ABSTRACT

Worldwide, analysts, researchers and academic play a focal point on pension fund asset not only on its ability to counterpoise individual retirement claims but also on the long run economic growth of the countries. The objective of this study is to empirically assess the impact of pension fund asset on Nigeria Gross Domestic Product (GDP). As such, pension fund asset have become an essential aspect of economic literature. However, the significance of pension fund asset on the total contribution to Nigerians GDP using annual data from 2007 to 2017 has not been empirically established. The study employed annual time series data for the pension fund asset within this period and the GDPt as its variables. Using Eviews 8 to empirically run an Ordinary Least Square (OLS) regression to estimate the relationship for the variables it was found that pension funds asset has a positive effect on GDP of Nigeria, and thus a percentage increase in the ratio of pension fund asset will induce a 120.78% increase in Nigeria’s GDP. The positive relationship advocates that pension assets have gradually become a significant part of GDP in Nigeria financial system. Thus, the study recommends that PFAs should improve efficient management of the portfolio of pension fund asset as it would further provide a veritable source of capital for financing economic growth in Nigeria.

Keywords: Gross Domestic Product, Nigeria, Pension fund asset
EMPIRICAL ANALYSIS OF PENSION FUND ASSET ON NIGERIA'S GROSS DOMESTIC PRODUCT (GDP)

1.0 INTRODUCTION

In addition to the fact that pension funds help countries to diversify the risk of increased pension liabilities against them, pension funds also provide a veritable source of capital for financing economic growth. In Nigeria, there is ample evidence that pension funds constitute a significant part of Gross Domestic Product (GDP) since the 2007 when the regulator started reporting its industry statistics. The contribution of pension funds to Nigeria's GDP has grown from 2.47% in 2007 to 5.63% in 2015. Similarly, total pension contributions in Nigeria stood at N5.3 trillion as at the end of 2015 (PenCom 2007, 2015). This underscores the importance of efficient management and investment of pension funds in Nigeria. Despite these huge contributions, the efficiency with which such funds effect GDP becomes an important source of concern.

The role of pension funds in promoting economic growth cannot be overemphasized. In the last few decades, Pension Industry witnessed a global shift from the Defined Benefit (DB) to the Defined Contributory (DC). These presented economies with a pool of pension fund collected from individual contribution in the Contributory Pension Scheme (CPS). As a result, pension fund is one of the key sectors of the Nigerian economy and plays a very vital role in the provision retirement income meant for retirees. The management of pension funds being long term funds meant for the older generation of any country is very imperative to that country financial circumstance (Afolabi, 2015).

A pension fund is a fund set aside by the existing scheme to support retirement income of employees. It is some long-term contributions from various plan owners plus the return of the pooled investments known as pension fund assets. Consequently, for the funds to be adequate at retirement investments must be effected so as to outperform the market challenges.

Allan and Blake (2005) argued that pension fund assets are made up of all the funds under the management of a pension fund. Pension fund assets would typically be made up of total pension contributions, total value of pension fund investment portfolios under management, and the return or any additional income generated from the investment (Antolin, 2008; Andonov, Bauer, and Cremers, 2015). According to Idowu and Olanike, (2010) and PenCom (2013), pension fund assets in Nigeria have been experiencing smooth growth over the years, and have become a significant part of the Nigerian financial system. Furthermore, the adequacy or otherwise of pension contributions generated by these Pension Fund Administrators PFAs to Nigerian GDP has not been investigated empirically.

This study therefore finds it expedient to evaluate pension fund asset contribution to Nigeria relative to GDP. Hence, the objective of this study is to empirically assess the pension fund asset in Nigeria relative to GDP. To achieve this, the study hypothesizes as follows:
H0: There is no significant effect of pension fund asset to Nigeria's Gross Domestic Product (GDP).

The remaining part is structured as follows: section two review of literature, section three discusses the methodology adopted for the study, section four presents the results, findings/discussion, section five conclusions and recommendations.

2.0 LITERATURE REVIEW

Ameh, Ajie & Duhu. (2017) conducted a study using Nigerian data to investigate the impact of the pension scheme on economic growth and one of the hypotheses tested was pension fund asset on gross domestic product. The study concluded that pension fund assets and pension contribution/savings mobilized over the years have positive but insignificant impact on economic growth. This implies that stakeholders have not optimized pension fund asset and savings mobilized to increase economic growth in Nigeria. The study recommended more importance on the management of pension assets in the capital market as well as government bond, real estate and investment trust to boost Gross Domestic Product (GDP) of the country (Nigeria). However, the study utilized data only up to 2016 meaning that the findings may not hold in 2018 due to volatilities that may occur within the period.

Farayibi, (2016) utilized Error Correction Model (ECM) and Ordinary Least Square (OLS) to investigate funded pension scheme and economic growth. Using Nigerian data, he found that pension fund contributions from both private and public sectors in Nigeria increased greatly and constituted a huge investment fund in the capital and money markets which increased liquidity. The paper concluded that good portfolio management by PFAs and PFCs could boost the country's GDP. However, the paper used data only up to 2012 which is not enough to explain events as at 2016.

Afolabi, (2015) assessed the pension industry in Nigeria for a period of nine years 2005 to 2013 after the introduction of the Contributory Pension Scheme (CPS). Stratified random sampling method was used to collect the data from stakeholders of Pension industry in Nigeria. The survey questionnaire administered had a response rate of 83.33 per cent. Thus, empirical evidence shows that there is a positive relationship between CPS and Gross Domestic Product (GDP) in Nigeria. The study is weakened by the use of primary data for it analysis.

Thomas, Spataro, and Mathew, (2013) utilized a panel data of 34 OECD countries from 2000 to 2010 and to estimate the impact of 22 pension fund assets invested in stocks and investment trust to boost Gross Domestic Product (GDP) of the country (Nigeria). However, the study utilized data only up to 2016 meaning that the findings may not hold in 2018 due to volatilities that may occur within the period.

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Volatility by applying random effects panel data model as well as Prais-Winsten regressions with panel corrected standard errors and autoregressive errors. They investigated the empirical relationship between the share of pension funds' assets invested in stocks and stock market volatility in OECD countries.
markets. Ikeji, Nwosu and Agba, (2011) conducted study on pension funds and argued that they perform the role of financial intermediation in the financial scene.

Mungoma, (2013) utilized Kenyan data for the period 2002 to 2011 using both qualitative and quantitative methods, content analysis and multiple regression to investigate the relationship between pension fund asset and GDP as a proxy for economic growth in Kenya and the study revealed a positive relationship on the variable. The study utilized on one proxy for GDP but ran a multiple regression instead of linear regression.

Gunu & Tsado, (2012) conducted a study using Nigeria data from 2007 to 2010 on the pension fund asset of the defined contributory scheme. The study found significant increase of pension asset against GDP 2008 had 4.29, the year 2009 had 6.18 and 2007 had 7.8 indicting a steady increase over the study period and total pension fund assets stood at N2,029 billion as at 2010. The study concludes that Contributory Pension Scheme has begun to contribute to the increase in growth and development of not only the Nigerian capital market but the economy in general.

Kipkoech (2012) conducted a study in Kenya pension industry and established that individual pension schemes are the major sources of retirement income being defined contributory in nature. As a consequence, Pension schemes are also important contributors to the gross domestic product (GDP) of countries. The study was concerned on fund governance as it exerts significant relationship on the growth of the pension schemes. This means that proper pension fund governance leads to not only improved growth of the individual pension schemes but improves the GDP of such country. The study had methodological weakness as it had no relevant analysis on the variables.

3.0 METHODOLOGY
This paper employs the correlational design because it seeks to establish effect between two variables. The population of the study consists of the various asset that make up the portfolio of pension asset. Time series data was collected through secondary sources from 2007 to 2017 as it coincides with the period the industry began its investment on the newly Defined Contributory Scheme. Data on annual pension fund asset was sourced from the audited and published annual reports of National Pension Commission (PenCom), while information on annual rate of Gross Domestic Product (GDP) was collected from the relevant statistical bulletin of the Central bank of Nigeria (CBN) for the period of the study.

The study restricts itself to of pension funds asset which have pre-determined investment guideline against gross domestic product and utilized Ordinary Least Squares (OLS) regression to express the relationship between the two variables GDP and pension fund asset (APF) with a view to testing the hypothesis formulated. The relationship estimated can be presented in the following functional form:

\[ GDP = f(APF) \]
Being time series data and in order to avoid the tendency of obtaining spurious results, GDP and pension fund asset series were subjected to stationarity test using the Augmented Dickey Fuller (ADF) test for the presence of unit root Moskowitz, Ooi, and Pedersen, (2012). Similarly, the Jarque-Bera (Bera & Jarque, 1981) test was employed to establish the normality of the estimated intercepts. The normality of the mean intercept is a pre-condition for the test of hypothesis (Tonks, 2006). Eviews 8.0 was employed for the analysis.

4.0 RESULTS/FINDING/DISCUSSION

Table 1  Pension Fund Assets and GDP in Nigeria (2007-2017) and its discussions.

<table>
<thead>
<tr>
<th>Year</th>
<th>Pension Assets (N'Billions)</th>
<th>Real GDP (N'Billions)</th>
<th>Assets as Percentage of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>815.18</td>
<td>32,995.38</td>
<td>2.47%</td>
</tr>
<tr>
<td>2008</td>
<td>1,098.99</td>
<td>39,157.88</td>
<td>2.81%</td>
</tr>
<tr>
<td>2009</td>
<td>1,529.63</td>
<td>44,285.56</td>
<td>3.45%</td>
</tr>
<tr>
<td>2010</td>
<td>2,029.77</td>
<td>54,612.26</td>
<td>3.72%</td>
</tr>
<tr>
<td>2011</td>
<td>2,442.84</td>
<td>62,980.40</td>
<td>3.88%</td>
</tr>
<tr>
<td>2012</td>
<td>3,153.11</td>
<td>71,713.94</td>
<td>4.40%</td>
</tr>
<tr>
<td>2013</td>
<td>4,058.87</td>
<td>80,092.56</td>
<td>5.07%</td>
</tr>
<tr>
<td>2014</td>
<td>4,611.29</td>
<td>89,043.62</td>
<td>5.18%</td>
</tr>
<tr>
<td>2015</td>
<td>5,302.88</td>
<td>94,144.96</td>
<td>5.63%</td>
</tr>
<tr>
<td>2016</td>
<td>6,164.77</td>
<td>101,489.49</td>
<td>6.07%</td>
</tr>
<tr>
<td>2017</td>
<td>7,515.35</td>
<td>113,719.05</td>
<td>6.61%</td>
</tr>
</tbody>
</table>


It can be seen from table 1, that total pension assets in Nigeria under the Defined Contributory scheme stood at N815.18 billion. This amount constitutes 2.47% of the country's real GDP as at the end of 2007, which was N32,995.38 billion. This shows that pension assets have contributed to overall economic activities of Nigeria in 2007.

In the year 2008, the table shows that pension assets increased by N283.81 billion.
billion (or 34.82% percent of total pension assets in 2007) to close at N1,098.99 billion. Similarly, GDP also increased by N6,162.50 billion (or 18.68% of 2007 figure) to stand at N39,157.88 billion. The annual contribution of pension assets to Nigeria's GDP also increased to 2.81% during the period. This suggests that pension assets have experienced reasonable growth in 2008 when compared to the preceding year.

Table 1 further shows that the growth in pension assets was sustained in the year 2009 as total pension assets increased by N430.64 billion (or 39.19% of pension assets in 2008) to N1,529.63 billion. Real GDP also appreciated by N5,127.68 billion (or 13.09% of 2008 value) to stand at N44,285.56 billion. The value of total pension assets constituted 3.45% of GDP in 2009, implying that pension fund assets were fast growing in relevance and importance within the Nigerian financial system.

Total annual pension assets in 2010 rose by N500.14 billion (or 32.70% of pension assets in 2009) to close at N2,029.77 billion by the end of the year. On the other hand, annual GDP increased to N54,612.26 billion, after increasing by N10,326.70 billion (or 23.32% of 2009 figure). Total pension assets for the year constituted 3.72% of GDP. The contribution of pension assets to GDP can be said to have increased by 0.27% when compared to the previous year, implying that pension assets were increasingly becoming an important component of economic growth.

In 2011, it revealed that total pension assets in Nigeria increased to N2,442.84 billion, after growing by N413.07 billion (or 20.35% of 2010 value). Similarly, real GDP also rose by N8368.14 billion (or 15.32% of 2010 value) to close at N62,980.40 billion by the end of the year. The table also shows that total pension assets in 2011 contributed 3.88% of Nigeria's GDP. When compared to the previous year, it can be seen that the growth rate for 2011 increased by 0.16% over the previous year's figure. The sustained growth of pension assets during the year suggests that pension assets in Nigeria have achieved sustained growth in assets since 2007.

It can be seen that pension assets continued to grow in 2012 as total assets value stood at N3,153.11 billion. This value was attained after the value of assets grew by N710.27 billion (or 22.53% of total assets value at the end of 2011). On the other hand, real GDP rose by N8,733.54 billion (or 13.87% of 2011 figure) to close at N71,713.94 billion. During the year pension assets constituted 4.40% of Nigeria's GDP, with the current rate increasing by 0.52% when compared with the contribution of pension assets to GDP in the previous year. This indicates that pension assets in Nigeria during the year sustained the growth that has its origin from the beginning of the scope of the study.

In the year 2013, total pension assets further appreciated by N905.76 billion (or 28.73% of total assets in 2012) to close at 4,058.87 billion. GDP also grew by N8,378.62 billion (or 11.68% of GDP in the previous year). The 2013 value of total...
Pension assets in Nigeria represents 5.07% of GDP, implying that the percentage of pension assets in GDP increased by 0.67% when compared with the contribution of pension assets to GDP in 2012. The table shows that both pension assets and real GDP sustained their earlier growth trends, which implies that the economy is growing and pension assets are becoming an important aspect of such growth.

The table further depicts that the year 2014 experienced sustained growth in total pension assets in Nigeria when compared to the previous year. Total pension assets during the year rose by N552.42 billion (or 13.61% of total pension assets as at the end of 2013) to stand at N4,611.29 billion. In the same vein, real GDP also appreciated by N8,951.06 billion (or 11.18% of 2013 figure) to close at N89,043.62 billion by the end of the year. Total pension assets during the year represented 5.18% of GDP, implying a 0.11% increase in the proportion of pension assets to GDP in the previous year. This shows that pension assets maintained its steady growth pattern despite economic uncertainties in Nigeria.

In 2015, pension assets appreciated in value when compared to the previous year. Total pension assets rose to N5,302.88 billion, having grown by N691.59 billion when compared to the 2014 value (15% of total pension assets in the previous year). On the other hand, GDP also experienced an increase of N5,101.34 billion (or 5.73% of GDP in 2014). The contribution of pension assets to GDP also increased significantly by 0.45% to stand at 5.63% by the end of 2015. This indicates that pension assets' growth was sustained in 2015 despite the economic uncertainties during the year such as the 2015 general elections. By 2016, pension asset increased to N6,164.77 billion naira while GDP for the same year also increase to N101,489.49 billion naira, This led to 6.07% percentage to GDP. Similarly, the year 2017 shows that pension asset maintained a steady growth pattern with N7,515.35 billion naira which is a 6.61% to GDP of that year.

In summary, it can be said that despite the stock market meltdown and banking sector crisis that have become pronounced in Nigeria between the first quarter of 2008 and the last quarter of 2010, pension assets have continued to experience steady growth. This growth may have been accounted for by the increase in total annual pension contribution remitted from the public and private sectors over the years, the positive return on investment from pension funds investment portfolios over the years, or both Sambo, (2016). An important issue worthy of note is the fact that throughout the period under consideration, pension assets grew at a rate far higher than the annual growth in Nigeria's GDP during the period 2007-2017. The importance of pension assets to economic growth also increased over the period under review because pension assets as percentage of GDP rose from 2.47% in 2007 to an amazing 6.61% by the end of 2017. This clearly indicates that pension assets have increasingly become an important part of GDP over the period, underscoring their importance to economic growth in Nigeria.

**EMPIRICAL ANALYSIS OF PENSION FUND ASSET ON NIGERIA'S GROSS DOMESTIC PRODUCT (GDP)**
The table explains the unit root test of the Jarque-Bera value of 0.7817 which implies that the paper seeks to examine as significant at the 10% level.

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF Test Statistic</th>
<th>Order of Integration</th>
<th>Stationary</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>0.986932</td>
<td>N/A</td>
<td>No</td>
</tr>
<tr>
<td>D(GDP)</td>
<td>-3.396351**</td>
<td>I(1)</td>
<td>Yes</td>
</tr>
<tr>
<td>APF</td>
<td>4.273034</td>
<td>I(0)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Source: Eviews 8 Output, 2018  
*, **and*** imply significance at the 10%, 5% and 1% levels respectively. 
NB: All ADF regressions contain an intercept. D(X) connotes first difference of a variable X.

The table explains the unit root test of the variables that the paper seeks to examine. GDP was not stationary at levels but at first difference with the value of 3.396351 which is significant at the 5% level. AFP was stationary at levels with the value of 4.273034 which also significant at the 5% level.

3. Descriptive Statistics of Regressor

<table>
<thead>
<tr>
<th>Pension asset</th>
<th>Mean</th>
<th>Standard Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Jarque-Bera</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3520.24</td>
<td>2197.09</td>
<td>7515.35</td>
<td>815.180</td>
<td>0.42416</td>
<td>2.0070</td>
<td>0.781703*</td>
</tr>
</tbody>
</table>

Observations: 11  
*, **and*** imply significance at the 10%, 5% and 1% levels respectively. 
Source: Eviews8 output, 2018

It can also be seen from table 3 that pension asset has a mean value of approximately 35.2% of total pension industry assets between 2007 and 2017. The table further depicts that the standard deviation of pension asset is approximately 21.9%, suggesting some little dispersion around the average pension industry asset. Furthermore, the skewness and kurtosis values of 0.4242 and 2.0070 respectively suggest positive skewness and peakedness (leptokurtosis) of the distribution. The Jarque-Bera value of 0.7817 which is significant at the 10% level imply that the observation of pension fund asset is not normally distributed. Though, the variables depicted abnormal skewness and kurtosis such non-normality poses no harm to the paper as the most important thing to establish is not the normality of the individual variables but that of the residuals from the model estimated using such variables.

4. Regression Results for regressor

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>28777054</td>
<td>11.53540**</td>
</tr>
<tr>
<td>APF</td>
<td>12077.87</td>
<td>19.83257**</td>
</tr>
</tbody>
</table>

R-squared: 0.97763  
Adjusted R-squared: 0.97514  
Durbin-Watson: 0.531797  
F-statistics: 0.0000**  
Obs: 11  
*, **and*** imply significance at the 10%, 5% and 1% levels respectively. 
Source: Eviews8 output, 2018

From table 4, It can also be seen that asset of pension fund (APF) has a positive coefficient of approximately 120.78% with a corresponding t-statistics of 19.833 which is strongly significant at the 5% level. This shows that pension funds asset has a positive effect on GDP of Nigeria, and thus a percentage increase in the ratio of pension...
The finding of positive significant effect that pension funds did not go through turbulent times during the scope of the study. It simply means that more positive pension funds asset led to increase of Nigeria’s GDP during the period under consideration. This finding of positive significance is consistent with previous findings by Gunu and Tsado, (2012), Mungoma, (2013) and Afolabi, (2015), Ameh, Ajie and Duhu. (2017) who found positive significant effect of pension fund asset and GDP, and inconsistent with Thomas, Spataro, and Mathew, (2013).

5.0 CONCLUSION AND RECOMMENDATIONS

This study can be concluded by saying that the pension fund asset injected into the Nigerian economy basically increase the GDP and its indeed a prove that these huge long term funds investment by PFAs needs to significantly be maximize to not only generate return on retirees’ funds but to increase the countries income. Furthermore, the study revealed significant contribution of pension fund asset to Nigeria’s Gross Domestic Product (GDP) over the period under study.

This study has far reaching policy implications because its findings imply that the pension funds achieved a vital role in the economy by directing all contributions accumulated in the Contributory Pension Scheme (CPS) into investments in financial assets such that it can be affected by market forces. In line with the finding and conclusion, the study recommends that PFAs should heighten portfolio management as well as management of...
assets of pension fund in other areas to reduce risk of idle funds and increase expected return of these long-term funds. Furthermore, a longitudinal study using monthly or quarterly data could better explain the effects of these variables and is therefore recommended.

REFERENCES


The link between transport and economic development has been debated over many years, but we still lack a generally applicable and clear relationship which can be used universally. Despite this, there is a popular view that transport is not only necessary for economic growth and development to be realized, it is the major instigator of such growth and development. Since the desire of every nation including Nigeria is the attainment of economic growth and development. This paper examines the linkage between transportation and economic development. It also examines the supply and demand for transport and then described the foundations of the possible linkage between transport and economic development from historical and contemporary perspectives. The study used both theoretical models as econometrics model as the data were sourced from secondary sources to examine the impact of transportation on economic development. The paper observes that there is positive relationship between transportation and economic development. The study thereby recommends that there should be positive necessary market conditions as well as complementing and supportive policies well designed and enforced by the transport policymakers and government in addition to provision of necessary infrastructure facilities.

Keywords: Transportation, Economic Development, Labour productivity. Ordinary Least Square, Transport supply and demand
1.0. INTRODUCTION

It is widely acknowledged that transport has crucial roles to play in economic development. In fact, like many economic activities that are intensive in infrastructures, the transport sector is an important component of the economy which impacts on development and welfare of the populace. In the case of developing countries in general and that of Nigeria in particular, the valuation of transportation as an important factor in the economic developing matrix of Nigeria presents an interesting story.

To put matter in perspective, there is a strong belief among decision makers, transportation planners, economists and historians that transportation plays a vital role in enhancing economic growth by stimulating investment and output and by improving productivity of labour and capital. Underlying this conviction is the assumption that the availability of fast, reliable and affordable transportation has historically been anchor on which cities and regions have developed and flourished. The ability to make people and goods move easily and economically is used to explain the relative economic advantage of region and cities. The reason is that when transport system are efficient and effective, they provide economic and social opportunities and benefits that result in positive multiplier effects such as better accessibility to the markets, employment and additional investments. On the other hand, when transport systems are deficient in terms of capacity or reliability, they can have an economic cost such as reduced or missed opportunities. Transport also carries an important social and environmental load, which cannot be neglected. Over the last four decades, Nigeria has witnessed rapid growth in the demand for public transport services due largely to urbanization, growth in population and economies activity. This paper focus on how the development in transportation establishes a correlation with the economic development. In the different lines of statically or empirical research into the interaction between economic growth and transport development, economic theory is an important source of information and an aid to interpretation. The paper made use of the specification model of the institute fur Verkehrscenschaflat the University of Cologne in 1999 with slight modification.

HISTORICAL PERSPECTIVE OF TRANSPORTATION AND ECONOMIC GROWTH

Adam Smith in his classic, “Wealth of Nation”, clearly explicated the state's responsibility for developing and maintaining that, in modern terms, is commonly called the civil infrastructure Adam Smith (1967). While Adam Smith did not explicitly assert that infrastructural development was the necessary condition for economic growth and development, the common perspective on the historical role of transportation was to be regarded as a major source of economic growth and productivity. Indeed, a plot of data from various countries showing infrastructure per capita VS GDP per capital in 1990 revealed a seemingly strong correlation between these variables World Bank (1994). As could be expected, poor
countries were also characterized by low level of per capita infrastructure, whereas the opposite characteristics well developed economies. But what is the cause and what is the effect? Does infrastructure development lead to enhanced growth (measure in terms of the rate of increase in GDP per capita), or does economic growth lead to as increase in the stock of infrastructure capital?

In addressing this issue, attention need to be given to the empirical historical research literature on the effect of transport development on growth and development is quite equivocal. Several major studies have shown that economic growth, which have been attributed to a specific transportation development, have many sources. One well known study was by Forgel (1964), he analyzed the impact of rail road development on American economic growth during the 19th century and concluded that, while rails ways has a primary impact on the costs of transport and that of social saving resulted from the movement of agricultural output by rail, no single innovation was vital for economic growth during the 19th century.

A different view was that of Rostow (1960); who argued that, historically, a reduction in transport costs through rail development has brought new areas and products in the market. He also asserted that transport investment has contributed to major new export sectors and was instrumental in the development of the coal, iron and engineering industries.

The land used transport link that underlie a significant part of the contemporary theoretically debate on the role of transport, were explicitly included in Von Thunen's classic study (1826) of the impact transport on pattern of agricultural development. As the quality (i.e speed of travel) of transport improves, the land devoted to agricultural production is extended and this, in turn, allows land values and land used to the reflected in the relative advantage to those locations served by the transport system.

Also, the influential research by Christalter (1933) in Southern Germany has demonstrated the links between transport cost and the spatial distribution of economic activities. He concluded that the improvement in transport infrastructure strengthened the accessibility and dominance of the central city. The basic assumption underlying much previous thinking is that transport and particularly transport infrastructure is growth enhancing. There is empirical support for this proposition: the last half of the twentieth century witnessed unprecedented level of growth in both transport and the economy in general. However, it is dangerous to assume that this is evidence of a causal link in a particular direction, is just a likely that economic growth induced by productivity growth. Historically low resources prices (especially of oil) and a world order which favoured rapid and stable growth of international trade fostered transport growth.

In the 90s however, while economic growth slowed down, transport growth
has continued. Users found themselves increasingly constrained by high fuel coast and a less rapid expansion of infrastructure especially in the developing countries in general and in Nigeria in particular. The big debate of the 1990 was whether transport infrastructure acted as a form of neo-Keynesian public work to help kick start the aggregate economy, whilst also serving to enhance the microeconomic efficiency of the economy. The problem was that it was plausible, but highly over simplified account of the role of transport in the economy. It also presupposed a number of key assumptions. First, how adequate id GDP as a measure of economic growth; secondly, is economic growth the same as economic development, thirdly, should mobility be viewed as an indicator of welfare and a goal of transport policy. It fails to incorporate a number of activities which are not traded. However, for the purpose of this study, we assume that GDP as a measure of economic growth which transcend to economic development.

2.0 LITERATURE REVIEW

2.1 Concept of Transportation and Economic Development

The key element that connects the transport sector with the overall economy is mobility. Interestingly, mobility is one of the cardinal features of economic activity as it underlines the basic need of economic agent moving from one location to another a need shared by critical factors in the production, consumption and distribution sphere of the economy: passengers, freight and indeed information. Mobility is therefore an important and reliable indicator of development.

Generally, in modern economy, provision of mobility is carried out by an industry that offers services to customers, employs people, pays wages and salaries invests capital and generates, income. In fact, the economic importance of the transportation industry can be views from both macroeconomic and microeconomic perspectives. At the macroeconomic level, transportation and its component element of mobility is connected to a level of output, employment and income within a national economy. In many countries, transportation accounts between 6-12 percent of the gross domestic product. In the case of Nigeria, it accounted for between 3.4 percent and 5.9 percent within the periods of 1983-2006 CBN (2006). Transport is also a major activity in the informal non-manufacturing sector. A study estimated that about 150-794 establishment creating about N647, 112,550.19 a total salaries and wages annually CBN/FOS/NISER (2001).

At the microeconomic level, transportation is linked to producer, consumer ans production costs. The importance of specific transport activities can best be appreciated when assessed for each sector of the economy. It has been suggested that transportation account on the average between 10 percent and 15 percent of household expenditures while at the same time representing about 4 percent of the cost of each unit of output in manufacturing Rodrigue (2007).
Transport has equally played a catalytic role in major flows of national, regional and international migration, transforming the economic and social geography of many nation. For instance, transportation has been a tool of territorial control and exploitation in Nigeria especially during colonial era where resource-based transport system (railways, inland waterways and roads) supported the extraction and evaluation of commodities from the hinterlands to major seaports for export to the imperial metropolis. The economic impacts of transport investment has been a tool of territorial control and tend to be significant when infrastructures were previously in existent or deficient exploitation in Nigeria especially during colonal era.

Much as transport impacts positively on economic and society, nevertheless, it has negative economic, social and environmental costs associated with it. Among the most important ones are mobility between different populations, cost difference, congestion, accidents, and the emission of pollutants with their wide range of environmental consequences which ultimately air quality, noise quality, water quality and land use.

There is also a tendency for transport investment to have declining marginal returns. While initial infrastructure investments tend to have high return since they provide new range of mobility options, the more the system is developed the more likely additional investment would result in lower returns. At some point, the marginal returns of transport investment from wealth production to wealth consumption. A common fallacy is assuming that additional transport investment will have a similar multiplying effect than the initial investment had, which can lead to capital misallocation. This means that the economic impacts of transport investment tend to be significant when infrastructures were previously in existent or deficient and marginal when an extensive network is already present.

It is important to know that the relationship between transportation and economic development is difficult to formally establish as it has been debated for many years. Its complexity lies in the variety of possible impacts. Timing of the development varies as the impacts of transportation can precede, occur during or take place after economic development. The lag concomitant and lead impacts make it difficult to separate the specific contribution of transport development. Types of impacts vary considerably. The spectrum of impacts ranges from the positive through the permissive to the negative in some case transportation impacts can promote, in other they may hinder economic development in a region. In many cases, few, if any direct linkages could be established.

2.2 Defining Transport Supply and Demand
Most economic system includes numerous activities located in different areas which require movement that must be supported by the transport system. Indeed, the demand for transportation is a derived demand. Transportation is service that must be consumed immediately and
thus cannot be stored. Mobility must occur over transport infrastructure—without movement infrastructure would be useless and without infrastructure mobility could not occur or would not occur in an effective manner this interdependence is expressed in two related concept, transport supply and transport demand.

Transport supply according to Umar and Akpokodje (2007). Is the capacity of transport infrastructure and modes to provide transport services generally over a geographically defined transport system and for a specific period of time? It is expressed in term of infrastructure (capacity), service (frequency) and network. The number of passengers, volume (for liquid or containerized traffic), or mass (for freight) that can transport demand, on the other hand is the expression of the transport need supply. Transport demand on the other hand fully, partly or not at all. Like its supply irrespective of whether these needs are met fully, partly or not at all like its supply counterpart, is transport demand expression in terms of number of people, volume or tons per unit of time and space. Transport demand is generated by the economy which is composed of person, institution and industries which generate movement of people and freight. When these movements are expressed in space, they part a pattern which reflects mobility and accessibility.

An important characteristic of urban public transport sector in Nigeria as in other developing country is its high growth rate in term of passenger carried, vehicles in use and route kilometers operated. In many cities and towns, conventional bus and taxi operators play the dominant role in the movement of passenger but are hardly able to satisfy the total demand of the travelling public. As a result, Para-transit, or immediate public transport (IPT) modes such as cycle or sector rickshaws, shared loan minibuses and even horse, oxen or donkey-drawn behinds (particularly in northern state of the federation) play an increasing part. Yet another characteristic of the urban public transport in these countries is its diversity, it is the case that in many smaller cities and town Para transit system has the dominant public transport role largely because they are better adapted to some of the difficult operating condition due to the unplanned of streets, or the slum-nature of most Nigeria cities and towns, rapid growth in population, limited financial resources available for investment of urban infrastructure as a result of reduced public spending and sheer disregard for standard codes in urban and regional planning.

Since the 1970 the demand for public transport in developing counties and Nigeria has been growing steadily due largely to the phenomenal rise in urban settlement and population in them Armstrong-Wright (1993), Mobogunje (1968). On the side of public transport supply, varieties of alternatives are provided in form of modes and services of public transportation, they are however forced to restrict their choice to a few due their inability to afford them. As a result,
there is wide disparity in the supply of public transport between towns, cities and by international standard.

2.3 The Effects of Transportation on Economic Growth and Development

Transport enables us to be linked with different places, improves the division of labour, raise the productivity of the factor of production labour and capital. The principal benefit of transportation is the growth in GDP, made possible by an increase in productivity. The productivity and growth effects of transport are the result of a great many individual factors, including:

- Lower cost and price for good and service
- Market expansion and economic of scale.
- New products and improved product quality
- Agglomeration economy
- New spatial structure, specialist land use, effective location
- Contribution to the formation of human capital
- Increase innovation and technical knowledge.

In fact, according to INFRAS (2000) the benefits can be divided up into benefit to the operator, the user, the third parties not involved in the market process and the general public as shown in table 5.1

Table 2.1 benefits of transport- overview

<table>
<thead>
<tr>
<th>Operator</th>
<th>User</th>
<th>Third party not involved in the market process:</th>
<th>General public</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Producer’s surplus Income</td>
<td>- Consumer’s surplus - Greater accessibility - Time saving - Lower transport cost - Gain in productivity - Less warehousing - Lower priced goods - Extension of division of labour - Greater power to overcome distance - Opening up of greater markets - Economies of scale places of work</td>
<td>Ground rent Lower priced consumer goods additional income stimulation of consumption Place of work</td>
<td>- Network forming function - Creating ties between regions - Increased attractiveness of industrial sites Lower concentration in towns better spatial distribution of prosperity Raising the rate of innovation - Increasing competitiveness - Stimulation of consumption Places of work contribution to formation of human capital Fulfilling basic social needs</td>
</tr>
</tbody>
</table>

Source: INFRAS, Nutzen des Verkehrs, information paper for the Workshop held on 29 June 2000 as part of the NFP (National Research Programme).
3.0 METHODS FOR MEASURING THE IMPACT OF TRANSPORT ON GROWTH

To measure the impact of transport on growth macroeconomic and microeconomic approach can be adopted - In macroeconomic models the benefits of transport result from increase attributable to mobility, in output, employment and across the national economic. A distinction must be between them in terms of nature and components of the models.

+ supply model economic (connection between fall in cost due to transport and increase in GDP).

+ demand models (effects of change in transport demand on the national economy)

+ growth models (impact of transport on the productivity of the factors of production)

+ input- output (illustration of input linkage in the national economy)

Macroeconomic models determine gross prosperity by adding up consumer surplus, producer supply and production cost. The benefit of transport is given by the area below the demand curve. Extensive result in this area may be obtained by the use of cost-benefit analysis. This is applied in the assessment of concrete infrastructure project.

However, for this study, the macro-economic approach is used with the employment of growth model with help multiple regression ordinary least square

4.0 ANALYSIS OF THE EFFECT OF TRANSPORT ON GROWTH IN NIGERIA

The essential point here to determine the impact of transport and other determine on the aggregate productivity of labour in Nigeria using economic functional Productivity of labour is defined as the ration of aggregate GDP to human resources used. The higher the productivity of labour, the higher GDP turn out be productivity of labour thus becomes the critical factors and driving force in the promotion of prosperity and higher income.

According to economic theory, the increase in the productivity of labour may be attributed to different factors. The more capital there is in a national economy the higher the productivity of labour will be.

The higher the level of education of the work force the higher productivity will be. This component relates to the quality of the human capital the productivity of labour will also be influenced by the efficiency of the enterprise and the work flow.

The mobility of person and goods also affect the productivity of labour it is central of the matter that concern us. Mobility means that person and capital can operate in accordance with division of labour.

The connection between transport performance productivity of labour employment and gross product is shown in figure 5.1 below.
1. The productivity of labour (PL) in the economy as a whole (not counting transport) falls within the transport performance (TP) PL = (TP)

2. The fall in productivity of labour can lead to raising unit costs (ULC). Unit labour cost gravitates between two extremes. Upper extreme if the wages remain constant unit wage increase and the productivity of labour decline. Lower extreme if the wage fall to the same extent as the productivity of labour unit wages cost remain constant.

3. The unit wage cost has impact on the level of employment (EM)
   \[ EM = f(ULC) \]
   For each of the two cases two variables are to be distinguished
   - If the unit wage cost increase employment declines
   - If the unit wage cost remain constant employment also remain constant

4. The fail in the productivity of labour and the potential decline in employment produce a lower GDP.
   \[ GDP = PL \times EM \]
   - If employment remain constants, GDP equally in the same proportion as the productivity of labour.
   - If the employment falls, GDP equally falls more sharply that the productivity of labour.

Regression analysis subsequently used to introduce empirical values in the model is used to establish the following relationships for Nigerien economy;
   - Relationship between productivity of work and transport;
   - Relationship between unit labour cost and productivity of labour;
   - Relationship between employment and unit labour costs.

Therefore, with the aid of the models that have been develop, the impact of transport on employment and GDP can be determined.
MEASURE OF THE RELATIONSHIP BETWEEN TRANSPORT AND ECONOMIC DEVELOPMENT IN NIGERIAN USING REGRESSION ANALYSIS

The productivity of human resources rises with the improvement in the quality of human capital, increase in fixed assets, improvement in company efficiency and greater mobility of human resources and input. It can therefore be established that there is functional relationship between these variables. 

\[ PL = f(K, QHC, TPGS, TPPS) \]

Where, 
- \( PL \) = Productivity of labour 
- \( K \) = Capital put 
- \( QHC \) = Quality of human capital 
- \( TPGS \) = Transport performance in the good sectors 
- \( TPPS \) = Transport performance in the passage sectors

The productivity of labour in the ration of production output on the input of labour. It is measured in GDP per number of workers in a year.

The quality of human capital is chiefly determined by the quality of education and state expenditure on education is taken as an editor. It must be assumed that there will be a delay between the raising of the higher education budget and the increase in the productivity of labour. This delay is estimated in 4 (four) years, with corresponded the average length of study in Nigeria.

Capital input is ascertained from the level of fixed assets, which in return is reflected in the level of annual depreciation.

The increasing transport performance in the goods sectors also produce an increased productivity of labour. The assessment takes account of the transport performance (tone-kilometer) of different form of transport (railways, road haulage, air freight transport, inland water way transport).

The increase in transport in the passenger sectors produces a rise in the productivity of labour. The transport performance (passenger kilometer) of various form of transport network (railways, motorized private transport and air transport), are taken into account in assessing transport geared towards production.

The relationship between productivity of labour and the contributory factor cited is estimated for the period 1985 to 2015 by means of regression analysis. Since development in the productivity of work and the contributory factor are subject to trends. Growth rate (gr) will be used to examine the nature of the relationship that exist between these variables growth rate for each variable are calculated from data obtained from Central Bank of Nigeria (CBN) statistical bulletin and National Bureau of statistics (NBS).

The study adopts the specification model of the institute for verkehrccenschaft at the University of Cologne in 1999 with slight modification. This model allows full unitization of ordinary and least square (OLS) of multiple regressions so as measure the impact of transport and other determinants on the aggregate productivity of labour in Nigeria.
Thus, the econometric model is specified as:

$$\text{grPL} = a_0 + a_1 \text{grTPGS} + a_2 \text{grTPPS} + a_3 \text{grQHC} + a_4 \text{grk} + U_i$$

Where:
- $\text{grPL} = \text{growth rate of productivity of labour}$
- $\text{grTPGS} = \text{growth rate of transport performance in the good sector}$
- $\text{grTPPS} = \text{growth rate of transport performance in the passenger sector}$
- $\text{grQHC} = \text{growth rate of quality of human capital}$
- $\text{grk} = \text{growth rate of capital input}$
- $a_0 = \text{intercept}$
- $a_1 = \text{slope/coefficient of explanatory variable grTPGS}$
- $a_2 = \text{slope/coefficient of explanatory variable grTPPS}$
- $a_3 = \text{slope/coefficient of explanatory variable grQHC}$
- $a_4 = \text{slope/coefficient of explanatory variable grk}$
- $U_i = \text{stochastic random term that repentant other factors/variable that effect productivity of labour}$

The most interesting thing to note is that all the coefficients of explanatory variable conform with the apriority expectation indicating that all the potential determinants of transport sector have the positive relationship with economic growth indicated by the productivity of labour. The $F$-value of 71.8929 indicates that the explanatory variables are jointly significant and capable of explaining changes in the productivity of labour. The Durbin-Watson coefficient of 1.55 verifies that there is no autocorrelation of residuals. Another important discovery from the estimation is that transport performance of the goods sector and that of passenger sector contribute more to the productivity of labour then other variables. For instance, from the estimation, a unit change in transport performance of goods sector (TPGS) will lead to 0.195 change in quality of human capital (QHC) will result to 0.008 changes in productivity of labour.

5.0 SUMMARY AND CONCLUSION

An attempt has been made to examine the relationship between transport and economic development in Nigeria by employing both qualitative and quantitative techniques through the use of theoretical and empirical model. It was shown that transport sector contributes positively to economic growth and development. The study evaluated the review of the subject matter of the paper in form of historical perspective. Definition of transport supply and demand was established after which the paper touched the influence of transportation (mobility) on economic growth and employment.
Attempt was also made on the analysis of the effects of transport on growth in Nigeria economy, and then the measurement of the relationship between transport and economic development using multiple regression analysis and Nigeria data.

In all, study showed that there was positive correlation between transportation and economic development. However, determining the overall impact of transport especially that of infrastructure investment remains fraught with uncertainty. Despite the progress that has been made in the evaluation of potential impact of transportation on economy, the models, and thus the assumption used, remain open to challenge. In addition, there are weakness in the method used to assess overall economic impacts, notably in terms of non-inclusion of other factors that may affect the productivity of labour, although economically that has been taken care with the introduction of stochastic random term (U).

Policy Implication of Findings and Recommendations
The theoretical and empirical analysis has shown that there are strong correlation between economic development via economic growth and transport. Transport policy should take these relationships in to account in providing for mobility.
Firstly, greater economic prosperity is linked to an increase in transport. If society wants greater prosperity, growth and development of transport sector cannot be compromised. The damage transport development causes to the environment are unavoidable consequences. This relationship is applied to Nigeria which seeks to achieve more generalized prosperity and equitable distribution of income through the integration and cohesion of the economically weaker and stronger cities and towns.

Secondly, given the relatively greater values of the contribution of transport performance of both the goods sector and the passenger sector of transportation, the policy makers should note that the growth in transport infrastructure is very low, especially in the areas of road and railways transport which happen to be the major means of mobility for both goods and passenger in the country as a result of many factors, but principally among these factors is poverty.

Thirdly, transport policy can contribute to the process of decoupling by promoting a higher degree of efficiency in the flow of transport or better ways of organizing it. However, importance must also be attached to the impact of other policies outside the field of transport like education policy, which happens to be determinant quality of human capital.

Fourthly, structural change in the economic will certainly lead to a falling off in the growth of transport in Nigeria. However, the problem of transport growth will not be solved in this way. Rather, the trend towards growth in road transport will continue, even under the different structural conditions. The share of high value goods in the production structure as well as the share of individual services will increase. The policy makers and government should therefore formulate
and implement policies that will turn the road transport from its present state to amore better state so as to enjoy the benefit of transport as a sector in Nigeria.

Fifthly, mobility and transport are important requirements for economic prosperity. The mobility of people and goods provide more enhanced division of labour, increased productivity, structural change, greater competitiveness, growth in incomes and higher employment. Economic activity, in this chain of cause and effect, a policy of transport avoidance as government of Nigeria has bend risk to further progress in productivity and growth which retards economic development in setting targets for prosperity, what matter most is to make the transport processes more cost effective and more efficient. The government and policy makers should gear their policy towards achieving these.
REFERENCES
INFRAS, Nutzen des Verkehrs, information paper for the Workshop held on 29 June 2000 as part of the NFP (National Research Programme).