EXPORT PROMOTION

A Decision Support Model Approach

Editors

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Chapter 5

Belgium's export opportunities and export potentials in the world: A quantitative assessment using the DSM approach

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5.1 Introduction

In the early 1990s, the DSM was developed for use by the Flemish export promotion organisation (EPO) and applied first to identify export opportunities of Belgium (see Chapter 4). The original version used 2-digit SITC international trade data, after which subsequent runs of the DSM for Belgium, Thailand and the Philippines used SITC 4-digit data. The present version of the DSM as outlined in Chapter 4 follows the original filtering process and its four filters, but the international trade data used is HS-data at 6-digit level. This change in the international trade data source leads to a much more detailed product classification of the export opportunities identified. Moreover, the results of the DSM can be readily recognised and interpreted by the exporters, as they are familiar with their product's Harmonized System code which they have to fill in on their export declaration forms.

The aim of the present chapter is to discuss the results of the latest DSM run for Belgium, primarily as a detailed illustration of the DSM methodology as outlined in Chapter 4. We review in detail the results of the respective filters. Where possible, these results are also compared with the previous runs of the DSM using 1985-1989, 2000-2003 and 2004-2006 statistical data. This leads us to conclusions about which of Belgium's export opportunities can be found where, as well as about the impact of changes over time in the international environment and import demand conditions. Furthermore, it allows the comparison of the robustness of the DSM results over time.

5.2 Belgium's preliminary market opportunities

As indicated in Chapter 4, Filter 1 of the DSM consists of two sets of importing country criteria that are investigated. We first analyse importing country risks for 241 countries, after which macro-economic performance of importing countries are analysed.

Based on compound country risk scores, which were calculated using the ONDD political and commercial risk scores at individual country level and the threshold value of 9.286¹ (see Chapter 4 section 3.1.1), the importing countries showing the highest risk are deleted. This leaves us with 209 countries, i.e. 86.7% of the countries that entered Filter 1 are retained. This selection rate was only 62.6% in the first DSM run for Belgium (Cuyvers *et al.*, 1995:177), but 78.6% in the 2000-2003 run (as reported in Chapter 8) and even 91.2% in the 2006 run (Cuyvers & De Voet, 2008). Differences in the selection rate obviously reflect the general economic situation in the world as evidenced by the business cycle. The reason for the low selection rate in the first DSM run is, however, probably the finer scoring scale used by ONDD, which first used to be a 1-5 scale instead of the 1-7 scale in the more recent exercises.²

Among the countries that show too high political and/or commercial risk are Afghanistan, Cambodia, Congo, Cuba, Guinea, Haiti, Lao PDR, Lebanon, Pakistan, Rwanda, Sudan and Zimbabwe for example.

Macro-economic performance of the 209 importing countries that pass the risk score filter as potential export markets is assessed by using 2005-2007 indicators for current GDP and current GDP per capita, as well as GDP growth and GDP growth per capita. However, due to lacking macro-economic data, 13 countries had to be left out.

As described in Chapter 4 section 3.1.2, a critical value (CV) or cut-off point is used to identify the number of potential export markets that should be further investigated in terms of the two macro-economic variables, namely GDP and GDP per capita, as follows:

$$CV = \bar{X} - \alpha \sigma_x \dots\dots\dots (1)$$

where $\bar{X}$ is the average value and σ_x the standard deviation of the indicator under investigation. The value of α is chosen by means of a simulation process where its value is

1 This value corresponds to a short, medium and long-term political risk score of 6 and a commercial risk score of C.

2 The risk filtering of the DSM can for all practical purposes be regarded as identical whichever exporting country is considered. In the DSM runs for Thailand it was 65.8% in 1993 and 60.9% in 1997 (Cuyvers, 2004).

varied between 0 and 1 by increments of 0.001. Visual inspection then leads to the most appropriate alpha value (see Figure 5.1), which for GDP and GDP per capita is 0.07.

The number of countries selected in terms of GDP and GDP per capita amounts to 36 and 56 respectively.

Figure 5.1. Determining the Alpha Value for GDP and GDP per capita in Filter 1.

The average and the standard deviation of the distribution are calculated for all the 196 countries in the three years under consideration. The critical value is determined for each of the years. A country would be selected in terms of its GDP (GDP per capita) if the country's GDP (GDP per capita) were greater than the critical value for at least two of the three years under consideration. To be selected on the basis of both GDP and GDP per capita, the country should at least be selected in terms of one of these two indicators. In this way 67 countries are identified as preliminary market opportunities.

As pointed out in Chapter 4 section 3.1.2, weaker performing countries can have been eliminated in Filter 1 on the basis of their GDP and GDP per capita being too low. Yet, these countries can show export potential in certain product groups. Therefore, the countries not included during the first phase of Filter 1 can still be considered for further analysis if their average growth rate percentage for the two indicators (GDP growth and GDP per capita growth) are both higher than the average of all the countries for each of the individual years under consideration. Among the "growth economies" thus additionally selected, mention can be made of Armenia, Belarus, Bulgaria, Colombia, Jordan, Kazakhstan, Romania and Vietnam for example.

At the end of Filter 1, a total of 107 countries that passed the two sets of criteria are retained for analysis of detailed export potentials, which represents 54.6% of the countries with which this part of Filter 1 started. This percentage is considerably smaller than the 77.6% (59 countries) in the DSM run with 1985-1989 data, but in that run we had been

confronted with more missing macro-economic data (Cuyvers, 1995:178). For comparison, this percentage amounted to 48.1% (90 countries) in the 2004-2006 run (Cuyvers & De Voet, 2008:9) and hardly 37.3% (69 countries) in the 2000-2003 run, a period of economic downturn.³

5.3 Belgium's possible export opportunities

In Filter 2, 2003-2007 import trade data from the United Nations Comtrade Database at HS 6-digit level are analysed for the countries that passed Filter 1. However, for some of these countries no import data were available, such as for Antigua and Barbuda, Puerto Rico, the Channel Islands, but also Taiwan. For some other countries, no 2007 international trade data were found, in which case the latest year was taken (e.g. 2006 for Vietnam and Macau, but e.g. even 2005 for the United Arab Emirates). In Filter 2, we finally are investigating 545,703 product-country combinations according to their size and their growth rates.

A given country's imports for a specific product will be considered as offering interesting export potential for Belgium if they show either sufficient volume and/or import growth in the short- and longer term. Critical values are calculated for each product group j at HS 6-digit level as explained in Chapter 4 section 3.2. To determine short-term growth of imports between 2006 and 2007, the simple percentage growth rate for each product group j in each country i is calculated. As for the long-term growth of imports, the compound percentage growth rate between 2003 and 2007 is calculated for each product group j in each country i .

The critical value, which determines whether a particular market shows potential in the growth of imports on the short and long term, is given as:

$$g_{ij} \geq G_j \quad \dots\dots\dots (2)$$

where g_{ij} denotes the rate of growth of imports either in the short or long term of product group j by country i . If g_{wj} denotes the rate of growth of total world exports of product group j and s_j is the scaling factor which takes into account the degree of specialisation in the exports of Belgium of a product group j (Willemé & Van Steerteghem, 1993) as measured by the revealed comparative advantage index (Balassa, 1965) (see also Chapter 4 section 3.2), then

$$G_j = g_{wj} s_j \quad \text{if} \quad g_{wj} \geq 0 ; \text{ or}$$

$$G_j = g_{wj} / s_j \quad \text{if} \quad g_{wj} < 0$$

3 In the 1993 and 1997 DSM runs for Thailand this percentage was 58.8% (53 countries) and 63.9% (53 countries) respectively (Cuyvers, 2004:264-265).

Alternatively or additionally, to determine whether a particular market shows potential in terms of the relative import market size, another critical value can be calculated as follows:

$$M_{i,j} \geq S_j \quad \dots\dots\dots (3)$$

where $M_{i,j}$ is the relative import market size of country i for product j and S_j denotes the cut-off point for relative import market size, taking into account the degree of specialisation of Belgium in product j such that:

$$S_j = 0.02 M_{w,j} \quad \text{if} \quad RCA_j > 1$$

$$S_j = [(3 - RCA_j) / 100] M_{w,j} \quad \text{if} \quad RCA_j \leq 1$$

where $M_{w,j}$ is the total import market of the world for product j and RCA_j denotes Balassa's revealed comparative advantage index of Belgium for product j . A market will be judged large enough if condition 3 is fulfilled. In line with our previous studies, we do not consider as having potential those product-country combinations that show neither sufficient size, nor sufficient growth in the short and long run. Nor are we further considering the product-country combinations that only show sufficient short-term growth (see Chapter 4, Table 4.5).

Using the above criteria we selected 150,528 product-country combinations, as possible realistic export opportunities for Belgium in the world market. These combinations represent 27.6% of the 545,703 possible product-country combinations at HS 6-digits. In 2003 and 2006, this percentage was 14.3% and 16.4% of the 59,780 and 82,320 product-country combinations at SITC 4-digits respectively (Cuyvers & De Voet, 2008:14; Chapter 8, Figure 8.1) which is the result of more detailed international trade data.⁴

5.4 Belgium's realistic export opportunities according to import market concentration

Filter 3 evaluates a country's ability to penetrate foreign markets. This ability depends on various trade barriers and restrictions. Although there are many tariff and non-tariff barriers, other trade barriers, such as transportation cost and lacking suitable infrastructure can severely hamper international trade between two countries. In this section it is assumed that also import market concentration is of sizeable influence on the potentials of an exporting country to tap possible export opportunities. Of course, concentration of supply of a given product j in a market relates to both domestic and foreign supply. As the combination

4 At 4 digits a product-country combination can fail the tests of the filter, although at 6-digit level a number of the product-country combinations, which are part of that at the 4-digit level, might pass.

of industrial production statistics and international trade statistics involves a complicated conversion procedure, we follow Cuyvers *et al.* (1995:180-181) and Cuyvers (2004:261-262), and restrict the analysis of concentration to imports of a product j and to the countries supplying these imports, using the Herfindahl-Hirschmann Index (HHI) (Hirschmann, 1964) as measure of the degree of market concentration, as follows:

$$HHI_{ij} = \sum \left(\frac{X_{k,ij}}{M_{tot,ij}} \right)^2 \dots\dots\dots (4)$$

where $X_{k,ij}$ is country k 's exports of product group j to country i and to country i 's total import of product group j . If the HHI is low for a particular importing country, it can be safely assumed that Belgium will likely find it easier to penetrate that specific market, as it is less concentrated in terms of imports supply.

As in the previous filters a critical value will be determined for the degree of market concentration, as follows:

$h_k = \bar{x}_h - 0.1 \alpha \sigma_h$, for large volume product-country combinations;

$h_k = \bar{x}_h + 0.1 \alpha \sigma_h$, for other (not-large) product-country combinations showing growth in the long and short term, or large product-country combinations which combine either short- or long-term growth;

$h_k = \bar{x}_h + 0.3 \alpha \sigma_h$, for large product-country combinations, which also show, short- and long-term growth.

As explained in Chapter 4 section 3.3.1, the formulas for the critical values are different for the various categories, with the first mentioned (product-country combination showing only a large size of imports) being allowed less market concentration, than the second group of categories. These, in turn, are considered as less interesting than the last mentioned category (product-country combinations showing large size of imports, together with sufficiently high growth rates in the short and the long term) and for which the formula for h_k allows the highest concentration ratio of all. In other words, our filtering process is least restrictive for that category and most restrictive for the first mentioned above.

To determine whether or not a particular product-country combination will be included for further analysis, the following condition has to be fulfilled:

$$h_k \geq HHI_{ij} \dots\dots\dots (5)$$

with h_k the cut-off point for market concentration.

If condition (5) is fulfilled, those product-country combinations will be included for further analysis. The cut-off point h_k is determined by first selecting α , which was done heuristically by looking for breaks in the number of “eliminated” product-country combinations when α increases (see Chapter 4 section 3.3.1).

As Figure 5.2 shows, this number of “eliminated” product-country combinations mostly decreases monotonously for increasing α , apart from two small downwards jumps when α is increased from 0.75 to 0.77, leading to 50,819 eliminations at $\alpha = 0.76$ (coming from 50,840) and another one when α is increased with 0.01 from 11.57. It was decided to choose $\alpha = 0.76$, leading to the h_k cut-off values as defined above, of:

$h_k = 0.4767$, for large volume product/country combinations

$h_k = 0.4990$, for other (not-large) product/country combinations showing growth in the long and short term, or large product/country combinations which combine either short- or long-term growth

$h_k = 0.5212$, for large product/country combinations which also show short- and long-term growth.

Thus, if an import market for a large volume product-country combination shows a $HHI > 0.48$, it is not selected due to being too concentrated. The same applies to large product-country combinations which also show short- and long-term growth with $HHI > 0.52$.

Figure 5.2. Determining the Alpha value for HH concentration index in Filter 3.

Using these cut-off values, leads us to select 99,709 product-country combinations as showing import market concentration ratios, which are smaller than the respective h_k 's, or 66.2% of the product-country combinations coming out of Filter 2. In the 2003 and 2006 run of the DSM for Belgium this percentage was 79.9% and 78% respectively (see Chapter 8, Figure 8.1; Cuyvers & De Voet, 2008:15-19), which is likely due to the use of international trade data at 6-digit level in the present run of the DSM. A comparison with the h_k 's in e.g. the 2006 run reveals that these were much less restrictive for "other (not-large) product-country combinations showing growth in the long and short term, or large product-country combinations which combine either short- or long-term growth" and "large product-country combinations which also show short- and long-term growth" which make up the vast majority of the product-country combinations (De Voet, 2008:56-57). This lower restrictiveness in 2006, as compared to the results in the present run, is probably due to the more buoyant state of international trade at that time.

5.5 Belgium's realistic export opportunities based on import market restrictions

As in previous research on realistic export opportunities of Belgium and Thailand (Cuyvers *et al.*, 1995, Cuyvers, 1996, Cuyvers, 2004), no attempt is made here to quantify the various market access barriers, but instead an index $M_{i,j}$ of "revealed absence of barriers to trade" is used as proxy:

$$M_{i,j} = \frac{\frac{X_{nij}}{X_{nj}} + \frac{X_{gij}}{X_{gj}} + \frac{X_{fij}}{X_{fj}}}{\frac{X_{wij}}{X_j}}$$

With X_{nij} = the exports of the Netherlands (Germany or France, respectively) of product group j to country i ,

X_{nj} = the total exports of the Netherlands (Germany or France, respectively) of product group j ,

X_{wij} = the total exports of the world of product group j to country i ,

X_{wj} = the total world exports of product group j .

This index shows the share of Belgium's continental neighbouring countries' exports to country i of product group j in their respective exports of product group j , corrected for the share of that country i in world trade of product group j . As like in the previous runs of the

DSM, no α could be determined unambiguously here, we were compelled to use the rule of thumb:

$$M_{ij} \geq 0.95$$

which implies that, apart from a margin of error of 5%, Belgium is assumed to have no "revealed barriers to trade" in a market if at least one of its three continental neighbouring countries has a "revealed comparative advantage" in exporting to that market.

Applying this criterion, leads to the selection of 98,792 product-country combinations with an apparent market accessibility which is similar to that which at least one of Belgium's neighbouring countries is experiencing for the same product group in the same importing country. This number represents 65.6% of these that entered Filter 3, as compared to 57.4% and 62% in 2003 and 2006 (Chapter 8, Figure 8.1; Cuyvers & De Voet, 2008:22). The increasing percentage of product-country combinations passing this filter of market restrictiveness probably reflects the general increase in trade liberalisation, as well as the growing integration of new emerging markets in the world economy.

5.6 The categorisation of Belgium's realistic export opportunities according to import market characteristics and import market share

As for realistic export opportunities (REOs), it is assumed that the respective import markets are sufficiently accessible and reasonably competitive (less concentrated), the union of the product-country combinations selected on the basis of import market concentration and market accessibility leads to the list of such REOs. The union thus constructed contains 61,051 REOs, which is 40.6% of the product-country combinations, which entered Filter 3 (as compared to 45.6% and 53.6% in 2003 and 2006)(Chapter 8, Figure 8.1; Cuyvers & De Voet, 2008:22). The complete filtering process is summarised in Figure 5.3.

Based on this output as well as on output from the individual filters, the REOs identified can now be further categorised according to the import market characteristics and the import market share for each REO taken separately. This categorisation is done by constructing Tables 5.1a, 5.1b and 5.1c.

Whereas the import characteristics are those defined in Filter 2, the categorisation according to import market share, as explained in Chapter 4 section 3.4, is linked to $\mu_{n,ij}$, the degree of market importance of country n 's exports of product group j to country:

$$\mu_{n,ij} = \left(\frac{X_{n,ij}}{X_{w,ij}} \right) / \left(\frac{X_{n,j}}{X_{w,j}} \right),$$

where $X_{n,ij}$ is country n 's exports of product group j to country i , $X_{World,ij}$ is the world's exports of product group j to country i , $X_{n,j}$ is country n 's total exports of product group j , and $X_{World,j}$ is the world's total exports of product group j .

Figure 5.3. The filtering process of Belgium's realistic export opportunities.

In order to indicate whether Belgium's market share is small or large, or intermediately small or large, for any particular product-country combination selected as REO, $\mu_{Belgium,ij}$ is compared with $\mu_{six,ij}$, the combined degree of market importance of the six exporting countries with the largest exports of the product category to the country in question. Following Cuyvers *et al.* (1995) and Cuyvers (2004), the following rules of thumb are used:

$\mu_{\text{six},ij} - \mu_{\text{Belgium},ij} > 3$: the relative market share of Belgium is relatively small;

$1.5 \leq \mu_{\text{six},ij} - \mu_{\text{Belgium},ij} \leq 3$: the relative market share of Belgium is intermediately small;

$0 < \mu_{\text{six},ij} - \mu_{\text{Belgium},ij} \leq 1.5$: the relative market share of Belgium is intermediately high; and

$\mu_{\text{six},ij} - \mu_{\text{Belgium},ij} \leq 0$: the relative market share of Belgium is relatively high.

Table 5.1a shows the distribution of the 61,051 REOs, whereas Table 5.1b depicts the distribution of the REOs for which Belgium has a reasonably high comparative advantage, say, $\text{RCA} \geq 0.7$.

Table 5.1a. Distribution of Belgium's potential realistic export opportunities according to relative market position and market characteristics.

	Market share of Belgium relatively small	Market share of Belgium intermediately small	Market share of Belgium intermediately large	Market share of Belgium relatively large	Total
Large product market	(Cell 1) 2,295 (3.76%)	(Cell 6) 1,377 (2.26%)	(Cell 11) 1,744 (2.86%)	(Cell 16) 1,716 (2.81%)	7,132 (11.68%)
Growing (long- and short-term) product market	(Cell 2) 27,226 (44.60%)	(Cell 7) 3,222 (5.28%)	(Cell 12) 3,114 (5.10%)	(Cell 17) 4,542 (7.44%)	38,104 (62.41%)
Large product market, short-term growth	(Cell 3) 1,266 (2.07%)	(Cell 8) 774 (1.27%)	(Cell 13) 1,053 (1.72%)	(Cell 18) 1,182 (1.94%)	4,275 (7.00%)
Large product market, long-term growth	(Cell 4) 1,062 (1.74%)	(Cell 9) 587 (0.96%)	(Cell 14) 759 (1.24%)	(Cell 19) 678 (1.11%)	3,086 (5.05%)
Large product market, short- and long-term growth	(Cell 5) 3,000 (4.91%)	(Cell 10) 1,604 (2.63%)	(Cell 15) 2,073 (3.40%)	(Cell 20) 1,777 (2.91%)	8,454 (13.85%)
Total	34,849 (57.08%)	7,564 (12.39%)	8,743 (14.32%)	9,895 (16.21%)	61,051 (100%)

A comparison with the percentage distribution of the REOs based on the 2003 and 2006 DSM results, for which much less detailed international trade data were used, reveals both striking similarities as well as differences. The distribution of the 2003 REOs according to import market characteristics and Belgium's relative market position (based on the information in Chapter 8, Table 8.1), is by and large similar to the REO distribution according to Table 5.1a (in spite of no 2003 REOs in the "large product market" row), but differs significantly from that of the 2006 REOs. The difference of the 2003 and present REOs distribution, and that of 2006, is apparently the result of the large share in 2006 of the REOs for which Belgium's relative market position is very small (93.8%, as compared to 44.6% in 2003 and 57.1% according to the above Table 5.1a). In particular, the share of the 2006 REOs in Cell 2 (long- and short-term growing product-country combinations) seems to be large (70%, as compared to 37.6% in 2003 and 44.6% according to Table 5.1a). It is challenging to attribute the difference with 2006 to the booming world economy at that time.

Table 5.1a can also be compared with the 2003 and 2006 DSM results as reported by Cuyvers and De Voet (2008), De Voet (2008) and Van Mol (2003), by ranking the cells of the respective Filter 4 output matrices. The Spearman rank correlation coefficient between the ranking of the 2006 and present 2008 cells is 0.632 and that between the 2003 and present ranking 0.520, which is moderate, thus being evidence for apparent shifts in the importance of the respective cells. To illustrate these shifts we can e.g., mention that the 2008 cell showing the largest number of REOs is Cell 2, followed by Cell 17, which in 2006 ranked fifth and sixth respectively. Some extreme examples of shift in importance show Cell 19 which in 2008 is ranked 19th, but 8th in 2006, or Cell 11 which in 2008 is ranked 9th, but 17th in 2006. One might be inclined, at first sight, to attribute these shifts to the different product classification and its level of aggregation. However, a similar Spearman rank correlation coefficient is found between the ranking of the cells in 2003 and 2006 (0.617) going together with similarly dramatic shifts in importance of the cells, in spite of the DSM results being based on SITC 4-digit international trade data. Therefore, the shifts over time within the categorisation of the REOs according to relative market position and market characteristics must be due to shifts in the country composition, which in turn depends on changes in country risks, and changing import demand conditions.

A comparison of Table 5.1a and 5.1b reveals that by imposing the condition $RCA \geq 0.7$, the number of REOs decreased from 61,061 to 29,968. However, in spite of the halving of the number of REOs, their percentage distribution according to import market characteristics and Belgium's market position remains remarkably similar. The imposition of the $RCA \geq 0.7$ condition dramatically negatively affects the large (not growing) product-country combinations, but positively the large product-country combinations among the REOs that also show both short- and long-term growth. We have no explanation for this, although

it seems to indicate that Belgium's future export performance can benefit from it, if the country and its exporters would decide as a priority to tap into these large and growing product-country combinations. Yet, it should not be forgotten that for approximately half (52.3%) of all REOs of Belgium (see Table 5.1b) that can be considered as actual and present opportunities, Belgium has acquired only negligible, if any, market share, thus tentatively indicating a potential source of rapid success for Belgium's export promotion. Although providing evidence for the power of the DSM as a tool for designing and prioritising export promotion activities, a further analysis of the implications is, unfortunately, beyond the scope of this chapter.

Table 5.1b. Distribution of Belgium's realistic export opportunities with $RCA \geq 0.7$, according to relative market position and market characteristics.

	Market share of Belgium relatively small	Market share of Belgium intermediately small	Market share of Belgium inter- mediately large	Market share of Belgium relatively large	Total
Large product market	(Cell 1) 601 (2.01%)	(Cell 6) 469 (1.57%)	(Cell 11) 644 (2.15%)	(Cell 16) 718 (2.40%)	2,432 (8.12%)
Growing (long- and short-term) product market	(Cell 2) 12,758 (42.57%)	(Cell 7) 1,881 (6.28%)	(Cell 12) 1,829 (6.10%)	(Cell 17) 2,221 (7.41%)	18,689 (62.36%)
Large product market, short- term growth	(Cell 3) 413 (1.38%)	(Cell 8) 357 (1.19%)	(Cell 13) 542 (1.81%)	(Cell 18) 631 (2.11%)	1,943 (6.48%)
Large product market, long- term growth	(Cell 4) 446 (1.49%)	(Cell 9) 353 (1.18%)	(Cell 14) 482 (1.61%)	(Cell 19) 472 (1.58%)	1,753 (5.85%)
Large product market, short- and long-term growth	(Cell 5) 1,467 (4.90%)	(Cell 10) 1,027 (3.43%)	(Cell 15) 1,438 (4.80%)	(Cell 20) 1,219 (4.07%)	5,151 (17.19%)
Total	15,685 (52.34%)	4,087 (13.64%)	4,935 (16.47%)	5,261 (17.56%)	29,968 (100%)

Whereas Table 5.1a and 5.1b relate to numbers of REOs, Table 5.1c shows the distribution of the REOs according to potential export values. In an attempt to make a rough estimate of the potential export values behind the REOs, we calculated following Viviers *et al.* (2010) per REO the average value of imports from the exporting countries which represent 80% of these imports, and assume that this average approximates sufficiently Belgium's export potential, measured in US\$. Instead of adding up numbers of REOs, we then proceed by adding up the potential export values of the REOs thus estimated.

Table 5.1c. Distribution of the estimated US\$ values (x1,000) of Belgium's potential realistic export opportunities according to relative market position and market characteristics.

	Market share of Belgium relatively small	Market share of Belgium inter-mediatly small	Market share of Belgium inter-mediatly large	Market share of Belgium relatively large	Total
Large product market	(Cell 1) 39,869,550 (3.92%)	(Cell 6) 64,054,192 (6.30%)	(Cell 11) 129,323,263 (12.71%)	(Cell 16) 72,392,980 (7.12%)	305,639,985 (30.04%)
Growing (long- and short-term) product market	(Cell 2) 68,237,276 (6.71%)	(Cell 7) 18,252,229 (1.79%)	(Cell 12) 24,859,216 (2.44%)	(Cell 17) 36,133,474 (3.55%)	147,482,195 (14.50%)
Large product market, short-term growth	(Cell 3) 33,704,814 (3.31%)	(Cell 8) 57,186,221 (5.62%)	(Cell 13) 47,236,954 (4.64%)	(Cell 18) 36,572,291 (3.59%)	174,700,280 (17.17%)
Large product market, long-term growth	(Cell 4) 11,373,054 (1.12%)	(Cell 9) 16,288,254 (1.60%)	(Cell 14) 27,931,761 (2.75%)	(Cell 19) 41,778,883 (4.11%)	97,371,952 (9.57%)
Large product market, short- and long-term growth	(Cell 5) 52,896,602 (5.20%)	(Cell 10) 42,489,891 (4.18%)	(Cell 15) 102,999,705 (10.12%)	(Cell 20) 93,733,246 (9.21%)	292,119,444 (28.71%)
Total	206,081,296 (20.26%)	198,270,787 (19.49%)	332,350,899 (32.67%)	280,610,874 (27.58%)	1,017,313,856 (100%)

From Table 5.1c it can be concluded that Belgium's potential REOs represent some 1,017 billion US\$, However, the potential US\$ value of each REO should not be considered as a true estimate of the export value that can be attained, but rather as a means to weigh each REO against all others.

Comparing Table 5.1a with 5.1c, we can clearly see how weighing the REOs by the assumed US\$ value of their respective export potential, makes quite a difference in the distribution of the REOs. Particularly, it appears that the importance of the REOs with a small or negligible market share of Belgium is much lower, although still representing 20.3%, which means that in this column we find many REOs with small potential export value. The reduction of the share of Cells 1-5 is largely due to the impact of weighing on Cell 2, which now represents only 6.7%, as compared to 44.6% if unweighted.

5.7 Top 30 of Belgium's realistic export opportunities

Before investigating Belgium's export potential per broad product category and per import region in the world, it is interesting to briefly look into the highest ranked HS 6-digits products according to number of REOs that can be associated with these, as well as in terms of potential export value, which is determined as just explained.

Table 5.2 below shows the Top 30 list of products according to potential export value. It can be clearly seen that merely counting the number of REOs here, can easily lead to wrong conclusions, from the point of view of public export promotion. Having to promote exports of e.g. HS 901839 – Needles, catheters, cannulae, etc. (medical), the product that ranks highest on the Top 30 list according to number of REOs (which is identical to number of countries where the REO at issue is found), in 59 countries and hoping to reach potential exports of that product of merely \$2,070,058, would waste scarce public resources for a meagre export return.

The product that ranks highest in Table 5.2 is an "umbrella" product category, which consists of products, that are difficult to categorise. We, therefore, should rather devote attention to the second product, HS 300490 – Medicaments n.e.s., in dosage, which is found in 52 different countries and promises a potential export value of \$35,878,950. From the point of view of export promotion, this product still needs promotion in too many countries. The same argument holds for HS 870324 – Automobiles, spark ignition engine of >3000 cc or HS 870323 – Automobiles, spark ignition engine of 1500-3000 cc. Moreover, these products are produced by large multinational companies (MNCs) which, following their own global strategies, can hardly be influenced by the export promotion activities in the countries where they produce.

This aspect illustrates the limitations of export promotion in a world dominated by MNCs. It is these conglomerates which evidently benefit most from the existing export opportunities. Attracting these MNCs to Belgium or keeping their investment in the country, by well-designed investment promotion "sticks and carrots" allows Belgium to benefit in terms of

export potential and employment, be it that any attempt to link these foreign affiliates to Belgium's export promotion targets must largely remain futile.

We clearly have to descend a rather long way down in the Top 30 to find products the exports of which can to some extent be incited by the export promotion organisations (EPOs) in Belgium, which evidently implies that in designing product targeted export promotion activities, the Belgian EPOs have to consult and cooperate closely with the sectoral organisations and the exporters. The output of the DSM can help to prioritise efforts towards the most promising import markets for the products offering the highest potential export value.

Table 5.2. Top 30 Belgian products according to potential export value.

Ranking	HS 6-digit product category	Product ranking based on number of REOs	Potential export value (US\$ thousands)	Number of countries for which the product is selected
1	300490 – Medicaments n.e.s., in dosage	3	35,878,950	52
2	870324 – Automobiles, spark ignition engine of >3000 cc	53	28,645,480	39
3	870323 – Automobiles, spark ignition engine of 1500-3000 cc	12	26,752,468	44
4	270900 – Petroleum oils, oils from bituminous minerals, crude	3,601	25,160,977	5
5	870332 – Automobiles, diesel engine of 1500-2500 cc	54	15,043,985	39
6	271019 – Light petroleum distillates n.e.s.	678	14,783,495	23
7	854221 – Monolithic integrated circuits, digital	2,282	11,738,462	12
8	847330 – Parts and accessories of data processing equipment ne	191	11,213,026	32
9	710239 – Diamonds (jewellery) worked but not mounted or set	1,145	10,110,193	19
10	271011 – Aviation spirit	1,951	10,048,119	13
11	852520 – Transmit-receive apparatus for radio, TV, etc.	832	9,190,521	22

Ranking	HS 6-digit product category	Product ranking based on number of REOs	Potential export value (US\$ thousands)	Number of countries for which the product is selected
12	841191 – Parts of turbo-jet or turbo-propeller engines	2,245	8,201,127	12
13	880240 – Fixed wing aircraft, unladen weight > 15,000 kg	3,324	8,027,382	7
14	300210 – Antisera and other blood fractions	683	7,616,974	23
15	293399 – Heterocyclic comps. with nitrogen hetero-atom(s) only	2,734	6,703,764	9
16	847130 – Portable digital computers < 10kg	1,046	6,352,009	20
17	852990 – Parts for radio/TV transmit/receive equipment, n.e.s	743	6,177,845	23
18	880330 – Aircraft parts nes	838	5,748,841	22
19	847989 – Machines and mechanical appliances n.e.s	3,307	4,843,573	7
20	950390 – Toys n.e.s	569	4,601,720	25
21	870899 – Motor vehicle parts n.e.s	26	4,447,469	42
22	841112 – Turbo-jet engines of a thrust > 25 KN	2,626	4,418,697	10
23	293499 – Nucleic acids & their salts, whether or not chemically defined, n.e.s.	681	4,179,096	23
24	851790 – Parts of line telephone/telegraph equipment, n.e.s	2,650	3,928,245	10
25	870840 – Transmissions for motor vehicles	370	3,773,607	28
26	740311 – Copper cathodes and sections of cathodes unwrought	3,068	3,730,956	8
27	901890 – Instruments, appliances for medical, etc science, n.e.s.	13	3,583,597	44

Ranking	HS 6-digit product category	Product ranking based on number of REOs	Potential export value (US\$ thousands)	Number of countries for which the product is selected
28	852540 – Still image video camera	230	3,557,355	31
29	870322 – Automobiles, spark ignition engine of 1000-1500 cc	653	3,425,992	24
30	8443990 – Parts of printing machinery and ancillary equipment	3,302	3,264,837	7

5.8 An analysis of Belgium's export potential per broad product category and import region

In this section, we limit ourselves to a brief overview of the characteristics of the list of REOs identified, based on the product composition and export destination. Of course, a much deeper overview and analysis is possible, but is beyond the scope of this chapter. We then proceed to analyse Belgium's REOs according to the geographical region in the world. Table 5.3a shows Belgium's REOs per broad product category.

Table 5.3a. Belgium's REOs per broad product category.

	Potential export value (US\$ thousands)	Percentage of total potential export value	Number of REOs	Percentage of number of REOs
01 – 05 Animal and animal products	13,813,352	1.36%	1,567	2.57%
06 – 15 Vegetable products	22,738,321	2.24%	2,984	4.89%
16 – 24 Foodstuffs	30,718,776	3.02%	2,542	4.16%
25 – 27 Mineral products	70,137,009	6.89%	831	1.36%
28 – 38 Chemicals and allied industries	132,492,719	13.02%	8,281	13.56%
39 – 40 Plastic/Rubbers	43,311,319	4.26%	3,574	5.85%
41 – 43 Raw hides, skins, leather, and furs	8,974,827	0.88%	790	1.29%
44 – 49 Wood and wood products	26,844,884	2.64%	2,840	4.65%

	Potential export value (US\$ thousands)	Percentage of total potential export value	Number of REOs	Percentage of number of REOs
50 – 63 Textiles	41,015,960	4.03%	9,119	14.94%
64 – 71 Stone / Glass	45,494,660	4.47%	2,965	4.86%
72 – 83 Metals	90,366,607	8.88%	6,851	11.22%
84 – 85 Machinery / Electrical	241,971,577	23.79%	11,382	18.64%
86 – 89 Transportation	131,948,034	12.97%	1,663	2.72%
90 – 97 Miscellaneous	117,485,811	11.55%	5,662	9.27%
Grand Total	1,017,313,856	100.00%	61,051	100.00%

Machinery and electrical equipment represents the largest share of the REOs, both weighted (23.8%) or unweighted (18.6%), followed by chemicals (13% when weighted by average export values) and transportation equipment (13% when weighted by average export values). It is difficult to compare with earlier DSM results due to a different product classification, but tentatively HS 01-24 which, according to the present results, contribute 11.6% of the total number of REOs, largely corresponds with SITC 0 (food and live animals) which in 2003 and 2006 represented 15.6% and 16.7% of the REOs, and HS 84-89 with 21.4% of the total number of REOs in the present results corresponds with SITC 7 (machines and transport equipment) making up 18.9% and 16.9% of the total number of 2003 and 2006 REOs, respectively (based on data in Van Mol, 2005 and De Voet, 2008). This seems to imply that more recently the REOs identified have shifted to machinery and transport equipment, which is probably related to the quick rise of the Central and Eastern European Countries (CEEC).

The distribution of Belgium's REOs according to geographical region in the world can be consulted in Table 5.3b, from which it can be seen that the EU-15⁵ alone, with 36.4% of all REOs, accounts for more than half of their total potential export value (56.3%). The Central and East European Countries (CEEC)⁶ in turn, a number of which became EU member

5 EU-15 consists of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom.

6 The group of Central and Eastern European Countries (CEEC) consists of the former Soviet Union and the "East Bloc" countries, plus former Yugoslavia: Albania, Armenia, Belarus, Bosnia and

countries more recently, contribute 28.2% of the REOs, which, however, only contribute 7.6% of the potential export value of all REOs. Surprisingly, the number of REOs of Belgium in ASEAN⁷ and Central Asia⁸ together represents only 6.1% of all REOs and 10.2% of the potential export value of Belgium's REOs. Adding South Asia⁹ doesn't change much.

Table 5.3b. Belgium's REOs per region in the world.

Region	Potential export value (US\$ thousand)	Percentage of total pot. export value	No. of REOs	Percentage of number of REOs
Africa	14,298,790	1.41%	3,000	4.91%
ASEAN	23,155,072	2.28%	1,545	2.53%
CEEC	77,168,688	7.59%	17,190	28.16%
Central America and Caribbean	8,353,030	0.82%	842	1.38%
Central Asia	80,718,518	7.93%	2,160	3.54%
EU 15	573,125,025	56.34%	22,204	36.37%
Middle East	25,178,862	2.48%	3,531	5.78%
North America	159,253,602	15.65%	2,018	3.31%
North Europe (non-EU)	5,884,249	0.58%	1,750	2.87%
Oceania	9,299,150	0.91%	1,028	1.68%
South America	11,802,938	1.16%	2,707	4.43%
South Asia	6,611,225	0.65%	983	1.61%
South Europe (non-EU)	22,464,707	2.21%	2,093	3.43%
Grand Total	1,017,313,856	100.00%	61,051	100.00%

It is interesting to compare the ranking of the countries according to number of REOs with the ranking in the past, say according to the 2003 results. Concentrating on the 55 countries that the present ranking and that of 2003 have in common, the Spearman ranking correlation coefficient is -0.3703, showing weak negative correlation between the two series, basically for reasons listed above. The comparative ranking is depicted in Table 5.4.

Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Turkmenistan and Uzbekistan.

7 ASEAN, the Association of South East Asian Nations, consists of Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar (Burma), Philippines, Singapore, Thailand and Vietnam.

8 Central Asia consists of China, Hong Kong, Japan, Macau, Mongolia and South Korea.

9 South Asia consists of Bangladesh, Bhutan, India and Sri Lanka.

Table 5.4. Comparative country ranking of 2008 and 2003 according to number of REOs.

Country	No. of 2008 REOs	2008 Ranking	2003 Ranking
Germany	3,180	1	8
France	2,829	2	4
United Kingdom	2,700	3	1
Italy	2,503	4	3
Spain	2,244	5	2
Russia	1,865	6	16
Poland	1,818	7	10
Netherlands	1,808	8	5
United States	1,710	9	9
Switzerland	1,296	12	29
Austria	1,234	13	19
Denmark	1,110	15	11
China	1,105	16	23
Sweden	1,066	18	14
Norway	1,018	19	26
Portugal	823	24	7
India	818	25	21
Finland	800	26	15
Saudi Arabia	762	27	28
Brazil	758	28	48
Iceland	732	31	20
Greece	641	38	12
Egypt	620	39	13
Ireland	617	40	6
Israel	609	41	18
Japan	601	42	24
Turkey	599	43	17

Country	No. of 2008 REOs	2008 Ranking	2003 Ranking
Cyprus	531	44	30
Singapore	468	46	43
Australia	451	47	33

Source: 2008 ranking based on own calculations, 2003 ranking from Van Mol (2003)

The country ranked 10th and 11th in the 2008 list is Romania and the Czech Republic, two countries which are not in the 2003 ranking. The same holds for country ranked 14th, 17th and 20th, which is Bulgaria, Lithuania and Slovakia, etc. showing how the emergence and rapid rise of the Central and Eastern European Countries (CEEC) affects the 2008 ranking dramatically.

Evidently, the quickness to make use of the 2008 REOs depends on Belgium already having gained sufficient comparative advantage. For this analysis we could take, as before in this chapter, a revealed comparative index (RCA) of 0.7 as cut-off value and consider only the REOs relating to products for which the RCA is at least equal to 0.7. We have to refrain from conducting this analysis, as it would unnecessarily repeat the Belgian part of the comparison of “actual REOs” and “potential REOs” between Belgium, South Africa and Thailand in Chapter 6, to which the reader is referred.

5.9 Conclusions

It is only by applying the DSM that its usefulness can be judged. The present chapter illustrates the DSM methodology, outlined in Chapter 4, as applied to Belgium, using statistical data up to 2008. Two types of conclusions can be drawn. The first type of conclusions relate to the results, the second to the stability of the results over time and its implications.

As to the results of the present “run” of the DSM for Belgium, the following can be concluded. Starting with 240 countries, these showing the highest country risks were eliminated, after which the remaining countries are evaluated based on their GDP and/or GDP per capita record, which identifies 67 countries as providing preliminary market opportunities. A further criterion related to the economic growth performance of the countries is used, such that 107 countries pass Filter 1 of the DSM.

Based on HS international trade data at 6-digit level, all product/country combinations for the 107 countries are assessed in the next filter based on market size and import market growth, after which, in Filter 3, the output of Filter 2 is evaluated based on import market concentration and “revealed absence” of barriers to trade. This leads to the identification of 61,051 realistic export opportunities, which in total represent a potential export value of

1,017 billion US\$. How many of these realistic export opportunities, or to what extent they are already tapped is not analysed, as it is beyond the scope of the present chapter (see Chapter 6).

Further data on relative market position of Belgium for each realistic export opportunity, as well as on basic import market characteristics, allows putting the potentials for immediate use into perspective. Also looking into Belgium's degree of specialisation at product level, based on the revealed comparative advantage index, allows some further assessment of these potentials.

In the Top 30 of these realistic export opportunities based on potential export values, automobiles, oil products, pharmaceuticals and integrated circuits figure prominently. Production of these products is dominated by multinational companies, and therefore promoting such exports looks rather nonsensical. One has to descend a rather long way down in the Top 30 to find products the exports of which can to some extent be incited by the trade promotion organisations (TPOs) in Belgium.

It is clear that the output of the DSM can offer a lot of input for identifying, prioritising, designing, planning and executing concrete export promotion activities by the Belgian export promotion organisations. However, as the results of the DSM are inescapably based on statistical data which are at least two years old, there is a need to have the realistic export opportunities assessed by experts "in the field" such as panels of exporters, representatives of sector organisations, commercial attachés at diplomatic missions abroad, etc.

Relating to the second type of conclusions, it should be stressed that we were unable to perform an inter-temporal robustness check of the results, but that the differences with previous DSM runs can be explained. However, even a superficial comparison of the present results with these for 2003 and 2006 should lead to some further caution. A thorough comparison is hampered by the different and more detailed product classification underlying the present DSM run. In addition, a somewhat lower selection rate of the countries based on country risk is achieved in Filter 1, probably due to the finer scoring scale used by ONDD on which the selection was performed for 2003 and 2006. In Filter 2 this seems to be compensated by a higher percentage of the product/country combinations identified as possible realistic export opportunities, as compared to the previous runs, probably due to the more detailed international trade data used presently. In turn, the selection rate in Filter 3 seems to be somewhat lower than for 2003 and 2006.

In sheer number, machines and transport equipment represent the bulk of the opportunities and their share seems to have increased somewhat, as compared to the results for 2003 and 2006. This is likely related to the importance of the EU-15 market and to the quick rise

in prominence of the Central and Eastern European Countries (CEEC) among the countries offering potential, which is in contrast with the results for 2003 and 2006. It presents a deep challenge for government export promotion, as the result illustrates that the economic environment can change so rapidly, that an export promotion strategy at product and country level, which by definition should aim at a sustained longer-term focus, runs the risk of being surpassed by events.

The same can be said when we look at the changes over time in the categorisation of the export opportunities. Comparing the present Belgian DSM results with these for 2003 and 2006 it was found that the rankings of the Filter 4 categories of realistic export opportunities for 2008, 2006 and 2003, although showing some reasonable correlation, sometimes changed dramatically. We did not confirm whether this also applies to the individual opportunities, as such an analysis is beyond the scope of this chapter. There is, however, no reason why this should not be the case, although the phenomenon is probably not widespread. Again, for those opportunities of which the categorisation changes, the export promotion strategies also have to be adapted (see Chapter 9).

Is government export promotion, therefore, another exercise in shooting from the hip at a moving target? Are a continuously changing international environment, country performances and risks, and import demand conditions, not making any attempt by the public sector to direct exporters to selected markets a predictable failure? We are convinced this is not the case. Rather, a repeated use of the DSM to identify realistic export opportunities will allow the export promotion organisation to better prioritise its activities, concentrating on the most promising and stable opportunities, be it that additional expert opinion on recent and expected future changes by privileged experts – both at country and product level – is required to optimise the use of the DSM results. The DSM seems to be a necessary, but not a sufficient condition for an efficient public export promotion programme.

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