Export Propensity and Intensity of Kenyan Manufacturing Firms: 
An Empirical Analysis

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Abstract

The study uses firm-level panel data from the manufacturing sector in Kenya to analyze the determinants of export propensity and intensity over the period 1992-2003. The focus of the study is on effects of total factor productivity on export propensity and intensity. These are estimated controlling for exogenous covariates such as location-specific and characteristics of firms, notably firm age and sunk investment. The paper uses a panel data estimator and the control function approach to account for fixed effects, endogeneity, unobserved heterogeneity, and sample selection bias to ensure that model parameters are properly computed.

The main finding of the study is that export propensity and intensity in Kenya are highly responsive to total factor productivity. Total factor productivity elasticities of export propensity and intensity are 5.8 and 1.8 respectively, so that a 1% increase in total factor productivity would increase export propensity by about 5.8% while increasing export intensity by 1.8%. The other finding is that ownership structure of the firm and unobserved factors specific to the firm’s sector of operation influence export propensity and intensity.

The results provide valuable information about the determinants of Kenyan exports which can be used to design policies to promote firms’ entry into the export market and to intensify sales in foreign markets.

JEL Classification: F14; O55; D21; D24
Keywords: Export-propensity, Export-intensity, Manufacturing firms, total factor productivity, control function
1. Introduction

A distinctive feature of the manufacturing sector in Kenya is the coexistence of the modern sector alongside a rapidly expanding informal sector. While the formal sector comprises mainly small, medium, and large-scale enterprises (i.e. firms employing more than 100 workers), the informal sector consists of numerous open-air small and micro-scale productive activities in towns and rural trading centres, usually employing less than five workers. Traditional artisan production in the informal sector is dominated by small undertakings employing less than 5 workers. A large proportion of their output is directed towards satisfying needs of consumer goods and services domestically. These include items such as clothing, furniture, foodstuffs and motor vehicle repairs. While data on this sub-sector is not easy to come by, there is little doubt from casual empiricism that it is one of the fastest growing sectors and a major source of employment in the country (Ikiara, 1988). It is equally clear that this sector has little or no impact on Kenyan manufactured exports, due mainly to the low quality of their products.

This study is motivated by the fact that exports and manufactured exports in particular have been recognized as crucial components of a sustainable economic growth strategy (GOK 2003). The principal objectives in this respect are to reduce the cost of doing business, eliminate impediments to supply chains and introduce appropriate policy, regulatory and institutional reforms conducive for sustained economic growth. We do note that manufacturing for the regional market is one of the six economic pillars of Vision 2030 with the country aiming to become the provider of choice for basic manufactured goods in Eastern and Central Africa. This will be done through improved competitiveness in manufacturing to promote efficiencies and to raise market share from 7% to 15% particularly targeting key agro-processing industries. The strategy is to restructure key local industries that use local raw materials but that have no competitive edge like sugar and paper manufacturing. Also envisaged is a strategic increase in the level of value addition in niche exports by additional processing of local agricultural products.

Following this introduction section 2 details the research problem while section 3 states the objectives of the study. This is followed in section 4 by the literature review. Section 5 discusses the models used in the study and presents the analytical results while section 6 concludes the paper.

2. The Research Problem

The focus of this paper is first to determine the factors that will influence the probability that a Kenyan manufacturing firm sells in the export market (export propensity) and secondly, to estimate the share of total output a Kenyan manufacturing firm sells in the export market (export intensity).
Having done so, we then investigate the factors that account for these exporting firms’ export-intensity, i.e. volume of exports expressed as a fraction of total sales.

Studying the factors that promote this export-oriented growth strategy would therefore allow the effective development of government policies aimed at improving and maintaining a steady increase in the country’s economic growth. In this respect, another issue arises, that is one concerning the role (and efficiency) of government intervention in the foreign trading activities of Kenyan firms.

Whether exports expansion cause GDP gains, whether GDP growth causes exports expansion or reduction and whether a two way causal relationship exists between exports growth and GDP growth can only be decided empirically, preferably for individual countries. Although the theoretical links between trade and economic growth has been studied for a long time, controversy still persists regarding their real effects. A substantial amount of research concerning the association between exports and growth has been carried out in both developed and developing countries fundamentally differing on methodology, analytical, techniques, sample periods and study countries.

How much do we know about the behaviour of individual exporting firms? Previous research provides little evidence on the performance of firms prior to and after they enter the export markets. These are important empirical questions not only for understanding the role of international trade in the economy but also for informing policies that seek to promote growth through exporting. To set appropriate goals we need to understand how firms become exporters, hence determine and estimate the factors that determine manufactured exports. Similarly, to set reasonable expectations about the effects of export promotion policies, we need to understand what happens to firms after they enter the export markets. Without empirical evidence of how firms perform prior and subsequent to exporting, we are at risk of selecting inappropriate trade policies.

The main research problem is therefore to identify what factors motivate firms to export and what then determines how much they export once they have entered the export market.

Bernard and Jensen (1997) argue that if efficient firms become exporters but there are no subsequent benefits to exporting then a policy that tries to pick future winners by aiding current exporters will target exactly the wrong firms, as it would be the firms yet to become exporters who are tomorrow’s winners. They further argue that if firms increase innovative and productive activities in order to enter the export market, that is, become good at exporting, then rewarding exporting ex-post may increase such activity at current non-exporters and successfully increase economic growth.
If there are no post-entry rewards from exporting, then policies designed to increase the numbers of exporters may also be wasting resources, as these firms and their workers will not receive any extra benefits. In fact, they may be exposed to considerable downside risk if they are not “export ready”, their stay in the export market is short, and there are negative consequences of stopping exporting.

On the reverse side, if gains do accrue to firms once they become exporters then the appropriate policy interventions would be those that reduce barriers to entering foreign markets. These might include macroeconomic and trade policies designed to increase openness to trade, and microeconomic policies to reduce entry costs, such as export assistance, information programmes, joint marketing efforts and even trade credits.

These arguments notwithstanding, studies on manufactured exports in Kenya and elsewhere have not been conclusive on why some firms become exporters while others do not and what determines their export levels once they are exporters. Empirical investigation of these issues at the firm level is needed. Our study aims at filling in this research gap. The study will address the following questions: what are the firm characteristics which influence the decision to export by Kenyan firms, what is the probability that a Kenyan firm will enter the export market, what factors will determine the export intensity among the exporting firms, what is the direction of causality between exporting and good firm performance, as measured by total factor productivity?

3. Objectives of the Study

This paper incorporates a number of techniques from previous research to investigate firm-level characteristics that determine a firm’s decision to export as well as fraction of output exported. The overall objective of the study is to examine and estimate the determinants of manufactured exports using firm-level panel data. The specific objectives are:

1. To identify and analyse factors that determine export propensity of Kenyan firms.

2. To identify and analyse the factors that determine the share of exports in total output, i.e. export intensity among the exporting firms.

3. To propose policy measures to improve export performance in Kenya.

4 Related Literature

The literature suggests a paucity of empirical studies of export determinants of Kenyan firms with the view to suggest specific policies that could make Kenyan firms more export-oriented. There is also the fact that most Kenyan firms export small percentages of their total output and mostly to the regional markets. Söderbom (2004) observes that, like most other sub-Saharan
countries, manufacturers in Kenya remain focused on the domestic market, the question is what limits their entry into foreign markets and how improvements in their access can be brought about. These are central policy issues that our study will address. Söderbom (2004) in his study of Kenyan manufacturing argues that one of the advantages of exporting commonly cited in the literature is that firms learn from exporting through exposure to new ideas and international competition. He conjectures that the scope for such learning is larger if firms export to relatively developed countries. It is therefore useful to investigate whether the factors determining Kenyan exports to non-African countries are similar to those driving regional exports. Söderbom (2004) finds that the general experience gained in the domestic market increases the likelihood that firms enter the regional exports market but does not affect the likelihood that firms export outside Africa. He therefore observes that for Kenyan firms to be able to break into the international export market, they may have to adopt a different business strategy to that for the domestic market. Policy measures designed to support firms in such a process can be reasonably assumed to have a positive effect on international exports. This paper hypothesizes that changes in manufacturing sector policies designed to influence the factors that determine export propensity and export intensity will impact on the manufacturing sector contribution to the Gross Domestic Product and therefore on the overall growth rate of the economy.

The literature reviewed above indicates that there is as yet no general consensus on the direction of causation between exports and firm productivity. Most of the studies imply that the direction of causation is conditioned by the interaction of several factors which include firm heterogeneity and sunk costs of exporting and several additional exogenous factors like direct or indirect subsidies to exporting establishments as well as spillovers from nearby exporters who reduce or increase the costs of needed inputs such as highly skilled labour or specialised capital. We note Bigsten’s (2008) conjecture that it may well be that the direction of causality between productivity and export activity may vary by the economic environment of the firm. He argues that one may presume that the exposure to exports has less of an effect in a highly industrialised country where we would expect the difference between exporting and non-exporting firms to be small. On the contrary, Bigsten argues that in the case of African countries like Kenya, causality may flow both from productivity to exporting as well as from exporting experience to improvements in performance. In this case Kenya will have more to gain by orientating its manufacturing sector towards exporting. This paper makes mainly a methodological contribution to the existing large literature in this area by estimating the effects of total factor productivity on both export propensity and export intensity taking into account the endogeneity of productivity, self-selection of firms into the export market,
heterogeneity of the exporting firms and unobserved fixed effects of firms. A control function approach (see Garen, 1984; Wooldridge, 1997; Florens et al, 2008; and Mwabu, 2008) is used to perform the estimations. This is the first time to my knowledge that these common estimation problems in models of export propensity and intensity have been addressed together.

From the literature reviewed above we can state that the paper presents a first attempt to estimate export propensity and intensity functions using the control function approach. This in our view is significant since some of the approaches used in the paper to analyse the two issues have been little studied in Kenya and other developing countries and are at the frontier of knowledge in the export literature. The paper uses panel data at the firm level and we are therefore able to control for firm specific effects unlike most studies which rely purely on cross-section and time series data sets.

The paper also uses a variety of econometric approaches to analyse the relationship between productivity and export growth and therefore takes into account some of the estimation issues not controlled for in previous studies. We are able to show how not taking into account the various estimation issues mentioned above would affect the estimated results. Finally the paper uses some of the approaches that are currently at the frontier of knowledge and is able to show how using these approaches improves the estimation results. We believe that having this combination in a single paper is a worthwhile contribution to the existing literature on export propensity and 0their export decisions. For this purpose a theoretical framework to be used has been developed in the previous section. Based on the theoretical model presented above and on the data available for this study the following “benchmark” model specification arises:

\[
\text{Export Status} = f \left( \frac{\text{total factor productivity, replacement}}{\text{value of capital, foreign ownership}}, \frac{\text{firmage, firmage}^2, \text{deviation from}}{\text{the mean of replacement value of capital,}} \frac{\text{sector dummies, location dummies}}{......} \right) \\
\]

Having multiple observations on cross-sectional units over time might allow exploiting such data structure by estimating individual specific effects which are not in fact observed. For a large number, N, of cross sections relative to time period T, this suggests using panel data analysis.

Note that our total factor productivity is calculated following Harding et al (2004) by subtracting inputs from output using appropriate weights. We assume a four-factor Cobb-Douglas production. Total factor productivity equation may be expressed as shown below:
\[ TFP = \log Y - (\beta_L \log L + \beta_K \log K + \beta_M \log M + \beta_E \log E) \]

Where \( Y \) = Total sales value (in KShs.)
\( L \) = Firmsize (total number of workers)
\( K \) = Replacement value of capital (in KShs.)
\( M \) = value of raw materials (in KShs.)
\( E \) = indirect costs (in KShs.) e.g. electricity, transport, water, liquid fuel, solid fuel, but not labour costs

The \( \beta \)'s are coefficients. To determine the values of these coefficients, we have drawn on previous work in this area (Bigsten et al, 2004 and Söderbom and Teal, 2004) who estimate production function parameters using a GMM instrumental variable estimator that controls for firm fixed effects. They use seven years of panel data on Ghanaian manufacturing firms. Table 4 column 4 in their paper reports the estimates as 

\[ 0.17, 0.09, 0.68, 0.07 \]

Our total factor productivity is calculated using these estimates. Bigsten et al, 2004 using two years of panel data from four African countries (Kenya, Cameroon, Ghana and Zimbabwe) obtain coefficients which are very similar to the ones used by Söderbom and Teal (2004) which we have adopted for this study. The Bigsten et al, 2004 coefficients are 

\[ 0.13, 0.04, 0.76, 0.09 \]

5. Modelling Export Intensity Decisions

Another way to study exporting activities is to investigate what firm characteristics affect their decisions on the volumes of exports. The dependent variable in this case is constructed as ratio of exports to the total volume of sales (exports/total sales). By construction, the dependent variable is limited to \((0,1)\). Moreover, since there is a significant number of the firms that do not export during all years in our sample there would be a considerable number of zeroes. Furthermore, to get a non-zero value for the dependent variable \((0 < \text{export intensity} \leq 1)\), a firm should pre-select itself to enter the export market and start exporting.

In deciding on the appropriate econometric technique to be employed for this kind of analysis, we should recognize that the factors that determine pre-selection of the firms into the export market might be different from those that affect the share of exports in total sales. In this case, a self-selection (or sample selection) model can be used for estimation. For this model to hold, the error term in the export decision function is to be correlated with the error term in the export quantity function.
A Heckman two-stage model with sample selection could be used assuming the following relationship

\[
Export\ Status = \gamma + \delta_1 z + \delta_2 X + \mu \quad \mu \sim N(0,1)
\]

\[
Export\ Intensity = \alpha + \beta_1 \hat{E} + \beta_2 X + \varepsilon \quad \varepsilon \sim N(0,\sigma)
\]

Where

- \(z\) are the instruments for export status (exclusion restrictions).
- \(\hat{E}\) is the the Inverse of Mills ratio
- \(\gamma\) is the constant term
- \(\delta_1, \delta_2, \beta_1, \text{ and } \beta_2\) parameters to be estimated
- \(X\) is the exogenous covariants
- \(\mu\) and \(\varepsilon\) are error terms

Where export intensity can be observed and takes non-zero values only if export status = 1.

For estimating this model, the following model specification could be considered:

**Decision Function**

\[
Export\ Status = f\left(\begin{array}{c}
\text{total factor productivity}, \text{ replacement value of capital}, \text{ foreign ownership}, \\
\text{firmage}, \text{ firmage}^2, \text{ deviation from the mean of replacement value of capital}, \\
\text{sector dummies, location dummies}
\end{array}\right)
\]

\[(3)\]

**Quantity Function**:

\[
Export\ Intensity = f\left(\begin{array}{c}
\text{Total factor productivity, foreign ownership, Inverse Mills Ratio} \\
\text{sector dummies, location dummies}
\end{array}\right)
\]

\[(4)\]

The choice of variables is motivated as follows: to become an exporter in the first place, a firm should have better characteristics than the average firm in the specific sector or industry (deviation variables), for example higher productivity (total factor productivity), higher proportion of non-production workers to production workers, larger size (total labour), more capital etc and produce goods that are likely to be demanded on the foreign markets (sector/industry dummies).

On the other hand, to increase the volume of exports, a firm should try to increase its productivity and possibly its size (to overcome sunk costs more easily).
Table: 1 Determinants of Export Propensity (t-statistics in parentheses)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Ordinary least squares and two-stage least squares</th>
<th>Control function approach (accounts for unobserved heterogeneity)</th>
<th>Probit Marginal effect</th>
<th>Probit Parameter estimates</th>
<th>Probit Random Effects Probit Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OLS, LPM (1)</td>
<td>IV-2SLS, LPM (2)</td>
<td>LPM (3)</td>
<td>Probit Marginal effect (4)</td>
<td>Probit Parameter estimates (5)</td>
</tr>
<tr>
<td>Total factor productivity</td>
<td>0.0190 (2.46)</td>
<td>0.4623 (2.66)</td>
<td>0.2208 (2.79)</td>
<td>0.1761 (2.34)</td>
<td>1.088 (2.31)</td>
</tr>
<tr>
<td>Mombasa</td>
<td>-0.0375 (-1.37)</td>
<td>0.0280 (0.43)</td>
<td>0.0221 (0.79)</td>
<td>-0.0017 (-0.06)</td>
<td>-0.0108 (-0.06)</td>
</tr>
<tr>
<td>Nakuru</td>
<td>-0.0181 (-0.47)</td>
<td>0.0373 (0.43)</td>
<td>0.0080 (0.21)</td>
<td>0.0085 (0.22)</td>
<td>0.0513 (0.23)</td>
</tr>
<tr>
<td>Eldoret</td>
<td>-0.0250 (-0.70)</td>
<td>0.1686 (1.54)</td>
<td>0.0835 (1.77)</td>
<td>0.0956 (1.38)</td>
<td>0.4712 (1.66)</td>
</tr>
<tr>
<td>Textile</td>
<td>0.0082 (0.26)</td>
<td>0.1611 (1.76)</td>
<td>0.1124 (2.84)</td>
<td>0.1025 (2.05)</td>
<td>0.5389 (1.93)</td>
</tr>
<tr>
<td>Wood</td>
<td>-0.0471 (-1.37)</td>
<td>0.1184 (1.19)</td>
<td>0.0946 (2.21)</td>
<td>0.0772 (1.37)</td>
<td>0.4051 (1.59)</td>
</tr>
<tr>
<td>Metal</td>
<td>0.0288 (0.93)</td>
<td>0.1851 (2.03)</td>
<td>0.1592 (4.05)</td>
<td>0.1634 (2.97)</td>
<td>0.8128 (3.53)</td>
</tr>
<tr>
<td>Foreign ownership</td>
<td>0.1633 (5.38)</td>
<td>0.1230 (1.80)</td>
<td>0.1118 (3.81)</td>
<td>0.1143 (2.90)</td>
<td>0.5581 (2.53)</td>
</tr>
<tr>
<td>Replacement value of capital</td>
<td>1.28e-09 (12.23)</td>
<td>3.03e-09 (3.71)</td>
<td>2.98e-09 (6.37)</td>
<td>2.31e-09 (5.02)</td>
<td>1.43e-08 (5.02)</td>
</tr>
<tr>
<td>Deviation from mean of replacement value</td>
<td>-1.20e-09 (-11.14)</td>
<td>-3.91e-09 (-3.60)</td>
<td>-2.94e-09 (-6.14)</td>
<td>-2.18e-09 (-4.64)</td>
<td>-1.35e-08 (-4.59)</td>
</tr>
<tr>
<td>Total factor productivity residual</td>
<td>-</td>
<td>-1.869 (-2.33)</td>
<td>-1.525 (-1.97)</td>
<td>-0.942 (-1.96)</td>
<td>-4.225 (-1.95)</td>
</tr>
<tr>
<td>Total factor productivity*total factor productivity residual</td>
<td>-</td>
<td>-0.0334 (-2.33)</td>
<td>-0.0257 (-0.05)</td>
<td>-0.1586 (-0.06)</td>
<td>-2.7912 (-0.61)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.1016 (-2.30)</td>
<td>-1.952 (-2.68)</td>
<td>-0.9936 (-3.01)</td>
<td>-6.9650 (-3.52)</td>
<td>-24.3019 (-3.12)</td>
</tr>
<tr>
<td>LR (CHI-SQUARE) p-value</td>
<td>-</td>
<td>275 (0.00)</td>
<td>275 (0.00)</td>
<td>0.351 (0.00)</td>
<td>0.351 (0.00)</td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>-</td>
<td>0.351 (0.00)</td>
<td>0.351 (0.00)</td>
<td>0.351 (0.00)</td>
<td>0.351 (0.00)</td>
</tr>
<tr>
<td>Wald Statistic</td>
<td></td>
<td>78.78 (0.0000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.209</td>
<td>-</td>
<td>0.303</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-Statistics (p-value)</td>
<td>23.24 (0.00)</td>
<td>3.59 (0.00)</td>
<td>31.79 (0.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Root MSE</td>
<td>0.3287</td>
<td>0.719 (0.00)</td>
<td>0.309 (0.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>889</td>
<td>889</td>
<td>889</td>
<td>889</td>
<td>889</td>
</tr>
</tbody>
</table>
In summarizing these results we can note that firm level variables enter significantly into the export propensity equation and confirm the hypothesis about the role of firm characteristics, i.e. large productivity firms have a higher probability of exporting as are firms with some measure of foreign ownership. In our ordinary probit estimations for the merged dataset (the full sample) we note that the lagged export dummy (our proxy for sunk costs) enter with a positive and significant coefficient thus rejecting the hypothesis of no sunk costs. This result seems to suggest that there are strong firm-specific components to the decision to export and entry into the export market is relatively easy for firms with the correct set of attributes. In a general sense, we find that our spill-over measures (location and industry dummies) are hardly significant in the determination of export propensity. However, this changes when the models are controlled for endogeneity and heterogeneity. It is also notable that in several cases, the location variables, especially location in Nairobi enter with a positive and significant coefficient in the full sample.

In terms of our export propensity estimates we can conclude that the major results are that entry costs are significant for Kenyan firms and firm heterogeneity is substantial and important in the decision to enter the export market. The role of firm heterogeneity is less surprising but means that only a subset of Kenyan manufacturing firms may have the characteristics necessary to become exporters. The results are less clear on the role of location and industry. There seems to be no major role for geographical location of the firm and similarly no evidence for the importance of a firm belonging to a particular industry in so far as its likelihood to participate in exporting market is concerned.
5.1 Determinants of Firms’ Export Intensity

Table 2: Determinants of Export intensity (t-statistics in parentheses)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Estimation methods</th>
<th>OLS without controls for endogeneity, heterogeneity and sample selection bias</th>
<th>IV-2SLS with controls for endogeneity only</th>
<th>IV-2SLS with controls for endogeneity and heterogeneity</th>
<th>Heckit/Control function approach with controls for endogeneity, heterogeneity, and sample selection bias</th>
<th>Random Effects/control function estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total factor productivity</td>
<td></td>
<td>0.0276 (4.26)</td>
<td>0.0257 (1.34)</td>
<td>0.0362 (1.61)</td>
<td>0.1091 (3.39)</td>
<td>0.0585 (2.02)</td>
</tr>
<tr>
<td>Mombasa</td>
<td></td>
<td>0.0646 (2.27)</td>
<td>0.0640 (2.20)</td>
<td>0.0617 (2.11)</td>
<td>0.0678 (2.34)</td>
<td>0.0566 (1.38)</td>
</tr>
<tr>
<td>Nakuru</td>
<td></td>
<td>0.1425 (3.68)</td>
<td>0.1425 (3.68)</td>
<td>0.1462 (3.75)</td>
<td>0.1524 (3.95)</td>
<td>0.0771 (1.28)</td>
</tr>
<tr>
<td>Eldoret</td>
<td></td>
<td>0.0156 (0.44)</td>
<td>0.0147 (0.41)</td>
<td>0.0199 (0.55)</td>
<td>0.0511 (1.37)</td>
<td>0.0134 (0.25)</td>
</tr>
<tr>
<td>Textile</td>
<td></td>
<td>0.0213 (0.68)</td>
<td>0.0208 (0.65)</td>
<td>0.0233 (0.73)</td>
<td>0.0286 (0.91)</td>
<td>0.0166 (0.35)</td>
</tr>
<tr>
<td>Wood</td>
<td></td>
<td>-0.0762 (-2.12)</td>
<td>-0.0765 (-2.12)</td>
<td>-0.0773 (-2.14)</td>
<td>-0.0523 (-1.43)</td>
<td>-0.0374 (-0.67)</td>
</tr>
<tr>
<td>Metal</td>
<td></td>
<td>-0.0511 (-1.60)</td>
<td>-0.0515 (-1.59)</td>
<td>-0.0520 (-1.61)</td>
<td>-0.0725 (-2.22)</td>
<td>-0.0738 (-1.58)</td>
</tr>
<tr>
<td>Foreign dummy</td>
<td></td>
<td>0.0120 (0.400)</td>
<td>0.0120 ((0.400)</td>
<td>0.0136 (0.45)</td>
<td>-0.0409 (-1.19)</td>
<td>-0.0151 (-0.31)</td>
</tr>
<tr>
<td>Total factor productivity residual</td>
<td></td>
<td>-</td>
<td>0.0 (0.11)</td>
<td>-0.0064 (-0.29)</td>
<td>-0.1003 (-2.70)</td>
<td>-0.0477 (-1.47)</td>
</tr>
<tr>
<td>Total factor productivity × total factor productivty residual</td>
<td></td>
<td>-</td>
<td>-</td>
<td>0.0033 (0.88)</td>
<td>0.0159 (2.90)</td>
<td>0.0104 (2.26)</td>
</tr>
<tr>
<td>Inverse Mills ratio</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.1089 (-3.13)</td>
<td>-0.0878 (-3.10)</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td>0.0468 (1.51)</td>
<td>0.0524 (0.89)</td>
<td>0.0210 (0.30)</td>
<td>-0.0412 (-0.58)</td>
<td>0.0753 (1.18)</td>
</tr>
<tr>
<td>R²</td>
<td></td>
<td>0.1151</td>
<td>0.1151</td>
<td>0.1170</td>
<td>0.1399</td>
<td>0.1242</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td></td>
<td>0.0960</td>
<td>0.0936</td>
<td>0.0931</td>
<td>0.1142</td>
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<td></td>
<td>6.05 (0.000)</td>
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<td>4.90 (0.000)</td>
<td>5.45 (0.000)</td>
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<tr>
<td>Root MSE</td>
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<td>0.21625</td>
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6. Discussion

The discussions in this paper indicate that total factor productivity positively impact on the firm’s export intensity. The results on the location and industry indicators seem mixed and indicate that location of the firm and the industry it belongs to do not seem to play any significant role in determining the proportion of the firm’s output that is sold in the foreign market. However, other estimates reported in the appendix indicate that a firm’s location in Nairobi influences its export propensity in a positive manner. These variables were also estimated in the form of their deviations from their respective means; this is motivated by the fact that for a firm to be an exporter it should possess better characteristics than the average firm in the specific sector or industry. For example, it should record higher total factor productivity, and higher than average proportion of non-production workers in its total workforce. The firm should similarly have more capital per employee than the average firm and higher than average total labour as well. The firm should also produce goods that are likely to be demanded in the foreign market, proxied here by the sector or industry dummies. From the results of these regressions using the deviation variables (not reported) we find that firm size and total factor productivity have significant impacts on the firms’ export intensity and have positive coefficients as well. This is in line with our apriori expectations. The results also indicate that the coefficient on production workers ratio is negative with a fairly large coefficient. This supports the theory in the literature, that production worker ratio negatively influences export intensity of firms. From these results, the location and industry dummies seem to exert no significant influence on the firms’ export intensity. When we proxy firm size using the firm’s wage bill, the variable is still statistically significant along with the total factor productivity and foreign ownership dummy. In these estimations Nairobi and food are the omitted categories in both the location and sector indicators, which imply these location and sectoral variables are being analysed with respect to the omitted categories as a reference point.

In summary we can conclude that the analysis in this paper has enabled us to identify some of the major factors that determine how much of a firms’ total output it will export given that the firm enters the export market. We have noted for example that firms located outside Nairobi are significantly less likely to export any significant proportion of their total output. In answering the question, how export-intensive are the exporting firms, we observe that Kenyan firms do not typically specialise in exporting.

We noted from our sample statistics that 41% of the sampled firms do not export at all and more than half of the exporting firms export less than 20% of their output. A general explanation of why firms in Kenya do not specialise in exporting is that they face declines in price when they increase
exports since regional markets offer only a limited extension of the domestic market and prices may fall if export volumes are relatively large (see Mans Söderbom, 2001). The exporters are therefore limited by the size of the regional market.

However, it can be concluded that on the whole, larger firms, those with 100 or more employees are much more likely to engage in exporting. While the majority of exporters sell less than 20% (18% on average) of their total sales abroad, large firms tend to export more. A sizeable share of output, up to 41% their total output goes to foreign destinations so that larger firms tend to export a higher share of their output. The small size of the manufacturing sector in Kenya makes this almost unavoidable.

References


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