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INVESTMENT AND ECONOMIC GROWTH IN SUDAN: AN EMPIRICAL INVESTIGATION, 1999-2011

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Abstract- Investment is defining as asset or item that is purchased with the hope that it will generate income or appreciate in the future. In an economic sense, an investment is the purchase of goods that are not consumed today but are used in the future to create with. In finance an investment is a monetary asset purchased with the idea that the asset will provide income in the future or appreciate and be sold at a higher price. The purpose of this paper is to investigate the impact of investment (public and private) on economic growth in Sudan during the period 1999-2011. Date were collected from central bureau of statistics. Using these data ordinary least squares method was applied to the linear form of the model. The obtained results showed that: investment has positive impact on economic growth measured by nominal gross domestic product, real gross domestic product and growth rate of gross domestic product. This is similar to what mentioned in economic theory.

Keywords- Investment, Economic growth, Gross domestic product, interest rate, aggregate demand, aggregate supply.

I. INTRODUCTION

Growth depends on the stock of physical and human capital in the economy, as well as technological progress. Investment at the level of the individual or the firm can contribute directly to increasing this stock. By showing empirically that access to financial services enables households to invest in education (which contribute to human capital), start or expand a business, or invest in agricultural inputs or new equipment which contribute to physical capital and technology progress (Ellis et al, 2010).

Investment means an increase in capital spending, e.g. buying new machines, building bigger factories (in economics it does not mean saving money in a bank). Investment is a component of aggregate demand (AD). Therefore, if there is an increase in investment it will help to boost AD and therefore economic growth. If there is spare capacity then a rise in AD will increase economic growth. However, if the economic is close to full capacity. Then rising AD will only cause inflation and not an increase in real GDP (economicshelp.org).

The objective of this paper is to analyze the impact of public and private investment of GDP growth during the period 1999-2011. The rest of the paper falls into four sections. Section two reviews investment and economic growth. Section three discusses investment and growth in Sudan. Section four includes our model and methodology as well as data. Finally, section five includes the results discussion and conclusion remarks.

II. INVESTMENT AND ECONOMIC GROWTH: A REVIEW

In economic, investment is the accumulation of newly produced physical entities, such as factories, machinery, house, and goods inventories. In finance, investment is putting money into an asset with the expectation of capital appreciation dividends, and/or interest earnings. This may or may not be backed by research and analysis. Most or all forms of investment involve some form of risk, such as investment in equities property, and even fixed interest security which are subject, among other thing, to inflation risk. It is indispensable for project investors to identify and manage the risk related to the investment (Wikipedia.org).

The Investopedia website defining investment as asset or item that is purchased with the hope that it will generate income or appreciate in the future. In an economic sense, an investment is the purchase of goods that are not consumed today but are used in the future to create with. In finance an investment is a monetary asset purchased with the idea that the asset will provide income in the future or appreciate and be sold at a higher price.

Economic growth is a long-term expansion of a country's productive potential. Short-term growth is measured by the annual% change in real national output- this is mainly driven by the level of aggregate demand (C+I+G+X-M) but it also affected by shifts in SRAS. Long-term growth is shown by the increase in trend of potential GDP and this is illustrated by an outward shift in a country's long-run aggregate supply curve LRAS (Riley, 2012).

Sial et al (2010) analyzed the role of the public and private investment and impact of the political and macroeconomic uncertainty on economic growth of Pakistan. They used vector approach (VAR) and concluded that in long run both public and private investment showed a positive impact on economic growth but the growth was largely driven by private investment as compared to public investment. In short run the private investment positively influences the growth but there was negative and insignificant effect of the public investment and government consumption expenditure on the growth.

Domestic investment and savings may also depend upon the performance of foreign sector. Export instability transmits in domestic savings as follows: (i) change in export proceeds will reflect into the change in profits of exporting industries and, therefore further affects their future investment and (ii) major portion of export earnings goes to government in the form of various taxes and profits from controlled exports like rice and cotton. Thus fluctuation in export further lead to destabilize revenue proceeds. To fill this gap, government has to have deficit budget or raise additional funds from borrowing both significantly affect investment and economic growth (Chaudhary and Waseem, 1996).

M' Amanja and Morrissey analyzed the foreign aid, investment, and growth in Kenya during the period 1964-2002. They found that shares of private and public investment and imports in GDP have strong beneficial effect on per capita income in Kenya. However, aid in the form of

net external loans is found to have a significant negative impact on long run growth. Private investment relates to government investment and imports negatively, but positively to foreign aid.

Abdel-latif and Schmitz (2010) investigated the politics of investment and growth in Egypt, whether it can explain the considerable inter- sectoral and inter- temporal differences in investment in Egypt. The paper showed that where public- private relationships are based on common interest, obstacles to investment and growth are more likely to be removed.

Investment is the most volatile component of AE. The factors that affect investment are: the real rate of interest, the level of sales, business confidence, and taxes. First the interest rate: affects investment as follows: a) Inventory: represents tied- up capital in them. Thus the higher the interest rate, the higher is the cost of capital, the lower is the desired inventory level. Also, there is a storage cost to carry inventory. b) Residential housing: the interest component of the cost of housing could represent a very large percentage of the total cost of a house. c) Plant and equipment: firms finance some or all capital expansion by retained earnings. The higher the interest, the less will be the desire to go for debt, and the more attractive is financial investment (the less attractive is real investment). So that a rise in Interest rates increases the cost of any investment and reduces profits. Second the level of sales: a) Inventory levels change with the level of sales and the level of production. b) If there is a surge in sales (demand) that firms believe is sustainable enough, they will invest in plant & equipment. However, once that is completed, investment decreases. What if the increase in demand is only transitory, how do firms meet the increase in demand? Third Business confidence: is a psychological factor that could change in either direction for many different reasons. It is a major source of investment volatility. Sometimes, it is the most important one. Finally Taxes: reduce profits and thus a cost that affects investments in plant & equipment. Governments give special tax reductions to encourage both domestic and foreign investment (Uthman, 2015).

III. INVESTMENT AND GROWTH IN SUDAN:

According to Ministry of Investment, Sudan is rich with its abundant resources, which are represented in vast areas of land, and various climates. It is special with its fertile agricultural lands, large amount of fresh water, and a variety in its animal resources. The extraction of petroleum gave Sudan an important economic dimension. This is besides the distinguished geographic locations of Sudan which makes Sudan a passage to other African countries which qualifies it as one of the commercial and investment inlets of those countries.

The importance of Sudan has increase in the field of investment during the last period due to its increasing economic importance from one side and its abundant economic resources from another. It has become the target businessmen from all around the globe who come to start investment in Sudan, supported by the fact that Sudan ranked second in the list of the world most attractive countries for investment according to the report of the regional and international organizations. The investment opportunities will grow after the stabilized of the peace process which adds an effective third dimension to the attractive investment climate. It will also allow investors to utilize natural resources abundant in Sudan states more efficiently (MOI, 2015).

The following table shows some facts about Sudan economy as reported by central bank of Sudan (CBoS).

Year	2005	2006	2007	2008	2009
Population (Million)	35.4	36.3	37.2	39.2	39.2
Exchange Rate of SDG Against US Dollar:					
Annual Average	2.4360	2.1712	2.0157	2.0913	2.3259
End of Year	2.3050	2.0048	2.0336	2.1840	2.2413
Inflation Head line annual average %	8.4	7.3	8.1	14.3	11.2
Growth Rate of Broad Money (M2) %	44.7	27.4	10.3	16.3	23.5
Growth Rate of Domestic Credit %	60.4	49.8	16.7	15.1	21.4
Surplus or Deficit / GDP %	(2.6)	(3.5)	(2.8)	(1.0)	(2.8)
Total Capital Expenditure / Total Expenditure %	24.6	24.2	17.0	12.5	14.7
Growth Rate of GDP %	5.6	9.9	8.1	7.8	6.1
Agricultural Sector Contribution In The GDP %	33.2	31.6	28.9	29.3	31.1
Industrial Sector Contribution In The GDP %	22.0	23.7	29.2	29.2	23.9
Services Sector Contribution In The GDP %	44.8	44.7	41.9	41.5	45.0

Table (1): Economic Indicators, 2005-2009

Source: CBoS

Sudan's real GDP grew by 3.6% in 2013, up from 1.4% in 2012, driven by agriculture and mining as well as the inflows from oil transit fees and the Transitional Financial Arrangement (TFA) with South Sudan. However, inflation remained high (36.2%), reflecting the combined effect of inflationary financing, the devaluation of the currency and high energy prices. It is estimated that real growth will recede slightly in 2014 to 2.7% and is projected at 3.8% in 2015. Inflation is estimated to drop by 9.4 percentage points in 2014, and projected at 23.2% for 2015. However, the credibility of the government's disinflation programme relies on addressing the contractionary effects of fiscal consolidation and boosting value addition in agriculture, manufacturing and mining (Eltahir et al, 2014).

According to central bank of Sudan, the population grew to 41.3 in 2010 than 39.9 in 2008 and then decrease to 35.1 in 2012 due to independence of South Sudan. The growth rate of GDP decrease from 5.2 in 2010 to 1.1 in 2012 (because of oil revenues decreasing).

The Model, Methodology and Data:

In this section we specify the model, data collection in addition to the methodology of the study. The model takes the following form:

GDP = fi (In) (1)

fi > 0 (2)

Equation (1) and (2) are general form of the model. We can specify it as specific form like this:

GDP = $\alpha + \beta$In + Ut (3)

Where:

GDP is gross domestic product (represents economic growth).

In is Investment

According to economic theory, there is positive relationship between investment (public and private) and GDP growth.

Table 1, shows our variables (dependent and explanatory variables).

Year	Investment*	GDP**	Growth rate of GDP***
1999	4424.5	27058.8	6.1
2000	3267.7	33662.7	8.3
2001	6787.5	40658.6	6.5
2002	10426.4	47756.1	6.1
2003	9880.1	55733.8	7.2
2004	13069.6	68721.4	8.3
2005	16756.4	85707.1	9.3
2006	20793.5	98718.8	6.5
2007	22165.3	114017.6	5.7
2008	24453.2	127746.9	6.4
2009	27321.1	148137.1	5.9
2010	8548.3	162203.9	5.2
2011	8372.3	186689.9	1.9

Table (2): public, private investment

Source: *and ** are own calculation based on data obtained from CBS and CBoS ***obtained from CBoS and Ibrahim, 2010.

Results Discussion and conclusion Remarks:

Apply ordinary least square to data of table (2), we report the following results:

GDP = 49677.36+3.12 In (4)

(1.82) (1.78)

F = 3.175 R2 = 0.22 Adjust R2 = 0.15

The equation (4) suggests that 22% of variation in GDP is explained by variation in investment (the remained is explained by other variables Ut).

Again we excluded the intercept, then we obtained the following results:

GDP = 5.9 In (5)

(6.2)

F = 39.6 R2 = 0.77 Adjust R2 75

Equation (5) is statistically significant as indicated by F value. The R2 suggests that 77% of variation in GDP is explained by Investment.

The following equation represents the results (the relationship between GDP growth rate and real investment.

Year	CPI*	Real investment	Real GDP
1999	22388.33	0.19	1.21
2000	24190.07	0.14	1.39
2001	25377.49	0.27	1.60
2002	27537.65	0.38	1.73
2003	29579.16	0.33	1.88
2004	32138.65	0.41	2.14
2005	34797.6	0.48	2.46
2006	37362.23	0.56	2.64
2007	40361.1	0.55	2.82
2008	46686.52	0.52	2.74
2009	48573.4	0.56	3.05
2010	24190.1	0.35	6.71
2011	25377.49	0.33	7.36

Table (3): Real Values of GDP and Investment

Source: own calculation. * CPI is consumer price index

GDP growth rate = 14.67 In (6) (7.68)

F = 59.0 R2 = 0.83 Adjust R2 = 0.82

Equation (6) is statistically significant at 1% level of the confidence as indicated by F statistic. 83% of the variation in GDP growth rate is explained by real investment.

Note: the figures inside the brackets are the t-ratios of the estimated parameters. Equations (4), (5) and (6) suggested that investment has positive impact on economic growth measured by nominal gross domestic product, real gross domestic product and growth rate of gross domestic product. This is similar to what economic theory said.

Estimated equation	**α**	**β**	**F**	**R^2**
Equation (4)	49677.36	3.12	3.175	0.22
Equation (5)	Without constant	5.9	39.6	0.77
Equation (6)	Without constant	14.67	59.0	0.83

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