Contribution of Human and Capital on Regional Economic Growth of Sumedang District of Indonesia

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Abstract

This article presents the analysis of the contribution of human capital growth and capital growth to regional economic development of sumedang district. Multiple regression Analysis by OLS model is applied to know the contribution of human growth variable and capital growth variable. While to know influence a number of variables about contribution to Sumedang Regional economic is applied by data times series from the year 1980-2010. This study shows that, human capital growth contribution negatively and insignificantly to the growth of the gross domestic regional product and capital growth has positively and significant influence on Sumedang Regional economic growth.

Keywords: *Economic Growth; Human Capital Growth; Capital Growth.*

Introduction

Human resource development is one of the necessary conditions for all kinds of growth-social, political, cultural, or economic (Harbison and Myers, 1964). The concept that investment in human capital promotes economic growth actually dates back to the time of Adam Smith (1776) and the early classical economists who emphasized the importance of investing in human capital. The close connection between economic performance and human capital has led to the formulation of and popularization of human capital theory in expositions on economic growth.

Human capital theory as well as endogenous growth theory suggests that there are substantial economic effects of education on the micro and macro economic level. Empirical studies including Schultz (1960,

1963), Denison (1962, 1974), Becker (1961), Harbison and Myers (1964), Tilak (1989), Barro(1991), Mankiw, Romer and Weil(1992), Benhabib and Spiegel (1994) and many others have shown that increased education of the labor force appears to explain a substantial part of the growth of output in both developed and developing countries.

Until recently, the experience of the Asian countries confirmed the importance of substantial investment in education and human capital formation. This was most apparent in the fast-growing Asian economies (Korea, Singapore, Hong Kong, Taiwan and China). The development of skilled labor force makes an important contribution to development. An educated, trained and more productive workforce contributes to a greater economic growth. It may therefore be argued that investment in education pays off.

Investment in human capital (e.g., higher expenditures on education and training) may play a more persistent role in the growth process.

However a study by Lant Pritchet (1996) showed that (especially for developing countries) the growth of educational capital per worker has had a mildly negative or no impact on the growth of these economies. He forwarded three reasons for this contradiction:

1. 1st Due to its quality, schooling may not actually raise cognitive schools or productivity.
2. 2nd Expanding the supply of education in the presence of stagnant demand for educated labor causes the economic return to education to fall rapidly.
3. 3rd Due to the institutional set up in these countries, the improved cognitive skills acquired through education engage in privately remunerative but socially dysfunctional or wasteful activities so that aggregate output stagnates or even falls.

The recommendation in perspective was not actually "don't educate" rather "reform so that investments (past and present) in education will pay off". So studies that assess the contribution of human capital to economic growth have important implications for policy formulations. Institutions whether in the labor market or not influence the allocation of resources, whether human capital is employed in growth-enhancing activities or elsewhere. The education system is central to the development of skills, a fact long recognized by both policy makers and educators. And this has huge ramifications for economic growth and development. That is why it would be critically essential to look in to the policy perspective with respect to the education system in the effort to study the contribution of human capital to economic growth especially regional economic growth.

While the specifically economic literature concerns itself with the measurable individual and social returns to educational investment and uses this as an indicator of the contribution of education to economic development, the evolutionary perspective emphasizes the essentially interactive relationships between the economic growth and human capital growth as the output of education.

The formulation of educational policies is central to the provision of education to economic growth and development. Serious imbalances are observed between the skills generated by education and the actual needs of the nation. In some cases the number of graduates surpasses the absorptive capacity of labor markets while in others, critical shortage of skills continue to create difficulties. Part of the reason may be the fact that the education system has produced graduates for the wrong kind of jobs. In some cases, despite the large number of unemployed graduates, an "appropriately trained" labor force continued to be imported from abroad for certain sectors of the economy in the wake of brain drain. This disjuncture between educational attainment aspirations and labor market opportunities calls into question the contribution of education to this aspect of economic development.

Most educators and economists familiar with such matters are now in general accord that economic considerations should be given serious weight in formulating educational development plans. So the planners and the statesmen must be convinced about the need for the integration between the economy and education.

Sumedang District confronts regional autonomy implementation, Sumedang District Government have authority to plan, utilize and supervise the development in their region, as a consequence in following the Law 32/2004 as regional autonomy policy guidance. Sumedang district has some areas which is the higer education region. This particular area has been ratified by the Governor of West Java Decree No. 593/SK-PIK/1989 of higher education region. Thus, if human capital, and labor and capital has an important role in promoting regional economic development, then those aspect become an economic asset in the future of the Sumedang District.

Literature Review

This study focuses on human capital growth as a determinant of Sumedang gross domestic regional production (GDRP) growth. Human capital is defined as a factor of economic growth, which captures the abilities, skills and knowledge of workers (Romer 1994). It plays a dual role in the process of economic growth. First, it is a factor of production, and second, it is a source of innovation (Mincer, 1989, 1). The human capital literature is dichotomised between two basic frameworks: that of Becker (1964) and that of Lucas (1988). They emphasize human capital as an alternative source of sustained growth (similar to the technological progress). Second, there is Schumpeter's growth literature, which is based on the work of Nelson and Phelps (1966). This stream of literature highlights the importance of human capital stock (and not its accumulation) for economic growth.

Regardless of which theoretical framework is used, human capital can be regarded as a production factor and can be simply built into the model of economic growth.

The most popular in empirical literature on human capital and economic growth in advanced market economies are growth regressions proposed by Barro and Sala-i-Martin (1995), empirical analysis conducted by Mankiw et al. (1992), and researches by Benhabin and Spiegel (1994). There exists also a body of literature and empirical analysis on the role of human capital in transition countries. Conventional wisdom holds that transition countries are well endowed with human capital, which is consistent with the main findings by Barro and Lee (2001). They emphasised that most human capital indicators are better placed in transition countries than in OECD countries, but on the contrary Boeri (2000) argued that the skills acquired in transition economies are over specialised, lowering labour force mobility across industries and consequently impeding economic progress.

Objective

The general objective of the study is trying to examine the contribution of human capital growth and capital growth to gross domestic regional economic (GDRP) growth in Sumedang District over the last 30 years (year 1980-2010).

Research Methods

The development perception of the region as a complementary or even alternative scale to the nation state for policy making in the economic development realm has important implications for the design and implementation of development strategies. Human capital is getting wider attention with increasing globalization and also the saturation of the job market due to the recent downturn in the various economies of the world. Developed and developing countries put emphases on a more

human capital development towards accelerating the economic growth by devoting necessary time and efforts. Thus human capital development is one of the fundamental solutions to enter the international arena.

There is a vast literature on the benefits of education stretching back to antiquity. Although the concept of investing in oneself to improve productivity is seemingly intuitive, the entire theory of human capital hinges on the paramount assumption that investments such as education do in fact translate into higher worker productivity.

Modern theoretical attempts to explain the impact of education on growth can be divided into two broad categories. The Neoclassical Model represents the first class, while the second group is inspired by an endogenous growth approach.

The macroeconomic literature on the returns to education is mainly based on the Neoclassical Solow model which is further extended to incorporate human capital. This model considers human capital as an accumulated factor of production and can be represented in a Cobb-Douglas production function: $Y = f(K,H,A,L)$. Where Y represents output level; A is the level of technology; K, H, and L are physical capital, human capital and labor respectively. It assumes that returns to physical and human capital are decreasing. On the long term growth path, the level of output is determined by the level of investment in physical and human capital, on the population growth rate and on exogenous technological progress. The empirical results of the influential paper (Mankiw, Romer, Weil, 1992) are conclusive. They show a significant positive impact of schooling on output per capita between 1960 and 1985.

Research on the topic has mainly relied on cross-country regression analysis. Cross-section regression studies of growth have numerous methodological drawbacks and much more testing on better quality educational data, and data consistency particularly for education, is required before firm conclusions can be drawn on the direct effect of education on economic growth. The cross-section focus may be inadequate if rates of return to education or the quality of education differ substantially across countries.

Following the theoretical construct, attempts to measure empirically the impact of education on growth are also divided into two categories. In fact, the evidence on the neo-classical vs. endogenous growth models is still inconclusive. The available macro evidence does not allow us in general to distinguish between theories, since most of them (although hypothesizing different ways in which human capital might enhance growth) are observationally equivalent. They yield similar predictions relating to the impact of some human capital variable on growth.

Despite these new developments, however, the fact remains that 'accounting is no explanation' (Griliches, 1997). Even if productivity growth has been allocated in detail to the various components the existence of such a positive correlation tells us nothing about causal relationships, about the mechanisms, the processes through which human capital accumulation affects economic growth.

For Indonesian case, Suahazil Nazara (1994) have conducted research on Indonesian regional growth, using an aggregate production function in year 1985 to 1991 with annual data 26 provinces at 1983 constant prices. The study shows that the capital, labor, the quality of

human capital and agglomeration have a significant effect on GDRP of each area of study. The data used area combination of sequential time data (time series) and between individuals or provincial data (cross section).

Another study, Ari Winarto (2005) Analyze the economic growth of Banyumas District in Year 1970 to 2001. The study shows that all the independent variables (Agglomeration, Capital, Labor) has a simultaneously significant impact to the dependent variable (economic growth of Banyumas district).

Model Specification and Methodology

Concerning the objective of the study, the existing literature contains a number of distinct conceptual rationales for the inclusion of human capital in models of economic growth. According to Romer (1996) the Human Capital Model showed that:

$$Y(t) = K(t)^\alpha E(t)^\beta [A(t)L(t)]^{1-\alpha-\beta} \dots\dots\dots(2.1)$$

If the equation above divided by *AL* this is transformed in to an empirically estimable specification following Mankiw, Romer and Weil (1992) as follows:

$$y(t) = k(t)^\alpha e(t)^\beta \dots\dots\dots(2.2)$$

Where :

$$y(t) = \frac{Y}{AL}; \quad k(t) = \frac{K}{AL}; \quad e(t) = \frac{E}{AL}$$

By following Source of Growth Model the equation (2.2) could be transformed in a Cobb-Douglas production function with constant returns to scale (Effendi and Sumantri, 2003):

$$y = f(k, e, t) \dots\dots\dots(2.3)$$

Where :

y = GDRP per labor force; k = Capital per labor force; e = Education per labor force and t = time for technological change in production function. The equation (2.3) is determined by the following differential equations with respect to time given by:

$$\frac{dy}{dt} = \left(\frac{\partial f}{\partial k} \cdot \frac{dk}{dt}\right) + \left(\frac{\partial f}{\partial e} \cdot \frac{de}{dt}\right) + \left(\frac{\partial f}{\partial t} \cdot \frac{dt}{dt}\right) \dots\dots\dots(2.4)$$

If the equation (2.4) divided by y and infused by k and e variables are expected to follow:

$$\frac{1}{y} \cdot \frac{dy}{dt} = \frac{1}{y}\left(\frac{\partial f}{\partial k} \cdot \frac{dk}{dt} \cdot k \cdot \frac{1}{k} + \frac{\partial f}{\partial e} \cdot \frac{de}{dt} \cdot e \cdot \frac{1}{e} + \frac{\partial f}{\partial t}\right) \dots\dots\dots(2.5)$$

The equation (2.5) can be written in the following form:

$$\frac{dy/dt}{y} = \left(\frac{(\partial f/\partial k)k}{y} \cdot \frac{(dk/dt)}{k}\right) + \left(\frac{(\partial f/\partial e)e}{y} \cdot \frac{(de/dt)}{e}\right) + \left(\frac{(\partial f/\partial t)}{y}\right) \dots\dots\dots(2.6)$$

Where :

$\frac{(dy/dt)}{y}$ = Level of GDRP Growth per labor force

$\frac{(dk/dt)}{k}$ = Level of Capital Growth per labor force

$\frac{(de/dt)}{e}$ = Level of Education Growth per labor force

$\frac{(\partial f/\partial k)k}{y}$ = Elasticity of GDRP toward Capital (per labor force)

$\frac{(\partial f/\partial e)e}{y}$ = Elasticity of GDRP toward Education (per labor force)

$\frac{(\partial f/\partial t)}{y}$ = Additional Output caused by another factors but not caused by capital changed and education changed.

Following The equation (2.6) can be seen the labor growth; capital growth; and human capital growth, and other factors basically determine the growth of an economy. In term of economic growth, equation (2.6) therefore can be represented as follows:

$$gy = \alpha_0 + \alpha_1 gk + \alpha_2 ge \ldots\ldots(2.7)$$

Where :

$gy = \frac{(dy/dt)}{y}$ = Level of GDRP Growth per labor force

$\alpha_0 = \frac{(\partial f/\partial t)}{y}$ = Additional Output caused by another factors but not caused by capital changed and education changed.

$\alpha_1 = \frac{(\partial f/\partial k)k}{y}$ = Elasticity of GDRP toward Capital (per labor force).

$gk = \frac{(dk/dt)}{k}$ = Level of capital growth per labor force

$\alpha_2 = \frac{(\partial f/\partial e)e}{y}$ = Elasticity of GDRP toward Education (per labor force).

$ge = \frac{(de/dt)}{e}$ = Level of education growth per labor force (human capital growth)

Assuming factor of economic crisis become equation (2.7) constraint the multiple regression model is given by:

$$gy = \alpha_0 + \alpha_1 gk + \alpha_2 ge + \alpha_3 econcrisis + \varepsilon \ldots\ldots(2.8)$$

Where :

gy = The GDRP Growth

gk = The Capital Growth

ge = The Human Capital Growth

econcrisis = Economic Crisis factor

ε = Error term

Specification of Variables and Source of Data

The empirical analysis employs data sets for the period 1980-2010 for all the variables. The time series are mainly from Sumedang District Development Report Released by Sumedang District Official Government.

Table 6. Estimated Results at Different Levels of Dependent Variable

Year	Capital Growth (%)	Human Capital Growth, (%)	GDRP Growth (%)	Note
1980	8	8.33	4.33	
1981	18	6.39	7.01	
1982	17	6	3.99	
1983	10	2.01	3.7	
1984	11	2.96	6.17	
1985	9	2.87	2.18	
1986	15	9.42	5.19	
1987	11	3.02	4.36	
1988	5	3.01	5.11	
1989	13	1.25	6.6	
1990	14	3.3	6.4	
1991	14	0.75	6.15	
1992	9	2.74	5.71	
1993	9	0.87	5.75	
1994	9	3.58	6.67	
1995	9	-2.35	7.27	
1996	14	6.98	6.91	
1997	12	1.57	4.16	Crisis
1998	-16	0.72	-11.61	
1999	-9	1.31	0.7	
2000	10	1.15	4.35	
2001	10	1.08	3.39	
2002	14	0.92	3.87	
2003	11	-0.94	3.41	
2004	9	3.24	3.86	
2005	10	0.25	4.31	
2006	10	1.59	4.52	
2007	8	4.69	4.17	

Year	Capital Growth (%)	Human Capital Growth, (%)	GDRP Growth (%)	Note
2008	14	2.62	4.64	
2009	7	2.56	4.29	
2010	8	8.33	4.55	

The dependent variable is GDRP level at year 2000 constant prices. The level forms are preferred to the growth rates in a time series framework mainly due to the stationary nature of growth rate time series. The growth of human capital is measured by growth rates of number of the economically active population for whom higher education level of schooling attained (≥ Senior High School graduated). The growth of capital will be proxied by growth of gross domestic capital formation at 2000 constant prices. The economic crisis will be proxied since 1997 upnow is time for indonesia economic crisis then the constant number upper 1997 is one and lower 1997 is zero

Results and Discussion

The empirical estimates presented below provide insights into the relationships between measures of capital growth and human capital growth on economic growth. However, these regressions should not be misinterpreted as causality tests: in particular, we acknowledge a substantial feedback effect from output toward the input, as emphasised in the endogenous growth literature. These estimates are not simple correlations because the input measures directly impact the economic growth process so that the measures are related directly. Rather, we view the evidence as indicating whether our human capital proxies improve upon traditional growth measurement Now we discuss the empirical result in detail

Table 7. Estimated Results at Different Levels of Dependent Variable

Variable	Coefficients	Std.Error	t.stat	Sig
Constant	0.242	0.838	0.289	0.775
gk	0.407	0.057	7.083	0.000
ge	-0.051	0.141	-0.360	0.721
econcrisis	0.042	0.071	0.589	0.561
Adj.R Square	0.662			
F stat	17.664			0.000[a]
DW	1.817			

The regression equation result is given by:
(gy) =0.242 + 0.407 gk – 0.051 ge + 0.042 econcrisis

The most striking result is that the human capital growth variable (ge) depicts a insignificant at 5% statistic level and negative impact on regional economic growth (gy). The capital growth (gk) variable shows a significant positive impact at 5% level and positive impact on regional economic growth (gy). The economic crisis variabel (econcrisis) had a insignificant positive impact at 5 % level of statistic significance and positive impact on regional economic growth (gy).

Jointly all the variables are significant at 1% as indicated by the F- statistic. The R^2 is higher as is expected showing a good fit in the model. The diagnostic tests show normality of the residuals, no multicolinearity and no autocorrelation as seen by the normality test, the VIF test and the Durbin Watson statistic (DW).

The results for relationship human capital (ge) with economic growth (gy) variable suggest that the coefficient of human capital growth is negative for Sumedang district case. As for as Sumedang is concerned, the most important reason might be that in Sumedang the human capital growth has been supporting factor for region closed area such as Bandung City and Bandung District. Since Sumedang was not be as industry area, labor force with higher education

prefer to work in Bandung city rather than in Sumedang.

Regarding the assumption of the model, it is notable that in case of Sumedang, there was contribution capital growth on economic growth which imply that the capital growth can generate perpetual economic growth. There is evident from the table that economic crisis factor effect positively and insignificantly to the growth of gross domestic regional product in Sumedang. The possible reason might be that Sumedang hasn't been market destination.

When we compare the results of human capital growth effect on economic growth, we found that the effect negatively and insignificantly to the growth of the gross domestic regional product for Sumedang. These results are contrary to several studies such as Barro (1991), Mankiw and Weil (1992), in which a region's subsequent growth is positively related to the measures of human capital. It implies that if there is increase in human capital accumulation, it will lead to decrease in economic growth.

Human capital occupies a central role in modern thinking about growth. Despite a large literature on the matter, there is a lot to be learned: there is no consensus of its role in growth and development, presumably because this role varies across different institutional settings and national environments. This study was undertaken in the hope of uncovering the situation for Sumedang District.

Conclusions

After constructing the required time-series, this paper investigated the impact of human capital growth on economic growth in Sumedang District through the application of an multiple regression methodology. The average level of growth of human capital appears to have no significant impact on the evolution of total level of output. The empirical results in this study have some policy implications. In particular, they underscore the need for further efforts in Sumedang to increase its level of human capital.

Different factors are considered to explain the unexpected outcome/seen from a theoretical perspective/ from the study. The structure of the labor market is critical for the quantity and quality of human capital that is generated and for the uses to which it is put. The structure of the labor market will determine, for example, how much human capital is put into growth-enhancing activities and how much into other activities. It will also determine what types of human capital will be demanded. Krishnan's (1998) finding that the labor market in developing country is rigid and unresponsive to either the pressure from the reform or the growing queues of educated unemployment attests to this case. Another problem very closely related to the rational and efficient utilization of educated labor force derives from brain drain; emigration of high level manpower which has become widespread and directly imposes on the contribution that would have been made from education.

The deteriorating quality of education in the wake of significant expansion in the sector is another element that puts into question the basic framework that education provides students with growth enhancing skills. This is also reinforced by the observation that the curriculum has been too academic, politically motivated and alien to the largest segment of the population. The policy direction of the education sector has also been top down usually following the politically perspective.

Human capital is just one aspect of the economy that enters into the determination of

growth. Simply providing more schooling may yield little or nothing in the way of economic growth in the absence of other elements such as the appropriate market, legal and governmental institutions and suitable policy environment in other sectors of the economy to support a functioning modern economy. Human capital growth by itself is not a sufficient engine of growth. In this direction the study also questions the economic policy directions, which could have been perverting the contribution to economic growth that would have been made from an expansion in educational investment.

Major initiatives toward reforming education could have substantial success in the economy. Addressing the issue of relevance and quality of education; the institutional workings of the labor market and employment conditions; and having a comprehensive database (information) related to the workings and relationships of education, labor and the economy would essentially help tap the contributions that could be made from education. The study ultimately points towards the importance of an institutional and political environment conducive to growth.

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