Kenya’s Human Capital Development and Economic Growth: Best Practices from South Korea and Singapore (2002-2014)

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Abstract

The study examined the role played by HCD in the economic development of Kenya between 2002 and 2014 by interrogating the development models adopted by South Korea and Singapore as a benchmark to determine the gaps in the model adopted by Kenya. Despite Kenya, Singapore and South Korea exhibiting similar income levels in the 1960s, the gap between Kenya’s economic growth and those of South Korea and Singapore has widened tremendously since independence in 1963. Kenya has recorded low Gross Domestic Product (GDP) compared to the two Asian countries. The researcher relied on secondary data sourced from national, regional and international websites and organizations. The data collected was corroborated with data sourced from government offices and websites. Data sets from the three countries was used to examine the extent to which HCD practices affect economic growth for the purposes of deriving the best HCD practices from South Korea and Singapore that influence economic growth. The design therefore necessitated causality analysis using the Granger Causality Test and correlational and regression analysis that facilitated the measurement, development and assessment of the statistical significance of the causal relationships among the study variables. The model variables included GDP as the response variable explained by six predictor variables; government expenditure on education, human development index, average years of schooling as a proxy for percentage of population that has attained education, patents filed by the countries, government effectiveness and government expenditure on research and development. Findings revealed that HCD had a great influence on economic development of a country. Findings further revealed that whereas human development index was found to be positively correlated to economic growth in South Korea and Singapore, it was negatively (inversely) correlated to economic growth in Kenya. To achieve sustained economic growth, the study recommends that the provision of education be strengthened to ensure successful implementation of Competency Based Curriculum with the government laying more emphasis on applied R&D.
1. Introduction

The concept of Human Capital (HC) has an extensive history in the economic literature (Psacharopoulos and Patrinos, 2004), and is rooted in development of the economic science (Alika et al., 2014). Even though there is no consensus definition of human capital, various scholars have defined Human Capital as the knowledge, expertise and skills accumulated through education and training that activate the labour force of a country leading to economic growth and development (Adamu, 2003; Adelakun, 2011). This knowledge is developed through formal and informal training and utilized in productive activity for the benefit of individuals, organizations and society. The United Nations Economic Commission for Africa (1988) and Awopegba (2001) supports this view by considering the acquired knowledge, skills and attitudes as vital for the manipulation of capital, technology and land in order to produce goods and services for human consumption. In economic terms, HC is described as the accumulation of knowledge and its effective investment in the development of an economy (Miyanda and Venkatesh, 2017). Thus, at the macro level, human capital is regarded as a key factor of production in the economy that contributes to economic growth (Umut, 2011), while at the micro level, it is viewed as an intangible asset which forms the intellectual and market capital value of an organization (Kucharcikova, 2011). Harbison (1973) further opines that the wealth of a nation is determined by its level of human capital. Several other economists such as Bergheim (2005), reinforced Harbison’s proposition by arguing that HC is critical as it increases the productivity of labour and physical capital.

Numerous studies by scholars such as Trostel, Walker and Woolley (2002), Psacharopoulos & Patrinos (2004) and Son (2010) have attributed the differences in the level of socio-economic development across countries to the quantity and quality of human capital. These studies singled out growth of human capital as the principal source of economic growth for both the developed and some South East Asian countries. Findings from these studies further provide a strong justification for governments and households to invest significant amounts of their resources in education, with the expectation that higher benefits will accrue over time to the individual and the country. Many theories explicitly connect investment in human capital development to education. Thus, HCD is viewed as the process of improving employee’s performance, capabilities and resources through education and training.

During the early years of independence, Kenya, South Korea and Singapore were at par in terms of economic development. The three countries were categorized as poor with low GDP per capita and high poverty rates. For example, in 1963 the Gross Domestic Product (GDP) for the three countries was 8.77, 9.53 and 9.98 respectively. In 1965 the GDP for South Korea was 5.19, 7.59 for Singapore and 2.0 for Kenya. The GDP growth rate for Kenya fell from 8.01% in the 1970s to 4.07% in the 80’s and to 1.67% in the 90’s, compared to Singapore that recorded an average growth rate of 8% a year through the 70s, 80s, and 90s, while South Korea maintained a high GDP growth rate of 6-7% between 1960–85.
Both Korea and Kenya’s GDP per capita was $105 in 1965 and a poverty ratio of 40% while Singapore’s GDP per capita was $516. In 1967, the per capita GDP for Kenya was $121 (Ksh. 12,221 by today’s exchange rates), that of South Korea was $161 (Ksh. 16,261) while Singapore was $625 (Ksh. 63,125). However, after half a century, Korea’s GDP per capita as at December 2017 was $35,938 (Ksh. 3.6 million), Singapore’s stood at $55,235 (Ksh. 5.6 million) while Kenya’s GDP per capita was $1,695 (Ksh. 171,195). Additionally, between 1980 and 2013 Kenya recorded an annual HDI growth rate of 0.49% compared to South Korea’s growth rate that stood at 1.10% in the same period (Hwa, 2015). This was twice or three times higher than Kenya’s. South Korea and Singapore maintained high GDP growth rates and are considered high income countries, while Kenya remains among the low middle income countries with high inequality.

From the aforementioned, it is apparent that the gap between Kenya’s economy and those of South Korea and Singapore has widened tremendously since independence with Kenya recording low GDP and high poverty rates compared to Singapore and South Korea. It is not clear why Kenya has lagged behind South Korea and Singapore in terms of economic development.

The study analyzed the various factors that contributed to the success of the Korean and Singaporean models and singled out aspects that are imitable. The study adopted a benchmarking approach because after independence, the economies of South Korea and Singapore exhibited similarities with Kenya in terms of GDP per capita and population.

Most studies examined the cause of economic growth in the period after independence up to the 1990’s. It is also worth noting that previous studies on Human Capital development in Kenya are quite limited in investigating this phenomenon. In addition, a few scholars who have examined the subject, such as Barro (1991), observed that there is no consensus on the cause of economic growth and development and therefore research on the topic is far from over, while Acevedo (2008) recommended that more country specific studies be undertaken to determine the relationship between Human Capital Development and economic growth. The present study was country specific and looked at HCD from a different perspective while using different variables to be able to understand reasons for stagnation of economic growth in Kenya.

**Study Objectives**

The study examined the role played by human capital development in the economic growth of Kenya between 2002 and 2014 by interrogating the development models adopted by South Korea and Singapore as a benchmark to determine the gaps in the model adopted by Kenya. HCD was used as a proxy to investigate why South Korea and Singapore had progressed faster in terms of economic development compared to Kenya, despite the three countries being at the same level of economic development in the 1960s. The study interrogated the Korean and Singaporean models of economic growth by analyzing the human capital factors that contributed to the success of those
models in order to draw lessons that could be learnt by Kenya’s policy makers. Specifically, the study was guided by the following objectives:

i. Assess the HCD model adopted by South Korea for economic growth over the period 2002 to 2014.

ii. Assess the HCD model adopted by Singapore for economic growth over the period 2002 to 2014.

iii. Assess the HCD model adopted by Kenya for economic growth over the period 2002 to 2014.

The study adopted the Human Capital Theory Model as developed by Swanson (2001). Additionally, the research was based on the Resource Based View Theory. Both theories emphasize that investment in people adds to their value and to the firm.

2. Methods

The study was guided by positivist research philosophy. The research philosophy reflected the principles of positivism because the research was based on the Resource Based View Theory and various research objectives developed were tested and confirmed. The study also adopted a deterministic causal research design to determine the effect of HCD on economic growth in South Korea, Singapore and Kenya. The deterministic causal research design was found appropriate for the study because the research sought to examine the causation between HCD indicators and economic growth indicators in the three countries. The design therefore necessitated causality analysis using the Granger Causality Test and correlational and regression analysis that facilitated the measurement, development and assessment of the statistical significance of the causal relationships among the study variables. The researcher used data sets from the three countries to examine the extent to which HCD practices affect economic growth for the purposes of deriving the best HCD practices from South Korea and Singapore.

The researcher relied on secondary data, sourced from national, regional and international websites and organizations. Statistical data (government expenditure on education and research and development; Human Development Index and Average Years of Schooling) were sourced from regional and international organizations namely, United Nations Development Programme (UNDP), UNESCO Institute for Statistics (UIS), IMF, the World Bank, Asian Development Bank (ADB) and African Development Bank (AfDB). The data collected was corroborated with data sourced from government offices and websites such as Statistics Korea (KESTATA), KOSIS, (for secondary data regarding South Korea), Kenya National Bureau of Statistics (KNBS) yearbooks and the National Treasury (for secondary data regarding Kenya) while data regarding Singapore was sourced from department of Statistics Singapore. Further, data on real GDP was sourced from different issues of IMF, the World Bank and International Financial Statistics Yearbooks, while data on patents and prototypes was sourced from WIPO website www.wipo.int. Additional data on Government Effectiveness was obtained from the Worldwide Governance Indicators website www.govindicators.org. An in-depth literature review of the areas of interest was conducted to examine the previous and current work of experts in the area of HCD as guided by Melissa (2014). Recent research and findings in the field of HCD in the
three countries were identified and reviewed. A research designed recording form was used to collect secondary data. Secondary data was analyzed using hypotheses tests, stationarity tests, granger causality tests, correlation analysis and regression modelling. To assess the normality of the data for modelling and parametric inference, Q-Q plots were constructed and coefficients of skewness and kurtosis were determined.

In order to perform the Granger Causality Test of the predictors as causes of the response variable, GDP, stationarity tests were performed. The study used the Augmented Dicky Fuller (ADF) test of stationarity, combined with the Akaike Information Criterion (AIC) for determination of the optimal lag. The ADF unit-root (stationarity) test was performed to test the hypotheses;

Null, $H_0$: There exists a unit-root (The data is non-stationary)

Alternative, $H_1$: There does not exist a unit-root (The data is stationary)

To assess the independence of the observations, Durbin-Watson tests of autocorrelation (serial correlation) were conducted. Further, Pearson’s correlation matrices helped in the assessment of collinearity/multicollinearity among HCD variables which are the explanatory variables for economic growth as measured using the GDP. Further, Variance Inflation Factors (VIFs) were used to assess collinearity of individual predictors against others in the resulting models. For this study, in case of collinearity, the weaker collinear predictor variable was weeded out in the development of the regression model. This resulted into a reduced model whose explanatory power was not compromised.

Least squares multiple linear regression analysis was performed on the secondary data for each country: South Korea, Singapore and Kenya. The model used was based on economic theory and on the available data relating to human capital being studied. The study adopted a modified model in the works of Gemmell (1996); Lucas (1988); Mankiw et al. (1992); and Romer (1990). The dependent variable was GDP as an indicator for economic growth, while the independent variables were; Total government expenditure on education, Human development index, Average years of schooling, Total number of filed patents, Government effectiveness and Total government expenditure on research and development. The structure of the whole model was:

$$GDP = \beta_0 + \beta_1TGEE + \beta_2HDI + \beta_3AYS + \beta_4TPF + \beta_5GE + \beta_6TGERD + \varepsilon$$

Where;
GDP: Gross Domestic Product
TGEE: Total Government Expenditure on Education
HDI: Human Development Index
AYS: Average Years of Schooling
TPF: Total Patents Filed
GE: Government Effectiveness
TGERD: Total Government Expenditure on Research and Development
$\beta_0$: Regression Constant
β₁, β₂...β₆: Regression coefficients
ε ≡ Random Error.
The goodness of fit of each multiple linear regression was assessed. The coefficient of
determination (Adjusted R²) was used to assess the explanatory power of each model.
To test the statistical significance of the models as well as their adequacy for
prediction, Analysis of Variance (ANOVA) was performed on an entire model
together with t-tests on the individual predictor variables. The ANOVA facilitates the
Fisher’s test (F-test) which uses the F-statistic as the test statistic. F-statistic was
computed for each model to test the hypotheses;

Null hypothesis, H₀: The model is NOT statistically significant, against;

Alternative hypothesis, H₁: The model is statistically significant.

To test the statistical significance of the individual predictors in the models, t-tests
were performed to test the hypotheses;

Null hypothesis, H₀: βᵢ = 0 (The associated predictor variable is NOT statistically
significant)
Alternative hypothesis, H₁: βᵢ ≠ 0 (The associated predictor variable is statistically
significant).

The Breusch-Pagan test which follows a Chi-square distribution was used to test for
homoscedasticity of the residuals with the number of regression parameters in a
model less one as the degrees of freedom. The procedure tested the hypotheses;

Null hypothesis, H₀: the variance is constant (residuals are homoscedastic), against

Alternative hypothesis, H₁: the variance is not constant (residuals are heteroscedastic).

3. Findings
3.1 Summary of the South Korean Model
South Korea had a mean GDP of 4 with 45.75% variation for the period 2002 to 2014. However, the GDP data was approximately normally distributed within the range. The variations of the GDP were found to be independent of time (years) thus ruling out the possibility of time being a confound explaining the variations in the GDP. The South Korea data was found to be stationary with a unit lag (p=1) which enabled Granger causality tests between the predictors and the response variable. Granger causality tests for South Korea indicated that there was a significant unidirectional causation where TGEE, HDI, AYS, TPF and TGERD Granger cause GDP. There was observed no significant causation on GDP by GE. To avoid spurious regression and spaghetti correlations, GE was weeded out in the prediction of GDP. Further, TPF was also weeded out on the basis of eliminating collinearity among the predictors as it was strongly correlated to TGEE which was a stronger predictor of GDP. The regression analysis indicated that TGEE, HDI and AYS shared a strong direct relationship with GDP. TGERD was inversely related to GDP. The model bore an adjusted explanatory
power of 61.58% which indicated that the model was statistically significant and adequate.

Table 1: Multiple Linear Regression Output: South Korea

| Regression Statistics |   |   |   |
|-----------------------|---|---|---|
| Multiple R            | 0.8624 | Std. Error | 1.6732 |
| R Square              | 0.7439 | Durbin Watson | 1.8346 |
| Adjusted R Square     | 0.6158 | Observations | 13 |

| ANOVA |
|-------|
|       | Df  | SS   | MS   | F    | Sig.   |
| Regression | 4  | 67.9532 | 16.9883 | 6.0679 | 0.0039 |
| Residual    | 8  | 23.3976 | 2.7997 |
| Total       | 12 | 91.3508 |

| Coefficients | Std. Error | t Stat | P-value | VIF |
|--------------|------------|--------|---------|----|
| Intercept    | -71.518    | -2.4363 | 0.0357  |
| TGEE         | 3.008      | 2.5598 | 0.0387  | 6.9543 |
| HDI          | 93.3146    | 2.3060 | 0.0453  | 2.3849 |
| AYS          | 13.5894    | 2.7091 | 0.0275  | 1.7833 |
| TGERD        | -3.6678    | -3.6100 | 0.0146  | 5.3674 |

The output yielded the model;

\[
GDP_{SK} = -71.52 + 3.01(TGEE) + 93.31(HDI) + 13.59(AYS) - 3.67(TGERD)
\]

It is observed that in South Korea, the level of GDP that is not influenced by the four predictor variables in the model is -71.518. Further, the GDP increased by 3.008 for every unit increase in TGEE, increased by 93.3146 per unit increase in HDI, increased by 13.5894 per unit increase in AYS and decreased by 3.6678 per unit increase in TGERD as shown in table 1.

3.2 Summary of the Singaporean Model

For the period 2002 to 2014, GDP for Singapore averaged at 6 with 77.92% variation. The GDP data was normally distributed over the period. The ANOVA on the data showed that time was not a confound in the prediction of Singapore GDP. The data yielded a unit optimal lag and was found to be stationary. The Granger causality test showed that TGEE, HDI, AYS, GE and TGERD Granger cause GDP. TPF does not Granger cause GDP in Singapore. Further, on correlation analysis, TPF was found to be strongly correlated to GE. For these reasons, TPF was eliminated in the regression of GDP on its explanatory variables. The regression analysis revealed that there exists a strong direct relationship between all captured explanatory variables and the GDP except for TGERD which was inversely related to GDP. The model was associated with an adjusted coefficient of determination of 79.68% indicating significance and adequacy. The model passed all other tests of goodness of fit.