

Linking export opportunities of products and services: the case of South Africa

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Abstract:

Trade in services has been playing an increasingly important role in the economic growth and development of many countries. In addition it has been found that services trade is more crisis-resilient than goods trade, leading to the need for developing countries especially to explore export opportunities in this sector. However, increasing the exports of services is a major challenge for most countries, given the complicated nature of services trade. Many governments are unaware of potential export opportunities for services and are therefore unable to successfully promote services in the right markets. In their attempts to explore new markets, most services firms tend to follow products in their exporting efforts due to products

and services becoming more and more interlinked, thereby offering clients a total package of products with their related services.

This study investigates how the results of the recently developed decision support models (DSM) for products and services respectively could serve as possible solution to the problem of identifying realistic export opportunities for services. The two DSM models for products and services respectively were developed to identify realistic export opportunities in foreign markets by following a sequential filtering process that eliminates those product-country and service-country combinations that hold the least export potential based on a set of macro- and micro-level criteria. This study analyses the results of both models as it was applied in the case of South Africa, to determine whether a linkage between the two sets of results could provide the government with those products and supporting services that hold the highest combined export potential. If the results of the models can be combined in such a manner, the government could use it in a more focussed export-promotion approach, which can result in a significant increase in exports of both sectors, but especially the services sector.

Keywords: international trade; products; services; decision support model; export opportunities; South Africa

1. Introduction

Trade in services is playing an increasingly important role in the global trade environment. Many governments realise the potential that services exports have for their economic development and that there has been a structural shift in world trade away from commodity production, raw materials and simple manufactured products, towards increasingly knowledge-based goods and services (Hoekman & Mattoo, 2008). A study by Borchert and Mattoo (2010) also indicated that services have proven to be much more crisis-resilient than products in the recent financial crisis in 2008. However, many services firms have insufficient knowledge of export opportunities and a lack of foreign connections (Winsted & Patterson, 1998). Many governments are also not aware of how to increase services exports as they are lacking the required information.

Traditionally services firms have either been 'pushed' or 'pulled' to export. A firm may be 'pushed' to become an exporter in order to maintain its position in a specific value chain. Firms can also be 'pulled' to become exporters because of other firms in the same value chain that engage in international markets. This would occur mostly due to manufacturing firms not finding their competitive edge in the product they supply, but in the product-related services they can offer (Zähringer, Niederberger, Blind & Schletz, 2011).

Products and services have therefore become more interlinked and many manufacturing companies find their competitive advantage to be in the associated services offered with the product package (Daniels, 2000; Francois & Hoekman, 2010). It is thus important for services firms to investigate different methods of identifying potential export markets and then determine whether it is possible to enter these markets by linking their export activities with those of production firms.

Products are heterogeneous but the associated services such as transport, telecommunication and financial services play an important supporting role in the ability to supply the product in a specific market's demand. Many supporting services in the exporting process involved in manufacturing goods are being outsourced to services firms that can provide these services at a higher quality – often referred to as the splintering of production (Francois & Hoekman, 2010). Samiee (1999) described this phenomenon by stating that every tangible product contains some service. This phenomenon has also been referred to as the social business network of services firms and manufacturing firms can only maintain customer loyalty or even enter into new markets by offering customers certain “services” (Martinez-Gomez et al., 2010). The export opportunities created by manufacturing firms could then evolve into additional export opportunities for services firms within the same markets, as their reputation has been established and the firm has become known to the local consumers.

Therefore, due to the fact that many services follow products in the export process, the challenge of identifying the export opportunities is relevant for both products and services. The issue lies in identifying those markets and export opportunities that hold the greatest potential for exports in terms of market characteristics, import demand and accessibility for both products and services. This is one of the reasons for the development of the decision support models (DSM) for identifying export opportunities for products and services.

Also from the angle of economic and social development of a country, linking exports of products and services is highly beneficial, offering both economies of scale and scope. Moreover, by developing an exporting services sector, developing countries and emerging economies alike, will be able to reduce balance of payments constraints and are in a position to gain comparative advantage in the world markets due to synergetic effects. Their export

promotion policies should therefore be closely geared towards the products and associated services that, together, offer the largest export opportunities.

The following section will explain both the models for products and services as it was applied in South Africa and will highlight the benefits of these models for both government institutions as well as exporting firms. This will be followed by a comparison of some of the results of both models to illustrate how the results of both models point towards relevant export opportunities for South African products and services that can be exported together. Co-operation efforts between the manufacturing and services firms to promote their respective products and services together in these potential markets could hold benefits for both manufacturing and services firms. It is important to note that the DSMs for products and services are adaptable and can be applied to other countries as well.

2. Decision Support Model (DSM)

In order to assist export promotion agencies (EPAs) with their international market selection challenge for products, a government decision support model (DSM) was developed by Cuyvers, De Pelsmacker, Rayp and Roozen (1995) to identify realistic export opportunities for Belgian exporters. This model was refined, adapted and applied by Cuyvers (1997; 2004), to identify export opportunities for Thailand. The model aimed to view all products and markets in the world as potential export destinations through a filtering process. The results of the model were a list of potential export opportunities for Belgian / Thai exporters. The model could therefore be used as a scientific instrument for EPAs in focussing their export promotion activities and allocating scarce resources more effectively.

In January 2007, the South African Cabinet adopted the National Industrial Policy Framework (NIPF) which sets out the government's broad approach to internationalisation and focuses on export diversification in order for the country to compete internationally beyond its current reliance on exports of traditional commodities (DTI, 2010b: 10). The original DSM provides a method with which the issue of diversifying exports in South Africa could be addressed. Therefore, in order to address the need for export diversification in South Africa, the original DSM was adapted for the Department of Trade and Industry (DTI) in South Africa in 2007 (Viviers & Pearson, 2007) and further refined in 2009 (Viviers, Rossouw and Steenkamp, 2009) and 2010 (Viviers, Steenkamp and Rossouw, 2010). The result was a new DSM for South African trade circumstances (Cuyvers, Steenkamp and Viviers, 2012:73-77). Since the need arose for the development of a similar model to identify the export opportunities for services in South Africa, it is the aim of this study to explain how the results of the DSM model for products and services can be used together to create an internationalisation platform for services in South Africa. The DSM model for products was therefore adapted for the available services data and the result of this adaptation was a new DSM model for services (Grater & Viviers, 2012).

One of the benefits of the DSM is that it provides a tool to assist export promotion authorities to decide how to prioritise and allocate their scarce resources to export promotion activities in various markets. It also provides information on export markets that are useful to derive appropriate export promotion actions in the different markets (Cuyvers *et al.*, 1995). The same export opportunities are valuable to both exporters of products and services to identify potential markets based on a scientific elimination process. However the model should not be depended upon in isolation and product-specific in-market information should still be researched.

2.1 Decision support model for products

The basic method of the DSM for products starts from 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, Steenkamp & Viviers, 2012). Four filters are applied and after every filter, a number of markets are rendered unrealistic, which are not considered further in subsequent filters.

In *filter 1*, countries that hold too high a political and/or commercial risk are firstly eliminated in filter 1.1. A second elimination of countries is done based on macro-economic size and growth performance in filter 1.2. The rationale for this is that, with all countries in the world as a starting point, filter 1 enables the researchers to quickly eliminate these countries with relatively low general market potential, in order to concentrate in detail on a more limited set of possible export opportunities (Cuyvers et al., 2012).

In *filter 2*, a more specific assessment of the various product groups for the remaining countries is made to identify the market potential of each possible product-country combination. The main purpose of this filter is therefore to eliminate markets that do not show sufficient demand potential. The main criteria that are used in this filter are the growth rate of imports of a given product by a given country (import growth) and the value of imports of a given product by a given country (import market size). Three variables are calculated for each market, namely, short term import growth, long term import growth and import market size. Short term import growth is considered to be the most recent year's growth rate in imports, while long-term growth is calculated as the average annual percentage growth in imports over a period of five years. Finally, the relative import market size is calculated as the

ratio of imports of country i for product group j and the total imports of all countries that entered filter 2 of product group j (Cuyvers et al., 1995; Cuyvers, 2004; Cuyvers et al., 2012).

In *filter 3*, trade restrictions and other barriers to entry are considered to further screen the remaining possible export opportunities. Two categories of barriers 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 is used to measure the concentration in each market that entered filter 3. It is argued that if a market is supplied by only one or a few big competitors, that market would be difficult to access. On the other hand, if the market is supplied by a relatively large number of competitors, it will be easier to penetrate the market. 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 (as explained at the beginning of section 3) 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 be able to overcome the trade barriers in that market (Cuyvers *et al.*, 1995; Cuyvers, 1997; Cuyvers, 2004; Cuyvers et al., 2012). In the application of the DSM to South Africa, this second part of filter 3 could not be applied in the same way because South Africa’s neighbouring countries do not have many similar characteristics to South Africa (Viviers and Pearson, 2007). Therefore a different approach needed to be followed. After two rounds of refinements (see Viviers and Pearson (2007) and Viviers et al (2010)), a market accessibility index was constructed for the South African market circumstances per product-country combination that entered filter 3 (see Cuyvers, Steenkamp and Viviers, 2012:75-77). This index includes 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*.

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 relative market importance (the exporting country's current market share compared to that of the top six competitors) and their relative market size and growth (Cuyvers, 2004; Cuyvers et al., 2012). The potential export value for each of the selected export opportunities is also estimated in this filter in order to prioritise between opportunities (Viviers et al, 2010; Cuyvers et al., 2012). The potential export value was calculated as the total imports of country i of product j divided by the number of countries that contributes 80% of these imports plus one. This estimation of export potential gives an indication of the size of the import demand for each product-country combination and takes into consideration the possibility of South Africa being added (therefore the plus one in the formula) to the group of countries that collectively supplies 80 percent of the imports of product j to country i .

In the 2010 South African application of the DSM for products (Viviers, et al, 2010; Cuyvers et al., 2012); an additional criterion / filter was introduced at this stage of the elimination process. The DSM mostly focuses on the demand potential (size, growth, competitors, market access) for products in different countries and do not take into consideration the production capacity of the exporting country. It may therefore be that there are export opportunities identified for a specific product in many countries, but the exporting country does not have the excess capacity to produce more of this product. South Africa's revealed comparative advantage (RCA) for each product that was selected up until this stage of the filtering process was therefore calculated. If South Africa has an RCA greater than one for a particular product it means that South Africa is relatively specialised in the production and exportation of the product (Balassa, 1965; Krugell & Matthee, 2009). Therefore to allow some flexibility, only the

export opportunities identified for the products that South Africa is sufficiently specialised in producing and exporting ($RCA \geq 0.7$) were selected as realistic export opportunities¹.

Cut-off values in most filters are determined at a value around the average for the particular variable within a certain percentage of the standard deviation. The specific percentage of the standard deviation allowed is determined by inspection of a definite break in the number of opportunities eliminated. For a more detailed description of the filters, formulas used and the determination of cut-off values, see Cuyvers (1997; 2004) and Cuyvers et al. (2012).

The application of the DSM for products in South Africa started with a list of combinations of 240 possible countries and 5403 possible HS 6-digit product classifications. Therefore 1 296 720 entered the filtering process. 101 countries were selected in filter 1 and therefore, 545 703 product-country combinations entered filter 2 (where the specific product-characteristics were included) and the model ended with a list of 15 389 product-country export opportunities after applying the filtering process (Cuyvers et al., 2012).

In order to address the lack in the literature of a model to identify realistic export opportunities for services, the following section will explain how the DSM for products in South Africa was adapted to develop a model to identify export opportunities for services in South Africa.

¹ For a comparison of these “actual” realistic export opportunities for South Africa, with the results for Belgium and Thailand for the same period, see Cuyvers, Steenkamp, Viviers & Rossouw (2012).

2.2 Decision support model for services

Due to the nature of services and services supply, the DSM was adapted accordingly and then applied to the available data for services in order to identify realistic export opportunities for services in South Africa. This was a completely new approach to the DSM and there are no other existing models in the literature that focus on identifying export opportunities for services for a country as a whole.

The DSM for services provides a scientific method with which any government agency or exporter can assess the world's potential export markets and eliminate the least promising markets, and therefore identify those services-country combinations that have the greatest export potential for services. The DSM for services is applied to South Africa as services exporting country.

The model is based on the same principle as the DSM for products by using a filtering process, as explained in section 2.1. However some of the filters had to be adapted to allow for the limited availability of services data as well as the nature of services trade and trade barriers (Grater & Viviers, 2012).

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

In *filter 2*, the import demand and import growth for services in the short and long term can also be calculated in the same way as in the DSM for products, since total import and export

data for services at a sub-sector level are available (International Trade Centre [ITC], 2010). The sub-sector data for services are grouped according to the EBOPS classification system (United Nations [UN], 2002).

The calculations used in the DSM for products in *filter 3.1 and 3.2*, however, cannot be used for the DSM for services, since bilateral import and export data for services are not available for all countries. Therefore 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 are not applicable to services as these variables are not measurable for 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, the assumption being made that if a country 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 of 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 of each services sector. Thereafter it was necessary to determine per services sector the ratio of imported services to the total services demanded in order to determine the openness in the market for the specific services sector, further referred to as the OSI (openness for services imports).

The OSI percentages were calculated for each services-country combination that came out of filter 2, thus creating an index for market openness for services (OSI). A cut-off value was determined in a similar way as in the DSM for products, to identify which services-country combinations showed a sufficient level of market openness. The final set of services-country

combinations from filter 3.1's selection process is considered in the final filter 3 selection, together with the results of filter 3.2.

Also for filter 3.2, a new methodology was developed based on market accessibility (Grater & Viviers, 2012). This filter needed a measure of market barriers in order to determine the accessibility of the market. For this purpose the frequency measures developed by Hoekman (1996) were used to calculate each services-country combinations' total market accessibility. All WTO member countries are committed under GATS to the level of restrictions they will apply to each services sector. These commitments are made available by the WTO in a schedule of commitments for each country (World Trade Organisation [WTO], 2009). Within these commitments each country specifies whether the given sector has no trade restrictions (a commitment of 'none'), whether a specific restriction to the sector is made (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):

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

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

These values were calculated for each services sector in each country that came out of filter 2 and was then compared with the maximum amount of commitments a country can make for each services sector, in order to build an index of market accessibility. A cut-off value was determined in order to eliminate the services-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 services-country combinations, with each combination complying to the criteria of both filters 3.1 and 3.2 in order to continue to filter 4. This set consists of the list of realistic services export opportunities for South Africa.

Filter 4 of the DSM for products analysed the output of filter 3 and grouped the product-country combinations into categories according the exporting country's (here South Africa) market share, the import market importance and the import market size and growth performance, as from filter 2. The categories used for the results of the DSM for products take into account South Africa's market share, which is not possible for services, as bilateral trade data for South Africa's services are not available. Therefore, a new classification method was developed to categorise the results for services. Also, in the case of products, a potential export value was calculated as explained above, a method which could not be followed for services due to the lacking bilateral trade data for all the export opportunities such that a different method had to be developed (Grater & Viviers, 2012).

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 services-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.

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, where the specific sector characteristics were included. The model followed the filtering process outlined above and a final set of 578 service-country combinations were identified in the last filter (Grater & Viviers, 2012).

The fact that products and services are interlinked in the export process, as explained in section 1, implies that a manufacturing firm and the related/linked services firms in a business network should ideally analyse the combined results of both models in order to identify those markets where the greatest export opportunities lie for both products and services. These results can then be used to develop a combined internationalisation strategy for all the firms involved, which could co-operate in exploring these potential export opportunities. The firms can therefore pursue the markets that have the greatest export opportunities for South African product and related services and avoid the other markets (Grater & Viviers, 2012). It follows, that the combination of the results of the DSM for products with these for services also allows the export promotion agencies involved to better prioritise their activities and use their scarce resources more efficiently, as compared to the expected exports.

In the following section the results of both models will be used to identify markets with the greatest potential for both South African products and services, to explain the value that both models can hold for both manufacturing and services firms.

3. Comparison and recommendations from the results of the DSM models

In section 1 it was found that products and services have become more interlinked and many manufacturing companies find their competitive advantage to be in the associated services offered with the product package (Daniels, 2000; Francois & Hoekman, 2010). Therefore due to the fact that many services follow products when exported, it is worthwhile to identify those markets and export opportunities that hold the greatest potential for exports in terms of market characteristics, import demand and accessibility for both products and services. This is one of the reasons for the development of the Decision Support Models (DSMs) for products and services, as explained in section 2.

In this section the results of both models, as applied to the South African trade data, are compared at a sector and country level to determine whether the results can be used to identify export opportunities, which are combining both products and related services.

Table 1 below indicates the top products and services sectors that were identified in 3 different importing countries using both DSM models. The aim of table 1 is to illustrate how products and services can be linked in export efforts to different markets, based on the results of the DSM models. Therefore the few services results that are indicated are only for those sectors that can potentially be linked to product export opportunities. The list also excludes the services export opportunities that were identified for the tourist sector, due to the fact that the this sector already contributes 63% to South Africa's exports of services, whereas the goal of the present exercise is to identify other sectors with high export potential and consequently to diversify South Africa's services exports.

Table 1: The product and services sectors with the highest import demand in 3 selected countries²

Country	Products (HS 6-digit level)	Services (EBOPS code ³ level)
China	870323 - Automobiles, spark ignition engine of 1500-3000 cc 750210 - Nickel unwrought, not alloyed 390210 - Polypropylene in primary forms	208 - Sea freight transport 277 - Business and management consultancy and public relations services 263 - Computer services
United Kingdom	710231 - Diamonds (jewellery) unworked or simply sawn, cleaved 870323 - Automobiles, spark ignition engine of 1500-3000 cc 220421 - Grape wines not elsewhere specified, fortified wine or must, pack < 2l	284 - Business, professional and technical services 213 - Other air transport services 277 - Business and management consultancy and public relations services
Canada	870323 - Automobiles, spark ignition engine of 1500-3000 cc 940190 - Parts of seats 842139 - Filtering or purifying machinery for gases not elsewhere specified	257 - Reinsurance services 260 - Financial services 277 - Business and management consultancy and public relations services

Table 1 above shows various instances of products and services that jointly have export opportunities in the same markets and that can be linked in co-operative export ventures. For

² These countries were randomly selected for illustrative purposes. More detailed results are available from the authors.

³ Detailed trade data for services was obtained from the ITC's Trademap Database (ITC, 2010) and this data is broken down per EBOPS codes as per the United Nations Manual on Statistics (UN, 2002).

example, in the Chinese market, South Africa's sea freight services sector has high export potential and could be linked to South Africa's exports of automobiles. In the UK there is potential to link the exports of diamonds with that of airfreight services. Another example shows Canada where the product with the highest export potential for South African exporters are automobiles with spark ignition engines of 1500-3000cc and the services subsectors with the highest export potential are reinsurance and financial services. These products and services could be marketed and exported jointly, as reinsurance as well as financial services would be supportive industries to the exports of automobiles. Also, in South Africa there is an export council for the automotive industry which assists all member firms on export-related issues. The insurance and financial firms could use the export council as a contact point to establish links and relationships with the producers of automotive parts, thus creating a business network. Building these exporting networks holds benefits for both the manufacturing firms as well as the services firms in creating competitive advantages and establishing reputations within the foreign market, if these firms have never exported to these markets before.

In Table 1 many of the sectors are not necessarily linkable, due to the table only showing the top 3 results for each country. Table 2 below compares the top 10 export opportunities to Canada⁴ as an example in order to show a further breakdown of results and where sectors could link their export activities to. Again the results for tourism services are not shown in this specific table.

⁴ Canada was randomly selected as an example for the purposes of indicating how the results of both models can be linked. The same analyses can be done for any country. Some countries have more products and services that link with each other than other countries.

Table 2: The 10 product and services sectors with the highest import demand in Canada

Rank	Products (HS 6-digit level)	Rank	Services (EBOPS code level)
1	870323 - Automobiles, spark ignition engine of 1500-3000 cc	1	224 - Road transport: passenger
2	940190 - Parts of seats	2	246 - Communications services: postal and courier services
3	842139 - Filtering or purifying machinery for gases n.e.s. ⁵	3	251 - Construction services in the compiling economy
4	870410 - Dump trucks designed for off-highway use	4	254 - Insurance services: Life insurance and pension funding
5	220421 - Grape wines n.e.s., fortified wine or must, pack < 2l	5	257 - Insurance services: Reinsurance
6	260300 - Copper ores and concentrates	6	258 - Insurance services: Auxiliary services
7	401120 - Pneumatic tyres new of rubber for buses or lorries	7	260 - Financial services
8	080610 - Grapes, fresh	8	891 - Franchises and similar rights
9	284410 - Natural uranium, its compounds, mixtures	9	892 - Other royalties and license fees
10	260400 - Nickel ores and concentrates	10	275 - Legal services

The table shows more clearly as an example, that certain services sectors can be matched with the products when exporting to Canada, such as communication services, reinsurance services and financial services that act as support services for any of the products shown in the table.

⁵ Not elsewhere specified.

It is clear that the DSM for products and services can hold great benefits for both manufacturing and services firms to identify those export opportunities with the greatest potential and to create a network for these firms to act within/interlink.

4. Conclusions and recommendations

Trade in services has been playing an increasingly important role in the global trade environment and has contributed considerably more to the economic growth and development of countries. However, many services firms have insufficient knowledge of exporting opportunities abroad and a lack of foreign connections. Many governments are also insufficiently aware of how to increase services exports as they have a lack of the same information.

This study started from the observation that that products and services have become more interlinked and that many manufacturing companies are more competitive due to the associated services that they offer. Therefore, it is important for services firms to investigate different methods of identifying potential export markets and then determine whether it is possible to enter these markets by linking their export activities to those of production firms.

Many services follow products when exporting, but the problem of identifying the export opportunities is relevant for both products and services. The issue lies in identifying those markets and export opportunities that hold the greatest potential for exports in terms of market characteristics, import demand and accessibility for both products and services. This is one of the reasons for the development of the decision support models (DSM) for products and services.

This study explained both models as applied for South Africa and provided a comparison of some of the results of both models to illustrate how the results could point to relevant export opportunities for South African products and services that can be exported together and the exports of which reinforce each other. Co-operation efforts between the manufacturing and services firms to promote their respective products and services jointly in these potential markets will hold benefits for both manufacturing and services firms. It is important to note that the DSMs for products and services are adaptable and can be applied to other countries as well.

The main benefit of the DSM for products and services is that they provide a tool to assist both exporters and export promotion authorities to decide how to allocate their scarce resources to pursue only those export opportunities that hold the greatest potential for South African products and services. For services firms the DSM model for products provides a set of manufacturing export opportunities with which the services firms could interlink and, in turn, provide export opportunities for these services firms as well. The DSM model for services also provides a guide whether export opportunities for services alone exist in the same markets as for products.

From the examples shown in tables 1 and 2 it is clear that the DSM for products and services can hold great benefits for both manufacturing and services firms to identify those export opportunities that hold the greatest potential and to create a network for these firms to act within/interlink. Specific services firms can use these results to identify the countries that have the highest export opportunities and they could take advantage of the interlinkages between products and services. They could also approach the relevant export councils or industry associations for the specified products in the model to find assistance in creating these links.

The export promotion agencies (EPAs), export councils and industry associations in South Africa could also use these results to identify the sectors that should be promoted in each foreign market, which will enable them to allocate their scarce resources efficiently. These EPAs could then link the relevant instruments to the different export opportunities to further assist these firms in the internationalisation process.

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