2014

Competitive Strategies Issues on Performance of Manufacturing Industries: Partial Least Square (PLS) Approach

ABDULLAHI HASSAN GORONDUTSE

Available at: https://works.bepress.com/abdullahi_gorondutse/14/
Competitive Strategies Issues on Performance of Manufacturing Industries: Partial Least Square (PLS) Approach

1Abdullahi Hassan Gorondutse and 2Haim Hilman
1School of Business Management, College of Business,
2Institute of Quality Management, Universiti Utara Malaysia, Malaysia

Abstract: The aim of this study is to examine the competitive strategies on performance of manufacturing industries. Competitive strategies are assumed to be one of the most imperative requirements for business to survive and flourish in unstable and volatile environments. This study examines competitive advantage and organizational performance in a manufacturing industry in Nigeria. The data for this study were collected from the Managers/owners in Kano State Nigeria. Out of 250 distributed questionnaires, 158 usable questionnaires were returned. Before examining the effect of competitive advantage on the performance of Manufacturing Industries, the validity and reliability of the measurement, outer, model was investigated and confirmed in line with the standardized reporting style of PLS structural equation modeling. The results of the study concerning to the impact of competitive advantage on the performance of Manufacturing Industries was confirmed in line with the existing literature. The last section of the study discusses the findings and provides further insights into the future research were also discussed.

Keywords: Competitive advantage, manufacturing industries, Nigeria, performance, PLS

INTRODUCTION

In recent year’s business have witnessed an increasing amount of competition in almost all areas of industry, this applicable at home or abroad, in markets upstream for raw materials, components, supplies, capital and technology as well as in markets downstream for end user goods and services (Henderson, 1983; Li et al., 2006; Wind and Robertson, 1983). This has resulted in greater attention to analyzing competitive behavior and competitive strategies under different environmental conditions. Typologies of generic competitive strategies or “strategy types” have, for example, been proposed by McGee and Thomas (1986) and Porter (1980, 1985) and empirically tested by Galbraith and Schendel (1983) and Miller (1986). Previous scholars have examined the levels of performance associated with these strategy types along with their organizational characteristics and the type of environmental condition sunder which these different types of competitive strategy are most likely to be pursued by the organization (Newbert, 2008).

However, most of the industrial organization and business strategy literature, considerable interest has been centered on Identifying generic business strategies or strategy types based on strategy components, such as the scope or domain of the business, resources deployment in marketing, production and R&D, asset management or parsimony and degree of vertical integration (Miles, 1982; Miller, 1986; White, 1986; Newbert, 2008; Yamin et al., 1999). A number of typologies or taxonomies of business and competitive strategies have been identified, some based on a priori conceptual frameworks, others on empirical studies. The number and precise nature of the strategy types identified varies widely, depending on the specific components or variables included, as well as the exact methodology employed (Li et al., 2006; Zhou et al., 2009).

Furthermore, the issue of competitive strategies received increasing attention from academics, practitioners and business managers alike (Li et al., 2006; Newbert, 2008; Zhou et al., 2009). Many businesses has begun to realize that competitive advantage is key to building sustainable strategies their products and services in an increasing jam-packed marketplace place (Li et al., 2006; Zhou et al., 2009). in addition, competitive advantages enable an enterprises or group of business within a organizations to attained a superior business performance, Competitive strategies and business performance have been sough through organizational adaptability as well as rigidity (Wright et al., 1991, 1995; Zhou et al., 2009).

Moreover, previous researches has found many Nigerian industries operate productively for less than
50% of even the normally function per year (Eti et al., 2004), thus are seeking to inculcate a competitive outlook to poses a culture that deals with more effective and provides rapids changes particularly in Manufacturing sector as applicable with developed nations (Abereijo et al., 2007; Eti et al., 2004). The significance of competitive advantages and innovation for optimum industrial growth had been recognized in numerous studies (Abereijo et al., 2007; Egbetokun et al., 2007), this is because successful competition and innovation is associated with better performance (Abereijo et al., 2007).

Manufacturing sector contribute to total output or employment, it is quit enormous in creating skilled jobs, a potential catalyst of modernization and a sector with tendency of generating multiplier effects (Tyboust, 2000). In addition the sector remains one of the significant vehicles in ensuring economic growth and has become an avenue for developing countries to benefit from globalization (Mike, 2010). Researches in this imperative sector in dwelling their action so as to maintain its competitive advantage is very crucial. Despite the fact that business in developing nations have dissimilar structure from those in USA and Europe. The target population in Nigeria is quite large and then is fears that the foreign Manufacturing demand for products (i.e., made in China products) will outdo the indigenous ones. This means that there is a need to increase the competitive advantages so as to boost their performance and satisfies numerous customer in different capacity.

However, the competitor’s forces research agenda focuses mostly on competition in terms meeting entry barriers and excluding rivals from opportunities (Adner and Zensky, 2006; Zhou et al., 2009). Specifically, there is low research on how consumer’s heterogeneity and decreasing affect competitive advantages (Adner and Zensky, 2006; Zhou et al., 2009) and how manager/owners of business dealt with competitive advantage in relation to business performances. To the best knowledge of the researcher not much has been done in terms understanding the technological behavior and competitive strategies of manufacturing industries in Nigeria (Egbetokun et al., 2007). Clearly, evidence that a specific resource or capability may enable a firm to attain a competitive advantage in a particular industry setting is important given that it provides managers operating in that context the incentive and justification to obtain and exploit it. Yet, it is precisely this degree of specificity that is this. This study has been undertaken to address some of these gaps in the present research base. The purpose of this study is to examine the relationship between competitive advantage and its effect of organizational performance, specifically in the context of Nigerian Manufacturing industries.

LITERATURE REVIEW

Competitive advantage: Competitive advantage refers to the relative positional advantage in the marketplace that leads a firm to outperform its rivals (Porter, 1985; Zhou et al., 2009). For example, a firm can achieve a cost advantage when the firm operates at a lower cost than its competitors but offers a comparable product. Also, a firm can achieve a differentiation advantage when customers consistently perceive its offerings as superior to those of its competitors (Miller, 1986, 1988; Porter, 1985; Zhou et al., 2009).

Furthermore, majority of research on generic business or competitive strategy has been conducted in relation to US businesses. A limited number of studies have been conducted outside US, predominantly in Canada or European markets, following the classic structure, strategy, performance paradigm (Cowling, 1972; Egbetokun et al., 2007; Scherer, 1980). Other studies have examined the link between market structure and performance variables such as market share and profitability rather than examining the intervening competitive strategy variables and strategic types (Jenny and Weber, 1976; Lambin, 1976; Yamin et al., 1999; Zhou et al., 2009). The only study conducted in Australia is at a macro level by Yetton et al. (1992) examining the application of Porter’s typology to study the competitive advantage of Canada, New Zealand and Australia.

In line with this, two schools of thought have emerged regarding the conceptualization and adoption of competitive strategies. These are summarized as Porter’s generic strategies of cost leadership, differentiation and focus. The first school of thought supports Porter in his assertion that an organization has to choose one of the generic strategies and devote total commitment of resources to it (Dess and Davis, 1984). On the other hand, several other authors have argued against Porter’s assertion and suggest that organizations should focus on a combination of strategies that best suit their circumstances (Wright et al., 1990; Yamin et al., 1999; Zhou et al., 2009). For the purpose of this study and in line with (Wright et al., 1990) and circumstances of the context of this study used porter’s generic strategies cost leadership only.

The first school of thought maintains that viable companies can seek either efficiency or differentiation. The more efficiency is sought by management, the less differentiated the company would be, while greater differentiation would be associated with a less efficient company. This school of thought reasons that the value chain required for a low-cost strategy is qualitatively different from the value chain required for a differentiation strategy.

Furthermore, the emphasis of a differentiation strategy is on achieving (even at considerable cost)
With the volume of literature on this topic increasing, thorniest issues confronting academic research today. Recognized by several scholars (Connally, 1980; et al). Effectiveness and its importance have been widely correlated, the two constructs are clearly theoretically and empirically distinct (Newbert, 2008; Yamin et al., 1999; Zhou et al., 2009). Several authors have argued the importance of organizational or business performance along three dimensions namely:

- Theoretical (Cameron and Whetten, 1983)
- Empirical (Ginsberg and Venkatraman, 1985)
- Managerial (Nash, 1983)

The narrowest conception of business performance centers on the use of simple outcome based financial indicators that are assumed to reflect the fulfillment of the economic goals of the firm and is referred to as the financial performance, which has been the dominant model in empirical strategy research (Hofer, 1983; Venkatraman and Ramanujam, 1986; Yamin et al., 1999; Zhou et al., 2009). Typical of this approach would be to examine such indicators as sales growth, profitability (reflected by ratios such as return on investment, return on sales and return on equity), earnings per share and so forth.

Furthermore, reflecting the popular and current view that “market” or “value based” measurements are more appropriate than accounting-based measures (Hax and Majluf, 1984), some strategy studies have employed such measures like market-to-book or stock-market returns and its variants (Montgomery et al., 1984). Nevertheless, this approach still remains very much financial in its orientation and assumes the dominance and legitimacy of financial goals in the firm’s system of goals (Venkatraman and Ramanujam, 1986; Yamin et al., 1999; Zhou et al., 2009).

Moreover, broader conceptualization of business performance would include emphasis on indicators of operational performance (i.e., nonfinancial) in addition to indicators of financial performance. Under this framework it would be logical to treat such measures as market-share, new product introduction, product quality, marketing effectiveness, manufacturing value-added and other measures of technological efficiency within the domain of business performance (Hilman and Mohamed, 2011; Venkatraman and Ramanujam, 1986).

**Relationship between competitive advantages and business performance:** In literature it is expected that competitive advantage and performance will be correlated, the two constructs are clearly theoretically and empirically distinct (Newbert, 2008; Yamin et al., 1999). While competitive advantage refers to the economic value that has been created from the exploitation of a firm’s resource capability combinations, performance refers to the, economic value that the firm has captured from their commercialization. Although a firm’s performance is influenced by a host of exogenous effects, the

Organizational performance: The performance concept and the broader area of organizational effectiveness and its importance have been widely recognized by several scholars (Connally et al., 1980; Yamin et al., 1999; Zhou et al., 2009). The treatment of performance in research settings is perhaps one of the thorniest issues confronting academic research today. With the volume of literature on this topic increasing, there appears to be little hope of reaching any agreement on basic terminology and definitions (Venkatraman and Ramanujam, 1986; Yamin et al., 1999; Zhou et al., 2009).
competitive advantages a firm attains are no doubt an important antecedent toward this end. Thus, it is expected that the performance of firms that are able to attain competitive advantages will be greater than the performance of those firms that are not (Yamin et al., 1999; Zhou et al., 2009).

Barney (1991) firms are able to improve their performance only when their (resource-based) strategies exploit opportunities or neutralize threats. In other words, the best performing firms will not necessarily be those that simply exploit the most valuable and rare resource-capability combinations, but rather those firms that exploit their combinations most effectively. In support, Castanias and Helfat (2001) argue that rents derive not from random and/or misguided initiatives, but rather from properly motivated and well-directed strategic effort. Thus, in order to improve performance, firms (or more specifically, firm actors) must first identify and implement resource-based strategies that actually result in the creation of economic value (Yamin et al., 1999; Zhou et al., 2009).

**METHODOLOGY**

**Sample:** In their assessment of what has been learned from the RBV literature, Barney and Mackey (2005) argue that ‘the best resource-based empirical work will involve collecting primary data from firms in a carefully drawn sample’. In response to this call, the data used for this study was collected employing the survey questionnaire research design. The questionnaire as the tool of the data collection was distributed to the customer, in line with the general rule, the minimum number of respondents or sample size is five-to-one ratio of the number of independent variables to be examined. Conversely, Hair et al. (2010) proposed that the acceptable ratio is ten-to-one. Therefore, Non probability purposive sampling was used in this study. Given that we could not get a list of all the elements of the population, we used a non-probability sampling of purposive sampling whereby only customers along the streets were chosen and those who were not involved were excluded from the sample. Out of 250 questionnaires distributed, 158 usable questionnaires were returned and used for the statistical data analysis and hypothesis testing, representing 63.2% responses rate which is superb.

**Measurement:**

**Competitive advantage:** Instruments that measure competitive advantage were adopted from Zhang (2001) and Li et al. (2006) Competitive Advantage (CA) construct was represented by 5 dimensions and 16 items and was found to reliable and valid attained internal consistence reliability.

**Performance:** For the organizational performance, the instruments combined both financial and nonfinancial measurement instruments. Specifically, it consists of seven questionnaires which were developed and tested by Hilman and Mohamed (2011), Venkatraman and Ramanujam (1986), Lee and Miller (1996) and Kaplan and Norton (1996).

**RESULT ANALYSIS**

As discussed earlier, this study aims to study the relationship between competitive advantage and performance in Nigerian Manufacturing Industry. Therefore, this study used Partial Least Square (PLS) method to analyzed the results this is due to growing number of researchers from various disciplines such as strategic management (Hulland, 1999), management information systems (Dibbern et al., 2004), e-business (Pavlou and Chai, 2002), organizational behavior (Higgins et al., 1992), marketing (Reinartz et al., 2004) and consumer behavior (Fornell and Robinson, 1983). Since 1987, in addition, The PLS methodology has also achieved an increasingly popular role in empirical research in international marketing, which may represent an appreciation of distinctive methodological features of PLS (Henseler et al., 2012). In order to obtain valid and reliable results, this study followed the two steps approach as suggested by Chin (1998). Therefore, the process was to confirm the construct validity before proceeding to test the hypothesis.

**The measurement, outer, model:** The goodness of measurement, outer, model has been established through the content validity and the construct validity.

**The content validity:** Construct validity testifies to how well the results obtained from the use of the measure fit the theories around which the test is designed (Sekaran and Bougie, 2010). In line with Hair et al. (2010) and Chin (1998), factor loading of the items could be used to confirm the content validity of the measurement model. Further, all the items meant to measure a particular construct should load highly on the construct they were designed to measure. If some items load on some other factors higher than their respective construct, these items will be candidate for deletion.

In addition, all the measures of the construct should be significantly loaded on their respective construct. As illustrated in (Table 1), all the items load highly and significantly on the constructs they were designed to measure. Thus, the content validity of the measurement, outer, model was confirmed, for example, this study used a cutoff value for loadings at 0.5 as significant (Hair et al., 2010). Therefore, if any items which has a loading of higher than 0.5 on 2 or more factors then they will be deemed to be having significant cross loadings. From Table 1 we can observe that all the items measuring a particular construct loaded highly on that construct and loaded lower on the other constructs thus confirming construct validity.
Table 1: Outer model loadings

<table>
<thead>
<tr>
<th>Items</th>
<th>Deliver (DD)</th>
<th>Performance (OP)</th>
<th>Prices Cost (PC)</th>
<th>Product Innovation (PI)</th>
<th>Quality (QU)</th>
<th>Time (TM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD08</td>
<td>0.89</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DD09</td>
<td>0.91</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DD10</td>
<td>0.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OP20</td>
<td></td>
<td>0.43</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OP22</td>
<td></td>
<td>0.95</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OP23</td>
<td></td>
<td>0.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OP24</td>
<td></td>
<td>0.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC01</td>
<td></td>
<td></td>
<td>0.92</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC02</td>
<td></td>
<td></td>
<td>0.94</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC03</td>
<td></td>
<td></td>
<td>0.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI11</td>
<td></td>
<td></td>
<td></td>
<td>0.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI12</td>
<td></td>
<td></td>
<td></td>
<td>0.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI13</td>
<td></td>
<td></td>
<td></td>
<td>0.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QU04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.95</td>
<td></td>
</tr>
<tr>
<td>QU05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.92</td>
<td></td>
</tr>
<tr>
<td>QU06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.93</td>
<td></td>
</tr>
<tr>
<td>QU07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td>TM14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.73</td>
</tr>
<tr>
<td>TM15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.87</td>
</tr>
<tr>
<td>TM16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.76</td>
</tr>
<tr>
<td>TM17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.91</td>
</tr>
</tbody>
</table>

In addition, this study employed Harman’s one factor test of common method bias (Podsakoff et al., 2003) and acquire a number of different factors from among the variables. Consequently, we may assume that common method variance bias is not a problem and the results corroborate the tenability of the proposed measurement model.

**Convergent validity:** Convergent validity which is the extent to which multiple items to measure the same conceptions are in agreement. In line with recommendation of Hair et al. (2010) we used the factor loadings, composite reliability and average variance extracted to appraise convergence validity. The loadings for all items are all above the yardstick value of 0.5 (Hair et al., 2010) except OP20 which is 0.42 close to recommend value and this may due to nature smaller business. Composite reliability values (Table 2), which present that composite reliability value of all the constructs exceeded the cutoff value of 0.7 and all the values of AVEs are all more than 0.5. Hence, one can corroborate that the measurement, outer, model possesses a sufficient degree of convergent validity and all valid measures of their respective constructs based on their parameter estimates and statistical significance (Chow and Chan, 2008).

**Discriminant validity:** The discriminant validity of the measures (the degree to which items differentiate among constructs or measure distinct concepts) was appraised by examining the correlations between the...
Discriminant validity

<table>
<thead>
<tr>
<th>Constructs</th>
<th>DD</th>
<th>OP</th>
<th>PC</th>
<th>PI</th>
<th>QU</th>
<th>TM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery</td>
<td>0.91</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>0.82</td>
<td>0.86</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>0.79</td>
<td>0.85</td>
<td>0.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product Inv.</td>
<td>0.88</td>
<td>0.79</td>
<td>0.81</td>
<td>0.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>0.84</td>
<td>0.83</td>
<td>0.87</td>
<td>0.86</td>
<td>0.93</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>0.77</td>
<td>0.81</td>
<td>0.79</td>
<td>0.74</td>
<td>0.70</td>
<td>0.82</td>
</tr>
</tbody>
</table>

Table 4: Hypothesis testing

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path coefficient</th>
<th>S.E.</th>
<th>t statistic</th>
<th>p value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD -&gt; OP</td>
<td>0.23</td>
<td>0.08</td>
<td>2.71</td>
<td></td>
<td>Supported</td>
</tr>
<tr>
<td>PC -&gt; OP</td>
<td>0.47</td>
<td>0.09</td>
<td>5.53</td>
<td></td>
<td>Supported</td>
</tr>
<tr>
<td>PI -&gt; OP</td>
<td>0.08</td>
<td>0.07</td>
<td>1.18</td>
<td></td>
<td>Not supported</td>
</tr>
<tr>
<td>QU -&gt; OP</td>
<td>0.15</td>
<td>0.08</td>
<td>1.78</td>
<td></td>
<td>Supported</td>
</tr>
<tr>
<td>TM -&gt; OP</td>
<td>0.20</td>
<td>0.07</td>
<td>2.74</td>
<td></td>
<td>Supported</td>
</tr>
</tbody>
</table>

S.E.: Standard error

Table 5: Predictive relevance model

<table>
<thead>
<tr>
<th>Dependable variable</th>
<th>R²</th>
<th>Cross validated redundancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>0.84</td>
<td>0.60</td>
</tr>
</tbody>
</table>

measures of potentially overlapping constructs. This means that the shared variance between each construct and its measures is greater than the variance shared among distinct constructs (Compeau et al., 1999). In order to assess the discriminant validity of the measurement model, this study used the criterion suggested by Fornell and Larcker (1981). As in correlation matrix illustrated in Table 3, the diagonal elements are the square root of the average variance extracted of all the latent variables. The discriminant validity is assumed if the diagonal elements are greater than other off-diagonal elements in their rows and columns. This situation is apparently the case in the correlation matrix and thus the discriminant validity is confirmed. Having established the validity and the reliability of the measurement model, the next step was to test the hypothesized relationship by running PLS algorithm and Bootstrapping algorithm in Smart PLS 2.0 (Table 4).

Predictive relevance of the model: Another important of the structural model can be assessed through $R^2$ which indicates the variance in the dependent variable that is explained by the independent variables. Based on the results reported in (Table 5), the $R^2$ was found to be 0.84 indicating that competitive advantages can account for 84% of the variance in the performance. In line with the assessment criterion suggested by Cohen (1988), 0.26 substantial, 0.13 moderate and 0.02 weak.

Therefore, in this study $R^2$ here is considered substantial indicating the power of competitive advantages in explaining the Performance. Similarly, another criterion to assess the quality of the model is using the Blindfolding procedure to generate the cross-validate communality and cross-validated redundancy. Blindfolding procedures is designed to remove amount of the data and handle them as missing values to estimate the model parameters. These parameters are used later to reconstruct the assumed missing data. Based on that, the comparison will be held to assess how close the real from the implied results and the Q2 values will be calculated.

A cross-validated communality Q2 is obtained when the data points are predicted using the underlying latent variable scores. Whereas, if the prediction of the data points is obtained by the LVs that predict the block in question, then a cross-validated redundancy Q2 is the output. In line with recommendations by Fornell and Cha (1994), the model will have predictive quality if the cross-redundancy value was found to be more than 0, otherwise the predictive relevance of the model cannot be concluded. Based on the Smart PLS 2.0 results, the obtained cross validated redundancy was found to be 0.60. This result supports the claim that the model has an adequate prediction quality (Fig. 1).

Effect sizes: On the contrary, to usual partial F-test, Cohen (1988) introduced effect sizes, contrary to F-test; the effect size $f^2$ does not mean to the sample at all, but to the fundamental populace of analysis, as a result, no degree of independence need to be well thought-out. Consequently, this is acceptable by the information that if a variance based structural equation model procedure more logically with square correlation values, it is more suitable to work straight forwardly with $f^2$ values rather than f (Cohen, 1988).

Consequently, for decision-making purpose it is not so much the importance that counts but the disparity effects of the latent constructs. Hence, effects size is a way to evaluate in as much as a predictor construct has a substantive control on the dependent variable, which can be explored in the course of the effect sizes $f^2$, the higher the $f^2$ the better the control of the independent constructs (Cohen, 1988).

The effect is defined as follows:

$$\text{Effect size : } f^2 = \frac{R^2_{\text{mod}} - R^2_{\text{crit}}}{1 - R^2_{\text{mod}}}$$

where,

$$f^2 = \text{Effect sizes}$$
Therefore, the change in the endogenous variable determination coefficient is examined by calculating the structural model in two times (i.e., one time with and one time without the exogenous variables ($R^2_{\text{incl}}$ and $R^2_{\text{excl}}$) values. Thus, Following Cohen (1988) criterion, $f^2$ is evaluated as:

- 0.02 small
- 0.15 medium
- 0.35 large

And therefore indicate the latent exogenous variable have an influence on the particular latent dependent variable (Cohen, 1988). It is significant to recognize that a small $f^2$ does not essentially imply an insignificant effect (Limayem et al., 2001).

Based on the Table 6, the result of this study reveals that the effect sizes on the association with respect to price and performance is Medium, the effect sizes on the association between product and performance indicate that none statistical influences which means that no effect sizes, in addition, the effects smaller than 0.02 indicate that a lack of substantiality, since insubstantiality effects means negligible control on the explanandum, they received smallest attention and may likely yield significant theoretical or managerial implications (Henseler et al., 2012). Similarly the effect sizes on the relationship between quality and performance is small, the effect sizes on the connections between delivery and performance is also small and finally, the effect sizes on the association with regards to time and performance reveals medium influences on the endogenous variables (Cohen, 1988).

**DISCUSSION AND CONCLUSION**

The results of this study have established the significant effect of competitive advantage on the Performance of Manufacturing Industries in Nigeria.
For instance, competitive advantage has confirmed to have a significant positive effect of the performance (Delivery: $\beta = 0.23$, $t = 2.71$, $p<0.05$; Price: $\beta = 0.47$, $t = 5.53$, $p<0.001$; Product: $\beta = 0.08$, $t = 1.18$, $p<0.24$; Quality: $\beta = 0.15$, $t = 1.78$, $p<0.07$; Time: $\beta = 0.20$, $t = 2.74$, $p<0.05$) at the 0.01, 0.05 level of significance, (Fig. 2 and 3). In other word, competitive advantage can account for 84% of the variance in the performance of manufacturing industries. This result confirmed the magnitude competitive advantage to the performance as comprehensively acknowledged in the easily reached literature (see for case in point (Li et al., 2006; Newbert, 2008; Yamin et al., 1999; Zhou et al., 2009)). Therefore, this means that manufacturing industry needs to enhance competitive in their procedures and able to response fast and quickly to the unexpected changing of the business environment.

Additionally, this study also examines the goodness of measure which is assessed by looking at the validity and reliability of the measures carried out using the PLS approach. The results showed that the measures used exhibited both convergent and discriminant validity. Next we proceeded to assess the reliability of the measures by looking at the Cronbach alpha values and composite reliability values. Both the Cronbach alpha values and composite reliability values were at par with the criteria set up by other established researchers. As such the measures in the model were shown to be reliable. further, using the PLS approach, statistical analysis of the data established generally accepted views that competitive advantage influence performance among Nigerian manufacturing industries. In addition the result reveals the effect sizes of all dimension of competitive advantages as it relate to performance. As we have already said earlier although this is generally true, the hypothesis has not been tested in an area like Kano state, Nigeria to the best knowledge of the researcher. This adds to the body of knowledge in terms of the applicability in Kano state, Nigeria. This study hence provides useful insights and information regarding the factors and areas that policy makers, manufacturing industries associations and other leaders need to consider to boost competitive advantage, in addition managers should be aware that Product innovation and quality of product need to be improved.

On a final note, one major limitation of this study was related to research design that is based on examining the relationship between competitive advantage and performance at one point of time, this
type of relationship might be clearer if examined on the long run. Similarly, the use of single respondents may result to measurement error. In addition to that, Future studies could perhaps identify and examine specific relationships in another sector so that the issue of variance in the extent of performance among them could be better understood; further research could enhancement these measures with more qualitative methodologies, such as conducting in-depth interviews with respondents. Additional insights from such interpretive research might provide a more affluent considerate of the process by which competitive advantage influence performance. And finally, future research should seek multiple respondent from each industries this may increase research result.

REFERENCES


