



## FINANCIAL INTERMEDIATION AND HUMAN CAPITAL DEVELOPMENT FOR SUSTAINABLE DEVELOPMENT: EVIDENCE FROM SUB-SAHARAN AFRICAN COUNTRIES

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### **Abstract:**

Economic development must be sustainable, improving and dynamic in order to achieve the critical goal of poverty alleviation. A review of extant literature indicates that studies in this area of finance have focused on the impact of finance on economic growth arising more from developed economies. Recommendations from these works may obviously have favoured these economies to the detriment of the developing ones. It is therefore, against the need to explore the role of finance in tackling developmental issues in developing economies with bias to sub-Saharan African countries that this study examined the impact of financial intermediation on human capital development of sub Saharan African countries from 1980 to 2012 utilizing panel data set from the World Bank and applying the Ordinary Least Square (OLS) regression in analysis. Results reveal that financial intermediation did not have positive and significant impact on human development in sub Saharan Africa within the period of this study. This trend must be reversed as it probably might have contributed to their underdevelopment. It is recommended that policy makers should pay more attention to the quality of growth so as to support all round human development. Countries may consider establishing banks of infrastructure or even go further to have banks of development. These will further assist in addressing critical areas such as life expectancy, adult literacy and school enrolment, amongst others beyond just economic growth.

**JEL:** N27, E24, J24

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Sub-Saharan Africa countries are still at a crossroad of development. Despite several years of economic reforms initiated and implemented by national policies and international financial agencies and institutions, Sub-Saharan Africa is still lagging in development. This region was thought of as an area with huge potential for economic growth; however, sub-Saharan Africa is now representing the poorest and least developed populations in the world and becoming the primary focus of international aid agencies<sup>ii</sup>. The region have a poverty rate of 46.1 percent, the highest regional poverty rate in the world and the population living on less than \$1per day represent 29 percent of the global population<sup>iii</sup>.

Again, according to United Nation<sup>iv</sup> report for sub-Saharan Africa which comprises 49 countries, 47% of the people live on less than \$1.25 a day. Although in 2011, the World Bank confirmed a positive declining trend in poverty, the level of poverty is still the highest in the world<sup>v</sup>. While there is large heterogeneity among countries in the sub regions, financial systems in most sub-Saharan African countries have remained poorly developed relative to other regions with only 24% of the adult population having bank accounts at a formal financial institution which is half the global average. The number of banks and other deposit-taking institutions, like cooperatives, dominate financial systems in sub-Saharan Africa with regulated microfinance institutions though increasingly playing an important role in expanding access to financial services to low-income earners is still not enough in sub-Saharan African countries. According to Financial Stability Board, International Monetary Fund, and World Bank<sup>vi</sup>, the last couple of years have also witnessed the emergence of Pan-African banking groups expanding rapidly in the region with significant share of domestic deposits. This has resulted in increased local competition while infusing new technologies, products, and managerial techniques. This notwithstanding there is still an un-served group in rural areas that need such financial institutions. Though, mobile money is increasingly playing a role in expanding access in the region where 16% of adults are reported to use a mobile phone to pay bills or send or receive money but when compared to global average it is less than 5%<sup>vii</sup>.

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<sup>ii</sup> , Tyler, Z.C &Gopal, S 2010. Sub-Saharan Africa at a crossroads: a quantitative analysis of regional development. *The Pardee Papers* series: Boston University

<sup>iii</sup> Go, D., Nikitin, D., Wang, X., &Zou, H 2007. Poverty and inequality in sub-Saharan Africa: literature survey and empirical assessment. *Annals of Economics and Finance* 8(2)251–304

<sup>iv</sup>UN 2012.Towards a food secure future. *Africa Human Development Report, United Nations*

<sup>v</sup> World Bank (2013) *World economic outlook 2012*, Washington: World Bank

<sup>vi</sup>FSB, IMF, & WB 2011.Financial stability issues in emerging market and developing economies. a Report to the G-20 Finance Ministers and Central Bank Governors prepared by a *Task Force of the Financial Stability Board and Staff of the International Monetary Fund and the World Bank*

<sup>vii</sup>FINDEX 2012. Sub Saharan African financial index. *International Monetary Fund: IMF*

One of the major indicators of under-development in Sub Saharan African countries is high mortality rate. The level of mortality in a population can be measured by the number of deaths per thousand inhabitants, number of infant deaths per 1000 births and summary measure of death risks/ survival chances over different ages. Of these, infant mortality rate is the most widely used indicator of the general health situation in a country. In the 1950s, infant mortality rates in Asia were as high as in sub-Saharan Africa. However, after 1960, the decline became more rapid in Asia, whereas the decline in sub-Saharan Africa continued at a slow pace and opines that the stall of the infant mortality rate decline during the last two decades of the 20th century can be seen as the result of a policy failure<sup>viii</sup>. One possible reason for low rates of improvements after 1980 could be the austerity measures propagated by many sub-Saharan countries based on the advice of the IMF and the World Bank<sup>ix</sup>. Severe cuts in government budgets and large lay-offs of public employees seem to have had negative effects on programmes aimed at health improvement. An alternative explanation is that the economic downturn was the key factor. What is clear is that sub-Saharan Africa during this period was unable to implement the kinds of broad-based health policies which have been so successful in reducing infant-mortality in Asia<sup>x</sup>.

According to the United Nations, as of the year 2008, there were 26 countries in the world that qualified as countries with “low human development” (United Nations Development Programme 2008b). Low human development is defined as a country with an HDI value of less than 0.5. Of the 26 countries, all but one (Timor-Leste) are located in sub-Saharan Africa. Not one country in contiguous sub-Saharan Africa (in other words excluding Island States) is considered to have “high human development.” The country with the highest human development index (HDI) rating located in contiguous sub-Saharan Africa is Gabon, with an HDI value of 0.729<sup>xi</sup>. To put this HDI value in perspective, countries with similar HDI values are the Philippines, Paraguay, Sri Lanka, and Jamaica<sup>xii</sup>. It is clear that along with the highest rates of poverty in the world and stagnant economic growth, sub-Saharan Africa is also home to the least educated and least healthy populations in the world.

It is therefore, against the need to explore the role of finance in tackling developmental issues in developing economies with bias to sub-Saharan African countries that this study examined the impact of financial intermediation on human capital development of sub Saharan African countries from 1980 to 2012 utilizing panel data set from the World Bank.

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<sup>viii</sup>Malmberg B 2010. Demography and the development potential of Sub-Saharan Africa. a paper presented to the Department of Foreign Affairs, Swedish Government

<sup>ix</sup> Same as 7

<sup>x</sup>Fort, M. P. & Mercer, M.A 2004. *Sickness and wealth: the corporate assault on global health*. Cambridge, Mass.: South End Press

<sup>xi</sup>UNDP (2008a). *Human development indices: a statistical update 2008*. New York: United Nations

<sup>xii</sup> Same as 10

## 2. General Background

It has been argued in some quarters that infrastructural financing did not constrain industrial take-off in the UK and some other developed economies. This has been generally accepted in historical literature; but in contrast, contemporary empirical evidence that financial development can be a causal determinant of economic growth<sup>xiii</sup>. To buttress these new empirical findings Trew concentrated on a particular aspect of industrializing United Kingdom where inefficiencies in finance could have had a strong bite (finance of physical infrastructures). Trew documented the historical record and developed the importance of spatial disaggregation and spillovers in both technological and financial development. Trew also developed a simple model that captures the nature of infrastructure finance within a theory of endogenous growth where financial costs are endogenous. Trew's argument was that the conception of the finance-growth nexus as a largely static, aggregative phenomenon misses out a good deal of complexity, and related that complexity to a number of implications for regulation of both financial systems and the emergence of infrastructure.

In support of the above argument, Mwenda and Mutoti investigated the effects of market-based financial sector reforms on the competitiveness and efficiency of commercial banks, and economic growth in Zambia. Their results showed that reforms adopted in Phase II (strengthening of regulatory and supervisory payments and settlements, and financial operations frameworks) and Phase III (implementation of a comprehensive financial sector development plan) had significant positive effects on bank cost efficiency. Macroeconomic variables such as per capita GDP and inflation had insignificant effects. Further, using an endogenous growth model in which industrial production is a proxy for GDP growth, it was found that bank cost efficiency, financial depth, Phase II and III financial sector reforms, the degree of economic openness, and rate of inflation were significant determinants of economic growth. Phase II policies and the inflation rate had negative effects while the rest of the variables had positive effects on economic growth<sup>xiv</sup>.

To further strengthen the role of finance in economic growth of nations, Wachtel posits that the role of financial sector development in economic growth has become a major topic of empirical research in the last ten years and opines that the standard approach to explaining growth has emerged and literature has examined the role of the aggregate amount of financial intermediation, bank lending and the influence of equity market on development. Wachtel was of the view that more recently, literature has examined aspects of institutional development and infrastructure on growth but

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<sup>xiii</sup>Trew, A 2010. Infrastructure finance and industrial takeoff in England. *Journal of Money, Credit and Banking*, 42(6)985-1010

<sup>xiv</sup>Mwenda, A. & Mutoti, N 2011. Financial sector reforms, bank performance and economic growth: evidence from Zambia. *African Development Review*, 23(1)60-74

despite the econometric difficulties encountered, there is an emerging consensus that the financial sector plays a crucial role in economic growth<sup>xv</sup>.

Also, Khanna and Palepu are of the opinion that numerous countries have undergone rapid transitions in their economic environments. Yet, little is known about firms' responses to such transitions. It is against this background that they used field-collected data to study the evolution of eighteen large and diversified business groups in Chile (1987-1997) and India (1990-1997). The chosen periods corresponded to significant deregulation in the primary markets in both countries. Khanna and Palepu opined that conventional wisdom suggests that the intermediation roles played by business groups ought to decrease during these periods. However, Khanna and Palepu found an increase in group scope, an increase in the strength of the social and economic ties that bind together group firms, an increase in self-reported intermediation attempts by the groups, and some evidence that these actions are associated with improvements in accounting and stock-market performance of the group affiliates. This suggests that the slow development of market intermediaries, in a manner suggested by institutional economics, and the attendant lack of reduction in transaction costs in primary markets, can explain their findings that improvements in accounting and stock-market performance enhances the growth of these firms<sup>xvi</sup>.

Harper and McNulty provided empirical evidence consistent with the notion that the size of the financial system will be smaller in these countries and this effect holds even after controlling for the effect of rule of law and/or legal origin, and other relevant variables. Harper and McNulty argue that in countries with transition economy status, additional explanatory power to traditional law and finance explanations of financial development were added. The classification of transition economies by legal origin revealed that Russian legal origin has a strong negative effect on financial development. The regression analysis showed claims on the private sector/gross domestic product (GDP) to be 46 to 60 percentage points lower in the countries of the former Soviet Union, and 23 to 39 percentage points lower in non-Soviet transition economies compared to countries of English legal origin. Again, there was a positive relation between claims on the private sector and the rule of law for a broad cross section of countries<sup>xvii</sup>.

Huang and Wang examined the impact of financial repression on economic growth during China's reform period. The aggregate financial repression index suggests that China's financial liberalization has been steady but gradual. Huang and Wang empirical estimation confirms that, on average, repressive policies helped economic growth, possibly as a result of the prudent liberalization approach adopted.

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<sup>xv</sup>Wachtel, P 2001. Growth and finance: what do we know and how do we know it?. *International Finance* 4(3)335-362

<sup>xvi</sup>Khanna T. & Palepu, K 1999. Policy shocks, market intermediaries and corporate strategy: the evolution of business groups in Chile and India. *Journal of Economics & Management Strategy*, 8(2)271-310

<sup>xvii</sup>Harper, J.I & McNulty, J.E 2008. Financial system size in transition economies: the effect of legal origin. *Journal of Money, Credit and Banking*, 40(6)1263-1280

But the impact turned from positive in the 1980s and the 1990s to negative in the 2000s, suggesting rising efficiency losses in recent years. Specifically, Huang and Wang found from lending to the state sector; interest rate regulation and capital account control were the main factors constraining China's economic growth in recent years<sup>xviii</sup>.

Mehra, *et al* extended the neoclassical growth model to include costly intermediated borrowing and lending between households and posited that this was an important extension as substantial resources are used to intermediate the large amount of borrowing and lending between households. Mehra, *et al* argue that in 2007 in United States of America, the amount intermediated was 1.7 times gross national product (GNP), and the resources used in this intermediation amounted to at least 3.4 percent of GNP. Therefore, the theory implies that financial intermediation services are an intermediate good, and that the spread between borrowing and lending rates measures the efficiency of the financial sector<sup>xix</sup>.

Guillaumont-Jeanneney, *et al* posits that financial development might lead to productivity improvement in developing countries and based their study on the data Envelopment Analysis approach. They used the Malmquist index to measure China's total factor productivity change and its two components and found that China recorded an increase in total factor productivity from 1993 to 2001, and that productivity growth was mostly attributed to technical progress, rather than to improvement in efficiency. Again, using panel dataset covering 29 Chinese provinces over the period, 1993 to 2001, and applying the Generalized Method of Moment system estimation, they investigated the impact of financial development on productivity growth in China. Empirical results showed that during this period, financial development significantly contributed to China's productivity growth, mainly through its favorable effect on efficiency<sup>xx</sup>.

Claus assesses the effects of bank lending in a small open economy with a floating exchange rate and sticky prices. A theoretical model with costly financial intermediation is developed for New Zealand. The results showed that the long-run and business cycle effects of bank lending are small and whether firms borrow from financial intermediaries or public debt markets, it is unlikely to affect economic activity. In other words, the financial structure, or degree to which a country's financial system is intermediary based or market based, does not matter<sup>xxi</sup>.

Mishkin examines whether financial globalization is beneficial to developing countries by first examining the evidence on financial development and economic growth and concludes that financial development is indeed a key element in promoting

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<sup>xviii</sup> Huang, Y. & Wang, X 2011. Does financial repression inhibit or facilitate economic growth? a case study of Chinese reform experience. *Oxford Bulletin of Economics and Statistics*, 73(6) 0305-9049

<sup>xix</sup> Mehra, R. F. Piguillem & Prescott, E.C 2011. Costly financial intermediation in neoclassical growth theory. *Quantitative Economics* 2(1)1-36

<sup>xx</sup> Guillaumont-Jeanneney, S., P. Hua & Liang, Z 2006. Financial development, economic efficiency, and productivity growth: evidence from China. *The Developing Economies*, 47(1) 27-52

<sup>xxi</sup> Claus, I 2007. The effects of bank lending in an open economy. *Journal of Money, Credit and Banking*, 39( 5)1213-1243

economic growth. It then asks why if financial development is so beneficial, it often does not occur. It then goes on to examine whether globalization, particularly of the financial kind, can help encourage financial and economic development and argues that it can. However, financial globalization does not always work to encourage economic development because it often leads to devastating financial crises. The issue is thus not whether financial globalization is inherently good or bad, but whether it can be done right<sup>xxii</sup>.

Jalilian and Kirkpatrick empirically investigated the link between financial development and economic growth and established that finance exerts a significant and positive influence on growth. Their paper extends this line of analysis by examining the contribution that financial development makes to poverty reduction in low-income countries. The results reported support the contention that financial sector development policy can contribute to achieving the goal of poverty reduction in developing countries<sup>xxiii</sup>.

Alun, *et al* evaluated the contributions of human capital and financial development to economic growth in a panel of 82 countries covering 21 years. The main innovations stem from the fact the use of a translog production function as a framework for estimating the relationships among economic growth and factor inputs. The factor inputs considered were labour, physical capital, human capital (deriving from endogenous growth theory), and a monetary factor (money or credit, deriving from the theory of money in the production function). Accordingly the translog production function enables a richer specification of the relationships among growth and factor inputs, than the more commonly used Cobb–Douglas approach, as it allows for interactions among factor inputs. This shows that significant evidence of such interactions, suggesting that studies which ignore such interactions are likely to be misleading. Overall, it was suggested that financial development is at least as important as human capital in the growth process<sup>xxiv</sup>.

Pagano and Pica investigated the impact of finance on employment and inter-industry job reallocation and presented a model supposing that financial development (i) increases employment and/or labour productivity and wages, with a smaller impact at high levels of the equilibrium wage and financial development; (ii) may induce either more or less reallocation of jobs depending on whether shocks to profit opportunities or to cash flow predominate; (iii) amplifies the output and employment losses in crises, firms that rely most on banks for liquidity being hit the hardest. Testing these predictions on international industry-level data for 1970–2003, it was revealed that

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<sup>xxii</sup>Mishkin, F.S 2007. Is financial globalization beneficial?. *Journal of Money, Credit and Banking*, 39(2–3)260-293

<sup>xxiii</sup>Jalilian, H and C. Kirkpatrick 2002. Financial development and poverty reduction in developing countries. *International Journal of Finance and Economics*, 7(2)97–108

<sup>xxiv</sup>Alun D. E, C.J. Green & Murinde, V 2002. Human capital and financial development in economic growth: new evidence using the translog production function. *International Journal of Finance and Economics*, 7(5)123–140

standard measures of financial development are indeed associated with greater employment growth, although only in non-OECD countries, and are not correlated with labour productivity or real wage growth. Moreover, they correlate negatively with inter-industry dispersion of employment growth. Finally, there is some evidence of a 'dark side' of financial development, in that during banking crises employment grows less in the industries that are more dependent on external finance and those located in the more financially developed countries<sup>xxv</sup>.

### 3. Methodology

Consistent with the research design and in line with researches conducted in this area of finance and economics where most data utilized were obtained from the World Bank Cross-Country Data, the panel data that we used in this study were extracted from World Bank Cross-Country Data from 1980 – 2012 for 49 Sub Saharan African Countries. The countries are Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroun, Cape Verde, Central African Republic, Chad, Comoros, Congo Democratic Republic, Congo Republic, Cote d Ivoire, Equatorial Guinea, Eritrea, Ethiopia, Egypt, Gabon, Gambia, Ghana, Guinea Bissau, Libya, Liberia, Kenya, Lesotho, Malawi, Mauritius, Mauritania, Morocco, Mali, Madagascar, Mozambique, Namibia, Nigeria, Niger, Rwanda, Seychelles, Senegal, Somalia, South Africa, Sierra Leone, Sudan, South Sudan, South Tome and Principe, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe. The beauty of the data from the World Bank is that all sub-Saharan African countries data are denominated in one single currency (U.S Dollars).

Following a detailed review of previous studies (Solow1956; Beck et al., 2000) and specifically King and Levine (1993a), human development index was expressed as a function of financial intermediation, and a set of control variable. This is expressed by equation (i) below as;

$$HDI = \beta_0 + \beta_1 FIM + \beta_2 W_i + \mu, \quad i=1 \dots m$$

Where:

<i>HDI</i>	=	Human Development Index
<i>FIM</i>	=	Financial Intermediation
<i>W<sub>i</sub></i>	=	Control variables
$\mu$	=	Error Term

However, incorporating the control variables we hypothesized that financial Intermediation does not have positive and significant impact on human development in sub Saharan African countries. The relevant model is represented as:

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<sup>xxv</sup> Pagano, M.S & Pica, G 2012. Finance and employment. *Economic Policy*, 1(4)5–55



$$HDI = \beta_0 + \beta_1 FIM + \beta_2 TS + \beta_3 CS + \mu$$

where:

TS = Trade Stock  
CS = Capital Stock

Human Development was measured using the Human Development Index (HDI). Lord Meghnad Desai and Nobel Laureate Amartya Sen invented the Human Development Index in 1993 (Jhingan, 2012). The Human Development Report (United Nations Development Programme 2008b) highlights that while economic growth is an important measurement of growth, it is nonetheless limited in capturing how expanding income translates also into human development more broadly. The HDI incorporates education, through a mix of combined gross enrollment ratio and adult literacy rate; health, through life expectancy at birth; and economics, through GDP per capita, in order to determine a development index. It has been widely accepted that including education and health factors improves upon previous “development” projections based solely on economics. Hence, HDI is an index that measures three key indicators of development, living a long and healthy life, having education and a decent standard of living.

For financial intermediation, two indicators are commonly used as proxy. These are the ratio of broad money supply (M2) to nominal gross domestic product (NGDP) and the ratio of domestic credit to the private sector (CPS) to the nominal gross domestic product (NDGP) (Shitu, 2012). While the former measures the capability of the banks to mobilize funds for investment purposes, the latter measures the financial opportunities available to firms, most especially new firms. However, for this study we used the ratio of domestic credit to the private sector (CPS) to the nominal gross domestic product because of the non-uniformity in the measure of broad money within and among the sampled Sub Saharan African Countries.

This study utilized other variables associated with economic development as control factors. Two of these variables, included in the model are capital stock ratio (CS) and trade stock ratio (TS). The ratio of capital expenditure to nominal gross domestic product is used as proxy for the capital stock while trade ratio is defined as the ratio of the total value of exports and imports to the nominal gross domestic product.

As observed from the model, the hypothesis was tested using Ordinary Least Square (OLS) regression technique. Regression analysis is concerned with the study of the dependence of one variable, the dependent variable, on one or more other variables, the explanatory variables, with a view to estimating and/or predicting the population mean or average value of the former in terms of the known or fixed (in repeated sampling) values of the latter (Gujarati and Porter, 2009).

Also, in an attempt to estimate the impact of financial intermediation on human capital development of sub-Saharan African countries, we first tested for the presence of unit root. This was necessary in order to ensure that the parameters are estimated using stationary time series data. Thus, this study sought to avert the occurrence of spurious results. To do this, the Augmented Dickey-Fuller (ADF) was used to test for stationarity<sup>xxvi</sup>.

#### 4. Analysis

The quest for sustainable economic development among sub Saharan African countries has led to the formulation and implementation of policies by various governments in the region that can lead to enhanced human capital development. However, the impact of such policies has not been adequately and empirically tested hence this study. Recall that the study covers the period, 1980 to 2012.

Although, there are 49 countries in the region, two (2) countries data were not available as the time of this study, hence the number observed. These countries are South Sudan and Guinea Bissau.

Table 4.1 presents the descriptive statistics used to analyse the impact of financial intermediation on human capital index of sub Saharan African countries.

**Table 4.1: Descriptive Statistics**

FIM				
	Percentiles	Smallest		
1%	1.210822	.1982856		
5%	2.962457	.4913875		
10%	4.137258	.5439041	Obs	1324
25%	8.071115	.7240987	Sum of Wgt.	1324
50%	13.65331		Mean	19.25282
		Largest	Std. Dev.	20.41446
75%	23.8042	152.6062		
90%	35.54779	153.8276	Variance	416.75
95%	54.04291	163.369	Skewness	3.432839
99%	119.3377	167.536	Kurtosis	18.71234
HDI				
	Percentiles	Smallest		
1%	.083005	.029264		
5%	.16566	.030546		
10%	.277053	.030741	Obs	1481
25%	.399748	.031019	Sum of Wgt.	1481
50%	.513906		Mean	.5157379
		Largest	Std. Dev.	.1904532
75%	.657159	1.027815		
90%	.735736	1.150693	Variance	.0362724
95%	.819214	1.276805	Skewness	.0542877

**Source:** Researchers' Stata Result

**Note:** FIM = Financial Intermediation, HDI = Human Development Index

<sup>xxvi</sup>Gujarati, D.N. and Porter D.C 2009. *Basic econometrics fifth edition*. Singapore: Mcgraw-Hill International Edition

Sub-Saharan Africa has remained low on UN Human Development Index over the years despite economic growth in the region<sup>xxvii</sup>. The average human development index of the region over the period of this study is 51.57%. One of the major reasons for this low level of human development index may be due to the region's vulnerability to poverty and insecurity which is less pronounced in industrialized countries. A cursory examination of the 187 countries which UNDP releases their HDI index indicates that at the top of the list is Norway, which is ranked as very highly developed, followed by Australia and Switzerland. Germany is in sixth place. But the bottom third of the list is primarily made up of countries from Sub-Saharan Africa. The lowest ranked country at number 187 is the central African country Niger<sup>xxviii</sup>.

Also, the low level of HDI in sub Saharan African countries may not be unconnected with high growth in the population. The greater the growth of a population, the more people has to be provided for thus despite good levels of economic growth, providing for their large populations, whether with food, education or health services, is a huge challenge for sub Saharan African countries in their current economic situations.

In other to estimate the impact of financial intermediation on human capital development of sub Saharan African countries, we tested for the presence of unit root in the panel data set. This was necessitated because we wanted to ensure that the parameters estimated are stationary panel series data. We utilized the Augmented Dickey-Fuller (ADF). To reject the null hypothesis that that the data are non- stationary, the ADF statistics must be more negative than the critical values and significant.

**Table 4.2: Unit Root Test**

ADF Test Statistic	-6.737984	1% Critical Value*	-3.4385
		5% Critical Value	-2.8644
		10% Critical Value	-2.5683

\*MacKinnon critical values for rejection of hypothesis of a unit root.

**Augmented Dickey-Fuller Test Equation**

Method: Least Squares

Sample(adjusted): 21 1481

Included observations: 1218

Excluded observations: 243 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIM(-1)	-0.066065	0.009805	-6.737984	0.0000
D(FIM(-1))	0.026878	0.028604	0.939659	0.3476
D(FIM(-2))	-0.037365	0.028509	-1.310620	0.1902
C	1.237511	0.268385	4.610949	0.0000
R-squared	0.051742	<b>Mean dependent var</b>		-0.028078
Adjusted R-squared	0.047830	<b>S.D. dependent var</b>		6.813920
S.E. of regression	6.648967	<b>Akaike info criterion</b>		6.631714

<sup>xxvii</sup>Duckstein S. 2014. Tackling Africa's vulnerability. *Development Policy*, 45(15)345-367

<sup>xxviii</sup>UN 2012. Towards a food secure future. *Africa Human Development Report, United Nations*

<b>Sum squared resid</b>	53581.02	<b>Schwarz criterion</b>	6.656861
<b>Log likelihood</b>	-4032.714	<b>F-statistic</b>	13.22674
<b>Durbin-Watson stat</b>	2.034550	<b>Prob(F-statistic)</b>	0.000000

**Source:** Researchers' E-View Result

The result of the unit root test is depicted in the table 4.3. As revealed, there was is presence of stationarity since the ADF Statistical is less than the critical values at 1%, 5% and 10% respectively.

Having examined the gap in literature especially as it pertains to sub Saharan African counties we hypothesizes that financial Intermediation does not have positive and significant impact on human development in sub Saharan African countries

The results from the regression result is depicted in table 4.3

**Table 4.3: Regression Result**

```
. xtreg HDI FIM TS CS HDI2, be

Between regression (regression on group means) Number of obs = 1324
Group variable: Obs Number of groups = 1324

R-sq: within = .
      between = 0.3953
      overall = 0.3953

Obs per group: min = 1
               avg = 1.0
               max = 1

F(4,1319) = 215.58
Prob > F = 0.0000

sd(u_i + avg(e_i.)) = .1486893
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HDI	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
FIM	-.0005998	.0002073	-2.89	0.004	-.0010064 -.0001931
TS	-.0574375	.0121672	-4.72	0.000	-.0813066 -.0335684
CS	.0139275	.0288964	0.48	0.630	-.0427605 .0706155
HDI2	.5744794	.0224104	25.63	0.000	.5305154 .6184434
_cons	.268757	.0167258	16.07	0.000	.2359449 .3015691

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Durbin-Watson statistic (original) 2.371970
Durbin-Watson statistic (transformed) 2.217869
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**Source:** Researchers' Stata Result

**Note:** FIM = Financial Intermediation, HDI = Human Development Index, TS = Trade Stock, CS = Capital Stock

As observed from table 4.3, the coefficient of financial intermediation had negative and significant impact on human development index  $\{\alpha = 0.0005, t\text{-value} = -2.89 (p\text{-value} = 0.004), R^2 = 39.53, \text{adjust } R^2 = 39.53, F\text{-statistic} = 215.58 (p\text{-value}=0.00), D.W = 2.37\}$ . For this result therefore, it shows that as financial intermediation varies across time by one unit, human development index decreases by 0.0005 units with a probability of obtaining a t value of -2.89 less than 5%%, thus significant at 0.05 critical values. The  $R^2$  is a summary measure of how well a sample regression line fits the data (goodness of fit). From the model above, the  $R^2$  value of 0.3953 means that 39.53 percentage variation in human capital index was explained by the independent variables (financial intermediation, trade ratio and capital stock). This was adjusted as indicated by Adjusted  $R^2$  to 39.53%. The  $R^2$  here might seem small but this is expected because of the diversity of units in the sample (Gujarati, 2009).

The F-value (215.58) which follows the F distribution with 4 degree of freedom in the numerator and 1319 degree of freedom in the denominator was significant (p-value of 0.000) at a critical value of 0.05. This implies that the entire model is significant. For the control variables, trade ratio had negative and significant impact on human development ( $\alpha = -0.057$ , t-value = -4.72, p-value = 0.000) and capital stock had positive and non-significant impact on human development in sub Saharan African countries within the period of this study ( $\alpha = 0.14$ , t-value = 0.48, p-value = 0.630). The Durbin Watson statistic is 2.37 however indicates that there is a slight trace of spatial and serial autocorrelation. This was supported by Breusch Godfrey LM test with a  $\chi^2$  value of 184.95 and a significant p-value of  $0.00 < 0.05$  (see appendix).

The Durbin Watson d statistics was taken into account using Newey West/Cochrane-Orcutt procedure and transformed to 2.21. This corrected the OLS standard errors and the  $R^2$  as well. As a result of these treatments, the coefficients of the independent variables were observed to perform better in explaining the model.

Based on the result above, the null hypothesis is accepted while the alternate rejected. This reveals that financial intermediation did not have positive and significant impact on human development in sub Saharan Africa within the period of this study.

## 5. Implications of Results, Conclusion and Recommendation

The role of financial intermediation has been examined in numerous finance literatures. Apart from the performance of specialized tasks such as reducing the costs associated with information acquisition and the conduct of financial transactions and aiding the creation of specialized products<sup>xxix</sup>, it has also been revealed that financial intermediation makes provision for insurances and risk sharing<sup>xxx</sup>, stimulating the funding of liquidity needs through credit lines<sup>xxxi</sup>.

These roles is not relatively new as earlier economists such as Smith, Ricardo, Malthus, Keynes, Rostow and Gerschenkron had emphasized the subject at both the macro-level, and the micro-level. Hence, at the macro-level, the significance of financial intermediation is that it facilitates the efficiency of the financial system<sup>xxxii</sup>. It also serves as a conduit through which monetary policy is effected (Benstom and Smith. Jr, 1975) as well as contracts, not available in the financial market, are implemented (Holmstrom and Tirole, 1998). Again, at the micro level, it has been shown that financial intermediation stimulates the restructuring and liquidation of distressed firms<sup>xxxiii</sup>,

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<sup>xxix</sup>Benston.G & Smith, Jr. 1975. A transaction cost approach to the theory of financial intermediation. *Journal of Finance*, 31(2)215-231.

<sup>xxx</sup> Allen. F & Gale, D 1997. Financial markets, intermediaries, and inter-temporal smoothing. *The Journal of Political Economy*, 105(3)523-546 and Allen. F & Gale, D 2004. Financial intermediaries and markets. *Econometrica*, 72(4)1023-1061

<sup>xxxii</sup>HolmströmB, & Tirole J. 1993. Market liquidity and performance monitoring. *Journal of Political Economy*. 101(4) 678-709

<sup>xxxiii</sup>Gromb.D & Vayanos.D 2010. A model of financial capital liquidity based on intermediary capital. *Journal of European Economic Association*, 8 (2-3)456-466 and Anad A & Subrahmanyam, A 2008. Information and the intermediary: are market intermediaries informed traders in electric markets?. *Journal of Financial and Quantitative Analysis*, 43(1)1-28

<sup>xxxiii</sup>Araujo.L & Minetti, R 2007. Financial intermediaries as markets for firms' assets. *Economic Journal* 117(4) 1380- 1402

eliminate the inefficiencies associated with the absence of smoothing, as a result of incomplete market information<sup>xxxiv</sup>.

This study thus recommends that policy makers should pay more attention to the quality of growth so as to support all round human development. Relevant countries studied may also critically consider establishing banks of infrastructure whose activities will have direct impact on their HDI. Some may even go further to establish bank of development. Such banks may be supported by international financial and non-financial institutions. These will assist in further addressing such critical areas as life expectancy; adult literacy; school enrolment and per capital income beyond economic growth.

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