

Combining the export promotion of products and services: the case of South Africa

S. Grater, E. Steenkamp, W. Viviers & L. Cuyvers

ABSTRACT

With the trade in services playing an increasingly important role in boosting economic growth and development in many countries, governments and business entities – particularly in developing countries – should be devoting more time to exploring export opportunities for the services sector. However, a major challenge is that the services sector is often not well understood by government, and service providers themselves lack insight into and contacts in foreign markets. Furthermore, many governments concentrate more on the export promotion of products, while giving the services sector relatively less attention. This study investigates how two complementary decision support models (DSMs), for products and services respectively, can help to address the challenge of identifying realistic export opportunities in both these sectors. Specifically, the two DSMs, which incorporate a scientifically designed filtering process, reveal which products and services have the greatest potential in a range of viable markets. This linked approach to identifying export opportunities is an important step in encouraging co-operation between tangible goods producers and service providers, and lays the foundation for the design of mutually beneficial export marketing programmes. The study also shows how export promotion agencies in South Africa can use the results of both models to develop strategic plans aimed at boosting product and service exports in specified markets, thereby contributing meaningfully to the country's internationalisation drive.

Key words: international trade, products, services, diversification, export opportunities, product-service combinations, decision support model (DSM), South Africa

Dr S. Grater and Dr E. Steenkamp are senior lecturers in the School of Economics, North-West University (Potchefstroom Campus). Prof. W. Viviers is research professor and leader of the TRADE research niche area and WTO chair, North-West University (Potchefstroom Campus). Prof. L. Cuyvers is an emeritus professor at the University of Antwerp, Belgium, where he is Director of the Centre for ASEAN Studies, and professor extraordinary at the North-West University (Potchefstroom Campus). E-mail: sonja.grater@nwu.ac.za

Introduction

Services are playing an increasingly prominent role in the global trade environment. Many governments realise the importance of service exports for their country's economic growth and development, evidenced by a structural shift in world trade away from raw materials and commodities, and simple manufactured products, towards more knowledge-based goods and services (Hoekman & Mattoo 2008). A study by Borchert and Mattoo (2010) indicated that services have been much more resilient than tangible products in the aftermath of the global financial crisis of 2008/2009. However, many service firms have insufficient knowledge of export opportunities and, furthermore, lack connections in foreign markets (Winsted & Patterson 1998; Erramilli & Rao 1990). In addition, many governments are not well acquainted with their services sectors and do not have clear strategies in place to advance the cause of service providers.

Governments in the developing countries are generally putting a great deal of effort into export promotion and market-opening initiatives for products. The same assistance should also be extended to services firms. From an economic and social development perspective, a combined export promotion effort for products and services makes a great deal of sense, as it expands and enriches the country's export effort and leads to efficiency-enhancing economies of scale. Moreover, by giving impetus to their service export sectors, developing countries and emerging economies alike will see some of the pressure taken off their balance of payments, and they will gain new areas of comparative advantage due to the synergies found in marketing products and services together. These countries should therefore be setting their sights on markets with high export potential for both products and services.

The challenge, though, lies in selecting those markets that offer the greatest potential for both products and services in terms of the size and growth of import demand as well as accessibility. Thus, the aim of this study is to present a methodology that the aforementioned governments can use to establish where the export potential for both products and services lies, and to formulate appropriate strategies that will steer and streamline their export promotion efforts.

The following section will provide some background on services trade and the determinants thereof. The decision support model (DSM) will then be discussed as a strategic tool to assist government export promotion agencies to make well-informed decisions that efficiently support both the product and services sectors alike.

Overview of services trade

The trade in services is different from the trade in products, as explained by the WTO's four modes of supply of services (WTO 1994). It follows then that the trade in services and the trade in products are affected by different trade barriers. Grunfeld and Moxnes (2003) indicated that trade barriers and corruption in the importing country would have a strongly negative effect on services trade. They also detected the strong influence of the home market effect on the trade in services, whereby a rich country would rather supply services domestically than import them. Kimura and Lee (2004) established that the geographical distance to the market is more important for services trade than it is for products trade, going on to state that the cost of transport for tradable services is higher than that for products. Membership of a regional trade agreement also has a significant impact on the trade in services.

Shepherd and Van der Marel (2010) investigated the determinants of services trade in the Asia-Pacific Economic Cooperation (APEC) region and found that reducing the restrictiveness of services sector regulation can boost trade. They also asserted that membership of a regional trade agreement would lead to higher trade flows in services, similar to the finding in the Kimura and Lee (2004) study. In addition, Shepherd and Van der Marel investigated the determinants of services trade at a sector-by-sector level and highlighted the strong influence of regulatory restrictiveness on services trade.

Van der Marel (2011) drew attention to some of the factors giving rise to comparative advantage in services. His study highlighted how aspects such as human capital and skills levels, quality of institutions, relationships with consumers, as well as differences in regulation across countries affect trade in general, but especially the trade in services.

Shepherd and Van der Marel (2010) emphasised that regulatory reform that reduces trade costs in the services sector not only goes a long way towards improving resource allocation through specialisation – thereby improving the competitive advantage of the sector itself – but has positive spill-over effects for other parts of the economy. Productivity in manufacturing can rise due to gains in services sector efficiency, which in turn can lead to improved export competitiveness. For example, improved financial services can create more opportunities for the sector itself, but can also translate into greater competitiveness in other economic sectors.

With many manufacturers' competitive advantage residing in the associated services offered with their product packages (Daniels 2000; Francois & Hoekman 2010), products and services are, not surprisingly, becoming increasingly interlinked. In fact, many services that support the export of manufactured goods are being outsourced to firms that are able to perform to a standard that exceeds the capabilities

of the manufacturers themselves – a trend often referred to as the splintering of production (Francois & Hoekman 2010). The export opportunities to which manufacturing firms are exposed could thus produce additional export opportunities for services firms.

Due to regulatory issues and other trade barriers encountered by services firms in the international arena, many service providers in developing countries still do not trade across borders, despite their often having competitive advantages that could help to clear the way. Many services firms still need the government to assist them in their internationalisation efforts (Javalgi & White, 2007; Grater & Viviers 2012). Francois & Hoekman (2010) highlighted the importance of government getting involved, for example, in negotiating for the removal of discriminatory regulations. They asserted that government interventions designed to clear regulatory hurdles and assist services firms to access foreign markets could lead to increased competition, resulting in improved trade performance in these services firms. This is especially true in developing countries where the services sector has traditionally been focused on the domestic market, and only in recent years has been shifting its attention to international markets.

Addressing this challenge was one of the factors that influenced the development of decision support models (DSMs) to identify export opportunities in the tangible goods and services sectors.

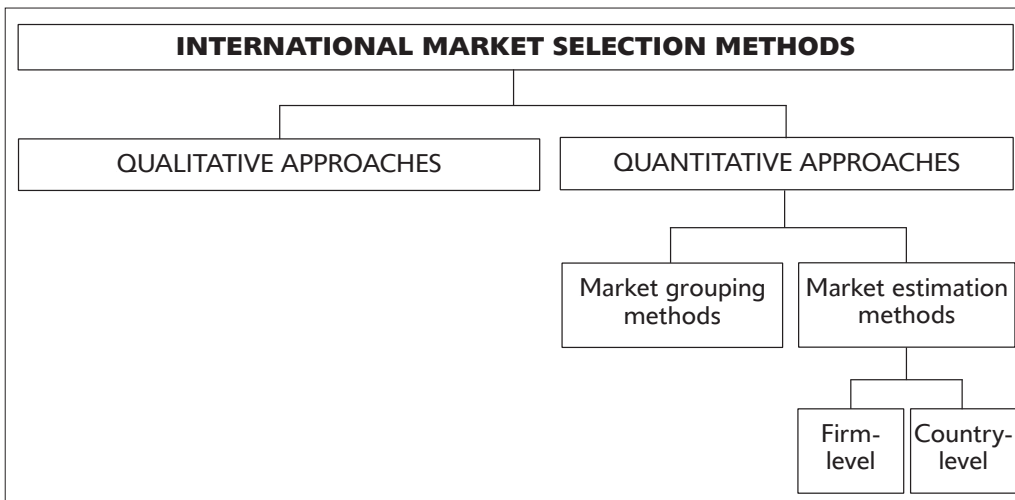
The next section will outline the methodology used in the decision support models for products and services respectively, as applied to South Africa, and will highlight the benefits of these models for both government institutions and exporting firms. Some of the results of the application of the DSMs will then be compared to illustrate how the models can be used together to identify markets with high export potential for both South African products and services. Importantly, government export promotion agencies can use the results as the basis for a combined export promotion strategy focusing on high-potential products and services.

Decision support model

To assist export promotion agencies (EPAs) to identify promising foreign markets for producers of tangible goods, a government decision support model (DSM) was developed by Cuyvers, De Pelsmacker, Rayp and Roozen (1995) to identify realistic export opportunities for Belgian exporters. The model was then refined, adapted and applied by Cuyvers (1997, 2004) for use among Thai exporters. The model involved viewing all markets in the world as potential export destinations for the country's products and, through a sequential filtering process, narrowing down the

possibilities to a list of realistic export opportunities. The model was intended as a scientific instrument that could be used by EPAs in planning and carrying out their export promotion activities.

Steenkamp, Viviers and Cuyvers (2012) provided a detailed discussion of the DSM. The theory behind this model is drawn from the international market selection literature, which is categorised in Figure 1.



Source: Steenkamp et al. (2012), adapted from Papadopoulos & Denis (1988)

Figure 1: Categorisation of the international market selection literature

Figure 1 indicates that market-selection methods can be grouped into qualitative and quantitative approaches. Most qualitative approaches typically identify the benefits and constraints of exporting a specific product to a given country by means of qualitative information collected from government agencies, chambers of commerce, banks, distributors, customers, international experts and foreign market visits (Pezeshkpur 1979). In contrast, quantitative approaches to international market selection involve analysing and comparing secondary trade data for a large number of products and countries. Papadopoulos and Denis (1988) divided quantitative approaches into two categories, namely market grouping methods and market estimation methods. Market grouping methods cluster countries on the basis of similarity, while market estimation methods evaluate market potential at a firm or country level (see Figure 1).

Steenkamp et al. (2009, 2012) compared various country-level market estimation methods, including the shift-share model (Green & Allaway 1985), global screening model (Russow & Okoroafo 1996), trade-off model (Papadopoulos, Chen & Thomans

2002), multiple criteria method used by the International Trade Centre (Freudenberg, 2006), trade opportunity matrix (Verno 2008), gravity model (Kepaptsoglou, Karlaftis & Tsamboula 2010) and decision support model developed by Cuyvers (1997, 2004) and Cuyvers et al. (2012a, b, c).

Following this analysis, it appeared that the DSM, which begins the market selection process with all products and countries, is a particularly useful tool for export promotion agencies to use when planning and prioritising their product- and country-level export promotion activities. A particular strength is that a limited number of product–country combinations with the highest export potential for the exporting country in question can be identified, allowing an export promotion agency to use its resources optimally.

The DSM is fundamentally based on Walvoord's¹ 1980 model for selecting foreign markets (Jeannet & Hennessey 1988). Walvoord's market screening process includes four filters; countries with relatively low general market potential are quickly eliminated on the basis of general macro indicators in the first filter, which allows a more limited set of export opportunities to be revealed in subsequent filters. Since Walvoord's model was designed for firm-level international marketing, Cuyvers et al. (1995) adapted the filters to arrive at a country-level market selection model that is specifically designed to support government export promotion institutions when planning and performing their market assessment and development activities (see a later section for details on the filters of the DSM).

The National Industrial Policy Framework (NIPF), which sets out the South African government's broad approach to internationalisation, stresses the importance of export diversification to enable the country to compete internationally in new markets and product categories, and to move away from its traditional reliance on commodity exports (DTI 2010b: 10). The World Bank (2014), in turn, has highlighted the need for South Africa to build a stronger export sector, by increasing exports in manufacturing as well as services, in order to create more jobs.

As the issue of export diversification is at the core of the original Decision Support Model design, the model was adapted for use by the Department of Trade and Industry (DTI) in South Africa in 2007 (Viviers & Pearson 2007) and further refined in 2009 (Viviers, Rossouw & Steenkamp 2009) and 2010 (Viviers, Steenkamp & Rossouw 2010). These adaptations and refinements gave rise to a new DSM that takes South Africa's current trade circumstances into account (Cuyvers et al. 2012a: 73–77).²

In the case of South Africa, the absence of a formal trade strategy for the services sector means that many of the country's services have been under-represented in the global market place, leading to disappointing export revenues. As government and

provincial export-promotion agencies in South Africa began to voice the need for a similar model to be developed for the services sector, the DSM model for products was adapted on the basis of the available services data. The result was a new DSM model designed specifically for services (Grater & Viviers 2012).

One of the key benefits of the DSM for both products and services is that it can be used as a tool to assist export-promotion authorities in deciding how best to prioritise their sector-related activities and allocate their scarce resources appropriately for various markets. However, it should be recognised that the model has its limitations and should not be relied on to the exclusion of other information sources.

Product-specific or services-specific in-market investigations should still be conducted for each export opportunity identified by the model to accommodate any changes in the regulatory environment or other trade barriers that are not quantifiable for the purposes of the model. For example, the DSM for products identifies an opportunity for the export of copper/copper alloy waste or scrap (HS code 740400) to China (see Table 4). However the South African government currently imposes regulatory barriers to limit the export of this specific product. Similarly, barriers could be imposed to limit illegal trade in goods or to home in on criminal activities for a certain period of time. It is not possible for the DSM model to incorporate all the information of this kind. The results of the model will always have to be used in conjunction with government trade regimes and other market-related information.

Decision support model for products

The point of departure of the DSM for products is the assumption that all world markets hold potential export opportunities for a particular country, and therefore all possible product–country combinations enter the filtering process (Cuyvers 2004; Cuyvers et al. 2012a). Four filters are applied, and after each filtering round, a number of markets are judged to be unrealistic and dropped from further consideration in subsequent filters.

With the starting point being all countries in the world, *filter 1* quickly eliminates those countries with relatively low general market potential, enabling the researchers to concentrate in detail on a more limited set of possible export opportunities (Cuyvers et al. 2012a).

Filter 1.1 eliminates those countries that present too high a political and/or commercial risk. The political and commercial risk ratings of the ONDD (2012) are used for this purpose, and the cut-off value is the second-highest combined risk score (for more details, see Cuyvers et al. 2012a).

A further elimination round takes place in *filter 1.2* where the countries' macroeconomic (GDP and GDP per capita) size and growth performance constitute the relevant criteria. The cut-off values (CV) for GDP and GDP per capita are calculated as follows:

$$CV = \bar{X} - \alpha\sigma_x$$

With:

\bar{X} denoting the world average GDP or GDP per capita; σ_x denoting the standard deviation in the GDP or GDP per capita values; and α denoting an alpha value that is increased by increments of 0.001 between 0 and 1.

The alpha value that is chosen for the cut-off value is determined where there is a clear break in the number of countries eliminated (Cuyvers 2004: 256). Countries are selected when they satisfy $X_i \geq CV$ for at least two years of the most recent three-year period for which the data can be sourced (Cuyvers 2004: 258), with X_i being the GDP or GDP per capita for country i .

GDP and GDP per capita growth rates are used as additional criteria for selection in *filter 1.2* so as to accommodate countries that achieved above world average GDP and GDP per capita growth in each year of the most recent three-year period, even if they were not adequate in size.

A country proceeds to *filter 2* if it qualifies on the basis of GDP, GDP per capita or growth in both GDP and GDP per capita. In *filter 2*, a more specific assessment of the various product groups in the remaining countries is carried out in order to identify the market potential of each product–country combination. The main purpose of this filter is to eliminate markets that show insufficient demand potential, with the main criteria being the short- and long-term import growth rates of a given product in a given country (growth in import demand) and the size of the imports of a given product by a given country (size of import demand) (Cuyvers 2004; Cuyvers et al. 1995, 2012a).

The cut-off values for short- and long-term import growth are defined as follows (Cuyvers 1997: 5; 2004: 260):

$$g_j \geq G_j$$

With:

g_{ij} denoting the import growth rate of product category j by country i ; and

$$G_j = g_{wj} s_j, \text{ if } g_{wj} > 0; \text{ or}$$

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

With:

g_{wj} denoting the total world imports of product category j ; and

$$S_j = 0.8 + \frac{1}{(RCA_j + 0.85)\exp(RCA - 0.01)}.$$

Where (Balassa 1965):

$$RCA = \left(\frac{X_{i,j}}{X_{W,j}} \right) / \left(\frac{X_{i,tot}}{X_{W,tot}} \right).$$

With:

$X_{i,j}$ denoting country i 's exports of product j ; $X_{i,tot}$ denoting country i 's total exports; $X_{w,j}$ denoting the world's (all countries') exports of product j ; and $X_{w,tot}$ denoting total exports in the world.

These cut-off values imply that if the exporting country for which the model is applied is not specialised in exporting product j ($RCA < 1$), the importing country's (country i) short- or long-term import growth rate of the product must be higher than, and up to two times, the world import growth rate for product j . If, however, the exporting country for which the DSM is applied specialises in exporting the product ($RCA > 1$), the importing country i 's import growth rate of product j is allowed to be slightly lower than the world import growth rate of product j .

The cut-off value for the relative import market size of country i for product category j was defined as (Cuyvers 1997: 6; 2004: 260):

$$M_{i,j} \geq S_j$$

Where:

$M_{i,j}$ is the import market size of country i for product category j ; and

$$S_j = 0.02M_{W,j}, \text{ if } RCA_j \geq 1; \text{ or}$$

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

With:

$M_{W,j}$ being the total world imports for product category j .

These cut-off values imply that if the exporting country for which the model is applied is not specialised in exporting product j ($RCA < 1$), the importing country's

(country i) imports of product j must be above 2% and up to 3% (if $RCA = 0$) of total world imports of product j . If the exporting country for which the DSM is applied specialises in exporting the product ($RCA > 1$), the importing country i 's imports of product j are allowed to be 2% of total world imports of the product. Only markets that are considered relatively large, growing in both the short and long terms, or large and growing in the short and/or long term are selected to enter *filter 3*.

In *filter 3* the remaining product–country combinations are further screened against the criteria of prevailing trade restrictions and other barriers to entry. Two categories of barrier are considered in this filter, namely the degree of market concentration (*filter 3.1*) and trade restrictions/market accessibility (*filter 3.2*). In *filter 3.1* the Herfindahl-Hirshmann index (HHI) (Hirshmann 1964) is used to measure the market concentration in each country that entered *filter 3*:

$$HHI_j = \sum \left(\frac{X_{k,j}}{M_{tot,j}} \right)^2$$

With:

$X_{k,i,j}$ denoting exports of a competitor country k to importing country i for product category j ; and $HHI=1$ denoting that there is a monopolistic country supplier to the market.

Cuyvers (1997: 7; 2004: 261) defines cut-off points for *filter 3.1* as follows:

$$h_k \geq HHI_j$$

With:

$$h_k = \bar{x} - 0.05\alpha\sigma_h, \text{ for large import markets;}$$

$$h_k = \bar{x} - 0.05\alpha\sigma_h, \text{ for markets growing in the short and long term, as well as markets that are large and growing in the short or long term;}$$

$$h_k = \bar{x} - 0.15\alpha\sigma_h, \text{ for markets that are large and growing in both the short and long terms.}$$

With:

\bar{x}_h denoting the average of the HHI-values of all product–country combinations under investigation; and σ_h denoting the standard deviation of the HHI-values of all product–country combinations under investigation. An alpha value (α) is selected where there is a clear break in the number of product–country

combinations eliminated by following a similar process to *filter 1.2* (Cuyvers 1997: 8; 2004: 262).

From these cut-off values, it is clear that for larger, growing markets, a higher degree of concentration is allowed (Cuyvers 1997: 8; 2004: 262). According to Cuyvers et al. (1995: 180), concentration poses a problem in markets that are not growing because an exporting country has to win over the market share of those that are already established in the market in order to gain market share. Concentration is less of a problem in growing and large markets. The cut-off value therefore depends on how the markets were categorised in *filter 2*.

In *filter 3.2*, the barriers to trade in each market that entered *filter 3* are determined. In the application of the DSM for Belgium and Thailand, an index for 'revealed absence of barriers to trade' was used as a proxy for trade barriers. It was argued that if Belgium's (or Thailand's) neighbours could successfully export a particular product to a country, it would not be too difficult for Belgium (or Thailand) to also overcome the trade barriers presented by that country (Cuyvers et al. 1995; Cuyvers 1997, 2004; Cuyvers et al. 2012a).

However, in the application of the DSM to South Africa, *filter 3.2* could not be used in the same way because neighbouring countries in the Southern African region do not share a sufficient number of characteristics with South Africa. Therefore, a market accessibility index was constructed for South African market conditions per product–country combination that entered *filter 3* (see Cuyvers et al. 2012a: 75–77). This index included the time and cost of international shipment; the time and cost associated with domestic transportation, handling, customs clearance and inspections; logistics performance; and ad valorem equivalent tariffs and non-tariff barriers. The cut-off for market accessibility is determined by using a procedure similar to that in *filter 1.2*.

In the last stage of the analysis (*filter 4*), the export opportunities (product–country combinations) that were identified in *filters 1 to 3* are categorised according to their import market size and growth (determined in *filter 2*) and their relative market importance (the exporting country's current market share compared with that of the top six competitors) (Cuyvers 2004; Cuyvers et al. 2012a). This categorisation in *filter 4* is illustrated in Table 1.

In order to prioritise between the export opportunities identified, the potential export value of each of the selected export opportunities is estimated as 80% of the imports of country *i* of product *j* divided by the number of countries that contribute these imports (Cuyvers et al. 2012a).

Table 1: Final categorisation of realistic export opportunities

Size and growth of importing market	Market share of country n compared with the top six competitors			
	Relatively small	Intermediately small	Intermediately high	Relatively high
Large product market	Cell 1	Cell 6	Cell 11	Cell 16
Growing (short- and long-term) product market	Cell 2	Cell 7	Cell 12	Cell 17
Large product market with short-term growth	Cell 3	Cell 8	Cell 13	Cell 18
Large product market with long-term growth	Cell 4	Cell 9	Cell 14	Cell 19
Large product market with short- and long-term growth	Cell 5	Cell 10	Cell 15	Cell 20

Source: Cuyvers (2004: 269)

The DSM mainly focuses on the demand potential (size, growth, competitors and market access) for products in different countries and does not take into consideration the production capacity of the exporting country. It could happen, however, that export opportunities for a specific product are identified in many countries, but the exporting country does not have the excess capacity needed to produce more of the product. In the South African application of the DSM for products (Viviers et al. 2010; Cuyvers et al. 2012a), an additional criterion/filter was introduced at this stage of the filtering process. South Africa's revealed comparative advantage (RCA) for each product selected was calculated. If South Africa has an RCA greater than one for a particular product, it means that the country is relatively specialised in the production and export of the product (Balassa 1965; Krugell & Matthee 2009). Therefore, to narrow the range of export opportunities to a more realistic number, only those opportunities identified for the products that South Africa is sufficiently specialised in producing and exporting ($RCA \geq 1$) were selected.³

The application of the DSM for products in South Africa started with a list of combinations of 240 possible countries and 5 403 possible Harmonised System (HS) six-digit product classifications. Therefore, 1 296 720 potential export opportunities entered the filtering process. 101 countries were selected in *filter 1*, and therefore 545 703 product–country combinations entered *filter 2* (which included the specific product characteristics). Once the filtering process was completed, a list of 15 389 product–country export opportunities remained (Cuyvers et al. 2012a).

In the absence of any reference in the literature to a model designed to identify realistic export opportunities for services, the next section will explain how the DSM

for products in South Africa was adapted to arrive at a model for identifying export opportunities for the country's services sector.

Decision support model for services

Given the factors influencing the supply of services, the DSM for products was adapted accordingly and applied to the available data for services. This took the DSM concept into new territory, as no existing models have come to light in the literature that focus on export opportunities emanating from the services sector in a country as a whole.

Like the DSM for products, the DSM for services provides a scientific method for any government agency or exporter to assess the export potential of the world's markets for a wide range of service categories, and eliminates the least-promising markets using a number of filtering criteria. What remains are those service–country combinations that hold the greatest export potential.

The DSM for services uses the same approach as the DSM for products (i.e. it narrows down potential export opportunities by means of a progressive filtering process, as explained in a later section). However, some of the filters used in the DSM for products had to be adapted to allow for the limited availability of services data, and the special nature of the services trade and its associated trade barriers (Grater & Viviers 2012).

The same methodology used in *filter 1* of the DSM for products is applied to the DSM for services since political and commercial risk, as well as macroeconomic size and growth performance, are equally important to both product and services exporters (Grater & Viviers 2012).

Similarly in *filter 2*, the size and growth of import demand for services in the short term and long term can be calculated in the same way that they are in the DSM for products, since total import and export data for services at a sub-sector level are available (ITC 2010). The sub-sector data for services is grouped according to the Extended Balance of Payments Services (EBOPS) classification system (UN 2002).

The calculations used in the DSM for products in *filters 3.1* and *3.2*, however, cannot be used in the DSM for services, since bilateral import and export data for services are not available for all countries. Consequently, the competitor analysis for market concentration cannot be applied in *filter 3.1*. Furthermore, the variables used to calculate market access in *filter 3.2* of the DSM for products are not measurable for the services trade.

A new methodology was therefore developed for *filter 3.1* of the DSM for services to measure market concentration or openness (Grater & Viviers 2012). As a proxy for

market openness, the filter used total imports of a service as a ratio of the specific total service demanded in each market. This method is also known as the import penetration index. The assumption here is that if a market shows a high ratio for that service, the market is viewed as relatively open to the imports of the same service. The calculation of total demand in each services sector was calculated by using the GDP disaggregates for services (i.e. services produced in the domestic market), adding total imports and subtracting total exports for each services sector. Thereafter it was necessary to determine for each services sector the ratio of imported services to the total services demanded in order to gauge the relative openness of the market for the specific services sector – also referred to as the OSI (openness for services imports). The OSI was thus calculated as follows:

$$OSI_{sj} = \frac{\sum M}{GDP - \sum X + \sum M} \times 100$$

Where:

- OSI_{sj} = openness for services value for service imports (s) in importing country j ;
- M = service imports;
- X = service exports.

The OSI percentages were calculated for each service–country combination that emerged from *filter 2*, thus creating an index for market openness for services (OSI) in all the remaining countries.

A cut-off value was determined by following the same process as the DSM for products in order to identify which service–country combinations showed a sufficient level of market openness. The final set of service–country combinations from *filter 3.1*'s selection process was considered in the final *filter 3* selection, together with the results of *filter 3.2*.

Similarly for *filter 3.2*, a new methodology was developed based on market accessibility (Grater & Viviers 2012). In this filter, the frequency measures developed by Hoekman (1996) were used to calculate the total market accessibility of each service–country combination. All WTO member countries are committed under the General Agreement on Trade in Services (GATS) to a certain level of restrictions in relation to each services sector (WTO 2009). Within these commitments, each country specifies whether the given sector has no trade restrictions (a commitment of 'none'), whether a specific restriction has been applied to the sector (shown in detail in the list of commitments), or whether the country is not willing to make any commitments for that specific sector (a commitment of 'unbound'). The frequency method allocates per country and at a sub-sector level a scale value of 1, 0.5 or 0

respectively to each commitment. Therefore the total level of market access (MA) can be calculated as follows (authors' own formula):

$$MA_j = \text{Average} \left(\frac{LOMA_j}{LOMA_t} \right) + \left(\frac{LONT_j}{LONT_t} \right)$$

Where:

- MA = market access;
- j = importing country;
- t = total/maximum amount of commitments that can be made for the sector;
- $LOMA$ = total score for limitations on market access as per GATS commitments;
- $LONT$ = total score for limitations on national treatment as per GATS commitments.

In order to build an index of market accessibility, these values were calculated for each services sector in each country that came out of *filter 2*, and then compared with the maximum number of commitments a country can make for each services sector. A cut-off value was determined in order to eliminate the service–country combinations with very low market accessibility, thus determined in *filter 3.2*.

Subsequently, the results of *filter 3.1* and *3.2* were combined into a final *filter 3* set of service–country combinations, with each combination meeting the criteria of *filters 3.1* and *3.2* in order to continue to *filter 4*. This set then constituted the list of realistic services export opportunities for South Africa.

In *filter 4* of the DSM for services, the results from *filter 3* were categorised in a new tabular format according to the import market size and growth performance of the service–country combinations (from *filter 2*), and the market openness and accessibility (from *filter 3*). As proxy for the total import demand of a specific service in a country, total imports of that sector in the country were used to prioritise between service–country combinations. As a final step in *filter 4*, the results were also categorised according to market size or import size and growth in *filter 2*, together with market openness and market access in *filter 3.1* and *filter 3.2*. Table 2 shows the cell categories for the results of the DSM for services.

The application of the DSM for services started with the same 240 countries as in the DSM for products, and a total of 6 039 service–country combinations entered *filter 2*, which included the characteristics of specific sectors. The model followed the filtering process outlined above, and a total of 578 service–country combinations were finally identified in the last filter (Grater & Viviers 2012).

Table 2: Final categorisation of realistic export opportunities for services

MARKET SIZE	Low openness for services and low market access	Low openness for services and high market access	High openness for services and low market access	High openness for services and high market access
Large services market	Cell 1	Cell 6	Cell 11	Cell 16
Market with short-term and long-term growth	Cell 2	Cell 7	Cell 12	Cell 17
Large services market and short-term growth	Cell 3	Cell 8	Cell 13	Cell 18
Large services market and long-term growth	Cell 4	Cell 9	Cell 14	Cell 19
Large services market, with short-term and long-term growth	Cell 5	Cell 10	Cell 15	Cell 20

Source: Grater & Viviers (2012)

Analysing the results of both models can pave the way for a combined product and service export promotion strategy for all the firms involved, which could also collaborate in exploring the potential export opportunities more thoroughly. This, in turn, would enable export-promotion agencies to plan more expansive, but also more precise, interventions, and allocate funding and other resources in a more efficient manner.

It is important to note that the DSM for services is based on direct exports of services. Therefore, if a product and a service show an export opportunity in the same market as per the DSM results, these products and services are not necessarily interlinked in terms of a value chain approach. Such a linkage would need to be investigated further on a sector basis. The results of the model do, however, reveal to export-promotion agencies which product and services sectors have the greatest potential in each market. This can help to reduce the risk of the promotion agencies using their scarce resources (funding and otherwise) unwisely. Ideally they should gear their efforts towards promoting those products and services that clearly have strong prospects, based on the model.

The next section, which features the results from the application of the DSMs for products and services respectively, will highlight how beneficial it can be for export-promotion agencies to identify markets with high potential for both products and services.

Comparison and recommendations from the results of the DSM models

In this section, the results of the DSMs for products and services respectively, as applied to South Africa's trade data, are compared with a view to determining whether they can be used to identify export opportunities that are promising to both manufacturers and service providers in South Africa. Table 3 shows the top 20 countries in this regard, once all the potential export values for products and services from both models have been added up.

Table 3: Top 20 countries identified by the DSMs for products and services

Ranking	Country
1	China
2	Germany
3	United Kingdom
4	Japan
5	Canada
6	United States
7	South Korea
8	Russia
9	Singapore
10	Saudi Arabia
11	France
12	Italy
13	Spain
14	Netherlands
15	Hong Kong
16	Australia
17	Malaysia
18	Romania
19	Norway
20	Belgium

To give an example of how the results of both models can be used by export-promotion agencies to actively promote products and services in the most promising markets, three of the developing countries from Table 3 were selected, namely China, Saudi Arabia and Singapore. Each will be discussed separately in the following sections.

Export opportunities for South African products and services in China

Table 4 shows the top ten results⁴ ranked according to the total import value revealed in both the DSM for products and the DSM for services in China. The table also indicates the cell classification of each export opportunity as outlined in Tables 1 and 2.

Table 4: Top ten product⁵ and service export opportunities in China

Country	Products: HS six-digit product code and description	Filter 4 cell classification
China	870323 – Automobiles, spark ignition engine of 1500–3000 cc	2
	750210 – Nickel unwrought, not alloyed	5
	390210 – Polypropylene in primary forms	13
	720241 – Ferro-chromium, >4% carbon	20
	740400 – Copper/copper alloy waste or scrap	15
	470329 – Chemical wood pulp, soda/sulphate, non-conifer, bleached	10
	721049 – Flat rolled iron or non-alloy steel, coated with zinc, width >600 mm, not elsewhere specified	1
	720918 – Flat rolled products/coils >0.5 mm	3
	760200 – Waste or scrap, aluminium	10
	230120 – Flour or meal, pellet, fish, etc., for animal feed	15
	Services: EBOPS code and sector description	Filter 4 cell classification
	208 – Sea transport – Freight	1
	243 – Travel personal – Other	10
	277 – Business and management consultancy and public relations services	1
	892 – Other royalties and licence fees	8
	239 – Travel business – Other	8
	891 – Franchises and similar rights	6
	263 – Computer services	6
	242 – Travel personal – Education-related	5

According to Cuyvers (1997: 14–15; 2004: 270), for those products in cell classifications between 1 and 10 (e.g. flat rolled iron or non-alloy steel, 1500–3000 cc automobiles, flat rolled coils, unwrought nickel and aluminium waste or scrap), South Africa has a relatively small market share and there is a need for extensive assistance from export-promotion agencies to increase the country's exports to the Chinese market.

The export opportunities in cells 11 to 15 (e.g. polypropylene, copper waste or scrap, animal feed) can be considered 'low-hanging fruits' for export-promotion agencies, since South Africa already has an established market share with scope for expansion. Export-promotion agencies would be advised to assist these exporters as a first priority. The export opportunities in cells 16 to 20 (e.g. ferro-chromium) are indicative of established demand patterns and market penetration, and there is no need for any additional export promotion assistance (Cuyvers 1997: 14–15; 2004: 270).

The top ten service opportunities in China are mostly categorised in cells 1 to 10, which points to opportunities with relatively low market openness and market access. As a result, the services firms in question are likely to need export-promotion assistance from government if they are to establish a foothold in these markets. The top ten results for services in China mostly indicate opportunities for personal and business tourism (travel), as well as computer and business services. An appropriate strategy for export-promotion agencies to adopt would be a very offensive one characterised by, for example, negotiating market access, investigating and overcoming regulatory issues where possible, and providing market intelligence and practical marketing assistance.

Export opportunities for South African products and services in Saudi Arabia

Table 5 shows the top ten products and services identified in Saudi Arabia by the two DSM models. The products are again mostly classified in cells 1 to 5 (e.g. automobiles, buses, tyres for buses and lorries, oranges), indicating that South Africa has a small or relatively small market share in these products. However, with a lot of effort and resources, and tailored assistance from export-promotion agencies, there is scope for the firms in question to increase their exports to Saudi Arabia. Iron or steel H sections (cell 14) and pumps (cell 15) can be considered the first priority for export-promotion agencies planning a market-expansion drive.

The top ten services results in Table 5 are mostly categorised in cell 18, which reflects opportunities where the market is very open and can be accessed easily. The services firms will therefore be less reliant on interventions from export-promotion agencies. Opportunities are most plentiful in personal and business travel, as well as construction and insurance. However, the personal and business travel opportunities call for a less offensive promotion strategy, whereas the construction and insurance sectors will need a lot more assistance if they are to overcome market barriers.

Table 5: Top ten product and service export opportunities in Saudi Arabia

Country	Products: HS six-digit product code and description	Filter 4 cell classification
Saudi Arabia	870323 – Automobiles, spark ignition engine of 1 500–3 000 cc	2
	740710 – Bars, rods & profiles of refined copper	10
	870322 – Automobiles, spark ignition engine of 1 000–1 500 cc	2
	720839 – Flat rolled products/coils > 3 mm	20
	870290 – Buses except diesel powered	3
	080510 – Oranges, fresh or dried	4
	401120 – Pneumatic tyres, new, of rubber for buses or lorries	4
	721633 – Sections, H, iron or non-alloy steel, hot-roll/drawn/extruded > 80 m	14
	841381 – Pumps not elsewhere specified	15
	854460 – Electric conductors, for over 1 000 volts, not elsewhere specified	5
	Services: EBOPS code and sector description	Filter 4 cell classification
	243 – Travel personal – Other	18
	208 – Sea transport – Freight	18
	251 – Construction services – Construction in the compiling economy	8
	239 – Travel business – Other	18
	250 – Construction services – Construction abroad	8
	242 – Travel personal – Education-related	18
	257 – Insurance services – Reinsurance	2
	238 – Travel business – Expenditure by seasonal and border workers	18
	241 – Travel personal – Health-related	18
	256 – Insurance services – Other direct insurance	7

Export opportunities for South African products and services in Singapore

Table 6 shows the top ten products and services identified in Singapore by both DSM models. The products in this case are mostly classified in cells 1 to 5 (e.g. aircraft engines, unwrought aluminium, radio receivers, refined sugar and helicopters), indicating that South Africa has a small market share in these products. Firms wanting to increase exports of these products to Singapore would benefit from active assistance from export-promotion agencies. Unwrought nickel and grape wines

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(both in cell 12) can be regarded as first-priority products for market expansion in Singapore.

Table 6: Top ten product and service export opportunities in Singapore

Country	Products: HS six-digit product code and description	Filter 4 cell classification
Singapore	840710 – Aircraft engines, spark-ignition	5
	760110 – Aluminium unwrought, not alloyed	4
	750210 – Nickel unwrought, not alloyed	12
	852721 – Radio receivers, external power, sound reproduce/recording	4
	720852 – Flat rolled products not in coil < 4.7 mm	5
	170199 – Refined sugar, in solid form, not elsewhere specified, pure sucrose	2
	730890 – Structures and parts of structures, iron or steel, ne	2
	721633 – Sections, H, iron or non-alloy steel, hot-roll/drawn/extruded > 80 m	10
	220421 – Grape wines not elsewhere specified, fortified wine or must, pack < 2 L	12
	880212 – Helicopters of an unladen weight > 2000 kg	5
	Services: EBOPS code and sector description	Filter 4 cell classification
	243 – Travel personal – Other	6
	208 – Sea transport – Freight	16
	283 – Other agricultural, mining and on-site processing	11
	209 – Sea transport – Other	20
	285 – Services between affiliated enterprises, not indicated elsewhere	14
	239 – Travel business – Other	6
	277 – Business and management consultancy and public relations services	16
	260 – Financial services	12
	280 – Architectural, engineering and other technical services	16
	278 – Advertising, market research, and public opinion polling	13

The top ten services results are mostly categorised in cells 10 to 20, which signals opportunities where the market is relatively to very open and can be accessed easily. For example, transport services, travel services, business consultancy services and architectural services are mostly in cells 16 to 20; thus, these services firms will need relatively less assistance from export-promotion agencies when setting out to access the Singapore market in the shorter term. The other sectors, such as financial services and advertising and market research, are mostly in cells 10 to 15, signalling

opportunities where there is a high degree of market openness according to import values, but low market access according to the regulatory environment. Given such a scenario, the export-promotion agencies could focus their attention on finding ways to improve market access for these firms in the longer term.

The DSM for products has already been used in the design of export-promotion strategies by various provincial organisations and product-specific export councils (Cuyvers et al. 2012c). The DSM for services, in turn, delivers valuable and complementary information to those entities wishing to expand their export-promotion strategies to include services as well. Both DSM models identify export opportunities for very specific product and services sub-sectors, which makes it easier for export-promotion agencies to target specific companies in South Africa that could benefit from promotional/marketing assistance.

It is clear that the DSMs for products and services respectively offer much scope for manufacturing and services firms to join forces in identifying the most-promising export opportunities and forming mutually beneficial networks to plan and execute their export ventures.

Conclusions

Export-promotion agencies have traditionally geared their activities towards the tangible goods sector, providing information, funding and other forms of support to assist manufacturers in accessing or expanding their presence in foreign markets. The services sector, in contrast, receives relatively little official attention – despite the fact that the sector plays a central role in countries' economies, particularly in supplying large numbers of jobs and boosting economic growth prospects. In the case of South Africa, the absence of a formal trade strategy for the services sector has led to many of the country's services being under-represented in the global market place, and export revenues being below par.

Notwithstanding the above, the trade in services is being given a boost by the growing realisation that many producers of tangible goods are deriving their competitive advantage from the package of services that accompany their products. These embellished product offerings are more distinctive and often help to convey an impression of greater value for money among discerning customers around the world. Clearly, then, products and services are becoming increasingly interlinked, and this should be a key consideration when government and business entities alike plan their foreign market activities. A major challenge, however, is identifying realistic export opportunities for products and services respectively, and determining where the natural linkages are so that joint synergistic export programmes can be devised.

The DSM for products was developed some years ago, and has subsequently been adapted and refined for South Africa to provide a scientific tool that reveals the most-promising export opportunities, as evidenced in specific product–country combinations. The precision of the DSM’s filtering process and the level of detail in its results help to take the guesswork out of the export market selection process, to focus the government’s export-promotion agenda, and to fast-track firms’ forays into promising foreign markets. Furthermore, the development of the DSM for services – modelled on the DSM for products but also incorporating a number of unique features – is poised to be a valuable aid to service providers wishing to do business internationally.

What is particularly noteworthy about the new DSM for services is that it can be used alongside the DSM for products, highlighting where specific combinations of products and services are likely to find a ready market and therefore encouraging co-operative relationships between tangible goods producers and service providers. This represents a ground-breaking development for South Africa, and heralds a new era in which the marketing of products and services will increasingly become the norm in the export-promotion and development arenas.

Endnotes

1. See Cuyvers et al. (2012a, b) for a detailed explanation of the original model by Walvoord, as well as the filters as adapted for the applications of the model by Cuyvers (1995). Cuyvers et al. (2012a, b) also cover the background literature that supports each of the filters in the DSM.
2. These filter adaptations and refinements were tested in discussions with the DTI in South Africa and with provincial export promotion organisations to ensure that the filters used were accepted by the end-users of the results of the model.
3. For a comparison of these ‘actual’ realistic export opportunities for South Africa, and the results for Belgium and Thailand for the same period, see Cuyvers et al. (2012b).
4. More detailed results for all countries can be obtained from the authors.
5. Some of the top product export opportunities that were identified in the model were in the minerals and precious stones sectors. For the purposes of this study, these opportunities were excluded (HS chapters 25–27 and 71), as the products in question usually attract sustainable demand from established markets and therefore do not need to be the target of formal export-promotion efforts.

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