MITIGATION STRATEGIES AND PRODUCTIVITY OF MANUFACTURING FIRMS IN RIVERS STATE

Dr. Enyia, Charles Daniel and Prof. B. C. Onuoha

Department of Management, University of Port Harcourt

Abstract

This study examines the extent to which mitigation strategies relate with productivity in manufacturing firms in River state. Risk transfer and risk avoidance were adopted as dimensions of mitigation strategies while efficiency and effectiveness were adopted as measures of productivity. This study adopted a cross-sectional research design, a total of five manufacturing companies out of the 62 registered manufacturing companies were selected for this study namely; Chinjex group of companies, West African Glass industry, General Plastic Nigeria Ltd, Metal and Plastic Industries Ltd and Demcok paints Ltd. These firms have a total of 309 employees. Using the Krejcie and Morgan table, we had a sample size of 169. Spearman rank order correlation was used in testing the stated null hypotheses. The study found a significant relationship between all dimensions of mitigation strategies and measures of productivity. The study further recommends collaboration with firms who are specialized in the aspect of risk that has great impact on firms’ production and performance. It would save them great cost and ensure their sustainability amongst others.

Keywords: Mitigation, Risk, avoidance, transfer, productivity, efficiency, effectiveness
Introduction

Manufacturing industries produce goods and services for sale with the aim of making returns on organizational investments. The goods and services are the output of the enterprises. In the process of production, industries make use of scarce resources which are called factors of production, namely land, labour and capital (Ahangar, 2011). These factors of production are generally referred to as inputs in the production process and their owners are rewarded from the returns generated by the enterprise. Combining these inputs to have a maximum result has been a fundamental problem of productivity within the Nigerian manufacturing industry. The negative trends in the performance of manufacturing production cannot but indicate falling productivity. The average growth of 2.6 per cent during the SAP period fell short of the expected rate of at least 8 per cent needed to put the sector on the path of recovery. Its stunted growth constrained the capacity of the reform process to pull the economy out of recession. In addition, capacity utilization rate at about 30 per cent is low to make for profitable operations estimated at about 50 per cent (Amir, Seyed & Hakimeh, 2019). Its share of about 6 per cent of GDP is also poor when compared with between 20 and 40 per cent in many industrialized and industrializing nations. Worst still, it is not encouraging when it is recognised that over 60 per cent of the nation’s foreign exchange earnings is allocated to a sub-sector that contributes only about 6 per cent of the GDP.

There is no universal definition of the term, productivity. It has been defined by Economists as the ratio of output to input in a given period of time (Mehmet, Aminu & Abdurrahim, 2014). In other words, it is the amount of output produced by each unit of input. Business Managers, on the other hand, see productivity not only as a measure of efficiency, but also connotes effectiveness and performance of individual organizations. Productivity incorporates quality of output, workmanship, adherence to standards, absence of complaints, customer satisfaction, etc (Udu, & Ewans, 2016). The administrator is more concerned with organisational effectiveness, while the industrial engineer focuses more on those factors which are more operational and quantifiable, work measurement and performance standards (Mills, & Smith, 2011). Productivity can be computed for a firm, industrial group, the entire industrial sector or the economy as a whole. It measures the level of efficiency at which scarce resources are being utilised. Higher or increasing productivity will, therefore, mean either getting more output with the same level of input or the same level of output with less input. In this study, we are considering how mitigation strategies significantly affect the productivity of manufacturing firms in Rivers state.

A risk mitigation strategy, by definition, is taking steps to reduce the risk (the severity of the impact and/or probability of the occurrence) (Luppino, Hosseini & Rameezdeen, 2014). Manufacturing firms should have at least a general plan for how it would systematically reduce an adverse exposure that goes beyond its established risk tolerance threshold. Risk mitigation helps firms to Control and mitigate the risk by providing sufficient instructions to manage risk (Simon, 2009). All risks identified are prioritized accordingly. This risk mitigation stagey includes risk response planning, risk avoidance risk transfer, etc. Risks can be mitigated by scenario planning. It allows project members to face the project risk as process of adaptation. This is a very much complex activity. The likely courses of action to be taken at the risk will be analyzed and planned at the beginning itself after the brainstorming and team briefing sessions. Project team can obtain sufficient guidance to develop the scenario plans from project manager or from external consultant if it is required according to the circumstances that they are operating (Asenova, Bailey & McCann, 2015). The identified risk can be shared with the project members accordingly considering their tasks and the roles that they have to play in the project. Sharing the risk will help project team
to manage the risk properly by dividing that into manageable levels among project members. The risk associated with each phase can be managed accordingly with a systematic use of work schedules. In this study, we shall adopt risk transfer and risk avoidance as dimensions of Mitigation strategies.

**Conceptual framework**

![Conceptual framework diagram]

Dimensions Adapted from Luppino et al (2014)
Measures adapted from: Armstrong, (2009)

**Research Objectives**

i. To examine the extent to which risk transfer influences efficiency
ii. To examine the extent to which risk transfer influences effectiveness
iii. To examine the extent to which risk avoidance influences efficiency
iv. To examine the extent to which risk avoidance influences effectiveness

**Research Questions**

i. To what extent does risk transfer influence efficiency?
ii. To what extent does risk transfer influence effectiveness?
iii. To what extent does risk avoidance influence efficiency?
iv. To what extent does risk avoidance influence effectiveness?
Research Hypotheses

H01  Risk transfer does not affect efficiency of manufacturing firms
H02  Risk transfer does not affect effectiveness of manufacturing firms
H03  Risk avoidance does not affect efficiency of manufacturing firms
H04  Risk avoidance does not affect effectiveness of manufacturing firms

Theoretical Framework

Theory of planned behavior

The theory of planned behavior is an extension of the theory of reasoned action as proposed by Ajzen & Fishbein, (1980) & Fishbein & Ajzen, (1975) which was made necessary by the original model’s limitations in dealing with behaviors over which people have incomplete volitional control. As a general rule, the stronger the intention to engage in a behavior, the more likely should be its performance. It should be clear, however, that a behavioral intention can find expression in behavior only if the behavior in question is under volitional control, i.e. if the person can decide at will to perform or not perform the behavior. Although some behaviors may in fact meet this requirement quite well, the performance of most depends at least to some degree on such non-motivational factors as availability of requisite opportunities and resources. Collectively, these factors represent people’s actual control over the behavior. To the extent that a person has the required opportunities and resources, and intends to perform the behavior, he or she should succeed in doing so.

In relation to this study, mitigation of risk is a planned action which is reflected in the behavior of members of institutions. It takes effective behavioral planning for risks to be mitigated because failure to plan for unseen risk would put manufacturing firms at risk.

Concept of Mitigation Strategies

Risk Mitigation is a strategy to prepare for and lessen the effects of threats faced by a business. Comparable to risk reduction, risk mitigation takes steps to reduce the negative effects of threats and disasters on business continuity (BC). Threats that might put a business at risk include cyber attacks, weather events and other causes of physical or virtual damage. Risk mitigation is one element of risk management and its implementation will differ by organization (Garvey, 2008).

Mitigation strategy is the process of planning for disasters and having a way to lessen negative impacts. Although the principle of risk mitigation is to prepare a business for all potential risks, a proper risk mitigation plan will weigh the impact of each risk and prioritize planning around that impact. Risk mitigation focuses on the inevitability of some disasters and is used for those situations where a threat cannot be avoided entirely. Rather than planning to avoid a risk, mitigation deals with the aftermath of a disaster and the steps that can be taken prior to the event occurring to reduce adverse and, potentially, long-term effects.

Ideally, an organization would be prepared for all risks and threats and avoid them entirely. However, having a risk mitigation plan can help an organization prepare for the worst, acknowledging that some degree of damage will occur and having systems in place to confront that. There are several types of risk mitigation strategies. Often, these strategies are
used in combination with each other, and one may be preferable over another, depending on the company's risk landscape. They are all part of the broader practice of risk management.

Risk avoidance is used when the consequences are deemed too high to justify the cost of mitigating the problem. For example, an organization can choose not to undertake certain business activities or practices to avoid any exposure to the threat they might pose. Risk avoidance is a common business strategy and can range from something as simple as limiting investments to something as severe as not building offices in potential war zones (Kossiakoff, & Sweet, 2003). Risk acceptance is accepting a risk for a given period of time to prioritize mitigation effort on other risks. Risk transfer allocates risks between different parties, consistent with their capacity to protect against or mitigate the risk. One example of this would be a defective product built with some amount of third-party material. The producer of the product may transfer responsibility for a certain fraction of the risk because of this.

Risk monitoring is the act of watching projects and the associated risks for changes in the impact of the associated risks. Risk can affect any combination of performance, cost and scheduling; therefore, different strategies should be used to address risks based on the way they affect these factors. For example, it might be more important for a company to perform well than for it to save money in a certain project scenario. The company would likely employ a risk acceptance strategy, temporarily prioritizing risks that affect performance more heavily than cost.

In this study, we shall adopt two of the several dimensions proferred by Luppino et al. (2014) which are risk transfer and risk avoidance.

**Risk Transfer**

Some scholars such as Smith, Merna & Jobling (2002) believe that firm owners should allocate risks to the parties best able to manage them. Although this sounds good, it is far easier said than done. It could be challenging, for example, to assign risks when there is no quantitative measurement of them. Risk allocation without quantitative risk assessment can lead to attempts by all project participants to shift the responsibility for risks to others, instead of searching for an optimal allocation based on mutually recognized risks. Contractors generally agree to take risks only in exchange for adequate rewards. To determine a fair and equitable price that the owner should pay a contractor to bear the risks associated with specific uncertainties, it is necessary to quantify the risks. Owners’ project representatives should explicitly identify all project risks to be allocated to the contractors and to the owner, and these risks should be made known to prospective bidders (Köhler & Som, 2014). In order to use a market-based approach to allocate risks, and to avoid unpleasant surprises and subsequent litigation, it is necessary that all parties to the agreements have full knowledge of the magnitude of the risks and who is to bear them.

Risk transfer can be entirely appropriate when both sides fully understand the risks compared to the rewards. This strategy may be applied to contractors, sureties, or insurance firms. The party that assumes the risk does so because it has knowledge, skills, or other attributes that will reduce the risk. It is then equitable and economically efficient to transfer the risks, as each party believes itself to be better off after the exchange than before and the net project value is increased by the risk transfer.

**Risk Avoidance**

Risk avoidance is the elimination or avoidance of some risk, or class of risks, by changing the parameters of the project (Gatzert & Kosub 2016). It seeks to reconfigure the project such
that the risk in question disappears or is reduced to an acceptable value. The nature of the solution may be engineering, technical, financial, political, or whatever else addresses the cause of the risk. However, care should be taken so that avoiding one known risk does not lead to taking on unknown risks of even greater consequence. Risk avoidance is an area in which quantitative, even if approximate, risk assessments are needed. For example, the project designers may have chosen solution A over alternative B because the cost of A is estimated to be less than the cost of B on a deterministic, single-point basis. However, quantitative risk analysis might show that A is much riskier than the alternative approach B (Chepa, Nor & Murad, 2015). The function of quantitative risk assessment is to determine if the predicted reduction in risk by changing from alternative A to alternative B is worth the cost differential. Risk avoidance is probably underutilized as a strategy for risk mitigation, whereas risk transfer is over utilized as owners are more likely to think first of how they can pass the risk to someone else rather than how they can restructure the project to avoid the risk (Kumsuprom, Corbitt & Pittayachawan, 2008). Nevertheless, risk avoidance is a strategy that can be employed by knowledgeable owners to their advantage.

Productivity

According to oxford dictionary Productivity is the rate at which a worker, a company or a country produces goods, and the amount produced, compared with how much time, work and money is needed to produce them (Armstrong, 2009). Productivity has two major components, technological change and manpower utilization. As technological change requires huge capital investment, organizations look for better manpower utilization to achieve increased productivity. With better human relations productivity can be increased. And there is no simple formula of getting the things done other then good human relations. Sometimes this can be stated that better relations can make an environment of productivity and that productivity if fairly and promptly rewarded, it makes very good human relations, which can work for a long time in the growth and success of the organization (Anumudu, 2010). Today, there are two things, which are very common in businesses, first is rapid growth and expansion and second is stiff competition both require efficient and highly productive human resources. To expand the business one must have all the things concerned with human beings that vision, zeal to learn and do, result oriented approach and habit of continuous improvement. There is no line where we can say that the best of our productivity has come. The best is always still to come and employees and their management always work for the same. The Productivity is the driving force behind an organization’s growth and profitability.

Productivity is the relationship between output of goods and services of workers of the organization and input of resources, human and non-human, used in the production process. In other words, productivity is the ratio of output to input. The higher the numerical value of this ratio, the greater the productivity (Sarminah, 2013). Productivity has been defined as the measure of how well resources are brought together in organization and utilization for accomplishment of a set result. It is reaching the highest level of productivity with the least expenditure of resources (Mills & Smith, 2011). According to Sarminah, (2013), productivity is the relationship between output of goods and services and input of resources, human and non-human, used in the production process. In order words, productivity is the ratio of output to input. The higher the numerical value of this ratio, the greater the productivity. Thus, productivity can be applied at any level, whether for individuals, for work unit, for the organization.

Productivity is a measurement or calculation between input and outputs. Inputs are the amount of resources such as human resource, money, time, physical, technological and effort.
spent working in the organization, while output are the result. If the inputs are equivalent to
the outputs, the worker is considered productive. When the employees are productive, they
accomplish more in a given amount of time. In turn, efficiency saves their company money in
time and labour. When employees are unproductive, they take longer time to complete
projects, which cost employee’s more money due to the time lost (Udu & Ewans, 2016).

Efficiency
The term efficiency refers to the peak level of performance that uses the least amount of
inputs to achieve the highest amount of output (Afonso, Schuknecht & Tanzi, 2003). Efficiency requires reducing the number of unnecessary resources used to produce a given
output, including personal time and energy. It is a measurable concept that can be determined
using the ratio of useful output to total input. It minimizes the waste of resources such as
physical materials, energy, and time while accomplishing the desired output. In general sense, the efficiency can be achieved under the conditions of maximizing the results
of an action in relation to the resources used, and it is calculated by comparing the
effects obtained in their efforts (Drucker, 2001). Measuring the effectiveness requires:

a) estimating the costs, the resources consumed the effort, in general, found in the
literature as the input; b) estimating the results, or the outputs; c) comparing the two (Afonso, et al 2003).

Effectiveness
According to Henri, (2004), organizational effectiveness is a mere hypothetical construct
that attempts to assess the overall functions of the organization. Explicitly, Champoux (2003) denoted the indicators of organizational effectiveness, which were;
objective indicators (such as; profit, and production rate), behavioral/subjective
indicators (such as; employee satisfaction, and quality of work-life), and social
indicators (such as; contribution to the surrounding community, and development of
infrastructure). These factors were crucial considerations for managers to get the work
done, and leveraged the ability to achieve the ultimate goal of the firm. Anusha and
Kathryn, (2009) provided the basic definitions on what organizational effectiveness
was all about. They indicated that organizational effectiveness measured the level of
organizational success in achieving its missions/goals by simply relying on its core
strategies and resources (Anantadjaya, 2009). It was apparent that the scope of
organizational effectiveness represented the results of organization's contextual,
structural, strategic, tactical and process variables.

Methodology
This study adopted a cross-sectional research design, a total of five manufacturing companies
out of the 62 registered manufacturing companies were selected for this study namely;
Chinjex group of companies, West African Glass industry, General Plastic Nigeria Ltd, Metal
and Plastic Industries Ltd and Demcok paints Ltd. These firms have a total of 309 employees.
Using the Krejcie and Morgan table, we had a sample size of 169. Spearman rank order
correlation was used in testing the stated null hypotheses.
Data Analyses

Test of Hypotheses

H01  Risk transfer does not affect efficiency of manufacturing firms

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Risk transfer</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk transfer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation</td>
<td>1.000</td>
<td>.723**</td>
</tr>
<tr>
<td>Coefficient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>169</td>
<td>169</td>
</tr>
<tr>
<td>Spearman's rho</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation</td>
<td>.723**</td>
<td>1.000</td>
</tr>
<tr>
<td>Coefficient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.</td>
</tr>
<tr>
<td>N</td>
<td>169</td>
<td>169</td>
</tr>
</tbody>
</table>

Our first test of hypothesis reveals a strong relationship between risk transfer and efficiency with a correlation coefficient of 0.723 and a p-value of 0.000 which is less than alpha of 0.05. We therefore reject the stated null hypothesis and accept the alternate.

H02  Risk transfer does not affect effectiveness of manufacturing firms

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Risk transfer</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk transfer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation</td>
<td>1.000</td>
<td>.435**</td>
</tr>
<tr>
<td>Coefficient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.</td>
<td>.001</td>
</tr>
<tr>
<td>N</td>
<td>169</td>
<td>169</td>
</tr>
<tr>
<td>Spearman's rho</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation</td>
<td>.435**</td>
<td>1.000</td>
</tr>
<tr>
<td>Coefficient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.001</td>
<td>.</td>
</tr>
<tr>
<td>N</td>
<td>169</td>
<td>169</td>
</tr>
</tbody>
</table>

Our second test of hypothesis reveals a significant relationship between risk transfer and effectiveness with a correlation coefficient of 0.435 and a p-value of 0.001 which is also less than alpha of 0.05. We also reject the stated null hypothesis and accept the alternate.
### H03  Risk avoidance does not affect efficiency of manufacturing firms

<table>
<thead>
<tr>
<th></th>
<th>Risk avoidance</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>1.000</td>
<td>.689**</td>
</tr>
<tr>
<td>Coefficient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>169</td>
<td>169</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

Test of hypothesis three reveals a moderate relationship between risk avoidance and efficiency with a correlation coefficient of 0.689 and a p-value of 0.000 which is less than alpha of 0.05. We therefore reject the stated null hypothesis and accept the alternate.

### H04  Risk avoidance does not affect effectiveness of manufacturing firms

<table>
<thead>
<tr>
<th></th>
<th>Risk avoidance</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>1.000</td>
<td>.534**</td>
</tr>
<tr>
<td>Coefficient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>169</td>
<td>169</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

Finally, Test of hypothesis four reveals another moderate relationship between risk avoidance and effectiveness with a correlation coefficient of 0.534 and a p-value of 0.000 which is less than alpha of 0.05. We therefore reject the stated null hypothesis and accept the alternate.

### Summary of findings

This study reveals that all the dimensions of mitigation significantly relates with the measures of productivity. More importantly, it revealed that the strongest relationship was in our first test of hypothesis where we tested the relationship between risk transfer and efficiency which had a coefficient of 0.723 and a p-value of 0.000, however, the least relationship was found within the second hypothesis which tested the relationship between risk transfer and
effectiveness. This implies that when firms transfer their risks to third parties, it does not only save them from future risks, it ensures that the risks are well managed to the barest minimum.

Conclusion

Based on the results of our findings, Mitigating risks have a lot to do with the productivity of manufacturing firms. This is because majority of the activities within the sector attracts a whole lot of risks that can be avoided and handled professionally if the firm must survive. Certain risks such as security risks could be contracted to private security companies as well as law enforcement agents such as the police and to a large extent, the army depending on the location and security risks involved. Risks relating to Health Safety and Environment could be effectively handled by professional HSE officers who have vast experience in the environmental conditions of the workplace.

Recommendations

i. Manufacturing firms should see the need to collaborate with firms who are specialized in the aspect of risk that has great impact on their production and performance. It would save them great cost and ensure their sustainability

ii. While considering the avoidance of risk, it is worth considering that risks are inevitable and at one point in time they must surface. Therefore, employees should be engaged on HSE training often.

iii. Signs and symbols should be placed on sensitive areas of the firm to avoid incidence of danger.

iv. The security of manufacturing firms could be contracted to private security firms and law enforcement agents to ensure safety of lives and properties.

References


Champoux, Joseph E. (2003), Organizational Behavior: Essential Tenets, 2nd Chari,


