Trend Analysis Approach of Nigeria Treasury Bills

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Abstract
The study looked at Treasury bill maturity using trend analysis approach for the period 1990 to 2019. The challenge of making passive income especially by senior citizens has pushed some of them into the confusion of where to invest for maximum profit. One major test method for assessing the validity and reliability of the test is the Normality Test. The data used for this research was secondary. Minitab version 17.0 was used for the analysis of the data. We found that there is a downward trend for the three months treasury maturity and the six months treasury maturity but a very slight and almost insignificant appreciation in the twelve months treasury maturity period. The implication of this is that investors who can afford to keep their money in the treasury market for a period of at least twelve months could be able to earn a slow dividend returns. This is collaborated by the recent reduction of the interest rate on treasury bills by the Federal government of Nigeria few months ago. We recommend the patronage of twelve months maturity period in the investments regarding Treasury Bills.
Key Word: Trend, Analysis, Treasury Bills, Normality test.

I. Introduction

This paper is an extension of Okorafor et al. (2018). The essence of economics and financial systems is to reduce if not completely eradicate poverty and improve the living condition of human beings. Assets diversification has played a very important role in the achievement of sustainable and good living condition of the populace. Financial institutions are drivers of both public and private econometrics. If the financial institutions are weak then expect weak economic performance (Mishkin, 2004).

According to Batini, (2004), banks play important roles in the financial system with regard to assets, deposits and loans.

There is gross underdevelopment in the financial institutions in Nigeria. Notwithstanding, all over the world, there has been speedy discoveries in financial institutions and governmental interventions. Treasury bills have been a major source of huge funds for the governments. These treasury bills have been instrumental to the asset of some financial institutions. Our financial markets are still at the teething, baby stage. Several innovations, changes have taken place over the years. These changes over time have been analysed to give update and assessment of the financial situations of nations. It has been proved that the asset of a financial institution shows the financial strength of the institution (Melnik,1999). Notwithstanding, the financial state of a financial institution sometimes might not be sufficient in assessing the financial strength of any financial institution. The Nigeria Treasury bills are designated periods that government give for depositors of money to leave their earnings with the Central Bank in form of fixed point so as to share in the proceeds obtained after the set period of time. These treasury bills are also primary market instruments for replacing money supply via Open Market Operations (OMO).

Statement of the Problem

There is confusion in the investment circles as a result of multiplicity of investment portfolios all over the places. Many people are faced with the confusion of where to invest their hard earned money especially people outside the arena of economics and financial markets. The professionals in the economic and financial systems are equally faced with the challenge of guiding and mentoring clients on the right path to take in their investments. This has resulted to several regrets in investment as many have lost fortunes due to misplaced and misguided investments. Inflation has at this crucial period of human history compounded the problem as well.

Aim and Objectives of the Study
The general aim of this study is to subject treasury bills for three, six and twelve months maturity periods to trend analysis with the following specific objectives:
1.   Determine the trend of Treasury Bill Rates for the periods under study.
2.   Determine the viable period(s) for investment in the different categories of the treasury bills maturities.

Scope and Limitation of the Study
The scope of this study is between the periods, 1990 – 2019 of the Treasury bills maturities in Nigeria. The major limitation to this work is the inaccessibility of data for the period under study.

Significance of the Study
The study will be of immense and great relief for our senior citizens looking for where to invest their money. The players in the helm of affairs of economic and financial systems and institutions will equally find this work very beneficial.

II.   Review of Literature

The essence of financial institutions is to evaluate and manipulate assets so as to circumvent the plunge of business transactions. The financial institutions should be the panacea for managing flow of cash, proceeds of investments yet making sure that our monies safe.

Kosmidous, Pasiouras & Floropoulos (2004) looked at assets on proceeds of eighty United Kingdom by the use of data between 1996 and 2002. The data used showcased the balance between assets and profits. They discovered that the banks that made high profits actually had low returns while those that made low profit also earn low returns. The liabilities, assets and the returns are intertwined to produce a balanced system. The investors make profits within a short time. The banks manipulate these factors to put smiles on people and partners.

Chu, Pittman and Chen (2007), examined the consumer price index and maturity rate of the United State treasury bill and discovered that inflation happens when these economic factors are compromised.

In the bid to find out the effect of inflation it was discovered that through irrational decisions of investors and operators of the economy. Fama (1981) showed the volatility of market forces can be linked to external forces influence the returns of investors. The efficiency of the system depends on the players in the financial institutions.

Mark and Aris (2002) used models to assess the influence of micro and macro factors on stocks, equities and returns. It was found that these had resulted to low returns excluding GNP which had improved the returns instead. Aydemir and Demirhanm, (2009) explained that bond brought in inflation and the attendant risks.

Mehra and Presscott (1985) asserted that these economic factors were not enough to bring succour to the treasuries of investors.

Akinbobola, (2012), postulated that the consumer price index indicates the living cost of individuals through changes mitigated by shares, bond and securities.

III.   Research Methodology

Data Source
Data used in this work is from secondary source – Central Bank of Nigeria Statistical Bulletin. It has the different categories of maturity periods ranging from three months, six months, twelve months and so on.

Method of Data Analysis
Trend Analysis was used and Minitab Version 17.0 was the statistical software used.
**Results**

Table 1: Money Market Interest Rate (per cent) of treasury bills

Years	3 months	6 months	12 months
1990 (1)	19.60	20.50	22.10
1991 (2)	15.71	17.09	20.10
1992 (3)	20.80	22.30	22.10
1993 (4)	23.60	23.26	23.99
1994 (5)	15.00	15.00	15.00
1995 (6)	13.62	13.65	13.96
1996 (7)	12.94	13.21	13.43
1997 (8)	7.04	7.49	7.46
1998 (9)	10.20	10.50	9.98
1999 (10)	12.68	12.75	12.59

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2000 (11)	10.60	10.27	10.67
2001 (12)	10.20	10.50	9.98
2002 (13)	16.31	16.99	16.50
2003 (14)	14.31	13.07	13.04
2004 (15)	13.69	12.47	13.32
2005 (16)	10.53	10.38	10.82
2006 (17)	9.75	9.33	8.35
2007 (18)	10.29	9.74	8.10
2008 (19)	11.95	11.85	11.84
2009 (20)	12.96	13.03	12.85
2010 (21)	6.52	6.28	5.67
2011 (22)	5.69	4.90	4.70
2012 (23)	8.40	7.85	7.18
2013 (24)	7.94	7.47	5.54
2014 (25)	20.80	28.29	92.80
2015 (26)	13.1267	13.6460	18.6492
2016 (27)	13.1179	13.6443	18.7399
2017 (28)	13.1090	13.6425	18.8306
2018 (29)	13.1002	13.6408	18.9212
2019 (30)	13.0913	13.6390	19.0119

Table 1 above shows the different interest rates for different classes of treasury bills maturities.

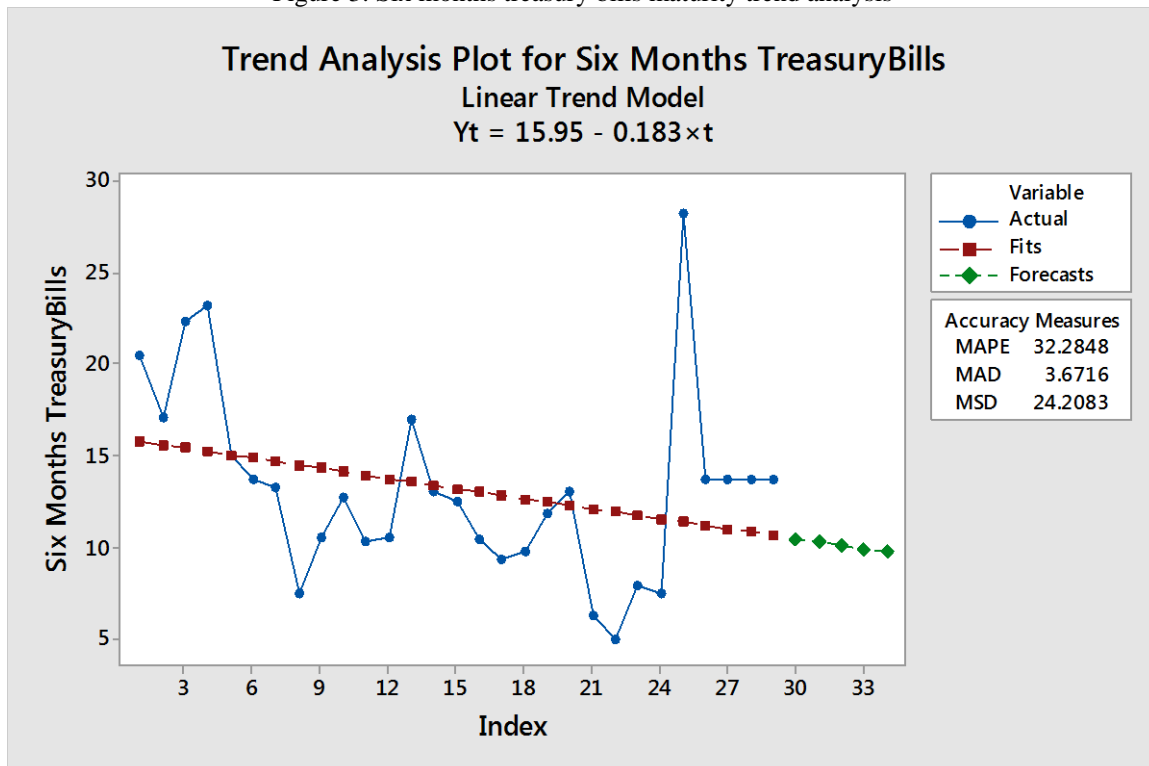Figure 1: Three months treasury bills maturity trend analysis
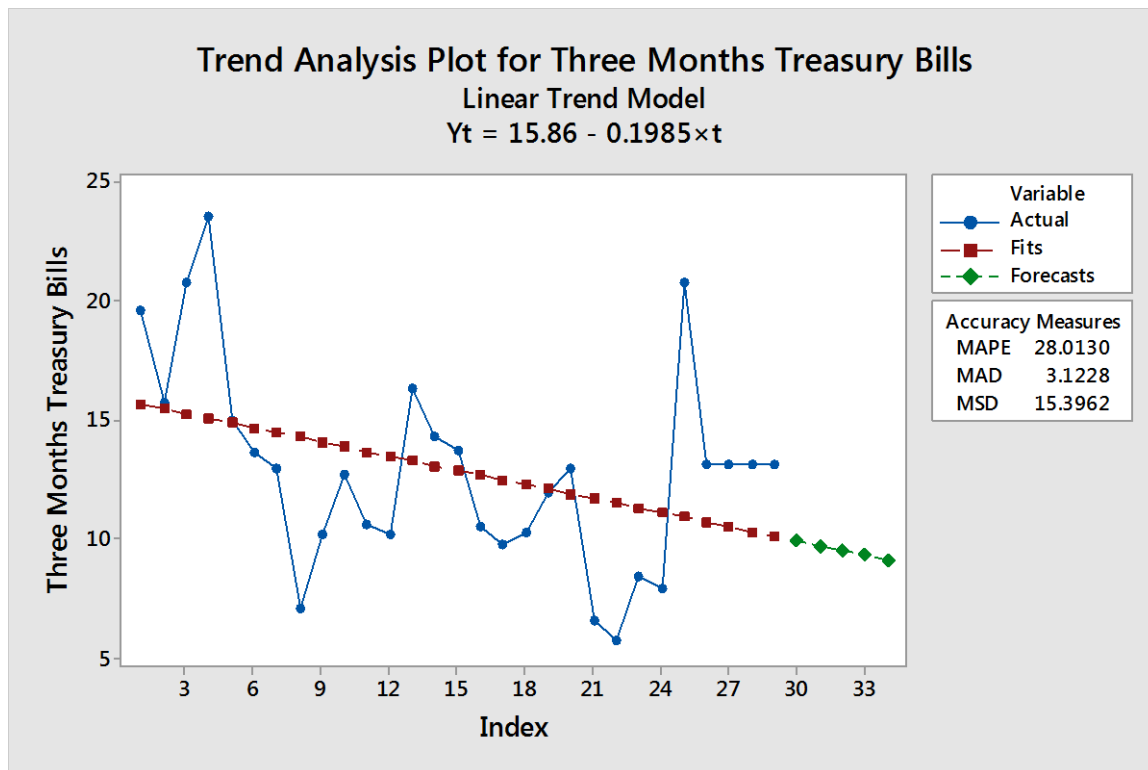
There is a downward trend in the three months treasury bills maturity rate, $Yt = 15.86 – 0.1985t$.
There was peak performance (yield) between points 24 (2013) and 27 (2016) of the data observed.

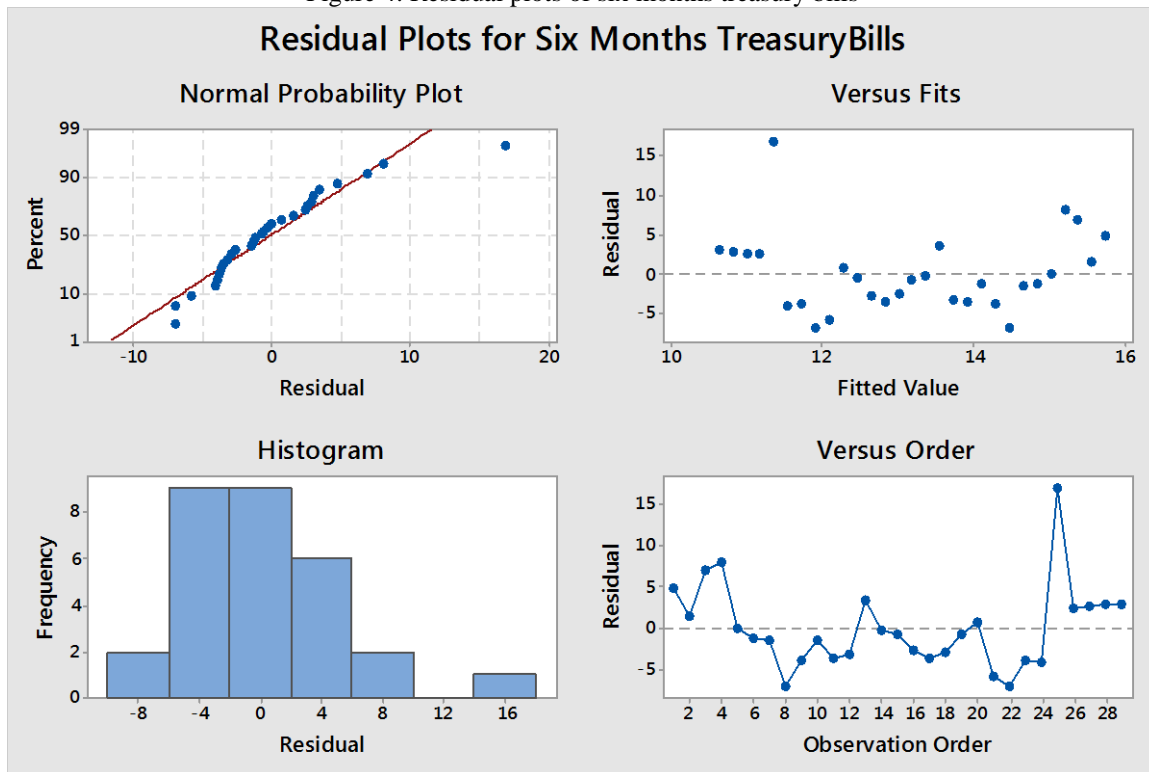Figure 2: Residual plots of three months treasury bills
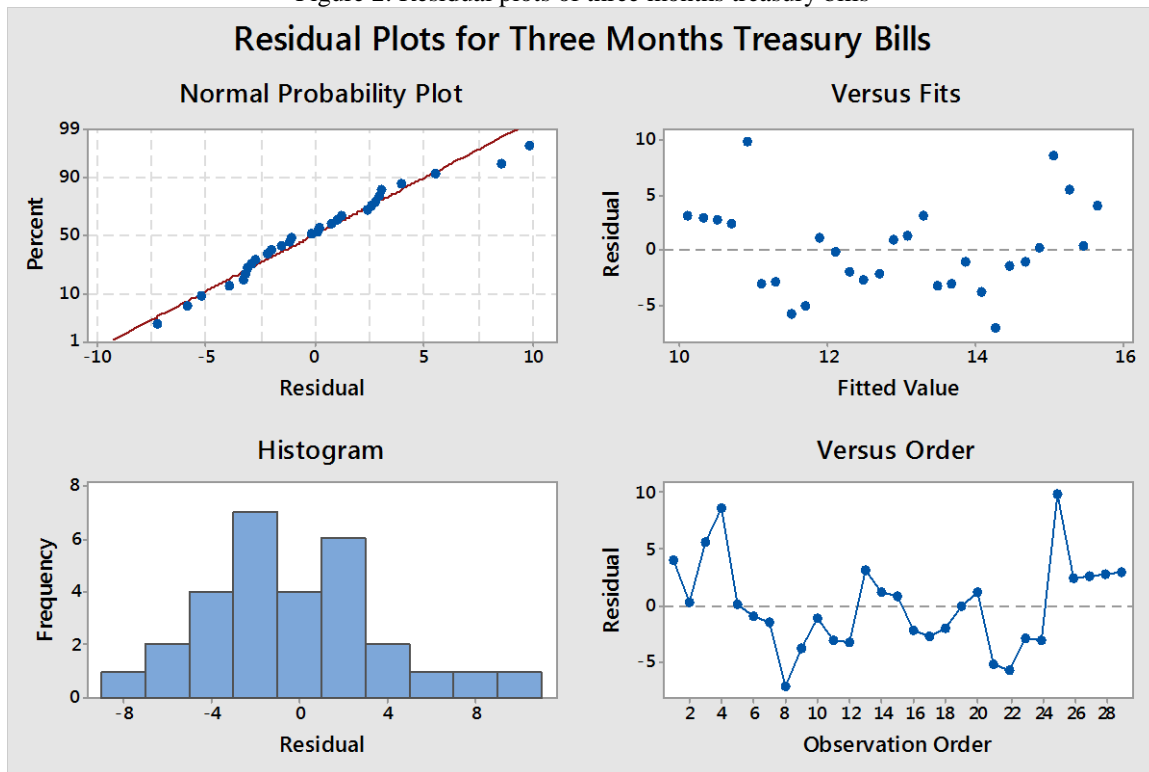
The Normality test shows that the data are clustered around the mean. The histogram depicts normality of the data. The observation order shows that there are booms and dooms in the data observed.

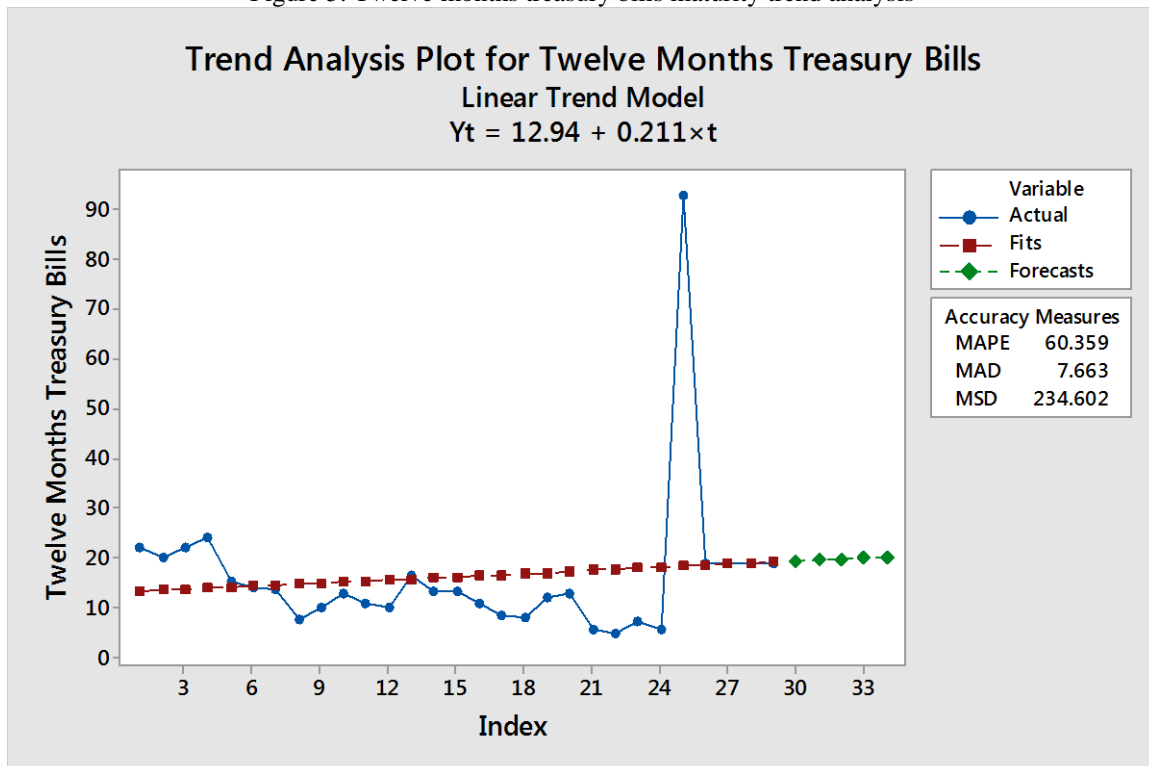Figure 3: Six months treasury bills maturity trend analysis

There is a downward trend in the six months treasury bills maturity rate, $Yt = 15.95 - 0.183t$. There was peak performance (yield) between points 24 (2013) and 27 (2016) of the data observed.

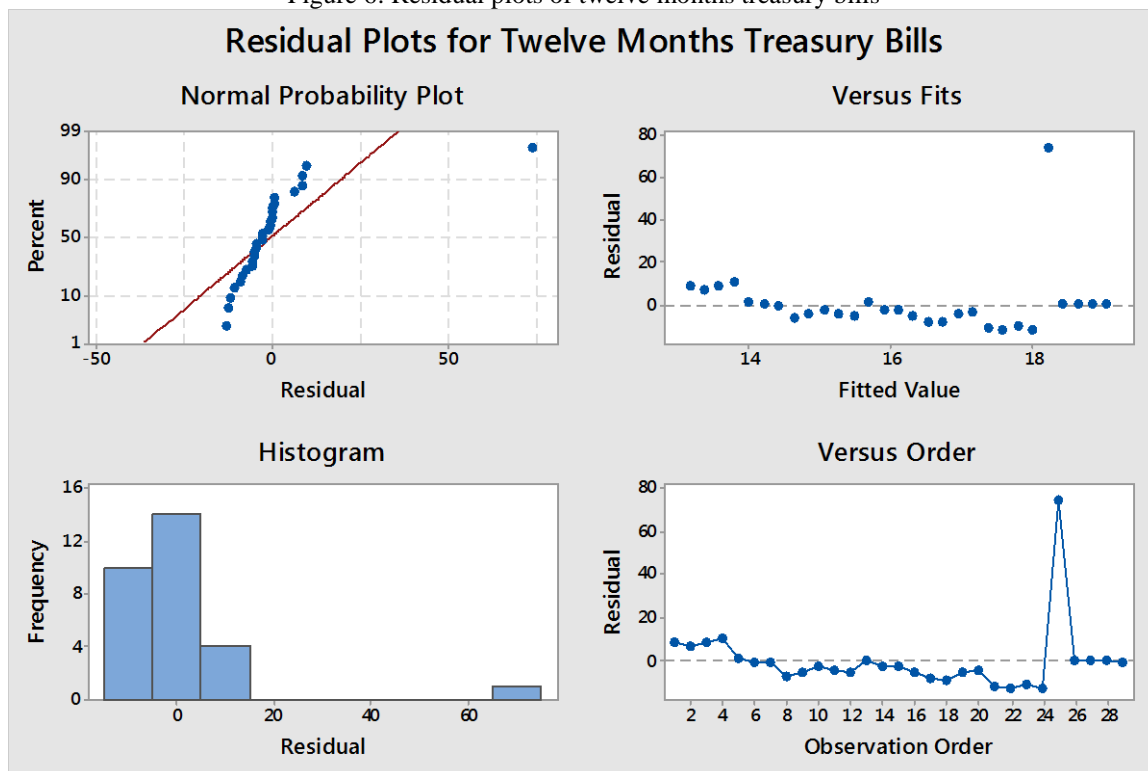Figure 4: Residual plots of six months treasury bills

The Normality test shows that the data are clustered around the mean. The histogram depicts normality of the data. The observation order shows that there are booms and dooms in the data observed.

Figure 5: Twelve months treasury bills maturity trend analysis

There is an upward trend in the twelve months treasury bills maturity rate, $Yt = 12.94 + 0.211t$. There was peak performance (yield) between points 24 (2013) and 27 (2016) of the data observed.

Figure 6: Residual plots of twelve months treasury bills

The Normality test shows that the data are clustered around the mean. The histogram depicts normality of the data. The observation order shows that there are booms and dooms in the data observed.

IV.   Findings, Conclusion And Recommendation

Findings:
        These were discovered in the course of the analysis of the Nigerian treasury bills using trend analysis approach. There is a downward trend in the three months treasury bills maturity rate, $Yt = 15.86 - 0.1985t$. There is a downward trend in the six months treasury bills maturity rate, $Yt = 15.95 - 0.183t$. There is an upward trend in the twelve months treasury bills maturity rate, $Yt = 12.94 + 0.211t$. There was peak performance (yield) between points 24 (2013) and 27 (2016) for all the different categories of the treasury bills maturity observed (three, six and twelve months). The Normality test shows that the data are clustered around the mean. The histogram depicts normality of the data. The observation order shows that there are booms and dooms in the data observed.

Discussion of Findings
        There was contrast in the results of this work and that of Okorafor et al. (2018) because whereas there was no significant difference in the performance of all the categories of the treasury bills (three, six and twelve months) using Kruskal Wallis, here only twelve months treasury bills gave an upward trend though the other two categories, three months and six months showed downward trends in their performance..

Conclusion
The performance of Nigeria treasury bills was low at three months and six months maturity periods. Only twelve months maturity period performed appreciatively with the prospect of doing well in the future.

Recommendation
We recommend that
(1)   Investors should opt for twelve months maturity period in the Nigeria treasury bills.
(2)   Trend analysis and other advanced time series analysis should be used in the analysis Nigeria treasury bills.

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