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The Effect of Investment Climate on Productivity of Food and Beverages Industries in Eswatini

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ABSTRACT

Food security and job creation are among the top priorities of the government of Eswatini. To address these priorities, the government have made substantial amount of investment to support the agricultural sector over the years. Regardless of these policy intervention, Eswatini is still an importer of food and unemployment remains substantial high. The study examined the influence of investment climate on productivity of food and beverages industries in Eswatini. Findings of this study will assist the government of Eswatini to design focused policy interventions in order to attract more local and foreign direct investment.A Cobb-Douglas production function for Eswatini of manufacturing industries was estimated using 2006 cross sectional data from the World Bank to produce a measure of TFP for each industry. In addition, an extended Cobb-Douglas production function was estimated with investment climate variables for selected manufacturing industries.The results showed that manufacturing industries in Eswatini are labour intensive and competition from informal sectors is the main obstacle faced by manufacturing industries in Eswatini. The findings of the study further reveals that an increase in corruption cause a decrease in productivity. The study recommends investment in institutional reforms especially to fight against corruption and efficacy in the provision of public goods and services. It further recommends a resilient support and regulation of the informal sector.

Keywords: Investment Climate, Total Factor Productivity, Policy Intervention, Food and Beverages Industries, Eswatini.

INTRODUCTION

The economy of Eswatini is closely linked to the economy of South Africa, from which it receives over 90% of its imports and exports about 70% of goods. Other key trading partners are the United States and the European Union (EU), from which Eswatini received preferences for textile exports under the African Growth and Opportunity Act (AGOA) to the USA and sugar exports to the EU. Both textile and sugar exports did well under these agreements with rapid growth and a strong inflow of foreign direct investment (FDI). Between 2000 and 2005 the textile exports grew by over 200% and the sugar exports by more than 50%. In 2014, the export sector was threatened by the removal of the trade preferences for textiles and phasing out of the preferential prices for sugar to the EU markets (Central Bank of Swaziland (CBS), 2016). Eswatini is now facing the challenge of remaining competitive in the changing global environment. The investment climate is a crucial factor in addressing this challenge. Firms in Eswatini are less productive than firms in most middle-income countries in other regions. Productivity of firms in Eswatini can be compared much easily with firms from lower middle income countries but it is difficult to do so because firms in Eswatini are hindered by inadequate government arrangements and infrastructure (World Bank, 2007).

In 2015, the World Bank approved a loan of $25 million to help the country to improve the environment for private sector development and to catalyze new investments. The private sector competitiveness project aims at supporting the economic diversification and job creation particularly in the agribusiness and tourism sectors. Another aim of the project is to help in implementation of the country's Investor Road Map. The main objective of the Investor Road Map is to create an enabling business climate. Private sector competitiveness project has to improve the investment environment which focus on regulatory reform and export facilitation to increase international and domestic investments and to increase exports. Through the private sector competitiveness project, the financial sector has to develop in order to improve access to finance for Micro, Small and Medium Enterprises (MSMEs). The development of the financial sector will help in the reviewing of the Export Credit and Small Scale Enterprise Guarantee Schemes and assist in the implementation of revised Schemes. These improvements has to facilitate private sector activity across sectors, including agribusiness and tourism (Commonwealth Network of Nation Report, 2017).

Objectives

The main objective of the study is to examine the influence of investment climate on the productivity of food and beverages industries in Eswatini. The specific objectives are to

1. Investigate the most serious obstacles facing industries in Eswatini.
2. Estimate total factor productivity of food and beverages industries in Eswatini.
3. Examine the effects of investment climate on the productivity of food and beverages industries.

STYLIZED FACTS ABOUT INDUSTRIES IN ESWATINI

Following the ISIC (revision 3.1) classification, the following industries in Table 1 were covered by the 2006 World Bank Investment Climate in Eswatini, namely: food and beverages, garments, textiles, machinery and equipment, chemical, wood, wood product and furniture, metal and metal products and other manufacturing.

Table 1: Types of Industries

Industry	Frequency	Percentage	Cumulative Frequency
Food and beverages	14	20	20
Garments	15	21.4	41.4
Textiles	5	7.1	48.5
Machinery & equipment	3	4.3	52.8
Chemical	4	5.7	58.5
Wood, wood product & furniture	3	4.3	62.8
Metal & metal products	2	2.9	65.7
Other manufacturing	24	34.3	100
Total	70	100	

Source: Own calculation, World Bank 2006

The importance of each industry on three factors: gross output, value added and employees is presented in Table 2. Food and beverages sector as a whole is the second largest industry in terms of gross output. In terms of number of employees the food and beverages industries employ a large number of people as compared to other industries. In terms of value added, food and beverages sector is the forth in the order of importance after garment, machinery and equipment and textiles industries.

Table 2: Importance of Industries

Industry	Gross Output	Value added	Employee
Chemical	2.56	4.13	2.10
Food and beverages	26.12	9.58	27.02
Garment	26.97	35.88	20.49
Machinery & Equipment	16.82	22.71	20.14
Metal	10.39	7.71	12.03
other manufacturing	5.54	3.43	6.88
Textile	10.81	15.56	10.61
Wood	0.77	0.99	0.72

Source: Own calculation, World Bank 2006

Empirical Model Specification and Estimation Technique

In this study Total Factor Productivity (TFP) was estimated for food and beverages, garment, textile, chemical and other manufacturing industries. The data was collected in three cities (Mbabane, Matsapha and Manzini) covered by the 2006 World Bank Enterprise survey for Eswatini. The computational models used in the study are shown in the next section.

Firm – level Total Factor Productivity

A Cobb-Douglas production frontier is estimated for food and beverages, garment, textiles, chemical and other manufacturing industries. The estimation of the firm-level total factor production is derived from the production frontier. The model is adopted from Kinda, Plane and Vganzons-Varondakis (2008). The production technology defines the relationship between the Value added (Y) as the dependent variable and capital (K) and labour (L) as the independent variables.

$$Log(Y_{i,j}) = \alpha Log(K_{i,j}) + bLog(L_{i,j}) + c_i + v_{i,j} \qquad (1)$$

Where:

$Y_{i,j}$ = Value added (Total sales less purchased total material)
$K_{i,j}$ = Capital (Net book value)
$L_{i,j}$ = Labour (Total number of employees)
c_i = city dummy variables
$v_{i,j}$ = error term
i/j = industries and cities

Assessment of the effects of Investment Climate on firm- level productivity

To assess the effects of investment climate variables on the productivity of industries, Cobb-Douglas production frontier with investment climate variables and firm characteristics were estimated for food and beverages and garment industries. The World Bank Investment Climate (IC) surveys made available information on a large number of investment climate (IC) variables as well as general information on firms' status, productivity, sales and supplies.

In the questionnaire, the IC variables are classified into 6 broad categories: (a) Infrastructures and Services, (b) Finance, (c) Business-Government Relations, (d) Conflict Resolution/Legal Environment, (e) Crime, and (f) Capacity, Innovation, Learning. The surveys contain multiple indicators for different categories. Within the same category, the correlation between indicators is high. One solution applied in some studies has been to restrict the analysis to a limited number of indicators and accept the omitted variable bias. This was also adopted in this study. Based on availability of data, the IC indicators used in this analysis were limited to the following: Average number of days to claim goods from customs (X_1), Total losses for the year as the % of annual sales (X_2), informal payments/gifts given to public officials as a % of total sales (X_3), number of days to obtain telephone lines (X_4), obtain a loan from a financial institution dummy (Yes =1, No = 0) (X_5), number of unskilled production workers (X_6), influences of the pressure from domestic competitors on production (X_7). The empirical model is shown below:

$$Log(Y_{i,j}) = aLog(K_{i,j}) + bLog(L_{i,j}) + c(X_1) + d(X_2) + e(X_3) + f(X_4) + h(X_5) + i(X_6) + j(X_7) + K(size) + l(export) + m(own) + c_i + v_{i,j} \quad (2)$$

Where:
$Y_{i,j}$ = Value added (Total sales less purchased total material)
$K_{i,j}$ = Capital (Net book value)
$L_{i,j}$ = Labour (Total number of employees)
X_1 = Average number of days to claim goods from custom
X_2 = Total losses for the year as the % of annual sales
X_3 = Informal payment/gifts given to public officials as a % of total sales
X_4 = Number of days to obtain telephone lines
X_5 = obtain a loan from a financial institution dummy (Yes =1, No = 0)
X_6 = number of unskilled production workers
X_7 = influences of the pressure from domestic competitors on production
$Size$ = size of firms ranking: Small= 1, Medium = 2 and Large = 3
$Export$ = percentage of establishment's sales scheduled for direct exports
$Ownership$ = percentage of firm owned by largest shareholder(s)

c_i = city dummy variables
$v_{i,j}$ = error term
i/j = industries and cities

Other individual variables that have been included in the model are: size of firm (Size), percentage of establishment's sales scheduled for direct exports (Export) and percentage of firm owned by largest shareholder(s) (Ownership).

Following Kinda, Plane and Varondakis (2011) one step procedure was used to estimate all the coefficients. That is the production frontiers and the factors contributing to the firms' productivity were estimated at the same time. This is to solve the problem of possible correlation between the production function inputs and the firm level productivity.

RESULTS AND DISCUSSIONS

Obstacles faced by industries in Eswatini

The section discusses the obstacles faced by industries in Eswatini. The results are presented in figure 1. Competition from informal sectors is the main problem faced by industries. One may say that competition is good for the industries because it encourages industries to provide quality goods and services to their customers. On the other hand, competition from informal sectors can reduce profits of industries. Most informal sectors do not pay rents where they are operating so they sell their goods and services at a low price. The low prices of informal sectors attract more customers. Also informal sectors do not have trading licenses, thus they do not pay tax. This can affect the country as a whole because tax cannot be collected from the informal sectors. Also informal sectors are not regulated.

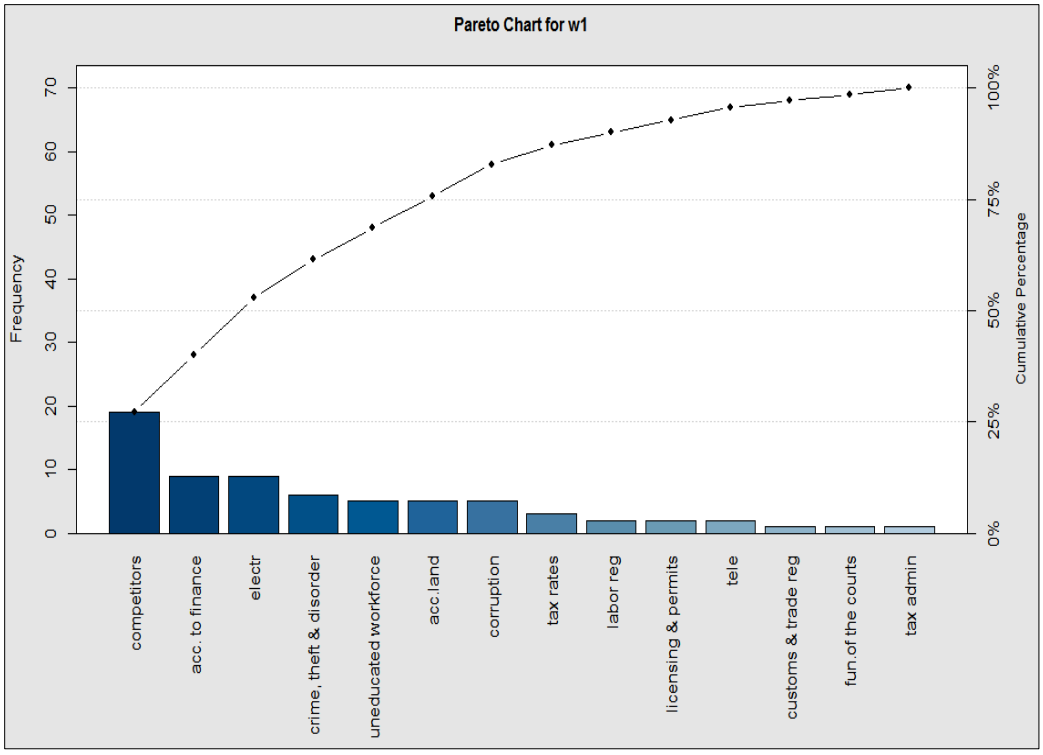

Fig.1. Obstacles faced by industries

Source: Author, 2018

The second obstacles faced by industries are access to finance and electricity. This means that industries in Eswatini cannot access capital from money institutions to start their businesses or to expand their businesses. The World Bank in 2007 also found that banks in Eswatini provide less finance to businesses. Power outages in Eswatini affects production of industries thus affecting their profits.

The third problem facing industries in Eswatini is crime, theft and disorder. Inadequately educated workforce, access to land and corruption are the forth obstacles faced by industries in the country. Other serious problems facing industries in Eswatini are tax rates, labour regulations, business licensing and permits, telecommunication, customs and trade regulation, functioning of courts and tax administration.

Firm-Level Total Factor Productivity

The estimates of the firm level total factor productivity using the stochastic production frontier for five industries is discussed in this section. Table 3 includes the coefficients and significance levels of labour and capital. R^2 and number of observations are also presented in Table 3 together with F-statistic. The R^2 give some information about the goodness of fit of a model. R^2 ranges between 0 and 1, 0 indicates that the model explains none of the variability of the response data around its mean. While 1 indicates that the model explains all the variability of the response data around its mean. R^2 in all the industries is above 0.5 that indicate a good fit of the model.

In all the industries except food and beverages industries, the sum of the coefficients relative to labour and capital is less than one. Which means that all the industries except food and beverages industries are probably mostly exposed to competition in the developing country like Eswatini. The coefficients of capital are insignificant in all the industries except in other manufacturing industries where it is significant at 5%. It means that 1 unit increase in capital will increase total output by 0.34 units.

Table 3: Estimates of the Stochastic Production Frontier

	Food	Garment	Textile	Chemical	Other manufacturing	Total
Log (Capital)	0.221 (0.176)	0.332 (0.294)	0.218 (0.149)	0.142 (0.089)	0.335** (0.052)	0.228*** (0.052)
Log (labour)	0.935** (0.350)	0.318 (0.346)	0.738*** (0.205)	0.806*** (0.174)	0.488** (0.098)	0.749*** (0.077)
Constant	8.793*** (1.421)	8.786 (3.868)	9.152*** (1.875)	9.913*** (1.172)	8.337*** (0.607)	9.036*** (0.673)
Observations	14	15	5	4	24	70
R^2	0.799	0.730	0.654	0.592	0.985	0.727
F Statistic	21.816***(df = 2; 11)	1.349 (df = 2; 1)	11.338*** (df = 2; 12)	15.215*** (df = 2; 21)	67.450** (df = 2; 2)	89.185*** (df = 2; 67)

Note:*p,0.1**p<0.05***p<0.01

Source: Own calculation, World Bank 2006

While the coefficients of labour are significant in all the industries except in garment industry where it is insignificant. Coefficients of labour in food and beverages and other manufacturing industries are significant at 5%. While in textile and chemical industries, the coefficients of labour

are significant at 1%. A unit increase in labour (number of employees), total output will increase by 0.94 units, 0.76 units, 0.81 units and 0.49 units in food and beverages, textile, chemical and other manufacturing industries respectively.

Stochastic Frontier Model with Investment Climate Variables

Table 4 shows the results of the stochastic production frontier with IC variables, the model is estimated at the sector level and the sample size varies from 14 observations in food and beverages industries, 15 in garment industry and 70 in total of the industries. The Cobb-Douglas production function was estimated with the production frontier. According to Ajetomobi, Ajagbe and Dlamini (2017) the merit of the model is that the coefficient of labour and capital expressed in logarithmic form can be treated as the variable's direct elasticity.

The results reveal that the elasticities of labour and capital are different in food and beverages, garment and total industries. The coefficients of labour and capital are strongly significant in the total industries. In food and beverages industries, the coefficients of labour and capital are significant at 5% and 10% respectively. The coefficient of labour is higher than that of capital in food and beverages, garment and total industries. This shows that all industries in Eswatini are labour intensive. The results are in line with what Ajetomobi et al. (2017) found in Nigerian industries. Thus there is a need to improve capital technologies in all sectors in Eswatini just like in Nigeria.

The coefficient of labour for the food and beverages industries is higher than the garment industry and the total industries in Eswatini. This means that food and beverages industries in Eswatini are more labour intensive than other industries.

Regarding the effects of investment climates, the results clearly reveal that differences in firm level efficiencies across industries in Swaziland can be pointed to discrepancies in investment climate. The results show that most of the investment climate variables are significant in food and beverages industries. An interesting aspect of the results is that corruption and unskilled workforce negatively and significant influences productivity of food and beverages industries. It is in line with what Ajagbe and Ajetomobi (2017) found in Nigeria in terms of corruption. Nguyen and Taisen (2017) also found that corruption in Vietnamese destroys markets and incentives for productive investments. Access to finances is insignificant in food and beverages, garment and the total industries. This might be a good reason for relatively low performance of industries in Eswatini because they are not able to obtain capital to expand their businesses. Poor finance, asymmetric information, inadequate modern technologies, power interruption, government bureaucratic bottleneck and corruption need to be given enough attention in order to address the challenges of poor returns and high production costs in food industries (Clement and Reiner, 2009 in Ajetomobi et al., 2017).

Table 4: Stochastic Production Frontier with Individual IC Variables

Variable	Food & beverages	Garment	Industries
log(capital)	0.546* (0.062)	0.289 (0.140)	0.221*** (0.058)
log(labour)	2.506** (0.155)	1.877 (0.762)	0.738*** (0.245)
X_1	-0.405* (0.042)	0.171 (0.159)	0.082 (0.088)
X_2	0.046 (0.024)	0.066 (0.111)	0.050 (0.047)
X_3	-0.959* (0.095)	0.297 (0.112)	0.087* (0.049)
X_4	0.269* (0.025)	-0.176 (0.062)	-0.013 (0.009)
X_5	0.767 (0.186)	0.431 (0.634)	-0.168 (0.222)
X_6	-0.022* (0.002)	-0.001 (0.0005)	-0.0002 (0.001)
X_7	1.008** (0.061)	0.058 (0.281)	0.232** (0.113)
Size	-2.991** (0.188)	-2.132 (1.182)	0.089 (0.392)
Export	0.010 (0.002)	-0.017 (0.015)	0.001 (0.004)
Ownership	0.004 (0.002)	0.012 (0.017)	-0.005 (0.004)
Constant	1.322 (0.690)	6.827* (1.680)	8.835*** (1.032)
Adjusted R^2	0.996	0.921	0.732
F statistic	291.451**(df=12; 1)	14.635*(df= 12; 2)	16.668***(df=12;57)
Observations	14	15	70

Note: *p<0.1; **p<0.05; ***p<0.01

Number of days to claim goods from customs is significant and negatively affect productivity of food and beverages industries. The results correspond with what Subramanian, Anderson and Lee (2005) found in their study in China and Brazil.

The importance of export and firm ownership is not significant in Eswatini in all the industries. This shows that industries in Eswatini are not willing to improve their productivity by learning from customers and by facing international competition. In addition industries in Eswatini are not willing to improve their productivity by allowing foreign investors to bring new technologies and management techniques.

Size of firms in food and beverages industries are significant but negative. According to kinda et al. (2011) the expected sign of size of firms is negative due to the fact that the one step procedure explains firm level inefficiency. The size of firms in food and beverages industries are significant and negative which means that small firms are more efficient than large firms. Small firms are able to manage their inputs in order to produce outputs. Large firms require large inputs which they cannot manage.

CONCLUSIONS AND POLICY RECOMMENDATION

This study examines the effects of investment climate on the total factor productivity (TFP) of food and beverages industries in Eswatini. The study is conducted in two phases namely: an estimation of firm-level productivity and the differences in TFP across firms is statistically related to indicators of investment climate, taking into consideration firms characteristics. The analyses used 2006 World Bank Enterprise survey data on Eswatini.

Competition from informal sectors is a main problem in all industries in the country not sparing food and beverages food and beverages industries. The results of the study show that Industries in Eswatini are labour intensive so there is a need to improve capital technologies in all industries including food and beverages industries. Investment climate indicators which are important for food and beverages industries are: competition from domestic pressure, average number of days to claim goods from custom, corruption, uneducated workforce and number of days to obtain telephone lines.

The following policy is recommended to enhance competitiveness of Eswatini manufacturing industries: Appropriate measures should be put in place to decrease the rate of unofficial payments in the country. The country can invest much more effort in institutional reforms especially to fight against corruption and efficacy in the provision of public goods and services.

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