

Relationship between economic sector performance and human development index in the Philippines

Lucerne M. Razalo

Department of Development Communication, College of Agriculture,
Central Mindanao University, Musuan Bukidnon Philippines.

Email: lulu_nomcarrd@yahoo.com

ABSTRACT

The primordial intention of the study was to explore the correlation between economic sector performances and human development index (HDI) in the Philippines. The economic sector is measured in terms of the gross value added (GVA) in agriculture, industry and services. Empirical estimate was based on a panel dataset covering the periods 2002 to 2009. The model was estimated through Ordinary Least Squares multiple Linear Regression. The measure of goodness of fit shows that the model is significant or has fit the data with F value of 30.310 and sig of .000. The R^2 value captured .65 deviations in the dependent variable. The R^2 value depicts that 65% in the variation of HDI is attributed to forestry, construction, mining and quarrying, trade and repair of motor vehicles, and transportation storage and communication. The 35% is attributed to factors other than the independent variables included in the model. The regression results show that forestry, construction, mining and quarrying, trade and repair of motor vehicles, and transportation storage and communication are predictors of HDI. For every 1% increase in GVA for forestry, there is an increase in HDI by .001%; for every 1% increase in GVA for construction, a .005% increase in HDI; for every 1% increase in GVA for mining and quarrying a .004% increase in HDI; for every 1% increase in GVA for trade and repair of motor vehicles, an increase in HDI by -.007%; and for every 1% increase in GVA for transportation storage and communication, a .006% increase in HDI.

Keywords: *Index, GVA, Linear regression.*

INTRODUCTION

Recent literature has shown contrast between human development (HD) and economic growth (EG) wherein the former was labelled as the absolute goal of the development process while the latter was defined as an imperfect representation for more general well-being, or as a method towards enhanced human development. This argument has widened the meanings and goals of

development, however, defining the important interrelationships between human development and economic growth is imperative. For greater independence and competencies to mend economic performance, human development has to have a significant influence on growth. In like manner, as improved incomes surge the array of choices and skills enjoyed by households and governments, economic growth in return, boosts human development.

The HDI, represents Amartya Sen's "capabilities" style to understanding human well-being, which underlines the meaning of ends (like a decent standard of living) over means (like income per capita) (Sen 1985). Fundamental capabilities are instrumentalized in HDI by the addition of proxies for three important ends of development namely access to health, education, and goods. Empowered by these and other capabilities, individuals can attain their anticipated state of being.

Nearly concomitant with the utilization of national income accounts to measure well-being is the blending of economic growth (as measured by the change in Gross Domestic Product) with development. Hicks and Streeten (1979) emphasized common assumptions prepared by the proponents of this measure: economic growth will inevitably "trickle-down" and extend its benefits across society; and when economic growth go amiss to trickle-down and consequently causes income dissimilarities, governments will stride in to help the situation. By one or both paths or directions, growth in per capita national income will lessen poverty. Hicks and Streeten note that, neither supposition had, at the time of their writing, verified correct: "Highly intense and uneven growth was noticed in some countries for extended periods, so that there was no general tendency for growth to extend over a large or increasing area.

Further, the ultimate drive of economic activities is enhancement in the quality of human resource development and the main objective of economic growth is the welfare of human beings. Almost all countries underscore social well-being as the major goal. So, the problem confronting policy makers is to improve social benefits. It is not clear though that indicators of economic growth and measures of wealth such as progression in income per capita are the prime bases of social and economic well-being of the commonalities. Growth in income per capita may be inadequate for human development and expanding social benefits. Mazumdar (1996) projected the predictive relationship between human development and economic growth and found out that there is no uniform relationship. Quality of human capital can stay poor despite rapid economic

growth. The transformation of economic growth to human development is in fact hinge on numerous reasons (Costantini, 2006).

Panggabean, undated claimed that economic growth continues to be used as an indicator of the success of economic development of a country /region. However, this indicator needs to be criticized, because it does not guarantee high economic growth (not always) positive impact on improving the welfare and reducing disparities of income distribution. Todaro and Stephen, 2006:20; Kuncoro, 2006:11 supported this claim saying that high economic growth is not accompanied by reductions in poverty, unemployment and inequality of income distribution is categorized as economic growth is not qualified. High economic growth, failed to make better the living ethics and/or morals of the majority of the population.

Meanwhile, Ramirez, et al (1988) revealed that there was a period in which economic performance affected human development, particularly through the activities of households and government. And there was a time when a high level of human development affected the economy through increasing the capability of the population and consequently also on their productivity and creativity. Agreeing with Ramirez et al, Soubbotina (2004:7-9) suggests that cyclical correlation between economic growth and human development. Soubbotina seeks construct as a tool of economic growth and human development as the goal. Quality economic growth can be enjoyed by people through improving access to health services, education and employment services. Sufficient access to public services specifically health, education, economic and community to deliver welfare achieve a better degree / higher quality to economic growth and sustainable. Economic growth and the quality is very possible to achieve sustainable human development aimlessly for qualified workers, technological innovation and management is reliable and trustworthy.

The a priori of this study is that economic sector performance does not have relationship to human development index. The present study is deemed significant because of the potential contributions of economic sector performance towards human development index. The findings of the study would be vital inputs to the government administrators, policy makers, and future researchers to understand the roles played by economic sector performance in human development.

METHOD

Data used for the study were taken from the reports available and accessible at the online sites. On account of data incompleteness, it was necessary to interpolate the accessed data using averaging.

The study endeavored to include all regions of the Philippines in the inferential analysis but unfortunately, data for the NCR (National Capital Region), including the CAR (Cordillera Administrative Region), specifically for Forestry were not available during the study. Also, the Autonomous Region in Muslim Mindanao (ARMM) had data only on Forestry for the year 2002. On national accounts, data on economic sector performance in agriculture, industry, and service that were available and accessible at the online sites only covered the period 2002 to 2009. This is why the study only included Regions 1, 2, 3, 4A, 4B, 5, 6, 7, 8, 9, 10, 11, 12, and 13 for the periods 2002 to 2009.

The study obtained data of economic sector performance in agriculture, industry, and service, based on Gross Value Added (GVA) released by the Philippine Statistics Authority (PSA) and National Statistics and Coordination Board (NSCB). The sub-sectors under the sectors agriculture, industry, and service that were available in the PSA and NSCB databank were limited only to those that were included in the analyses.

The GVA measures the contribution to the economy of each individual producer, industry or sector. It only means that the value of the amount of goods and services that have been produced, less the cost of all inputs and raw materials are directly attributable to the production or the net output of a sector after adding up all outputs and subtracting intermediate inputs. It was calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources.

The HDI used in the study are the data released by the United Nations Development Program (UNDP) covering the period 2002 to 2009. The HDI is a summary measure of average achievement in fundamental dimensions of human development which include a long and healthy life, being knowledgeable and have a decent standard of living. The index is expressed in values from 0 to 1.

The model below examines the relation of economic sector performance on agriculture, industry and services to human development index. The model is outlined as:

$$\text{HDI} = \quad + B_1 \text{Log For} + B_2 \text{Log Man} + B_3 \text{Log Cons} + B_4 \text{Log Min} + B_5 \text{Log Elec} \\ + B_6 \text{Log Trade} + B_7 \text{Log Trans} + \mu_i$$

Where:

HDI= Summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living

= Constant

For= GVA in Forestry measured in current prices and expressed in logarithms

Man = GVA in Manufacturing measured in current prices and expressed in logarithms

Cons= GVA in Constructions measured in current prices and expressed in logarithms

Mining & Quarrying = GVA in Mining & quarrying measured in current prices and

expressed in logarithms

Elec = GVA in Electricity, Gas and Water Supply and measured in current prices and

expressed in logarithms

Trade = GVA in Trade and Repair of Motor vehicles measured in current prices and

expressed in logarithms

Trans = GVA in Transportation storage and communication measured in current prices

and expressed in logarithms

The model was estimated through Ordinary Least Squares (OLS) multiple linear regression analysis using SPSS as a software. Before the estimation, assumptions for OLS were made such as linearity, normality, multicollinearity, and homoscedasticity, and autocorrelation among others.

RESULTS AND DISCUSSION

Presented below are the findings drawn from the descriptive and inferential analyses employed in the study. The figures depict economic sector performance by region and human development index in composite from 2002 to 2009. The predictive relationship of economic sector performance to human development index in the Philippines is also presented in this chapter.

Trends of the Philippine Economic Sector Performance, 2002 to 2009

Figures 2 to 8 show the trends of economic sector performance of the country from 2002 to 2009, by regions. As noticed in all the figures, only fourteen regions namely Regions 1, 2, 3, 4A, 4B, 5, 6, 7, 8, 9, 10, 11, 12, and 13 were analyzed due to the absence of data in Cordillera CAR and in ARMM.

The Region 2, over the rest of the regions, showed an upward trend of economic performance on GVA forestry which started in 2002 and posted highest performance in 2005 (Figure 2). However, it dropped significantly heading towards 2009. Region 3 also showed an improvement on its GVA from 2004 to 2006, dropped in 2007 to 2008 and went up again in 2009. Region 8 obtained the lowest GVA performance. The rest of the regions have relatively the same performance.

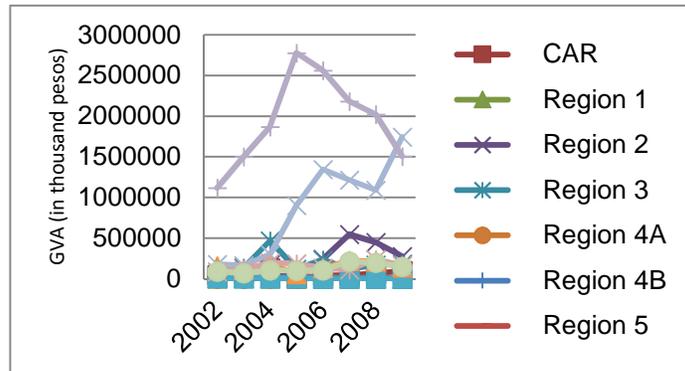


Figure 2. GVA Forestry, Trend Performance by Region, 2002-2009

Figure 3 shows GVA manufacturing in Region 4A which grew progressively over the past seven years where highest GVA performance was posted in 2008, however, it dropped in 2009. Region 3 shows but little growth in GVA performance next to Region 4A and the region which posted lowest GVA performance is Region 2.

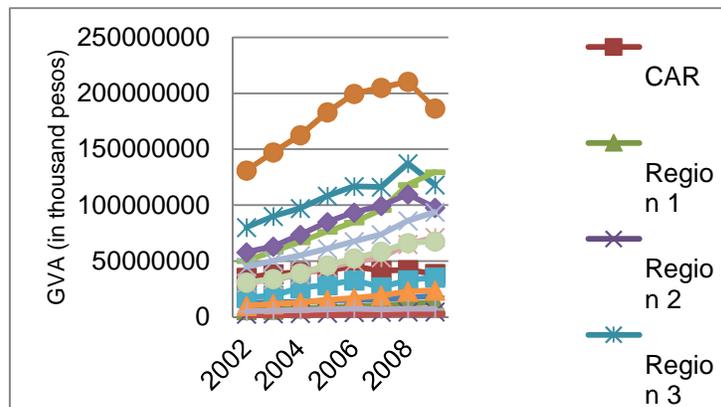


Figure 3. GVA Manufacturing, Trend Performance by Region, 2002-2009

Figure 4 shows that Region 3's GVA construction has been significantly growing from 2002 to 2009. Highest performance was posted in 2009. Among the Regions, CAR has the lowest GVA performance. Region 4A also shows an increasing GVA and maintains a steady performance in 2008 to 2009.

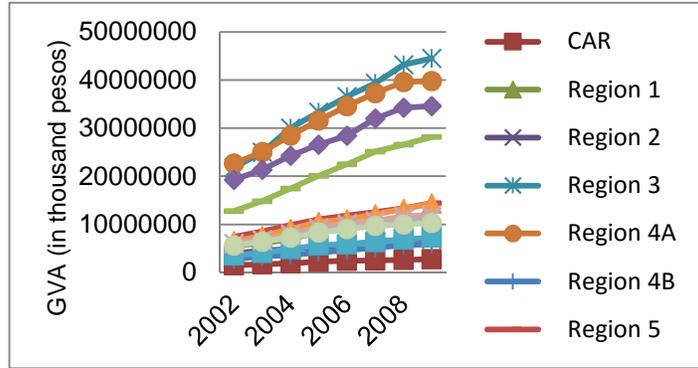


Figure 4. GVA Construction, Trend Performance by Region, 2002-2009

Figure 5 displays the trend performance for GVA mining and quarrying. Region 3 which is the highest performer shows fluctuating trend from 2002 to 2009. Region 11 also shows an erratic performance from 2002 to 2009. Meanwhile, Region 2 shows a steady low performance from 2002 to middle of 2005 and started to go up in the same year until it reached its highest in 2009.

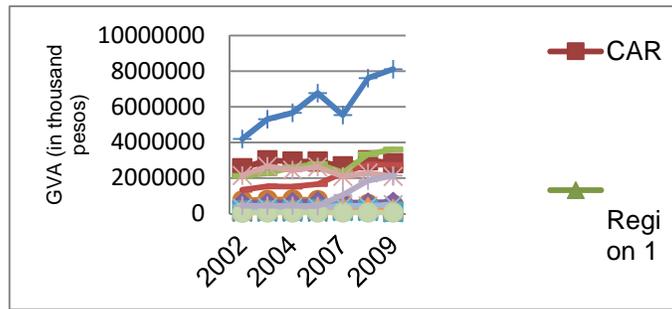


Figure 5. GVA Mining and Quarrying, Trend Performance by Region, 2002-2009

Figure 6 shows that Regions 3, 4A, 7 and 1 display an increasing trend in GVA performance on electricity, gas and water supply from 2002 to 2009. Regions 9, 11, and 12 present relatively the same performance in the period under study.

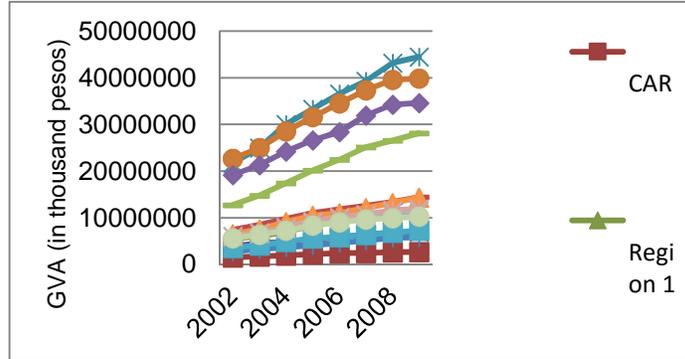


Figure 6. GVA Electricity, Gas and Water Supply, Trend Performance by Region, 2002-2009

Figure 7 shows that Regions 4A and 7 show an increasing trend on GVA trade and repair of motor vehicles from 2002 to 2006 and a steady state from 2007 to 2009. Further, Regions 6, 3, 10 and 11 also show an increasing trend.

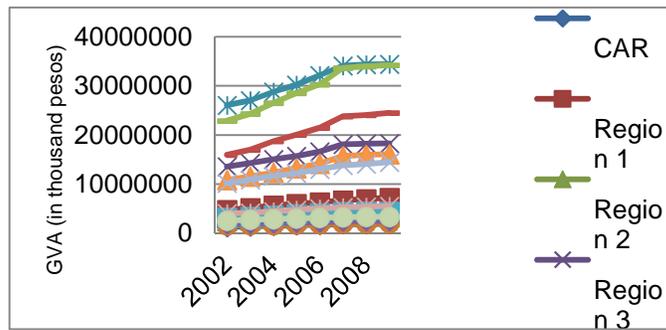


Figure 7. GVA Trade and Repair of Motor Vehicles, Trend Performance by Region, 2002-2009

Figure 8 shows the GVA transportation storage and communication trend performance. Region 3 posted the highest trend performance while CAR had the lowest. Meanwhile, Region 6 displays a consistent increase from 2002 to 2009.

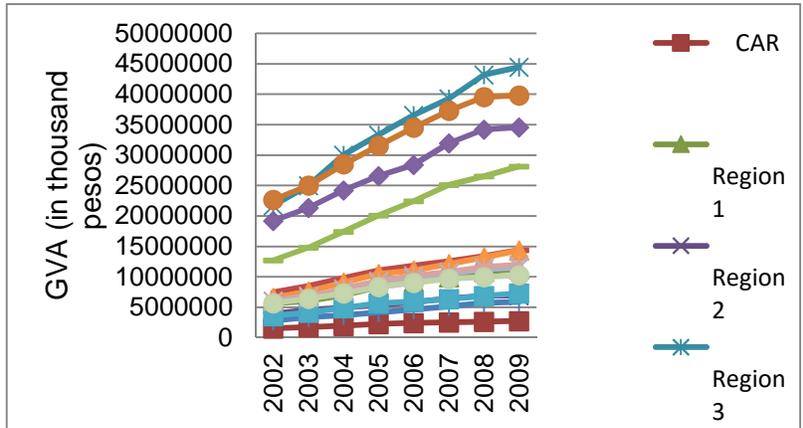


Figure 8. GVA Transportation Storage and Communication, Trend Performance by Region, 2002-2009

Figure 9 depicts the HDI trend of the Philippines from 2002-2009 with values expressed from 0 to 1. Higher trends were posted in 2007, 2008, and 2009 although the highest value was in 2008. Further, HDI trend of the country is observed to be the same in 2002 to 2004. It also showed a uniform trend in 2005 to 2006.

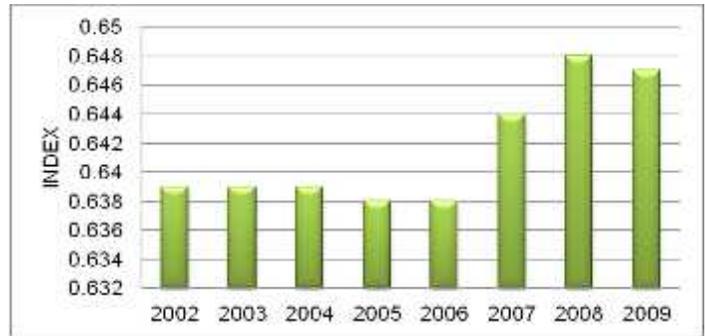


Figure 9. HDI Trend Philippines, 2002 to 2009

Estimation Results

The ANOVA measure of goodness of fit shows that the model is significant or has fit the data with F value of 30.310 and sig of .000. The R² value captured .65 deviations in the dependent variable. The R² value depicts that 65% in the variation of HDI is attributed to forestry, construction, mining and quarrying, trade and repair of motor vehicles, and transportation storage and communication. The 35% is attributed to factors other than the independent variables included in the model. Regression results show that forestry, construction, mining and quarrying, trade and repair of motor vehicles, and transportation storage and communication are predictors of HDI.

The slope coefficient for forestry is .001 which means that every 1% increase in GVA for forestry corresponds to .001% increase in HDI, holding other things constant. Slope coefficient also for construction which is .005 means that for every 1% increase in GVA for construction will result to .005% increase in HDI, holding other things constant. Further, the beta coefficient for manufacturing which is .000 means that every 1% increase in manufacturing corresponds to .445% decrease in HDI, holding other things constant. Beta coefficient for mining and quarrying which is .004 means that every 1% increase in GVA for mining and quarrying results to .004% increase in HDI, holding other things constant. The slope coefficient for electricity, gas and water supply which is -.001 means that every 1% increase in GVA for electricity, gas and water supply corresponds to .409% decrease in HDI, holding other things constant. The beta coefficient also for trade and repair of motor vehicles which is -.007 means that every 1% increase in GVA for trade and repair of motor vehicles results to .007% decrease in HDI holding other things constant.

Finally, slope coefficient for transportation, storage and communication which is .006 means that every 1% increase in GVA for that industry corresponds to .006% increase in HDI, holding other things constant. This rejects the null hypothesis that the slope coefficients for these variables are 0. From the analysis of the interactions of the set of independent variables and dependent variable the model below is constructed and/or built:

$$\text{HDI} = .593 + .001\text{Log For} + .005\text{Log Cons} - .007\text{Log Trade} - .006\text{Log Trans} + .004\text{Log Min}$$

The findings that there is a relationship between economic sector performance and human development index is supported by Bashir's (2004) study on Empirical Analysis of Higher Education and Economic Growth in West Virginia which indicates that income growth and education growth are positively related. The main objective of the said study was to examine the correlation between education and economic growth in West Virginia. County level analysis based on the changes of income, education and population, highlight two important points. First, empirical analysis reveals that both education growth and income growth positively affect each other. Thus, more attempts to increase job or income generation opportunities would be beneficial.

Human development also plays an important role in any country's economic growth. As Solow (1956) revealed in the neoclassical growth model, human development is identified the input and result of economic growth. Thus, human capital gets deep meaning in determining the level of economic growth with respect to education, health and nutrition as evidenced in the work of Lewis (1955) and in modern endogenous growth theories, as well. Torras and Boyce (1998) as well as Klick (2002) include measures of human development as control variables in their respective setup.

The study of Yanis (2004) on Human Development and Economic Growth elaborates Amartya Sen's perspective. Human development finds its theoretical underpinnings in Sen's capabilities approach which holds "a person's capability to have various functioning vectors and to enjoy the corresponding well-being achievements" as the best indicator of welfare (Sen, 1985). This viewpoint alters the analysis of development to the direction of not only attributes (referring to the fundamental needs view of human welfare) e.g. income, education, health and others, but also the path of possible opportunities available to individuals in a particular country. Certainly, there is a connection between the two--these opportunities are affected by certain aspects of an individual: a hungry or illiterate individual would only have a number of choices than a healthy, educated person. Increased income is contributory to directly improving the capabilities of individuals and so the human development of a nation since it encapsulates the economy's command over resources (Sen, 2000).

On industry of which mining is a component and found to affect human development, the NSCB considered mining industry as a potential driver of economic growth in the Philippines. This is because of the country's available mineral wealth of at least PhP 47 trillion in gold, copper, chromites, manganese, silver and iron (MGB, 2013). The said amount is ten times the country's annual

gross domestic product, which is enough to eradicate poverty completely. Aside from that, mining and quarrying sector also provide 0.7 percent (252,000 people) of the country's total employment.

CONCLUSION AND RECOMMENDATION

The present study explored the trends of economic sector performance on agriculture, industry, and services; described the trend of human development index in the Philippines from 2002 to 2009, and determined the relationship between economic sector performances to human development index. Region 2 tops on GVA Forestry. Region 4A has the highest performance on GVA manufacturing. Region 3 performed best on GVA construction. Region 3 is also highest performer on GVA mining and quarrying, electricity, gas and water supply. Regions 4A and 7 were highest performers on GVA trade and repair of motor vehicles. On GVA transportation, storage and communication, Region 3 again has its best trend performance. HDI trend of the Philippines from 2002-2009 is observed to be fluctuating. Highest value was posted in 2008 and lowest was during the period 2005 to 2006. The study further demonstrated that forestry, construction, mining and quarrying, trade and repair of motor vehicles, and transportation storage and communication affect human development index in the Philippines. Manufacturing; electricity, gas and water do not affect human development.

It is recommended to use other statistical tools to prove the correlation between economic sector performance and human development. Results of the investigation are not that conclusive; hence further study is needed by adding all sub-sectors in agriculture, industry and service, and sets of independent variables. Furthermore, it is also suggested to determine the causal relationship between the economic sector performance and human development in the Philippines by using Granger Causality Test.

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