

Corporate Strategy on Timing of Cash Flows in Relation to Liquidity Risk and Organisational Performance of Pharmaceutical Industry in Nigeria: Evidence from Panel Data

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Abstract:

The study empirically examined corporate strategy on timing of cash flows in relation to liquidity risk as it affects organizational performance. Presently, the economic situation is very tight which is why it is very difficult if not impossible to procure working capital in money market. Where it is available the associated cost usually which makes the organization to be worse off. The option left to management is to strategies on timing of cash flows as it affects the liquidity risk and performance. The study aimed at realizing four objectives. To achieve the stated objectives, four corresponding research hypotheses were formulated. The population of the study was made of all the pharmaceutical companies in the pharmaceutical industry. Purposive sampling method was employed based on the gross operating profit as a measure of performance of the entities that made up the population. Secondary method of data collection was used because the data collected from the financial statement of the sampled entities had been subjected to certain degree of scrutiny to ensure validity, accuracy and completeness of the information. The study revealed that there is positive correlation between the independent variable (GOP) and explanatory variables (DIH, DSO, DPO and CCC) though very low, except that of the relationship between GOP and DIH. R² Within, Between and overall revealed 54%, 0% and 27% respectively as a measure of the proportion of the variation in the dependent variables. The result of R² showed that there is no collinearity in the model. The overall significance of the model was assessed by the value of F-statistics of 123165.62 and p-value of 0.00 which is less than 0.05. The implication is that there is no autocorrelation between dependent variable and the independent variable. The outcome of the regression analysis revealed that all the predictor variables made contributions to the variation no matter how small in the dependent variable.

Keywords:

Autocorrelation, Collinearity, Strategy, Predictor, Purposive Sampling, Strategic, Management

1. Introduction

Time taken by an organization to convert its net financial assets and financial liabilities into cash is very crucial and of great importance. This is a reflection of the ability in terms of effectiveness and efficiency of the organization to manage its short-term liquidity position and to guide against liquidity risk. Hence, the time between buying raw materials to manufacture products and generate cash revenue on selling the products is sacrosanct in term of liquidity risk and organization performance. The shorter this period, the faster the company is able to free up its cash that might have stuck in working capital. On the other hand, if the period is too long, then the capital gets locked in the operational cycle without earning any returns. Therefore, as business tries to shorten this period to improve the short-term liquidity condition in order to guide against liquidity risk, thus sustainability of the business efficiency is guaranteed.

The pharmaceutical industry in Nigeria is a critical sector as a result of the policy of the government in terms of sound health policy of the government at the centre. This has therefore made it possible to have ever increasing demand for drugs and medical care. This, however, serves as an advantage to domestic producers as well as a favourable circumstance for growth and development of the sector. The federal government has shown its commitment towards making the sector self-sufficient as well as improving the overall standard and quality of its products and service delivery thereby making the constituent companies able to compete internationally. This commitment was shown through the reengineering of the National Agency for Food and Drug Administration (NAFDAC). NAFDAC on its own has made concerted efforts at reducing the prevalence of fake and substandard drugs, yielding huge successes in the process. This strategic approach has also helped stem down the rate of corruption within the system and improved in all ramification the overall quality of its product delivery.

Corporate policy as it relates to timing of cash in relation to liquidity risk as well as corporate performance is not limited only to maintaining comfortable cash balance as buffer stock but including managing financial assets and financial liabilities. Giving the situation of capital market in Nigeria, it is very unfortunate that not every company is able to easily find external financing as a result of crises in the capital market coupled with economic downturn. Where external source of finance is available; the associated cost may be too expensive thereby making the firms to be worse off. It is evident now that corporation cannot operate both effectively and efficiently without strategically managing her timing of cash flow. Companies now have to look for other ways to gain liquidity and improve cash flows. Strategies which can be adapted within the firm to improve liquidity and cash flows concern the management of the current operating assets and current operating liabilities, which are usually neglected under favourable economic conditions.

Corollary to the above, cash conversion cycle (that is the time it takes between expenditure for the purchase of raw materials and the collection of sales of finished goods) which is the number of days that inventories are held plus the number of days sales outstanding minus the number of days payment is outstanding is very crucial and germane in the strategic management of cash. The longer the period, the longer cash is tied down. This is an issue to be addressed in this study, especially when it is very costly to procure finances in the capital market.

2. Objectives of the Study

From the above, the general objective of the study is to investigate how corporate strategy on timing of cash flow affects liquidity risk in conjunction with organization performance. The specific objectives are to:

- i. Determine how numbers of days inventories are held affect performance.
- ii. Examine the effect of number of days sales are outstanding on performance
- iii. Establish the effect of average payment period on performance
- iv. Ascertain the influence of cash conversion cycle on performance

3. Hypotheses

To achieve the above stated objectives, the following are the hypotheses stated in null form.

- i. There is no significant relationship between performance and the number of days inventories are held.
- ii. There is no significant relationship between performance and the number of days sales are outstanding.
- iii. There is no significant relationship between performance and the number of days payments are outstanding.
- iv. There is no significant relationship between performance and cash conversion cycle.

4. Review of Related Literature

4.1. The Cash Conversion Cycle (CCC)

Corporate policy as well as strategic determination of the number of days it will take a business to collect cash is very critical in order to guard against liquidity risk and to improve the organization performance. The cash conversion cycle according to Sathyamoorthi & Wally-Dima [1] is the number of days between the expenditure of purchase of firm's raw materials and the cash collection from the product sales. In addition, cash conversion cycle is a fundamental tool that is applied in the assessment of the efficiency of financial assets and financial liabilities. Bieniasz and Golas [2] in their study postulated that the cash conversion cycle is based on the three partial cycles namely: length of operational cycle, account receivable cycle and the accounts payable cycle. The combination of the three is being referred to as cash conversion cycle. In the same vein, Alayemi [3] posited that the major yardstick of effective management of financial assets and financial liabilities has been introduced by erudite scholars such as Shin and Soenen [4], Lazaridis and Tryfonidis [5] and Garcia-Teraul and Martinez Solano [6] as cash conversion cycle. Unquestionably, the different parts of financial assets and financial liabilities are inventories (stocks), account receivables and accounts payables. It is very important that these parts are managed in different ways in maximising the profit or increasing the company's value (Deloof [7]).

4.2. Management of Receivables

The number of days sales are outstanding is the time frame during which accounts receivables are expected to be collected back from the respective debtors. The accounts receivable of an organization is the sum total of unpaid credit that the organization has allowed her customers to enjoy. Accounts receivable can assume any

of the following: credit extended to other business, consumer credit or both from the study carried out by Moles, et al [8]. Trade and consumer credit are provided by organization among other things because doing so increases sales and because it is often a competitive strategy to match the credit terms offered by competitors. In addition, it is very essential when formulating strategy or policy on the average collection period as a mean of effectively managing account receivables to always have in mind what is supposed to be a credit standard for a given firm? That is to say, what standard should be applied in accepting or rejecting an account for the purpose of granting credit?

4.3. Inventory Management

Number of day's inventory is held (DIH) is used as a proxy for management of inventory. The DIH is one of the partial components of cash conversion cycle and by extension. Inventories components are: supplies, finished goods, work-in-progress and raw materials. These categories of inventory constitute an essential part of virtually all business operations as opined by Brigham & Houston [9]. Raw materials are materials and components that are inputs in making the final product. Work-in-process refers to goods in the intermediate stages of production while finished goods are final products that are ready for sale (Moles, et al [8]). An efficient management of inventory ensures a stable working capital, which ultimately increase profitability. The optimal inventory level about the inventory is decided by the management. When evaluating the efficiency of inventory management, it is very common to calculate $\text{days inventory held (DIH)}$ which expresses the average time that a good is held in inventory before it is sold to customer. Since goods laying idle in inventory represents costs for the company, the shorter DIH are more efficiently assets are managed (Maness & Zietlow [10]). Furthermore, Lazaridis and Tryfonodis [5] concluded that businesses must always as much as possible endeavour to maintain an optimum level of inventories. They demonstrated that there was negative significant relationship between inventory turnover in days and profitability.

4.4. Payable Managements

The average payment period is used as a proxy for accounts payable which is a partial component of the cash conversion cycle, and this cycle is used to measure the efficiency regarding management of financial assets and financial liabilities (Brigham & Houston [9]). Accounts payable arises from the fact that firms generally make purchases from other firms on credit and record the debt as an account payable. It is the largest single category of short term debt. Hence, it is a spontaneous financing source, since it spontaneously arises from ordinary business transactions (Brigham & Houston [9]). Trade credit can either be costly or free. Where the seller refuses to offer discounts, then it is free, in the sense that there is no cost for using this credit. While the costly trade credit is any trade credit over and above the free trade credit (Brigham & Houston [9]). It represents about 20-25 percent of short-term financing (Prasana [11]). Trade credit can also be used as a marketing tool to facilitate the selling process and to compete in the market. Schwartz [12] views credit terms as an integral part of the firms` pricing policy.

Investigations carried out by the following researchers Mohammad [13]; Deloof [7]; Falope and Ajilore [14]; Mahuva [15]; Laziridis and Tryfoniddis [5]; Garcia-Teruel and Martinez-Solano[6]; Samiloglu and Demirgunes,[16];Karaduman, Akbas, Caliskan and Durer[17]; Raheman and Nasr[18]; Uremadu, Egbide, and Enyi [19] and

Adeniran, Bosun-Adekunle, & Imuzeze [20] had produced diverse results. It was discovered that the investigation concentrated on the management of working capital and its effect on the profitability of an organization. There is no any known research that dealt with the issue of timing of cash flows in relation to organization performance. Therefore, this study was carried out to investigate what relationship exists between timing of cash flows on performance and liquidity risk.

5. Methodology

5.1. The Study Design-Methods and Procedures

The present study was basically conducted to examine the hypothesised relationships through correlation analysis and regression analysis to measure the impact of dependent variables on independent variables. The correlation analysis was aimed at seeking the exact relationships between dependent variable (GOP) and independent variables (DIH, DSO, DPO and CCC) as proxies for liquidity risk using STATA.

The sample was drawn from the listed pharmaceutical that are purposively taken from health industry (Alayemi [21]). The data used for analysis is for the period 2006 to 2015. The data in this study had been taken from secondary sources. The necessary secondary data had been collected from the financial statements published in the Annual Reports and financial statements were downloaded from the companies' official websites. This method of data collection was employed because the validity, accuracy and completeness of the data had been attested to in various ways.

Table 1. Measurement of variables.

| | Variables | Calculation | Nature |
|---|---------------------------------|---|----------------------|
| 1 | Gross Operating Profit (GOP) | Gross Profit/Cost of Goods sold | Dependent variable |
| 2 | Days Inventories are held (DIH) | Inventory/Cost of goods sold x 365 | Independent variable |
| 3 | Days sales outstanding (DSO) | Account receivable/Sales x 365 | Independent variable |
| 4 | Days payments outstanding (DPO) | Account Payable/Cost of goods sold x365 | Independent variable |
| 5 | Cash Conversion Cycle (CCC) | 2+ 3 – 4 | Independent variable |

6. Model Specification

$$Y = f(x)$$

Y= Gross operating profit (GOP)

$$X = f(x_1, x_2, x_3, x_4)$$

X = Liquidity Risk (LIR)

x_1 = Number of days inventories are held (HID)

x_2 = Days sales are outstanding (DSO)

x_3 = Days payments are outstanding (DPO)

x_4 = Cash conversion cycle (CCC)

In relation to this model, DIH, DSO, DPO and CCC are used as proxies for liquidity risk (LIR).

The relation is as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 X_{it} + \beta_3 X_{it} + \beta_4 X_{it} + \varepsilon_{it}$$

$$GOP_{it} = \beta_0 + \beta_1 DIH_{it} + \beta_2 DSO_{it} + \beta_3 DPO_{it} + \beta_4 CCC_{it} + \varepsilon_{itS}$$

7. Data Presentation and Analysis

7.1. Descriptive Statistics

This method was employed to summarise and classify the data collected. Thereafter, inferential statistics (correlation to determine the significant of the relationship between the dependent variable and the independent variables and thereafter to investigate the impact of independent variables on dependent variable).

Table 2. Descriptive statistics.

| Variables | N | Minimum | Maximum | Mean | Std. Dev. |
|-----------|----|---------|---------|--------|-----------|
| GOP | 40 | 0.31 | 0.62 | 0.47 | 0.09 |
| DIH | 40 | 12.74 | 526.51 | 111.21 | 108.65 |
| DSO | 40 | 15.95 | 343.63 | 109.20 | 78.24 |
| DPO | 40 | 5.88 | 226.73 | 73.65 | 57.22 |
| CCC | 40 | -56.08 | 585.42 | 146.10 | 158.05 |

From the table it can be said that from the sampled collected, the minimum Gross operating profit is 31% while the maximum is 62%. In the case of the explanatory variables; the minimum number of days inventory are held is 12.74 days an indication that stocks are moving very fast. So also, the minimum number of day's sales outstanding is 15.95 days. It meant that it takes 15.95 days for customers to pay. This indicated that the industry adopted liberal as far as collection of receivables are concerned. The number of day's payment outstanding is 5.88 days in the industry. Comparing the number of day sales are outstanding and the number of days payments are outstanding showed that it took the industry 5.88 days to per its suppliers while the customers pay in 15.95 days. Hence, the combination of DIH, DSO, and DPO led to negative cash conversion cycle of -56.08 days. The maximum GOP is 62% in the industry. This indicated that the industry is making 62 kobo out of every one Naira (N1). The maximum number of days inventory are held is 526.51 days. This is not normal considering the expiration day of drug. There is discrepancy between the numbers of days sales are outstanding and the number of days payments are outstanding. Therefore, the cash conversion cycle is 585.42. This is too lengthy a time. The most important measure that shows the balance point and the exertion centre of distribution is arithmetic mean (Azar and Momeni [22]). As indicated in Table 2, the mean value of GPO, DIH, DSO and CCC is 0.47, 111.21, 109.20, 73.65 and 146.10 respectively. The highest mean from the distribution is that of CCC (146.10) followed by that of DIH (111.21). The sixth column showed standard deviation from the mean. The highest deviation from the mean is that of 158.05(CCC).

7.2. Correlation Analysis

Correlation showed relationship between different variables on which the analysis was built. It explained how two variables react to each other as shown in Table 2 From The table revealed that there is weak positive, that is direct relationship between dependent variable (GOP) and the independent variables (DIH, DSO, DPO and CCC) except the relationship between GOP and DIH which is high. The correlation analysis revealed that the relationship is significant at 0.05 level of significant. This means that as (DIH, DSO, DPO, and CCC) increases GOP will move in the same direction.

Hence, all the Null hypotheses are rejected indicating that there is significant relationship between GOP and independent variables (DIH, DSO, DPO and CCC).

Table 3. Correlation Analysis.

| | | | | | |
|-----|---------------|---------------|---------------|---------------|-----|
| | GOP | DIH | DSO | DPO | CCC |
| GOP | 1 | | | | |
| DIH | 0.54* 0.00 | 1 | | | |
| DSO | 0.40* 0.01 | 0.64* 0.00 | 1 | | |
| DPO | 0.32* 0.04 | 0.38* 0.02 | 0.18 0.26 | 1 | |
| CCC | 0.45* 0.00 | 0.85 0.00 | 0.86* 0.00 | -0.01 0.96 | 1 |

*Correlation is significant at the 0.05 level (2-tailed)

7.3. Regression Analysis

Dependent variable was regressed against the independent variables using Fixed effect (FE) and random effect (RE)

Table 4. Fixed Effect (FE).

| | | | |
|---|-----------------------|---|--------|
| Fixed-effects (within) regression | Number of observation | = | 40 |
| Group variable: year | Number of groups | = | 11 |
| R-sq: within | Obs per groups: min | = | 1 |
| between | avg | = | 3.6 |
| overall | max | = | 4 |
| | F (4, 25) | = | 7.31 |
| Corr (c _i , X _b) | Prob > F | = | 0.0005 |

| gop | coef. | Std. Err. | t | P> t | [95% Conf. Interval] |
|---------|---|-----------|-------|-------|----------------------|
| dih | .0058094 | .0035416 | 1.64 | 0.113 | -.0014847 .0131035 |
| dso | .0064089 | .003721 | 1.72 | 0.097 | -.0012547 .0140725 |
| dpo | -.0051495 | .0035596 | -1.45 | 0.160 | -.0124807 .0021816 |
| ccc | -.005839 | .0036456 | -1.60 | 0.122 | -.0133472 .0016693 |
| _cons | .355151 | .0259963 | 13.66 | 0.000 | .3016107 .4086914 |
| sigma_u | .05924902 | | | | |
| sigma_e | .06969184 | | | | |
| rho | .41953858 (fraction of variance due to u _i) | | | | |

F test that all u_i=0: F (10, 25) =2.14 Prob > F = 0.0597

Table 5. Random Effect (RE).

| | | | |
|-------------------------------|-----------------------|---|--------|
| Random-effects GLS regression | Number of observation | = | 40 |
| Group variable: year | Number of groups | = | 11 |
| R-sq: within | Obs per groups: min | = | 1 |
| between | avg | = | 3.6 |
| overall | max | = | 4 |
| | Wald chi2 (4) | = | 16.92 |
| Corr (c _i , X) | Prob > chi2 | = | 0.0020 |

| gop | coef. | Std. Err. | z | P> z | [95% Conf. Interval] |
|-----|----------|-----------|------|-------|----------------------|
| dih | .0028389 | .0034305 | 0.83 | 0.408 | -.0038847 .0095625 |

| | | | | | | |
|---------|-------------------------------------|----------|-------|-------|-----------|----------|
| dso | .0027256 | .003571 | 0.76 | 0.445 | -.0042734 | .0097247 |
| dpo | -.002258 | .0034435 | -0.66 | 0.412 | -.0090071 | .0044911 |
| ccc | -.0025525 | .0035145 | -0.73 | 0.468 | -.0094409 | .0043359 |
| _cons | .3946087 | .0261958 | 15.06 | 0.000 | .3432659 | .4459516 |
| sigma_u | 0 | | | | | |
| sigma_e | .06969184 | | | | | |
| rho | 0 (fraction of variance due to u_i) | | | | | |

Thereafter, Hausman test was conducted to test which of the two is better. The result of the analysis revealed that the FE was preferable because Prob >Chi2 = 0.0051 is less than 0.05.

Table 6. Hausman Test (Fixed Random).

| | Coefficient | | | |
|-----|-------------|------------|---------------------|-----------------------------|
| | (b) fix | (B) ran | (b-B) difference | sqrt(diag(v_b-v_B)) S.E. |
| dih | .0058094 | .0028389 | .0029705 | .0008803 |
| dso | .0064089 | .0027256 | .0036832 | .0010459 |
| dpo | -.0051495 | -.002258 | -.0028915 | .0009018 |
| ccc | -.005839 | -.0025525 | -.0032865 | .0009687 |

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha; efficient under H0; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\text{chi2 (4)} = (\text{b-B})' [(\text{v}_b - \text{V}_B)^{-1}] (\text{b-B})$$

$$= 14.82$$

$$\text{Prob} > \text{chi2} = 0.0051$$

(V_b-V_B is not positive definite)

The FE effect was further analysed to arrive at result as shown below. The result of the analysis was then employed to explain the research model.

Table 7. Fixed Effect Robust.

| | | |
|-----------------------------------|--|-----------|
| Fixed-effects (within) regression | Number of observation = | 40 |
| Group variable: year | Number of groups = | 11 |
| R-sq: within = 0.5390 | Obs per groups: min = | 1 |
| between = 0.0028 | avg = | 3.6 |
| overall = 0.2702 | max = | 4 |
| | F(4, 10) = | 123165.62 |
| Corr (c_i, Xb) = -0.3140 | Prob > F = | 0.0000 |
| | (Std. Err. adjusted for 11 clusters in year) | |

| gop | Robust | | | | | |
|---------|---|-----------|-------|-------|----------------------|-----------|
| | coef. | Std. Err. | t | P> t | [95% Conf. Interval] | |
| dih | .0058094 | .0011333 | 5.13 | 0.000 | .0032842 | .0083346 |
| dso | .0064089 | .0011848 | 5.41 | 0.000 | .0003769 | .0090488 |
| dpo | -.0051495 | .0011569 | -4.45 | 0.001 | -.0077272 | .0025719 |
| ccc | -.005839 | .0012169 | -4.80 | 0.001 | -.0085504 | -.0031276 |
| _cons | .355151 | .0196565 | 18.07 | 0.000 | .3113537 | .3989484 |
| sigma_u | .05924902 | | | | | |
| sigma_e | .06969184 | | | | | |
| rho | .41953858 (fraction of variance due to u_i) | | | | | |

$GOP = 0.36 + 0.01DIH + 0.01DSO - 0.01DPO - 0.01CCC$, R^2 Within = .54, Between = 0.00, Overall = .27, F-Stat = 0.00

| | | | | | |
|----|--------|--------|--------|---------|---------|
| SE | (0.12) | (0.00) | (0.00) | (0.00) | (0.00) |
| t | (18.2) | (5.13) | (5.41) | (-4.45) | (-4.80) |

The R^2 measured the proportion of the variation in the dependent variable accounted for by the independent variables included in the variables in the model. As shown above, R^2 within the entities is 0.54 that is 54 % of the variation was explained while 46% was not explained. In addition between the entities 0% of the variation was explained while 100% was unexplained. The overall R^2 showed that 27% was explained while 73% was not explained. The model as shown by F-value of 123165.62 and a p-value of 0.00 was an indication that the model is significant and that there is no autocorrelation. As indicated in the model above, all the predictor variables made contributions to the variation no matter how small in the independent variables. The result as shown indicated that in the absence of stock, sales and purchases the company could still make a profit of 36%. This may not appeal to common sense. However, this revealed that apart from normal operation, there are certain extra-ordinary transactions that might have been accounted for in the study. The F-statistics as a test of the overall significance of all the variables in the model; the null hypotheses is that all the coefficients are equal to zero. That is, $H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4$. Therefore, all the hypotheses are rejected.

8. Conclusions

Timing of cash movement as indicated by the number of days, weeks or months it takes for inventory to be converted into cash as reflected in the cash conversion cycle; a components of number of days inventories are made, number of days sales outstanding and days payment outstanding. Strategically, because if the interplay of these components, the onus lies on the management of the organisation to formulate the length of time it will take to convert inventory into sales (account receivables), the credit policy to induce sales and the payment strategy that will stimulate debtors to pay on time in consideration of the credit facilities enjoyed from suppliers. The reason being that if the addition of the number of days it takes to convert inventory into sale and the number of days it takes to collect payment from debtors is lower than the number of days payment is outstanding, there will be disequilibrium regarding cash flows of the organization leading to liquidity risk. Therefore, efforts of the management must be focused on the strategic plan to be put in place to reduce the probability or likelihood of cash crunch.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

Suggestion for Further Research

The result of regression revealed that explanatory variables on explained variable are minimal, therefore, further research should be carried out to find out how apart from the variables studied can relate with performance.

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