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**Tracking the Performance of Food Processing Sub-Sector Firms in Zambia  
amidst a volatile Economic Environment**

**By**

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**ABSTRACT**

Since 2012 food processing firms have experienced constraints in their growth resulting in either stagnation or decline all together. This is more so given the changes in the operating environment prevailing in Zambia. This paper analyses the performance of sixteen selected food processing firms in Zambia. The paper further attempts to answer the question of why the general performance of the firms has been poor. The analysis in terms of performance has been done by examining the firms' EIBIT, capacity to employ new staff, re-investing in new technology, process and product upgrading. Literature shows that these variables are good indicators of performance. The firms are in two categories; the more successful and the less successful. This paper relies upon data collected for the Successful African Firms and Institutional Change (SAFIC) Project. The data in question comprise survey data conducted between 2012 and 2013. Furthermore, the data collected from in-depth interviews conducted in 2014 and 2015 have also been used in this paper. Based on the empirical data, it is apparent that the majority of firms have not performed up to expectations in accordance with the indicators of performance used. It seems that even the so-called more successful firms have been equally adversely affected. The argument is that this apparent poor performance of these firms has largely been attributed to the external factors which include: firstly, shortage of power that has negatively affected production and also increased the cost of production, especially where generators have been used. Secondly, the fluctuations of the value of the local currency, the Zambian Kwacha against the major global currencies, which has lost its value by more than 100% in 2015 against the US

dollar, and the raising inflation. This scenario has had a telling effect on the firms which depend on imported inputs including plant machineries and parts. It can therefore be concluded that the change in the operating environment in the past three to four years has had a major role in the poor performance of the firms. It has also become difficult for the firms to adjust and adapt to the changing environment.

**Key Words: Zambia, Food Processing, Changing Environment, Performance**

## **Introduction**

It is important to observe that firm performance is affected by a number of factors. There are indeed several factors that will lead to growth of firms and at the same time there those factors that the hamper firm growth. Such factors are called barriers or constraints/obstacles to firm growth. These factors can be categorised as those that are internal to the firm and those that are external.

In order to monitor firm performance it is critical to use certain indicators or measures. However, debate is still raging regarding firm performance measurements and their indicators. Firstly, it is normally to clear whether performance is in terms of manufacturing or overall organisational performance of a firm. Secondly, whether or not the indicators used are applicable to different sectors and irrespective of the size of the firm. There seems to a reason to believe that a ‘one size fits all’ approach to the application of indicators for firm performance may not be appropriate.

In the SAFIC project, it was generally agreed that a certain number of selected indicators should be used to measure firm performance. These indicators included turnover, estimated profit margin (earnings before interests and taxes=EBIT) and average number of permanent employees from 2007 to 2015.

Certain scholars have argued that firm performance indicators should include several indicators such as profitability, growth, customer satisfaction, employee satisfaction, social performance, and environmental performance (Santos and Brito, 2012). Santos and Brito (2012) further caution that it also provides a conceptual structure to define performance indicators and

dimensions. We base our work in the stakeholder theory, which allows distinguishing between performance antecedents and outcomes. In addition, Santos and Brito (2012: 99) argue that

*The stakeholder theory offers a social perspective to the objectives of the firm and, to an extent, conflicts with the economic view of value maximization. Such ontological discussion is outside the scope of this paper; yet the stakeholder theory has found its way into the corporate and academic world. It is possible to see its influence in corporate annual reports. The use of stakeholders' satisfaction as firm performance was also adopted by a large number of different authors.*

Other authors have investigated the relationship between capital structures, ownership structure and firm performance using a sample of French manufacturing firms (Margaritis and Pssilaki, 2010). In examining the impact of R&D on the performance of firms, two performance measures are considered such as labour productivity and productivity in innovative (new to the market) sales (Belderbos et al., 2004).

For project based service firms, Gastl (2009) identifies four key factors as being critical in measuring performance and is of the view that the ratio of senior to junior staff referred to as the firm's leverage, the average fee charged per unit of time, the percentage of billable time referred to as utilisation, and the profit margin should be considered.

However, according to the World Competitiveness Report Yearbook (2009), there is some level of understanding in terms of the measures of performance. The following measures have been identified as critical indicators of firm performance: revenue growth, profitability growth, and productivity growth. Nonetheless, it is problematic to compare performance of different firms in absolute terms due to the fact that firms may be operating at different growth levels (World Competitiveness Report Yearbook, 2009).

Overall, there seems to be no prescribed or so called appropriate indicators of firm performance. But economic related measures appear to be favoured measures for firm growth.

Indicators measuring firm performance are not the ultimate but the factors that explain a given performance of firms. For the SAFIC project and based on the fact that the general performance of the food processing subsector has been poor, is imperative to examine the factors that have

constrained the growth or contributed to either the decline or stagnation of the firms. Essentially, the factors that were identified as barriers to firm growth and are summarised as weak managerial capabilities, lack of qualified labour, limited access to technology, cost of capital, stagnant market demand, competition by dominant firms, lack of brand and high input costs. Others *inter alia*, include political interference, corruption, dormant business associations, lack of collaboration among local firms, incompetent suppliers and distributors as well as unfair competition from foreign firms.

It is important to restate that there has been a dramatic experience which the firms have undergone following the survey results of 2012 and 2014. Even firms which were seemingly doing much better appear to have faced difficulties beginning the year 2015 and that the constraints which they initially mentioned as hampering the growth of their firms somewhat shifted. It appears that the internal factors though critical may not provide an adequate explanation to the current situation. Coincidentally, this is period when the operating environment in the country deteriorated, especially the worsening of the macro-economic variables including the energy crisis.

It is against this background that this paper attempts to identify the factors which have contributed to the poor performance of the firms in the food processing subsector in Zambia. Therefore the overall objective of this paper is to examine the factors that have impacted adversely the growth of the food processing firms in Zambia which to a large extent are external to the firms.

The paper is divided into several sections. It proceeds with a section on some theoretical perspectives and selected literature on firm performance and barriers to firm growth before turning to research methods. This is followed by results, and the discussion the conclusion.

### **Theoretical Perspectives and Selected literature**

This section presents theoretical debates on firm performance. In particular, it focusses on the theoretical underpinnings of the subject. Later in the section, the focus turns to literature on barriers to firm growth. By so doing, a survey of different constraints that inhibit firm performance is done.

The factors that are believed to contribute to firm success are not universally agreed upon by researchers. Most studies have concentrated mainly on factors that are internal to the firm such as psychological and behavioral traits of firm owners, their motivation as well as the managerial skills and training of entrepreneurs (Chu et al, 2007) with lesser emphasis on factors that are external to the firm.

Theoretically, schools of thought that are more aligned to the firm as a singular unit and attribute factors of success to firm internal aspects. The resource based view and dynamic capabilities theories try to understand the internal dynamics of the firm and how firm owners or managers leverage resources, be it physical human or financial in order to generate capabilities that can be used to gain competitive advantage. The firm is seen as a bundle of resources and dynamic capabilities that enables it to grow and engage with the external environment. The element of 'dynamic' capabilities bring in an element of time which factors in the changing external environment such as market economic institutions as well as social and political institutions instead of a sole focus on the firms growth trajectory and history (SAFIC, 2011). The actions and decisions taken by managers or firm owners can influence both the firm internal factors which they have control over, and the firm external factors to which they have less control over. Firm 'internal' factors are the (physical, human and financial) resources and the (dynamic) capabilities (Grant 1991; Teece *et al.*, 1997) that the firms have and develop over time, while firm 'external' factors are the market economic institutions on the one hand and the social and political institutions, whereby access to certain resources and capabilities can be accomplished (Malik 2008)

In terms of capabilities and firm performance, there is a general view that dynamic capabilities or organizational learning mechanisms and the operational flexibility of the firm are important in firm performance and these help a firm to adapt to the changing environment (Bustinza *et al.*, 2010; Chiou, 2010). It is therefore envisaged that the development of dynamic capabilities will help to improve firm performance (Bustinza *et al.*, 2010). Further, Chiou (2010) argues that the critical factors that influence firm success are determined by innovation in functional strategies and capabilities with respect to research and development, marketing and production. To this effect, Malik (2008) contends that it is imperative that resource conditions, strategic paths, and requisite dynamic capabilities match in order to improve the fitness of firms.

According to Chiou (2010: 294), “in terms of competitive advantages in the high technology industry, besides developing unique skills using corporate resources, companies should also combine dynamic capabilities and collaborative network to ensure the sustainability of such advantages”.

For small firms, firm performance is related to both differentiation and cost leadership Strategies (Lechner and Gudmundsson, 2014). However, the Ugandan and Kenyan experiences of SMEs shows that certain factors were common among the successful SME leaders (Mwangi *et al.*, 2013). The success factors include visioning, building commitment, social capital, personal values, anticipation and resilience, resourcefulness, responsiveness, and entrepreneurial orientation (Mwangi *et al.*, 2013).

Other theories that are relevant in explaining firm performance include organisational economics theories, resource-based theories, and institutional theories. Clearly, these theories are relevant in providing an understanding of firm strategies and growth (Meyer and Peng, 2005). Therefore, it is argued that by incorporating institutions into these theories including organisational economics theories and resource based theories, would advance an institution-based view of business strategy as a complementary perspective (Meyer and Peng, 2005). Particularly regarding resources, it is possible to “identify types of resources which can lead to high profits. In analogy to entry barriers, these are associated with what we will call resource position barriers” (Wernerfelt, 1984: 172).

According to existing literature, several factors have been identified which affect constrain firm growth across the world, especially developing countries. However, it is argued that these constraints differ from one sector to another and according to the size of the firm. Bartlett and Bukvic (n.d: 6)

*distinguish between institutional barriers (including the legislative framework, the degree of corruption and bribery a firm encounters), barriers due to the external market position of a firm (the sector in which the firm operates, the degree of competition, whether a firm is facing strategic behaviour by competitors, extent of network alliances to support growth), financial barriers (including availability and cost of capital and finance), internal organisational barriers*

*(including managerial capacity and capability, objectives of firm, principal-agent difficulties, skills), and social barriers (to do with the support, or lack of it, from local actors and agencies).*

However, Nkonoki (2010) categorizes barriers in terms of being internal or external. As for the internal the following barriers have been identified: Lack of motivation and drive, lack of background and experience in the business, capital constraint, lack of a proper business plan/vision, theft/cheating and lack of trust in doing business, poor management, Running informal/unregistered businesses, lack of proper record keeping, inadequate education and training, people factor/lack of needed talent and improper professional advice and consultation. Regarding external factors, Nkonoki (2010) contends that corruption, competition, government policy, technological barrier, lack of access to finances/funding, bureaucratic processes, unfavorable economic factors are among the key factors.

But one such constraint that has been singled out is electricity. According to Afraz *et al.*, (2013), electricity is the most important constraint and it overshadows the effects of other factors in constraining long term firm growth. The Other factors include infrastructure, trade, finance, regulations, taxes and business licensing, corruption, crime and informality, finance, innovation and labour (Nkonoki, 2010; Afraz *et al.*, 2013). This finding is consistent with the finding of from the survey report of the barriers to growth of SMEs across sub-Saharan Africa (Fjose *et al.*, 2010). In the case of firms in Senegal, poor access to education and lack of access to electricity has again been identified as key to explaining why firms fail to grow (Maurel and Seghir, 2014). With respect to poor access to education, one of the studies in Tanzania also noted that inadequate education was hindrance to the growth of firms (Nkonoki, 2010).

Access to finance has also been cited as a critical factor in influencing firm performance. In developing countries there has been either poor access or lack of it leading to firms failing to grow (Aghion *et al.*, 2007; Fjose *et al.*, 2010; Nkonoki, 2010; Afraz *et al.*, 2013).

For UK firms, the state of the economy is the most important barrier (NESTA, 2011). This finding is support by the one of the findings of a study in Tanzania that the unfavourable economic conditions adversely affected the growth firms (Nkonoki, 2010). Similarly in Zambia, although the economy was considered to be stable prior to 2015 (Chisala, 2008), the state of the economic environment drastically changed in 2015 thereby negatively impacting firm

performance (KPMG Zambia Limited, 2015). Chisala (2008) has argued that government can play a significant role in helping firms to create resilience by supporting and facilitating training, education, innovation and credit support.

## **Research Methods**

Both quantitative and qualitative data have been utilized in this paper. There are basically three phases in the collection data that were followed. The first phase involved mapping of the firms in the food processing subsector. The second phase was the survey stage and a questionnaire was administered to a group of 38 firms which met the criteria of being local, employing at least 10 employees, at least 5 years of age. In the third phase two rounds of in-depth interviews were conducted in 2014 and 2015 to the 16 selected firms out of the total of 38 surveyed firms. However, in the second round of in-depth interviews, four firms could not be interviewed due to a variety of reasons. One firm had closed while two others were not willing to be interviewed again.

As for data analysis, survey data were analysed quantitatively and descriptive statistics have been obtained. Additionally, qualitative data mainly from in-depth interviews were analysed using qualitative methods, in particular content analysis. Suffice it to state that there were challenges in collecting quantitative data from certain firms due to the sensitive nature of such data. Therefore, there are gaps in such data as turnover and EBIT thereby making analysis difficult in quantitative terms. Consequently, there is a heavy reliance on qualitative data in this paper. In addition, it must be stated that the paper does not dwell on indicators *per se* but on the explanatory factors to the poor firm performance as stated by the firm owners.

## **Results**

The economies of sub-Saharan Africa have been experiencing slow growth and this trend is expected to continue. According to the World Bank (2015) projections, the decline is from 4.6 percent in 2014 to 3.7 percent in 2015. This decline in growth is attributed to a slump in

commodity prices on international markets coupled with a slowdown of the Chinese economy and tightening global financial conditions.

In terms of firm performance for the firms that were studied in 2012 and 2013, there were two sets of factors; the success factors and the barriers to firm growth. As for the former, the respondents stated that the vision and leadership of the owner was the most important as 60% of the firms stated that the ‘vision and leadership of the owner’ was the most important factor in explaining the growth of the firm. This was followed by 10% for ‘highly skilled and specialized employees’ another 10% for ‘a strong brand’ as the most important factor. Three factors were mentioned by 5% of the firms being a) ‘ability to produce at low cost’, b) ‘superior technology’ and c) ‘strong and sustained growth in market demand. Finally, one company mentioned ‘easy access to capital’

Regarding barriers to growth, the picture was less clear. However, ‘High cost of capital’ and ‘High input cost undermine ability to compete’ were both mentioned by 18% of the companies. ‘Political interference in business’ was stated by 10% of the firms. ‘Limited access to technology’ and ‘Competition is restricted by dominant firms’ were stated by 8% each. The economic situation started changing in 2014 during the first round of interviews as the responses with respect to barriers shifted from those in the survey results collected in 2012 and 2013 and became much clearer in 2015. It is worth noting that the Zambian economy has been experiencing challenges which intensified in 2015.

The growth of the economy dropped to beneath 4 percent in 2015 for the first time since 1998 (World Bank: 2015, 7), this is from an average of 6.4 percent between 2010 and 2014. This has been attributed to external shocks such as the strengthening of the United States of American dollar coupled with domestic shocks such as the energy crisis.

Until recently, the Kwacha retained relative stability and inflation was stable at a single digit. The Kwacha has been depreciating gradually from 2012 and even with this gradual loss in value,

food processing firms reported fluctuations in exchange rate and currency depreciation as one of the factors that was affecting their business.

“The currency fluctuation early this year affected us; depreciation affects our products because we import some of the inputs, this eventually leads to an increase in the price of our products”<sup>1</sup> (Interview with Zayaan Investments: 2014)

The major depreciation began in 2015. Between January and August 2015, the Kwacha depreciated by over 21 percent over a period of 30 weeks (World Bank, 2015). From August 2015, it experienced a further and steeper depreciation that was followed by large volatility and a sharp decline in exchange rate. This period was characterized by hourly changes in exchange rate and prices of exchange rate sensitive commodities, putting the operations of local businesses at risk. For 2015 alone, the kwacha depreciated by over 61%. This depreciation was followed by a spike in inflationary pressure. Currently, the kwacha has retained relative stability due to the interventions of the central bank in the economy through an expansionary monetary policy; however, inflation has remained high.

Between January 2012 and September 2015, inflation remained stable at an average rate of 7.2 percent. However; inflationary pressure started to build up from mid-2015 due to the deprecation of the kwacha. In October 2015, inflation rate moved away from a single digit barrier to double at 14.3 percent. It further rose to 19.5 percent in November 2015 as shown in the figure below (World Bank, 2015, CSO: 2016).

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<sup>1</sup> Verbatim from the interview notes with Zayaan Investments, 26<sup>th</sup> November, 2014.



**Figure 1: Trend in inflation rate in Zambia.**

Source: central Statistics office (2016).

This shift is said to be driven by an increase in food prices. The big jump in inflation is consistent with expectations about the pass-through from currency depreciation to inflation. Zambia is said to have a relatively higher rate of pass-through because local processing firms producing for domestic markets still rely on import of key inputs, parts and intermediary goods. Currently inflation is at 22.9 percent and is still expected to remain high in the first half of 2016<sup>2</sup>.

This spike in inflation led to an increase in the cost of key inputs for local processing firms, even those that are acquired locally. Some firms have been able to shift this inflationary pressure onto consumers but others have been unable to do so especially in the poultry and dairy processing subsector.

Consequentially, the rise in inflation had to be curbed through rising interest rates. The higher interest rates entail that the cost of borrowing has gone up making it more difficult for local firms to access credit. During the SAFFIC survey phase in 2012, access to finance was highlighted as one of the major constraints in the business environment in Zambia. Within the SAFIC project, the main proposition is that successful firms are those that have been able to develop their resources, access external resources and navigate in and adapt to recent years' rapidly changing

<sup>2</sup> Parliament of the Republic of Zambia, 24<sup>th</sup> February, 2016.

institutional environments in Africa. However, with the rise in interest rates, external borrowing has becoming challenging for most agro processing firms.

### **Energy crisis**

Electricity is the lifeblood of the economy. In its vision 2030, energy is recognized as a key driving force in the development of the economy. Zambia's electricity supply is dependent on hydrology as 95 percent of power generation capacity is linked to hydropower plants. Until 2006, Zambia had power surplus and was able to export power to neighboring countries. This surplus in generated power kept tariffs very low discouraging investments in the grid and new generation capacity to meet the rising demand but nonetheless, favorable for processing firms.

Due to increasing demand for power, the country began to experience power shortages beginning in 2006. This deficit in energy supply led to power outages but these were very minimal and happened only when there was an overload on the grid. However, the situation suddenly changed and became severe in the second quarter of 2015. The power outages since May 2015 to date average 6-10 hours a day affecting commercial and industrial consumers. The electricity supply company has attributed this to poor rainfall during the 2014/2015 rain season which led to lower water levels at the country's main reservoirs hence reduced hydroelectric generation (EIZ, 2015).

The result of this energy crisis is a slowdown in economic activities. It has led to reduced production in the manufacturing sector. Water utility companies are also rationing water because of the electricity shortage which affects the operations of food processing firms. The firms reported increased costs in production as they are forced to run costly power generators or switch shifts to when electricity is available (which entails additional cost- paying workers extra for working at night).

“We have also had a challenge of power outages as you have witnessed for yourself, power is ever on and off and this disturbs our production process and sometimes leads to wastage. We have bought a generator but as you know it's not the same as electricity and we cannot have it power the plant for too long. Initially it was so bad that when power goes it meant that even water went because we are on a low water table, so we have also had to buy 4 water tanks with a capacity of 10,000 litres”<sup>3</sup> (Royal Oak: 2014).

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<sup>3</sup> Verbatim from the interview with Royal oak, 26<sup>th</sup> November, 2014.

Within food processing, different subsectors have expressed the negative effects of erratic power supply. The Poultry Association of Zambia (PAZ) indicated that the long hours of electricity black-outs are likely to negatively hinder development in the industry. Power outages have led to losses for the subsector. While the aggregate losses cannot be immediately quantified, PAZ "is certain that most players in the sector are finding it difficult to operate at desired operational capacity".<sup>4</sup>

Dairy processors also voiced their concerns at the effect of power outages and the effect on doing business. The dairy plants are taking five hours to regenerate after eight hours of power cut, which equates to a loss of around 13 hours. This is affecting firms in the subsector because it means their products go to waste.<sup>5</sup>

Firms engaged in complex procedures such as those whose machines are designed to run for 24 hours and require 3-4 hours of heating before use and those requiring refrigeration have been largely affected. Others reported that they can only meet about 30 to 40 percent of production capacity.<sup>6</sup> The Millers Association of Zambia (MAZ) for example, reviewed that increased power outages have reduced production days from six to three days in a week leading to a 50 percent loss in production.<sup>7</sup>

In order to appreciate the impact of long hours of power outages on firms, it is important to understand the direct and indirect costs on firms resulting from power rationing (Samboko et al, 2016). Table 1 and Table 2 show a possible list of direct cost and Indirect cost respectively as reported by firms in the agro processing industry.

**Table 1: Possible Direct costs on firms in specific subsectors**

<b>Direct Costs</b>	
Poultry Firms	<ul style="list-style-type: none"> <li>• Average number of hours of load-shedding experienced per day</li> <li>• Value of lost output due to load-shedding</li> <li>• Overtime paid to staff due to power outages</li> </ul>

<sup>4</sup> Quoted in Daily Mail, date 21<sup>st</sup> July, 2015

<sup>5</sup> Quoted in The post, dated 21<sup>st</sup> July, 2015.

<sup>6</sup> Refer to interview with Royal Oak 26<sup>th</sup> November 2014

<sup>7</sup> See Lusaka Times, 4th October, 2015. <https://www.lusakatimes.com/2015/10/04/millers-increase-price-of-mealie-meal-as-government-says-there-is-no-justification/>

	<ul style="list-style-type: none"> <li>• Number of workers laid off due to power outages</li> <li>• Costs from equipment damage, restarts, and emergencies</li> <li>• Wages paid to idle labor (in Kwacha)</li> <li>• Mortality due to load-shedding</li> </ul>
Millers, Processors, and Animal Feed Manufacturers	<p>Milk</p> <p>Average number of hours of load-shedding experienced per day</p> <ul style="list-style-type: none"> <li>• Lost output due to load-shedding (Value or tonnage)</li> <li>• Overtime paid to staff due to outages</li> <li>• Number of workers laid off due to power outages</li> <li>• Costs incurred from equipment damage, restarts, and emergencies</li> <li>• Wages paid to idle labor</li> </ul> <p>Indirect Costs</p>

**Table 2: Possible Indirect Costs on Firms across subsectors**

<b>Indirect Cost</b>	
<b>Firms in all Subsector</b>	<ol style="list-style-type: none"> <li>1. Cost of acquiring and installing alternative power sources: <ul style="list-style-type: none"> <li>○ Generators</li> <li>○ Invertors</li> <li>○ Own power plants</li> <li>○ Solar panels</li> <li>○ Other power source (e.g., charcoal, gas, firewood)</li> </ul> </li> <li>2. Costs of running alternative power sources <ul style="list-style-type: none"> <li>○ Fuel</li> <li>○ Oil</li> <li>○ Maintenance costs</li> <li>○ Labor</li> <li>○ Spare parts</li> <li>○ Other costs not listed</li> </ul> </li> </ol>

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### **Cost of power rationing on Firms**

The cost of power has had adverse effects on industrial and commercial activities. The food processing subsector has equally been negatively impacted. The following are some of the examples of the effects of energy deficit on firms:

#### **Case in the Grain Milling Subsector**

For a wheat flour mill with a capacity of 9.5 tons per hour, power rationing has increased costs of production, and this has been passed on to consumers through price hikes. Costs incurred for a particular firm include diesel costs at ZMW 239,400 per month, 2 by 1,400 kilo-volt-ampere (kVA) generators valued at \$500,000 (or ZMW 5,400,000) (As shown in Table 3). Production losses related to start-up of the machinery are estimated at 100 tons of flour per week (with 8-10 hours of lost time due to machinery start-ups). The average price of a 50 kilogram of flour is ZMW 309. This translates to a production loss of ZMW 618,000 per week (Samboko et al., 2016).

**Table 3: Example of Additional costs on a milling Firm**

	Direct Costs	Indirect Costs
Production Loss	618,000 per week	
Cost of Power Generator		5,400,000
Diesel		239,400 per month

#### **Case of a firm in the Dairy subsector**

In the case of dairy processors, the effect of power cuts is felt through additional costs incurred for pumping water, cold storage for the milk, and milking milk in the case of those who produce their own milk while using alternative sources of power.

The firm in question reported a 30 percent increase in operation costs resulting from electricity load shedding. The firm produces and processes its own milk to the quantity of 10,500 liters of milk per day. The firm incurred costs of acquiring a 5,000 kVA generator at £15,000 (British

pound, about ZMW 241,129 at an exchange rate of ZMW 16.08 per pound). This cost excludes shipping and duty. The maintenance costs for the generator amounting to ZMW 3,000 per month, and the generators uses diesel worth ZMW 25,000 per week.

Unlike in the milling subsector, the increased production costs have not been passed on to consumers as milk prices have remained constant; as such producer profitability has been eroded with firms barely breaking even. Firm strategy given the current situation is to at least break even by altering feed formulations with hope that the situation will normalize soon enough (Samboko *et al.*, 2016).

**Table 4: Example of Additional costs on a Dairy Firm**

	Direct Cost	Indirect Cost
Production loss	K618 000 per week	
Generator (Capital cost)		241,129.5
Diesel		25,000 per week

In the case of large processors who use small scale farmers as suppliers of fresh milk, ZNFU (2015) reports that power rationing has resulted in insufficient supply at milk collection centers. It has also been reported that load shedding and voltage fluctuation has led to damage of machinery in the dairy processing sector<sup>8</sup> and firms have ended up investing into industrial surge protectors thereby adding to their costs.

Ultimately it is the size of the firm that determines the path a firm takes given the electricity challenge. For the small firms/firms the most visible option has been to cut down on production which ultimately reduces the processing capacity of large firms/processors that have the ability to acquire and operate generators, with a possibility of reducing their competitiveness.

#### **Case of the Poultry Subsector**

Effects of power rationing in this subsector are both direct and indirect. Firms have faced additional costs for acquiring and operating alternative power source estimated at 15% for the industry (including issues of currency depreciation and inflation). The monthly cost of

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<sup>8</sup> See Lusaka Voice 2015

maintaining generators is estimated at about ZMW 1,500 and fuel running cost of ZMW 1,000 per day.

Most poultry processing firms also produce their own chickens as is the case with Galunia farms (Diamonddale). Power rationing negatively affects Feed conversion ratio (FCR) of the birds putting a risk on profitability should the birds be underweight. Small changes in feed conversion ratio can have a substantial impact on financial margins (Ross, 2011). With power cuts, a farmer with 20,000 birds who used to buy 1,200 x 50 kg bags of feed for the chickens to reach market weight now has to buy 70 additional bags for birds to reach the same market weight. In terms of the additional cost for the 20,000 birds, the farmer has to spend ZMW 14,350 for the 70 additional bags (ZMW 205/bag). This results in an increase in the cost of production, which consequently reduces profits for the farmer because the average price of broilers has not increased much. The Poultry Association of Zambia signaled that prices might go up should power cuts continue (Samboko, 2016).

For the small-scale broiler producers, enterprise profitability is likely to reduce given that animal feed prices have risen more than the price of birds can compensate for. Moreover, because the feed conversion ratio is negatively affected by the reduced lighting, the feed costs are higher than normal as it takes more time to grow birds to market weights. For the large-scale producers/processors of broilers, costs due to output losses are unlikely as most of them will acquire generators, while benefiting from economies of scale. Costs among these are mainly from acquisition and operation of back-up power sources.

### **Discussion and Conclusion**

Clearly, the food processing firms in Zambia have experienced a slow growth in the past one to two years. Looking at the survey results the explanation regarding the decline in the performance of the subsector was largely due to the barriers, in particular those that are internal to the firm. These included input and capital costs as well as poor access to technology and political interference and stiff competition from dominant firms. This is in line with what some scholars have argued (Nkonoki, 2010; Afraz *et al.*, 2013). Other scholars include Aghion *et al.*(2007) and

Fjose *et al.*(2010). Many others have not covered political interference as one of the barriers to firm growth.

In this paper, the external environment seems to be a major factor that explains the slowdown in the performance of firms in this subsector. The role of government is critical in providing a conducive environment to do business. Nevertheless, the worsening of the macroeconomic environment as an external factor has contributed the difficulties which the firms are experiencing. All the macroeconomic fundamentals deteriorated, especially starting in 2015. The local currency lost value, inflation rose as well as interest rates. All these have had negative implications on the resilience of the firms. Generally, it is argued that the role of government is critical in providing an operating environment that will help firms grow. This is in agreement with the by NESTA (2011) and Nkonoki (2010). With respect to Zambia, it has been noted that the state of the economy plays a key role in the performance of firms (Chisala, 2008; KPMG Zambia Limited, 2015). This provides evidence that the state economy is a primary in ensuring that firms improve their performance.

Another factor that has gained importance in the recent past is energy. Several firm owners attributed power shortages to the problems that they are experiencing. In this paper it has been demonstrated that unstable power is a huge cost on the firm. To a large extent, this could explain the poor performance of these firms. It is clear once again, that power outages became common in 2015.

While firms within agro processing have been affected by power rationing, the effects differ in magnitude depending on the size of the firm. The firm's ability to respond to shocks is dependent on firm internal factors and size is one such variable. Some firms may not see economic sense to invest in generators while for others it is inevitable. ZIPAR (2015) indicated that medium-sized firms experienced the highest losses from power rationing (i.e., 11% of annual sales), while the small and large firms experienced losses of about 6% of annual sales.

From the discussion above, it stands to reason that the major factors that have contributed to the poor performance of firms relate to those that are connected with the management of the

economy. Definitely, the government has a role to play in managing the economy thereby providing a good environment failure to which even the most innovative firm may be challenged. Apart from the role of the economy and perhaps the most important is the energy. It has been clearly noted how the cost of energy has increased recently. This challenge to firms is immense. Finally, whereas the constraints that are internal to the firm are important in explaining firm performance, over time, it has become evident the other factors that are external the firm seem to be critical. This is in spite of the argument that dynamic capabilities can help the firm to be flexible and improve performance by adapting in a changing environment ((Bustinza *et al.*, 2010; Chiou, 2010).

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