

Financial Performance of Listed Pharmaceutical Companies on Ghana Stock Exchange

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Abstract

This paper examines the profitability, liquidity and solvency and probability of failure of listed pharmaceutical companies on the Ghana Stock exchange. The findings from the activities ratios indicated efficiency of Arytons management in utilizing the asset of the firms in day-to-day basis is declining in recent years while that of Starwin is improving even though Aryton Drug Ltd is generally more efficient than Starwin Ltd. The Average cash converting cycles of Aryton and Starwin were found to be 196 and 282 respectively which are relatively higher than the benchmark in Germany, UK and US of 145 days, 127 days and 142 days respectively. The liquidity ratio metric indicated that Aryton Drug Ltd manages its liquidity and is in a very good position to meet its long term obligation as well, as opposed to Starwin Ltd which has very limited cash to cover its short term debt and is less solvent. Starwin's is more geared which has exposed the firm to higher interest expense. The study also discovered from the DuPont analysis that operating income-to-revenue and revenue-to-total assets ratios significantly influence ROE positively. Measurement of profitability, proxy by ROE and ROA, shows that Aryton generates more returns on its asset and on equity than Starwin Ltd, although lower than industrial benchmarks in UK and US of 54.9% and 32.5% respectively, however Starwin Ltd is seen to be posting good returns in recent years which is almost at par with Aryton's. Starwin's COGS growth rate has been generally greater than its revenue growth rate which is not the case for Aryton Ltd. A test of financial soundness and stability with Altman's Z-score revealed that Aryton is not financially distressed but Starwin is in financial distress and likely to be bankrupt in the near future, exposing investors to serious risk. Thus Starwin Ltd should consider takeover offer or merger for reorganization of the firm.

1.1.0 Introduction

Globally, the pharmaceutical industry offers invaluable contribution to strong economic growth in diverse ways, besides the main aim of production of drugs for clinical purpose or healthcare. According to (Karamchic, 2013) the industry generates high-quality jobs and increases economic output for economies. According to (Jhee, 2008) in the United States, the pharmaceutical industry is classified among the top three most profitable industries but in Ghana the picture is in sharp contrast, according to (Harper & Gyansah-Lutterodt, 2007). The efficiency with which financial decisions, with respect to source of funds and the application of the funds, are made and other production inputs affects profitability. Theoretically, every management is required to optimize firm available resources, to maximize shareholders' wealth, failure of which will result in low returns on equity.

Thus elsewhere some attention has been focused on the financial performance of the Pharmaceutical industry to provide much insight into their annual reports; United States, (Goodman, 2009) and in India (Nair, 2013) and (Kheradmand & Bahar, 2013), but very little is known about the financial performance of the industry. The absence of critical financial indicators about the performance of firms in the sector affects attractiveness of investments and trading volumes and value of financial assets holdings of investors in the sector. Thus the purpose of this study is to examine the profitability, liquidity and solvency of the publicly traded Pharmaceutical companies on Ghana stock exchange and also identify financial ratios with significant contribution effects on return on equity and further test the financial soundness or distress of the firms.

This study employs multi-method; trend and DuPont, regression analysis as well as Altman Z-score and to examine firms' financial data from 2006 to 2012. In spite of the limited number of pharmaceutical companies studied and the lack of industrial averages for relative performance or comparative analysis, this paper reveals critical findings about the performance of the selected companies for which there is immense benefit to the industry's regulators, investors, academics and other relevant stakeholders.

The findings are expected to drive the necessary policy changes to attract the needed investment in the industry and to improve their competitive position of the firms in the global and domestic marketplace.

The rest of the paper is organized as follows: Chapter two gives literature review about the study. Chapter Two reviews the existing literature. Chapter three entails the methodology applied to achieve the objectives of the study. The data analysis, findings and discussion are presented in Chapter four. In Chapter five, the Summary, conclusions and recommendations are presented.

Literature review

Overview of pharmaceutical industry in Ghana

Ghana's pharmaceutical manufacturing sector is rated the best in West Africa for producing high quality pharmaceuticals as result of stringent regulation. About 30% of the Pharmaceuticals in Ghanaian market are locally produce and while about 70% are foreign mainly from India and China, (PMAG, 2012). There are about 38 registered manufacturing firms currently. About 29 of the firms belong to local industrialists, of which just Starwin and Aryton are listed on the Ghana Stock Exchange currently.

Both (Harper & Gyansah-Lutterodt, 2007) and (PMAG, 2012) reported that the sector is bedevil with access to long term finance, development capital and high financing cost, distribution and importation of relatively cheaper drugs from China and India, hence they produce under capacity of about 55% on the average.

Financial performance of the industry globally: key developments

This part looks at various empirical works and reports of the financial performance of the industry elsewhere and drug development cost.

The industry's value added process is characterized by high capital expenditure and higher returns, though with startling higher risks. According to (Ogburn, 2009) the sector requires huge capital investment in billions of dollars medicinal compounds discovery, however only infinitesimal part of about 0.01% successfully realize as authorized drug. Studies conducted by (PhRMA, 2012) in United States affirmed the high risk involve in pharmaceutical production as they found that the average cost to develop a drug, including the cost of failures is \$1.2 billion and it takes about 10 to 15 years to develop a drug of which only 15% approved drugs generate sufficient revenue to compensate for the costs of their development. In addition, only 33% of every approved drug brings in adequate sales to offset the costs of development of previous unsuccessful or rejected compounds. In the United States, (Goodman, 2009) found that the U.S pharmaceutical industry growth rate plummeted to 6.7% from 2004 to 2009. (Bashar & Islam, 2014) studied into factors that influence the industry's profitability in Bangladesh and found among other ratios the Average Inventory/Cost of Goods Sold and Average Accounts Payable/Cost of Goods Sold significantly influenced the gross profit margins of the firm. (Leahy, 2012) had similar findings in terms Average Inventory/Cost of Goods but in addition found average accounts receivable / net sales as a key determinant of profitability but surprising found average accounts payable/cost of goods insignificant as ratio, indicating rising short term liabilities thus not significantly affects profitability of U.S pharmaceutical manufacturers. In India (Ashvin, 2012) found that total assets to sales ratio and creditors' velocity were critical to the achievement of optimum profit for some selected pharmaceutical companies.

Also in study conducted by (Nair, 2013) on the Indian pharmaceutical companies' financial performance, found that 48 % of the companies were likely to be financially distress and 9% of the companies were financially distressed due to decreased EBIT. Recently (Karamchic, 2013) also analysed the financial performance of the United States Pharmaceutical industry and forecasted that the industry's profits were likely going to decline in the future.

Financial performance metrics

Predominantly accounting ratios are used to gauge financial performance of firms and there exist a plethora of them. For instance (Gombola & Ketz, 1983) identified 58 financial ratios, with varying structure from one industry while (Ho & Wu, 2006) identified 59 ratios. However, various financial literatures such as (CFA, 2012) broadly categorized them into Asset utilization (Activity), Liquidity, Solvency, Profitability and shareholders ratio to measure specific financial or financial characteristics of business. Empirical studies by (Bhunja & Sarkar, 2011) found financial ratios could forecast the Bankruptcy of Indian pharmaceutical firms.

2.1 Methodology

The study was conducted by selecting the annual financial statements and reports from the period between 2005 and 2012 of the listed pharmaceutical companies on the Ghana Stock Exchange.

Trend, common size ratio and percentage change analysis were employed.

For purpose of logical analysis and interpretation they were classify into Activity, Liquidity, Solvency, Profitability and Investor ratios. In calculating the solvency ratios only interest-bearing short debt term and long debt were used. Also regression analysis was employed to find critical factors that affect each company's overall profitability proxy by Return on Equity from DuPont Five-factors.

Finally, Altman's z-score model was also used to identify whether any of the selected companies faces eminent financial distress.

The Z-score bankruptcy predictor combines five common business ratios, using a weighting system that was statistically calculated by Edward Altman to determine the likelihood of a company going bankrupt at some point in the future.

ALTMAN'S Z-SCORE BANKRUPTCY PREDICTION MODEL

$$Z = 3.3x_1 + 0.999x_2 + 0.6x_3 + 1.2x_4 + 1.4x_5,$$

Where;

$$x_1 = \frac{\text{Operating income}}{\text{Total assets}}, x_2 = \frac{\text{Sales}}{\text{Total assets}}, x_3 = \frac{\text{Equity}}{\text{Debt}}, x_4 = \frac{\text{Working capital}}{\text{Total assets}}, x_5 = \frac{\text{Retained Earnings}}{\text{Total assets}}$$

This model of Altman's Z-score was chosen because all the companies are public companies and considers only financial factors only.

3.1.0 Results and discussion

This section shows the results of the data analysis used in achieving the research objectives.

Table 1 Financial ratios for Aryton drug manufacturing company limited

RATIOS	2012	2011	2010	2009	2008	2007	2006	Average
Liquidity								
Current ratios	6.9424	6.6329	6.11373	9.80646	6.5881	6.36675	4.84222	6.75608
Quick ratios	4.02151	4.40049	4.09743	6.22863	2.56676	3.95528	3.33157	4.08596
Efficiency								
Inventory turnover	2.33259	2.6751	1.87267	2.28811	2.17523	2.90712	5.70851	2.85133
Days sales in inventory	156.478	136.443	194.909	159.52	167.798	125.554	63.9397	143.52
Days sales in receivable	119.589	110.675	136.173	76.7758	71.7542	84.2769	46.2261	92.21
Total assets turnover	1.11972	1.11713	0.85361	1.33885	1.23723	1.16235	2.11497	1.2777
Solvency								
Debt-to-equity	0.1253	0.14259	0.13341	0.08381	0.12064	0.12444	0.15241	0.12609
Long Term Debt-to Asset	0.0034	0.01297	0	0	0	0	0	0.00234
Profitability								
Return of assets	0.12056	0.15967	0.15925	0.24575	0.18443	0.18092	0.27485	0.18935
Return on equity	0.13665	0.18176	0.17697	0.27035	0.207	0.20841	0.32592	0.21529
Net Profit (%)	0.10767	0.14293	0.18656	0.18355	0.14907	0.15565	0.12995	0.15077

Table 2 : Financial ratios for Starwin products limited.

RATIOS	2012	2011	2010	2009	2008	2007	2006	Average
Liquidity								
Current	1.54963	1.53547	1.46875	1.08392	1.41772	1.50906	1.72956	1.47059
Quick	0.63525	0.93322	0.51434	0.48579	0.64646	0.66705	0.76335	0.66364
Efficiency								
Inventory turnover	1.76728	1.58793	1.45097	1.62858	1.49052	1.14356	1.14046	1.45847
Days Sales in inventory	206.532	229.858	251.557	224.122	244.881	319.179	320.046	256.597
Days in sales receivable	89.7385	81.9371	59.9258	69.918	88.5832	99.8314	128.328	88.3231
Total assets turnover	1.17573	1.13634	1.00567	0.87172	0.73815	0.62926	0.69608	0.89328
Solvency								
Debt-to-equity	0.74792	0.59042	1.00372	1.09505	0.72234	0.61543	0.44246	0.74533
Long term debt	0.01026	0.00914	0.10733	0.02517	0.09804	0.0845	0.03961	0.05344
Times interest earned	3.8651	3.71733	1.39167	0.48781	0.31177	0.73134	9.80707	2.90173
Profitability								
Return on assets	0.07317	0.12772	0.02221	-0.0436	-0.0395	0.00829	0.03194	0.02574
Return on equity	0.12279	0.22694	0.04558	-0.0831	-0.0660	0.01284	0.04134	0.0429
Net Profit (%)	0.06223	0.1124	0.02209	-0.0501	-0.0536	0.01318	0.04588	0.02174

Graphical presentation, analysis and findings

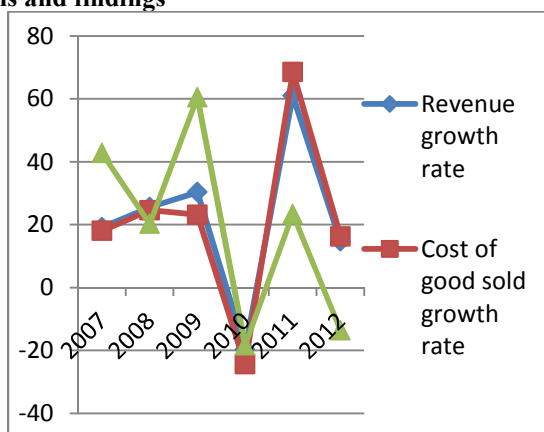


Fig. 1 Revenue and COGS and Net income growth rate

The figure 1 above shows the growth rate in revenue, cost of goods sold (COGS) and net income of Aryton Ltd. In 2007 and 2008 it appears the growth rate in revenue and COGS were approximately equal at 18.1% in 2007 and 25% in 2008, while the net income growth rate move from 42.8 to 20.2% in these years. The net income growth rate jumped to 60.5% in 2009 but plummeted together with the revenue and COGS rate to -18.4%. In 2011 revenue and COGS rate rose simultaneously even though COGS rate was higher than growth in revenue. The variation in the rate of growth of the variables seems to be huge. The average (geometric) growth rate in revenue, COGS and net income are respectively 19.4%, 17.9% and 15.7%.

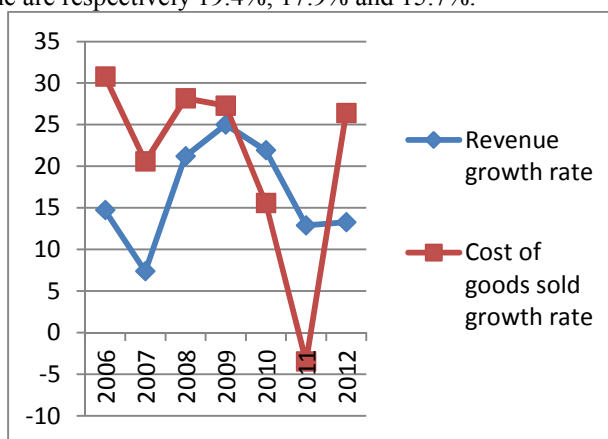


Fig. 2 Revenue and COGS of Starwin Ltd

The figure 2 above shows the growth rate in revenue, cost of goods sold (COGS) and net income of Starwin Ltd. With the exception of 2010 and 2011 the company's growth rate in COGS were higher than the growth rate in sales but generally at declining rate up to 2011. Between 2009 and 2011 there was huge drop in rate of COGS from 27.3% to -3.5% and jump to 26.4% above the revenue growth of 13.6% in 2012. The figure shows that Starwin's COGS growth was on the average higher than its revenue growth rate. The Geometric growth rate in revenue and COGS were approximately 16.5% and 20.2% while the average net income growth was -0.60.5%.

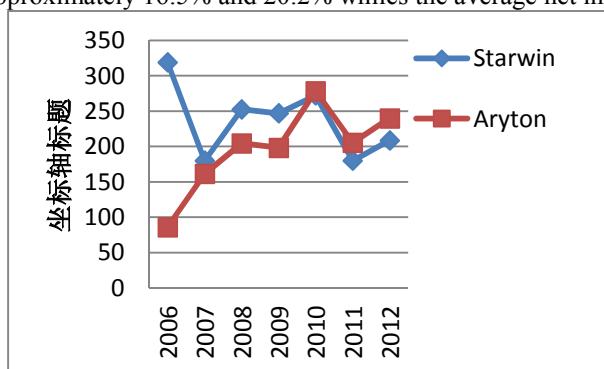


Fig.3-Cash conversion ratio

Figure 3 shows the trend of the cash conversion ratio for both firms. It indicates the number of days taken for Starwin averagely to convert its raw materials to cash is relatively higher than that of Aryton Ltd. For the seven year period the average cash conversion cycle for Starwin and Aryton is approximately 282 days with negative skewness and 196 days with higher negative skewness respectively. However, Starwin's cash conversion cycle has improved significantly in recent years by trending downwards, a sharp contrast to Aryton, this is observed in the period between 2008 and 2012 and specifically outperforming Aryton between 2010 and 2012.

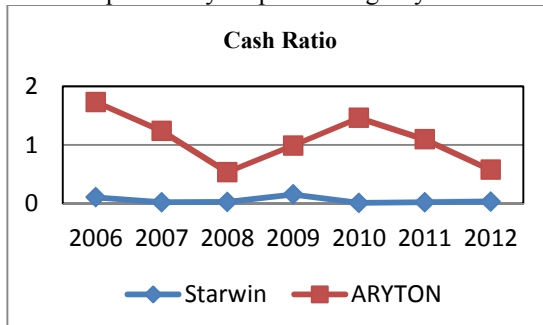


Fig.4-Cash ratio

The figure 4 above indicates that the cash ratio of Aryton is far better than that of Starwin. The cash ratio of Aryton declined from its maximum value of 1.6 to 0.5 from the period between 2006 and 2008 while rising thereon to approximately 1.5 in 2010 then trending downwards again thereafter. On the average the ability of Aryton to meet its current liabilities with cash and near cash equivalent is far better than Starwin. On the average Aryton's cash has been 1.1 times their current liability over the seven year period with a variability of 0.43, while that of Starwin is approximately 0.28 with a variability of 0.91. However, the current asset to current liabilities of Starwin on the average over the years has been 1.5 as shown in the figure below. Thus for every C1 current liabilities incurred, it has C1.5 current asset to pay it on the average with a deviation of 0.2. It therefore suffices to conclude that Aryton Ltd is more liquid than Starwin.

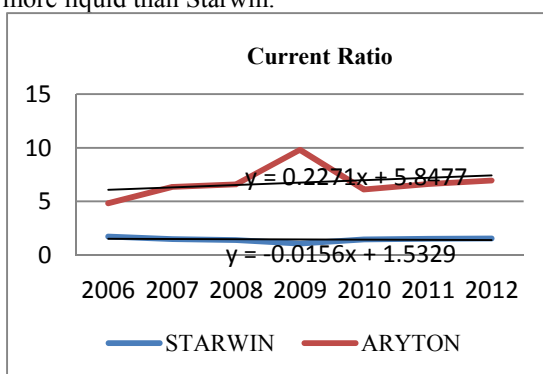


Fig. 5-Current ratio

Figure 5 shows the current ratio for Aryton Ltd and Starwin Ltd. It indicates that Aryton's current ratio was 4.84 for 2006, increased to 6.36 in 2007 and 6.58 in 2008. There was a high percentage change of about 48% between 2008 and 2009 as the figure soared to 9.8. The figure decreased to 6.11 in 2010, moved a little up 6.63 in 2011 and 6.94 for the year 2012. This implies that the current assets of Aryton were able to cover its current liabilities up to an average of about 6.76 times over the seven year period. With the period the change in Aryton's cash ratio with respect to time remained positive. As such the company has been able to meet its short term debt obligations.

The figure 3 however shows that the Current ratio for Starwin Products Limited remained relatively low trending with a negative rate of change within the period.

This implies that the current assets of Starwin Products Limited were able to cover its current liabilities up to an average of about 1.47 times over the seven year period while Aryton's current ratio could cover its short term debts as when they fall due up to an average of 6.75 times within the seven year period.

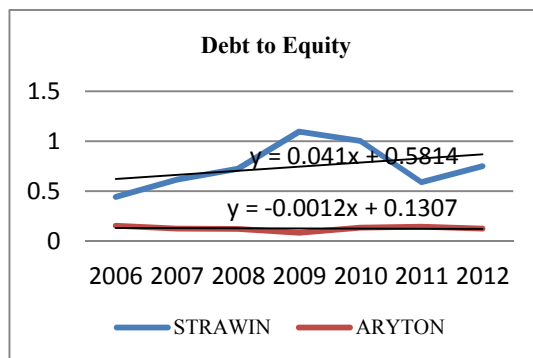


Fig.6-Debt to Equity ratio

The figure 6 above shows the Debt to equity ratio of the two companies. It indicates that Starwin gear ratio has been higher than that of Aryton. The average percentage with regard to debt of equity is 74.53% with skewness of 0.49 and 12.61% with skewness of -1.19 for Starwin Ltd and Aryton Ltd respectively. Between 2006 and 2009 Aryton debt to equity ratios were reducing marginally. The rate of decrease within the period remained approximately constant at -12%. It got the minimum value of 0.084 while within the same period Starwin gear ratio increased sharply from 0.44 to a maximum value of 1.01. However after 2009 it declined continuously to approximately 0.59 in 2011 but changed its trajectory there on. It depicts trending up with increasing rate of change in Starwin's Debt to Equity ratio. This implies Starwin's solvency has been weakening over the period and also there is higher risk associated with Starwin's equity earnings (earnings per share).

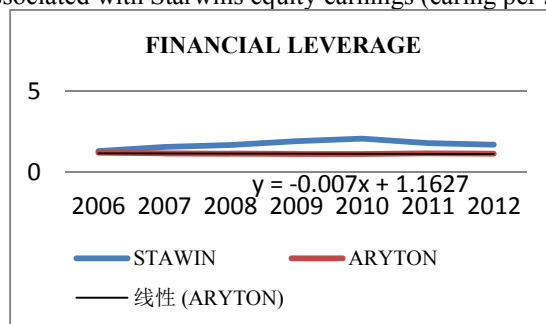


Fig.7-Financial leverage

The figure 7 shows the trajectory of the reliance of debt financing by the firms. It shows that Starwin Ltd relied on more debt finance than Aryton. While Starwin's total asset to equity ratio kept increasing at an approximately constant rate of 0.189 (19%) with the time period between 2006 to 2010, Aryton's leverage change with respect to time remained approximately zero by maintaining an approximately constant leverage ratio of 1.11. This indicates that about 90% of the total assets of Aryton is financed by equity and thus for C1.11 value of asset acquired by Aryton C1.00 from shareholders' fund is used to finance it. In the case of Starwin the average leverage ratio remains relatively higher at 1.7. In 2010, it reached a maximum ratio of 2.1 and declined to 1.68. Thus on the average for every C1.70 assets of Starwin C1.00 is from equity. Conclusion: Clearly Starwin is highly leveraged than Aryton Ltd.

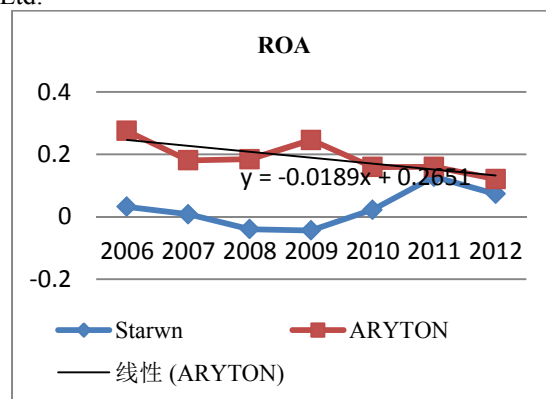


Fig. 8- Return on Assets

Figure 8 shows that return on assets of Aryton was persistently higher than Starwin, though generally at decline rate as the trend point downwards. The average rate of change was approximately -1.9% with an average of about 18.94%. As shown the maximum and the minimum occurred in the year 2006 and 2012 respectively. Starwin's return on assets remained relatively low, going to negative in 2008 and 2009. However, from the 2010 up to 2012 Starwin improve on their performance with positive returns on assets. For the seven year period under considerations Aryton could make an average return of each cedi of asset of about C0.19 as opposed to Starwin's average return on assets of C 0.03.

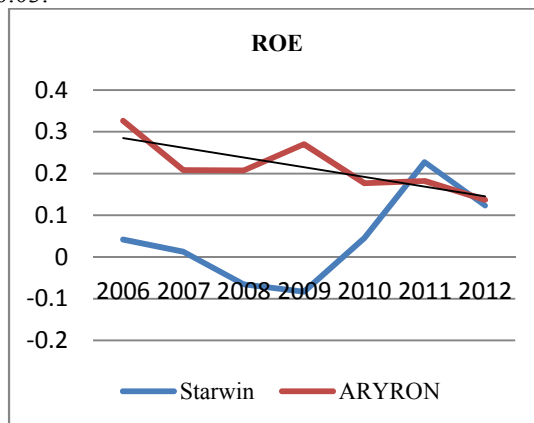


Fig.9-Return on Equity

The figure 9 above shows the graph of return on equity for the firms. Similarly, as in the case of return on asset, Aryton's return on equity remained higher than that of Starwin in the period between 2006 and 2010 but it shows decreasing rate as shown by the trend line. Aryton recorded its highest value in 2006 and minimum value in 2012. In the years 2007, 2008 and 2011 it remained relatively constant at about 0.20. Although Starwin's return on equity was relatively lower in the years between 2006 and 2010, Starwin show up sharp increase in performance from 2009 peaking in 2011 at about 0.23 and both companies posting about the same results approximately 0.13 returns on asset. The average return on equity for Aryton was approximately 22% while that of Starwin was approximately 4.3%.

3.1.1 DUPONT ANALYSIS.

The figure 10 below shows the decomposition of the ROE in its expanded form to identify key profitability factors or ratios. The figure indicates that factors that greatly affect the profitability of Aryton measured in terms of returns on equity are revenue to asset ratio and earnings before taxes to operating income. From 2006 to 2007 a drop in value of the revenue to asset ratio also saw the ROE fall from approximately 0.32 to 0.21 and when the revenue to asset ratio increased from 1.16 to 1.34 in 2007 to 2009 the ROE of Aryton increased marginally from 0.208 to 0.27. Overall it seems there exists positive correlation between them and a change in revenue to asset ratio with respect to change in ROE is positive. Although, variations in the earnings before taxes to operating income ratio of Aryton over the years seems not be huge but from the graph it positively correlates with the company's ROE. For instance from the period between 2007 to 2009 when it increased from approximately 0.15 to 0.18, the ROE moved from approximately 0.21 to 0.27. Thus a percentage change of about 18.9% of the ratio led to about 29.7% change in ROE.

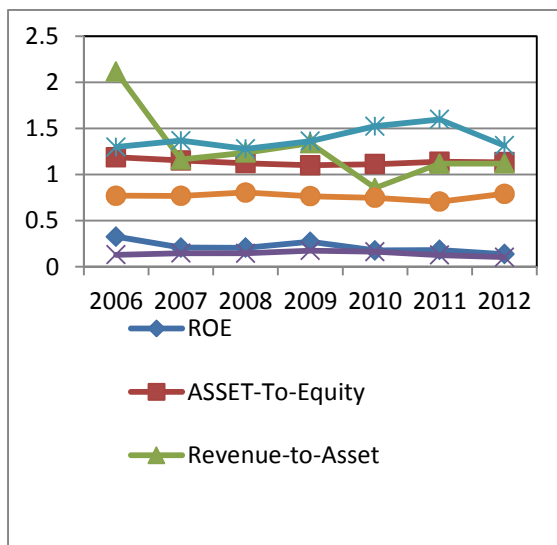


Figure 10 -decomposition of the ROE

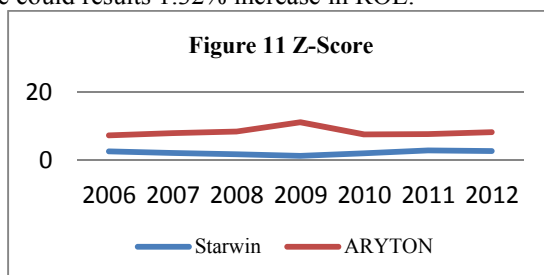
3.1.2 Regression analysis of the Dupont factors.

The regression analysis that was done on the components to critically examine which of them has significant impact on the ROE is shown below.

Table 3: The Regression Results of DuPont Analysis

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.378712	0.262282	1.443913	0.385611
TA/EQ	0.026264	0.081838	0.320925	0.802303
RE/TA	0.141078	0.008155	17.29916	0.03676
OP.INC/REV	1.315858	0.06589	19.97048	0.031851
EBT/OP.INC	-0.11116	0.060236	-1.84542	0.316139
1-(TA/EBT)	-0.53025	0.203713	-2.60293	0.23351

Base on the P-values above the components with significant impact on the ROE are operating income to revenue and revenue to total assets ratios at 5% and that they all have positive relationship with ROE. Keeping all ratios constant 1% increase in revenue to total assets leads to about 0.14% increase in ROE and 1% increase in operating income to revenue could results 1.32% increase in ROE.



The Z-score Analysis: Using the Altman's Z score model it was found out that Aryton drugs manufacturing limited is operating in safe financial conditions since its Z score over the period under study has been above the minimum safe zone score of 2.99. For Starwin, the company has been struggling financially and was in financial distress and was likely to go bankrupt between 2008 and 2010 since its Z score for the preceding two years was below the safe zone. The company was in serious financial distress in 2008 and 2010, but management were able to put in measures to make the company profitable and also got some short term finances in the form of overdraft to sustain the company. From the 2012 figure of 2.6 still the company is likely to be bankrupt in the next two years.

4.1.0 Major findings

4.1.1 Activity management performance.

The cash conversion cycle of Aryton is on the average shorter than Starwin but starwin is doing better in recent years in converting it raw materials quicker than Aryton. Thus the efficiency of Arytons management in utilizing the asset of the firms in day-to-day basis is found to be dropping while that of Starwin is improving. However, the Average cash converting cycles of both Aryton and Starwin of 196 and 282 respectively are relatively higher than the bench mark in Germany, UK and US of 145 days, 127 days and 142days respectively.

4.1.2 Liquidity management

Over all it is found that Aryton Ltd maintains enough liquid asset to meet its short term liabilities than Starwins Ltd as they fall due over the period of study, hence Aryton is more liquid than Starwin even though the cash ratio is seen to be declining in recent times while the current ratio is relatively increasing from the year 2010. Comparatively, Aryton Ltd maintains cash ratio equivalent to the bench marks in Germany (2.3), UK (0.9) and US (1.1) . Aryton's average cash ratio is found to be 1.1 with the standard deviation of 0.43. Starwins Ltd cash ratio of 0.28 averagely is below the bench marks of its local and global competitors, hence it emerges that it has not been maintaining enough cash to meet the current financial claims on the company.

4.1.3 Solvency performance measurement

The two metrics, debt- to- equity and asset- to- equity ratios, used to measure the relative solvency revealed that Starwin is more geared than Aryton. Starwin employs more debt to finance its activities than Aryton, which implies that it makes more interest expense than Aryton. Investment in Starwin is seen to be more risky than Aryton as it is more vulnerable to downturns in the business cycle since the company must continue to service its debt regardless of lower sales volume. On the average, for every C1.00 of shareholders fund employed by Aryton Ltd, it supports it with 12 pesewas debt while for Starwin for every C1.00 equity employed it supports it approximately 75 pesewas lender's fund on the average sometimes borrowing more than 100% of equity. Thus Aryton is more solvent than Starwin.

4.1.4 Profitability performance

Measurement of profitability, proxy by ROE and ROA, shows that Aryton has been generating more returns on its asset and on equity than Starwin, however Starwin is seen to be posting good returns in recent years, starting from 2011 than before and almost at par with Aryton's. For every one cedis equity employed both generated 18.2% in 2011 and 13.7% returns on equity compare to industrial bench marks in UK and US of 54.9% and 32.5% respectively. The performance of Aryton is observed to be falling since 2006 when the firm met the bench mark in US. Also Aryton Drug Ltd is more profitable than Starwin as it makes an average net profit of C 0.15 on every C 1.00 sale made as compared to Starwins average, of C 0.02 on every C 1.00 sales made.

The DuPont analysis revealed that operating income- to- revenue and revenue- to- total assets ratios significantly influence ROE positively. Analysis of COGS and revenue shows that Starwin Ltd is not minimizing its cost of goods sold to make the firm more profitable compare to Aryton Ltd. Starwins COGS growth rate has been generally greater than its revenue growth rate which is not the case for Aryton Ltd.

4.1.5 Test of financial distress Or bankruptcy

Applying Altman's Z-score to investigate the likelihood of the firms going into bankruptcy, it is found out that Aryton Ltd Z-score has been higher, way above the bankruptcy range, indicating Aryton Ltd is financially sound and not near financial distress. However, the Z-score of Starwin Ltd has been within the bankrupt zone of 1.8 to 2.7 score except in 2011 where it went up into the grey area. Over all Starwin is not financially sound and has been operating in a situation of financial distress and being struggling to survive.

5.1.1 Conclusion and recommendation

In summary the study has shown that the management of Aryton drug manufacturing limited are more efficient in managing the activities of the firm but Starwin Ltd has been inefficient though there has been improving in recent years. In terms of Liquidity, Aryton is more liquid than Starwin as it has an average cash ratio of 1.1 to cover its short term liabilities as opposed to Starwin's 0.28 averages meaning it is unable to cover its short term debt.

Starwin Ltd is found to be more geared as it employs more debt to finance its operations than Aryton. As such Starwin Ltd makes a lot of interest expense and is exposed to higher risk in economic downturn than Aryton. Investing in Starwin is very risky than investing in Aryton. Aryton is solvent than Starwin.

The study also found that Aryton Ltd is more profitable than Starwin as it makes a net profit of C 0.15 on every C 1.00 sale made as compared to Starwins Ltd's average, of C 0.02 on every C 1.00 sales made. Starwin's COGS growth rate has been generally greater than its revenue growth rate which is not the case for Aryton Ltd. Starwin's Ltd Geometric growth rate in revenue and COGS were found to be approximately 16.5% and 20.2% while the average net income growth was -0.60.5%. While Aryton's Ltd average (geometric) growth rate in revenue, COGS and net income were respectively 19.4%, 17.9% and 15.7%. A test of financial soundness and stability with Altman's Z-score revealed that Aryton is not financially distressed but Starwin is in financial distress and likely to be bankrupt in the near future, exposing investors to serious risk. Thus Starwin

Ltd should consider takeover offer or merger for reorganization of the firm while investors have cautious investing Starwins Ltd.

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