UMYU Journal of Accounting and Finance Research. Vol.7 No.1 December 2024, pp 083-097.
https://doi.org/10.61143/umyu-jafr.7(1)2024.006
ISSN: 2795-3831
E-ISSN: 2795-3823

TREASURY SINGLE ACCOUNT AND REVENUE GENERATION IN THE NIGERIAN MARITIME INDUSTRY: A PRE AND POST EVALUATION

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Abstract

This study investigates the impact of the Treasury Single Account (TSA) policy on revenue generation in Nigeria's maritime sector, focusing on the Nigerian Maritime Administration and Safety Agency (NIMASA) and the Nigerian Shippers' Council (NSC). Introduced to promote financial transparency and accountability, the TSA policy is expected to influence the financial performance of public institutions. However, its specific effects on the maritime sector remain underexplored. The research evaluates TSA's impact on revenue generation, financial efficiency, and asset utilization using a quantitative design. Secondary data were collected from NIMASA and NSC, covering 2010 to 2019. The Difference-in-Differences (DiD) method was applied to compare the treatment group (NIMASA) with the control group (NSC). Rigorous data selection ensured validity, while reliability was established through consistency checks. A 100% response rate was achieved as all required data were sourced from relevant agencies. Findings reveal that the TSA policy positively influenced revenue generation and financial efficiency but negatively affected asset utilization. The study concludes that while TSA strengthens revenue management in the maritime sector, challenges in asset management persist. Recommendations include extending the study period, leveraging technology for enhanced TSA implementation, and analysing TSA's effects in other sectors to provide a comprehensive evaluation of its overall effectiveness.

Keywords: *Asset utilisation, Financial efficiency, Revenue generation, Revenue leakage, Treasury Single Account.*

INTRODUCTION

The Nigerian maritime industry, a crucial pillar of the nation's economy, has undergone significant evolution since independence in 1960. Initially hampered by limited infrastructure and regulatory frameworks, the sector has seen various reforms aimed at enhancing its capacity and efficiency. Key agencies such as the Nigerian Maritime Administration and Safety Agency (NIMASA) and the Nigerian Shippers' Council (NSC) have been instrumental in driving these reforms. Despite these efforts, the sector has faced persistent challenges, including revenue leakages, corruption, and financial inefficiencies.

In 2012, the Nigerian government introduced the Treasury Single Account (TSA) policy, with full implementation beginning in 2015 under President Muhammadu Buhari. The TSA policy mandates that all government revenues, including those generated by maritime activities, be consolidated into a single account maintained by the Central Bank of Nigeria (CBN). This policy aims to enhance transparency, accountability, and efficient management of public funds by eliminating fragmented accounts and curbing financial malpractices. Before the TSA, the fragmented banking system in the maritime industry led to significant revenue losses and difficulties in financial oversight.

The implementation of the TSA policy marked a paradigm shift in public finance management within the maritime industry. By consolidating revenues, the TSA aimed to close loopholes that previously enabled revenue losses and ensure transparent and efficient utilisation of funds. While proponents argue that the policy has improved financial discipline and increased revenue generation, critics contend that the centralized nature of the TSA could pose operational challenges for maritime agencies, potentially affecting their financial autonomy and efficiency.

There are four key regulators in the maritime industry namely, Nigerian Maritime Security and Safety Agency (NIMASA), Nigerian Ports Authority (NPA), Nigerian Shippers' Council (NSC) and Nigerian Waterways and Inland Agency (NIWA).

This research focuses specifically on the impact of the TSA policy on revenue generation in two of these regulators: the Nigerian Maritime Security and Safety Agency and the Nigerian Shippers' Council. These two government agencies represent fifty percent of the regulators in the Nigerian maritime industry. The revenue data of both NIMASA and NSC from 2010 to 2019 will be evaluated to determine the impact of the TSA policy on revenue generated during this period.

Problem of the Study

Nigeria, a resource-rich country in West Africa, has long struggled with issues such as revenue leakages, mismanagement, and lack of transparency in its financial systems (Effiong & Dan, 2020). Despite being blessed with an abundance of human and natural resources in all states of the federation, the country is facing severe economic crises. Corruption has been identified as the main factor contributing to Nigeria's worsening economic situation (Ewa & Abubakar, 2016).

The Nigerian economy heavily relies on revenue generated from the oil sector. Although there has been an increase in oil prices in the global market due to the relaxation of lockdown measures and the resumption of economic activities, this rise has had no significant impact on Nigeria's economy. Instead, oil revenue and foreign reserves have significantly declined. Revenue collections as of November 2021 fell 47.4% short of the projected target, which was 31.1% lower than the figure for 2020. External reserves have also been decreasing throughout 2021 and 2022 (The Nigerian Economic Summit Group, 2022).

Typically, addressing revenue leakages and improving efficiency in revenue collections should lead to improved revenue generation (Ewa & Abubakar, 2019). Therefore, the first problem to be examined pertains to the effectiveness of the Treasury Single Account Policy in mitigating revenue leakages within the Nigerian maritime industry. Prior research has primarily focused on revenue leakages within the broader public sector, utilising selected public institutions as sample populations. However, there exists a gap in the literature regarding the assessment of the efficacy of TSA policy within the maritime industry which is an integral component of Nigeria's blue economy and a pivotal source for economic diversification. Therefore, this study is set to achieve the below as a specific objective:

To examine the impact of TSA Policy (pre and post) on revenue generation in the Nigerian maritime industry.

In addition, scrutiny on the impact of the TSA policy on the revenue-to-expense ratio within the Nigerian maritime industry is also critical. This research endeavours to address a notable

ISSN: 2795-3831
E-ISSN: 2795-3823

gap in current literature. The anticipated findings hold the potential to offer valuable insights, considering that the revenue-to-expense ratio serves as a fundamental financial indicator of efficiency and profitability within businesses or industries. Through an examination of this ratio within the framework of TSA policies, stakeholders can evaluate whether the industry's financial well-being is experiencing positive or negative effects. Hence, this study is poised to also achieve the below specific objective:

To assess the influence of TSA Policy (pre and post) on revenue to expense ratio in the Nigerian maritime industry.

Furthermore, this study aims to furnish actionable recommendations for policymakers, industry stakeholders, and maritime enterprises, aiming to enhance financial performance and foster sustainable growth amid the evolving regulatory landscape in the maritime industry.

Existing literature on the TSA policy predominantly focuses on its implementation and effects within the wider public sector. However, there is a notable shortage of studies that specifically investigate its implications within the maritime industry. Considering the distinct operational and financial features of the maritime industry which includes port operations, vessel management, and international trade, a specialised examination of the TSA's impact on revenue generation in this industry is imperative.

LITERATURE REVIEW

The Nigerian Maritime Administration and Safety Agency (NIMASA) is a government agency in Nigeria that regulates shipping, maritime labour, and coastal waters. Its core functions include maritime safety administration, maritime labour regulation, and maritime security coordination (NIMASA Act, 2007). The Nigerian Shippers' Council (NSC) was established by the Nigerian government in 1978 to regulate and oversee the activities of shippers, shipping companies, and other stakeholders in the maritime industry. The NSC's primary objective is to promote and safeguard the interests of shippers in Nigeria by ensuring fair treatment, reasonable charges, and efficient services in the maritime transport sector (Shippers' Nigerian Council, 1997). The TSA policy seeks to consolidate all inflows from government agencies into a single account at the Central Bank of Nigeria. This shift in policy was a response to the challenges associated with fragmented government accounts and the need for greater transparency and accountability in public financial management (Lienert, 2009).

Revenue generation in the Nigerian maritime industry plays a crucial role in the country's economy due to Nigeria's vast coastline and dependence on maritime trade. The sector encompasses shipping, port operations, maritime services, and offshore oil and gas exploration. The concept of the Blue Economy in Nigeria has significant potential for sustainable economic development, particularly in the Niger Delta region (Adepoju et al., 2023; Elisha, 2020). However, this potential is hindered by various challenges, including sea piracy, illegal arms trafficking, terrorism, and environmental degradation (Elisha, 2020).

The Treasury Single Account Policy

Historically, different government agencies managed their funds independently, resulting in inefficiencies and challenges in monitoring and controlling revenue inflows and outflows. Recognizing these issues, the Federal Government's Economic Reform and Governance (ERG) recommended the Treasury Single Account Policy in 2004. As a follow-up to this

https://doi.org/10.61143/umyu-jafr.7(1)2024.006
ISSN: 2795-3831
E-ISSN: 2795-3823

recommendation, the TSA policy was included in the Public Financial Management (PFM) reforms, which were part of the national strategy to achieve Vision 20:2020 (Ochiwu & Ibrahim, 2020).

On August 18, 2011, the Federal Government of Nigeria issued Executive Order No. 55, was signed into law by President Goodluck Jonathan. This order aimed to improve the country's transportation infrastructure and ensure the effective implementation of various projects and programs in the transportation sector. In 2015, President Muhammadu Buhari instructed government Ministries, Departments, and Agencies (MDAs) to fully implement the Treasury Single Account (TSA) policy, following the recommended reforms mentioned earlier, as a crucial step towards financial reform and accountability in public finance management.

The TSA policy seeks to consolidate all inflows from government agencies into a single account at the Central Bank of Nigeria. This shift in policy was a response to the challenges associated with fragmented government accounts and the need for greater transparency and accountability in public financial management (Lienert, 2009). Prior to its implementation, the government's funds were distributed across multiple accounts in different commercial banks, leading to inefficiencies, lack of transparency, and opportunities for financial misconduct. The policy aimed to address these issues by consolidating the funds into a single account, streamlining the collection, disbursement, and management of government revenue.

This research focuses on evaluating the impact of the TSA Policy on revenue generation in the maritime industry, which has been identified as a viable sector for driving sustainable economic development activities in Nigeria.

Revenue Generation in the Maritime industry

The Nigerian maritime industry has experienced an increase in revenue generation, particularly since the implementation of port privatization policies (Ndikom, 2013). However, there is still room for improvement, and it is necessary to implement user-friendly strategies and conduct regular policy reviews. The concept of the Blue Economy presents opportunities for sustainable economic development, but factors such as security and investment need careful consideration (Adepoju et al., 2023). Marine fisheries, which are a vital component of the maritime industry, face challenges such as low aquaculture contribution and noncompliance with regulations (Olaoye & Ojebiyi, 2018). Revenue generation is also affected by tax compliance barriers, including a lack of a reliable tax database and the prevalence of cash transactions (Obara & Nangih, 2017).

Revenue generation in the Nigerian maritime industry plays a crucial role in the country's economy due to Nigeria's vast coastline and dependence on maritime trade. The sector encompasses shipping, port operations, maritime services, and offshore oil and gas exploration. Understanding the dynamics of revenue generation in this sector is critical for policymakers and stakeholders who seek to enhance economic growth and development. The Nigerian maritime industry is a significant contributor to the country's economy, accounting for a substantial share of government revenue and foreign exchange earnings. It plays a crucial role in facilitating trade, supporting industries such as oil and gas, and providing employment opportunities.

Theoretical Review

The reviewed papers used various theoretical frameworks to analyse the effects of TSA on revenue generation in the public sector. These include the Public Financial Management (PFM) Theory and Revenue Management Theory.

Public Financial Management (PFM) Theory

The theory was developed by Richard Musgrave and it explains that all resources of government should be properly managed. Public Financial Management (PFM) plays a critical role in ensuring the efficient and effective utilisation of public resources. The implementation of the Treasury Single Account (TSA) has been a significant reform in numerous countries, including Nigeria.

According to Audu (2020), public finance encompasses the processes through which governments generate and utilize financial resources. It covers key areas such as public revenue, public expenditure, and public debt. PFM theory underscores the importance of robust budgeting, expenditure control, and revenue management to attain fiscal sustainability and advance economic development (Ewa & Abubakar, 2019).

This theory forms the basis for this study as treasury single account is a policy that is proposed to encourage prudent management of government resources (revenue) and the blockage of holes that promote leakage of funds. Therefore, the theory tries to show that there is a possibility of a relationship between treasury single account (independent variable) and revenue management (dependent variable).

Revenue Management Theory

Revenue management theory shows that revenue can be properly utilised to achieve a specific objective. Revenue management is a strategic approach focused on maximizing revenue through the optimization of pricing, inventory, and distribution decisions (Talluri & van Ryzin, 2005). Revenue management theory relies on principles such as pricing, demand prediction, and inventory control (Talluri & van Ryzin, 2005). It emphasises the significance of understanding customer behaviour, dividing markets into segments, and price determination based on demand elasticity and capacity limitations (Smith & Leimkuhler, 2006). Through strategic adjustments to prices and inventory levels, organizations can maximise revenue and profitability. In Nigeria's maritime industry, the application of revenue management theory can enhance port charges, shipping tariffs, and other revenue streams. Analysing historical data, forecasting demand, and segmenting customers based on their willingness to pay can enhance revenue yield and financial performance (Okerekeoti & Okoye, 2023). According to Oloba et al. (2017), revenue management theory offers insights into optimizing revenue practices in the Nigerian maritime industry.

Unlike public management theory, revenue management theory addresses only revenue management (dependent variable) and does not fully address the possible relationship between treasury single account and revenue management.

Empirical Review

Treasury single account and Revenue generation

The impact of the Treasury Single Account (TSA) on revenue generation in the Nigerian public sector is a subject of debate. Numerous studies have been conducted to examine the impact of the TSA policy on different sectors of the economy. While some studies have demonstrated a positive impact on specific sectors, some showed negative effects and results from other studies have shown no correlation between TSA policy and revenue generation.

Among the studies that showed negative impact was that conducted by Ogungbade et al. (2021) in the study of Treasury Single Account Policy and Revenue Generation Among Federal Parastatals in Ekiti-State, Nigeria. The results showed that the TSA had a negative effect on revenue generation in federal parastatals in Ekiti State. The gap in that study was the researchers did not provide reason for the decline after implementation of TSA policy. Similarly, a study by Arumona et al. (2021) on the impact of the Treasury Single Account (TSA) on public sector performance in Nigeria revealed that the implementation of the TSA has a negative and significant effect on Federally Collected Revenue (FCR). Additionally, the same study by Arumona et al. discovered that Federal Government Capital Expenditure (FGCE) significantly increased after the implementation of the Treasury Single Account policy.

Likewise, a study by Ajetunmobi et al. (2017) demonstrated that the implementation of the Treasury Single Account had a negative impact on the liquidity base of banks in Nigeria. The study also highlighted a significant difference in the profit after tax (PAT) of banks in Nigeria before and after the adoption of the Treasury Single Account (TSA). These findings were supported by the results of another study by Oti et al. (2016), which showed that deposit money banks are affected as they can no longer rely on the availability of government revenue for trading. Consequently, the business sector, which previously depended on deposit money banks for short-term credit facilities, no longer benefits.

However, several studies have been carried out that showed that the TSA policy has significant positive impact on management of public fund in Nigeria. for example, Adeagbo and Oladeji (2019), and Nkechi et al. (2017) both highlighted the potential of the TSA to block financial leakages and promote transparency and accountability in public financial management. Nkechi et al. concluded by recommending that since the adoption of TSA has significantly improved the performance of federal government ministries, departments, and agencies (MDAs) in Nigeria, government should enforce the adoption of TSA and ensure that it is mandatory for all MDAs and parastatals in the country. Adeagbo and Oladeji (2019) recommended from their that government should review controls put in place for TSA operation always for early detection of defective controls that may lead revenue leakages.

George and Agbata (2022) in their study of effect of Treasury Single Account on government expenditure and borrowing revealed that the implementation of TSA has achieved the objective of ensuring cash availability for government expenditure programmes. The implication of this is that government cash resources have increased and there are now more funds available for Government to carry out its various responsibilities towards improving the quality of life of citizens. The study recommended that government should not relent in enforcing discipline and punishing defaulters so as not to allow the TSA scheme to fizzle out, and that government should carry out an investigation to identify all her revenue sources to bring them into the TSA scheme.

https://doi.org/10.61143/umyu-jafr.7(1)2024.006
ISSN: 2795-3831
E-ISSN: 2795-3823

Bankole et al. (2021) opined that in their of loopholes in government expenditure a case of Treasury Single Account stated that institutionalisation of TSA has significantly affected and improved the performance of government. The study recommended that the system requires political will, honesty, and determination to overcome the various challenges identified. The study also recommended that Nigeria government should promote education and training of staff on the operation of TSA to avert sabotage of the policy. Similarly, the government should ensure that all the MDAs fully implement the TSA without any hidden accounts, and all the relevant information communication technology facilities required to enhance the operation of TSA should be made available and functional.

Ofor et al. (2017) in their study of the nexus between Treasury Single Account, revenue generation, transparency, and accountability posited that the Treasury Single Account improves accountability, transparency and reduces leakage in the financial system. The study recommended that federal government should conduct periodic checks on all MDAs to enforce the implementation of the TSA policy in all their revenue generation activities. However, there was population gap in this study as the researcher relied on results of questionnaire drawn on 125 respondents in sector with over 940 ministries, departments, and agencies.

According to Ewa and Abubakar (2016) in their study of impact of TSA policy implementation on the Nigerian economy, the TSA has implication on Nigeria economy such as commercial banks liquidity reduction and losses of job. The study recommended among others that TSA should be embraced by all levels of governments and stakeholders and monetary, fiscal and budgetary policies should be use by the government to cushion the implications of TSA on Nigerian economy. There was methodology gap in this study as the researcher relied on results of questionnaire drawn on 150 respondents drawn from the study population which comprises of commercial banks staff, Federal Government’s Ministries, Departments and Agencies (MDAs) and Nigeria citizens.

Effiong and Dan (2020) conducted a study that showed that the implementation of the treasury single account has a significant scientific influence on the growth of the economy in real GDP terms, while revenue generated by government and per capita income were negatively influenced by the operation of TSA. The study concluded that TSA affects economic growth in both positive and negative dimensions. It was therefore recommended that the Government should secure, as soon as possible, appropriate legislations to support the growth of the industry to enhance adequate revenue generation to match unending government expenditures. There was application gap in the recommendation of this study, as it relies heavily on enactment of new regulations by the Federal Government of Nigeria.

Tomoi (2022) showed that TSA implementation has improved revenue generation at the University of Ilorin. Further findings revealed that University's revenue utilisation improved after TSA implementation from N6.69 billion to N8.92 billion. Therefore, Tomoi (2022) recommended that government at all levels should prioritise universities education funding as part of fulfilment of its millennium development goals (MDG). This position corroborated the findings of Omosidi et al. (2020) whose findings showed that the implementation of the Treasury Single Account has improved revenue generation in the University of Ilorin. The study recommended that university administrators, should, as a matter of importance, device other means of boosting their internally generated revenue.

Ewa and Abubakar (2017) through their study of Treasury Single Account as a viable tool for repositioning government MDAs for sustainable development in Nigeria posited that TSA has enhanced regular monitoring of government cash balances, accountability and transparency, efficient use of government financial resources, probity, reduction of cost of borrowing and help to check corruption in Federal Government's MDAs. The study recommended among others that TSA should be embrace by all Government's Ministries, Departments and Agencies (MDAs) at all levels of governments; federal, states and local government councils in Nigeria and that MDAs in Nigeria should take advantages of TSA policy implementation to enhance economic development in Nigeria by keying into all aspects of the policy drive and urgently addressing all the shortcoming associated with the policy.

The position of Ewa and Abubakar (2017) was supported Odiegwu et al. (2019) after their study of awareness and diffusion of TSA as creative governance tool among Lagosians. The study showed that the citizens' knowledge of the introduction of the governance instruments was slow but steady within the first three months; many of the citizens were positively disposed to TSA based on their belief that it would bring transparency and curb financial corruption. The paper recommended that the introduction of new ideas into governance, particularly technologically driven initiatives, needs to be adequately publicised through the media to enable a good majority of the citizens to understand and buy into it as citizens' acceptance and adoption are paramount.

Oloba et al. (2017) concluded that TSA does not have so much negative impact on the Nigerian financial institutions as most of the institutions are still very stable and buoyant financially. Therefore, they recommended that government should re-invest the funds taken away from the financial institutions back into the economy in the form of capital expenditure in order to revamp the economy from its current state of recession. The position was supported by the position by Mbah et al. (2023) in the study of effect of Treasury Single Account (TSA) on tax revenue collected in Nigeria revealed that TSA has a positive and significant effect on company income tax and value added tax revenue collected in Nigeria. TSA has a negative and insignificant effect on petroleum profit tax in Nigeria. This implies that TSA implementation has increased company income tax and value added tax collected in Nigeria.

Gap in Literature

A significant gap in current literature is the absence of empirical studies that directly evaluate the impact of the TSA policy on revenue generation in Nigeria's maritime industry. While some research has explored its effects on public finance management, few studies have specifically investigated its influence on revenue generation in this industry. The maritime industry plays a vital role in the country's economy, contributing significantly to government revenue.

METHODOLOGY

Population of the Study

The population for this research contains four key players responsible for regulatory responsibilities in the maritime industry, namely Nigerian Maritime Administration and Safety Agency, Nigerian Ports Authority, Nigerian Shippers' Council, and National Inland Waterways Authority. The revenue comprises income generated from shipping companies, shipping agents, port operators, and other entities directly affected by the TSA policy in the maritime industry.

Sampling Unit

Revenue generation was obtained from Safety Agency (NIMASA) and the Nigerian Shippers'

https://doi.org/10.61143/umyu-jafr.7(1)2024.006
ISSN: 2795-3831
E-ISSN: 2795-3823

Council (NSC). The panel data used in this study includes revenue generation data from NIMASA and NSC for the period of 2010 to 2019, as reported by both agencies. The panel data used in this study includes revenue generation data from NIMASA and NSC for the period of 2010 to 2019, as reported by both agencies.

The sampling unit was constrained by data availability, as efforts to obtain relevant financial data from other key maritime agencies, such as the Nigerian Ports Authority (NPA) and the National Inland Waterways Authority (NIWA), were unsuccessful.

Model Specification

Model I: $rev_{it} = \beta_0 + \beta_1 Treatment_i + \beta_2 Time_t + \beta_3 (Treatment_i * Time_t) + \varepsilon_{it}$

Dependent Variable

Rev – Revenue

Independent Variables

Treatment - binary variable: 1 to treatment group (NIMASA) and 0 (NSC) for control group

Time - assign value of 1 for observations after the treatment (post-TSA) and 0 for observations before (pre-TSA) the treatment.

$(Treatment_i * Time_t)$ - interaction of the treatment and time

β_3 - ATET shows the actual impact of the treatment (must be statistically significant to have an impact)

Model II:

$$rev\_exp_{it} = \alpha_0 + \alpha_1 Treatment_i + \alpha_2 Time_t + \alpha_3 (Treatment_i * Time_t) + \alpha_4 rev\_ass + \varepsilon_{it}$$

Dependent Variable

rev_exp – Revenue to expense ratio

Independent Variables

rev_ass – Revenue to asset ratio

Treatment - binary variable: 1 to treatment group (NIMASA) and 0 (NSC) for control group

Time - assign value of 1 for observations after the treatment (post-TSA) and 0 for observations before (pre-TSA) the treatment.

$(Treatment_i * Time_t)$ - interaction of the treatment and time

α_3 - ATET shows the actual impact of the treatment (must be statistically significant to have an impact)

DATA PRESENTATION, ANALYSIS, AND DISCUSSION OF FINDINGS

Preliminary Analyses

Table 1 displays the descriptive statistics of all the variables used this study. The summary statistic Table is divided into 2 major parts, the first part consists of the treatment group (NIMASA) and the control group (NSC). The second part details period of pre and post treasury single account policy implementation. The values of the mean, standard deviation, minimum, and maximum, are compiled and further interpreted as follows.

Table 1: Descriptive Statistics

	Panel A		**Panel B**	
	Treatment Group		Control Group	
	Revenue	*Expense*	*Revenue*	*Expense*
Mean	893,018.4	526,273.2	639,0.976	6,133.158
Range	994,067.7	628,413.3	8,889.369	8,672.146
Minimum	439,341.8	208,120.4	2,910.194	2,893.592
Maximum	1,433,409	836,533.7	11,799.56	11,565.74
Sum	8,930,184	5,262,732	63,909.76	61,331.58
Count	10	10	10	10

	Panel C		**Panel D**	
	Pre-TSA Policy		Post-TSA Policy	
	Revenue	*Expense*	*Revenue*	*Expense*
Mean	282,553	204,700.3	616,856.4	327,706.1
Range	855,290.4	702,410.8	1,426,124	829,668.5
Minimum	2,910.194	2,893.592	7,285.752	6,865.162
Maximum	858,200.6	705,304.4	1,433,409	836,533.7
Sum	2,825,530	2,047,003	6,168,564	3,277,061
Count	10	10	10	10

The two major variables use in the analysis are revenue (REV), and expense (EXP). The summary statistics of these variables are capture in four different panels (Panel A, B, C & D) to meet the dictate of the method of the analysis. The treatment group is the first panel, which relate to data of Nigerian Maritime Security and Safety Agency (NIMASA)'s revenue, expenditure and the asset.

Impact of TSA Policy (pre and post) on revenue generation in the Nigerian maritime industry.

***H₀₁*:** TSA policy does not have significant impact on revenue generation in the Nigerian maritime industry.

 ISSN: 2795-3831
E-ISSN: 2795-3823

Table 2: Revenue Difference-in-Differences

Number of observations in the DIFF-IN-DIFF: 20				
	Before	After		
Control:	5	5	10	
Treated:	5	5	10	
	10	10		
Outcome var.	**rev**	**S. Err.**	**|t|**	**P>|t|**
Before				
Control	3,689.353			
Treated	561,416.58			
Diff (T-C)	**561,416.58**	**7.8e+04**	**7.15**	**0.000*** **
After				
Control	9,092.599			
Treated	122,4620.1			
Diff (T-C)	**122,4620.1**	**7.8e+04**	**15.58**	**0.000*** **
Diff-in-Diff	**657,800.27**	**1.1e+05**	**5.96**	**0.000*** **

R-Square: 0.95
* Means and Standard Errors are estimated by linear regression **Inference: *** p<0.01; ** p<0.05; * p<0.1
Source: Author's Computation (Stata 16)

Given that the research question addresses the impact of treasury single account policy implementation the following model is therefore specified for this

Model I: $rev_{it} = \beta_0 + \beta_1 Treatment_i + \beta_2 Time_t + \beta_3 (Treatment_i * Time_t) + \varepsilon_{it}$

Rev - Revenue

Treatment - binary variable: 1 to treatment group (NIMASA) and 0 (NSC) for control group

Time - assign value of 1 for observations after the treatment (post-TSA) and 0 for observations before (pre-TSA) the treatment.

Table 2 displays the output of the difference-in-difference estimated model as stated above. The decision to reject the null hypothesis is based on the significance of the value of diff-in-diff coefficient. The value of diff-in-diff is 657,800.27 which is positive and statistically significant at 1%. This implies that the implementation of the treasury single account policy has a positive impact on the revenue of the maritime agency. On the average after the implementation of the TSA policy, revenue is expected to increase by N657,800.27.

Influence of TSA Policy (Pre and Post) on Revenue to Expense Ratio.

***H_{02}*:** TSA policy (pre and post) does not have influence on revenue to expense ratio (financial efficiency).

Model II: $rev\_exp_{it} = \alpha_0 + \alpha_1 Treatment_i + \alpha_2 Time_t + \alpha_3 (Treatment_i * Time_t) + \alpha_4 rev\_ass + \varepsilon_{it}$

Rev_exp – Revenue to expense ratio

Treatment - binary variable: 1 to treatment group (NIMASA) and 0 (NSC) for control group

Time - assign value of 1 for observations after the treatment (post-TSA) and 0 for observations before (pre-TSA) the treatment.

Table 3. Revenue to Expense Ratio Difference-in-Differences

Number of observations in the DIFF-IN-DIFF: 20				
	Before	After		
Control:	5	5	10	
Treated:	5	5	10	
	10	10		
Report - Covariates and coefficients:				
Outcome var.	**rev_exp**	**S. Err.**	**|t|**	**P>|t|**
Before				
Control	0.908			
Treated	0.659			
Diff (T-C)	**-0.249**	**0.423**	**-0.59**	**0.564**
After				
Control	0.907			
Treated	1.222			
Diff (T-C)	**0.315**	**0.201**	**0.93**	**0.366**
Diff-in-Diff	**0.564**	**0.284**	**2.04**	**0.059***
Rev_ass	**0.128**	**0.062**	**2.074**	**0.056***

R-Square: 0.72
Source: Author's Computation (Stata 16)

Table 3 shows the output for the difference-in-difference estimate of the above model. Inference from the result revealed that the ATET (diff-in-diff coefficient) indicates that the average treatment effect on the treated is 0.564 and statistically significant at 10% level. That means, the introduction of the TSA policy to the maritime agency impacts the revenue to expense ratio indicator of financial efficiency (ability of the industry to generate revenue relative to its expenses).

Summary of Findings

The difference-in-difference analysis indicated that revenue increased on average after the TSA policy was implemented, leading to the rejection of the null hypothesis, confirming a significant positive effect of the TSA policy on maritime agency revenue. The findings align with several empirical studies, including those by Adeagbo and Oladeji (2019) and Nkechi et al. (2017), which also highlighted TSA's role in enhancing public financial management through blocking leakages and improving transparency. Durodola et al. (2023) further affirm that TSA improves revenue generation and accountability, as seen in the maritime industry.

The second objectives investigate the influence of TSA on the ratio of revenue to expense. The results of the study indicate that the Average Treatment Effect on the Treated (ATET) is statistically significant at the 10% level, showing a positive impact of the Treasury Single Account (TSA) policy on the financial efficiency of maritime agencies.

CONCLUSION AND RECOMMENDATIONS

This research aimed to assess the impact of the Treasury Single Account (TSA) policy on revenue generation, financial efficiency, and asset utilisation in the Nigerian maritime industry. The analysis focused on data from the Nigerian Maritime Administration and Safety Agency (NIMASA) as the treatment group and the Nigerian Shippers Council (NSC) as the control group. Using revenue generation (Rev), revenue to expense ratio, and revenue to asset ratio as the primary variables, a Difference-in-Differences method was employed to compare pre- and post-TSA implementation periods. The study sheds light on the effects of TSA across these financial variables within a critical economic sector.

It is concluded from this study that TSA policy had a statistically significant positive impact on revenue generation in NIMASA. Hence, it is recommended that:

i. To strengthen compliance and enforcement of TSA is crucial for sustaining the positive impacts observed. The Nigerian government should ensure that all maritime agencies, including NIMASA and NSC, fully adhere to TSA regulations. This could involve routine audits and stricter enforcement mechanisms to prevent financial leakages and improve transparency.
ii. Enhancement of asset utilisation and management is necessary to address the observed inefficiencies post-TSA. Maritime agencies should optimize their asset management strategies by improving allocation, conducting comprehensive audits, and adopting modern asset-tracking systems.

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ISSN: 2795-3831
E-ISSN: 2795-3823

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