

Effect of Treasury Single Account on Liquidity of Banks in Nigeria

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ABSTRACT

This study, **effect of treasury single account (TSA) on liquidity of banks in Nigeria**, was conducted in Nigeria. The adoption of TSA in Nigeria raised concern about its effect on bank's liquidity because, before 2015, deposits of the ministries, departments and agencies (MDAs) of government contributed a significant proportion of banks' liquidity. The specific objectives of this study were to evaluate the effect of TSA on the cash ratio, absolute liquidity ratio, liquidity coverage ratio and net working capital ratio of banks in Nigeria. The study adopted an *ex-post facto* design. Data were generated from the audited financial reports of the selected domestic systemically important banks (D-SIBs) in Nigeria from 2008-2014 (*pre-TSA period*) and 2015-2022 (*post-TSA*) period. Paired sample t-test was employed to analyze the data using Stata 14.2. The study found that TSA has a significant negative effect on absolute liquidity ratio; a non-significant negative effect on cash ratio and net working capital ratio; and statistically non-significant positive effect on the liquidity coverage ratio. These findings imply that Nigerian banks have not yet adjusted their liquidity management policies and strategies to cushion the negative economic externality effects of TSA adoption by the government on the banks. Therefore the study recommends efficiency in liquidity management, particularly investment of short-term assets and transferable assets to cushion the adverse effect of future liquidity distress.

Keywords: Treasury Single Account, Cash Ratio, Absolute Liquidity Ratio, Liquidity Coverage Ratio and Net Working Capital Ratio

INTRODUCTION

Treasury single Account (TSA) is a financial policy used in several countries all over the world. It was introduced by Federal Government of Nigeria in 2015 to consolidate all inflows from all agencies of government into a single account at the Central Bank of Nigeria (CBN). Before the introduction of TSA, there are proliferation of bank accounts operated by Ministries, Departments and Agencies (MDAS) and collection of government revenues was characterized by several corrupt practices (Kanu, 2016; Ezinando, 2020).

As a result, TSA was introduced to foster efficiency in the collection and management of government revenue; to ensure that all the payments have been made through a consolidated Revenue Account (CRA); to promote accountability and transparency, and to stifle the corruption in Nigeria (Ogbonna & Amaji, 2018). Scholars such as Adebisi and Okike (2006); Ajetunmobi *et al.* (2017); and Ogbonna and Amaji (2018) averred that TSA is an efficient and effective means of managing government revenue generation and system that provide and enforce sufficient self-control mechanism in revenue generation and budget implementation using daily account balances of various MDAs into a control account. As a financial tool, it uses a single account or a set of linked accounts thereby unifies all government accounts in a single pool for effective cash management (Odewole, 2016). Meanwhile, several concerns have been raised on the effect of the introduction of TSA on the performance of banks, particularly the liquidity (Adeolum 2015,

Ajetunmobi *et al.* 2017; Sabo *et al.*, 2018; Ejike, 2019; Ezinando, 2020). Adeolum (2015) observed that the maintenance of a TSA will eliminate all idle funds usually left with banks. These funds that were eliminated were initially part of banks liquidity profile, hence there were this popularly held view that the TSA will throw the banks into liquidity crises by creating cash crunch. From the banking business model, liquidity is very essential and deposit accounts are very crucial for sustenance and prosperity. Prior to the implementation of Treasury Single Account banks fed fat on the “float” created by the duplicated and unaccounted MDA’s Accounts with Deposit money banks in Nigeria.

For instance, as at the first quarter of 2015 prior the adoption of TSA, the public sector funds with the deposit money banks in Nigeria amount to about N2.2 trillion. The effect of such amount of money leaving Nigerian banks can be imagined. For instance, the outflow of funds of big revenue generating agencies and parastatals like Nigerian National Petroleum Corporation (NNPC) out of the deposit money banks will constitute a major effect on the Liquidity of Nigerian banks. Again, the CBN has raised the CRR on public sector deposits from 50% to 75% and that of the private sector deposits from 12% to 20% in 2014; and subsequently increased to 31% in May 2015. Consequently, there were obvious downsizing incidences in Nigerian banking sector after the introduction of TSA. These phenomenon ranges from staff straight reduction, to closure of several branches and merge throwing most of the bank staff to the labour market. Hence, it seems that the adoption of the TSA policy in Nigeria have impacted negatively to the achievement of these goals, particularly as it concerns liquidity of banks.

Like most developing nation, Nigeria is still confronted with the challenge of how to achieve efficient allocation of resources and achieve optimum liquidity in banks to facilitate provision of loan or capital to owners of businesses, reduce lending rate and increase lending small and medium scale industries that is the engine of economic growth and development. The reduction in the bank accounts of MDAs that is the major source of inflow to banks will definitely affect banks liquidity. However, it is expected that the management of the banks should implement adequate liquidity management procedure and technique to respond to this externality effect of the TSA adoption. Liquidity management involves regular monitoring of cash ratio of the banks, absolute liquidity ratio, liquidity coverage ratio and net working capital ratio. These indices measures the ability of the banks to meet its’ various short-term liabilities adequately as at when due and a critical component of effective performance. Based on extant studies, there is a drought of empirical evidence on the effect of TSA on liquidity indices. Therefore, the quest to examine the pre and post liquidity position of Nigeria banks to ascertain the post-TSA adoption effect on the liquidity performance of banks in Nigeria. The specific objectives of the study are:

1. To examine the difference between the pre and post effect of the Treasury Single Account adoption on the cash ratio of banks in Nigeria;
2. To evaluate the distinction between the pre and post effect of the Treasury Single Account adoption on the absolute liquidity ratio of banks in Nigeria;
3. To assess the distinction between the pre and post effect of the Treasury Single Account adoption on the liquidity coverage ratio of banks in Nigeria;
4. To determine the difference between the pre and post effect of the Treasury Single Account adoption on the net working capital ratio of banks in Nigeria.

LITERATURE REVIEW

Treasury Single Account

Kanu (2016) views TSA as one of the financial policies implemented by the Federal Government of Nigeria to integrate all revenues and treasuries from all ministries, departments and agencies and extra ministerial departments in the country where all the collections are paid into money depositing banks trailed to a single account at apex bank of the nation (CBN). Tayo (2015) opine that by implementing the TSA, the federal Government through its independent revenue e-collection initiative, hopes to automate direct revenue

collection from the existing MDAs. Yusuf and Chiejina (2015) noted that all revenues collected would be paid directly into consolidated Revenue fund (CRF account at the central bank of Nigeria through a designed platform (Remita-e collection platform) and several other electronic payment platform or channels like GIFMIS. In fact, TSA is seen as a structure that unifies government bank accounts that gives an amalgamated or integrated view of government's cash resources.

The institutionalization of TSA helps the money deposit banks over their proliferated and chain of activities which they perform. Although, DMBs will still keep revenues account for MDAs and extra ministerial departments but all the treasuries collected by them money depositing banks shall be paid into CRF maintained with the CBN daily. They also maintained a cash balance with the money deposit banks which must have nil balance daily by remitting all the treasuries collected to the treasury single account. This is a result restricts money depositing banks from having access to multiple deposits accounts (Kanu, 2016). Thus, the introduction of TSA was expected to reduce the multiplicity of banks accounts previously maintained by various MDAs, ensuring transparency and accountability in all organs of the government and hence adversely affect cash holding by the banks.

Liquidity

Liquidity refers to the ability of any organization to meet up with its maturing obligations (Opayemi *et al.*, 2017) in the form of current liabilities and long-term debt (Olagunju *et al.*, 2011). Nigeria. In financial terms, liquidity connotes the value of capital which is readily available for settlement of bills and investment. These include; cash and cash equivalent, amount held in other banks and the CBN, debtors, marketable securities and other short-term investments. Opeyemi *et al.* (2017) observed that the concept of liquidity is source worry to the management regarding the uncertainty surrounding the future and business sustainability. The dilemma arises from selection of the possible trade-off options between liquidity and profitability (Raheman & Nasr, 2007 in Opeyemi *et al.*, 2017); other concerns is working capital management and balancing the risk and return (Lee & Kang, 2008 in Opeyemi *et al.*, 2017). Efficiency in liquidity management will assist the firm to avoid conditions that will worsen liquidity position of the banks or throw the bank into crises (Mitchell, 1923).

In view of the core banking business model, efficient intermediation demands sound management of working capital, basically liquidity. The two major conflicting roles of the banks, deposit mobilization (collection of deposits) and credit extension (loan and advances) are parallel in that an attempt to focus on profit maximization without adequate attention to liquidity and vice versa, will degenerate into a liquidity crisis or loss of revenue. Hence, the liquidity management approach must inculcate regular review of these core functions to ensure that the ratio of loans to deposits moderated, as it would mean optimal liquidity, because loan is in the class of the most illiquid assets of the bank; and lay emphasis on the maturity structure of a bank's assets and liabilities (net working capital ratio) to measure cash flow on liquidity basis.

In 2014 before the implementation of the TSA, CBN increased the cash reserve ratio [CRR] on private sector deposits from 12% to 20% while the CRR on public sector deposits for all tiers of government was raised from 50% to 75%. In May 2015, the CRR on private sector deposits was further increased to 31%. However, the CBN overall threshold for cash reserve ratio [CRR] was 30% and 70% for loans to deposits ratio from 2014 to date. Available data from successive year's annual reports of the NDIC show that the overall CRR of DMBs took a continuous downward trend from 53.65 in 2014 to 41.33 in 2021. Meanwhile, the overall loans to deposits ratio overshoot the 70% threshold in the first two years (2015 & 2016) of TSA adoption but reversed on a downward slope from 87.69% in 2016 to 54.16 in 2021. However, the reports indicated that the performance met the CBN regulatory threshold. Although the NDIC concluded that the liquidity position of the DMBs was still adequate, the persistence downward trend of CRR and loans to deposits ratio does not show that the DMBs has optimized the tradeoff between profitability and liquidity after the adoption of TSA. Therefore, specific attention should be paid to the cash ratio, absolute liquidity ratio, liquidity coverage ratio and net working capital ratio.

Cash Ratio

Cash or equivalent ratio measures a bank’s most liquid assets such as cash and cash equivalent to the entire current liability of the concerned bank. As money is the most liquid form of assets, this ratio indicates how quickly, and to what limit the bank can repay its current dues with the help of its readily available assets. It measures whether a bank can pay the current debts by using only the cash and cash equivalents balances and marketable securities.

$$\text{Cash Ratio} = \frac{\text{Cash and equivalent}}{\text{Current liabilities}}$$

Absolute Liquidity Ratio

Absolute liquidity ratio is marketable securities, cash and equivalents against liabilities. It measures the absolute liquidity of the firm. It does not include inventory and Debtors because there is no guarantee of their realization.

$$\text{Absolute liquidity Ratio} = \frac{\text{Cash and Bank Balance} + \text{marketable Securities} + \text{current Investment}}{\text{Current liabilities}}$$

Liquidity Coverage Ratio

Liquidity coverage ratio (LCR) refers to the proportion of highly liquid assets held by financial institutions, to ensure their ongoing ability to meet short-term obligations. This ratio is essentially a generic stress test that suitable capital preservation, to ride out any short-term liquidity disruptions, that may plague the market.

$$\text{Liquidity Coverage Ratio} = \frac{\text{High quality liquid asset amount}}{\text{Total net cash flow amount}}$$

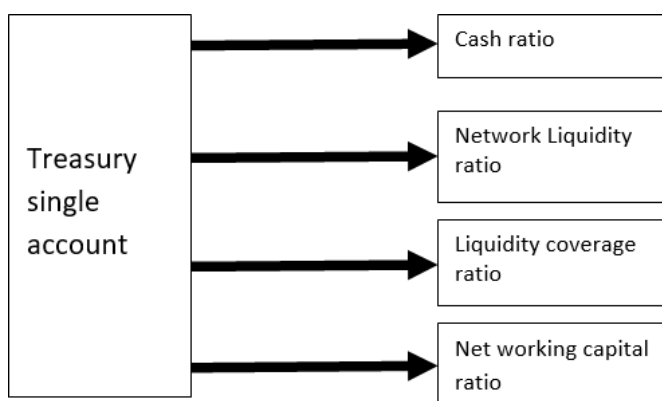
Net Working Capital Ratio

It is a measure of cash flow. The answer to this ratio should be positive, usually the banker keeps an eye on this ratio to see whether there is a financial crisis or not.

$$\text{Net working Capital Ratio} = \frac{\text{Current Asset} - \text{Current liabilities}}{\text{Current Asset}}$$

Conceptual Framework

Figure 2.1: Conceptual Framework



Source: Author’s conceptualization, 2021.

Theoretical Framework

This study is anchored on two sets of theories:

The Externality Theory

Arthur Pigor in 1920s propounded the externality theory. This theory contends that externality occurs when the action of a party causes another party to incur costs or enjoy benefits which was not enjoyed by the party. Arthur assumed that externality could be positive (benefit) or negative (costs). In 2009, Guogian Tian and Liyan Yang extended this theory to develop the theory of negative consumption externalities. The relevance of this theory to the current study could be assessed from the angle that the effect of TSA on banks liquidity is an economic externality effect because the government who is the actor that initiate TSA intended to instill accountability and transparency in government revenue collection and cash management in the MDAs of the government but not the banks.

Theories of Liquidity

The *Liquidity Preference Theory* as opposed by liquidity management theories. The liquidity preference theory was proposed by Lord John Maynard Keynes in 1936. According to this theory, investors will ordinarily want to hold cash or highly liquid assets but the interaction between the desire to hold cash and near cash or long-term investment is moderated by the interest rate. Hence, two contending issues that affect the liquidity of the banks as financial institution are the supply of money (deposit) and the lending interest rate. On the other hand, H.V. Prochanow in (1936) and Waldo Mitchell (1923) offered the *Commercial Loan Theory and Shiftability Theory* theories of liquidity management respectively. The *Commercial Loan Theory* posits the commercial banks should maintain appropriate liquidity by giving only short-term productive self-liquidating loans which the central banks will use as a security to lend to the banks. Prochanow contends that when this happens, the liquidity of banks and the money supply to the economy will be sustainable and optimal; while the *Shiftability Theory* maintained that if commercial banks investment on short-term and marketable securities that can be transferable within the banks without material loss, the problem of liquidity in the banks will be managed because they can be directly sold whenever there is a need to raise funds by banks. The relevance of these theories to this work is not in doubt because they offered clear insight of the conflicting interest that could result to liquidity crisis in banks as well as standard practices which could be adopted to manage the liquidity externality challenges as a result of the implementation of TSA.

Public Finance Management Theory

Another theory which offered insight on the need for the introduction of TSA is the public finance management theory (Fry *et al.*, 1996). This theory assumed that all aspects of financial resources, mobilization and expenditure should be well managed in government for the benefits of the citizenry. It includes resources mobilization, prioritization of programmes, the budgetary process, efficient management of resources and exercising control to guide against threats. Treasury Single Account (TSA) primarily is to avoid misapplication of public funds. For the purpose of this study public finance management theory has been developed over the years concerning bank liquidity.

Empirical Studies

Empirically, a longitudinal study conducted by Oguntodu *et al.* (2016) on the relationship between Treasury Single Account and economic performance in Nigeria CBN statistical data from 1999 to 2015 show that the Treasury Single Account has a position significant impact on the country's economic growth indices such as Money Supply (MS), Credit with CBN (CR) and Deposit to CBN (DP). A survey of 27 bank staff in 10 banks in Nigeria on the effect of TSA on the liquidity of banks by Kanu (2016) revealed that TSA has severe negative impact of liquidity and performance of banks in Nigeria. The investigation of the impact of

TSA on banks liquidity in Nigeria by Ajetunmobi *et al.*, (2017) using data from fifteen listed Nigerian banks revealed significant negative impact of TSA on profit after tax, current ratio and quick ratio. The study of the impact of TSA introduction on banks credit to private sector, deposit mobilization, and loans and advances by Ndubuaku *et al.*, (2017) concluded that the introduction of Treasury Single Account Significantly reduced credit to private sector, Deposit mobilization loans and advances. Ighosewe *et al.* (2017) also found a negative significant relationship between Treasury Single Account and bank profitability.

Muraina (2018) employed used correlational design to examine the impact of TSA on liquidity of Deposit money banks in Nigeria from 2012 to 2017. The study revealed that Federal Government Deposit (FGD) had a positive and significant effect on the Deposit Money Banks' liquidity position in the Pre-TSA Era whereas Federal Government Deposit (FGD) had a negative and significant effect on the Deposit Money Banks' liquidity performance in the Post-TSA Era. Using a multivariate model, Ogbonna and Amuji (2018) assessed the effect of TSA on performance of banks in Nigeria and found no significant effect of TSA Capital adequacy ratio, liquidity ratio and credit to deposit ratio. Ejike (2019) adopted the Pre-TSA and Post TSA approach to examine the effect of TSA on liquidity of banks in Nigeria sampling 15 listed banks and revealed a statistically significant difference in both liquidity and profit between the pre and post TSA-period which skewed negatively. Ezinando (2020) adopted *ex-post facto* design to examined the effect of TSA on the performance of deposit money banks in Nigeria from 2011 to 2018 (Pre and Post). Performance was measure by loan and advances, deposit mobilization by banks and private sector credit while the federal government deposits were used as proxy for TSA. The result of simple regression analyses of the pre and post period revealed that TSA has improve the banks deposit mobilization, loan and advance, and credit to private sector.

METHODOLOGY

Research Design

The researcher adopted *ex-post facto* research design. The geographical area of study is Nigeria. Six domestic systemically important banks in Nigeria as at July 31 2021; Access bank Plc, Zenith International Bank Plc, United Bank for African Plc, First Bank Holding Nigeria Plc, Guarantee Trust Corporation Plc, Fidelity Bank Plc was selected. The study covers from 2008 – 2021. Data were collected from the audited financial reports of the selected banks in Nigeria.

Model Specification

We adopted and modified the model as used in Ofurum *et al.* (2018). The Pre and Post model was adopted to compare the outcome of events to ascertain the best performance. Therefore, the study divided the period into two. The *pre-TSA* period was termed the control period that is period from 2008 to 2014. The second period is the experimental period which is the *post-TSA* from 2015 to 2022. To balance the dataset, we used the average of the 7 years.

Consistent with the thesis propagated in this study that there is no significant difference between the pre and post effect of the TSA adoption on liquidity of banks in Nigeria; this models are stated as below:

$$\text{Post-TSA (CR)} = \text{Pre-TSA (CR)} \quad \text{Eq 1}$$

$$\text{Post-TSA (ALR)} = \text{Pre-TSA (ALR)} \quad \text{Eq 2}$$

$$\text{Post-TSA (LCR)} = \text{Pre-TSA (LCR)} \quad \text{Eq 3}$$

$$\text{Post-TSA (NWCR)} = \text{Pre-TSA (NWCR)} \quad \text{Eq 4}$$

Where:

- CR = Cash Ratio;
- ALR = Absolute Liquidity Ratio;
- LCR = Liquidity Coverage Ratio; and
- NWCR = Net Working Capital Ratio.

Method of Data Analyses

Descriptive statistical analyses were conducted. The hypotheses of the study were tested using tested by comparing the mean of the two periods using a pre-post statistical technique called “*paired sample t-test*” using Stata 14.2. The entire tests were conducted at 5% significant levels. The merit of t-test is that it allows researchers to utilize more of the information available to estimate the dependent variable (Zinkmud, 2007). The decision rule involves accepting the alternate hypothesis (Hi) if the coefficient for cash ratio is either positive or negative, the modulus of the t-Statistic > 2.0 and the P-value of the t-Statistic < 0.05. Otherwise, accept H₀ and reject H₁.

Description of Variables in the Model

Table 1: Variable and Proxies

Period	Variable Name	Measurement	Proxy
<i>Control Period (Pre-TSA)</i>	Cash ratio (Pre_CR)		Pre-TSA Cash ratio
	Absolute liquidity ratio (Pre_ALR)		Pre-TAS Absolute liquidity ratio
	Liquidity coverage ratio (Pre_LCR)		Pre-TSA Liquidity coverage ratio
	Net working capital (Pre_NWC)		Pre-TSA Net working capital ratio
<i>Experimental Period (Post TSA)</i>	Cash ratio (Post_CR)		Post-TSA Cash ratio
	Absolute liquidity ratio (Post_ALR)		Post-TSA Absolute liquidity ratio
	Liquidity coverage ratio (Post_LCR)		Post-TSA Liquidity coverage ratio
	Net working capital (Post_NWC)		Post-TSA Net working capital ratio

Source: Author’s Compilations (2023)

DATA ANALYSES

Table 2: Summary Statistics and Normality Tests

stats	post_cr	pre_cr	post_alr	pre_alr	post_lcr	pre_lcr	post_nwcr	pre_nwcr
obs	48	48	48	48	48	48	48	48
<i>Summarize Statistics:</i>								
mean	0.2596	0.2599	0.4215	0.4882	0.3875	-10.7534	0.2596	0.1078

mean	0.2596	0.2599	0.4215	0.4882	0.3875	-10.7534	0.2596	0.1078
median	0.2513	0.2996	0.4613	0.0908	0.2551	0.3893	5.5415	0.1025
se(mean)	0.0191	0.0254	10.1110	0.0123	0.0150	0.0193	10.3203	0.0250
sd	0.1320	0.1320	0.1338	0.1763	71.5008	70.0513	0.1729	0.0852
min	0.0870	0.0388	0.2034	0.2179	-294.6624	-474.0669	-0.5506	-0.0047
max	0.5002	0.6800	0.7627	0.9652	320.7608	24.3248	0.2200	0.3320
Normality test:								
skewness	0.6330	0.7871	0.8366	0.9956	0.4547	-5.9676	-2.8030	0.7486
Pr(skweness)	0.0449	0.0242	0.0156	0.0045	0.1847	0.0000	0.0000	0.0278
kurtosis	3.7956	3.8764	41.5962	3.0130	2.9818	2.9245	15.4746	7.3456
Pr(kurtosis)	0.6903	0.1495	0.7624	0.1282	0.0000	0.0000	0.0006	0.6532
joint... Prob>chi2	0.1590	0.0516	0.0733	0.0228	0.0002	0.0000	0.0000	0.1095
Shapiro-Wilk								
Prob>z	0.0285	0.0511	0.0024	0.0030	0.0000	0.0000	0.0000	0.0044

Source: Stata 14.2 Output, 2023

Table 4.1 shows the mean, median, maximum and minimum values as well as other key statistics of the periods under examination for better comparison. The mean and the median of the cash ratio and absolute liquidity ratio, the powerful statistical measures of mid-point even though vulnerable to extreme values for the two periods in forty-eight observations exhibited significant similarities (0.2596, 0.2513; 0.4215, 0.4613) and (0.2599, 0.2996; 0.4882, 0.0908) for the post-TSA and pre-TSA periods respectively.

Conversely, the mean and median values of liquidity coverage ratio and net working capital ratio shows a great disparity (0.3875, 0.2551; 0.2596, 5.5415) and (-10.7534, 0.3893; 0.1078, 0.1025) for the post-TSA and pre-TSA periods respectively. On the other hand, the standard deviation, a measure of dispersion, computed in three dimensions for all the variables is quite large for the liquidity coverage ratio (71.5008) and (70.0513) for the post-TSA and pre-TSA periods respectively. Fortunately, the standard errors of the mean of the other variables, the most valuable estimator, are quite small and conformed to the theoretical proposition of getting lesser as the sample size advances to the population. These variables recorded standard error values of less than 15% and 19% for liquidity coverage ratio.

Normality tests are used to determine whether a data set is modeled for normal distribution. The null hypothesis of this test statistic states that the distribution is normal. Also, the decision rule is such that the p-value of the test is greater than the significance levels at 5%. Table 4.1 presents the outcome of skewness/kurtosis tests and Shapiro-Wilk W' test. The overall probability (*Prob>chi2*) and Shapiro-Wilk 'W' outcomes for all the variables suggest that the distribution is not normally distributed except for post-TSA and pre-TSA cash ratio.

Test of Hypotheses

Hypothesis One

H_0 : There is no significant difference between the pre and post effect of the Treasury Single Account adoption on the cash ratio of banks in Nigeria

Table 3: Paired t-Statistics of Post-TSA and Pre-TSA Cash ratio

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
post_cr	48	0.2596	0.0150	0.1038	0.2294	0.2897
pre_cr	48	0.2599	0.0191	0.1320	0.2216	0.2982
diff	48	-0.0004	0.0183	0.1266	-0.0371	0.0364
<i>mean(diff) = mean(post_cr - pre_cr)</i>					<i>t = -0.0192</i>	
<i>Ho: mean(diff) = 0</i>			<i>degrees of freedom = 47</i>			
<i>Ha: mean(diff) < 0</i>		<i>Ha: mean(diff) != 0</i>		<i>Ha: mean(diff) > 0</i>		
<i>Pr(T < t) = 0.4924</i>		<i>Pr(T > t) = 0.9848</i>		<i>Pr(T > t) = 0.5076</i>		

Source: Stata 14.2 Output

The result of the examination of the *post-TSA cash ratio = pre-TSA cash ratio* exhibited a non-significant difference with $t = -0.00192$, $H_a: mean(diff) < 0, = 0.4924$, $H_a: mean(diff) != 0 = 0.9848$ and $H_a: mean(diff) > 0 = 0.5076$ all greater than 0.05. This outcome implies that the cash ratio of the banks has not changed significantly as a result of the TSA adoption. Albeit non-significant difference, the direction of the result shows that the slight difference was on a negative direction. This result agrees with the available data from the NDIC reports which show that the CRR of the DMBs in Nigeria is on a continuous downward trend from 2014 (53.65%) to 2021 (41.33%). The result is also in alignment with the finding in Ogbonna and Amuji (2018) who found that TSA has no significant effect on the liquidity of banks in Nigeria. It also negates the results of Ezinando (2020) that revealed an improvement of banks' liquidity as a result of TSA adoption.

Hypothesis Two

H_0 : There is no significant distinction between the pre and post effect of the Treasury Single Account adoption on the absolute liquidity ratio of banks in Nigeria.

Table 4: Paired t-Statistics of Post-TSA and Pre-TSA Absolute Liquidity ratio

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
post_alr	48	0.4215	0.0193	0.1338	0.3827	0.4604
pre_alr	48	0.4882	0.0254	0.1763	0.4370	0.5394
diff	48	-0.0667	0.0233	0.1614	-0.1136	-0.0198
<i>mean(diff) = mean(post_alr - pre_alr)</i>					<i>t = -2.8629</i>	
<i>Ho: mean(diff) = 0</i>			<i>degrees of freedom = 47</i>			
<i>Ha: mean(diff) < 0</i>		<i>Ha: mean(diff) != 0</i>		<i>Ha: mean(diff) > 0</i>		
<i>Pr(T < t) = 0.0031</i>		<i>Pr(T > t) = 0.0063</i>		<i>Pr(T > t) = 0.9969</i>		

Source: Stata 14.2 Output

Post-TSA absolute liquidity = pre-TSA absolute liquidity has the t-statistics (-2.8629) and p-values: (0.0031, 0.0063, and 0.9969). This outcome suggests that the pre and post TSA absolute liquidity ratio was significantly different, implying that the adoption of TSA has a strong negative effect on the absolute liquidity of banks. Ideally, this variable constitutes a major segment of a bank's liquidity considering cash

and cash equivalents, short-term investment, trading securities and deposits with banks, it is crucial that good liquidity management practice fosters growth and profitability to sustain the business as a going concern. The outcome of this test agrees with the findings in Igbosewe (2017) and Ejike (2019) that TSA has significant negative impact on banks liquidity.

Hypothesis Three

H_0 : There is no significant distinction between the pre and post effect of the Treasury Single Account adoption on the liquidity coverage ratio of banks in Nigeria.

Table 5: Paired t-Statistics of Post-TSA and Pre-TSA Liquidity Coverage ratio

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
post_lcr	48	0.3875	10.3203	71.5008	-20.3741	21.1492
pre_lcr	48	-10.7534	10.1110	70.0513	-31.0942	9.5874
diff	48	11.1409	14.5418	100.7486	-18.1134	40.3953
mean(diff) = mean(post_lcr – pre_lcr)					t = 0.7661	
Ho: mean(diff) = 0			degrees of freedom = 47			
Ha: mean(diff) < 0		Ha: mean(diff) != 0		Ha: mean(diff) > 0		
Pr(T < t) = 0.7763		Pr(T > t) = 0.4474		Pr(T > t) = 0.2237		

Source: Stata 14.2 Output

The test of *hypothesis three; post-TSA liquidity coverage ratio = pre-TSA liquidity coverage ratio* revealed $t = 0.76619$ and p-values $0.7763, 0.4474, 0.2237 > 0.05$ in all measures. This result also shows no significant difference in liquidity coverage of banks before and after the adoption of TSA. Hence, TSA has no significant impact on liquidity coverage.

Hypothesis Four

H_0 : There is no significant difference between the pre and post effect of the Treasury Single Account adoption on the net working capital ratio of banks in Nigeria.

Table 6. Paired t-Statistics of Post-TSA and Pre-TSA Net Working Capital ratio

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
post_nwcr	48	0.0486	0.0250	0.1729	-0.0016	0.0988
pre_nwcr	48	0.1078	0.0123	0.0852	0.0830	0.1325
diff	48	-0.0592	0.0241	0.1666	-0.1076	-0.0108
mean(diff) = mean(post_nwcr – pre_nwcr)					t = -2.4609	
Ho: mean(diff) = 0			degrees of freedom = 47			
Ha: mean(diff) < 0		Ha: mean(diff) != 0		Ha: mean(diff) > 0		
Pr(T < t) = 0.0088		Pr(T > t) = 0.0176		Pr(T > t) = 0.9912		

Source: Stata 14.2 Output

Hypothesis four, post-TSA net working capital ratio = pre-TSA net working capital ratio shows that net working capital ratio of pre-TSA adoption and post-TSA adoption in Nigeria are significantly different

CONCLUSION

There has been the popular held view that the introduction of TSA will drastically affect the liquidity of banks in Nigeria. For this reason, the liquidity banks in Nigeria were compared for the period 2008-2014 (pre-TSA) and 2015-2022 (post-TSA). Based on our finding, we conclude that TSA has a non-significant negative effect on the cash ratio, a significant negative effect on absolute liquidity ratio, a non-significant positive effect on liquidity coverage ratio and a significant negative effect on net working capital ratio. Hence the following recommendations were offered:

1. The banks should improve their cash management procedures so as to avert the negative difference observed in this study and reverse the downward trend cash ratio since the adoption of TSA in 2014 as revealed in the NDIC reports.
2. The management of banks should as a matter of urgency review their liquidity policies and trading investments in other avert the adverse consequences of liquidity crisis.
3. Bank management should also facilitate liquidity monitoring procedures in order to improve the liquidity coverage ratio of the banks.
4. The banks should also conduct a regular review of loans and advances in order to improve the working capital ratio of the banks to ensure that the ratio is not far below the regulatory threshold in order to balance the tradeoff between profitability and liquidity.

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