically.

$$\mathbf{POV_{it} = \beta_1 + \beta_2(G\_EXP\_EDU)_{it} + \beta_3(EXP\_TER\_EDU)_{it} + \beta_4(EXP\_SE\_EDU)_{it} + \beta_5(EXP\_PR\_EDU)_{it} + \beta_6 X'_{it} + \varepsilon_{it}} \quad \textbf{---------- (3.1)}$$

In equation 3.1. POV is Poverty the dependent variable, (G_EXP_EDU) is total government expenditure on education as % of GDP. Similarly, (EXP_TER_EDU) is government expenditure on tertiary education as % of total educational expenditures. In the same way, (EXP_SE_EDU) is government expenditure on secondary education as % of the total educational expenditures. Likewise, (EXP_PR_EDU) is government expenditure on primary education as % of total educational expenditures. X' is vector of control variables [FDI as net inflow, Unemployment annual rate, Trade openness as (sum of exports and imports as % of GDP), Gross capital formation as % of GDP, Inflation rate and Population growth rate] which have been incorporated to capture their impact on Poverty while β_1 ….. β_6 are coefficients and ε is the error term.

3.3 Estimation Methodology

To empirically estimate the impact of Public educational expenditures along with some control variables on Poverty, Fixed Effect Model (FE) and Random Effect Model (RE) have been used for panel data analysis. Fixed Effect technique considers that each cross section differs from other ones in intercept, but it is constant over time or it is time in-variate. While, Random Effect model assumes that all the cross sections differ in error terms. This study has employed both techniques but has

selected the best and appropriate one between the two to interpret the obtained results. To select the best technique between Fixed and Random Effect Models, Hausman test has been applied.

3. Results and Discussion

This section provides detailed explanation about obtained results where all the variables have been discussed one by one. Our results table contains both Fixed Effect Model as well as Random Effect Model.

Table 4.1. Elaborates the obtained results of empirical analysis

Dependent Variable: Poverty		
Variables	Fixed Effect Model	Random Effect Model
Government expenditure on Education Total	-0.216** (0.033)	-0.227** (0.022)
Expenditures on Tertiary Education	-0.408*** (0.000)	-0.396*** (0.000)
Expenditures on Secondary Education	-0.410*** (0.001)	-0.403*** (0.001)
Expenditures on Primary Education	-0.847*** (0.000)	-0.855*** (0.000)
FDI inflow	-0.089*** (0.000)	-0.089*** (0.000)
Constant	2.030*** (0.000)	2.012*** (0.000)
Observations	292	292
R-squared	0.596	0.596
Wald chi^2		403.61 (0.000)
F-Statistic	79.34 (0.000)	
Hausman test Chi-sq statistic	3.521 (0.620)	
P-value in parentheses: *** P< 0.01, ** P< 0.05, * P< 0.10		

Table 4.1. shows the Fixed and Random Effect Models results and Hausman test has been applied to check that which model is more appropriate for the data i.e. Random Effect Model or Fixed effect model. Hausman test has Null hypothesis that RE is more appropriate model for data with alternative hypothesis that FE is appropriate, and we have P-value (0.620), so we do not reject null hypothesis and conclude that RE model is appropriate.

Looking at the results of RE model in the table, it is quite obvious that there exists a significant and inverse relation between public spending and poverty. As the government increase expenditures on education, as a result, poverty declines. Result suggests that when public sector increases its educational expenditures by 1%, poverty declines by 0.227%.

We have taken education as whole and then also split total education into three categories i.e. primary, secondary and tertiary education. When government spends more on primary education, it contributes in reducing poverty the most. A 1% more spending on primary education declines poverty by 0.855%. similarly, when there is 1% increase in expenditures on secondary and tertiary education by the government, poverty declines by 0.403% and 0.396% respectively. All these results support prior studies like [Aref, 2011; Awan, et al. 2011; Fan, et al. 2004; Gupta, et al. 2002; Lanjouw, et al. 2001]. Likewise, in the control variables, only FDI shows impact on poverty reduction in the sample economies and when there is 1% increase in the FDI inflow, it also reduces poverty in the receiving country by 0.089%, while the rest of variables do not have any impact on poverty in these countries and therefore have been dropped from the analysis.

5. Conclusions and Policy Implications

This study empirically examined the relation between public expenditure on education and Poverty in 20 Asian countries. Findings suggest that there exists an inverse relation between educational expenditures and Poverty and as government allocates more funds for education, poverty declines in sample countries. In the disaggregated analysis, results also suggests that with an increase in expenditures on all three categories of education i.e. primary, secondary and tertiary, it leads to a decline in Poverty in these countries. FDI inflow also shows an inverse relation to poverty reduction and as there is an increase in FDI inflow to a country, it reduces poverty in that country. As policy recommendation, governments should allocate more funds towards education to on one hand tackle with the poverty and should take steps attracting FDI on the other hand to alleviate poverty from the country.

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Appendix 1. Names of Sampled Asian Countries

Bahrain	Bangladesh	China	India	Indonesia
Japan	Jordan	Korea South	Kuwait	Malaysia
Pakistan	Philippines	Russia	Singapore	Sri Lanka
Turkey	UAE	Iran	Nepal	Thailand

Appendix 2. Descriptive Statistics

Variables	Mean	Med	Max	Min	Std. Dev.	Obs
Poverty	1.349	1.373	2.189	0.278	0.442	840
Govt exp on Edu	0.498	0.519	1.152	-0.087	0.173	438
Exp on Tertiary Edu	1.249	1.254	1.678	0.233	0.193	381
Exp on Sec Edu	1.513	1.550	1.726	1.008	0.119	325
Exp on Prim Edu	1.577	1.574	1.853	1.266	0.122	331
FDI infl	8.620	8.901	11.46	0.000	1.677	723

Appendix 3. Correlation Matrix

Variables	Poverty	Govt exp on Edu	Exp on Tertiary Edu	Exp on Sec Edu	Exp on Prim Edu	FDI inflow
Poverty	1.000					
Govt exp on Edu	-0.476	1.000				
Exp on Tertiary Edu	0.383	-0.248	1.000			
Exp on Sec Edu	-0.199	-0.019	-0.407	1.000		
Exp on Prim Edu	-0.127	0.167	-0.631	-0.152	1.000	
FDI Inflow	-0.472	0.249	-0.255	0.077	0.185	1.000