

## **DOES MONEY MARKET SPUR ECONOMIC GROWTH IN NIGERIA? GRANGER CAUSALITY APPROACH**

**Dr Lyndon M. Etale and Dr Peter E. Ayunku**

Department of Finance and Accountancy, Faculty of Management Sciences, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria

---

**ABSTRACT:** *This study examined the relationship between money market and economic growth in Nigeria. The study adopted money market instruments such as treasury bills (TBs), commercial papers (CPs) and bankers' acceptances (BAs) as proxy for money market (independent variables), and gross domestic product (GDP) as proxy for economic growth (the dependent variable). Secondary time series data for the variables were collected from CBN Statistical Bulletin and the National Bureau of Statistics for the period 1989-2014. The study employed econometric techniques such as ADF, Unit Root Test, OLS, multiple regression and Granger Causality Test to analysed the study data; and found strong evidence that TBs, and CPs had positive and significant influence on GDP, while BAs had positive but insignificant influence on GDP in Nigeria. The granger causality test result revealed no directional causality relationship between TBs and GDP, meaning that TBs does not granger cause GDP and vice-versa. There was also no directional causality relationship between CPs and GDP, BAs and GDP. However, there exists bi-directional relationship running from CPs to TBs and BAs as it was established at 5 per cent level of significance. The study recommended among others that for the money market to influence meaningful economic growth and development in Nigeria, appropriate policies should be employed to strengthen and deepen the market.*

**KEYWORDS:** Treasury Bills, Commercial Papers, Bankers' Acceptances, Economic Growth, Gross Domestic Product, Money Market.

---

### **INTRODUCTION**

The money market plays an important role in the mobilization of financial resources for long term investment through financial intermediation. According to Mohammed (2009) the existence of money markets facilitate trading in short-term debt instruments to meet short-term needs of large users of funds such as government, banks and similar institutions. In an analysis of money market instruments Kacperzyk and Schnabl (2010) described commercial papers, specifically, as the cheapest way of raising capital at short term interest rates. They noted that commercial paper was the largest U.S. government short term debt instrument since the beginning of 2007. Asogwa and Ezema (2004) noted that money market instruments such as treasury bills and treasury certificates are the only short term government debt instruments which were marketable and negotiable. In Nigeria, treasury bills are currently the only short term government debt instruments traded in the money market since the use of treasury certificates were discontinued by government in 1996 (Asogwa & Ezema, 2004) and (Adofu & Abula, 2010).

Nwosu and Hamman (2008) noted that the money markets are integral part of the financial infrastructure of industrial countries among the largest financial markets in the world. They posited that the overall performance of the money market has been mixed when compared;

asserting that, the market is said to be shallow and is characterised with inadequate securities, paucity of instruments and that there exist a wide range of lending and deposit rates. The market also lacks breadth, resilience and depth, to effectively discharge its primary functions of financial intermediation. These developments have no doubt affected the growth and development of the Nigerian money market when compared with advanced countries.

Also, Oghenekaro (2013) observed that the money market is essentially for the efficient distribution of liquidity in the financial system, allocation of capital as well as the hedging of short-term risks. The money market is the market where short-term financial assets are bought and sold. The market is essentially an intermediary, where short-term financial assets that are close substitute for money are usually traded. In Nigeria, the money market is not yet vibrant and developed. This is so because the market is currently facing liquidity problems. The market is largely dominated by government instruments such as treasury bills and bonds, with a wide gap of deposit and lending rates or very high cost of borrowing when viewed.

However, Iyiegbuniwe (2005) noted that the Nigerian money market has experienced some remarkable and significant growth and development both in breadth of securities as well as the volume of trading since the deregulation of the financial system in 1986. He averred that the market still needs to be deepened to achieve the required vibrancy that is expected of a money market. He affirmed that this does not mean that the market is inefficient, but that there is need to further evaluate its performance in relation to its contribution to economic growth and development of the country.

The role of money market transactions in economic growth and development of Nigeria has continued to attract the attention of some policy makers and scholars in recent times. This is due largely to the fact that most of the past studies had focused attention on capital market developments, and not much was done on research on money market activities. Furthermore, the study findings of previous studies linking the activities of the money market to economic development showed a lack of consensus among researchers. This lack of consensus clearly indicates the existence of a research gap which this study attempted to bridge, and by so doing contribute to the existing literature. Thus, the broad objective of this study was to examine whether money market spur economic growth in Nigeria. But in more specific terms the study examined the effect of money market instruments such as treasury bills, commercial papers, and bankers' acceptances on gross domestic product (proxy for economic growth). Consequently, the research questions addressed and hypotheses tested in the study followed from the above objective.

The rest of the paper is structured as follows: section two provides the review of empirical literature; followed by the research methodology in section three. Section four provides the results of the study and the discussion of the findings; while the conclusion and the recommendations of the study are presented in section five.

## **REVIEW OF EMPIRICAL LITERATURE**

This section deals with the review of past empirical literature on the topic in order to provide a justification for the study of the impact of treasury bills, commercial papers and bankers' acceptances on economic growth in Nigeria. The review cited the following studies.

Pavtar (2016) investigated the link between money market and economic growth in Nigeria using time series data for the period 1985-2014 collected from the Central Bank of Nigeria. The study adopted treasury bills (TBs), treasury certificates (TCs), commercial papers (CPs) and certificate of deposits (CDs) as the independent variables and proxy for money market; while gross domestic product (GDP) was used as proxy for economic growth. The study adopted an *ex-post-facto* research design, and employed descriptive statistics, OLS multiple regression techniques for data analysis. The findings revealed that TBs, TCs and CPs had no effect on GDP, but CDs had significant impact on GDP. The study recommended among others the creation of appropriate macroeconomic policies by government to promote economic growth in Nigeria.

In a similar study, Adofu and Abula (2010) examined the relationship between domestic debt and economic growth in Nigeria for the period 1986-2005 using OLS techniques for data analysis. The study adopted a model regressing gross domestic product (proxy for economic growth) against domestic debt, the explanatory variable which included treasury bills, treasury certificates and development stock. The study results showed that domestic debt had negative effect on economic growth in Nigeria. The study therefore recommended that government should discourage domestic borrowing and increase tax revenue. Also, Maana, Owino and Mutai (2008) examined the impact of public domestic debt on economic growth in Kenya for the period 1996-2007. The study employed Generalised Method of Moments Regression and linear estimation models for data analysis. The findings of the study revealed that domestic debt had a positive but insignificant effect on economic growth in Kenya.

However, Ehigiamusoe (2013) examine the link between money market and economic growth in Nigeria, using data for the period 1980 – 2013. He used econometric techniques such as Ordinary Least Square (OLS) method, Johansen Co-integration test and Vector Error Correction Model to examine both the short-run and long-run relationships between money market and economic growth. The results suggest that though, a long-run relationship exists between money market and economic growth, but that the present state of the Nigerian money market is significantly and negatively related to economic growth. He observed that the link between the money market and real sector of the economy remains weak and concluded that government should create the appropriate macroeconomic policies, legal framework and also sustain the present reforms with a view of developing the market so as to promote productive investment activities and ultimately economic growth.

Iwedi and Igbani (2015) investigates the nexus of money market operations on economic growth in Nigeria during the period 1980–2013, using econometric tools of Vector Auto Regression (VAR), Johansen Co-integration and Granger causality tests in the analysis of their Data. The results indicate that there is a positive significant short-run and long-run relationship between money market operations and economic growth in Nigeria. The results of the Causality test suggest that causality flows from economic growth proxy by gross domestic product (GDP) to money market operations but not vice versa. They concluded that money market operations (as key components of the financial system) produced short-term growth tendencies and help to ensure long-run impressive and steady economic growth rates in Nigeria. They recommended that government should both in the short and long run prioritize policies geared towards increasing or developing money market operations in Nigeria in order to make the economy more stable.

Similarly, Ikpefan and Osabuohien (2012) investigated the interaction between discount houses, money market instruments and economic growth in Nigeria for the period 1992 – 2007,

using Co-integration and Vector Error Correction techniques. They found that a long-run relationship exists between discount house operations, money market instruments and economic growth in Nigeria. They posited that discount houses can serve as a veritable tool in stimulating economic growth in Nigeria, especially in the era of the global economic meltdown that brought serious financial challenges to the Nigerian stock market.

Also, Okpe (2013) studied the impact of money market on the Nigerian economic development for the period 1987 – 2007 by employing Ordinary Least Square (OLS) method. The results suggest that Nigerian Stock Exchange has contributed to some extent in financing small and medium scale enterprises, and that the market appears to be bright considering the current position of government and players of the industry in the area of formulation and implementation of favourable policies.

Maduka and Nnwuka (2013) examined both the short-run and long-run relationships between financial structures and economic growth, using secondary time series data. The results indicate that financial market structure has a negative and significant effect on economic growth. According to them, information on the Nigerian financial market suggests a low level of development of the country's financial sector. However, based on the findings of their study they recommended that there is need to put appropriate financial policies in place that would encourage the growth of per capita GDP in Nigeria.

Ogege and Shiro (2013) studied the role of banks deposit money in the growth of the Nigerian economy, for the period 1974 to 2010, using Co-integration and Error Correction Model (ECM) and structural analysis technique to analyse data. They found that there exists a long-run relationship between the dependent variable and the explanatory variables; and that the results conform to economic a priori expectations. The study therefore recommended that policies which tend to increase the gross domestic product through financial sector operations such as increase in banks deposit liabilities, low interest rates, and high liquidity ratios be encouraged.

Ajao and Festus (2011) in their study examined the effect of the global financial meltdown on the Nigerian money market in two separate time periods, 2000 – 2005 and 2006 – 2009. They employed Ordinary Least Square (OLS) techniques in analysing data. The study variables included the ratio of money supply to GDP (used as proxy for the impact of the global financial meltdown and the dependent variable), while money market instruments such as treasury bill (TBs), commercial papers (CPs), bankers' acceptances (BAs), certificate of deposits (CDs), bank lending rate (BLR) and inflation rate (INF) were used as the explanatory variables for the two time periods. They found that during the non-crises era (2000 – 2005) all the explanatory variables met the a-priori expectations; but during the crises era (2006 – 2009) only the coefficient of inflation retains its a-priori expectations or sign. They averred that economic activities were adversely affected by the global financial meltdown as seen in the adverse effect on financial deepening, and that this had a corresponding effect on the money market which ultimately destabilized its indicators. The study therefore recommended that adequate procedures for handling financial sector crisis should be drawn up promptly in preparation for emergencies, and that the monetary authorities should identify the vulnerabilities of the money market and safe guide its effectiveness as a means of further reducing the effect of financial meltdown on the Nigerian economy.

In a related study Ehigiamusoe (2016) examined the challenges of money market development and its impact on economic growth in Nigeria, using Ordinary Least Square (OLS) techniques for data analysis. The results suggest that the Nigerian money market is significant but

negatively related to economic growth. He observed that the Nigerian money market is not yet virile enough to produce the needed growth that will propel the economy to meaningful development, and that the link between the money market and real sector of the economy remains very weak.

Agha, Ahmed, Mubarak and Sliyah (2000) in their study examined the transmission mechanism of the monetary policy in Pakistan's economic development. They asserted that the role of bank lending is very prominent because of the dominance of the banking sector and other factors which might have enhanced the banks role such as financial reforms, market based credit allocation and crowding in of private sector credit due to the decline in fiscal dominance. Also, Raja and Mahalakshmi (2015) studied the impact of money market in Indian economic development. They stressed that financial stability is crucial for sustained economic growth but this cannot be achieved without strong financial system. They stated that the financial sector in India is witnessing an era of innovations since liberation, and that there has been a broadening and deepening of the financial market. They noted also that the financial sector has acquired greater strength, efficiency and stability by the combined effect of competition, regulatory measures, policy environment and motivation among the market players including banks and other financial institutions in India.

Agbada and Odejimi (2015) investigated the developments in money market operations and economic viability in Nigeria for the period 1981 – 2011, using multiple regression techniques for data analysis. The study adopted money market instruments such as treasury bills (TBs), treasury certificates (TCs), certificate of deposits (CDs), commercial papers (CPs) and bankers' acceptances (BAs) as independent variables and proxy for money market operations, while gross domestic product (GDP) was used as proxy for economic growth and the dependent variable. They found that the variations in the growth trends of GDP and the explanatory variables in the graphical representation appears to cast doubt on whether money market operations made significant contribution to GDP growth for the period under review. They observed that the Pearson correlation coefficient matrix substantially attested to strong linear relationship between the explained and explanatory variables. The study therefore recommended among others that monetary authorities should initiate policies to boost money market operations and also be proactive in their surveillance role in order to check practices that are capable of sabotaging market soundness.

## **METHODOLOGY**

This section of the paper presents the methodology adopted for this study, which covers the source of data, variables of the study, data analysis technique and the regression model specified to facilitate data analysis. This study examined the effect of money market instruments on economic growth in Nigeria for the period 1989 – 2104 using an ex-post facto research design.

### **Sources of Data**

The study is based on time series data for the Nigerian monetary market spanning from 1989 to 2014. Secondary time series data for the study variables were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and National Bureau of Statistics (NBS) publications for the twenty six years period covered by the study. The availability of the relevant required data

relating to the study variables informed the choice of the study period. Besides, this source of data is considered reliable and dependable.

### Variables of the Study

The study investigated the relationship between treasury bills (TBs), commercial papers, (CPs), bankers' acceptances (BAs) and gross domestic product (GDP) in Nigeria, using secondary time series data for the period 1985 – 2014. Gross domestic product was used as proxy for economic growth (the dependent variable), while TBs, CPs and BAs used as proxy for money market are the independent variables. Thus, the study employed ex-post facto research design which deals with already existing data where the researchers lack the power to manipulate the data.

### Data Analysis Technique

The study employed econometric techniques such as ADF, Unit Root Test, OLS, multiple regression and Granger Causality Test to analyse data collected for the study covering the period 1989 – 2014. The aim of the techniques of analysis employed was to provide robustness in data analysis and hypotheses testing.

### Model Specification

To facilitate the analysis of data, a regression model of the following order was developed to capture the causality relationship between TBs, CPs, BAs and GDP:

$$GDP = f(TBs, CPs, BAs)$$

The above regression model was explicitly translated into a regression equation as stated below:

$$GDP = \alpha + \beta_1 TBs + \beta_2 CPs + \beta_3 BAs + e \quad \text{equation 1}$$

Where;

*GDP* = Gross domestic product (proxy for economic growth), the dependent variable

*TBs* = Treasury bills, one of the independent variables

*CPs* = Commercial papers, the second independent variable

*BAs* = Bankers' acceptance, the third independent variable

$\alpha$  = is the constant term

$\beta_1, \beta_2, \beta_3$  = are the coefficients of the independent variables, and each, as expected  $\neq 0$

$e$  = is the error term of the equation

Equation 1 above can further be expressed in terms of logarithm as follows:

$$\text{Log } GDP = \alpha + \beta_1 \text{Log } TBs + \beta_2 \text{Log } CPs + \beta_3 \text{Log } BAs + e \quad \text{equation 2}$$

## RESULTS AND DISCUSSION

Table 1 below present the Augmented Dickey Fuller (ADF) unit root test to ascertain whether the variables were stationary so as to avoid estimating spurious regression

**Table 1 Augmented Dickey Fuller (ADF) Unit root test results.**

Series	ADF Test Statistics	5% Critical Values	10% Critical values	Order of Integration	Remarks
Log (GDP)	-2.659750	-1.955681	-1.608793	1(1)	Stat at 1 <sup>st</sup> diff
Log (TBS)	-3.948476	-1.955406	-1.608495	1(2)	Stat at 2 <sup>nd</sup> diff
Log (CPS)	-6.311388	-1.955681	-1.608793	1(1)	Stat at 1 <sup>st</sup> diff
Log (BAS)	-5.627221	-1.955681	-1.608193	1(1)	Stat at 1 <sup>st</sup> diff

Source: E-view output

From table 1 above, the ADF unit root test result indicates that all the variables were stationary at 1(1) that is first difference, except the series of TBs that was stationary at 1(2) second difference. All the variables indicate the rejection of the null hypothesis of the unit root at the 5% and 10% significance level.

**Table 2 Least Squares Multiple Regression Result**

Dependent variable: Log (GDP)

Variables	Coefficient	Std.Error	t-Statistic	Prob.
C	6.667128	0.165854	40.19888	0.0000
LOG(TBs)	0.001542	0.000114	13.54168	0.0000
LOG(CPs)	0.324825	0.090477	3.590159	0.0016
LOG(Bas)	0.005313	0.007442	0.722033	0.4779
R-Square	0.939338	Durbin-Watson Stat.	1.414137	
Adj. R-squared	0.931066	Prob (F-statistic)	0.000000	
F-statistic	133.5551			

Source: E-view output

From table 2 above, the multiple estimation regression result shows the relationship between money market instruments and economic growth with GDP as proxy for economic growth. The result indicates that the variables such as TBs and CPs exhibited a positive and significant relationship with GDP proxy for economic growth, while BAs also showed a positive but insignificant relationship with economic growth in Nigeria. These results are consistent with the findings of Iwedi and Igbani (2015).

Further, the result indicates that about 94 per cent of variation in the dependent variable is well explained by the independent variables. In the overall, the variables are jointly significant and very well explained the variations in GDP (economic growth) as the Prob. (F-statistics) value is 0.0000. Also, the Durbin Watson statistics value of 1.414137 exhibited or showed the absence of auto correlation among the variables. Thus, the model for the study was a good fit.

Table 3 below presents the pairwise Granger Causality Test result.

**Table 3 Pairwise Granger Causality Test Result Log 2:**

Null Hypothesis	Objects	F-statistic	Prob.
Log (TBs) does not arrange cause Log(GDP)	24	0.77868	0.4731
Log (GDP) does not granger cause Log(TBs)		3.30669	0.0586
Log (GDP) does not granger cause Log(CPs)	24	0.49067	0.6198
Log (GDP) does not granger cause Log(BAs)		0.19610	0.8236
Log(BAs) does not granger cause Log(GDP)	24	0.24304	0.7866
Log(CPs) does not granger cause Log(GDP)		0.00811	0.9919
Log(CPs) does not granger cause Log(TBs)	24	4.95327	0.0186
Log(TBs) does not granger cause Log(CPs)		4.29644	0.0289
Log(BAs) does not granger cause Log(TBs)	24	13.0206	0.0003
Log(TBs) does not granger cause Log(BAs)		1.58214	0.2314
Log(BAs) does not granger cause log(CPs)	24	3.96902	0.0363
Log(CPs) does not granger cause Log(BAs)		8.06617	0.0029

Source: E-view output

The Pairwise granger causality test result from table 3 above indicates that F-statistics value of 0.77868 and 3.30669 with the p-values of 0.4731 and 0.0586 clearly indicates that there exist no directional causality relationship between Treasury bills (TBs) and Gross Domestic Product (GDP) as proxy for economic growth. Meaning that the TBs did not granger cause GDP and vice versa in this study.

However, a bi-directional causality relationship running from CPs to TBs, and BAs was established at 5 per cent significance level respectively. While a uni-directional relationship existed between BAs and TBs at 5 per cent significance level. The study therefore concluded that CPs granger caused TBs and BAs as the study rejected the null hypothesis at 5 per cent level of significance. However, TBS does not granger cause GDP.

## CONCLUSION AND RECOMMENDATIONS

### Conclusion

This study examined the relationship between money market and economic growth in Nigeria. The study employed first ADF unit root test OLS multiple regression and Granger Causality test using the econometric software E-views to analyse the data obtained from secondary sources for the period 1989 – 2014. The findings revealed that TBs, CPs have positive and significant influence on economic growth while BAs had positive but insignificant influence on economic growth.

The granger causality test result revealed that the pairwise values of 0.77868 and 3.30669 with p-values of 0.4731 and 0.0586 clearly indicates that there exist no directional causality relationship between Treasury bills (TBs) and Gross Domestic Product (GDP) as proxy for economic growth in Nigeria. Meaning that TBS did not granger caused no directional relationship between the variables such as CPs and GDP, BAs and GDP, vice versa. However, running from CPs to TBs and BAs as this was duly established at 5 per cent level of significance, while a uni-directional relationship existed between BAs and TBs and vice versa at 5 per cent level of significance.

## Recommendation

The policy implication of these results suggested that the Nigerian money market is still very shallow as it lacks depth and breath. The market is still dominated by government securities and instruments. Thus, the study recommended among others that for the money market to impact meaningful economic growth and development, the monetary authorities should explore appropriate policies that would strengthen and deepen the market.

## REFERENCES

- Adofu, I. and Abula, M. (2010) Domestic debt and the Nigerian economy, *Current Research Journal of Economic Theory*, 2(1), 22-26
- Agba, A. I., Ahmed, N., Mubarak, V. A., and Sliyah, N. (2005) Transmission mechanism of monetary policy in Pakistan, *SBP Research Bulletin*, 1(2), 1-10
- Agbada, A. O. and Odejimi, D. O. (2015) Developments in money market operations and economic growth viability in Nigeria: An empirical analysis, *European Journal of Business and Management*, 7(18), 42-52
- Ajao, M. G. and Festus, B. O. (2011) Appraisal of the effect of the global financial meltdown on the Nigeria money market, *International Journal Economics and Finance*, 3(4), 95-105
- Asogwa, R. C. and Ezema, C. C. (2005) Domestic government debt structure, risk characteristics and monetary policy conduct: Evidence from Nigeria, Final Research Project Submitted for the International Research Project on Macroeconomic Policy Challenges for Low Income Countries, p 1-44, <https://www.imf.org/external/np/res/seminars/2005/macro/pdf/asogwa.pdf>. Accessed 04/08/16
- Ehigiamusoe, U. K. (2013) The link between money market and economic growth in Nigeria: Vector Error Correction Model Approach, *World Academy of Science Engineering and Technology, International Journal of Social Education, Economics and Management Engineering*, 7(12), 1792-1800
- Ehigiamusoe, U. K. (2016) The challenges of money market development and its impact on economic growth in low income countries: Evidence from Nigeria, National Institute of Legislative Studies, National Assembly, Abuja, 1-3, [www.academia.edu/.../The\\_challenges-of-money-market-development-and-its-impact...pdf](http://www.academia.edu/.../The_challenges-of-money-market-development-and-its-impact...pdf) Accessed 03/08/16
- Igbatoyo, S. (2011) The challenges of the global economic crises and Nigeria financial markets stability, *Journal of Emerging Trends in Economics and Management Sciences*, 2(6), 497-503
- Ikpefan, O. A., and Osabohien, E. (2012) Discount houses, money market and economic growth in Nigeria, *Economic Insight Trends and Challenges*, 1(3), 19-30
- Iwedi, M. and Igbani, D. S. (2015) The nexus between money market operations and economic growth in Nigeria: An empirical investigation, *International Journal of Banking and Finance Research*, 1(2), 1-17
- Iyegbuniwe, W. I. C. (2005) The Nigerian money market: Evolution and structure, In Fakiyes, O. O. and Akano, S. O. (eds) Issues in money, *Finance and Economic Management in Nigeria*, Lagos, University of Lagos Press.
- Kacperczy, M. and Schnabl, P. (2010) When safe proved risky: Commercial papers during the financial crisis of 2007-2009, *Journal of Economic Perspectives*, 24(1), 29-50

- Maana, I., Owino, R. and Mutai, N. (2008) Domestic debt and its impact on the economy – The case of Kenya, A Paper Presented at the 13th Annual African Econometric Society Conference in Pretoria, South Africa, July 9-11, p 1-27
- Maduka, A. and Onwuka, K. O. (2013) The financial market structure and economic growth: Evidence from Nigeria, *Asian Economic and Financial Review*, 3(1), 75-98
- Mohamed, J. (2009) The Role of financial markets in economic growth, DG/CEO, Sierra Leone Stock Exchange and Bank of Sierra Leone
- Nwosu, C. P. and Hamman, H. M. (2008) The Nigerian money market: Issues and challenges, *Bullion Publication of the Central Bank of Nigeria*, 32(2), 51-62
- Ogege, S. and Shiro, A. A. (2013) Does deposit money banks impact economic growth? Evidence from Nigeria, *African Journal of Business Management*, 7(3), 196-205
- Oghenekaro, O. A. (2013) The Nigeria money market, Central Bank of Nigeria (CBN) Understanding Monetary Policy Series 27.
- Okpe, I. I. (2013) Money market on the Nigerian economic development, *Journal of Economic and Sustainable Development*, 4(5), 5-11
- Pavtar, A. (2016) The nexus between money market instruments and Nigeria's economic growth: A time series analysis, *Journal of Accounting and Finance Management*, 2(3), 22-39
- Raja, P. and Mahalakshmi (2015) Impact of money market in Indian economic development, *International Journal of Advanced Scientific Research Development*, 2(01), 108-117