

Effect of shipping company demographic characteristics on cabotage vessel finance and repayment in Nigeria

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Abstract: The research examined the effect of shipping company demographic characteristics on cabotage vessel finance and repayment in Nigeria. The Nigerian Maritime Administration and Safety Agency (NIMASA) have been concerned about the inability of the Ship Acquisition and Ship Building Fund (SASBF) beneficiaries to pay back disbursed loans fully, resulting in the suspension of further disbursement of the fund required for the development of Nigerian local content capacity. The Cabotage Act 2003 was intended for local content development of shipping and maritime logistics capacity. The fund realized through a 2% surcharge on cabotage trade has accrued since inception, but no shipowner has benefited from the CVFF loan. The study relied on both primary and secondary data. Data was collected through a well-structured questionnaire. The study utilized a Statistical Product Service Solution (SPSS v. 23) and a one-sample chi-square test as statistical tools for data analysis. The results reveal that demographic characteristics of shipping companies, such as age, number of vessels, number of employees and total annual revenue, significantly influence CVFF loan repayment.

Purpose: To identify and analyze the shipping company demographic characteristics which influence cabotage vessel finance and repayment in Nigeria. The findings suggested practical steps for effective CVFF loan disbursement and reliable loan recovery.

Methodology: The study utilized Statistical Product Service Solution (SPSS v. 23) and a one-sample chi-square test as statistical tools for data analysis.

Results: The demographic characteristics of a shipping company, such as company age in years, number of employees, share capital, number of vessels and shipyards as well as the age of vessels and shipyards has a significant influence on her Character, Capacity, Credibility, Capital, Conditions, Collateral and Creditworthiness of the organization.



Theoretical contribution: The research contributed to exploring, understanding, and applying the probability of credit default theory in shipping finance loan repayment. The demographic internal microeconomic organization Character, Capacity, Credibility, Capital, Conditions, Collateral and Creditworthiness significantly affects the ability of CVFF fund beneficiaries to repay the loans.

Practical implications: Prospective borrower indigenous maritime operators should be duly and professionally evaluated to ensure sustainable cash flow and revenue projection during and after granting CVFF loans to guarantee complete repayment.

Keywords: shipping, company, demographic, finance, loan, repayment

1. Introduction

The Nigerian Maritime industry in both International Liner Conferences and Coastal Trade was dominated by foreign operators partly because purchasing ships and other maritime assets requires the commitment of huge sums of money that necessitate different types of funding structures. However, access to funds often depends on an organization's internal and external conditions. In Nigeria, there are various opinions regarding why the indigenous maritime operators (ship/vessel, barges, dredger, platform/rig and shipyard owners) who were beneficiaries of the Ship Acquisition and Ship Building Fund (SASBF) did not fully repay the loans leading to suspension of further disbursement. This research evaluated shipping companies' internal demographic characteristics, which significantly affect cabotage Vessel Finance and repayment in Nigeria, particularly regarding SASBF non-repayment and the resulting non-disbursement of the cabotage Vessel Finance Fund (CVFF). The research focused on the internal demographic characteristics of maritime organizations that determine the accessibility of ship finance funds, effective and efficient utilization of loans, and meeting loan obligations. The research studied the influence of demographic characteristics such as company age, number of vessels, number of employees, total revenue, net profit and creditworthiness on loan repayment and postulated an effective and efficient model for sustainable loan administration in Nigeria's shipping industry.

The Nigerian Military government promulgated the National Shipping Policy Decree 10 of 1987, establishing the National Maritime Authority (NMA) to coordinate the implementation of Nigerian shipping policy. In 1988, the government initiated the Ship Acquisition and Ship Building Funds (SASBF), giving loans that were intended to encourage ownership of ships by Nigerians to participate in the United Nations Conference on Trade and Development (UNCTAD) international cargo sharing following the liquidation of the Nigerian National Shipping Line (NNSL). By 2003, the government reviewed the law and enacted the Coastal and Inland Shipping Act. The Cabotage Act, Part VIII Section 42.2, states that "the purposes of the Fund shall be to promote the development of indigenous ship acquisition capacity by providing financial assistance to Nigerian operators in the domestic coastal shipping". The act is intended to deliberately reserve the transportation of goods and services within Nigerian waters to Nigerian-owned and flagged vessels, thereby encouraging ship capacity building. However, the promulgation of the Cabotage Act did not improve "indigenous shipping development; rather, it seems to be worsening. Fleet expansion has not been achieved; instead, there has been a considerable depletion of the national fleet" (Ganiyu & Bello, 2011).

The Nigerian ship owners that benefited from the SASBF loan disbursement did not fully meet the loan obligations. Most indigenous maritime operators rely on internal finance since they cannot meet the stringent requirements for external debt and equity financing. However, internal finance is not usually adequate to fund the development and expansion of the highly capital-intensive ship acquisition, ship building and management business. Thus, the research considered the continuous limitations and shortage of funds desperately required for the tenacious growth and strengthening of local content in the cabotage business to eliminate foreign dominance in the cabotage trade. The Nigerian government-

subsidized CVFF loan appears to be the most feasible since access to commercial Bank loans is limited due to high interest rates and stringent collateral requirements. The research further considered the microeconomic factors determining indigenous ship owners' fund availability. It understudied why the CVFF loan is not accessible to indigenous maritime operators and why the maritime operators cannot meet the requirement to access the CVFF and recommended a more effective and efficient loan administration. It gave insight into the future of ship finance and how the Nigerian maritime logistics industry can evolve a sustainable strategy for accessing the available but inaccessible cabotage finance fund. The global ship finance market is highly dynamic, innovative, volatile and complex. Thus, it requires specialized knowledge in articulating the business plan, corporate credibility, capital, company tangible asset base (collateral), corporate character, synergized corporate relationship, efficient credit risks assessment and loan repayment strategy in order to convince the lender that the intended borrower is capable of meeting the loan obligations.

2. Literature review

2.1. Conceptual and theoretical framework

The section extensively reviewed SASBF and CVFF policies, Ship owner demographic characteristics (company's Age, number of vessels, number of employees, annual revenue) influencing CVFF loan repayment and Banks (PLI's) credit appraisal (character, capacity, credibility, capital and collateral). An organization's ability to utilize its internal resources to create value is a function of its potential for profitability and ability to pay back loans. The research considered beneficiaries of SASBF loan repayment performance. Factors such as age of business, number of vessels, business plan, number of staff and corporate management are important variables that determine loan repayment rate.

Demographic characteristics of maritime companies

The Liner shipping and local maritime operator companies' demographic characteristics such as age and size of business, number of vessels owned and or chartered, number of employees, annual total revenue, credit worthiness and net profit were found to be determinants for benefiting in the SASBF or CVFF fund. An organization's ability to utilize its internal resources to create value is a function of its potential for profitability and ability to pay back loans. The skill, knowledge, and experience of every individual employee, whether working on board or shore office personnel, constitutes the human capital of a ship management company.

Primary lending institutions (bank's) credit appraisal

The Primary Lending Institution (Banks) credit appraisal model is based on the 7Cs of credit appraisal- Character, Capacity, Credibility, Capital, Collateral, Condition and Credit Scoring which provide factual evidence of the level of credit risk related to a particular borrower. "These financial models are useful in predicting the repayment ability of a firm, especially in stable industries" (Yurdakul & Yusuf, 2004). "Credit appraisal is the process by which a lender appraises the creditworthiness of the prospective borrower, which involves appraising the borrower's payment history and establishing the quality and sustainability of his cash flow" (Milcah et al., 2014). The shipping company's demographic characteristics significantly affect credit appraisal, sustainable cash flow, and loan repayment capacity.

- i. **Character:** It is an evaluation of the borrower's personality by the management of the lending institution. "This assessment is performed to check the integrity and trustworthiness of the borrower" (Abadi & Karsh, 2013). The prospective borrower's "past borrowing records are investigated for honesty in loan repayment without compulsion. This is a moral and human factor assessment of business ethics, commitment and responsibility" (Kabir, Jahan, Chisty & Hasin, 2010). Character evaluation may be observed through the profile and references given by the borrower. It could also be obtained through existing credit reference institutions.
- ii. **Capacity:** "The assessment of prospective borrower's capacity is to determine the ability of the borrower to repay the loan" (Sharma & Kalra, 2015). Capacity can be referred to as cash flow, which is generally the indigenous shipping companies' primary source of repayment. Lenders (Bankers or NIMASA) will look at the business's operating cash flow when determining the shipping company's ability to repay a term loan. Cash flow is defined as sales minus operating

expenses, depreciation and amortization expenses, and interest expenses. The amount left over is the cash available to pay back debt. The submitted financial information will assist in determining the borrower's capacity. The capacity may be calculated by comparing total annual revenue and cash flow to a loan repayment schedule. Other indices for capacity prediction include financial performance indicators such as Net Profit Margin, Debt Service Coverage Ratio and Liquidity Ratio.

Lenders want to know if the maritime operator generates enough cash flow to cover the loan repayment schedule. Lenders want to know if the shipping company's operating cash flow from daily Charter Rate or Cargo Throughput can support interest and principal payment schedules within the expected loan period.

- iii. **Credibility:** Banks usually have a "loan credibility prediction system that helps the organizations in making the right decision to approve or reject the loan request from a customer" (Sivasree & Rekha, 2015). The lender needs to determine and predict the reliability and credibility of prospective borrowers regarding loan repayment through the organizations behaviour and demographic characteristics. A prospective shipping company borrower should address all of the Primary Lending Institution concerns and instil confidence in the lender regarding honesty, reputation, work environment, operational factors, performance, communication, motivation and leadership.
- iv. **Capital:** Banks analysis of firm capital is critical because it helps determine borrowers' risk of an unexpected loss in the industry. An indigenous shipping company with "high equity is capable of covering all expenses to ensure break-even and profitability" (Strischek, 2000). The ownership capital structure "shows financial commitment and confidence in the business as depicted by Equity ratio and Debt to Equity Ratio" (Noradiva & Azlina, 2016). Capital is a critical criterion to ascertain the amount of loan the applicant is worth. Substantial capital reflects the applicant's resilience to withstand ups and downs due to the shipping circle and the dynamic prevailing market lending rates. It builds the lender's faith in the applicant's repayment capacity. The applicant's equity must be good enough to meet or exceed the monthly obligations with the additional overheads.

Capital is cash invested by the borrower. Generally, banks will not finance 100% of the cost of a capital-intensive asset such as ships. The indigenous maritime operator needs to be prepared to pay part of the enormous cost of purchasing the ship they want a loan to finance. The willingness to commit some of the company's own savings is a sign of their commitment to the business. If the shipping company is unwilling and unable to commit own savings or capital to the investment; it is unrealistic to expect the bank and/or any potential investor to lend money or invest in maritime assets.

Capital represents the general financial position of the potential borrower's firm with particular emphasis on tangible net worth and profitability, indicating the ability to generate funds over time continuously. The net worth of the indigenous maritime enterprise is the critical factor that governs the amount of credit that would be made available to the borrower.

- v. **Collateral:** "This is the alternative source for the loan repayment should there be a failure" (Williams, Albert & Evans, 2017). Collateral relates to the security made available to secure a loan. Banks ensure security and have a proper title that is marketable and valuable enough to cover the loan amount. The collateral quality is assessed by using the Loan-to-Value Ratio. Lenders also want to ensure the borrower takes a risk by putting up a guaranteed asset, such as real estate or property; the lender understands that the prospective borrower is serious about repaying the loan.
- vi. **Condition:** This analyses the purpose of the loan, the Cabotage trade industry in Nigeria, the micro/macro-economic environment and the political environment. A fair study of these conditions is required before a loan is approved (by NIMASA or PLIs) and disbursed. "This is done to ascertain the borrower's vulnerability to happenings in the economy" (Moti, Masinde, Mugenda & Sindani, 2012). "The political analysis involves looking at all levels of everyday politics, which include political stability, government policies and its impact on doing business in the country" (Hudson & Leftwich, 2014). This measures any external factor that could influence and hamper the loan repayment. In the shipping industry analysis, the shipping circle from loan disbursement to loan maturity is an essential determinant of the borrower meeting its obligations. Banks offer loans considering the prevailing market conditions, industry status,

shipping company, interest rate movements, inflation, charter rate and cargo throughput fluctuations etc. Therefore, an indigenous shipping company applying for loans during strong and positive maritime industry growth and economic conditions are indicators of the applicant's ability to generate revenue and repay the debt. The conditions of the local, national and international economy, the financial health of the shipping industry, particularly cabotage trade and competition for the available CVFF loan in the coffers of NIMASA.

- vii. **Credit Scoring:** Recently, Credit Scoring has become famous for determining a prospective or existing borrower's creditworthiness. "Credit scoring is a statistical technology that quantifies the credit risk posed by a prospective or current borrower and seeks to rank them so that those with poorer scores are expected to perform worse on their credit obligations than those with better scores. Credit scoring has an advantage in that it saves time and cost and believes in increasing access to credit, promoting competition and improving market efficiency. Credit scoring reduces subjective judgment and possible bias during the credit assessment process" (Holger, Gerald & Marlene, 2002). "The credit rating agency evaluates the issuing company's credit history and its ability to repay and issues a credit rating which provides a current opinion on the obligor's creditworthiness concerning the specific financial obligation, including an estimate of the risk of default" (Martin, 2009). If an effective credit scoring method is adopted for prospective ship owners intending to benefit from the CVFF loan before advancing loans, it can determine the ability of the borrower to pay back the loans. In some cases, it may not be a guarantee since the future is uncertain, considering the high volatility of the shipping market.
- viii. **Creditworthiness:** The effectiveness of both NIMASA and PLIs in loan monitoring and loan disbursement lag time significantly affects indigenous shipping company's repayment performance. Bruck (1997) contended that the administration of loans "extends beyond the approval of loans. It requires control and supervision of outstanding loans to ensure their repayments". The prospective borrower's historical microeconomic conditions, particularly capital structure and financial performance, are factors to be considered by lenders before giving out loans. "The efficiency of shipping companies to create profit from the equity used in the investment; financial statement analysis is a judgmental procedure, which tries to identify the underlying reasons that affect the company performance. Financial ratios provide further insight into wealth production's core ingredients" (Thalassinos, Liapis & Politis, 2015). The ability of the shipping company to pay off its debts as they come due, over the short-term and long-term period, and effectively manage its vessels could be a significant factor determining access to loans. The combined effects of liquidity, asset management and debt on operating results determine a shipping company's financial performance. It indicates what lenders think of the shipping company's internal condition and future loan repayment prospects.

The Lenders, including "bankers, focus on the criteria of corporate recourse (CR) in their decision-making of the credit factors; the financial strength of the ship owner is the most important factor, followed by the ship owner's business history and the bank-firm relationship" (Koung & Myong, 2018). With the current underwriting attitude, the shipping sector may have limited access to shipping loans from international commercial banks due to low corporate ratings caused by the prolonged recession and the nature of the industry itself: volatility, fragmentation, capital intensity, high leverage etc., appropriate structure on the institutional framework for ship financing is required to improve loan repayment.

Credit Risk Management is also a significant factor in the loan accessibility and the overall performance of a shipping company. The ability of a shipping company to manage its internal risk concerning external exposure will determine its profitability and ability to pay back loans. The shipping industry is intrinsically volatile and characterized by a high risk – high return profile, making its rates and prices challenging to forecast. "In the shipping industry, investment decisions are taken on a proper risk measurement and management basis since they are long-term decisions with important financial implications. Risk management is useful for providing appropriate mitigating actions that protect the business, stakeholders, assets and capital" (Ghiorghe & Gianina, 2014). Knowledge represents the critical factor in minimizing risks because if risks are understood, information can be obtained to ensure they are dealt with properly to ensure investment decisions are taken on a proper risk measurement and management basis since they are long-term decisions and the difficulty of entering and exiting the

market imposes certain obstacles. In recent years, shipping companies have faced various risks, including price, credit, and pure risks.

Internal Factors affecting SASBF/CVFF loan repayment performance

The research considered beneficiaries of SASBF loan repayment performance. Factors such as age of business, number of vessels, NIMASA and PLI's method of lending, loan processing and prequalification- time laps between loan application and disbursement, loan size, loan diversion, repayment period, number of staff and management, which are important variables that determine loan repayment rate. In addition, the loan repayment structure, which includes prequalification, processing, timely release of loan, allowing suitable repayment period, and approving equitable loan size sufficient for the shipping business proposals, may also enhance loan repayment performance.

3. Empirical review

This section explored a few pieces of literature on ship financing, particularly cabotage vessel finance and repayment in Nigeria. The Maritime Operators and ship owner's communities are always in need of significant amounts of capital in order to fund its fleet modernization and expansion strategy as well as to refinance its existing trading fleet.

"Traditionally, shipowners have satisfied their ship financing requirements through their own (or family and friends) equity resources as well as on bank debt finance, which represents the cheapest form of external capital when compared to other alternative sources" (Alexopoulos & Nikos, 2016).

According to (Okoroji & Wilfred, 2011) "if the Cabotage Law is properly implemented, Nigeria will be able to develop maritime capacity". They opine that the "lack of knowledge about the maritime sector could be blamed for the feeble response it has generated from the investing public". Donatus, Aghalugbulam, and Akujuobi (2013) considered the "factors affecting Nigerian banks' financing and developing maritime shipping sector Small and Medium-Sized Enterprises (SMEs). Using Likert scaled questionnaires and ordered logit regression model, identified the lack of skills in maritime sector SMEs financing and unfavourable regulatory environment as significant factors affecting banks investments in the shipping sector".

Kalu (2018), "opines that inadequate funding and absence of investment are central in hampering ship acquisition and the development of shipbuilding capability, thereby undermining Cabotage in Nigeria. He further asserted that to some extent, the Cabotage legal regime in Nigeria is fundamentally flawed due to waivers without safeguards to protect indigenous ship operators".

Furthermore, (Theophilus, Chinemerem and Igboanusi, 2015) "analyzed the existing Cabotage policy using T-test, and found that foreign operators earned more revenue and concluded that the Cabotage policy be amended to remove waiver option for foreign vessels".

Taofeek, Siti, and Lim (2016) "examined the factors determining the accessibility of microcredit loans in Nigeria using descriptive statistics and Logit Regression Model analysis".

Stefan et al. (2011) "considered the extreme changes in revenues, operating cash flows, and asset values during the recent financial crises, which led shipping companies to source for alternative means of ship financing".

Makorere (2014) examined the "factors affecting loan repayment behaviour and concluded that the uttermost factors like interest rate, grace period, profitability, moral hazard and economic stability have strong effects in stimulating loan repayment".

Lozinskaia, Andreas, Anna, and Henry (2017) "focused on the determinants of the probability of default using a sample of 192 listed shipping companies and employ a logit model to investigate the determinants of the probability of default". The authors isolated cases of company liquidations and those cases where companies had to change their legal status due to warning liquidity signals. Their principal findings align with prior research and depict a changing trend in the marginal effects of relevant variables on the probability of default. They further showed, through an empirical application, how obtained results can be used in a managerial decision-making process and in a bank credit underwriting process to assess a shipping company's creditworthiness.

Gong, Heng-Qing and Yvonne (2013), in their research note on "impacts of the recent financial crisis on ship financing in Hong Kong, presented an assessment of the impacts of the recent financial crisis, which peaked in late 2008 on banks' ship financing practices. The survey of banks with a shipping division in Hong Kong suggests that banks reduced their lending to shipping after the financial crisis.

Banks also tend to emphasize loan quality and security over market share. The research concluded that there was a lower appetite for risk-taking and more stringent requirements for collaterals and guarantees by the banks during the economic recession".

Orestis, Johns and Grau (2014) focused "exclusively on ship finance and its contributions to the increasingly complex field of ship finance, which has over the last two decades become a key aspect in the world of shipping and ship owning".

Vera (2015) looked at "the different financing options available to shipping companies in Greece, including the conditions and procedures for obtaining approval of a shipping loan. It also considered the modern financial instruments and shipping companies' methods to fund their investment projects".

Alex (2014) identified "causes of loan default in Ghanaian Microfinance as high-interest rate, inadequate loan sizes, poor appraisal, lack of monitoring, and improper client selection. Measures to control default include training before and after disbursement, reasonable interest rate, monitoring of clients, and proper loan appraisal". While (Balogun & Alimi, 1988) opined that education, loan diversion, monitoring, marital status and income are significant factors that influence loan default in the Small-Farmer Credit Programme in Nigeria. The research also recognized credit education, effective loan monitoring, loan appraisal systems and credit scoring systems as measures to control default among small farmers in Lagos State, Nigeria. From the preceding, no previous research considered the effect of shipping company demographic characteristics on cabotage vessel finance and repayment in Nigeria. This research is, therefore, intended to close this critical gap in the literature on ship financing.

4. Research methods

"A research design is a plan that guides the researcher in collecting, analyzing and interpreting observations" (Nachmias & Nachmias, 2009). This research adopted the cross-sectional research design. The cross-sectional research design is a survey method whereby the researcher samples randomly selected individuals or groups to respond to a set of questions. In this study, the researchers will attempt to identify the challenges of Cabotage vessel finance (CVFF) loan repayment in Nigeria by administering questionnaires to selected individuals and groups.

The target population includes five hundred and sixty-two (562) maritime operators and stakeholders involved in local Cabotage trade, registered with the Nigerian Local Content Development and Monitoring Board (NCDMB); Nigerian Maritime Administration and Safety Agency (NIMASA); Nigerian Shippers Council and the Primary Lending Institutions (nominated Banks) in Nigeria. Table 1 shows the population distribution of shipping companies involved in local cabotage trade as of May 2020.

Table 1: Population distribution of shipping companies involved in local cabotage trade as of May 2020

S/N	NO. of Vessels, including barges, dredgers, platforms, rigs, and shipyards owned by maritime companies involved in cabotage trade as at May 2020.	Number of Maritime Companies
1	Less than 5 vessels	155
2	5 – 10 vessels	118
3	11-16 vessels	146
4	17- 22 vessels	97
5	23 and above vessels	46
	Total no. of shipping companies	562

Sources: <https://www.ncdmb.gov.ng/images/MARINEVESSEL/April-May2020mvr.pdf>

Table 2 shows an institutional survey of the maritime industry in Nigeria.

Table 2: Institutional Survey Maritime Industry in Nigeria

S/N	Stake Holders	Sample Size
1.	Nigerian Maritime Administration and Safety Agency (NIMASA)	1
2.	Nigerian Shippers Council (NSC)	1
3.	Primary Lending Institutions (PLIs) - Fidelity Bank, Polaris (Skye) Bank	2
Total		4

Source: Researchers concept, 2020

4.1. Method of data analysis

The study data was collected from primary and secondary sources depending on the objective.

Objective I: To determine the relationship between the age of maritime companies and CVFF loan repayment.

Data: The data for this objective include information on the perception of the age of maritime companies and CVFF loan repayment.

Data Collection: Data was collected using a Likert scale format-structured questionnaire.

Hypothesis - (H_{a1}): Maritime companies' age has no influence on CVFF loan repayment.

Data Analysis: The use of simple statistical techniques like tables, percentages, and graphs were employed to show distribution, while the One-sample chi-square test was used to test the hypothesis

Objectives II: To examine the relationship between the number of vessels owned by maritime companies and CVFF loan repayment.

Data: The data for this objective includes information on the number of vessels owned by maritime companies and CVFF loan repayment.

Data Collection: Data was collected using a Likert scale format-structured questionnaire.

Hypothesis - (H_{a2}): Number of vessels including barges, dredger, platform, rig, shipyard owned by maritime companies, do not influence CVFF loan repayment.

Data Analysis: The use of simple statistical techniques like tables, percentages, and graphs were employed to show distribution, while the One-sample chi-square test was used to test the hypothesis

Objective III: To determine the relationship between maritime companies' number of employees and CVFF loan repayment.

Data: The data for this objective includes information on the number of maritime companies' employees and CVFF loan repayment.

Data Collection: Data was obtained using a Likert scale format-structured questionnaire.

Hypothesis - (H_{a3}): Maritime companies' number of employees does not influence CVFF loan repayment.

Data Analysis: The use of simple statistical techniques like tables, percentages, and graphs were employed to show distribution, while the One-sample chi-square test was used to test the hypothesis

Objective IV: To examine the relationship between maritime companies' annual total revenue and CVFF loan repayment.

Data: The data for this objective includes information on annual total revenue and CVFF loan repayment.

Data Collection: Data was obtained using a Likert scale format-structured questionnaire.

Hypothesis - (H_{a4}): Maritime companies' annual total revenue do not influence CVFF loan repayment.

4.2. Data presentation and analysis

Simple statistical techniques like Tables and percentages were employed to show distribution, while the One-sample chi-square test was used to test the hypothesis. Table 3 shows the number of questionnaires administered to maritime companies and regulators.

Table 3: Number of copies of the questionnaire administered to maritime companies and regulators

Maritime Companies/Regulators	Number of administered questionnaires	The number of questionnaires retrieved	Response Rate (%)
562	237	198	83.5

Source: Researchers concept, 2020.

The above table shows the distribution of questionnaires to maritime companies, including two primary lending institutions and two maritime regulators; out of the two hundred and thirty-seven (237) questionnaires distributed, one hundred and ninety-eight (198) were returned, accounting for a return rate of 83.5%.

5. Research results

Table 4 shows the internal demographic characteristics of shipping companies.

Table 4: Internal Demographic characteristics of shipping companies

Characteristics	Frequency	Percentage (%)
Company Size (Million)		
Less than ₦50m	40	20.2
₦50-₦100m	37	18.7
₦101-₦151m	17	8.6
₦152-₦202m	33	16.7
₦203-₦253m	4	2.0
₦254-₦304m	23	11.6
₦305m and above	44	22.2
Total	198	100.0
Company Age		
Less than 10years	32	16.2
10-20 years	65	32.8
21-31 years	54	27.3
32-42 years	41	20.7
43-53 years	6	3.0
53 years and above	0	0
Total	198	100.0
Number of Employees		
Less than 50	56	28.3
50-100	22	11.1
101-151	33	16.7
152-202	15	7.6
203-253	25	12.6
254-304	13	6.6
305 and above	34	17.2
Total	198	100.0
Number of vessels/barges/dredgers/platforms/rigs and shipyards		
Less than 5 Vessels	48	24.2
2-10 vessels	36	18.2
11-16 vessels	28	14.1
17- 22 vessels	32	16.2
23- 28 vessels	24	12.1
29- 34 vessels	10	5.1
35 vessels and more	20	10.1
Total	198	100.0
Age of vessels /barges/dredgers/platforms/rigs and shipyards		

Less than 5 years	14	7.1
6-10 years	58	29.3
11-16 years	44	22.2
17- 22 years	37	18.7
23- 28 years	18	9.1
29- 34 years	7	3.5
35 years and more	20	10.1
Total	198	100.0

Source: Field survey, 2019/2020

Demographic characteristics

Table 4 revealed the internal demographic characteristics of 198 shipping companies. This is based on their share capital in millions, company age in years, number of employees, number of vessels/barges/dredgers/platforms/rigs, number of shipyards as well as the age of vessels/barges/dredgers/platforms/rigs and shipyards.

It further showed that the majority (44) shipping companies, accounting for 22.2% had share capitals of ₦305million and above; 40 companies accounting for 20.2% had share capitals of less than ₦50million; 37(18.7%) had share capitals between ₦50million and ₦100million; 17 shipping companies accounting for 8.6% had share capitals of ₦101million-₦151million; 33(16.7%) had share capitals of ₦152million-₦202million; 4 shipping companies yielding a percentage of 2% had share capitals between ₦203million and ₦253million. At the same time, 23(11.6%) had share capital between ₦254million-₦304million.

As regards the company age, table 4.1 revealed that the majority (65) shipping companies were 10-20years, followed by 54 shipping companies between 21 and 31years, 32 (16.2%) were less than 10 years of age, 41 shipping companies between 32 and 42 years while 6 companies were between 43 and 53years. Nevertheless, no shipping company was above 53 years.

In terms of the number of employees, table 4.1 revealed that the majority (56) shipping companies had less than 50 staff with percentage at 28.3; 22 (11.1%) had between 50 and 100 employees; 33 (16.7%) respondents had 101-151 employees; 15 (7.6%) had between 152 and 202 employees; 25 companies had employees between 203 and 253; 13 (6.6%) shipping companies had employees between 254 and 304. At the same time, 34 (17.2%) shipping companies had above 305 employees.

Apropos the number of vessels/barges/dredgers/platforms/rigs and shipyards owned by shipping companies; 48 (24.2%) had less than 5 vessels; 36 (18.2%) had between 2 and 10vessels; 28 (14.1%) had 11-16 vessels; 32 (16.2%) had 17-22 vessels; 24 (12.1%) had between 23 and 38vessels; 10(5.1%) had vessels between 29 and 34; while 20(10.1%) had 35 and above vessels.

Regarding the age of vessels/barges/dredgers/platforms/rigs and shipyards, majority of shipping companies (65) had vessels/barges/dredgers/platforms/rigs and shipyards aged between 6 and 10 years, followed by 44 (22.2%) between 11 and 16 years; 37 (18.7%) between 17 and 22 years; 20 (10.2%) had vessels aged above 35 years; 14 (7.1%) less than 5years and 7 (3.5%) between 29 and 34 years.

Analysis of data

Relationship between age of maritime companies and CVFF loan repayment

This section examined the relationship between the age of maritime companies and CVFF loan repayment, as captured in the questionnaire and shown in Table 5 below. Table 5 shows the responses on the relationship between the age of maritime companies and CVFF loan repayment.

Table 5: Response on the relationship between the age of maritime companies and CVFF loan repayment

Question: The age of maritime companies has a positive correlation with the repayment of CVFF loan		
Likert Rating Scale	Frequency	Percentage
Strongly disagreed (1)	21	10.6
Disagreed(2)	44	22.2
Agreed(3)	59	29.8
Strongly Agreed(4)	74	37.4
Total	198	100.0
Mean	2.94	

Source: Field survey, 2019/2020

Mean criterion: Reject the statement if the mean score exceeds 2.5. Otherwise, accept

Table 5 shows the descriptive statistics (frequency and percentage) of responses by respondents as it concerns the relationship between the age of maritime companies and CVFF loan repayment. It showed that 74 (37.4%) strongly agreed, 59 (29.8%) agreed, 44 (22.2%) disagreed, and 21 (10.6%) strongly disagreed with the statement "the age of maritime companies has a positive correlation with repayment of CVFF loan".

Using the Likert Scale formula for 4-points:

$$\text{Mean value} = \frac{\text{Sum total of responses}}{\text{No. of respondents}} \quad (1)$$

$$\text{Mean Value} = \frac{(74 \times 4) + (59 \times 3) + (44 \times 2) + (21 \times 1)}{198} = 2.94$$

The statement was accepted since the mean value of 2.94 is greater than the mean criterion of 2.50.

Test of hypothesis (1)

H_{a1}: The age of maritime companies does not influence CVFF loan repayment.

This hypothesis was tested using the one-sample chi-square test given as:

$$X_c^2 = \sum_{j=1}^k \frac{(o-e)^2}{e} \quad (2)$$

Where

$$e = \frac{\text{Total Observed}}{N} \quad (3)$$

N = number of categories (4)

O = the observed frequency (Responses)

Decision Rule

When the P-Value < α (0.05) at a given degree of freedom (df): Reject the Null Hypothesis (H_a).

Similarly, if X_{cal} > X_{tab}, Reject the Null Hypothesis

When the P-Value > α (0.05) at a given degree of freedom (df): Accept the Null Hypothesis (H_a).

Similarly, if X_{cal} < X_{tab}, Accept the Null Hypothesis.

Presentation of results

The age of maritime companies positively correlates with the repayment of CVFF loans. Table 6 shows the distribution of responses to the research questions. The statistical test for the question is also shown in Table 7.

Table 6: Respondents distributed a positive correlation between the age of maritime companies and the repayment of CVFF loans

	Observed N	Expected N	Residual
Strongly disagreed	21	49.5	-28.5
Disagreed	44	49.5	-5.5
Agreed	59	49.5	9.5
Strongly Agreed	74	49.5	24.5
Total	198		

Table 7: Test correlation statistics between maritime companies' age and CVFF loan repayment

	The age of maritime companies positively correlates with the repayment of CVFF loans.
Chi-Square	30.970 ^a
Df	3
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 49.5.

Source: SPSS Output, version 23

This output consists of two major parts: frequencies and test statistics. The frequency output reports each group's observed, expected and residual frequencies. The residual frequency represents the difference between the expected and the observed frequencies and is obtained by subtracting the expected from the observed frequencies.

The first block of the frequencies output represents observed frequencies of responses on the relationship between the age of maritime companies and CVFF loan repayment.

The test statistics output reports the chi-square obtained, the degrees of freedom (Number of groups - 1), and the exact significance level, which are reported in separate analysis rows.

For the Response variable, the chi-square obtained is 30.970. With 3 degrees of freedom (4 - 1 = 3) and a significance level of 0.000, which falls below the 0.05 alpha level, this indicates that the age of maritime companies influences CVFF loan repayment. Hence, the null hypothesis was rejected.

Relationship between the number of vessels, including barges, dredgers, platforms, rigs, shipyards owned by maritime companies and CVFF loan repayment

This section examined the relationship between the number of vessels, including barges, dredgers, platforms, rigs, and shipyards owned by maritime companies and CVFF loan repayment as captured in the questionnaire as shown in Table 8, which shows the responses on the number of vessels including barges, dredgers, platforms, rigs, shipyards owned by maritime companies and CVFF loan repayment.

Table 8: Response on the number of vessels, including barges, dredgers, platforms, rigs, shipyards owned by maritime companies and CVFF loan repayment

Question: The number of vessels owned by the maritime companies positively correlates with the repayment of the CVFF loan.

Likert Rating Scale	Frequency	Percentage
Strongly disagreed (1)	22	11.1
Disagreed(2)	31	15.7
Agreed(3)	68	34.3
Strongly Agreed(4)	77	38.9
Total	198	100.0
Mean	3.01	

Source: Field survey, 2019/2020

Mean criterion: Reject the statement if the mean score exceeds 2.5. Otherwise, accept.

Table 8 shows the descriptive statistics (frequency and percentage) of respondents' responses concerning the relationship between the number of vessels, including barges, dredgers, platforms, rigs, shipyards owned by maritime companies and CVFF loan repayment. It showed that 77 (38.9%) strongly agreed, 68 (34.3%) agreed, 31 (15.7%) disagreed, while 22 (11.1%) strongly disagreed with the statement "The number of vessels owned by the maritime companies has a positive correlation with repayment of CVFF loan".

Using the Likert Scale formula for 4-points: from equation (1)

$$\text{Mean value} = \frac{\text{Sum total of responses}}{\text{No of respondents}}$$

$$\text{Mean Value} = \frac{77 \times 4 + (68 \times 3) + (31 \times 2) + (22 \times 1)}{198} = 3.01$$

The statement was accepted since the mean value of 3.01 is greater than the mean criterion of 2.50.

Test of Hypothesis (2)

H_{a2}: The number of vessels, including barges, dredgers, platforms, rigs, and shipyards owned by maritime companies, do not influence CVFF loan repayment.

This hypothesis was tested using the one-sample chi-square test expressed from equation (2) as:

$$X_c^2 = \sum_{j=1}^k \frac{(o - e)^2}{e}$$

Where

$$e = \frac{\text{Total Observed}}{N}$$

N = number of categories (4)

O = the observed frequency (Responses)

Decision Rule

When the P-value < α (0.05) at a given degree of freedom (df): Reject the Null Hypothesis (H_a).

Similarly, if X_{cal} > X_{tab}, Reject the Null Hypothesis

When the P-value > α (0.05) at a given degree of freedom (df): Accept the Null Hypothesis (H_a).

Similarly, if X_{cal} < X_{tab}, Accept the Null Hypothesis.

The number of vessels owned by the maritime companies positively correlates with the repayment of CVFF loans. Table 9 shows the distribution of the respondents answers to the research questions. The test statistics of respondents on the question are shown in Table 10.

Table 9: Respondents distributed a positive correlation between the numbers of vessel ownership and CVFF loan repayment

	Observed N	Expected N	Residual
Strongly disagreed	22	49.5	-27.5
Disagreed	31	49.5	-18.5
Agreed	68	49.5	18.5
Strongly Agreed	77	49.5	27.5
Total	198		

Table 10: Test Statistics on the positive correlation between the number of vessel ownership and CVFF loan repayment

	The number of vessels owned by the maritime companies has a positive correlation with the repayment of CVFF loans.
Chi-Square	44.384 ^a
Df	3
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 49.5.

Source: SPSS Output, version 23

For the Response variable, the chi-square obtained is 44.384. With 3 degrees of freedom (4 - 1 = 3) and a significance level of 0.000, which falls below the 0.05 alpha level, this indicates that some vessels, including barges, dredgers, platforms, rigs, shipyards owned by maritime companies, influence CVFF loan repayment. Hence, the null hypothesis was rejected.

Relationship between the number of maritime companies' employees and CVFF loan repayment

This section examined the relationship between the number of maritime companies' employees and CVFF loan repayment as captured in the questionnaire, as shown in Table 11.

Table 11: Response on the number of maritime companies' employees and CVFF loan repayment

Question: The maritime companies' number of employees positively correlates with the repayment of the CVFF loan

Likert Rating Scale	Frequency	Percentage
Strongly disagreed (1)	15	7.6
Disagreed(2)	32	16.2
Agreed(3)	65	32.8
Strongly Agreed(4)	86	43.4
Total	198	100.0
Mean		3.12

Source: Field survey, 2019/2020

Mean criterion: Reject the statement if the mean score exceeds 2.5. Otherwise, accept.

Table 11 shows the descriptive statistics (frequency and percentage) of respondents' responses concerning the number of maritime companies' employees and CVFF loan repayment. It showed that 86 (43.4%) strongly agreed, 65 (32.8%) agreed, 32 (16.2%) disagreed, while 15 (7.6%) strongly disagreed with the statement "The maritime companies' number of employees has a positive correlation with repayment of the CVFF loan".

Using the Likert Scale formula for 4-points as expressed in equation (1):

$$\text{Mean value} = \frac{\text{Sum total of responses}}{\text{No of respondents}}$$

$$\text{Mean Value} = \frac{((86 \times 4) + (65 \times 3) + (32 \times 2) + (15 \times 1))}{198} = 3.12$$

The statement was accepted since the mean value of 3.12 is greater than the mean criterion of 2.50.

Test of Hypothesis (3)

H_{a3}: Maritime companies' number of employees does not influence CVFF loan repayment.

This hypothesis was tested using the one-sample chi-square test as expressed in equation (2):

$$X^2_C = \sum_{j=1}^k \frac{(o - e)^2}{e}$$

Where

$$e = \frac{\text{Total Observed}}{N}$$

N = number of categories (4)

O = the observed frequency (Responses)

Decision Rule

When the P-value < α (0.05) at a given degree of freedom (df): Reject the Null Hypothesis (H_a). Similarly, if X_{cal} > X_{tab}, Reject the Null Hypothesis

When the P-value > α (0.05) at a given degree of freedom (df): Accept the Null Hypothesis (H_a). Similarly, if X_{cal} < X_{tab}, Accept the Null Hypothesis.

Response to the question that the number of employees in the maritime companies has a positive correlation with repayment of the CVFF loan is shown in Table 12. The test statistics for the question are shown in Table 13.

Table 12: Respondents on the positive correlation between maritime employees and CVFF loan repayment

	Observed N	Expected N	Residual
Strongly disagreed	15	49.5	-34.5
Disagreed	32	49.5	-17.5
Agreed	65	49.5	15.5
Strongly Agreed	86	49.5	36.5
Total	198		

Table 13: Test Statistics of respondents on the positive correlation between maritime employees and CVFF loan repayment

The maritime company's number of employees positively correlates with the repayment of the CVFF loan.

Chi-Square	62.000a
Df	3
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 49.5.

Source: SPSS Output, version 23

For the Response variable, the chi-square obtained is 62.000. With 3 degrees of freedom ($4 - 1 = 3$) and a significance level of 0.000, which falls below the 0.05 alpha level, this indicates that Maritime companies' number of employees influences CVFF loan repayment. Hence, the null hypothesis was rejected.

Relationship between annual total revenue of maritime companies and repayment of CVFF loan

This section examined the relationship between marine companies' annual total revenue and CVFF loan repayment, as captured in the questionnaire and shown in Table 14.

Table 14: Responses to maritime companies' annual total revenue and CVFF loan repayment

Question: The annual total revenue of maritime companies positively correlates with the repayment of CVFF loans

Likert Rating Scale	Frequency	Percentage
Strongly disagreed (1)	23	11.6
Disagreed(2)	12	6.1
Agreed(3)	77	38.9
Strongly Agreed(4)	86	43.4
Total	198	100.0
Mean	3.14	

Source: Field survey, 2019/2020

Mean criterion: Reject the statement if the mean score exceeds 2.5. Otherwise, accept

Table 14 shows the descriptive statistics (frequency and percentage) of responses by respondents on the annual total revenue of maritime companies and repayment of CVFF loans. It showed that 86 (43.4%) strongly agreed, 77 (38.9%) agreed, 12 (6.1%) disagreed, and 23 (11.6%) strongly disagreed with the statement "The annual total revenue of maritime companies has a positive correlation with repayment CVFF loan".

Using the Likert Scale formula for 4-points:

Mean value = $\frac{\text{Sum total of responses}}{\text{No. of respondents}}$

No. of respondents

$$\text{Mean Value} = \frac{((86 \times 4) + (77 \times 3) + (12 \times 2) + (23 \times 1))}{198} = 3.14$$

The statement was accepted since the mean value of 3.14 is greater than the mean criterion of 2.50.

Test of Hypothesis

H_{a4}: The total annual revenue of maritime companies does not influence CVFF loan repayment.

This hypothesis was tested using the one-sample chi-square test given as:

$$X_C^2 = \sum_{j=1}^k \frac{(o - e)^2}{e}$$

Where

$$e = \frac{\text{Total Observed}}{N}$$

N = number of categories (4)

O = the observed frequency (Responses)

Decision Rule

When the P-value < α (0.05) at a given degree of freedom (df): Reject the Null Hypothesis (H_0).

Similarly, if $X_{cal} > X_{tab}$, Reject the Null Hypothesis

When the P-value > α (0.05) at a given degree of freedom (df): Accept the Null Hypothesis (H_0).

Similarly, if $X_{cal} < X_{tab}$, Accept the Null Hypothesis.

The annual total revenue of maritime companies positively correlates with the repayment of the CVFF loan.

Table 15 shows the respondents' distribution of positive correlation between annual total revenue and maritime loan repayment. The test statistic for the respondents' distribution is shown in Table 16.

Table 15: Respondents to a positive correlation between annual total revenue of maritime CVFF loan repayment

	Observed N	Expected N	Residual
Strongly disagreed	23	49.5	-26.5
Disagreed	12	49.5	-37.5
Agreed	77	49.5	27.5
Strongly Agreed	86	49.5	36.5
Total	198		

Table 16: Test statistics of respondents to a positive correlation between annual total revenue of maritime CVFF loan repayment

	The annual total revenue of maritime companies positively correlates with the repayment of CVFF loans.
Chi-Square	84.788a
Df	3
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 49.5.

Source: SPSS Output, version 23

For the Response variable, the chi-square obtained is 84.788. With 3 degrees of freedom ($4 - 1 = 3$) and a significance level of 0.000, which falls below the 0.05 alpha level, this indicates that Maritime companies' annual total revenue influences CVFF loan repayment. Hence, the null hypothesis was rejected.

5. Discussion of results

This study mainly focused on the effect of shipping company demographic characteristics on cabotage Vessel Finance and Repayment in Nigeria. The research imperially analyzed the effect of shipping companies' internal microeconomic characteristics on Cabotage Vessel Finance and Repayment in Nigeria. The proceeding section presents the results and discussion of the findings.

Relationship between the age of maritime companies and repayment of the CVFF loan.

The first objective sought to determine the relationship between maritime companies' age and CVFF loan repayment. Findings revealed that the age of maritime companies significantly influenced the CVFF loan repayment. This finding is in connection with (Nawai, 2012), whose study on factors affecting repayment performance in microfinance programs revealed that age, gender, total income and formal religious education significantly affected borrowers' repayment performance. Similarly, according to (Fafchamps, 1997), "demographic characteristics of a company such as age, size, and sector usually

increase with the size of the firm. It is easier for larger firms to obtain credit and financing than smaller ones".

Relationship between the number of vessels, including barges, dredgers, platforms, rigs, shipyards owned by maritime companies and CVFF loan repayment.

The second objective considered the relationship between the number of vessels, including barges, dredgers, platforms, rigs, shipyards owned by maritime companies and CVFF loan repayment. The findings revealed that demographic characteristics such as age and size of business, number of vessels owned and or chartered, number of employees, annual total revenue, cash flow and creditworthiness are determinants for benefiting in the CVFF fund. The finding also aligns with (Fafchamps et al., 1994) research, which opined that 'the use of credit by firms as a source of enterprise financing increases with the size of the firm and its assets'.

Relationship between the number of maritime companies' employees and CVFF loan repayment.

The findings revealed that the number of maritime companies' employees influences CVFF loan repayment. This finding is linked to the conclusion of (Balogun & Alimi, 1988), who concluded "that number of employees, education, loan diversion, monitoring, marital status and income are significant factors that influence loan default in Small-Farmer Credit Programme in Nigeria".

Relationship between annual total revenue of maritime companies and repayment of CVFF loan.

Findings revealed that the annual total revenue of maritime companies depends on cash flow, interest rate, charter rate and cargo throughput, which influences CVFF loan repayment. This finding could be linked to (Makorere, 2014), who examined the "factors affecting loan repayment behaviour and concluded that the uttermost factors like revenue, interest rate, grace period, profitability, moral hazard and economic stability have strong effects in stimulating loan repayment". (Alexandros & Mariniki, 2006) also suggested that "shipping loan or ship project/cash flow financing depends on freight rate revenues. Freight rates revenues depend on profitable maritime operations and external factors such as shipping circle and currency devaluation".

The above-outlined demographic characteristics are the internal factors for measuring the probability that prospective beneficiaries of the CVFF loan will likely default on their financial obligations, as explained in the probability of Credit Default theory. These demographic characteristics lead to shipping companies' microeconomic corporate financial conditions. The age, number of vessels, number of employees and total annual revenue indicate the company's asset size and financial strength. The higher the total revenue and assets over the company's liabilities, the greater the probability of fulfilling its financial obligations.

6. Conclusion

This study concludes that demographic characteristics such as the age of maritime companies, the number of vessels including barges, dredgers, platforms, rigs, and shipyards owned by maritime companies, the number of maritime companies' employees and the annual total revenue of maritime companies influences the repayment CVFF loan. The research also identifies Poor Cash flow and Weak Revenue base, Insufficient Collateral, Security and Guarantee, low Credit Rating and Creditworthiness, Inadequate Business proposal and plan, Charter Rate and Cargo throughput, High Transactional Cost and Weak corporate management of Maritime Operations and Asset as organizations' microeconomic factors that influence CVFF loan repayment.

Finally, the research proposed strict monitoring of CVFF loans, sustainable cash flow and revenue projection, creditworthiness, and Long-term Repayment periods as solutions to CVFF loan repayment. The 7Cs of the credit appraisal model are valuable tools for evaluating prospective maritime companies' creditworthiness to ensure the full recovery of the CVFF loan.

The study recommends that:

1. The demographic characteristics (age of maritime companies, the number of vessels including barges, dredgers, platforms, rigs, shipyards owned by maritime companies, number of maritime companies' employees and annual total revenue) of a prospective borrower indigenous

maritime operator should be duly professionally evaluated to ensure they have a sustainable cash flow and revenue projection during and after granting CVFF loans to guarantee complete repayment.

2. Maritime Operators should improve their revenue and collateral base to meet the requirements of NIMASA and the Primary lending institutions (Banks) for benefiting from the CVFF loan.
3. Finally, it is recommended that NIMASA should act as a Regulator and Guarantor of CVFF loans according to international best practices, while the Primary Lending Institutions professionally manage and strictly monitor CVFF loan performance throughout the loan period. Defaulting beneficiary indigenous maritime company's assets should be taken over by Asset Management Company of Nigeria (AMCON) to recover the loans.

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Conflicts of interest

The authors declare no conflict of interest.

Data availability

Some or all data and models that support the findings of this study are available from the corresponding author upon reasonable request.

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