Saudi Arabia’s Manufacturing Sector
Looking Beyond Petroleum
Sebastian Bustos & Muhammed Ali Yildirim
June 2017
Founded in 1989, the Lebanese Center for Policy Studies is a Beirut-based independent, non-partisan think tank whose mission is to produce and advocate policies that improve good governance in fields such as oil and gas, economic development, public finance, and decentralization.

This research was funded by the International Development Research Center

IDRC | CRDI
International Development Research Centre
Centre de recherches pour le développement international

Copyright© 2017
The Lebanese Center for Policy Studies
Designed by Polypod
Executed by Dolly Harouny

Sadat Tower, Tenth Floor
P.O.B 55-215, Leon Street,
Ras Beirut, Lebanon

T: + 961 1 79 93 01
F: + 961 1 79 93 02
info@lcps-lebanon.org
www.lcps-lebanon.org
Saudi Arabia’s Manufacturing Sector

Looking Beyond Petroleum

Sebastian Bustos
Sebastian Bustos is a PhD candidate in public policy at Harvard University and a doctoral fellow at the Center for International Development at Harvard University. Bustos’s research focuses on how international competition impacts local markets and the benefits and challenges presented by multinational corporations operating in developing countries. He holds a master’s degree in public administration and international development from Harvard University and a BS in economics and business from the University of Chile.

Muhammed Ali Yıldırım
Muhammed A. Yıldırım is an assistant professor of economics at Koç University in Istanbul and an associate at the Center for International Development at Harvard University. He specializes in studying network and spillover effects in a multitude of research areas including industrial policy, international trade, productivity, and economic growth. Yıldırım is a co-author of The Atlas of Economic Complexity and contributes to the back end of the associated website, which contains millions of data visualizations on the industrial structure of various countries. He obtained his PhD in applied physics from Harvard University and a BS degree from the California Institute of Technology.
**An overview of Saudi Arabia**

A study of Saudi Arabia's product space reveals that the kingdom’s development path should focus on new complex products, particularly in the machinery/electrical clusters and a few products in the chemical community that are most attractive in terms of the tradeoff between distance and complexity or Complexity Outlook Gain. Table 1 lists target sectors that the methodology identifies as those strategic for Saudi Arabia’s future development.

The community with the greatest number of target products is the chemical & allied industries cluster, with 19 products (HS2:28-38). The foodstuff cluster follows closely with a total of 15 products (HS2:16-24) that are closer in distance in terms of the country’s productive knowledge and capabilities, but have on average, lower complexity. The methodology also identifies products in other higher complexity clusters, specifically seven products in the machinery/electrical (HS2:84-85) and six in the plastics/rubbers community (HS2:39-48).

**Table 1** Summary of target sectors

<table>
<thead>
<tr>
<th>HS2</th>
<th>Product name</th>
<th>Product Targets</th>
<th>Product World Exports ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>Machinery and Mechanical Appliances, Computers, Boilers, Nuclear Reactors</td>
<td>6</td>
<td>1957 B</td>
</tr>
<tr>
<td>32</td>
<td>Putty and Inks, Dyes, Pigments, Paints and Putty</td>
<td>5</td>
<td>62 B</td>
</tr>
<tr>
<td>21</td>
<td>Misc. Edible Preparations</td>
<td>5</td>
<td>57 B</td>
</tr>
<tr>
<td>40</td>
<td>Rubbers and Articles Thereof</td>
<td>4</td>
<td>209 B</td>
</tr>
<tr>
<td>39</td>
<td>Plastic and Articles Thereof</td>
<td>4</td>
<td>210 B</td>
</tr>
<tr>
<td>38</td>
<td>Misc. Chemical Prods.</td>
<td>3</td>
<td>162 B</td>
</tr>
<tr>
<td>30</td>
<td>Pharmaceutical Products</td>
<td>3</td>
<td>462 B</td>
</tr>
<tr>
<td>28</td>
<td>Inorganic Chem, Precious Metal Compounds, Isotopes</td>
<td>2</td>
<td>106 B</td>
</tr>
<tr>
<td>33</td>
<td>Oils and Resinoids, Perfumery, Cosmetics</td>
<td>2</td>
<td>75 B</td>
</tr>
<tr>
<td>85</td>
<td>Electrical Machinery</td>
<td>2</td>
<td>1913 B</td>
</tr>
<tr>
<td>19</td>
<td>Preps. of Cereals, Flour, Starch or Milk</td>
<td>2</td>
<td>21 B</td>
</tr>
<tr>
<td>20</td>
<td>Preps. of Veggies, Fruits, Nuts, Etc.</td>
<td>2</td>
<td>38 B</td>
</tr>
<tr>
<td>34</td>
<td>Soaps, Waxes, Candles</td>
<td>2</td>
<td>15 B</td>
</tr>
<tr>
<td>23</td>
<td>Food Industries Residue and Animal Feed</td>
<td>2</td>
<td>72 B</td>
</tr>
<tr>
<td>24</td>
<td>Tobacco and Manuf. Tobacco Subs.</td>
<td>1</td>
<td>40 B</td>
</tr>
<tr>
<td>94</td>
<td>Furniture, Bedding, Lighting, Prefabricated Buildings</td>
<td>1</td>
<td>186 B</td>
</tr>
<tr>
<td>16</td>
<td>Ed. Prep of Meat, Fish, Crustaceans, Etc.</td>
<td>1</td>
<td>44 B</td>
</tr>
<tr>
<td>29</td>
<td>Organic Chemicals</td>
<td>1</td>
<td>222 B</td>
</tr>
<tr>
<td>18</td>
<td>Cocoa and Cocoa Preps</td>
<td>1</td>
<td>42 B</td>
</tr>
<tr>
<td>17</td>
<td>Sugars and Confectionery</td>
<td>1</td>
<td>17 B</td>
</tr>
<tr>
<td>35</td>
<td>Albuminoidal Sub, Starches, Glues, Enzymes</td>
<td>1</td>
<td>26 B</td>
</tr>
<tr>
<td>22</td>
<td>Beverages, Spirits and Vinegar</td>
<td>1</td>
<td>88 B</td>
</tr>
</tbody>
</table>
Saudi Arabia is the largest economy in the region. Its GDP per capita has grown steadily over the last two decades, but at a low rate (figure 1). Its exports per capita, on the other hand, increased significantly from 1995 to 2008, and later decreased sharply with the great recession, fluctuating according to the international price of oil. Most notably, Saudi Arabia’s Economic Complexity Index (ECI) has fallen from 0.8 in 1995 to 0.4 in 2012, indicating that the average complexity of Saudi Arabia’s products has decreased. This can be explained by the relative reduction of non-oil products in the country’s exports. In general, countries whose export baskets are more complex than what their income would suggest have tended to grow faster. Unfortunately, as will be seen in the following section, Saudi Arabia’s product space, in addition to not having a high average complexity, has few nearby opportunities for diversification.

**Table 1**

<table>
<thead>
<tr>
<th>HS2</th>
<th>Product name</th>
</tr>
</thead>
<tbody>
<tr>
<td>63</td>
<td>Made-Up Text, Articles Nesoi, Needlecraft Sets, Worn Clothing, Rags</td>
</tr>
<tr>
<td>90</td>
<td>Optical, Photo/Cinematographic, Medical Instruments and Accessories</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product Targets</th>
<th>Product World Exports ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>47 B</td>
</tr>
<tr>
<td>1</td>
<td>481 B</td>
</tr>
</tbody>
</table>

**Figure 1** Evolution of Saudi Arabia’s complexity, GDP and exports

---

Note: Own calculation using HS4-level trade data from United Nations COMTRADE, and World Development Indicators from the World Bank Database.

K = thousand, M = million, B = billion
From figure 2 it follows that the methodology locates Saudi Arabia in the bridge over troubled waters quadrant. This figure shows the position of countries in terms of ECI (after controlling for the effect of income and natural resources) and the country’s position relative to complex products in the product space. The relatively low complexity of Saudi Arabia’s export basket, even taking into account the intensity of natural resources (ECI < 0)—coupled with the lack of presence in products well placed in the product space, which complicates the transition to other new industries that use similar capabilities—places Saudi Arabia in the lower left quadrant of the figure. Countries in this quadrant would benefit from placing strategic bets or industrial policy ‘in the large’ to ease the transition into new and more complex industries. In these cases, enhancing production possibilities around existing industries will not produce leaps that are desired. Industrial policy should focus on selecting a number of new industries or products at which to target public inputs. The aim of such support is to provide temporary public support that will attract and facilitate private investment in new products.

Note: Own calculation using HS4-level trade data from United Nations COMTRADE, and World Development Indicators from the World Bank Database.
Saudi Arabia’s productive structure

In 2011, Saudi Arabia’s exports totaled some $260 billion (figure 3a), the vast majority in oil, be it crude, refined, or gases. Thus natural resource-based products accounted for more than 85% of total exports in 2011, which is not unusual among resource exporters. In figure 3c it can be clearly seen that the relevance of oil in the export basket fluctuates with the price of oil in world markets. Among non-oil exports two industries stand out: Chemicals and petrochemicals, both accounting for about 6% of total net exports.

Figure 3 Saudi Arabia’s trade structure in 2011 and evolution of exports per capita of Saudi Arabia (1995-2011)

Exports of Saudi Arabia

Saudi Arabia’s exports totaling approximately $259 billion
b **Net exports of Saudi Arabia**

Saudi Arabia’s net exports totaling approximately $246 billion

C **Evolution of exports**

Note: Own calculation using HS4-level trade data from United Nations COMTRADE. Products are colored according to the communities that they belong according to the following legend:
Given Saudi Arabia’s exports, what productive knowledge is available to facilitate diversification? In order to get a sense of this, as well as diversification possibilities, Saudi Arabia’s product space and its change from 1995 and 2011 are analyzed (figures 4a and 4b).

Figure 4  Saudi Arabia in the product space

Note Own calculation using HS4-level trade data from United Nations COMTRADE. Node size is proportional to world trade. Solid colored nodes indicate the products in which Saudi Arabia is competitive in world markets (i.e. RCA> 1). The nodes are colored according to the communities that they belong to.
Saudi Arabia’s position in the product space has worsened over time. As shown in figure 4, in 1995 the kingdom had a presence in more products—some in the central part of the product space—than what it had by 2011. It is important to note that the loss of presence in some industries is not a mechanical effect of increasing the share of oil when using Balassa’s RCA to account for presence. As indicated in the methodology, a two-stage RCA process was used, removing in the first stage those products which are abnormally relevant in the export basket (as oil is for Saudi Arabia), and then calculating the RCA for the remaining products other than oil. Hence, the loss of competitiveness in non-oil products persists even when accounting for the importance of oil, suggesting that is a source of concern for the country’s future prospects.

Additionally, the country’s presence is mainly in the periphery of the product space, such as in the chemical cluster (upper left region) and petrochemicals cluster (upper central region), with a few products in the construction and materials cluster that are in the central (more interconnected) region of the space. The lack of competitive industries in the central cluster is of concern as it suggests that it will be difficult for the country to transition to other more complex industries going forward.

Figure 5  **Strategic bets for Saudi Arabia**

![Product Complexity Index](image)
Saudi Arabia’s position in the product space limits its possibilities of increasing the average complexity of its production. As mentioned above, there are not many industries in the space near to what the country is currently exporting. Figures 5a and 5b highlight the products that are attractive based on Product Complexity Index (PCI) and Complexity Outlook Gain, respectively. Countries will optimize between the attractiveness of the product versus the ease of conquering the product. Therefore, the most attractive corner is the northwest section of the graphs. Using these criteria it is possible to identify frontier products that Saudi Arabia can target with its industrial policy. A detailed description of the products on the target list is provided in table 2. These products signal to strategic clusters in Saudi Arabia for which industrial policy should aim to provide temporary public support and public inputs to attract and facilitate private investment in new products and sectors.

From the figure it can be seen that products with the minimum distance to the current export basket are considerably farther away than what is found for China or Lebanon. The products identified as interesting for the kingdom are mostly chemical and petrochemicals, with some products in the foodstuff cluster. Additionally, six products
are identified in the machinery cluster. As a group, the products in the foodstuff cluster are relatively closer in terms of the country possessing the inputs required for its production, making it therefore easier to ‘conquer’. Nevertheless these products have a lower PCI or Complexity Outlook Gain, making them less desirable. On the other hand, the machinery, chemical, and petrochemical clusters are farther in distance, making them harder to develop based on present productive knowledge in the country, while they have higher values of PCI and Complexity Outlook Gain. New products belonging to these communities would increase the average complexity of Saudi Arabia’s export basket, compensating for the cost of developing them.

The size of the products in these figures is determined by the world trade in those product categories. The product with the largest potential market is medicaments, packaged (3004), whose world trade for 2011 was over $330 billion. In the machinery community, on the other hand, two of the products identified have over $50 billion in world trade: Parts for use with hoists and excavation machinery (8431) and turbojets, turbo propellers, and other gas turbines (8411). Nevertheless, although the level of world trade of a product category is an important aspect to be considered, the distance and PCI or Complexity Outlook Gain are the driving variables that are used in order to identify strategic opportunities. By considering the tradeoff between existing productive knowledge (distance), complexity of a new product and future diversification possibilities that the new productive knowledge will bring, a country is more likely to be successful in diversifying its product space.
### Table 2  Recommendations for Saudi Arabia

<table>
<thead>
<tr>
<th>HS4</th>
<th>Product name</th>
<th>RCA-2012</th>
<th>Distance</th>
<th>PCI</th>
<th>Target rank</th>
<th>World Trade ($)</th>
<th>Top Importers</th>
<th>Top Exporters</th>
</tr>
</thead>
<tbody>
<tr>
<td>3823</td>
<td>Industrial monocarboxylic fatty acids; acid oils from refining; industrial fatty alcohols</td>
<td>0.3</td>
<td>2.2</td>
<td>2.4</td>
<td>1</td>
<td>47 B</td>
<td>CHN DEU ESP</td>
<td>DEU USA JPN</td>
</tr>
<tr>
<td>3004</td>
<td>Medicaments, packaged</td>
<td>0.1</td>
<td>2.2</td>
<td>1.5</td>
<td>2</td>
<td>331 B</td>
<td>USA DEU BEL</td>
<td>DEU USA CHE</td>
</tr>
<tr>
<td>3215</td>
<td>Ink</td>
<td>0.1</td>
<td>2.2</td>
<td>2.0</td>
<td>3</td>
<td>13 B</td>
<td>DEU FRA GBR</td>
<td>DEU JPN NLD</td>
</tr>
<tr>
<td>2106</td>
<td>Food preparations not elsewhere specified</td>
<td>0.3</td>
<td>2.1</td>
<td>0.1</td>
<td>4</td>
<td>31 B</td>
<td>USA GBR DEU</td>
<td>USA DEU NLD</td>
</tr>
<tr>
<td>1806</td>
<td>Cocoa powder, sweetened</td>
<td>0.1</td>
<td>2.1</td>
<td>0.1</td>
<td>5</td>
<td>23 B</td>
<td>USA FRA DEU</td>
<td>DEU BEL ITA</td>
</tr>
<tr>
<td>3208</td>
<td>Paints and varnishes, nonaqueous</td>
<td>0.1</td>
<td>2.1</td>
<td>1.0</td>
<td>6</td>
<td>13 B</td>
<td>RUS CHN DEU</td>
<td>DEU JPN USA</td>
</tr>
<tr>
<td>3917</td>
<td>Tubes, pipes and hoses and fittings</td>
<td>0.6</td>
<td>2.1</td>
<td>-0.2</td>
<td>7</td>
<td>21 B</td>
<td>USA DEU MEX</td>
<td>DEU USA CHN</td>
</tr>
<tr>
<td>3307</td>
<td>Shaving products</td>
<td>0.5</td>
<td>2.2</td>
<td>1.0</td>
<td>8</td>
<td>10 B</td>
<td>DEU GBR USA</td>
<td>DEU GBR CHN</td>
</tr>
<tr>
<td>8431</td>
<td>Parts for use with hoists and excavation machinery</td>
<td>0.1</td>
<td>2.1</td>
<td>0.9</td>
<td>8</td>
<td>59 B</td>
<td>USA DEU CHN</td>
<td>CHN DEU USA</td>
</tr>
<tr>
<td>9406</td>
<td>Prefabricated buildings</td>
<td>0.6</td>
<td>2.1</td>
<td>-0.1</td>
<td>10</td>
<td>7 B</td>
<td>DEU NOR AUS</td>
<td>CHN DEU NLD</td>
</tr>
<tr>
<td>1704</td>
<td>Confectionery sugar</td>
<td>0.9</td>
<td>2.1</td>
<td>-0.4</td>
<td>11</td>
<td>9 B</td>
<td>USA DEU GBR</td>
<td>DEU CHN NLD</td>
</tr>
<tr>
<td>3506</td>
<td>Glues and adhesives</td>
<td>0.9</td>
<td>2.2</td>
<td>1.9</td>
<td>13</td>
<td>10 B</td>
<td>CHN DEU MEX</td>
<td>DEU USA CHN</td>
</tr>
<tr>
<td>2104</td>
<td>Soups and broths</td>
<td>0.4</td>
<td>2.1</td>
<td>-0.4</td>
<td>13</td>
<td>3 B</td>
<td>USA GBR MEX</td>
<td>USA DEU CAN</td>
</tr>
<tr>
<td>2103</td>
<td>Sauces and seasonings</td>
<td>0.7</td>
<td>2.1</td>
<td>-0.1</td>
<td>13</td>
<td>10 B</td>
<td>USA GBR FRA</td>
<td>USA NLD DEU</td>
</tr>
<tr>
<td>2105</td>
<td>Ice cream</td>
<td>0.1</td>
<td>2.2</td>
<td>0.6</td>
<td>15</td>
<td>3 B</td>
<td>GBR FRA DEU</td>
<td>DEU FRA BEL</td>
</tr>
<tr>
<td>3212</td>
<td>Pigments, nonaqueous</td>
<td>0.1</td>
<td>2.3</td>
<td>3.2</td>
<td>16</td>
<td>2 B</td>
<td>DEU CHN USA</td>
<td>DEU JPN USA</td>
</tr>
<tr>
<td>3209</td>
<td>Paints and varnishes, aqueous</td>
<td>0.2</td>
<td>2.2</td>
<td>0.9</td>
<td>17</td>
<td>6 B</td>
<td>CAN DEU FRA</td>
<td>DEU USA ITA</td>
</tr>
<tr>
<td>3816</td>
<td>Refractory cements, mortars</td>
<td>0.5</td>
<td>2.2</td>
<td>2.6</td>
<td>18</td>
<td>2 B</td>
<td>RUS UKR IND</td>
<td>CHN CHN USA</td>
</tr>
<tr>
<td>3214</td>
<td>Glaziers’ putty</td>
<td>0.3</td>
<td>2.2</td>
<td>1.8</td>
<td>19</td>
<td>7 B</td>
<td>DEU RUS CAN</td>
<td>DEU USA BEL</td>
</tr>
<tr>
<td>1904</td>
<td>Cereal foods</td>
<td>0.3</td>
<td>2.1</td>
<td>-0.6</td>
<td>20</td>
<td>5 B</td>
<td>USA CAN FRA</td>
<td>DEU USA GBR</td>
</tr>
<tr>
<td>2835</td>
<td>Phosphinates and phosphonates</td>
<td>0.0</td>
<td>2.2</td>
<td>0.4</td>
<td>21</td>
<td>4 B</td>
<td>USA DEU FRA</td>
<td>CHN DEU USA</td>
</tr>
<tr>
<td>1901</td>
<td>Malt extract</td>
<td>0.1</td>
<td>2.1</td>
<td>-0.5</td>
<td>22</td>
<td>15 B</td>
<td>CHN GBR USA</td>
<td>NLD FRA DEU</td>
</tr>
<tr>
<td>2309</td>
<td>Preparations of a kind used in animal feeding</td>
<td>0.0</td>
<td>2.2</td>
<td>0.4</td>
<td>23</td>
<td>23 B</td>
<td>DEU USA JPN</td>
<td>NLD USA FRA</td>
</tr>
<tr>
<td>3304</td>
<td>Beauty or make-up preparations</td>
<td>0.0</td>
<td>2.2</td>
<td>0.5</td>
<td>24</td>
<td>28 B</td>
<td>USA GBR DEU</td>
<td>FRA DEU USA</td>
</tr>
<tr>
<td>3925</td>
<td>Plastic builders’ ware</td>
<td>0.1</td>
<td>2.2</td>
<td>1.3</td>
<td>25</td>
<td>9 B</td>
<td>USA FRA DEU</td>
<td>CHN DEU POL</td>
</tr>
<tr>
<td>2007</td>
<td>Jams, jellies</td>
<td>0.1</td>
<td>2.1</td>
<td>-1.0</td>
<td>26</td>
<td>2 B</td>
<td>USA DEU FRA</td>
<td>FRA DEU BEL</td>
</tr>
<tr>
<td>3405</td>
<td>Polishes and creams</td>
<td>0.6</td>
<td>2.2</td>
<td>1.6</td>
<td>27</td>
<td>2 B</td>
<td>KOR TWN DEU</td>
<td>JPN USA DEU</td>
</tr>
<tr>
<td>4008</td>
<td>Plates, sheets, strip, rods and profile shapes, of vulcanized rubber</td>
<td>0.1</td>
<td>2.3</td>
<td>3.5</td>
<td>27</td>
<td>4 B</td>
<td>USA DEU NLD</td>
<td>DEU USA CHN</td>
</tr>
<tr>
<td>2203</td>
<td>Beer</td>
<td>0.0</td>
<td>2.1</td>
<td>-0.6</td>
<td>29</td>
<td>12 B</td>
<td>USA FRA GBR</td>
<td>MEX NLD DEU</td>
</tr>
<tr>
<td>3005</td>
<td>Wadding, gauze and bandages</td>
<td>0.1</td>
<td>2.2</td>
<td>1.1</td>
<td>30</td>
<td>7 B</td>
<td>USA DEU FRA</td>
<td>CHN USA DEU</td>
</tr>
<tr>
<td>3403</td>
<td>Lubricating products</td>
<td>0.2</td>
<td>2.3</td>
<td>3.9</td>
<td>31</td>
<td>9 B</td>
<td>CHN NLD DEU</td>
<td>DEU USA BLR</td>
</tr>
<tr>
<td>3003</td>
<td>Medicaments, not packaged</td>
<td>0.2</td>
<td>2.2</td>
<td>1.8</td>
<td>31</td>
<td>10 B</td>
<td>USA GBR ITA</td>
<td>ISR IRL USA</td>
</tr>
<tr>
<td>2101</td>
<td>Extracts of coffee, tea or mate</td>
<td>0.0</td>
<td>2.1</td>
<td>-1.3</td>
<td>33</td>
<td>8 B</td>
<td>USA DEU RUS</td>
<td>DEU BRA MYS</td>
</tr>
</tbody>
</table>
When repeating the exercise one observes that Saudi Arabia had opportunities in the year 2000, as identified by the methodology, in sectors very similar to those recommended based on the 2011 export basket. These are chemicals, petrochemicals, and some products in the machinery cluster. The complete list of products identified as opportunities is provided in table 3. Most of these products are highlighted in blue, indicating that they were not developed in Saudi Arabia by 2010. These are interpreted as missed opportunities. These blue products warrant special attention as they might also hint to the presence of market failures in the country.

<table>
<thead>
<tr>
<th>HS4</th>
<th>Product name</th>
<th>RCA-2012</th>
<th>Distance</th>
<th>PCI</th>
<th>Target rank</th>
<th>World Trade ($)</th>
<th>Top Importers</th>
<th>Top Exporters</th>
</tr>
</thead>
<tbody>
<tr>
<td>8424</td>
<td>Mechanical appliances for dispersing liquids or powders; fire extinguishers; spray guns; steam or sand blasting machines</td>
<td>0.6</td>
<td>2.3</td>
<td>3.5</td>
<td>34</td>
<td>17 B</td>
<td>USA CHN DEU</td>
<td>CHN DEU USA</td>
</tr>
<tr>
<td>9015</td>
<td>Surveying, hydrographic, oceanographic, hydrological, meteorological or geophysical instruments and appliances</td>
<td>0.0</td>
<td>2.1</td>
<td>-1.1</td>
<td>35</td>
<td>9 B</td>
<td>USA CHN GBR</td>
<td>USA FRA GBR</td>
</tr>
<tr>
<td>2306</td>
<td>Cotton seed oilcake</td>
<td>0.0</td>
<td>2.1</td>
<td>-1.6</td>
<td>35</td>
<td>7 B</td>
<td>USA NLD ESP</td>
<td>CAN UKR IDN</td>
</tr>
<tr>
<td>2917</td>
<td>Polycarboxylic acids</td>
<td>0.3</td>
<td>2.3</td>
<td>2.9</td>
<td>37</td>
<td>21 B</td>
<td>CHN DEU ITA</td>
<td>KOR TWN BEL</td>
</tr>
<tr>
<td>2836</td>
<td>Carbonates; peroxocarbonates (percarbonates); commercial ammonium carbonate containing ammonium carbamate</td>
<td>0.1</td>
<td>2.2</td>
<td>-0.0</td>
<td>38</td>
<td>6 B</td>
<td>MEX KOR IDN</td>
<td>USA CHN DEU</td>
</tr>
<tr>
<td>8544</td>
<td>Insulated wire; optical fiber cables</td>
<td>0.1</td>
<td>2.2</td>
<td>-0.1</td>
<td>38</td>
<td>101 B</td>
<td>USA DEU JPN</td>
<td>CHN MEX USA</td>
</tr>
<tr>
<td>4012</td>
<td>Retreaded or used pneumatic tires of rubber</td>
<td>0.0</td>
<td>2.2</td>
<td>1.5</td>
<td>40</td>
<td>3 B</td>
<td>USA DEU FRA</td>
<td>LKA DEU CHN</td>
</tr>
<tr>
<td>1601</td>
<td>Sausages</td>
<td>0.1</td>
<td>2.2</td>
<td>1.4</td>
<td>41</td>
<td>4 B</td>
<td>GBR DEU JPN</td>
<td>DEU USA ITA</td>
</tr>
<tr>
<td>2008</td>
<td>Fruit, nuts and edible plants preserved with sugar</td>
<td>0.1</td>
<td>2.1</td>
<td>-2.1</td>
<td>41</td>
<td>13 B</td>
<td>USA DEU JPN</td>
<td>CHN USA THA</td>
</tr>
<tr>
<td>8426</td>
<td>Ships’ derricks; cranes</td>
<td>0.1</td>
<td>2.2</td>
<td>-0.1</td>
<td>43</td>
<td>15 B</td>
<td>USA RUS SGP</td>
<td>CHN DEU USA</td>
</tr>
<tr>
<td>4011</td>
<td>Turbojets, turbo propellers and other gas turbines</td>
<td>0.1</td>
<td>2.3</td>
<td>3.7</td>
<td>44</td>
<td>100 B</td>
<td>USA GBR DEU</td>
<td>USA GBR FRA</td>
</tr>
<tr>
<td>3808</td>
<td>Insecticides, rodenticides, fungicides, herbicides</td>
<td>0.2</td>
<td>2.2</td>
<td>0.1</td>
<td>44</td>
<td>30 B</td>
<td>BRA FRA DEU</td>
<td>DEU FRA CHN</td>
</tr>
<tr>
<td>2402</td>
<td>Cigars</td>
<td>0.0</td>
<td>2.1</td>
<td>-2.0</td>
<td>46</td>
<td>22 B</td>
<td>ITA FRA JPN</td>
<td>DEU NLD POL</td>
</tr>
<tr>
<td>4002</td>
<td>Synthetic rubber</td>
<td>0.1</td>
<td>2.3</td>
<td>4.0</td>
<td>47</td>
<td>28 B</td>
<td>CHN USA DEU</td>
<td>USA KOR JPN</td>
</tr>
<tr>
<td>8474</td>
<td>Machinery for working earth, stone, and other mineral substances</td>
<td>0.1</td>
<td>2.2</td>
<td>0.7</td>
<td>47</td>
<td>19 B</td>
<td>RUS USA CHN</td>
<td>DEU CHN USA</td>
</tr>
<tr>
<td>4011</td>
<td>New pneumatic tires, of rubber</td>
<td>0.0</td>
<td>2.2</td>
<td>0.7</td>
<td>49</td>
<td>86 B</td>
<td>USA DEU FRA</td>
<td>CHN JPN DEU</td>
</tr>
<tr>
<td>6309</td>
<td>Used clothes and textiles</td>
<td>0.3</td>
<td>2.2</td>
<td>-0.9</td>
<td>50</td>
<td>4 B</td>
<td>PAK RUS UKR</td>
<td>USA GBR DEU</td>
</tr>
</tbody>
</table>

K = thousand, M = million, B = billion
Of the target list of products, Saudi Arabia only developed a presence in five products (red and yellow). Only three of these products (included in the table)—raw sugar (1701), saturated acyclic acids (2915), and mixed alkylbenzenes and mixed alkynaphthalenes (3817)—exhibit high complexity and have the potential to improve the position of the country in the product space.

As mentioned before, when comparing the product space in 1995 and 2011 in figure 4, the position of the kingdom has worsened over time. This can also be observed by comparing products that were recommended on the target list in 2000 and 2011, by comparing figure 6 and figure 5 respectively. In year 2000, Saudi Arabia was closer to machinery and chemicals, products of high complexity and in a more strategic position in the product space, than it was by year 2011. Interestingly, many of the opportunities identified for year 2000 in the chemical and machinery clusters were not seized on by 2010.

Figure 6  **Strategic bets for Saudi Arabia**

![Graph showing strategic bets for Saudi Arabia](image)
b  Complexity Outlook Gain

![Complexity Outlook Gain Diagram](image)

C  Product Complexity Index 2000

![Product Complexity Index 2000 Diagram](image)
Note Own calculation using HS4-level trade data from United Nations COMTRADE. Node size is proportional to world trade. The nodes are colored according to the communities that they belong to in (a) and (c). In figures (b) and (d), Red nodes are conquered by Saudi Arabia and were also in our target list, Blue nodes are not conquered by Saudi Arabia and were in our target list. Finally, Yellow nodes are conquered but were not in the target list.

Table 3 Strategic bets for Saudi Arabia in year 2000

<table>
<thead>
<tr>
<th>HS4</th>
<th>Product name</th>
<th>RCA-2000</th>
<th>RCA-2010</th>
<th>Distance</th>
<th>PCI</th>
<th>COG</th>
<th>World Trade ($)</th>
<th>Target rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>3208</td>
<td>Paints and varnishes, nonaqueous</td>
<td>0.4</td>
<td>0.2</td>
<td>1.8</td>
<td>1.7</td>
<td>0.8</td>
<td>6 B</td>
<td>1</td>
</tr>
<tr>
<td>3405</td>
<td>Polishes and creams</td>
<td>0.4</td>
<td>0.6</td>
<td>1.7</td>
<td>0.6</td>
<td>0.5</td>
<td>949 M</td>
<td>2</td>
</tr>
<tr>
<td>8431</td>
<td>Parts for use with hoists and excavation machinery</td>
<td>0.1</td>
<td>0.3</td>
<td>1.8</td>
<td>1.4</td>
<td>0.8</td>
<td>19 B</td>
<td>3</td>
</tr>
<tr>
<td>3808</td>
<td>Insecticides, rodenticides, fungicides, herbicides</td>
<td>0.1</td>
<td>0.2</td>
<td>1.7</td>
<td>0.4</td>
<td>0.5</td>
<td>11 B</td>
<td>4</td>
</tr>
<tr>
<td>4010</td>
<td>Conveyor or transmission belts of vulcanized rubber</td>
<td>0.0</td>
<td>0.0</td>
<td>1.8</td>
<td>4.5</td>
<td>1.3</td>
<td>2 B</td>
<td>4</td>
</tr>
<tr>
<td>4011</td>
<td>New pneumatic tires, of rubber</td>
<td>0.1</td>
<td>0.0</td>
<td>1.7</td>
<td>0.9</td>
<td>0.4</td>
<td>24 B</td>
<td>6</td>
</tr>
<tr>
<td>8474</td>
<td>Machinery for working earth, stone, and other mineral substances</td>
<td>0.1</td>
<td>0.1</td>
<td>1.8</td>
<td>0.7</td>
<td>0.5</td>
<td>5 B</td>
<td>7</td>
</tr>
<tr>
<td>2208</td>
<td>Alcoholic preps for beverages</td>
<td>0.0</td>
<td>0.0</td>
<td>1.7</td>
<td>-0.2</td>
<td>0.4</td>
<td>11 B</td>
<td>8</td>
</tr>
<tr>
<td>8705</td>
<td>Special purpose motor vehicles</td>
<td>0.2</td>
<td>0.1</td>
<td>1.8</td>
<td>0.5</td>
<td>0.5</td>
<td>4 B</td>
<td>9</td>
</tr>
<tr>
<td>8546</td>
<td>Electrical insulators of any material</td>
<td>0.2</td>
<td>0.1</td>
<td>1.8</td>
<td>3.8</td>
<td>1.3</td>
<td>1 B</td>
<td>10</td>
</tr>
<tr>
<td>2103</td>
<td>Sauces and seasonings</td>
<td>0.3</td>
<td>0.7</td>
<td>1.7</td>
<td>-0.9</td>
<td>0.1</td>
<td>3 B</td>
<td>11</td>
</tr>
<tr>
<td>8903</td>
<td>Yachts</td>
<td>0.0</td>
<td>0.0</td>
<td>1.8</td>
<td>3.1</td>
<td>1.1</td>
<td>5 B</td>
<td>12</td>
</tr>
<tr>
<td>HS4</td>
<td>Product name</td>
<td>RCA-2000</td>
<td>RCA-2010</td>
<td>Distance</td>
<td>PCI</td>
<td>COG</td>
<td>World Trade ($)</td>
<td>Target rank</td>
</tr>
<tr>
<td>------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
<td>------</td>
<td>------</td>
<td>-----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>2402</td>
<td>Cigars</td>
<td>0.0</td>
<td>0.0</td>
<td>1.7</td>
<td>-1.3</td>
<td>0.1</td>
<td>13 B</td>
<td>13</td>
</tr>
<tr>
<td>3307</td>
<td>Shaving products</td>
<td>0.2</td>
<td>0.1</td>
<td>1.8</td>
<td>0.4</td>
<td>0.5</td>
<td>4 B</td>
<td>14</td>
</tr>
<tr>
<td>3816</td>
<td>Refractory cements, mortars</td>
<td>0.2</td>
<td>0.2</td>
<td>1.8</td>
<td>3.7</td>
<td>1.3</td>
<td>791 M</td>
<td>15</td>
</tr>
<tr>
<td>2007</td>
<td>Jams, jellies</td>
<td>0.3</td>
<td>0.2</td>
<td>1.7</td>
<td>-1.1</td>
<td>0.1</td>
<td>758 M</td>
<td>16</td>
</tr>
<tr>
<td>3214</td>
<td>Glaziers’ putty</td>
<td>0.4</td>
<td>0.3</td>
<td>1.8</td>
<td>3.4</td>
<td>1.2</td>
<td>3 B</td>
<td>17</td>
</tr>
<tr>
<td>3823</td>
<td>Industrial monocarboxylic fatty acids; acid oils from refining; industrial fatty alcohols</td>
<td>0.2</td>
<td>0.2</td>
<td>1.9</td>
<td>5.2</td>
<td>1.6</td>
<td>13 B</td>
<td>18</td>
</tr>
<tr>
<td>3005</td>
<td>Wadding, gauze and bandages</td>
<td>0.3</td>
<td>0.2</td>
<td>1.8</td>
<td>1.5</td>
<td>0.7</td>
<td>2 B</td>
<td>19</td>
</tr>
<tr>
<td>8432</td>
<td>Agricultural, forestry machinery for soil preparation</td>
<td>0.1</td>
<td>0.1</td>
<td>1.8</td>
<td>3.0</td>
<td>1.0</td>
<td>2 B</td>
<td>21</td>
</tr>
<tr>
<td>2309</td>
<td>Preparations of a kind used in animal feeding</td>
<td>0.0</td>
<td>0.0</td>
<td>1.8</td>
<td>0.4</td>
<td>0.5</td>
<td>8 B</td>
<td>21</td>
</tr>
<tr>
<td>2833</td>
<td>Sulfates; alums; peroxosulfates (persulfates)</td>
<td>0.0</td>
<td>0.1</td>
<td>1.8</td>
<td>0.2</td>
<td>0.4</td>
<td>1 B</td>
<td>21</td>
</tr>
<tr>
<td>8417</td>
<td>Industrial or laboratory furnaces and ovens, including incinerators</td>
<td>0.1</td>
<td>0.1</td>
<td>1.9</td>
<td>4.6</td>
<td>1.5</td>
<td>2 B</td>
<td>23</td>
</tr>
<tr>
<td>2203</td>
<td>Beer</td>
<td>0.1</td>
<td>0.0</td>
<td>1.8</td>
<td>0.3</td>
<td>0.5</td>
<td>5 B</td>
<td>23</td>
</tr>
<tr>
<td>3304</td>
<td>Beauty or make-up preparations</td>
<td>0.0</td>
<td>0.0</td>
<td>1.8</td>
<td>0.4</td>
<td>0.6</td>
<td>9 B</td>
<td>25</td>
</tr>
<tr>
<td>2104</td>
<td>Soups and broths</td>
<td>0.2</td>
<td>0.7</td>
<td>1.8</td>
<td>-0.6</td>
<td>0.3</td>
<td>1 B</td>
<td>26</td>
</tr>
<tr>
<td>2106</td>
<td>Food preparations not elsewhere specified</td>
<td>0.3</td>
<td>0.2</td>
<td>1.8</td>
<td>-1.1</td>
<td>0.1</td>
<td>9 B</td>
<td>27</td>
</tr>
<tr>
<td>3922</td>
<td>Baths, shower baths, sinks, washbasins, bidets, lavatory pans, seats and covers</td>
<td>0.1</td>
<td>0.1</td>
<td>1.8</td>
<td>2.4</td>
<td>0.9</td>
<td>1 B</td>
<td>28</td>
</tr>
<tr>
<td>3004</td>
<td>Medicaments, packaged</td>
<td>0.1</td>
<td>0.1</td>
<td>1.8</td>
<td>1.4</td>
<td>0.7</td>
<td>74 B</td>
<td>29</td>
</tr>
<tr>
<td>8530</td>
<td>Electric signal, safety and traffic controls, railways, waterways, parking or airfields</td>
<td>0.1</td>
<td>0.0</td>
<td>1.9</td>
<td>5.8</td>
<td>1.8</td>
<td>761 M</td>
<td>30</td>
</tr>
<tr>
<td>2101</td>
<td>Extracts of coffee, tea or mate</td>
<td>0.0</td>
<td>0.0</td>
<td>1.8</td>
<td>-1.2</td>
<td>0.2</td>
<td>2 B</td>
<td>31</td>
</tr>
<tr>
<td>4002</td>
<td>Synthetic rubber</td>
<td>0.1</td>
<td>0.1</td>
<td>1.9</td>
<td>4.5</td>
<td>1.5</td>
<td>8 B</td>
<td>32</td>
</tr>
<tr>
<td>1901</td>
<td>Malt extract</td>
<td>0.1</td>
<td>0.1</td>
<td>1.8</td>
<td>-1.4</td>
<td>0.1</td>
<td>4 B</td>
<td>33</td>
</tr>
<tr>
<td>8418</td>
<td>Refrigerators, freezers</td>
<td>0.1</td>
<td>0.1</td>
<td>1.8</td>
<td>1.6</td>
<td>0.7</td>
<td>15 B</td>
<td>34</td>
</tr>
<tr>
<td>3925</td>
<td>Plastic builders’ ware</td>
<td>0.1</td>
<td>0.1</td>
<td>1.8</td>
<td>2.2</td>
<td>0.8</td>
<td>3 B</td>
<td>35</td>
</tr>
<tr>
<td>8462</td>
<td>Machine tools for working metal by forging; machine tools for working metal by bending, folding, straightening or flattening</td>
<td>0.1</td>
<td>0.0</td>
<td>1.9</td>
<td>3.5</td>
<td>1.1</td>
<td>6 B</td>
<td>36</td>
</tr>
<tr>
<td>8419</td>
<td>Machinery, plant or laboratory equipment involving a change of temperature such as heating, cooking, roasting</td>
<td>0.6</td>
<td>0.1</td>
<td>1.9</td>
<td>4.9</td>
<td>1.5</td>
<td>14 B</td>
<td>37</td>
</tr>
<tr>
<td>1701</td>
<td>Raw sugar, cane</td>
<td>0.1</td>
<td>1.7</td>
<td>1.7</td>
<td>-3.1</td>
<td>-0.3</td>
<td>9 B</td>
<td>37</td>
</tr>
<tr>
<td>2835</td>
<td>Phosphinates and phosphonates</td>
<td>0.1</td>
<td>0.0</td>
<td>1.8</td>
<td>2.0</td>
<td>0.9</td>
<td>2 B</td>
<td>39</td>
</tr>
<tr>
<td>8609</td>
<td>Containers for carriage by one or more modes of transport</td>
<td>0.1</td>
<td>0.4</td>
<td>1.8</td>
<td>0.4</td>
<td>0.4</td>
<td>1 B</td>
<td>40</td>
</tr>
<tr>
<td>8455</td>
<td>Metal-rolling mills</td>
<td>0.0</td>
<td>0.0</td>
<td>1.9</td>
<td>4.7</td>
<td>1.5</td>
<td>2 B</td>
<td>41</td>
</tr>
<tr>
<td>8433</td>
<td>Harvesting or agricultural machinery</td>
<td>0.0</td>
<td>0.0</td>
<td>1.9</td>
<td>4.5</td>
<td>1.5</td>
<td>6 B</td>
<td>42</td>
</tr>
<tr>
<td>2915</td>
<td>Saturated acyclic monocarboxylic acids</td>
<td>0.1</td>
<td>1.0</td>
<td>1.9</td>
<td>5.3</td>
<td>1.7</td>
<td>5 B</td>
<td>43</td>
</tr>
<tr>
<td>8480</td>
<td>Molding boxes for metal foundry</td>
<td>0.0</td>
<td>0.0</td>
<td>1.8</td>
<td>2.3</td>
<td>0.9</td>
<td>9 B</td>
<td>44</td>
</tr>
<tr>
<td>6203</td>
<td>Men’s suits, not knit</td>
<td>0.4</td>
<td>0.0</td>
<td>1.8</td>
<td>-3.3</td>
<td>-0.4</td>
<td>25 B</td>
<td>45</td>
</tr>
</tbody>
</table>
Export destinations
Lastly, possible markets for the country’s exports are analyzed. As can be observed in figure 7a, Saudi Arabia mainly exports to Asian countries. The two major destinations of Saudi Arabia’s exports are China and Japan (accounting for 19% and 18%, respectively), followed by the Republic of Korea and India (13% and 11%). Figure 7b shows that exports to Asia have increased their relative share over time.

Figure 7 Saudi Arabia trade partners (2011)
When taking into account the current trade of countries in eligible products versus potential, it is possible to identify top export destinations for a country. Table 4 presents potential trade with those export destination countries as well as the potential of other countries included in this report. From the table it follows that Saudi Arabia’s greatest trade potential countries are France, the United States, the Netherlands, and Italy.
<table>
<thead>
<tr>
<th>Importer</th>
<th>Trade Health</th>
<th>Number of Eligible Products</th>
<th>Potential in Eligible Products ($)</th>
<th>Current Trade in Eligible Products ($)</th>
<th>Total Trade ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARE</td>
<td>10.7</td>
<td>33</td>
<td>95 M</td>
<td>2 B</td>
<td>2 B</td>
</tr>
<tr>
<td>CHN</td>
<td>1.2</td>
<td>1</td>
<td>0 K</td>
<td>2 B</td>
<td>4 B</td>
</tr>
<tr>
<td>DEU</td>
<td>0.0</td>
<td>17</td>
<td>1 B</td>
<td>218 M</td>
<td>280 M</td>
</tr>
<tr>
<td>DZA</td>
<td>0.7</td>
<td>8</td>
<td>5 M</td>
<td>45 M</td>
<td>121 M</td>
</tr>
<tr>
<td>EGY</td>
<td>4.5</td>
<td>25</td>
<td>17 M</td>
<td>430 M</td>
<td>539 M</td>
</tr>
<tr>
<td>FRA</td>
<td>0.0</td>
<td>15</td>
<td>774 M</td>
<td>189 M</td>
<td>223 M</td>
</tr>
<tr>
<td>ITA</td>
<td>0.1</td>
<td>19</td>
<td>410 M</td>
<td>635 M</td>
<td>713 M</td>
</tr>
<tr>
<td>JOR</td>
<td>14.5</td>
<td>32</td>
<td>5 M</td>
<td>339 M</td>
<td>423 M</td>
</tr>
<tr>
<td>KWT</td>
<td>34.7</td>
<td>25</td>
<td>326 K</td>
<td>362 M</td>
<td>537 M</td>
</tr>
<tr>
<td>LBN</td>
<td>7.2</td>
<td>25</td>
<td>338 K</td>
<td>119 M</td>
<td>147 M</td>
</tr>
<tr>
<td>LBY</td>
<td>0.6</td>
<td>15</td>
<td>5 M</td>
<td>15 M</td>
<td>29 M</td>
</tr>
<tr>
<td>NLD</td>
<td>0.2</td>
<td>9</td>
<td>414 M</td>
<td>257 M</td>
<td>581 M</td>
</tr>
<tr>
<td>SYR</td>
<td>5.4</td>
<td>23</td>
<td>5 M</td>
<td>331 M</td>
<td>364 M</td>
</tr>
<tr>
<td>TUN</td>
<td>2.5</td>
<td>16</td>
<td>2 M</td>
<td>94 M</td>
<td>130 M</td>
</tr>
<tr>
<td>TUR</td>
<td>0.8</td>
<td>21</td>
<td>48 M</td>
<td>794 M</td>
<td>810 M</td>
</tr>
<tr>
<td>USA</td>
<td>0.0</td>
<td>6</td>
<td>607 M</td>
<td>385 M</td>
<td>572 M</td>
</tr>
<tr>
<td>YEM</td>
<td>20.7</td>
<td>26</td>
<td>445 K</td>
<td>208 M</td>
<td>259 M</td>
</tr>
</tbody>
</table>

K = thousand, M = million, B = billion