

## CHAPTER SIX: SECTORAL GRAVITY MODELS

### 6.1 Introduction

This chapter presents the results from the estimated sectoral gravity trade models. Given that the results of the F-test reported in Chapter 3 showed the Fixed Effects Model (FEM) as the most appropriate estimation procedure, this section will analyze and interpret the estimated results from the FEM. Besides the F-test confirmation, the FEM is also a logical model to use given that the country's trading partners have different and distinct features which renders them totally different. For instance, there is no doubt that trading partners such as USA and Zambia, or Canada and Mozambique are totally different. Nevertheless, the pooled model equation which assumes that Botswana's trading partners for each of the three sectors are the same will also be presented, and interpreted only for dummy variables which cannot be estimated by the FEM. In estimating gravity models for both pooled and FEM models, Equations (12) and (13) will be employed, with the difference between the two being that the latter has one extra explanatory variable to cater for IIT in the diamond model, and INT in textiles, and meat and meat products models. As will be shown, since estimations from Equation (13) in each of the three gravity models have more variables that are significant and also have higher adjusted-R<sup>2</sup> and F-values, this section will mainly analyze results estimated by Equation (13), although results estimated from Equation (12) will also be shown.

As alluded to before, Ghosh and Yamarik (2004) point out that a total of 48 explanatory variables have been used in the gravity equation in literature. This presents a potential challenge in terms of which variables to choose for each of the three gravity trade model equations. Whilst a number of these explanatory variables have been experimented with in the estimations, the fact of the matter remains the same that no one has ever designed an experiment that is free of bias, and no one can (Leamer, 1981). As such, robustness analysis whereby the coefficients of the final variables selected for each of the gravity models have been checked for consistency by way of adding or deleting the explanatory variables have been done. The results of this robustness investigation indicate that the coefficients of the explanatory variables

presented in this section do not change significantly as variables are added or deleted from the respective gravity trade model equations. Table A3 to Table A5 in Section 3 of the Appendices presents the results of the robustness estimations. The experimentation with a number of these potential explanatory variables also acts as a reliability check especially given that results from these gravity models estimations will be used further to investigate export destinations with untapped potential exports in Chapter 7.

In terms of interpretation of explanatory variables, Jayasinghe and Sarker (2007) argue that because of the double-logarithmic representation of the gravity Equations (12) and (13) to be estimated, the parameter estimates on non-dummy variables such as  $Y_{ik}$ ,  $k_{ik}/l_{ik}$ ,  $Y_j$ ,  $D_{ij}$ ,  $P_i$ ,  $\Pi_j$  and  $exr_{i,usa}$  variables can be interpreted as elasticities. For instance, in both Equations (12) and (13),  $\alpha_l$  shows the percentage change in  $X_{ijk}$  induced by a 1% change in  $Y_{ik}$  while holding all other variables constant.

## 6.2 Diamond sector

The results from the gravity trade model estimations of Equations (12) and (13) presented in Table 8 show that both Botswana's sectoral GDP and the importers' GDP are important factors which encourage exportation of diamond. A 1% increase in GDP in the mining sector in Botswana and a 1% rise in the GDPs of importing countries will increase diamond export by 1.9% and 1.3%, respectively. This positive relationship is, as explained earlier, according to theoretical expectations. These results compare well with the findings of most studies on gravity equations estimated on trade, including a study by Chan-Hyun (2001), Jayasinghe and Sarker (2007) and Rojid (2006). The Chan-Hyun study showed that Korea's mineral exportation was, among other factors, propagated by both the importers' and exporter's GDPs. In particular, the paper found that a 1% increase in the product of Korea's GDP and the GDP of any of its trading partners resulted in an increase in mineral exportation by 1.1%. In the case of the Jayasinghe and Sarker's (2007) study, a 1% increase in the GDPs of the exporter and importer trading partners increased the export trade of the exporting partner by 8.24% and 17.49%, respectively. Finally, Rojid's (2006) findings showed that a 1% increase in GDP of both the importing and exporting trading

partners increase export trade of the exporting partner by 0.9% and 0.8%, respectively.

**Table 8: Diamond sector regression results (dependent variable: export)**

Variable	Pooled Model		Fixed Effects Model	
	Equation (12)	Equation (13)	Equation (12)	Equation (13)
Botswana mining GDP	4.9 (1.33)	8.9 (1.8)**	1.2 (1.93)**	1.9 (3.2)***
Importer GDP	1.4 (3.2)***	1.5 (3.4)***	1.01 (1.1)	1.3 (1.8)*
Importer population	1.5 (3.2)***	1.6 (3.4)***	5.1 (1.7)*	3.2 (2.7)***
Botswana mining K/L ration	-3.04 (-1.25)	1.8 (2.6)**	-0.7 (-0.2)	-0.6 (-0.12)
Exchange rate	1.6 (1.4)	1.2 (1.9)*	1.7 (2.3)**	1.2 (3.8)***
Hafbauer index	-----	50.1 (2.4)**	-----	59 (1.84)*
Distance in Kilometers	1.5 (2.9)***	1.6 (3.4)***	-----	-----
De Beers Trading Co. dummy	6.1 (3.0)***	6.11 (3.19)***	-----	-----
Adjusted – R <sup>2</sup>	0.57	0.65	0.65	0.69
F-Test	5.89	6.6	5.30	6.36
Total observations	48	48	48	48

Notes: [\*\*\*], [\*\*], [\*] significant at 1%, 5%, 10% level

t-statistics in parenthesis

The coefficient of the product differentiation variable, the Hafbauer index, is positive and in accordance with theoretical expectations. Given that the diamond sector is intra-industry trade (IIT) driven as empirically tested in Chapter 5, an increase in the Hafbauer index will result in more diamond export, ceteris paribus. Thus, a 1% increase in the Hafbauer index will result in a 59% increase in the proportion of total diamond exports which follows the IIT and/or product differentiation trade model structure.

The results on dummy variables (pool Equation (13)) indicate that the diamond trade arrangement dummy, representing the De Beers Trading Company (DBTC) preferential trade arrangement through which a larger proportion of Botswana's

diamond sells are handled, positively affect the mineral's exportation. This sign is theoretically expected, since trade arrangements are mostly aimed to improve trade flows, exports and imports. These results are also supported by the findings of Rose (2005) whereby PTA in the form of regional trade arrangements (RTA) increased trade for both export and import gravity equations.

The positive sign on distance is wrong as theory predicts that it should be negative under the assumption that the longer distances between trading partners increase costs, hence negatively affecting trade flows. Three possible reasons for the wrong sign can be postulated. First, since diamond is a high valued product, and its exportation mostly uses air transport, as opposed to sea or road transport, distance may not be a major hurdle. Second, purchase of diamond is associated with rich people. Thus, for the rich diamond buyers, what matters is the need to have diamond products to ostentatiously or proudly show off their riches and hence, costs (including transport) do not matter. Third, as a means of avoiding the sector's activities falling into the trap of 'blood diamond', like other African countries, Botswana prefers trading with buyers in far nations, as opposed to customers in the domestic market or neighbouring countries. The assumption being that, with proximity buyers, there will be a temptation by many potential illegal diamond miners to come into the industry as they will be able to illegally sell the diamond quickly to nearby buyers located in the country or neighbouring countries. A positive sign for the distance coefficient, although rare, is however also present in literature. For instance, Jayasinghe and Sarker's (2007) gravity estimations on red meat found a positive coefficient on distance on two (i.e, 1985-1987 and 1988-1990) of the five time periods for which the estimations were done.

The importer countries' population, as shown in Table 8, is associated with an increase in diamond export and this implies that as the populations for the trading partner countries grow, the international market expands and there will be an increase in the export of diamond. This result is in line with Rose's (2005) study which also found a positive coefficient for the importer country's population.

A depreciation of the pula is associated with an increase in diamond exports and this is according to theoretical expectations. Table 8 indicates that a 1% depreciation (or

increase in exchange rate) will increase Botswana export trade by 1.2%. These results compare well with the findings of most studies on gravity equations estimated on export trade, including a study by Rahman *et al*, (2006), Rahman (2003) and Molinari 2003. Rahman *et al*, (2006) found that a 1% depreciation (or increase in exchange rate) resulted in an increase in Bangladesh's exports by 0.077%, while Molinari (2003) found that a 1% increase in exchange rate (depreciation) increased exports by a range of 0.023% to 0.123% for the eight sectoral exports that were investigated.

Comparing the performance of the two equations, for both pooled and FEM, using the adjusted  $R^2$  and F-test (Equation (13)), the modified gravity model performs better than the traditional gravity trade model of Equation (12).

### 6.3 Textile sector

The textile sector's exports increased as the GDP for the importing countries and the Botswana manufacturing sector's GDP increased. Specifically, textile exports increased by 1.1% and 1.5%, respectively, when both the GDP for Botswana's manufacturing sector and that of importing countries increased by 1%. These results are shown in Table 9. This result is closer to Rojid's (2006) findings where a 1% increase in the GDP of the importing country increased exports by 0.9% while a rise in the GDP of the exporting trading country increased exports by 0.8%.

The estimated coefficient for distance, from the pooled Equation (13), has the expected negative sign and is statistically significant. For instance, a 1% increase in distance will reduce textile exports by approximately 2.3%. This negative finding is in line with most studies, for instance, Marques (2008), Kandogan (2008), and Baier and Bergstrand (2005), to mention just three papers.

The dummy variable representing Botswana's textile export trade under AGOA is positive and significant. This is in agreement with trade theory which expects trade to increase in the presence of regional trade arrangements. A study by Eita and Jordaan (2007) found that the SADC regional trade arrangement was one of the factors which boosted South Africa's wood exports to other regional member countries.

The coefficient RCAI is positive, and according to theoretical expectations. Given that the textiles sector is INT driven, as empirically tested in Chapter 5, an increase in the RCAI index will result in more textile export, ceteris paribus. Thus, a 1% increase in the RCAI index will result in a 0.5% increase in the proportion of total textile exports which follows the INT model structure.

**Table 9: Textiles regression results (dependent variable: export)**

Variable	Pooled Model		Fixed Effects Model	
	Equation (12)	Equation (13)	Equation (12)	Equation (13)
Botswana manufacturing GDP	2.83 (3.89)***	2.56 (2.1)**	1. (2.1)**	1.1 (1.8)**
Importer GDP	0.92 (4.6)***	0.91 (4.58)***	1.6 (1.2)	1.5 (2.4)**
Importer population	0.57 (1.82)*	0.57 (1.83)*	2.1 (2.3)**	2.6 (3.7)***
RCAI for textiles	-----	0.74 (2.7)***	-----	0.50 (2.1)**
Importer Inflation	0.01 (1.83)*	0.01 (1.81)*	0.001 (2.2)**	0.01 (3.8)***
Botswana manuf. K/L ratio	-1.57 (-1.65)*	-1.61 (-1.41)	-0.24 (-0.04)	-0.22 (-0.03)
Exchange rate	0.1 (2.2)**	0.2 (2.9)***	0.12 (1.8*)	0.22 (2.5)**
AGO dummy	4.04 (2.69)***	2.4 (6.8)***	-----	-----
Distance	-2.4 (-3.83)***	-2.3 (-3.82)***	-----	-----
Adjusted – R <sup>2</sup>	0.61	0.66	0.64	0.69
F-Test	15.30	15.61	9.26	9.80
Total observations	192	192	192	192

Notes: [\*\*\*], [\*\*], [\*] significant at 1%, 5%, 10% level

t-statistics in parenthesis

The positive coefficient on exchange is according to theory. Tabulated results indicate that 1% depreciation increases textile exports by 0.22%. This result is closer to Rahman (2003) findings where a 1% depreciation (or increase in exchange rate) increased exports by 0.34%.

Comparing the performance of the two equations using the adjusted  $R^2$  and F-test, the modified gravity trade model Equation (13) relatively performs better than the traditional or basic gravity trade model Equation (12).

#### **6.4 Meat and meat products sector**

Increases in both Botswana's agricultural GDP and importers' GDP, as shown in Table 10, result in a positive effect on the sectoral meat export. For instance, meat and meat products exports increased by 1.9% and 0.74%, respectively, when the GDP for Botswana's agriculture sector and that of importing countries increased. These positive signs, as explained above, are according to theoretical expectations and compare well with studies by such researchers as Eita and Jordaan (2007), and Rose (2005), who among others, also found positive impacts of both the importers' GDP and exporters' GDP on exports of a given partner.

The importer's inflation has a negative sign, implying that an increase in the inflation levels of the trading partners will cause them to reduce their expenditure, including imports of meat from Botswana. For example, a 1% rise in importers' inflation will reduce meat imports from Botswana by 0.21%.

The negative coefficient on distance is according to theoretical expectation, whereby an increase in distance will increase such things as transaction and transportation costs, among other expenses, thus resulting in a reduction in exports of meat and meat products. According to Table 10, a 1% increase in distance reduces Botswana's meat exports by 0.77%. Previous studies by Marques (2008) Kandogan (2008), Baier and Bergstrand (2005), among others also found a negative sign for the coefficient of distance in their respective gravity trade equations.

The coefficient RCAI is positive, and according to the theoretical expectations. Given that the meat and meat products sector is INT driven, as empirically tested in Chapter 5, an increase in the RCAI index will result in more textile export, *ceteris paribus*. Thus, a 1% increase in the RCAI index will result in a 0.43% increase in the proportion of total meat and meat exports which follow the INT model structure.

Although, the capital-labour ratio is correctly signed, it is however not statistically significant.

The dummy variable representing Botswana's meat and meat products export trade under Cotonou agreement positive and significant. This is in agreement with trade theory which expects trade to increase in the presence of regional trade arrangements. A study by Eita and Jordaan (2007) found that the SADC regional trade arrangement was one of the factors which boosted South Africa's wood exports to other regional member countries.

**Table 10: Meat regression results (dependent variable: export)**

Variable	Pooled Model		Fixed Effects Model	
	Equation (12)	Equation (13)	Equation (12)	Equation (13)
Botswana agriculture sector GDP	1.8 (3.5)***	2.1 (2.5)**	1.0 (2.5)***	1.9 (3.5)***
Importer GDP	0.61 (2.86)***	0.63 (2.9)***	0.74 (2.2)**	0.74 (1.8)*
Importer Inflation	-1.23 (-3.72)***	-1.2 (-3.28)***	-0.19 (-2)**	-0.21 (-3.7)***
RCAI for meat	-----	0.52 (2.67)**	-----	0.43 (2.1)**
Botswana agriculture K/L ration	2.91 (0.55)	1.11 (4.6)***	1.1 (0.9)	2.4 (1.4)
Exchange rate	1.3 (2.3)**	1.9 (1.8)*	0.9 (1.2)	1.4 (2.2)**
Cotonou dummy	0.9 (1.8)**	1.2 (2.3)**	-----	-----
Distance	-0.66 (-1.50)	-0.77 (-1.72)*	-----	-----
Adjusted – R <sup>2</sup>	0.62	0.67	0.64	0.65
F-Test	6.12	6.5	5.16	7.3
Total observations	88	88	88	88

Notes: [\*\*\*], [\*\*], [\*] significant at 1%, 5%, 10% level

t-statistics in parenthesis

A depreciation of the pula is associated with an increase in meat and meat products exports and this is according to theoretical expectations. Table 10 shows that a 1% depreciation (or increase in exchange rate) will increase Botswana's meat export trade



by 1.4%. These results compare well with the findings of most studies on gravity equations estimated on export trade, including a study by Molinari (2003). The Molinari (2003) investigation found that a 1% increase in exchange rate (depreciation) increased exports by a range of 0.023% to 0.123% for the eight sectoral exports that were investigated.

Comparing the performance of the two equations in terms of the maximum number of significant coefficients in each equation, Table 10 indicates that the modified gravity model Equation (13) performs better than the traditional gravity model Equation (12).

## 6.5 Conclusions

This chapter investigated the determinants of sectoral exports from Botswana for the period 1999 to 2006 and these estimations were done for the country's exports of diamond, textile, and meat and meat products sectors. The following are the conclusions that emanated from the empirical evidence done on the three sectors.

- i. In all the three sectoral results, the respective Botswana's sectoral GDPs and the GDPs for the importing countries were positive and statistically significant determinants of Botswana's sectoral exports. This implies that growth in the GDP or economic activities in mining, manufacturing and agriculture enhanced Botswana's diamond, textiles, and meat and meat products, respectively.
- ii. With the exception of diamond exports, results from the sectoral gravity estimations indicate that distance retarded exports, and this is expected from theory. The negative correlation implies that, as distance increased from Botswana to any trade partner, the country's export trade from both textiles and meat and meat products sectors declined.
- iii. Regional trade arrangements contributed positively to the country's exports in all the three sectors for the period under review. For instance, in the case of textiles, the AGOA trade preferences in the form of duty-free-quota-free

(DFQF) resulted in Botswana's textiles entering the USA market freely since 2000 than was the case before the arrangement was initiated. This has increased exports of textiles.

- iv. The statistically significant positive signs on the IIT trade variable in the diamond gravity equation and INT variables in both textiles and meat and meat products indicate that product differential in the diamond sector; and factor endowments in the other two sectors promote sectoral exports.
- v. The relationship between exchange rate on one hand, and exports from the sectors on the other hand was found to be positive and statistically significant. This implies that currency devaluation leads to increase in exports across these three sectors.

## **6.7 Policy recommendations**

The findings from the gravity trade model estimations suggest the following policy recommendations for consideration by Botswana policy makers.

- i. Given that higher GDPs for importing partners promote Botswana's export trade, the country needs to continue its engagement especially with those partners with higher GDPs. This can be easily achieved if the country remains committed in such trade arrangements as the envisioned Economic Partnership Agreement (EPA) with the EU, and the AGOA trade arrangements with the USA. Continued engagement with high income countries can also be enhanced if the country implements the various agreed trade liberalizations promulgated by the WTO so that it can get reciprocal treatment and trade preferences from some of the high income and developed WTO members
- ii. The fact that distance retards exports especially in textiles, and meat and meat products means that the country should increase its trade as much as possible

with proximity countries. Botswana, besides being a full member of the already advanced and highly integrated Southern African Customs Union (SACU), should also move together with other member states of the Southern African Development Community (SADC) in their endeavour to move from the current Free Trade Area (FTA) to higher stages of regional integration such as Customs Union (CU), Common Market (CM), Monetary Union (MU) and Economic Union (EU). These higher stages of integration, especially with geographically close countries will also mean enlarged markets for Botswana's exports, among other benefits.

- iii. To continue increasing its exports, the country needs to remain in its current trade arrangements, ranging from bilateral, regional (for instance with SACU and SADC), inter-regional (with EU) and multilateral (at WTO level). The country can also consider entering into new preferential trade arrangements not only with the current rich countries, but also with emerging and fast growing economies such as China, India and Brazil, among others, as they provide huge future potential in terms of markets for Botswana's exports.

## CHAPTER SEVEN: SECTORAL EXPORT TRADE POTENTIALS

### 7.1 Introduction

Following estimations of Botswana's three sectoral gravity equations for bilateral export flows in Chapter 6, the study continues with the next step of estimating the trade potential for the same sectors. Thus, in this Chapter, the sectoral model estimates from the previous chapter are employed to predict Botswana's sectoral trade with all the relevant countries in the respective samples.

This section of the thesis is important especially at this juncture given that the country is still finalizing its national export strategy policy, which *inter alia*, seeks to promote exports from textiles, and meat and meat products sectors, among others, in its drive to diversify away from diamond exports. As such, the policy implications associated with the presence of unrealized trade potential with relevant trading countries in the above sectors would, according to Ram and Prasad (2007), "extend from the necessity of country-specific trade promotional campaigns and bilateral integration to the need to anticipate relevant distributional changes due to the effect of the expansion in bilateral flows in the near future". This section of the thesis is also helpful as it will assess the extent to which Botswana has some unrealized sectoral trade potential with its relevant major (sectoral) trading partners and with its diverse preferential trade partners with whom it has a number of operational trade arrangements. Lastly, the study will provide valuable indicators for current negotiations for the new Economic Partnership Agreement (EPA) with the European Union to be introduced at any time from 2010.

### 7.2 Objectives

Given the above introduction, the main objective of this chapter is to empirically investigate Botswana's trade potential for its three sectors under study. In pursuit of

this objective, the following are the three questions that this chapter will try to answer:

- i. With which trading partners has Botswana reached its trade potential in these three sectors?
- ii. With which trading countries has Botswana gone beyond its trading potential in these three sectors?
- iii. With which partner countries does Botswana still have untapped (or unrealized) trade potential in these three sectors?

### 7.3 Export trade potential

In this section, coefficients from gravity trade models estimated in Equation (13) of Chapter 6, also presented below, will be used to analyse the unrealised export potential for the country's sectoral exports.

$$\ln X_{ijk} = \alpha_0 + \alpha_1 \ln Y_{ik} + \alpha_2 \ln \left( \frac{K_{ik}}{L_{ik}} \right) + \alpha_3 PTA_{ijk} + \alpha_4 \ln Y_j + \alpha_5 \ln D_{ij} + \alpha_6 \ln P_j + \alpha_7 \ln \Pi_j + \alpha_8 \ln exr_{i,usa} + \alpha_9 IIT(INT)_{ik} + \varepsilon_{ij} \quad (13)$$

The gravity trade model Equation (13) will be simulated to get within export potential for all the three sectors, diamond, textiles, and meat and meat products. This is mainly because results from this equation are more significant than those from Equation (12) for these three sectors' gravity estimations presented in the previous chapter. As indicated earlier in Chapter 6, the coefficients of these gravity models have been tested for sensitivity and robustness, and the conclusion made was that they are relatively stable. Thus, this section uses the coefficients of each of the three gravity equations estimated in the previous chapter assuming them to be reliable.

Analysis of untapped trade potential with some regional groupings have been chosen keeping in mind the current and approaching preferential trading arrangements that are already operational (e.g., SACU and SADC FTA) as well as those that are in offering in the near future (EU, SADC CU, EPA). The regional blocs that will be analyzed for sectoral trade potential with Botswana are the group of countries under the SADC and SACU. Furthermore, this chapter will investigate Botswana's export trade potential with the European Union (EU) under the Economic Partnership Agreement (EPA) regime which is expected to enter into force any time from January 2010<sup>24</sup>.

Having estimated the respective sectoral gravity models for bilateral export trade flows between Botswana and its respective trading partners, the study proceeds to estimate the export trade potential for the country. This section relies on the sectoral model estimations from the previous chapter. The ratio of sectoral export trade potential (P) as simulated/predicted by the model and actual sectoral export trade (A), i.e., (P/A), will be used to analyze the future direction of export trade for the country's three sectors. In terms of interpretation, in a case where the value of the ratio (P/A) exceeds 1, that will indicate existence and evidence of export trade potential between Botswana and the country in question. Following Batra (2004) and the International Trade Centre (ITC) (2005, 2003), evidence of unrealized export trade in turn implies the potential for Botswana to expand its exports to that country. On the other hand, if the value of (P/A) is less than 1, it indicates that Botswana has exceeded its trade potential with that country. In short, values of (P/A) can either be greater than or less than 1, with the former indicating countries with which Botswana has potential for expansion of export trade in the foreseeable future, while the latter shows trading partners with which Botswana has already exceeded its trade potential.

Conversely, the absolute difference between the potential and actual level of export trade, that is, the value of (P-A) can also be used to indicate whether a country has unrealized export trade potential with Botswana or not. In this case, a positive value will indicate unrealized export trade potential, thus the possibility of future export

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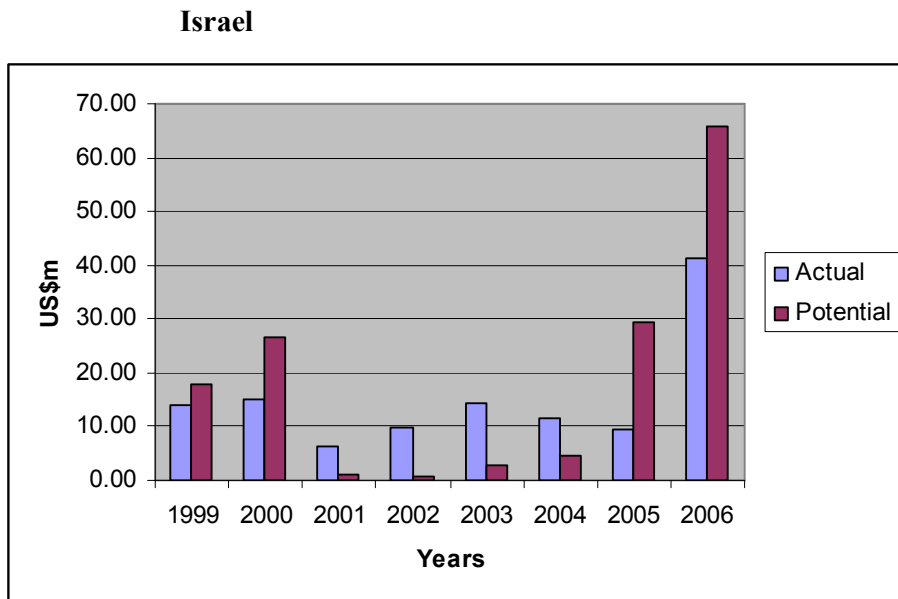
<sup>24</sup> EPAs were supposed to have come into effect from January 1<sup>st</sup> 2008. However, due to delays in completion of the negotiations, they have been postponed to at least enter into force anytime in 2010.

trade expansion into that country while a negative value will indicate that the country’s exports have already exceed their trade potential.

### 7.3.1 Export trade potential in diamond sector

An analysis of Botswana’s diamond export trade potential indicates that there is, on average, untapped potential in three destination countries, Israel, South Africa and Switzerland, as shown in Table A6 of the Appendices. Figure 4 graphically depicts the trade potential for Israel. Note that South Africa and Switzerland could not be depicted graphically due to the fact that the range between some figures across the years is so big resulting in drawing scale problems. Existence of unrealized export potential implies that Botswana should export diamond products to these partner countries so as to exhaust the unrealized trade potential. On the other hand, the country has exceeded its export trade potential in diamonds with Belgium, United Kingdom (UK) and United States of America (USA).

**Figure 4: Diamond export potential**



### **7.3.1.1 Botswana's diamond trade potential with regional groupings**

This part of the study will analyze the country's export trade potential with regional trade groups to which Botswana is a member. The analysis is done on both already existing regional trade blocs as well as those to be operationalized in the near future, using estimates from the gravity model. In particular, this section will investigate the group of trading partners constituting SADC, SACU, and the EU (both under the Cotonou agreement and under the envisioned Economic Partnership Agreement (EPA)).

Among the trading partners who are members of the EU, there is only one country, Switzerland, where there is unrealized trading potential for Botswana's diamond exports according to Table A8 of the Appendices. This suggests that Botswana and Switzerland are trading much less than what the gravity model predicts and this implies that Botswana has untapped export trade potential in diamond with this EU trading bloc nation. This scenario suggests that it will be an advantageous move for Botswana to make all efforts to implement its free trade area (FTA) commitments under the envisioned EPA with the EU.

Table A9 of the Appendices shows the trading partners in America and EU regional groups where Botswana has exceeded its export trade potential in the export of diamond. This implies that Botswana and these respective countries in these regional groupings are trading more than the gravity model predicts and this is an indication of a successful partnership, using the trade dimension only, among trading countries (International Trade Centre (ITC) (2005, 2003)).

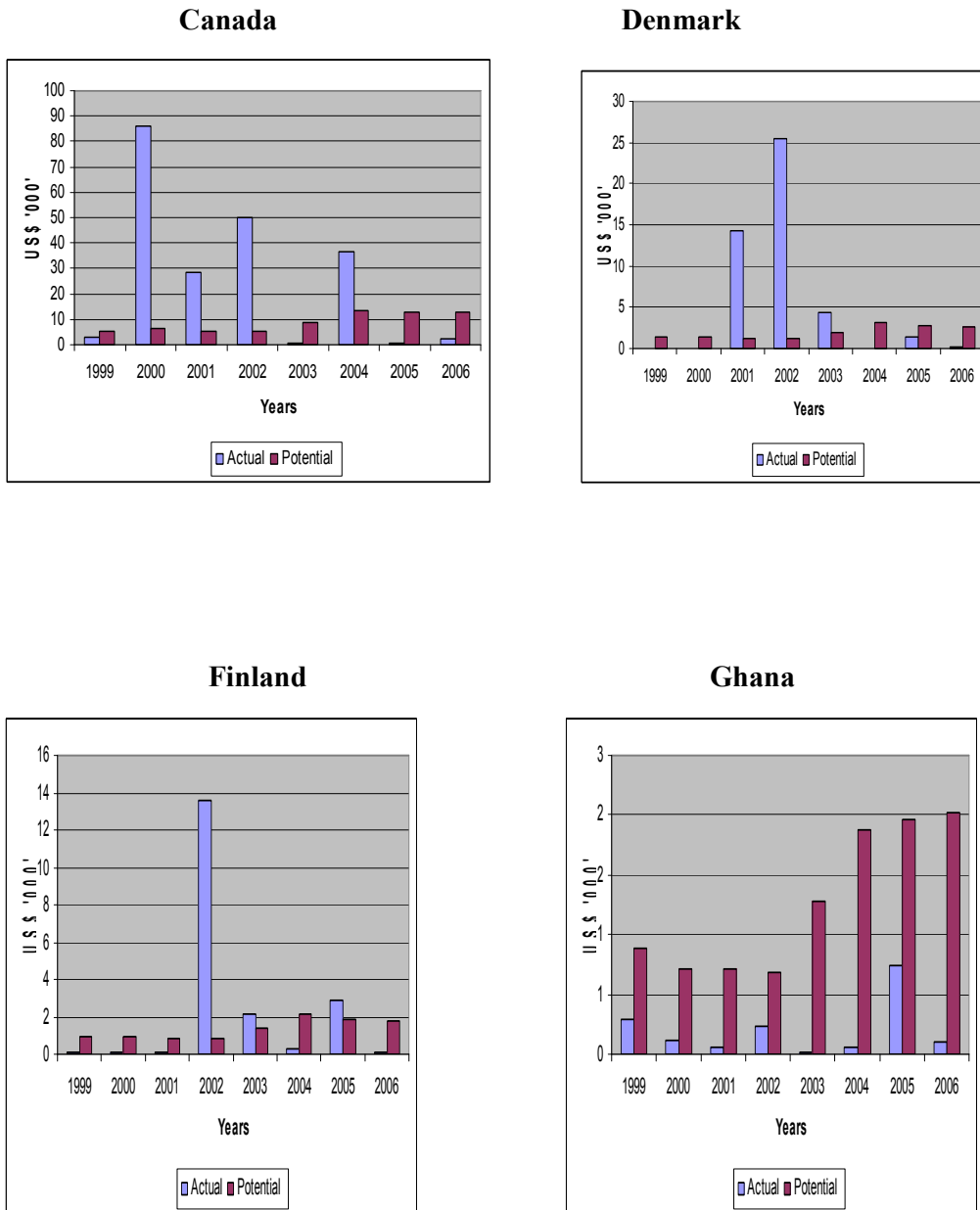
### **7.3.2 Export trade potential in textile sector**

When Botswana's textile export potential is compared among different trading partners, maximum potential is indicated for Ghana and Mozambique. Figure 5 also shows that Canada, Denmark, Finland, Saudi Arabia, Spain, and Switzerland are the other export destinations in which textiles exports from Botswana have unexploited trade potential. This suggests that Botswana should export textile products to these



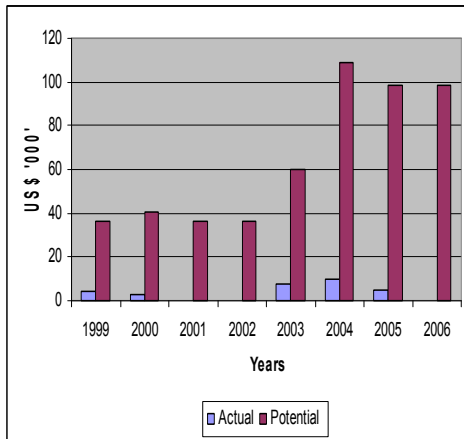
countries so as to exhaust the unrealized trade potential. See also Table A10 in the Appendices.

**Figure 5: Textile export potential**

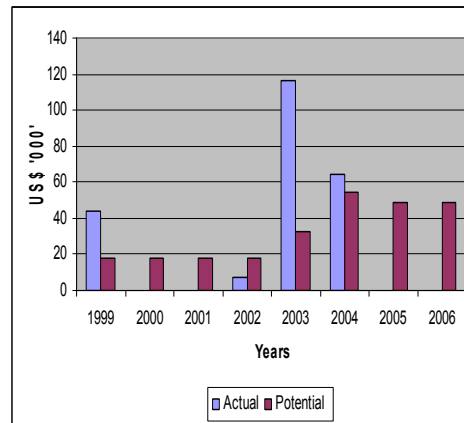




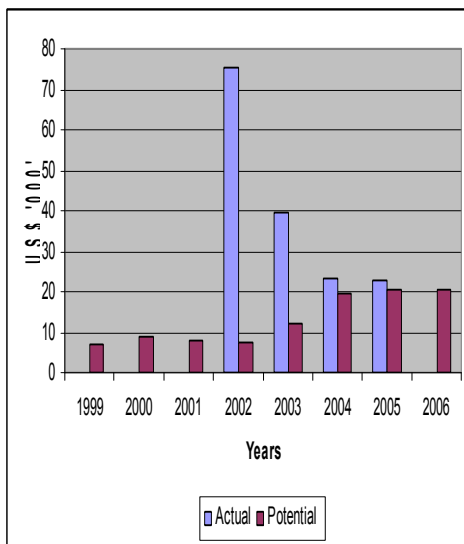
### Mozambique



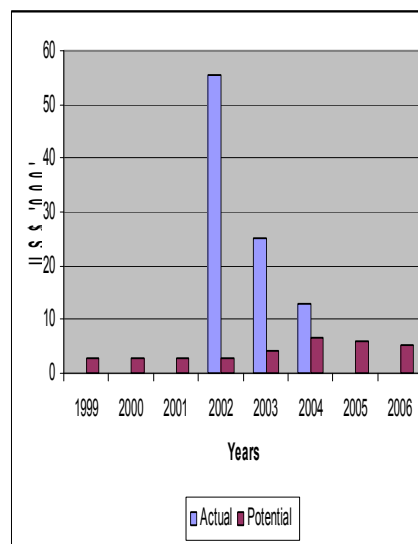
### Spain



### Saudi Arabia



### Switzerland



#### 7.3.2.1 Botswana's textile trade potential with regional groupings

In this section the study analyzes Botswana's export trade potential with sets of countries defined by some preferential trading arrangements which are already in existence as well as those to be operationalized in the near future, using estimates from the gravity model. In particular, the thesis investigates the group of trading partners constituting the SADC, SACU, USA's AGOA and EU (both under Cotonou agreement and the envisioned EPA).

Among the trading partners who are members of EU, the highest unrealized trading potential in textile for Botswana, according to the calculation in Table A12 of the Appendices, is shown in Spain, followed by Switzerland and Finland, among other countries. On the other hand, highest export textile trade potential according to the magnitude of the trade potential calculation is indicated for Mozambique, followed by Tanzania and lastly by Swaziland, for countries in the SADC regional configuration. Thus, tabulated information shows that Botswana and its respective trading partners in the EU and SADC are trading much less than what the gravity model predicts and this implies that Botswana has untapped export trade potential in textiles with countries in both the EU and SADC. This scenario suggests that it will be a noble move for Botswana to continue making all efforts to implement its free trade area (FTA) commitments under the SADC and also for the country to enter into an EPA with the EU, i.e. expected to be implemented any time from 2010.

Table A13 shows the trading partners in America, EU and SADC (SACU) regional groups where Botswana has exceeded its export trade potential in textile products. This implies that Botswana and these respective countries in these regional groupings are trading more than the gravity model predicts. This is an indication of a successful partnership among trading countries (International Trade Centre (ITC) (2005, 2003).

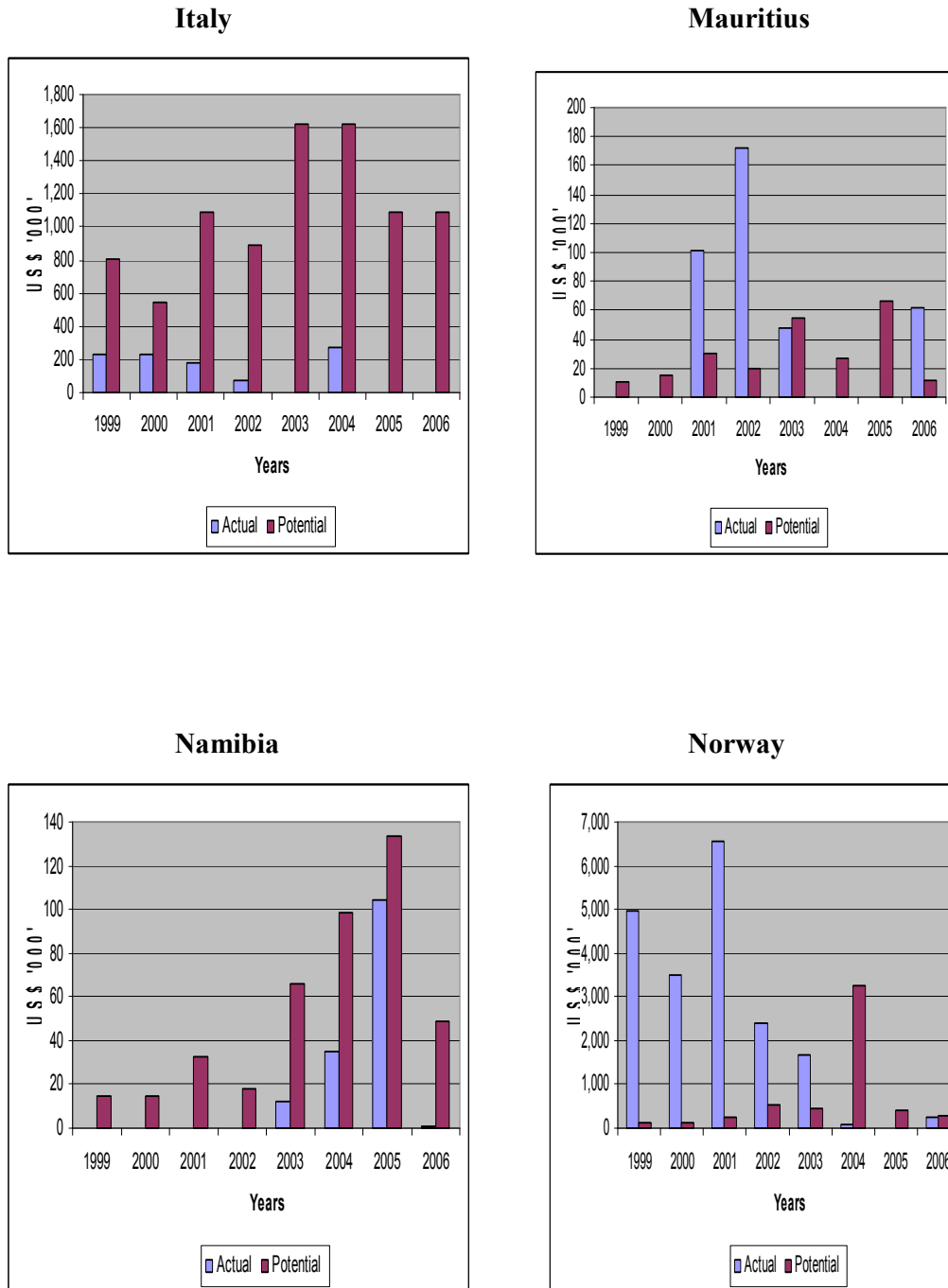
### **7.3.3 Export trade potential in meat and meat products sector**

Export trade potential among Botswana's meat and meat products destination is maximum for Italy, followed by Namibia, Norway and Mauritius, as shown in Figure 6. This suggests that Botswana should export meat and meat products to these countries so as to exhaust the untapped trade potential. See also Table A14 of the Appendices.

Generally, for the meat and meat products sector, the country has more trading partners with which it has exceeded its export trade potential when compared to trading partners with which it has untapped potential. Table A15 (of the Appendices)

presents the countries that Botswana has exceeded its export potential during the period 1999 to 2006.

**Figure 6: Meat and meat products export potential**



### **7.3.3.1 Meat and meat products trade potential with regional groupings**

At regional level, Table A16 of the Appendices indicates that the EU (Italy) and SADC (Mauritius and Namibia) are the trading blocs with which Botswana has unrealized export trade potential. On the other hand, Germany, the Netherlands and United Kingdom from the EU, and South Africa and Zimbabwe from SADC, are the countries with which Botswana has successful bilateral partnerships given that trade potential with these countries in meat and meat products has been exceeded. See Table A17 of the Appendices.

## **7.4 Comparison with other studies**

The unrealized export potential results are not unique to the findings of this thesis, but compares well with other previous studies which also found untapped potential in various trading partners for a given country's exports. For instance, Ram and Prasad's (2007) found that Fiji had untapped trade potential for its aggregate exports with its trading partners such as Australia, New Zealand, Thailand and the United States. A study by Eita and Jordaan (2007) found that South Africa's leather products for the period 1997 to 2004 had unrealized export trade potential to such trading partners as South Korea, UK, USA, and Zimbabwe. Batra's (2004) study on India's global trade indicates that the country, for the year 2000, had highest unexploited export trade potential with trading partners from the Asia-Pacific region followed by Western Europe and North America. At country level, India had the highest unrealized export potential with countries like China, UK, Italy and France

## **7.5 Causes of unrealized export trade**

The existence of unrealized trade potential with a number of trade partners signifies that there might be some trade barriers still inhibiting export trade to some of these trade partners. The following are some of the possible trade barriers that Botswana's sectoral exports face in a number of countries.

**i. Stringent rules of origin (RoO)**

Although tariffs applied by most of Botswana's export partners have generally declined over the years, stringent rules of origin (RoO)<sup>25</sup> continue to present challenges to the country's exports. For instance, in the case of textiles, whilst the USA's AGOA allows even for global cummulation<sup>26</sup> under the "Special Rule" (Allen *et al.*, 2007); while trade with EU (under Cotonou and the envisioned EPA) only allows regional (SADC) and diagonal cummulation<sup>27</sup>, thereby limiting the ability of Botswana manufacturers to source textiles inputs from potentially cheaper countries. Thus, these RoO have limited Botswana's exports to the EU, especially those from the textiles sector, resulting in the actual exports being less than the predicted or simulated exports.

**ii. Non-tariff barriers (NTBs)**

Most countries, especially from the developed world have over the years developed sophisticated NBTs which are arbitrary, difficult and costly to meet, especially for the developing exporting countries. In the case of the EU, application of Sanitary and Phyto-sanitary Standards (SPS) measures whose

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<sup>25</sup> RoO can be simply defined to mean the country of origin from which a given exported product came or was manufactured.

<sup>26</sup> Cummulation when applied within RoO concepts implies that if Botswana textile manufacturers use cotton or yarn imported say from Zimbabwe (an Africa/SADC country) to manufacture their textiles for exports, the exported textiles will be considered as wholly originating from Botswana. Thus Africa-wide cummulation implies that Botswana can import cotton or yarn from any African country for manufacturing its textiles for exports and those exports will be considered as originating from Botswana. SADC cummulation means the manufactured exported textiles will only be considered as originating from Botswana if the yarn, cotton, etc., used to manufacture them were imported from SADC countries. Thus, SADC cummulation when compared to Africa-wide cummulation limits the sources from which Botswana's textiles manufacturers imports their production inputs.

<sup>27</sup> Diagonal cummulation means that any material, e.g. cotton, yarn, zips, etc., used to manufacture textiles in Botswana should be imported only from EU member countries so that the exported textiles can be considered as wholly originating from Botswana. If the manufacturers import cotton or yarn say from India or USA, the exported textiles will not be considered as originating from Botswana when entering EU markets, and thus will not be given any preferential treatment within the ACP-EU trade preferential arrangement, and will be levied import duty like any other textiles from other non-preferential trade partners.

main objectives are to safeguard damages to health, animal and plant life have become disguised trade barriers. SPS standards have affected agricultural exports including meat products not only of Botswana but also for most ACP countries. EU SPS measures require that for any exporter to export to the EU member states, he or she must be certified and for one to be certified he or she must meet some ‘standards’ set by EU bodies. In the case of meat products, SPS requires that the abattoirs must be certified; the animals to be slaughtered, e.g. cattle, should be traced to their origin, i.e. from which farm, area or region within any country they originated. Meeting these requirements is costly and cumbersome and this has resulted in less meat products being exported to some developed trade partners, especially in the EU.

### **iii. Animal diseases**

FAO (2005) reports that Botswana’s meat and meat export products have been limited due to a plethora of diseases, chief among them being the foot and mouth<sup>28</sup>. With the outbreak of foot and mouth disease, all meat exports are abruptly brought to a halt until health officials are fully satisfied that the disease has come under control or been eradicated. Owing to the lengthy procedure involved in arriving at the conclusion that the diseases has been brought under control, the country ended up exporting less than its potential meat products in the years where such disease has occurred.

### **iv. Unrecorded informal trade**

Another possible cause of unrealized export trade potential is the fact that informal trade exports figures were not recorded. A case in point, as an illustration, is the fact that more than 80% of Zimbabweans<sup>29</sup> have been

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<sup>28</sup> Other listed diseases are (i) African swine fever, (ii) Avian Influenza, (iii) Bluetongue, (iv) Bovine spongiform encephalopathy (BSE), (v) Contagious bovine pleuropneumonia (CBPP), (vi) lumpy skin disease (vii) Newcastle diseases, (viii) Rinderpest, (ix) sheep and goat pox and (x) Rift valley fever

<sup>29</sup> Zimbabwe is just an illustration given that Botswana’s textiles, and meat and meat products to this partner country have exceeded their export potential.

importing their groceries from their neighbouring countries including Botswana (South Africa, Zambia and Mozambique) for nearly a decade. Given that these imports were mostly done in small amounts or informally, e.g. groceries of around US\$150 per month per individual, both Botswana customs and Zimbabwean customs were not officially recording these ‘small figures’. However, if these small figures are aggregated, they run into millions of US dollars. Thus, the existence of untapped trade potential may be as a result of the fact that informal trade figures were not recorded, resulting in the actual recorded trade figures being less than the predicted potential figures.

**v. Inadequate international marketing**

Effective trade, especially with international consumers is underpinned by rigorous marketing of the products on offer. Botswana’s National Export Strategy (NES) (Republic of Botswana, 2008) alludes to the fact that the country’s exports have not been vigorous marketed at international fora. Whilst it may be difficult to single out the effect of marketing on a country’s exports, the fact remains that marketing contributes positively towards exports, especially given the continued growth in competition from other countries in most products offered on the international market by Botswana.

**vi. Relative low quality**

Salm *et al.* (2004) alludes to the fact that relatively low quality, especially in the textiles sector, has contributed towards reduced exports of Botswana’s exports from this sector. In particular, the study noted that although the RoO for yarn under the AGOA have been enhanced, the sector has not adequately taken advantage of that gesture by ensuring that it procures the better quality fabric required by regional garment manufacturers producing for the USA market. As a result, relatively low quality fabric has been in manufacturing resulting in relatively low quality garments which faced fierce competition on the international market on quality terms.



## 7.6 Conclusions

This chapter presented the countries in which Botswana has unrealized trade potential in the diamond, textile, and meat and meat products export sectors. The reported results indicate that Israel, South Africa and Switzerland are export destinations for which there is still untapped export potential for Botswana's diamond, and as such, the country should increase its diamond export to these countries. Countries such as Canada, Denmark, Ghana and Mozambique, among others have unrealized export markets for textile products from Botswana while Italy, Mauritius, Namibia and Norway are the export destination in which Botswana should increase its export of meat and meat products as these countries have untapped market potential for meat and meat products.

## 7.7 Policy recommendations for utilizing unrealized trade potential

The ultimate objective of investigating whether a country has unrealized export potential with its trading partners is to help the country to initiate relevant trade and promotional policies, among others, so as to try and export more to those destination countries with untapped markets. This section therefore presents some of the policy options that Botswana can consider so as to try and expand its sectoral exports to relevant export destination partners which have unexhausted markets for the country's sectoral exports. In the presence of existing export potential, the following are some of the policy recommendations:

1. Analyze export barriers

Botswana policy analysts need to do an investigation of the factors that hinder the country's sectoral export to countries with untapped export potential. Such an investigation will help to identify hindrances to export of sectoral products to these countries. With that information policy makers will be in a better position to design relevant policies to capitalize on those unrealized export markets and export more.

2. *Increase export promotion activities*

Effective trade, especially with international consumers is underpinned by rigorous marketing of products on offer. Botswana's National Export Strategy (NES) (Republic of Botswana, 2008) alludes to the fact that the country's exports have not been vigorous marketed at international fora. The country should therefore increase trade promotional activities of its foreign services and consulates, especially in countries where there is untapped export potential. These consulate offices abroad can provide more information on how one can import from Botswana as well as what products can be imported. If possible, the country can put new consulate offices in a trade partner country where there were no such services before. Presence of new consulate services which also provides trade information, among other services, may encourage imports from Botswana. According to Rose (2005), *ceteris paribus*, "each additional consulate placed abroad is associated with a rise of bilateral exports of between 6% and 10%".

3. *Negotiate for better trade preferences*

Given that Botswana is still in the process of negotiating a number of free trade arrangements, for instance with EU countries and also with WTO member countries, the country can try to ensure that it gets the most in terms of liberal trade preferences and better market access for its sectoral exports, especially with countries from these two groups with which it has untapped sectoral trade potential.

4. *Seek technical assistance to meet NTBs*

The country needs to work closely and in collaboration with its developed trade partners, especially the EU, with the aim of getting technical assistance in meeting some of the SPS and RoO requirements. Meeting and satisfaction of these measures will positively enhance the country's sectoral exports to the

EU trade partners, hence exhausting any currently existing untapped potential within these markets.

5. Enhance diseases monitoring mechanisms

The success of Botswana's meat and meat products, among other agricultural products, is underpinned by the country's ability to eradicate perennial diseases such as the foot and mouth. Whilst the country is highly endowed with a larger head of cattle, failure to control diseases means the country will not be able to maximize its exports from this sector. Thus, the country should consider enhancing disease monitoring mechanisms to ensure that should there be an outbreak of any animal disease; the country will be able to swiftly put it under control or totally eradicate it.

6. Improve product quality

It is important to note that importers (and hence consumers) do not simply consider price when importing any product, but also consider other issues, among them being the quality of the product. Most importers, especially from the developed world, are particular about the quality of the products they purchase and they generally prefer products of high quality. Thus, Botswana manufacturers can enhance the possibility of increasing its sectoral exports, especially those from the textiles sector if they use high quality yarn and fabric in their manufacturing processes.