EFFECT OF PRODUCT DIVERSITY AND MARKET COMPETITION ON REVENUE GENERATION IN THE MINISTRY OF TRANSPORT AND INFRASTRUCTURE IN KENYA: A CASE OF MECHANICAL AND TRANSPORT DIVISION

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ABSTRACT

Governments are tasked with provision of services, maintenance of law and order as well as ensuring the welfare of the citizens is addressed among other responsibilities. In order to meet their developmental goals and plans, some Governmental agencies have been mandated to collect additional revenue so as to reduce the burden on the exchequer and fast track National development. The Mechanical and Transport Division within the State Department of Infrastructure in the Ministry of Transport and Infrastructure, through an act of parliament was mandated to levy charges for provision of equipment hire and consultancy services in all counties of the country. In the recent past however, the income generated has been on a downward trend. The objective of this study was to determine the effect of selected factors on revenue generation within the Ministry of Transport and Infrastructure taking the case of the Mechanical and Transport Division. The research sought to explore the effect of product diversity and market competition as the independent variables and revenue generation as the dependent variable. The study reviewed the resource – based view theory, the systems theory and the decision theory and is anchored on the resource – based view theory as it helps to focus on organizations resources in totality. The research adopted a descriptive research design on 67 respondents from a population of 154 selected through stratified sampling method. The primary data was collected by use of a structured questionnaire and analyzed using mean, standard deviation, frequencies and percentages. The statistical analysis revealed that a unit increase in product diversity would lead to a unit increase in revenue generation by 0.187, a unit increase in market competition would lead to a unit decrease in revenue generation by 0.052. It was apparent that the regression model was statistically significant in predicting the independent variables influence on the dependent variable. The study observed that market competition had reduced the revenue collected thereby making the division more innovative. From the findings of the study through product diversification, the division has been able to increase its revenue generation and hence increased profitability though it must review its product diversification strategies as guided by market dynamics in order to ensure sustainability in the long run. It was also found that revenue generation for the division was largely dependent on the existing level of market competition and the division should monitor the market dynamics if it has to maintain sustainability in the long run. It is recommended that research and development should take a key role in guiding the diversification strategy, provision of new products and services while marketing strategies should be enhanced.

Key Words: product diversity, market competition, revenue generation
INTRODUCTION

The Ministry of Transport and Infrastructure is one of the ministries within the Government of Kenya and is composed of several State Departments. The functions of the State Department of Infrastructure is national roads development policy, development, standardization and maintenance, mechanical and transport services among others. The Mechanical and Transport Division is one of the branches within the State department of Infrastructure and is responsible for provision, maintenance and renewal of mechanical transport and plant services. The Division is also responsible for standardization of vehicles, plant and equipment as well as an adviser to the Government on issues related to mechanical and automotive engineering. In the year 2003, the Division was mandated by a legal notice to levy charges for its services in order to provide additional funds required for administration, planning, development, management, regulations, operations and maintenance of effective, economical and efficient mechanical and transport services. MTD functions through MTF - fund which was created for coordination of the revenue generation activities. The fund was initiated through a loan advanced by a donor in order to facilitate MTD’s acquisition of required equipment for Government’s infrastructural development and towards attainment of Vision 2030. According to Vijaya (2010), raising revenue from various sources is a requirement for the Government to be able to meet its multiplicity of demands by the citizens.

The ever rising economic and financial needs of governments all over the world and budgetary constraints that exists threaten the growth and its sustainability, hence forcing these governments to find new innovative mechanisms to generate and collect revenue (Mogues T. & Benin S., 2012). Many national and county governments plus the local authorities have adequate revenue bases to finance the current level of services, but collection levels are often low; although some have deficits in revenue generation. Revenue generation in any organization is often faced with myriad of challenges including managerial ones, strategic ones and lack of innovative and inventive ways. Mwangi (2011) noted that at times the generated revenue is faced with challenges in collecting it. Revenue generation and collection are the key functions of management. In all enterprises the recurrent expenditure is met by the recurrent revenue generated on daily bases, thus such enterprises must find new formats for generation of revenue. Failure to generate or collect revenue is a catastrophe that manifests in incomplete operations in an enterprise as a result of unpaid salaries, poor service delivery and stalled projects (Mwangi, 2011). There are various factors that affect revenue generation among government ministries. Some as noted by Grace (2013) such as product diversity and market competition are among the key factors and many governments are working hard to ensure that they are handled well so as to be able to generate more revenue in order to sustain many of the government expenditures and undertake developmental projects.

STATEMENT OF THE PROBLEM

In order to handle recurrent budgets, revenue generation is an important management’s concern in State departments which are mandated to levy charges for their services. Many national and county governments plus the local authorities have adequate revenue bases to finance the current level of services, but collection levels are often low. MTD generates
revenue through hire of equipment for road works and consultancy services. In the recent past however, the revenue generated has exhibited a decreasing trend. In the FY 2012/2013, the revenue generated through provision of the services by MTD declined from Ksh. 1.31B to Ksh. 1.24B representing a reduction of 5.34%. While there was a 4.84% increase in revenue generated in FY 2013/2014, this was dampened by a further decline from Ksh. 1.3B to 1.06B representing a drop of 18.5% in 2014/2015 Financial year. The situation was still evident in 2015/2016 with a further reduction of 14% from Ksh 1.06B to Ksh 0.912B. This trend depicts a state of unpredictability in revenue generation resulting to uncertainty in the planning process of the Division. Sustained revenue generation in state departments ensures that the burden of their recurrent budget is offloaded from the National Treasury thereby fast-tracking delivery of services to other needy sectors. MTD envisaged to have increased revenue generation as a key backbone to enable it become a semi-autonomous Government agency. Decline in revenue generation limits the Division’s capacity to handle its current and emerging developmental needs jeopardizing the sustainability of MTD’s operations – yet it is common knowledge that the infrastructural needs of the country have been on an upward growth. Moreover, renewal of road maintenance equipment is capital intensive and thus reduced income from the revenue generation activities implies that the Division may not be able to acquire new equipment to handle increased demand. Inadequate funding of maintenance activities results in reduction of serviceability levels of existing equipment fleet while maintenance costs escalate exponentially thereby compounding the problem.

GENERAL OBJECTIVE

The main objective of this research was to study the effect of product diversity and market competition on revenue generation at the Ministry of Transport and Infrastructure focusing of the case of Mechanical and Transport Division

SPECIFIC OBJECTIVES

1. To determine the effect of product diversity on revenue generation at the Mechanical and Transport Division
2. To establish how market competition influences revenue generation at the Mechanical and Transport Division

THEORETICAL LITERATURE REVIEW

The Resource - Based View Theory

Resources are what a company has at its disposition to translate into either its strength or weakness. It therefore implies that the competitive advantage of a company is related to how it translates its tangible or intangible resources. RBV theory has gained a lot of usage in the recent past in business competitive environment’s analysis. According to Kozlenkova, Samaha and Palmatier (2013), in the past decade, there has been a fivefold increase in the use of Resource based view theory use as a framework to explain firms’ competitive environment and prediction of outcomes in marketing research. It is held by the proponents of the resource based view theory that the difference in performance between companies is
translatable to their assets and resources. Wiklund & Shepherd (2004) postulate that resources are either knowledge-based or property-based and indicate that property-based resources can be traded and are not specific to the firm. The Resource – Based View theory finds applicability in this study since a grounded understanding of organization resources and their interactions is critical to the survivability of an organization such as MTD.

Whilst RBV has emerged as one the substantial theory in assessing and analyzing how firms’ internal resources contribute to the competitive advantage and thus an important tool in strategic management, the theory has attracted considerable criticism. Akio T. (2005) for example argues that the role of the strategies employed by the entrepreneur and their capabilities as important sources of a firm’s competitive advantage are overlooked by the theory. Kraaijenbrink, Spender and Groen (2010) give a detailed analysis of critiques and categorized them indicating their severity and impact and concluded that RBV theory can withstand most criticisms quite well when its variables, boundaries, and applicability are more clearly specified.

**Systems Theory**

Mele, Pels & Polese (2010) define a system as an assemblage of objects united by some form of regular interaction or interdependence and indicate that systems can be natural, physical, conceptual, closed or open. A system is a set of distinct parts that form a complex whole. Pearson (2010) alleges that since organizations are systems, knowledge of systems thinking is an important asset for planning and problem solving because it puts into consideration interdependence shared within and between organizations, the short and long-term implication of actions by individual organizations and the wider effect on the society.

According to Mele, Pels & Polese (2010), systems theory is an interdisciplinary theory about every system in nature, in society and in many scientific domains as well as a framework with which we can investigate phenomena from a holistic approach. In their detailed analysis the authors state that in management today, the systems theory is one of the dominant organizational theory. An organization is treated as either an open or closed system whereby an open system is affected by the environment while a closed system is not. Systems theory is particularly important to this study since the environment within which MTD operates is dynamic and requires foresight in understanding the interplay and relationships between the organization’s components for the Division’s managers to institute appropriate changes to ascertain sustainability of the division.

**Decision Theory**

Individuals always make choices among available options. The decision theory focusses on decisions made in prevailing factors such as uncertainties which can influence the course of action. Decisions on payments for example may involve small payments made earlier in comparison to waiting for a larger payment at a later time. Decisions may also involve having a sure payment or a payment which may have no assurance, also referred to as a lottery. A utility function can summarize such conditions by assigning numbers to possible options with the individual choosing the highest numbered option (Aldo et al, 2012).
Decision making has a great implication in management of organizations. Ejimabo (2015) studied how decision making influences organizational leadership and management activities in current organizations, which then has an impact on growth and effectiveness, creativity, success and goal accomplishments. It is concluded that organizational executives ought to engage in improvement and changes in their decision making so as to accommodate diversity, technology, globalization and team work if they have to show effectiveness in their leadership. Useful models for decision making in businesses have been developed over time with a view to express the processes that interplay before conclusions are arrived at.

The decision theory is applicable to this study in that it guides the understanding and knowledge of decision making in the midst of various options as required from time to time by management of the Mechanical and Transport Division. These may include issues such as accessing credit, purchase of equipment and changing existing structures.

**EMPIRICAL LITERATURE REVIEW**

**Product Diversity and Revenue Generation**

Albarelli, Ensinas and Silva (2014) in Brazil studied product diversification of second generation of ethanol in order to enhance its economic viability. In the survey they established that diversification has consistently intrigued government since the 20th Century in the efforts to boost performance while reducing risks. According to the authors, there are various types of diversification; internally by making mergers and acquisitions and cooperating with related industries in various geographical regions as well as distinct product categories. The authors study was based on diversification into multiple product categories within a high tech industry related to manufacturing.

There is need for the improved performance and continuous survival of firms all over the world; the construction firms also need the same things. And as other firms in different sectors of the economy diversify into different businesses, the construction firms in Nigeria are also shifting to make new products and enrolled into other business activities. Adamu, Zubairu, Ibrahim and Ibrahim (2011) evaluated the impact that product diversification had on the financial performance in some construction firms in Nigeria and mention that most of the construction firms have diversified into construction-related businesses. The increased volatility and competitiveness of the construction industry has made the industry more vulnerable to fluctuations in demand, thereby aggravating the situation and making survival more crucial. These construction firms have diversified into other activities including construction plant hire, property development, and sales of construction related materials.

**Market Competition and Revenue Generation**

Mathuva (2009) postulates that competition among firms in the manufacturing industry has morphed towards intangible resources with the measure being the internal capacity to innovate and outsource. It also depends upon the firm’s capability to invest in high-tech areas. The competitive market helps to minimize expenditures while the products’ quality availed to the consumers is enhanced. It is therefore noted that some factors ought to be
considered in order to have the outsourcing process flow smoothly. Firstly, manufacturing and research and development should operate as separate entities and secondly, the technology engaged in the manufacturing ought to increase (Mathuva, 2009). Market competition forces, if not strategically managed can greatly jeopardize the sustainability of a firm in times of financial distress. According to Lange, D.E. (2012), it is dawning on corporate managers that there is absolute need to expand goals outside their usual expectations since the need for sustainability of organizations became a prominent issue in business world. It is stated that studies in sustainability seek to understand why and how sustainability approaches are done by business entities. While overcoming market forces make firms focus outwards, Kaufman E. (2014) argues that firms need to be keen in how they use their human capital in order to survive the intensity of competition. Accordingly, it is proposed that this is achievable by implementation of high-performance work practices. Jonnalagedda S. (2011) reviewed the opportunities and challenges of revenue generation in the information era and highlight that innovative revenue generating models are as critical as bringing cutting edge technology to the market in an information economy.

**RESEARCH METHODOLOGY**

The study uses descriptive research design as it purposes to determine the effect of the selected factors on revenue generation in the Ministry of Transport and Infrastructure. The study targeted 154 Senior and middle level Engineers at the MTD Headquarters, Regional Mechanical Engineers at the Counties, Accounts staff, Human Resource staff, County Mechanical Officers and Equipment Operators. The target group was then classified according to Job Groups with the seniority grouping being the Job Group. The study adopted stratified sampling method for the population where the target population was placed in three strata; the senior managers, middle level managers and junior staff working at MTD. Simple random sampling was applied to each stratum allowing it to be fairly included in the study; simple random sampling ensures that each member has an equal selection chance for participating in a study. A simple random sampling was applied where 30% from each of the stratum was selected for inclusion in the study. The total sample size for this study included 67 respondents who are employees working at the mechanical and transport division at the Headquarters and the counties. The study used primary data collected using a questionnaire. To make inferences, the conclusions and recommendations, the collected questionnaires from the respondents were corrected, coded, and fed into the Statistical Package for Social Sciences (SPSS version 23.0) for further analysis. The study used descriptive analysis where means, standard deviations, percentages and frequency distributions were computed for the data in order to come to understand the relationships between the data. The study also conducted a multiple regression analysis to establish the nature of the existing relationship between the independent and dependent variables being studied, inferential statistics using the following model:

\[
Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon
\]
Where: $Y = $Revenue Generation; $\beta_0 =$ Constant Term; $\beta_1, \beta_2, \beta_3, \beta_4=$ Beta coefficients; $X_1 =$ Variable representing Product Diversity; $X_2 =$ Variable representing Market Competition; $\varepsilon =$ Error Term

**RESEARCH RESULTS**

**Product Diversity**

The respondents were required to indicate the extent to which they agreed with each of the statements as they applied in their organization. Mean and standard deviation were used for ease of interpretation and generalization of findings. On whether diversification efforts had boosted revenue collection of their department, the respondents were in agreement to a large extent as depicted. This was represented by a value of mean being 3.71 while the standard deviation value was 1.040. This shows that revenue collection had improved as a result of diversification. The respondents agreed to a moderate extent that diversification efforts had boosted risk management in the department. This was represented by a value of mean being 3.20 and a standard deviation being 0.978. This implies that the department had applied risk mitigation measures as they diversify their processes. As to whether diversification of products had called for increased research and development, the respondents were in agreement to a moderate extent. This was represented by the value of mean being 3.12 and the standard deviation being 1.252. This implies that the department had embarked in creating research and development at the division as they diversify on their products.

The respondents agreed to a moderate extent that product diversification by the Ministry had led to higher market value of their products. This was represented by the mean value being 2.73 and the standard deviation being 1.150. This indicated that as a result of product diversification the Ministry had expanded its market leading to improved value for the products. The respondents agreed to a moderate extent that high levels of product innovation had improved financial sustainability of the department as shown by the mean value being 2.79 with a standard deviation of 1.154 - indicating that the department had advanced in creation of new products which have boosted their performance financially.

Regarding to whether product diversification had enabled them gain economies of scale, the respondents agreed to a moderate extent as depicted by the mean value being 3.00 and the standard deviation being 1.136. This shows that the department was gaining as results of increasing the variety of services rendered. The respondents were in agreement to a great extent that revenue generation was high due to improved efficiency in assets management. This was represented by the mean value being 3.87 while the standard deviation was 1.136 – implying that asset management in the department had contributed to increase in the returns. The respondents were in agreement to a little extent that revenue had declined over time. This was represented by the mean value being 2.36 and standard deviation of 0.950. This shows that the revenue of the department had slightly declined over the period.
Market Competition

From the representation in table 4.1, the respondents were in agreement that competition had reduced the revenue collected by MTD. This was represented by the mean value being 3.57 with 1.000 being the standard deviation - showing that competition in the market had adversely reduced the returns over the period. As to whether competition had made their division more innovative the respondents agreed to a moderate extent. This was represented by the value mean of 2.63 and 0.928 standard deviation - implying that the division had developed innovative products to counter the competition.

The respondents were in agreement to a moderate extent that competition had necessitated skills development of their staff. That was represented by the value of mean being 3.48 and the standard deviation being 1.043 - showing that the ministry was developing skills for the staff in order to be up to date in their work. The respondents indicated to a large extent that using highly-skilled workforce at the department had made them competitively strong at the market as indicated by a mean of 3.63 with a standard deviation of 1.093. This shows that knowledge and skills among the workforce was necessary to cope up with the competition. On whether their capability to outsource some services had offered them competitive advantage on the market, the respondents indicated moderate extent with a mean of 3.10 with a standard deviation of 1.278. This shows that outsourcing some of its services to third parties reduces the cost thus enabling them to compete favorably.

As to whether competition had reduced the market value of their equipment, the respondents moderately agreed with a mean of 3.22 with a standard deviation of 1.373. This shows that the adverse competition in the market resulted to decrease in worth of the assets. The respondents agreed to a large extent that competition had reduced the general income earned by the division from plant hire which as indicated by the mean value being 3.42 and 1.080 standard deviation – showing that the hiring of equipment and plant from the division had decreased or prices reduced resulting to low proceeds.

Revenue Generation

The respondents were in agreement to a moderate extent that the department had continuously increased revenues collected from its activities as depicted by the value of mean being 3.02 and the standard deviation being 1.050 – implying that the revenue generated from the activities at the division was somehow gradually increasing. The respondents agreed to a large extent that revenue generation had largely depended on the quality of plant and equipment depicted by mean being 4.24 and the standard deviation being 0.662 – implying that the department had to acquire modern state of the art machines and equipment that can generate higher revenue.

On whether the revenue generation had largely depended on the competency of employees the respondents agreed to a large extent with the mean being 4.08 and the standard deviation being 0.759 - indicating that knowledge and skills were necessary for efficiency at the division. As to whether the revenue generation had largely depended on the capital available to finance department operations, the respondents agreed large extent as depicted by a mean
of 3.83 with the standard deviation being 0.850. This shows that capital was a prerequisite requirement at the division since the equipment and machines required huge capital.

The respondents agreed to a large extent that the revenue generation had largely depended on the existing level of competition as depicted by the mean being 3.73 while the standard deviation was 0.995. This implies that division had to come up with other ways to cope up with their competitors in order to improve their revenues generation.

Regarding whether the revenue generation had largely depended on the variety of equipment and services offered the respondents were in agreement to a large extent with a mean of 4.16 with the standard deviation of 0.850. This implies that proper equipment and efficient services offered by the division was key in the revenue generation. The respondents agreed to a moderate extent that the department’s revenue had increased over time as depicted by the mean of 3.14 with the standard deviation being 0.707 which shows that the revenue generation at the department had not constantly increased over the time.

The respondents also agreed to a little extent that the department’s revenue had decreased over time with a mean of 2.48 with a standard deviation of 1.063 and this indicates that the revenue had been constant over the time. On whether the department had experienced stable revenue generation over the past five years the respondents were in agreement to a moderate extent with a mean of 3.08 with a standard deviation of 1.096. This indicates that the revenue generation had been unstable in the division over the period.

REGRESSION ANALYSIS

R was 0.865 meaning that there was a positive relationship between all the four independent variables. R2 was 0.749 implying that 74.9% of the variation in the dependent variable was explained by the independent variables while 25.1% of the variations were due to other factors. This implies that the regression model has very good explanatory and predictor grounds.

Table 1: Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.865a</td>
<td>.749</td>
<td>.726</td>
<td>1.97265</td>
</tr>
</tbody>
</table>

From the results, the significance value is 0.000 which is less than 0.05 thus the model is statistically significant in predicting the independent variables influence on dependent variable. The F critical at 5% level of significance is 2.57. Since F calculated (value = 32.812) is greater than the F critical (2.57), this shows that the overall model was significant.

Table 2: ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>510.739</td>
<td>4</td>
<td>127.685</td>
<td>32.812</td>
<td>.000b</td>
</tr>
<tr>
<td>Residual</td>
<td>171.220</td>
<td>44</td>
<td>3.891</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>681.959</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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The regression equation becomes:

\[ Y = 0.304 + 0.187 X_1 - 0.052 X_2 + \varepsilon \]

Where: \( Y \) = Revenue Generation; \( \varepsilon \) = Error Term; \( \beta \) = Coefficient factor; \( X_1 \) = Product Diversity; \( X_2 \) = Market Competition.

**Table 3: Coefficients**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>( .304 )</td>
<td></td>
<td>.089</td>
<td>.929</td>
</tr>
<tr>
<td>Product Diversity</td>
<td>( .187 )</td>
<td>( .332 )</td>
<td>3.520</td>
<td>.001</td>
</tr>
<tr>
<td>Market Competition</td>
<td>( -.052 )</td>
<td>( .085 )</td>
<td>-.770</td>
<td>.445</td>
</tr>
</tbody>
</table>

From the findings of the regression analysis, if all factors (product diversity and market competition) were held constant, revenue generation would be at 0.304. A unit increase in product diversity would lead to a unit increase in revenue generation by 0.187. A unit increase in market competition would lead to a unit decrease in revenue generation by 0.052.

**CONCLUSIONS**

The study concludes that through product diversification the division increased its revenue generation and hence increased profitability. It is however established that the revenue generated over time has been declining though the department has remained fairly above competition in the short term by taking advantage of market opportunities and utilizing them to enhance their products and services. The choice of MTD competitive strategy was concerned with choosing a favorable environment in which to operate. Competition is a major determinant to the survival of a firm due to its effect on its sustainability.

**RECOMMENDATIONS**

The study established that the Mechanical and Transport Division had effectively adopted diversification giving it a competitive edge over its competitors in the short term, the study therefore recommends that the division should continuously review its product diversification strategies guided by the market dynamics so as to stay ahead of competition.

It was further established that the division had created a unique position in the market through provision of products and services, it is therefore recommended that the division should continue to invest in generation of more unique products and services so as to have services that are differentiated. In addition, the division should engage in aggressive marketing of services in order to sustain their delighted customers while targeting new ones.

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construction firms. *Journal of construction in developing countries*, 16(2), 91-114.


