

Sources of Finance and Financial Performance of Downstream Petroleum Firms in Nigeria

Rasheed Olatunji ANIMASAUN*

Department of Accounting, College of Social and Management Sciences, Crescent University, P.M.B. 2104
Sapon, Abeokuta, Ogun State, Nigeria

Abdul Ganiyu A. BABAYANJU

Department of Accounting, College of Social and Management Sciences, Crescent University, P.M.B. 2104
Sapon, Abeokuta, Ogun State, Nigeria

Abstract

This study examined the various sources of finance employed by the downstream petroleum firms in Nigeria. It also determined the effect of long-term finance on profitability. Furthermore, it ascertained the impact of short-term finance on profitability and found out the relationship between the medium-term finance and profitability in view of providing information of the significant effect of long-term and short-term finance on financial performance. The study employed secondary source of data. The technique of analysis was fixed-effect model through the panel data collected. The research design is quantitative. The targeted population consisted of 25 downstream petroleum firms in Nigeria from which a sample size of 20 firms was selected using a purposive sampling technique. Data were sourced on variables such as profit after tax; long-term source of finance, short-term source of finance and medium-term source of finance from the audited financial statements of downstream petroleum firms. The data collected from the audited financial statements of the 20 firms covered 5 years between the periods of 2011-2015. The results of the study revealed that sources of finance as a whole significantly affected organizational performance in the downstream petroleum industry in Nigeria as F-statistic = 249.1042 with Prob. value = 0.0000. Also, it was found that the results of the study were in consonance with the theoretical apriori expectations. Moreso, the study revealed that long-term finance significantly affected profitability as the t-value of long-term finance was -5.644289 with its attendant Prob. value = 0.0000. Furthermore, it was found that short-term finance significantly impacted on profitability as the t-value of short-term finance was 9.881206 with its attendant Prob. value = 0.0000. Moreover, the study revealed that there was direct relationship between the medium-term finance and profitability as the slope of coefficient was 0.178386. This indicated that 1% increase in medium-term finance would make the profitability to increase by 17.8%. The study concluded that in as much as sources of finance affected financial performance of downstream petroleum firms in Nigeria, the management and board of directors should pay attention to the utilization of these sources particularly short-term finance so as to avoid mismatch.

Keywords: Sources, Finance, performance, downstream, petroleum, and profit-after tax.

1. Introduction

Finance is the elixir that assists in the formation of new business, and allows business to take advantage of opportunities to grow, employ local workers and in turn support other businesses as well as all levels of government through the remittance of income taxes. The strategic use of sources of finance, such as loans and stocks, is the key to the success of every business (Carpenter and Petersen, 2011). Finance is the process of creating, moving and using money as it facilitates global money flow (Daniel and Reitsperger, 2009). When some elements of finance process break down, companies go out of business and the economy moves into recession. All facets of the global economy depend upon an orderly process of the finance. Oil is a major source of energy in Nigeria and the world in general. Oil being the mainstay of the Nigerian economy plays a vital role in shaping the economic and political destiny of the country. Although, Nigeria's oil industry was discovered at the beginning of the century, it was not until the end of the Nigeria civil war (1967 - 1970) that the oil industry began to play a prominent role in the economic life of the country (Odularu, 2008). The growth of petroleum industry in Nigeria appears to have brought dramatic changes in the structure of the economy since 1970. In less than a decade, agriculture's share of gross domestic product (GDP) declined from roughly one-half to less than 30% and its erstwhile pre-eminence as generator of state revenue and foreign exchange all but vanished (Aigbedion and Iyayi, 2007). Downstream oil is the refining of crude oil into petroleum products, the distribution and marketing of those products.

Empirical evidence from the developed and few emerging economies have shown that the petroleum industries particularly downstream sector tend to influence the entire economy of the nation, but without adequate finance for these firms the operation, business friendly environment, effective management, and growth-oriented government policies will not thrive as expected (Amir and Lev, 2010). However, source of finance is a major problem for most downstream petroleum firms as it often constitutes a limiting factor in the scheme of things. Avolio, (2012) opined that the continued existence of any downstream petroleum industry does not only predicate

on its ability to source for fund but rather on its strategies to make better application so as to avoid mismatching. Also, Banker, Potter and Schroeder, (2011) argued that the downstream petroleum industry needs to finance short-term project with short-term finance and long-term investment with long-term finance which is the pre-requisite to the concept of 'going concern' basis and better financial performance.

No one can start a business or run a business without adequate funds. The amount of capital required depends upon the nature and size of business. Finance required for downstream petroleum firms may consist of owners' contribution and borrowings from different sources (Ouchi, 1979). The importance of finance arises basically due to the time lag between revenue generated through sales and the initial expenditure. Availability of finance is therefore, considered essential for day-to-day activities as well as for investment in durable (fixed) assets. The importance of finance has increased and will continue to increase with the growth of business and industry. This is because large scale production and distribution require considerably large amount to be invested in downstream petroleum business. Even then, the necessity of finance does not come to an end with the commencement of business (Simons, 1990). Additional funds are needed from time to time for expansion. Furthermore, changing environment of business and increasing competition may require new methods of production or distribution to be adopted, or plant and machinery to be modernised, or new products to be introduced in the market. In the absence of additional investment for such purposes it may be impossible for the business to survive. Finance plays such a vital role in modern enterprise that it is often said to be the lifeblood of business. Finance is needed at every stage in the life of a business. It must be available at the proper time. It must also be adequate for the purpose for which it is needed. Insufficient funds may affect the growth of the firm adversely. All economic activities in the modern world centre round the use of finance. The term finance "means money or funds". Financing means making money available when it is needed. Business finance refers to money required for business purposes. Sources of finance remain a controversial issue in finance literature because of its dynamic nature of corporate financing mix, which takes the stage of many events in firms' activities (Anthony, 2012).

Corporate sources of finance are generated either internally or externally. The importance of sources of finance lies in its pivotal role in satisfying long-term physical investment needs across all sectors of the economy and specifically they are key drivers of growth, competitiveness and procurement of assets such as the infrastructure, real estate, research & development and new ventures. The financial sector plays an essential role in providing and channelling financing for investment. The recent financial performance, the current financial position and the expected future financial performance of the downstream petroleum firms need to be taken into account, when considering the source of finance to be used by the industry. When evaluating recent or forecasting financial performance, key areas to consider include the growth in turnover, the growth in operating profit, the growth in profit after tax and the movement in profit margins. Return on capital employed and return on equity could be calculated. A fundamental part of reigniting growth is ensuring the availability of sufficient resources to meet long-term investment needs.

Downstream performance refers to ability of an enterprise to achieve such objectives as high profit, quality product, large market share, good financial results, and survival at pre-determined time using relevant strategy for action (Kale and Noe, 2012). Organizational performance can also be used to view how an enterprise is doing in terms of level of profit, market share and product quality in relation to other enterprises in the same industry. The term "Performance Management and Measurement" refers to any integrated, systematic approach to improving organizational performance so as to achieve strategic aims and promote an organization's mission and values (Fisher, 2011). It is also referred to the accomplishment of a given task measured against pre-set known standards of accuracy, completeness, cost, and speed (Eccles, 1991).

1.1 Research Questions

In view of the subject matter, certain pertinent research questions were designed for investigation to put the study in its right perspective. These were:

- i. What effect do sources of finance have on financial performance of downstream petroleum firms?
- ii. To what extent has long-term finance impacted on profit after tax of downstream petroleum firms?
- iii. What is the effect of short-term finance on the performance of downstream firms?

1.2 Statement of Objectives

The general objective of this study is to establish the effect of sources of finance on financial performance of downstream petroleum firms in Nigerian economy. Specifically, the research objectives are to:

- i. determine the extent to which long-term finance impacts on firm's profitability; and
- ii. ascertain the effect of short-term finance on profitability

1.3 Statement of Hypotheses

Having considered both the research questions and the objectives of the study, the following research hypotheses

were tested;

- i.** **H₀:** Sources of finance as a whole do not significantly affect organisational performance.
- ii.** **H₀:** There is no significant effect of long-term finance on profitability.
- iii.** **H₀:** There is no significant effect of short-term finance on financial performance of the downstream petroleum industry.

2. Review of Related Literature

2.1 Sources of Finance Concept

The primary responsibility of financing a business venture is that of the owners of the business (Atkinson, Waterhouse and Wells, 1997). However, loans and credits also meet the financial requirements of business firms. In sole proprietorship business, the individual proprietor generally, invests his own savings to start with. He may reinvest a part of the profits earned in course of time. He may also borrow money on his personal security or the security of assets. Similarly, the capital of a partnership firm consists partly of funds contributed by the partners and partly of borrowed funds. If necessary they may also decide to reinvest their own shares of profit. The company form of organisation enables the promoters to raise necessary funds from the public, who may contribute capital and become shareholders of the company. In course of its business, the company can raise loans directly from banks and financial institutions or by issue of debentures to the public.

Besides, profits earned may also be reinvested instead of being distributed as dividend to the shareholders. Thus, for any business enterprise, there are two sources of finance, that is, funds contributed by owners, and funds available from loans and credits (Barclay and Smith, 1995). In other words, the financial resources of a business may be provided by owners' funds and borrowed funds.

2.1.1 Types of Business Finance

Bruns and McKinnon, (1993) pointed out that funds are required by business firms for different purposes — to acquire fixed assets, to provide for operating expenses, and to improve methods of production. Depending on the nature and purpose to be served, we may distinguish between three types of finance. These are:

- (i) Long term finance;
- (ii) Medium term finance;
- (iii) Short term finance.

Long term finance: Funds which are required to be invested in the business for a long period (say more than five years) are known as long term finance (Barth and Mc Nichols 1994). It is also known as long term capital or fixed capital. This type of finance is used for acquiring fixed assets, such as land, building, plant and machinery, etc. The amount of long term funds required naturally depends on the type of business and the investment required for fixed assets. For example, the manufacture of steel, cement, chemicals, etc. involve heavy expenses to be incurred on buildings, machinery and equipments. A small factory or a small workshop repairing electrical goods will require much smaller investment in fixed assets (Bass, 1990).

On the other hand, traders generally, require smaller amounts for long term investment as compared to the requirement of manufacturers. This is because trading concerns do not require expensive long-lived assets to be used for their activities. The size of the business firm also determines the amount to be invested in fixed assets. Large scale manufacturing and trading activities will obviously require more long term capital than small scale enterprises (Bencivenga, Valerie, and Bruce Smith 1991). Long term finance is required for acquisition of assets and modernisation purposes.

Medium term finance: Business firms often need funds for a period exceeding one year and not more than 5 years for particular purposes (Berger, and Udell, 1995). This is referred to as medium term finance or medium term capital. They may include expenses on modernisation of plant and machinery, or introduction of a new product, adoption of new methods of production or distribution, or an advertisement campaign (Bolton, and Scharfstein, 2010).

The necessity of this type of finance generally, arises on account of changes in technology or increasing competition. Manufacturing industries are more often in need of such finance. The amount required depends on the nature or purpose. The expenditure incurred is regarded as an investment because higher returns are expected out of it (Brown, Martin, Tullio and Pagano, 2007).

Short term finance: This type of finance is required for a short period up to one year. It refers to funds needed to meet day-to-day requirements and for holding stocks of raw materials, spare parts, etc. to be used for current operations (Calomiris and Himmelberg, 1996). Short term finance is often called working capital or short term capital, or circulating capital. As soon as goods are sold and funds are recovered the amount is again used for current operations. Generally, speaking, production processes are completed within a year and goods are ready for sale. Hence, short term funds can be used over and over again from year to year. How much short term finance will be required depends on (a) the nature of business undertaken; (b) the time gap between commencement of production or purchase of goods and their sale; and (c) the volume of business (Chenhall, 1997).

Trading firms normally require proportionately more of short term capital than long term capital.

Manufacturing concerns, on the other hand, need relatively smaller amounts of short term capital as compared to long term capital. Again, if production time and the time gap between production and sale is shorter (say one or two months), it will require much less short term finance than if the time gap is one year (Chong, 1996). The volume or scale of business activity also determines the amount of short term finance. Thus, a small factory needs much less short term capital than a large manufacturing enterprise.

2.1.2 Owners Funds or Ownership Capital

It may be useful to distinguish between the term funds and the term capital. Ownership capital consists of the amounts contributed by owners as well as profits. This is because profits ultimately belong to the owners. But the term fund has wider scope and coverage. It includes the profits reinvested in the business, and amounts received from any other inward remittance. The key features of ownership funds are as follows:

- (i). Provision of risk capital: One major characteristic of owner's fund as a source of finance is that it provides risk capital. It is known as risk capital because every business runs the risk of loss or low profits, and it is the owners who bear this risk. In the event of low profits they do not have adequate return on their investment. If losses continue, the owners may be unable to recover even their original investment after meeting the loan obligations. However, in times of prosperity and in the case of a flourishing business the high level of profits earned accrue entirely to the owners of the business.
- (ii). Permanent source of capital: The second characteristic of this source of finance is that ownership capital remains permanently invested in the business. It is not refundable like loans or borrowed capital. Hence, a large part of it is generally, used for acquiring long term fixed assets. It is also used to finance a part of the working capital which is permanently required to hold a minimum amount of cash, stocks etc. Besides, this type of finance is available for all purposes throughout the life of the business.
- (iii). Separation of ownership and management: Another characteristic of ownership capital relates to the management of business. In case of a company, it is managed by the officers under the control and supervision of the board of directors, who are elected by the shareholders. Although the owners of the company are the shareholders, the responsibility of management does not rest with them.
- (iv). No security required: No security of assets is to be offered against ownership capital.

2.1.3 Institutional Finance

Collins, Holtzmann and Mendoza, (1997) opined that Institutional finance refers to institutional sources of finance to industry. These financial institutions or financial intermediaries or agencies act as a link between savers and investors. These financial institutions offer finance and financial services in areas which are outside the purview of traditional commercial banking (Conger, 1999). The term institutional finance generally, includes: (a) Capital Market (b) Special Financial Institutions (c) Mutual Funds (d) Leasing Companies

2.1.4 Performance as a Multi-dimensional Concept

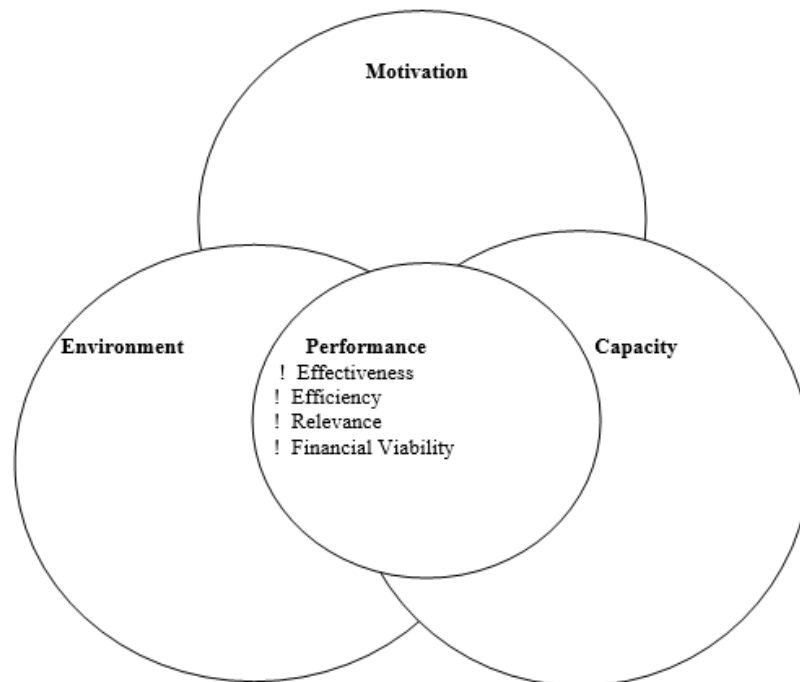
Performance is a multi-dimensional concept. On the most basic level, Borman and Motowidlo (1993) distinguish between task and contextual performance. Task performance refers to an individual's proficiency with which he or she performs activities which contribute to the organization's 'technical core'. This contribution can be both direct (e.g., in the case of production workers), or indirect (e.g., in the case of managers or staff personnel). Contextual performance refers to activities which do not contribute to the technical core but which support the organizational, social, and psychological environment in which organizational goals are pursued. Contextual performance includes not only behaviours such as helping co-workers or being a reliable member of the organization, but also making suggestions about how to improve work procedures.

Three basic assumptions are associated with the differentiation between task and contextual performance (Borman & Motowidlo, 1997; Motowidlo & Schmit, 1999): (1) Activities relevant for task performance vary between jobs whereas contextual performance activities are relatively similar across jobs; (2) task performance is related to ability, whereas contextual performance is related to personality and motivation; (3) task performance is more prescribed and constitutes in-role behaviour, whereas contextual performance is more discretionary and extra-role.

2.1.5 Measures and Factors Affecting Performance

In the schematic representation of our framework shown below, performance is defined in terms of effectiveness (mission fulfilment), efficiency, on-going relevance (the extent to which the organization adapts to changing conditions in its environment), and financial viability (Quinn, 1988). The framework implies that certain contextual forces drive performance: the capacities of an organization, forces in its external environment, and the internal motivation of the organization.

Conceptual model of factors Affecting Performance:



External Environment:

Organizations exist within certain external contexts or environments that facilitate or impede their performance. Key factors are the policy or regulatory environment, and in the economic, political, socio-cultural, environmental and technological contexts, they affect how the organization does its work, or the work it does.

Internal Motivation:

Internally, performance is driven by the organization's motivation to perform, which refers to the organizational culture, history, mission, values and incentive systems (Pagano and Marco, 1993). These factors affect the quality of work, the nature of how the organization competes, and the degree of involvement of internal stakeholders in decision-making processes.

Capacity:

Performance is driven, in part, by organizational capacity, which we now understand as existing in seven basic areas: strategic leadership, human resources, financial resources, infrastructure, programming and process management, and inter-institutional linkages (Otley, and Berry, 1980). Each of these seven capacity areas may be described in sub-components, as for example in the organization's strategic leadership capacity which is understood as its structure, governance, leadership, strategic plans and niche management. Human resources, financial resources and infrastructure are seen as resources as well as the management of these resources. Organizations also have capacities that result from the relations, partnerships and alliances they have established with other organizations— referred to as inter-institutional linkages (Naaborg, Scholtens, De Haan, Bol, and De Haas, 2003).

2.1.6 Organizational Performance versus Organizational Effectiveness

Although organizational performance dominates the strategic management literature, not to mention economics, finance, and accounting, it is not unchallenged. Performance is one type of effectiveness indicator, with some advantages and disadvantages. Hence, we first need is to distinguish between organizational performance and the more general construct of organizational effectiveness (Venkatraman & Ramanujam 1986). Organizational effectiveness is a broader construct that captures organizational performance, but with grounding in organizational theory that entertains alternate performance goals (Cameron & Whetten 1983). Management research in general, and strategic management research more specifically, has taken a much more limited empirical view, emphasizing the central role of accounting, financial and stock-market outcomes. To simplify this discussion and keep some consistency with the usage in the literature we will distinguish between the domains of organizational effectiveness and organizational performance.

Organizational performance encompasses three specific areas of firm outcomes: (1) financial performance (profits, return on assets, return on investment, etc.); (2) market performance (sales, market share, etc.); and (3) shareholder return (total shareholder return, economic value added, etc.).

Organizational effectiveness is broader and captures organizational performance plus the plethora of internal performance outcomes normally associated with more efficient or effective operations and other external measures

that relate to considerations that are broader than those simply associated with economic valuation (either by shareholders, managers or customers), such as reputation. Although innovation and efficiency measures are generally placed into the wider conceptual domain of 'organizational effectiveness' (Cameron & Whetten, 1983; Venkatraman & Ramanujam, 1986), other management researchers have taken these same variables as their dependent performance measure (Capon et al., 1990; Hall et al., 2005). For instance, Wu et al. (2005) use patient outcomes as a control variable capturing performance and several papers adopt effectiveness measures that they describe as measuring performance. The implementation of balanced scorecards has also increased the attention given to wider aspects of organizational effectiveness.

Although primarily used for internal management and control, balanced scorecards explicitly include measures of financial performance, customer outcomes, innovation and internal processes (Kaplan & Norton, 1996). However, in doing so they are more closely tailored to each individual firm. Allowing for this tailoring in order to compare firms would be almost impossible, given that the implementation of a balanced scorecard for a single firm is already complex and difficult (Neely & Bourne, 2000; Schneiderman, 1999). It is for this reason that organizational performance dominates organizational effectiveness for management researchers.

The narrower domain of organizational performance provides the useful potential to make meaningful comparisons across firms and industries. However, what is evident is that even with a narrower domain organizational performance is not a one-dimensional theoretical construct nor is it likely to be characterizable with a single operational measure. Although the multi-dimensionality of performance is recognized in accounting (Callen, 1991) and finance (Henri 2004) and discussed theoretically in the management literature (Venkatraman & Ramanujam, 1986).

2.1.7 Downstream firms

In relation to the petroleum industry, the downstream consists of the post-production stages of crude oil until the various products derived from the crude oil pass to the final consumers. Petroleum firms operating in the refining, marketing and distribution of petroleum products which apparently are activities subsequent to the production are said to have downstream interest (Omorogbe, 2004). The downstream sector is the part of the oil industry involved with purifying crude oil and refining it into different products (OPEC, 2013). It also involves the transportation and marketing of crude oil and its products.

2.2 Theoretical Review

2.2.1 Pecking Order

The pecking order theory stems from Myers (1984) who in turn was influenced by the earlier institutional literature including the book by Donaldson (1961). Myers (1984) argues that adverse selection implies that retained earnings are better than debt and debt is better than equity. This ranking was motivated with reference to the Myers and Majluf's (1984) adverse selection model. The ordering, however, stems from a variety of sources including agency conflicts and taxes.

Myers (1984) defined that a firm is said to follow a pecking order if it prefers internal to external financing and debt to equity if external financing is used.

This definition can be interpreted in different ways. What does it mean to "prefer" internal financing? Does this mean that the firm uses all available sources of internal finance before using any debt or equity issues? Or does this mean that, "other things equal", the firm will mostly use internal financing before using external financing? If the verb "prefer" is interpreted strictly the theory is more testable. If "prefer" is interpreted in the "other things equal" way, then any test of the theory rests on the specification of "other things equal." Most firms hold some internal funds (cash and short-term investments) even when raising outside funds. This is so obvious that it is rarely considered in tests of the pecking order. It is implicitly assumed that these funds are held for reasons that are outside the theory, such as for transactions. Accordingly, almost all discussions maintain some version of an "other things equal" interpretation of the relative use of internal and external funds.

A second problem for the definition concerns the preference of debt over equity. As we will see, initial claims for the theory tended to rest on a strict interpretation in which equity is never issued if debt is feasible. As it has become increasingly clear that this strict interpretation is not only more refutable, but actually refuted, proponents of the pecking order theory have moved increasingly to the "other things equal" interpretation. Different papers invoke different empirical versions of "other things equal." Of course, the more a test depends on the other things, the less the data is explained by the pecking order itself. At what point is equity introduced? The strict interpretation suggests that after the IPO, equity should never be issued unless debt has for some reason become infeasible. This leads to the notion of a "debt capacity." The debt capacity serves to limit the amount of debt within the pecking order and to allow for the use of equity. Obviously, this raises the problem of defining the debt capacity. The literature provides no agreed upon definition. Several recent papers have used factors commonly employed in tests of the trade-off theory, in order to define the debt capacity. Of course, this leads to difficulties in interpreting the results. Pecking order models can be derived based on adverse selection considerations, agency considerations, or other factors. There seem to be a couple of common features that underlie pecking order theories.

The first feature is the linearity of the firm's objective function. This helps because it means that costs tend to drive the results to corner solutions. The second common feature of pecking order models is the relative simplicity of the model. The pecking order hierarchy is a relatively simple structure. A model that is complex is unlikely to have such a simple solution. When many things are factored in, a more complex range of things tend to happen. Thus, it seems that the pecking order is generally more likely to emerge from an illustrative model than it is from a unifying model.

2.3 Empirical Review

The result of Ravindranath (2012) showed that relationship exists between the performance of the organisation and the financing options. He used only secondary data to arrive at his conclusion.

Christa, Garashi, Odhiambo and Ochieng (2012) investigated Effect of Financial Restructuring on Organization Performance. The study employed casual research design and questionnaire which is the research instrument for primary data. They concluded that financial restructuring had greatest impact on the performance particularly among the mobile services providing industry.

William (1996) examined Organizational Learning and performance through the approach of case-study methods. He tried to examine the concept of learning and knowledge and their influences on the performance of an organization. In conclusion, the study believes that there is strong connection between the dependent variable and the independent variables.

Corina, Liviu and Roxana (2011) studied Determinants of Organizational performance. They argued that knowing the determinants of organizational performance is important especially in the context of the current economic crises because it enables us to identify those factors that should be treated with an increased interest in order to improve the organizational performance. In arriving at the conclusion, a sample of 92 Romanian manufacturing companies was collected through survey design. A simple linear regression was employed to conclude that there is a strong relationship between the determinants, such as structure, leadership, environment etc, and the organizational performance.

3. Methodology

3.1 Area of Study

The operational area is the downstream petroleum industry while the geographical area of the study is Nigeria, particularly, Lagos State. Lagos state had been chosen because of easy availability and accessibility to information so as to have focus without compromising the representativeness and accuracy of data.

3.2 Research Design

The essence of methodology is to explain the methods and procedures employed to gather data and the techniques adopted in the analysis of data collected, in order to draw logical conclusions that will provide the basis for validating or nullifying the propositions made in the study. This study therefore, employed quantitative research design. Towards achieving the objectives of this study, three (3) hypotheses were tested. Inferential statistics was used to analyse the dependence of one variable on the other.

3.3 Population, Sample and Sampling Technique

The targeted population for this study are twenty-five (25) downstream petroleum firms in Nigeria from which a purposive sampling technique was employed to select twenty (20) as sample size. The purposive sampling technique was used because the necessary and desirable information was only found in the sampled firms.

3.4 Model Specification

$$FP = f(SOF)$$

FP means financial performance while SOF denotes sources of finance. The constituents of sources of finance are; long-term, short-term and medium-term finance while profit after tax (PAT) was used as a proxy for FP.

$$\text{Therefore, } FP = f(LTF, STF, MTF)$$

$$\text{LogPAT}_{it} = A_0 + A_1 \text{LogLTF}_{it} + A_2 \text{LogSTF}_{it} + A_3 \text{LogMTF}_{it} + \mu_{it}$$

Where:

PAT means profit after tax and it served as a proxy for financial performance in the above equation.

LTF means long-term finance and it served as one of the proxies for sources of finance in the equation.

STF means short-term finance and it served as one of the proxies for sources of finance in the equation.

MTF denotes medium-term finance and it served as one of the proxies for sources of finance in the equation.

A_0 is the intercept i.e the average value of PAT where LTF, STF, and MTF equal zero.

A_1 , A_2 and A_3 are the partial slope coefficients.

μ is the stochastic error term.

Apriori Expectation

This explains the theoretical linkage between the signs and magnitude of parameters of the specified function. A priori expectations are determined by the principles of economic theory guiding the economic relationship among the variables under the study (Koutsoyiannis, 2003). The theoretical a priori expectations set by the economic theory for the model were as follows: $A_1 < 0$, $A_2 > 0$, $A_3 > 0$.

We should expect, according to the general theoretical basis, the following findings:

The parameter A_1 is expected to have a negative sign which postulates an inverse relationship between long-term finance and profit after tax.

The parameter A_2 is expected to have a positive sign which suggests a direct relationship between short-term finance and profit after tax.

The parameter A_3 is expected to appear with a positive sign which indicates a direct relationship between medium-term finance and profit after tax.

4. Presentation of Results and Findings

4.1 Presentation of Results

LNPAT Dependent variable				
Parameters	Statistics	Pooled	Fixed Effect	Random Effect
Constant	Coefficient	-0.710806	-1.277624	-1.069735
	Std. Error	0.148080	0.102745	0.107998
	t-Statistic	-4.800148	-12.43491	-9.905110
	Prob.	0.0000	0.0000	0.0000
LogLTF	Coefficient	-2.383995	-1.201741	-2.094526
	Std. Error	0.158335	0.212913	0.141781
	t-Statistic	-15.05663	-5.644289	-14.77301
	Prob.	0.0000	0.0000	0.0000
LogSTF	Coefficient	2.856580	1.972903	2.715019
	Std. Error	0.170016	0.199662	0.037230
	t-Statistic	16.80183	9.881206	9.203409
	Prob.	0.0000	0.0000	0.0000
LogMTF	Coefficient	0.487931	0.178386	0.342645
	Std. Error	0.054921	0.043604	0.037230
	t-Statistic	8.884187	4.091079	9.203409
	Prob.	0.0000	0.0001	0.0000
R-square		0.949564	0.986144	0.956338
Adjusted R-squared		0.947988	0.982186	0.954974
F-statistics		602.4731	249.1042	700.9087
F-Stat (p-value)		0.0000	0.0000	0.0000
Durbin- Watson stat		0.783259	1.581272	0.918186
Hausman Chi Sq. and (p-value)			60.742513 (0.0000)	

Source: Compiled by Researcher Using E-views 8

POOL

Dependent Variable: LOG(PAT)
 Method: Panel Least Squares
 Date: 10/08/16 Time: 14:02
 Sample: 2011- 2015
 Periods included: 5
 Cross-sections included: 20
 Total panel (balanced) observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(LTF)	-2.383995	0.158335	-15.05663	0.0000
LOG(STF)	2.856580	0.170016	16.80183	0.0000
LOG(MTF)	0.487931	0.054921	8.884187	0.0000
C	-0.710806	0.148080	-4.800148	0.0000
R-squared	0.949564	Mean dependent var		1.376740
Adjusted R-squared	0.947988	S.D. dependent var		1.893950
S.E. of regression	0.431935	Akaike info criterion		1.198097
Sum squared resid	17.91055	Schwarz criterion		1.302303
Log likelihood	-55.90483	Hannan-Quinn criter.		1.240271
F-statistic	602.4731	Durbin-Watson stat		0.783259
Prob(F-statistic)	0.000000			

FEM

Dependent Variable: LOG(PAT)
 Method: Panel Least Squares
 Date: 10/08/16 Time: 14:03
 Sample: 2011- 2015
 Periods included: 5
 Cross-sections included: 20
 Total panel (balanced) observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(LTF)	-1.201741	0.212913	-5.644289	0.0000
LOG(STF)	1.972903	0.199662	9.881206	0.0000
LOG(MTF)	0.178386	0.043604	4.091079	0.0001
C	-1.277624	0.102745	-12.43491	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.986144	Mean dependent var	1.376740
Adjusted R-squared	0.982186	S.D. dependent var	1.893950
S.E. of regression	0.252787	Akaike info criterion	0.286095
Sum squared resid	4.920390	Schwarz criterion	0.885284
Log likelihood	8.695263	Hannan-Quinn criter.	0.528597
F-statistic	249.1042	Durbin-Watson stat	1.581272
Prob(F-statistic)	0.000000		

REM

Dependent Variable: LOG(PAT)
 Method: Panel EGLS (Cross-section random effects)
 Date: 10/08/16 Time: 14:04
 Sample: 2011- 2015
 Periods included: 5
 Cross-sections included: 20
 Total panel (balanced) observations: 100
 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(LTF)	-2.094526	0.141781	-14.77301	0.0000
LOG(STF)	2.715019	0.140172	19.36915	0.0000
LOG(MTF)	0.342645	0.037230	9.203409	0.0000
C	-1.069735	0.107998	-9.905110	0.0000

Effects Specification		S.D.	Rho
Cross-section random		0.205688	0.3983
Idiosyncratic random		0.252787	0.6017

Weighted Statistics			
R-squared	0.956338	Mean dependent var	0.663122
Adjusted R-squared	0.954974	S.D. dependent var	1.507592
S.E. of regression	0.319901	Sum squared resid	9.824327
F-statistic	700.9087	Durbin-Watson stat	0.918186
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.940779	Mean dependent var	1.376740
Sum squared resid	21.03037	Durbin-Watson stat	0.604408

HAUSMAN TEST

Correlated Random Effects - Hausman Test
 Equation: Untitled
 Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	60.742513	3	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LOG(LTF)	-1.201741	-2.094526	0.025230	0.0000
LOG(STF)	1.972903	2.715019	0.020217	0.0000
LOG(MTF)	0.178386	0.342645	0.000515	0.0000

Cross-section random effects test equation:

Dependent Variable: LOG(PAT)

Method: Panel Least Squares

Date: 10/08/16 Time: 14:05

Sample: 2011- 2015

Periods included: 5

Cross-sections included: 20

Total panel (balanced) observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.277624	0.102745	-12.43491	0.0000
LOG(LTF)	-1.201741	0.212913	-5.644289	0.0000
LOG(STF)	1.972903	0.199662	9.881206	0.0000
LOG(MTF)	0.178386	0.043604	4.091079	0.0001

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.986144	Mean dependent var	1.376740
Adjusted R-squared	0.982186	S.D. dependent var	1.893950
S.E. of regression	0.252787	Akaike info criterion	0.286095
Sum squared resid	4.920390	Schwarz criterion	0.885284
Log likelihood	8.695263	Hannan-Quinn criter.	0.528597
F-statistic	249.1042	Durbin-Watson stat	1.581272
Prob(F-statistic)	0.000000		

Hausman Specification Test

In a bid to select the use of the best model for the panel data regression analysis, series of tests were carried out. According to Yaffee (2005) either of the fixed-effects or random-effects would be the best linear unbiased estimator (BLUE). To achieve this, the Hausman specification test was used.

Decision Rule

Null hypothesis: Random-effect model is appropriate if the Hausman specification test p-value is greater than 5 per cent.

Alternative hypothesis: Fixed-effect is appropriate if the Hausman specification test p-value is 5 per cent or less. From table above, the Hausman test clearly rejects the null hypothesis, for the estimated Chi Sq. (X^2) and p-value of 60.742513 (0.0000) are highly and statistically significant. Therefore, the Fixed-effect model was adopted and analysed in this study.

4.2 Analysis of Parameters under Fixed-Effect

By using E-views package, I have:

$$\text{LogPAT}_{it} = -1.277624 - 1.201741 \log \text{LTF}_{it} + 1.972903 \log \text{STF}_{it} + 0.178386 \log \text{MTF}_{it}$$

$$\text{S.E} = (0.102745) \quad (0.212913) \quad (0.199662) \quad (0.043604)$$

$$\text{t-statistic} = (-12.43491) \quad (-5.644289) \quad (9.881206) \quad (4.091079)$$

$$R^2 = 0.986144$$

$$\text{Adjusted R-squared} = 0.982186$$

$$\text{F-statistic} = 249.1042$$

$$\text{Prob. Value} = 0.0000$$

$$\text{DW} = 1.581272$$

Parameters

From the result above, the intercept value of -1.277624 signifies that if the value of LTF, STF, and MTF are zero, then the average value of log (PAT) will be -1.277624.

Also, the slope coefficient of LTF is negative. It shows that there is inverse relationship between the Profit after tax and the Long-term finance. Thus, the slope coefficient shows that if LTF increases by 1%, the PAT will fall by 120% while other predictors are held constant.

The partial regression coefficient of STF is positive. By implication, the slope explains that the Profit after tax will increase by 197% as a result of an increase in Short-term finance by 1%.

Similarly, the partial regression coefficient of MTF is positive. It shows that any increase in Medium-term finance by 1% will occasion an increase in Profit after tax by 17.8% with other explanatory variables held

constant.

4.3 R² – Coefficient of Determination

From the result of the model above, it can be observed that R² is 0.986144. This means that the 98.6% of the variation in dependent variable that is, profit after tax is explained by the combined variation in explanatory variables namely, long-term, short-term and medium-term sources of finance. This shows a very good fit and tells us that the remaining 1.4% variation in dependent variable is attributable to the stochastic variable that is μ term.

4.4 Data Analysis using t-statistic at 5% level of significance.

H₀ = null hypothesis

H₁ = alternative hypothesis

Hypothesis one

H₀: Sources of finance do not significantly affect financial performance.

H₁: Sources of finance significantly affect financial performance

The algebraic expression is:

$$H_0 = 0 \quad H_1 \neq 0$$

The null hypothesis states that if the explanatory variables are combined together, they do not have significant effect on the financial performance while the alternative hypothesis states otherwise. Now, from the result above the F-statistic which shows the combined effect of independent variables on dependent variable is 249.1042 with its attendant Prob. value = 0.0000. This is highly significant,

Decision: the null hypothesis should be rejected and the alternative hypothesis should be accepted (F= 249.10, p < 0.05). In a nut shell, sources of finance significantly affected financial performance in the downstream petroleum industry in Nigeria.

Hypothesis two

H₀: There is no significant effect of long-term finance on profitability.

H₁: There is significant effect of long-term finance on profitability.

The algebraic expression is:

$$H_0: A_1 = 0 \quad H_1: A_1 \neq 0$$

The null hypothesis suggests that, with short-term and medium-term held constant, long-term finance does not impact on the profitability significantly while the alternative hypothesis suggests otherwise. From the result presented and analysed above, the t-value of long-term finance is -5.644289 with its attendant Prob. value = 0.0000. The result is statistically significant.

Decision: the null hypothesis should be rejected while the alternative hypothesis should be upheld (t= -5.64, p < 0.05). As a result, the long-term finance significantly affected the profitability in the downstream petroleum industry in Nigeria.

Hypothesis three

H₀: There is no significant effect of short-term finance on profitability.

H₁: There is significant effect of short-term finance on profitability.

The algebraic expression is:

$$H_0: A_2 = 0 \quad H_1: A_2 \neq 0$$

The null hypothesis states that, with long-term and medium-term held constant, the short-term finance does not significantly affect profitability and the alternative hypothesis suggests otherwise. The t-value of short-term finance, from the above result, is 9.881206 with its attendant Prob. value = 0.0000. This means the result is also statistically significant.

Decision: the alternative hypothesis must be accepted while the null hypothesis should be rejected (t= 9.88, p < 0.05). In view of this, the short-term finance significantly affected profitability in the downstream petroleum industry in Nigeria.

4.5 Findings

The findings of this study agreed with the alternate hypotheses set above. The study employed panel data analysis. It was found that sources of finance affected financial performance of downstream petroleum firms in Nigeria. Based on the methodology adopted in this study, it was revealed that short-term finance affected the performance most in a positive direction. From the foregoing, the following findings were discovered:

One, the sources of finance significantly affected financial performance of downstream petroleum industry in Nigeria. This was revealed by the F-statistic of 249.1042 with p-value of 0.0000. Besides, the R² also showed that the 98.6% variation on the performance was caused by the explanatory variables while the remaining 1.4% variation was accounted for by the error term.

Two, the study revealed that long-term finance significantly affected profitability as the t-value of long-term finance was -5.644289 with its attendant Prob. value = 0.0000.

Three, it was found that short-term finance significantly impacted on profitability as the t-value of short-term finance was 9.881206 with its attendant Prob. value = 0.0000. It was found that it had the highest positive contribution to the profitability. This is because of the absence of finance cost which may serve as one of the deductible expenses on the profitability.

5. Conclusion and Recommendations

5.1 Conclusion

Profitability is one of the crucial indicators for determining the performance of the business concern. The survival of any downstream petroleum firm depends upon its earning capacity. If an enterprise fails to make profit, then the capital employed will be eroded and if this circumstance persists, the enterprise ultimately will go out of the operation. At this point, the research questions that were set above had been answered by the findings one to three. Also, the research hypotheses stated above were tested in order to give more credibility to the conclusion.

Therefore, it is concluded that in as much as long-term finance and short-term finance had significant effects on profitability then, the sources of finance significantly affected financial performance of downstream petroleum firms in Nigeria. The management and board of directors should pay attention to the utilization of these sources particularly short-term finance so as to avoid mismatch.

5.2 Recommendations

The study had examined various issues empirically. In view of the above findings and conclusion, the following recommendations were suggested:

One, the study showed that sources of finance affected the financial performance of downstream petroleum firms in Nigeria. Therefore, the management should always make financing decisions that will allow the achievement of organizational goal. Also, they should try to avoid mismatching in the utilization of the funds. The management should ensure that the working capital policy of the firm is supportive.

Two, the significance of better performance of the downstream petroleum industry to the shareholders on one hand, and to the country's economy on the other hand, cannot be overemphasized, therefore, the board of directors must rise up to the task they are saddled with to ensure better performance.

Three, the financial institutions and capital markets from which long-term finance can be obtained should regulate the interest rates which made the source to have inverse relationship with the performance. They should also review most of the regulations in order to encourage full participation of the downstream petroleum firms.

5.3 Contributions to Knowledge

This study has added to our understanding on the nature of sources of finance as well as financial performance. The result of this study greatly assisted downstream petroleum firms understand the effect of sources of finance on financial performance in a bid to maximize shareholders wealth. The study enabled us to know the trends and pattern of relationship between each source and profitability which helped in making strategic investment and financial decision.

The results of the study helped the financial statement users to make informed and balanced economic decisions and also expanded knowledge on how good utilization of sources of finance could contribute to efficiency and performance of downstream petroleum firms in Nigeria

The downstream petroleum sector in any economy is reputed to be the engine of growth and the ultimate pillar for sustainable growth and development: the result is expected to encourage policy makers to adjust and intensify initiatives or efforts for greater understanding of sources of finance and profitability especially in a petroleum firm.

5.4 Suggestions for further Study

Future studies can pay attention to other sector like the financial sector, real sector, and agricultural sector. Even within the petroleum sector the researchers can look into upstream petroleum firms.

Also, future studies may consider either time series or cross sectional data separately so as ascertain any change in the findings.

Moreover, further studies can examine the effect of sources of finance on organizational performance in terms of non-financial measure.

Further research can concentrate on one source of finance with respect to financial performance rather than combining all the sources in order to determine the correct management policies.

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