The Definition of Possible Export Opportunities for Iran’s High-Tech Manufacturing Goods: a Decision Support Model Approach

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Abstract
The purpose of this paper is to determine target markets of high-tech manufacturing goods for Iran and suggesting a trade strategy which can improve Iran’s current account and other developing indices. For this purpose, a Decision Support Model has been used in this paper. This model, which consists of four consecutive steps or filters, leads to a list of possible export opportunities in the countries which have a relatively good economic performance and environment. Iran’s export opportunities in each these countries are listed and categorized according to criteria such as the import market characteristics together with Iran’s share in these export opportunities.

Keywords: Exports, High-tech manufacturing goods, Decision Support Model, Iran
Jel: F10, F13, L10

Introduction
High-tech manufacturing goods trade has a critical role in economic development and growth. Export of these kinds of products guarantees gain of term of trade whilst the import of these products can open the way for technology spillover.

Iran recently relies on the export of fuel which averagely shapes at least 80% its total export in the last decade. Iran has started to carry out the export promotion strategy from nearly 15 years ago but as the data shows Iran has not been successful in this area. As part of export promotion and export diversification strategy in general, Iran has arranged the policies which articulated in its “The Fifth Developing Plan” to promote high-tech manufacturing goods; e.g. the increasing research and develop expenditures policy in producing high-tech goods area.

In spite of all policies, Iran has not been successful in the export of manufacturing goods. According to the World Bank data [21], the share of Iran in the global GDP has been averagely

1 - The authors would like to acknowledge the financial of University of Tehran for this research under grant number 4460001/1/3-12
about 0.5% during 2001-210, but its share in the global export of high-tech manufacturing goods was only 0.0.3% in 2010. These realities point out that carrying out the manufacturing goods export promotion of Iran needs some subtle tools. One of those tools is choosing potential markets which are special characteristics that give more chance for the exporter to penetrate them along with of the ability of exporters which may be largely rooted in whose country’s political and economic environment and endowments.

Governments and private firms that seek to stimulate their economic growth via export promotion must distinguish between the vast numbers of export possibilities due to the fact that, in most circumstances, a large number of export opportunities exist, and only a limited number of these should be focused since scarcity of resources [7]. The challenge that governments and private firms therefore face is choosing specific sectors for export promotion. In order to get a higher return on investment and being sure about that resources are not wasted in less attractive export markets, they should focus on their advantages to influence into target export markets.

The process of evaluating worldwide export opportunities is complicated for a number of reasons. These include the difficulty of examining all possible export opportunities to all the countries of the world and the availability of data for specific consumers, businesses or governments that limits the screening process for using only published data [7]. Numerous attempts to formulate appropriate international market selection processes have been made in the literature. One of them has been used in this paper which explained in the section below.

1. Literature Review
Papadopoulos and Denis summarized the literature on international market selection methods up until the late 1980s [15]. They classified over 40 proposed international market selection models into two broad types of approaches “qualitative approaches” (rigorous and systematic gathering and analysis of qualitative information about one or a handful of potential country markets) and “quantitative approaches” (analyzing large amounts of secondary statistical data about many or all foreign markets). According to Papadopoulos and Denis [15] most “qualitative approaches” typically start with identifying a short list of countries for further consideration by establishing objectives and constraints for exporting a specific product to each country under consideration. They suggest that pure qualitative approaches to international market selection could be seen as biased as they are based on perceptions and are largely inaccurate.

Douglas et al. [10] stated that the biggest challenge in international market selection is the large number of countries throughout the world that need to be analyzed. They suggest that a screening procedure of secondary data be used to determine which countries to investigate in depth. “Quantitative approaches” to international market selection do exactly this by analyzing and comparing secondary data of a large number of countries and will be discussed subsequently.

Papadopoulos and Denis [15], Steenkamp and Ter Hofstede [20] and Shankarmahesh et al. [19] are based on the assumption that the most attractive markets for a firm are the ones that most closely resemble the markets it has already penetrated successfully. By providing insight into structural similarities, these methods enable firms to standardize their offerings and marketing strategies across markets [18]. Countries are clustered based on similarities in social, economic and political indicators while demand levels are, for the most part, not taken into account [18]. Market grouping methods are mostly criticized for relying exclusively on general country indicators, rather than on product-specific market indicators, as macro indicators may not reflect market development for a product [18, 13].
Studies that attempted to include more product-specific information faced the problem of insufficient data, and are limited to the product ranges of a particular firm. Thus, they cannot be applied to all possible product groups [15]. Sakarya et al. [18] also argued that grouping methods fail to take into account similarities among groups of consumers across national boundaries. Furthermore, focusing only on countries with similar characteristics to markets already penetrated may hold the risk of overlooking lucrative opportunities in countries with other characteristics [13].

Market estimation models evaluate foreign markets on the basis of several criteria that measure aggregate market potential and attractiveness [18, 15]. The criteria vary across methods and often include wealth, size, growth, competition and access indicators [18]. Papadopoulos and Denis [15] summarized the different methods of measuring market potential that were introduced up until the late 1980s and included multiple factor indices, regression analyses and multiple criteria import demand estimations. They found that common shortcomings of these methods include the lack of product specificity, the assumption of a static environment and methodological problems due to data availability [15].

Henceforth, the more recent literature on market estimation methods will be discussed in detail. Most of these methods are based on, the methodological shortcomings of earlier studies [15].

Firm-level methods can be applied by firms to identify markets for their limited product ranges. These methods usually include an analysis of the firm’s objectives, profitability, managerial experience and knowledge, customer standards and attitudes and product adaptation requirements when identifying potential export markets. Country-level methods, on the other hand, can be applied by a country’s export promotion agency to identify the most promising country-product combinations to focus their export promotion efforts on. Criteria and data used in these methods should be product-specific, applicable to many country-product combinations and generally available. These criteria might include product-specific market growth, market size, level of competition and barriers to trade. Although these three studies were conducted before 1988, it was not included in Papadopoulos and Denis’ [15] summary of the international market selection literature, and is therefore included here.

On first inspection, the methods of Green and Allaway [11], Russow and Okoroafo [17] and Papadopoulos et al. [16], although applied to a limited number of countries and products, seemed to be applicable for screening a wide range of country-product combinations and are therefore categorized under country-level market estimation methods.

Papadopoulos and Denis [15] mentioned a multiple criteria method proposed by the International Trade Centre (ITC) to assist developing countries that want to extend exports in identifying potential export markets. On a research visit to the ITC in Geneva in September 2008, the researchers found that the ITC is still using a similar method to assist developing countries in identifying potential export markets.

Three other studies that can be classified under country-level market estimation models are the studies of Arnold and Quelsh [1], Cavusgil [3] and Sakarya et al. [18].

Another method that was specifically designed to be applied on a country-level is the decision support model proposed by Cuyvers et al. [8]. This model was designed to screen all possible worldwide country-product combinations to identify potential export opportunities for Belgium. Cuyvers adapted and applied this model to Thailand as the exporting country [7].

Also Cuyvers et al. [9] applied this model for South Africa. Results have been reported on the application of this decision support model to the case of South Africa, adapted for an analysis of foreign trade data at the SITC four-digit level up to 2004. In this way, South Africa’s export
opportunities in individual countries are listed and categorized according to criteria such as import market characteristics and South Africa’s market share in the various markets.

2. **Methodology**

The Decision Support Model (DSM) consists of a sequential filtering process using four filters to eliminate countries (markets) which have weaker specifications to be potential export markets. To do that, the first filter considers the macro-economic environment which is usually measured by country risk ratings\(^2\) and GNP per capita and GNP per capita growth\(^3\)of the trade partners. These indicators of Iran’s trade partners have been considered in this paper as the filter one of DSM method.

In filter two, import markets growth in the short and long term and relative market size are considered for each product/country combinations. According to the filter three of DSM method, some product/country combinations based on market access (MA) for Iranian exporters has been eliminated. This filter has evaluated two sets of criteria, namely the degree of market concentration and import restrictions or market access [9]. In filter four; the possible export opportunities identified in the previous filters are classified. This classification is done by calculating Iran’s relative market importance for each product/country combinations and combining this with the result of the classification in filter two [8, 9].

In this paper, the high-tech manufactures are the same defined by OCED (2011) [14] which Classified manufacturing industries into categories based on R&D intensities. According to International Standard Industrial Classification of all economic activities, Rev.4, the high-tech manufactures are aircraft and spacecraft (code 353), pharmaceuticals (code 2423), office, accounting and computing machinery (code 30), radio, TV and communications equipment (code 32) and Medical, precision and optical instruments (code 33) that the goods which are produced by these industries are called high-tech manufacturing good. These goods are categorized on nine groups: 1- aerospace 2- computers - office machines 3-Electronics & telecommunications 4- pharmacy 5- Scientific instruments 6-Electrical machinery 7-Chemistry 8- Non-electrical machinery

This paper considers initially all countries as the markets for Iran’s high-tech manufacturing goods and tries to select the best of them step by step. As well as, the paper studies the related annual data for 2007-2011.

3.1. **Filter 1 of the decision support model for high-tech manufacturing goods**

The first step in the analysis involves in determining the countries that in later steps merit more investigation as potential markets. Interesting markets should have relatively lower commercial and political risks, together with market potential in terms of economic growth and/or size. Commercial and political risks that involve in doing business with foreign countries can be assessed using parameters such as, the current account deficit as a percentage of GDP, the external debt service as a percentage of export earnings, the stock of foreign debts of a country in

\(^2\) The countries risk ratings components for all countries are in “Country Risk Classification” report publishing by OECD [14].

\(^3\) These data are from World Bank [21].
proportion to its GDP, etc., as well as the past and future change of these parameters [9] which all of them together defines country risk ratings.

The cut-off point is determined by:

$$\alpha = \dot{\iota} \left( \frac{P_{Rs} + P_{Rm} + P_{Rl}}{3} \right)$$

$$Country\ Risk - \dot{\iota}$$

$$Commercial\ Risk - \dot{\iota}$$

(1)

Where $e$ is Neper number which has been practically $2.71828$ in this paper. PRs, PRm and PRI stand for short term, medium term and long term political risks respectively.

In this way, $\alpha=9.399$; so the 41 countries have commercial risk & political risk more than $\alpha$ and therefore they have been left out, leaving 243 countries. For 202 of these 243 countries data on GNP and GNP per capita between 2009 and 2011 could be collected. No or incomplete data were available for 37, so 165 countries have been finally selected for next step.

In order to select more interesting markets among these 165 countries, a cut-off point is calculated for the GNP and GNP per capita values, such that:

$$x = X - \alpha \sigma_{X_i}$$

(2)

Where index $i$ is country (market), $\chi$ is the cut-off value of $X$, $\dot{X}$ is the average of $X$ (GNP or GNP per capita)$^4$, $\sigma_X$ is the standard deviation of $X$ and $\alpha$ comes from formula 1. The countries are selected when this condition realizes:

$$X_j \geq \chi$$

(3)

3.2. Filter 2 of the decision support model for high-tech manufacturing goods

In the next stage of the assessment of Iran’s high-tech export opportunities, the import data in high-tech manufacturing goods from Iran has been analyzed for each countries selected in the previous section. Filter 2 has used high-tech manufacturing goods export and import data for this filter. The RCA$^5$ [2] for Iran’s manufacturing goods which are produced by high-tech manufactures has been used to determine a cut-off value for each high-tech product group. It is assumed if Iran is relatively specialized in a particular high-tech manufacturing goods group like $j$ ($RCA_j > 1$), then the selection of markets showing the most potential can be less strict against Iran’s exporters than in a case of Iran does not specialized in the high-tech manufacturing goods group ($RCA_j < 1$). Therefore, in order to take the degree of specialization in exports of Iran for a trading high-tech manufacturing products group like $j$ into account, the model has defined a scaling factor as follows (Cuyvers et al., 1995; Cuyvers, 2004)[7, 8]:

$$s_j = \frac{\sum |h_{jt} - h_{jt}|}{2} + \frac{1}{RCA_j + \frac{1}{2} \left( \sum |h_{jt} - |h_{jt}| \right) e^{(RCA_j - 0.01)}}$$

4 GNP and GNP Per capita have been used and the both of them have the same results in this paper.

5 Revealed Comparative Advantage. Balasa (1965) [2] approach has been used to calculate RCA here.
Where i, j and t indicate country, high-tech manufacturing goods group and period of time (2008 to 2011) respectively. $S_j$ is the scaling factor, RCA$_j$ is the revealed comparative advantage index of Iran in trading high-tech manufacturing goods group j. h$_{ijt}$ shows the share of high-tech manufacturing goods group j in total exports of country i at time t and h$_{jt}$ points to the share of high-tech manufacturing goods group j in total world exports at time t.

Then the cut-off point for imports growth of high-tech manufacturing goods group j is:

$$G_j = g_{\text{world},j} \cdot S_j \quad \text{if} \quad g_{\text{world},j} > 0$$

$$G_j = \frac{g_{\text{world},j}}{S_j} \quad \text{if} \quad g_{\text{world},j} < 0$$

(5)

Where $G_j$ is the cut-off value for the rate of growth of imports of high-tech manufacturing goods group j and $g_{\text{World},j}$ is the rate of growth of world imports of high-tech manufacturing goods group j.

This scaling factor has been used to determine whether the market for a specific high-tech manufacturing goods group in a specific country can be seen as a suitable market. This would be the case if:

$$g_{ij} \geq G_j$$

(6)

That $g_{ij}$ is the growth rate of the high-tech manufacturing goods group j import in the country i.

This procedure has been applied to calculate both the short-term and the long-term cut-off growth rates. For taking the market size of the country i in the high-tech manufacturing goods group j to account, instead of using the import value of j in i, the share of this market in the world import of that high-tech manufacturing goods group has been used. This criterion enables to identify interesting markets which is rooted in their size. Taking the degree of specialization of Iran in a particular high-tech manufacturing goods group, j, into account the cut-off point for relative of import market size, $S_j$, has been determined as follows:

$$s_j = \left( \frac{\sum_i |h_{ijt} - h_{it}|}{2} \right) \cdot M_{\text{world},j} \quad \text{if} \quad \text{RCA}_j > 1$$

$$s_j = \left( \frac{\sum_i |h_{ijt} - h_{it}|}{2} \right) \cdot \frac{\text{RCA}_j}{100} \cdot M_{\text{world},j} \quad \text{if} \quad \text{RCA}_j < 1$$

(7)

(8)

In Which $M_{\text{world},j}$ is the aggregate imports in the world of high-tech manufacturing goods group j.

As we can see, the cut-off points for relative import market size vary between 3% and 2% according to the RCA.

Then it is considered that the relative import market size of country i in high-tech manufacturing goods group j must be sufficiently large; therefore a product/country combination is selected as a possible export opportunity for Iran if:

________________________

6 Long term and short term import growth rate expressions mean average import growth rate in 2 and 4 years respectively here. The choosing of “long term” period length is mainly restricted by limitation of available data in this paper.
Where \( M_{i,j} \) is the index of “revealed absence of barriers to trade” in high-tech manufacturing goods group \( j \) in country \( i \).

Each product/country combinations are now assigned 1 or 0 values, according to the conditions in 5 being fulfilled or not. The distribution of the 589 product/country combinations according to the various combinations of fulfillment or non-fulfillment of conditions in 3 for short-term and long-term market growth is shown in Table 1.

According to Cuyvers, [9], the product/country combinations which demonstrate either sufficient relative import market size or sufficiently high import market growth in the short-term and in the long-term have been considered. This implies that the product/country combinations in the categories 0, 1 and 2 are not selected. Base on that, being 356 possible export opportunities for Iran, this stage has been completed.

### 3.3. Filter 3 of the export opportunities model for high-tech manufacturing goods group

The purpose of the third stage of the decision support model used is to analyze the 356 product/country combinations selected in the previous stage according to their “accessibility” for Iran manufacturing goods exporters. This “accessibility” depends on trade restrictions and other barriers to entry which can prevent Iranian exporters of a high-tech manufacturing goods group \( j \) to reach a significant market position in country \( i \). The decision support model considers two such barriers: the degree of market concentration and import restrictions. Market concentration is measured using the well-known Herfindahl-Hirschmann index (Hirschmann, 1964):

\[
HHI_{i,j} = \sum_k \left( \frac{X_{k,i,j}}{M_{tot,i,j}} \right)^2
\]

(10)

Where

- \( X_{k,i,j} \): Country’s k’s exports of high-tech product group \( j \) to country \( i \)
- \( M_{tot,i,j} \): Country i’s total imports of high-tech product group \( j \)

In order to determine whether \( HHI_{i,j} \) is sufficiently low, cut-off points have been calculated analogous to the procedure outlined in section 2, by using average, standard deviation “\( \sigma \)” and “\( \alpha \)” parameter to be determined.

Therefore the cut-off point for HHI is defined as:

\[
h_k = \bar{x}_h + \alpha \delta_h
\]

(11)

\[
h_k \geq HHI_{ij}
\]

(12)

for import restrictions. The concept of “revealed absence of barriers to trade” was used as an indicator of the ability for a country to export to another market.

As an alternative, an index for market accessibility has been constructed using the following five variables: distance, transport cost, the World Bank Logistics Performance Index (LPI), average applied tariffs, and the frequency coverage ratio of non-tariff barriers. [21]

### 3.4. Filter 4 of the export opportunities model for high-tech manufacturing goods

This section has analyzed the 356 possible export opportunities detected according to their high-tech product group, the geographical markets involved, and some major characteristics of these markets. The calculation of Iran’s relative market shares for each product/country combination has been discussed. For each chosen exporting country \( n \) (Iran in this case), the
The degree of market importance of country, like n, n’s exports of high-tech product group j to country i have been defined as:

\[ \mu_{n,i,j} = \frac{X_{n,i,j}}{X_{world,i,j}} \times \frac{X_{n,j}}{X_{world,j}} \]  

(13)

Where:
- \( X_{n,i,j} \): Iran’s exports of high-tech manufacturing goods group j to country i,
- \( X_{world,i,j} \): The world’s exports of high-tech manufacturing goods group j to country i,
- \( X_{n,j} \): Iran’s total exports of high-tech manufacturing goods group j,
- \( X_{world,j} \): The world’s total exports of high-tech manufacturing goods group j.

A comparison can now be made for any particular product/country combination selected in the previous section of Iran’s \( \mu_{Iran,i,j} \) with \( \mu_{Six,i,j} \), the combined degree of market importance of the six exporting countries which have the largest export of the high-tech manufacturing goods category in the world. By calculating the difference between Iran’s degree of market importance and that of the six dominant exporting countries in high-tech manufacturing goods group j to country i, and now determine whether Iran’s relative market share is large or small.

\[ \mu_{six,i,j} - \mu_{Iran,i,j} > 3 \]: relatively small market share of Iran
\[ 1.5 <= \mu_{six,i,j} - \mu_{Iran,i,j} <= 3 \]: relative market share of Iran intermediate small
\[ 0 <= \mu_{six,i,j} - \mu_{Iran,i,j} <= 1.5 \]: relative market share of Iran intermediate high,
\[ \mu_{six,i,j} - \mu_{Iran,i,j} <= 0 \]: relative market share of Iran relatively high

Table 2 shows the distribution of the possible export opportunities according to the characteristics of the foreign markets and Iran’s relative market share. As we see, 163 out of 356 initial product/country combinations- or 27% of initial product/country combinations- are chosen as more possible export opportunities for Iran in the export of high-tech manufacturing goods. These markets are reported in Table 4.

### 3. Conclusions

This paper has used a DSM to find export potential markets for Iran’s high-tech manufacturing goods. The result shows that the most potential markets for Iran’s high-tech manufacturing products are:

- Aerospace: Bahrain, Austria, France, Malaysia, Qatar.
- Computers-office machines: India, Qatar, Malaysia, Turkey, Australia.
- Electronics, telecommunications: Canada, Oman, Malaysia, Azerbaijan, Turkey.
- Pharmacy: Pakistan, Egypt, Azerbaijan, Oman, South Africa.
- Scientific instruments: Bahrain, Pakistan, Netherlands, Qatar, Venezuela.
- Electrical machinery: Norway, Kenya, Qatar, Canada, Malaysia.
- Chemistry: Egypt, Lebanon, Bulgaria, India, Turkey.
- Non-electrical machinery: Turkey, Thailand, Pakistan, Netherlands, Bahrain.

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7 These countries are China (457 bn US$), Germany (183 bn US$), United States (145 bn US$), Japan (126 bn US$), Singapore (126 bn US$), Korea, Rep (122 bn US$) which have reported in The World Bank [21].
Actually the analysis has been taken place in this papers can be used as a strategic plan to promote Iran’s exports of high-tech manufacturing goods and a section of Iranian trade strategy which is related to those.

References

Balassa, B. (1965); “Trade Liberalization and Revealed’ Comparative Advantage”; Manchester School of Economic and Social Studies, Vol. 33, Issue 2.


International Trade Centre (2013);”International Trade in Services Statistics by Service”.


OECD (2013); “Country Risk Classification”.

9


World Bank (2013);” World Development Indicators”.
### Table 1: Distribution of high-tech product/country combinations according to short-term import market growth, long-term import market growth, and relative import market size.

<table>
<thead>
<tr>
<th>Number of service/country combinations</th>
<th>Relative market size</th>
<th>Long term market growth</th>
<th>Short term market growth</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>356</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>144</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>97</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 2: Cell classification for the export opportunities model for high-tech product group

<table>
<thead>
<tr>
<th>Share %</th>
<th>Number of product/country combinations</th>
<th>Describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.0</td>
<td>265</td>
<td>relatively small market share of Iran</td>
</tr>
<tr>
<td>27.3</td>
<td>161</td>
<td>relative market share of Iran intermediate small</td>
</tr>
<tr>
<td>15.6</td>
<td>92</td>
<td>relative market share of Iran intermediate high</td>
</tr>
<tr>
<td>12.1</td>
<td>71</td>
<td>relative market share of Iran relatively high</td>
</tr>
<tr>
<td>100</td>
<td>589</td>
<td>Total</td>
</tr>
</tbody>
</table>

### Table 3: High Tech Product group composition of Iran's possible export opportunities

<table>
<thead>
<tr>
<th>Number of export opportunities</th>
<th>High Tech Product group</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Aerospace</td>
</tr>
<tr>
<td>23</td>
<td>Computers - office machines</td>
</tr>
<tr>
<td>31</td>
<td>Electronics, telecommunications</td>
</tr>
<tr>
<td>18</td>
<td>Pharmacy</td>
</tr>
<tr>
<td>34</td>
<td>Scientific instruments</td>
</tr>
<tr>
<td>17</td>
<td>Electrical machinery</td>
</tr>
<tr>
<td>18</td>
<td>Chemistry</td>
</tr>
<tr>
<td>13</td>
<td>Non-electrical machinery</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>163</td>
</tr>
</tbody>
</table>

### Table 4: Iran’s possible export opportunities

<table>
<thead>
<tr>
<th>Market’s Name</th>
<th>High Tech Product group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahrain, Austria, France, Malaysia, Qatar</td>
<td>Aerospace</td>
</tr>
<tr>
<td>India, Qatar, Malaysia, Turkey, Australia</td>
<td>Computers - office machines</td>
</tr>
<tr>
<td>Canada, Oman, Malaysia, Azerbaijan, Turkey</td>
<td>Electronics, telecommunications</td>
</tr>
<tr>
<td>Pakistan, Egypt, Azerbaijan, Oman, South Africa</td>
<td>Pharmacy</td>
</tr>
<tr>
<td>Bahrain, Pakistan, Netherlands, Qatar, Venezuela</td>
<td>Scientific instruments</td>
</tr>
<tr>
<td>Norway, Kenya, Qatar, Canada, Malaysia</td>
<td>Electrical machinery</td>
</tr>
<tr>
<td>Egypt, Lebanon, Bulgaria, India, Turkey</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Turkey, Thailand, Pakistan, Netherlands, Bahrain</td>
<td>Non-electrical machinery</td>
</tr>
</tbody>
</table>