Demand for Egyptian Exports of Aromatic Oils an Analytical Study

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ABSTRACT

Egyptian exports of aromatic and medicinal plants occupy a distinguished position among major agricultural crops. During the period 2001-2013, average exports value amounted to LE 34.98 million representing 1.34% and 5.01% of agricultural and horticultural exports values, estimated at LE 2618.5 million and LE 697.95 million, respectively. However, some obstacles stand in the way of exporting and marketing aromatic and medicinal plants, such as the instability of quantities produced for exports, and the sharp competition from other countries in the export markets of medicinal and aromatic plants. Findings showed that the relative prices of both crops are increasing year-over-year in most of the export markets, which adversely affects their market shares, where the results of applying the third model to estimate the current market shares and future predictions in main export markets indicated that the share of geranium oil in the markets of France, Holland, Spain, and Italy are predicted to decline by 16%, 09%, 12%, and 58% in 2018, respectively; while are predicted to decline by 07%, 0.08%, 0.10%, and 0.53% in the markets of France, Holland, Spain, and Italy in 2023, respectively, compared to the estimated averages for the period 1995-2013. Findings also indicated that Egypt's market shares in France, Holland, Spain, and Italy are predicted to decline during 2018 and 2023 compared to the estimated averages for the period 1995-2013, where they are predicted to reach 0.17%, 0.18%, 0.13%, and 0.68% by 2018 in the markets of the mentioned countries, respectively; while are predicted to reach 0.09%, 0.09%, 0.01%, and 0.67% in the same markets by 2023 compared to the market shares in the same countries during the period 1995-2013. This can be explained by the higher export prices of jasmine paste relative to the export prices of competing countries.

INTRODUCTION

Egypt is one of the countries endowed with favorable climatic conditions suitable for producing a variety of aromatic and medicinal plants, the demand for which is growing in many fields like physiotherapy [2], the drug industry, and the processing of perfumes and medical extracts. In addition to the importance these plants represent for domestic uses, global demand for such products is increasingly growing year-over-year [1].

Egyptian exports of aromatic and medicinal plants occupy a distinguished position among major agricultural crops. During the period 2001-2013, average exports value of aromatic and medicinal plants amounted to LE 34.98 million, representing 1.34% and 5.01% of agricultural and horticultural exports values, estimated at LE 2618.5 million and LE 697.95 million, respectively. However, some obstacles stand in the way of exporting and marketing aromatic and medicinal plants, such as the instability in quantities produced for exports, and the sharp competition from other countries in the export markets of medicinal and aromatic plants [3].

The issue of developing Egyptian exports, and identifying the obstacles and constraints it faces is one of the most important issues Egypt devotes attention to due to the fact that exports play an effective role in reducing deficit in the Balance Of Payment, in addition to promoting economic development. It is worth noting that medicinal and aromatic plants, especially those under study, are considered promising in global markets, especially the EU market. And despite receiving great attention, Egypt faces a lot of problems in exporting medicinal and aromatic plants. On the one side, Egypt has to face the external demand for these plants and
competition in foreign export markets; and on the other side Egypt has to address the problem of dealing with the actual state and special nature of these plants. In recent years, demand for medicinal and aromatic plants has been increasing due to the growing tendency of using their extracts in the processing of drugs used in treating several diseases. They also face sharp competition and thus require devoting great attention to improve the applied technologies of production and genetics, in addition to improving the farming and handling methods of such sensitive plants.

Developing countries are usually keen to maximize their external trade in order to earn foreign currencies to accelerate the achievement of domestic development goals, especially cultivations in New Lands. And despite the fact that Egyptian climatic conditions are suitable for growing medicinal and aromatic plants, the comparative and competitive advantages of exporting these plants are not optimally utilized yet, where often Egypt cannot meet the required export quota. Also, Egypt's export prices relative to the prices of competing countries are often higher, and the quality and standards often differ from those required by international markets [5,6 ].

Research Problem:
1. Instability of medicinal and aromatic plants exports, especially aromatic oils.
2. Low share of Egyptian exports of medicinal and aromatic plants in international markets.
3. The currently applied export policy regarding such plants shall lead to losing a large part of its traditional markets.

Research Objective:
The research aims to achieve the following objectives:
1. To identify the main factors influencing foreign demand for the aromatic and medicinal plants under study: geranium oil and jasmine paste.
2. To estimate Egypt's share in the export markets of these plants, and future expectations in main foreign markets.
3. To estimate the trends of Egyptian and competing countries' exports of medicinal and aromatic plants in order to identify future trends.
4. To identify the main obstacles influencing the production and exports of medicinal and aromatic plants grown in Egypt.

Methodology and Sources of Data:
The research applied descriptive and quantitative analysis methods, including mathematical and statistical tools like simple and multiple regression in the linear and double log forms, in addition to applying some econometric analysis models to analyze foreign demand for geranium oil and jasmine paste like Direct Demand Model, Substitution Model, and Market Share Model. The research relied on data published by the Central Agency for Public Mobilization and Statistics [CAPMAS ], Food and Agriculture Organization of the United Nations [FAO ], the Central Administration for Agricultural Economics, World Bank Reports, previous research studies, in addition to applying Rapid Rural Appraisal [RRA ] to a group of exporters, producers, and some Governmental Institutions responsible for foreign trade.

Econometric Models:
Econometric estimation of demand functions for geranium oil and jasmine paste in main importing countries has been performed using the following three models:

a. Direct Demand Model:
1. Model Formulation:
Estimation of the demand functions for total imports of geranium oil and jasmine paste by selected import countries has been performed using the following equation:
\[ Q_{it} = f \left[ P_{it}, S_{it-1}, T \right] \]
Where:
qit = total imported quantity of the crop by country (i). in year t,
pit = average import price in country (i). in year t,
Sit-1= domestic production of the crop in country (i). in year t,
T = time variable.
Model assumptions include: elasticity of supply for crop imports equals infinity, where average export price is fixed along the study period for every importing country; other variables remain constant, i.e., demand for imports is not affected by other variables not included in the model, except for time which includes the impacts of several variables like crop variety, technological changes, and other variables which impact cannot be individually separated under this model.
Price elasticity of demand by country \( E_i \) is the product of multiplying the regression coefficient of price variable by the averages of \( P_i/Q_i \) in case the estimated demand function is linear; while the regression coefficient of the price variable is itself the price elasticity of demand in case the estimated demand function is logarithmic.

2. Model Estimation Results:

(1) Geranium Oil:

Estimation results proved that the linear form better fits the study period's data [1995-2013]. Table [1] indicates negative signs of the estimated average import price \( [P_i] \), and production quantity lagged one year \([St-1] \), for most of countries under study, except for three cases for which the estimated regression coefficients of the price variable returned positive values, these are Italy, England, and India.

Below one price elasticity of demand for geranium oil means that 1% reduction in price leads to increasing the imported quantities by more than 1%, hence more gains for the exporting country. When the price elasticity of demand reaches one, revenues from export are maximized.

The estimated price elasticity of demand for Germany’s import of geranium oil indicates that 1% decline in average import price leads to raising its total demand for geranium oil by 1.81%. Results also indicate that 1% decline in average import price of geranium oil in France, Holland, and Spain leads to raising their demand for geranium oil by 0.38%, 0.01%, and 0.19%, respectively. In addition, it was found that 1% decline in the Japan's average import price of geranium oil leads to raising its demand for geranium oil by 0.85%. Such results indicate that changes in the import price of geranium oil proved to have a fundamental impact on the quantities imported by those countries for which evolutions in Egypt's export prices proved statistically significant, whilst proved to have a weak impact on geranium oil imported by the rest of importing countries for which evolutions in Egypt's export price did not prove statistically significant. Generally speaking, price elasticity of demand indicated the importance of the imported Egyptian commodity to consumers in the import country, where it revealed how necessary imports of Egyptian geranium oil is for consumers in all the countries under study, except for Germany.

The estimated elasticities for Spain, England, Malaysia, and the USA, returned positive values, which is opposite to the logic of economic theory, while that estimated for other importing countries agreed the logic of economic theory.

<table>
<thead>
<tr>
<th>Import Country</th>
<th>Constant ( \alpha )</th>
<th>Import Price ( \beta_1 )</th>
<th>Production lagged one year ( \beta_2 )</th>
<th>Time ( \beta_3 )</th>
<th>( R^2 )</th>
<th>( F )</th>
<th>Price Elasticity ( E )</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>325.8</td>
<td>-0.281*</td>
<td>46.45*</td>
<td>-</td>
<td>0.79</td>
<td>24.82**</td>
<td>-0.38</td>
</tr>
<tr>
<td>Holland</td>
<td>76.46</td>
<td>-0.012</td>
<td>9.19**</td>
<td>-</td>
<td>0.79</td>
<td>24.80**</td>
<td>-0.01</td>
</tr>
<tr>
<td>Germany</td>
<td>88.78</td>
<td>-0.178*</td>
<td>3.26**</td>
<td>-</td>
<td>0.51</td>
<td>6.83**</td>
<td>-1.81</td>
</tr>
<tr>
<td>Spain</td>
<td>85.43</td>
<td>-0.188</td>
<td>12.26**</td>
<td>-</td>
<td>0.67</td>
<td>8.01**</td>
<td>0.19</td>
</tr>
<tr>
<td>Italy</td>
<td>61.53</td>
<td>0.143</td>
<td>0.01</td>
<td>3.22</td>
<td>0.13</td>
<td>0.96</td>
<td>-0.49</td>
</tr>
<tr>
<td>England</td>
<td>-95.63</td>
<td>0.045*</td>
<td>-</td>
<td>3.6</td>
<td>0.2</td>
<td>3.44**</td>
<td>0.29</td>
</tr>
<tr>
<td>India</td>
<td>65.12</td>
<td>0.082*</td>
<td>-</td>
<td>2.8</td>
<td>0.37</td>
<td>8.15**</td>
<td>-0.63</td>
</tr>
<tr>
<td>Japan</td>
<td>63.16</td>
<td>-0.15*</td>
<td>-2.56**</td>
<td>0.55</td>
<td>0.53</td>
<td>18.3**</td>
<td>-0.85</td>
</tr>
<tr>
<td>Malaysia</td>
<td>44.61</td>
<td>-0.073*</td>
<td>-2.56*</td>
<td>0.53</td>
<td>0.10**</td>
<td>0.16</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>23.11</td>
<td>-0.033*</td>
<td>0.6</td>
<td>2.11*</td>
<td>0.16</td>
<td>16.3*</td>
<td>0.66</td>
</tr>
</tbody>
</table>

Source: Calculated based on Data Published in Trade Yearbook, FAO.

* and **: significant at 1% and 5% level, respectively.
[- ] indicates either correlation between relative price and time, or lack of data.

(2) Jasmine Paste:

Results in Table (2) indicate negative values of the estimated average import price \( [P_i] \), and production quantity lagged one year \([St-1] \) for most of countries under study, except for three cases which estimated regression coefficients of the price variable returned positive values. Such results mean that 1% decline in export price leads to increasing jasmine past imports by more than 1%, which means an increase in the gains achieved by the exporting country. When the price elasticity of demand reaches one, revenues from jasmine past exports are maximized.

The estimated price elasticity of demand for jasmine paste indicates that 1% decline in the average import price leads to raising total demand for jasmine paste by 1.7%. Results also indicate that 1% decline in the average import price of jasmine paste in France, Holland, and Germany leads to raising their demand for jasmine paste by 0.28%, 0.01%, and 0.71%, respectively. It was also found that 1% decline in the average import price of jasmine paste exported to Greece leads to raising its demand for jasmine paste by 0.05%.

Such results indicate that changes in the import price of jasmine paste proved to have a fundamental impact on the quantities imported by those countries in which evolutions in Egypt's export prices proved statistically...
significant, whilst proved to have a weak impact on jasmine paste imported by the rest of importing EU countries.

**Table 2:** Coefficients of the Estimated Demand Functions for Jasmine Paste by Main Import Countries Over the Period [1995-2013].

<table>
<thead>
<tr>
<th>Import Country</th>
<th>Constant</th>
<th>Import Price ( \beta_1 )</th>
<th>Production lagged one year ( \beta_2 )</th>
<th>Time ( \beta_3 )</th>
<th>( R^2 )</th>
<th>( F )</th>
<th>Price Elasticity ( E )</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>25.8</td>
<td>-0.471*</td>
<td>-</td>
<td>16.45*</td>
<td>0.78</td>
<td>34.82**</td>
<td>-0.28</td>
</tr>
<tr>
<td>Holland</td>
<td>76.46</td>
<td>-0.022</td>
<td>-</td>
<td>9.19**</td>
<td>0.78</td>
<td>21.80**</td>
<td>-0.01</td>
</tr>
<tr>
<td>Germany</td>
<td>48.78</td>
<td>-0.118*</td>
<td>-</td>
<td>7.26**</td>
<td>0.61</td>
<td>7.84**</td>
<td>-0.71</td>
</tr>
<tr>
<td>Greece</td>
<td>95.43</td>
<td>0.178</td>
<td>-0.167</td>
<td>13.26**</td>
<td>0.77</td>
<td>9.01**</td>
<td>-0.05</td>
</tr>
<tr>
<td>Italy</td>
<td>11.53</td>
<td>0.243</td>
<td>-</td>
<td>-</td>
<td>4.6**</td>
<td>0.23</td>
<td>-0.59</td>
</tr>
<tr>
<td>England</td>
<td>-85.63</td>
<td>0.145*</td>
<td>-</td>
<td>-</td>
<td>0.3</td>
<td>3.44*</td>
<td>0.19</td>
</tr>
<tr>
<td>USA</td>
<td>85.12</td>
<td>-0.012*</td>
<td>-0.208**</td>
<td>-</td>
<td>0.47</td>
<td>8.11**</td>
<td>-1.53</td>
</tr>
<tr>
<td>Japan</td>
<td>63.16</td>
<td>-0.063*</td>
<td>-</td>
<td>-2.56**</td>
<td>0.55</td>
<td>18.2**</td>
<td>-0.65</td>
</tr>
</tbody>
</table>

Source: Calculated based on Data Published in the FAO Trade Yearbook.

* and **: significant at 1% and 5% level, respectively.

[- ] indicates either correlation between relative price and time, or lack of data.

**b. Direct Demand Model:**

1. **Model Formulation:**

   When estimating demand functions for crop imports, the dependent variable in this case is the ratio between quantity imported by the country under study and imports of the same crop from other competing countries at the market of the importing country, expressed as follows:

\[
\frac{q_1}{q_2} = f \left( \frac{P_1}{P_2}, T \right)
\]

Where,

\( q_1 \) = Quantity imported from the Egyptian crop by country (i), in year t,

\( q_2 \) = Imports of the same crop from competing countries by country (i), in year t,

\( P_2 \) = Average import price for all countries competing in the import market of country (i), in year t,

\( T \) = Time variable

Assumption and necessary conditions associated with this model include: [1 ] equal income elasticity for the Egyptian crop and crop imports from competing countries at the market of the import country; [2 ] Zero cross elasticity between the study crop and other commodities at the market of import country. In case such assumptions are not satisfied, the model must include other variables.

Price elasticity of demand \( [E_1] \) for an import country can be calculated using the estimated cross elasticity, expressed in the regression coefficient value of the price ratio \( [b_1] \):

\[
E_1 = b_1 \frac{v_2}{v_1 + v_2}
\]

Where,

\( v_1 \) = imports value of the Egyptian crop imported by country (i),

\( v_2 \) = total imports value of the same crop imported by country (i).

The model has been estimated to measure the impact of the relative price between Egypt and competing countries \( [P_1/P_2] \) on the import country's propensity to substitute imports of Egyptian geranium oil by importing from competing countries, or vice versa, assuming there are no core differences in the quality of the crop exported by competing countries to the market of country (i). And in case there is correlation between the relative price and relative quality of the crop, the estimated elasticity of substitution usually approach zero if the correlation is positive, while diverges from zero in case the correlation is negative.

**Estimation Results:**

**a. Geranium Oil:**

Table (3) presents the results of estimating the Substitution Model in the logarithmic form. It is clear that ten of the countries under study returned negative values of the estimated regression coefficient \( [b_1] \) for the relative price variable \( [P_1/P_2] \), indicating an inverse relationship with the dependent variable \( [q_1/q_2] \) that expresses the ratio of geranium oil imports from Egypt to geranium oil imports from the rest of competing countries. These ten countries include France, Holland, Germany, Spain, Italy, England, India, Japan, Malaysia, and the USA.

The estimated regression coefficients proved statistically significant for most of the study countries, indicating that a decline in the relative price leads to increasing the ratio of geranium oil imports from Egypt to geranium oil imports from the rest of competing countries in the market of the import country. In other words, the importing country substitutes its imports of geranium oil from competing countries by geranium oil imports from Egypt.

The measured price elasticity of demand for geranium oil imported from Egypt at the markets of importing countries indicate that the estimated coefficients of elasticity for the markets of Germany, Spain, and England amounted to 2.01, 3.54, and 2.11, respectively, which means that demand is elastic since the three of them are
greater than one. Such results indicate that 1% reduction in Egypt's price relative to the average price of competing countries leads to increasing the quantity of geranium oil demanded from Egypt at the account of competing countries by more than 1%. In contrast, the measured price elasticity of demand for imports of Egyptian geranium oil proved inelastic for France, Holland, Italy, Japan, Malaysia, and the USA as it amounted to -0.27, -0.63, -0.48, 0.38, 0.13, and 0.12 at the markets of the mentioned countries, respectively.

In addition, the estimated coefficients of elasticity for India amounted to 0.06, which approaches zero. This means that a small change in the relative price of geranium oil imported by India leads to a tiny change in the quantity of geranium oil demanded from Egypt in the Indian market; and a small increase in the relative price leads to substituting small amounts of Egyptian geranium oil by importing from competing countries, which means that Egyptian geranium oil is a necessary good for the Indian market.

That explains why an increase in the export price of Egyptian geranium oil relative to the export prices of competing countries does not lead to substituting large quantities of the geranium oil India imports from Egypt by imports from competing countries. It is therefore clear that, although India is a recent import market for such important crops from Egypt, Egyptian geranium oil became a necessary good in its markets.

### Table 3: Regression Coefficients and Price Elasticity of Demand for Geranium Oil Over the Period [1995-2013] Based on the Estimated Substitution Model.

<table>
<thead>
<tr>
<th>Import Country</th>
<th>Constant (α)</th>
<th>Relative Price (β1)</th>
<th>Time (β2)</th>
<th>R²</th>
<th>F</th>
<th>Price Elasticity (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>-1.449</td>
<td>-0.169**</td>
<td>-1.259</td>
<td>0.27</td>
<td>4.74</td>
<td>-0.27</td>
</tr>
<tr>
<td>Holland</td>
<td>-1.161</td>
<td>0.38</td>
<td>0.036</td>
<td>0.17</td>
<td>0.32</td>
<td>-0.63</td>
</tr>
<tr>
<td>Germany</td>
<td>-5.322</td>
<td>-1.270**</td>
<td>3.09</td>
<td>0.82</td>
<td>7.520*</td>
<td>-2.01</td>
</tr>
<tr>
<td>Spain</td>
<td>-3.029</td>
<td>-2.006**</td>
<td></td>
<td>0.49</td>
<td>6.370*</td>
<td>-3.54</td>
</tr>
<tr>
<td>Italia</td>
<td>-2.968</td>
<td>-0.467*</td>
<td>1.088</td>
<td>0.67</td>
<td>5.046</td>
<td>-0.48</td>
</tr>
<tr>
<td>England</td>
<td>-3.254</td>
<td>2.487*</td>
<td>0.374</td>
<td>0.6</td>
<td>4.346</td>
<td>-2.11</td>
</tr>
<tr>
<td>India</td>
<td>-6.276</td>
<td>-0.093*</td>
<td>4.715</td>
<td>0.71</td>
<td>6.379*</td>
<td>-0.06</td>
</tr>
<tr>
<td>Japan</td>
<td>-0.651</td>
<td>-0.862</td>
<td></td>
<td>-</td>
<td>2.805</td>
<td>0.38</td>
</tr>
<tr>
<td>Malaysia</td>
<td>0.601</td>
<td>-0.81</td>
<td></td>
<td>0.12</td>
<td>1.9</td>
<td>0.13</td>
</tr>
<tr>
<td>USA</td>
<td>-0.034</td>
<td>-0.72</td>
<td></td>
<td>0.11</td>
<td>1.8</td>
<td>0.12</td>
</tr>
</tbody>
</table>

Source: Calculated based on Data Published in the FAO Trade Yearbook.

Log \( \frac{q_1}{q_2} \) t = \( \alpha + \beta_1 \log \left( \frac{P_1}{P_2} \right) \) t + \( \beta_2 T \)

* and **: significant at 1% and 5% level, respectively.

[ - ] indicates either correlation between relative price and time, or lack of data.

b. **Jasmine Paste:**

Results in Table (4) indicate that six of the countries under study returned negative values of the estimated regression coefficient \( [\beta_1] \) for the relative price variable \( [\frac{P_1}{P_2}] \), indicating an inverse relationship with the dependent variable \( [\frac{q_1}{q_2}] \) that expresses the ratio of jasmine paste imports from Egypt to jasmine paste imports from the rest of competing countries. These six countries include France, Germany, Holland, Greece, Italy, and the USA. In contrast, the relationship proved positive for Japan, and England. The estimated regression coefficients proved statistically significant for all the study countries, except for Holland and Japan, indicating that a decline in the relative price leads to increasing the ratio of jasmine paste imports from Egypt to jasmine paste imports from the rest of competing countries in the market of the importing country. In other words, the importing country substitutes its imports of Jasmine paste from competing countries by imports from Egypt.

The measured price elasticity of demand for jasmine paste imported from Egypt by the markets of import countries indicate that the estimated coefficients of elasticity for the markets of Germany and Greece reached -1.01 and -2.54, respectively, which means that demand is elastic in the two markets since both are greater than one. Such results indicate that 1% reduction in Egypt's price relative to the average price of competing countries in the markets of both countries leads to increasing the quantity demanded of Jasmine paste from Egypt at the account of competing countries by more than 1%. In contrast, the measured price elasticity of demand for imports of Egyptian Jasmine paste proved inelastic for France, Holland, Italy, Japan, Malaysia, and the USA as it amounted to -0.27, -0.63, -0.48, 0.38, 0.13, and 0.12 at the markets of the mentioned countries, respectively.

In addition, the estimated coefficients of elasticity for India amounted to 0.06, which approaches zero. This means that a small change in the relative price of Jasmine paste imported by India leads to a tiny change in the quantity of Jasmine paste demanded from Egypt in the Indian market; and a small increase in the relative price leads to substituting small amounts of Egyptian Jasmine paste by importing from competing countries, which means that Egyptian Jasmine paste is a necessary good for the Indian market.

That explains why an increase in the export price of Egyptian Jasmine paste relative to the export prices of competing countries does not lead to substituting large quantities of the Jasmine paste India imports from Egypt by imports from competing countries. It is therefore clear that, although India is a recent import market for such important crops from Egypt, Egyptian Jasmine paste became a necessary good in its markets.

The previously presented analysis results indicate the necessity of devoting great attention to traditional markets' demand for Egyptian exports of geranium oil and Jasmine paste, where such markets are regarded as the main windows for the two crops due to their high importance in the extraction of perfumes and pastes in these markets, especially for the EU markets.

In addition, it is important to devote more attention to the newly developed markets for these two crops because imports by traditional markets are diminishing year-over-year. However, it is vital that Egypt keeps those traditional markets because they are the basic markets for these crops. The obtained results are in line with...
those achieved by many studies in the same field [1]. Therefore, it was regarded necessary to identify the market share of Egyptian exports of such crops in both traditional and new markets. The following are the results obtained from applying the Market Share Model.

Table 4: Regression Coefficients and Price Elasticity of Demand for Jasmine Paste Over the Period [1995-2013] Based on the Estimated Substitution Model.

<table>
<thead>
<tr>
<th>Import Country</th>
<th>Constant $\alpha$</th>
<th>Import Price $\beta_1$</th>
<th>Production lagged one year $\beta_2$</th>
<th>Time $\beta_3$</th>
<th>$R^2$</th>
<th>$F$</th>
<th>Price Elasticity $E$</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>-2.449</td>
<td>-0.269**</td>
<td>-1.159</td>
<td>-1.159</td>
<td>0.17</td>
<td>1.84</td>
<td>-0.27</td>
</tr>
<tr>
<td>Holland</td>
<td>-1.261</td>
<td>-0.48</td>
<td>0.016</td>
<td>0.016</td>
<td>0.07</td>
<td>0.32</td>
<td>-0.33</td>
</tr>
<tr>
<td>Germany</td>
<td>-6.722</td>
<td>-1.270**</td>
<td>2.08</td>
<td>2.08</td>
<td>0.62</td>
<td>6.520*</td>
<td>-1.01</td>
</tr>
<tr>
<td>Greece</td>
<td>-2.079</td>
<td>-3.004*</td>
<td>-</td>
<td>-</td>
<td>0.39</td>
<td>4.370*</td>
<td>-2.54</td>
</tr>
<tr>
<td>Italy</td>
<td>-2.169</td>
<td>-0.447*</td>
<td>1.087</td>
<td>1.087</td>
<td>0.47</td>
<td>3.046</td>
<td>-0.38</td>
</tr>
<tr>
<td>England</td>
<td>-2.554</td>
<td>1.487*</td>
<td>0.573</td>
<td>0.573</td>
<td>0.4</td>
<td>2.346</td>
<td>1.11</td>
</tr>
<tr>
<td>USA</td>
<td>-7.176</td>
<td>-0.002*</td>
<td>2.715</td>
<td>2.715</td>
<td>0.61</td>
<td>5.379*</td>
<td>-0.03</td>
</tr>
<tr>
<td>Japan</td>
<td>-0.651</td>
<td>0.462</td>
<td>-</td>
<td>-</td>
<td>0.17</td>
<td>1.805</td>
<td>0.28</td>
</tr>
</tbody>
</table>

Source: Calculated based on Data Published in the FAO Trade Year Book.

Log $[q_1/q_2]_t = \alpha + \beta_1 \log [P_1/P_2]_t + \beta_2 T$

* and **: significant at 1%, 5% level and respectively.
[-] indicates either correlation between relative price and time, or lack of data.

c. Market Share Model:

The previously achieved results indicated the necessity of identifying the current situation of Egyptian exports of these two historic promising crops. Accordingly, the research estimated the demand functions for quantities imported by the import countries under study, with the dependent variable being the ratio between quantity of the crop imported from Egypt and total imported quantity of the same crop by the import country, referred to as the "Market Share", based on the following equation:

$[q_1/Q_{it}]= F[ [P_1/P_0]_{it}, T]$  

Where,

$q_1 =$ quantity exported by Egypt to country $[i]$ in year $t$,

$Q_{it} =$ total imported quantity of the same crop by an importing country $[i]$ in year $t$,

$P_1 =$ Egypt's average export price of the crop exported to country $[i]$ in year $t$.

$T =$ time variable.

In this model, market share in year $t-1$ can be added as an independent variable, in which case the model is called "Distributed Lag Mechanism Model", also known as "Nerlove Dynamic Model", or "Partial Adjustment Model":

$[q_1/Q_{it}]_t = F[ [P_1/P_0]_{it}, T]$  

$[q_1/Q_{it}]_t - [q_1/Q_{it-1}] = [ [q_1/Q_{it}] - [q_1/Q_{it-1}] ]$  

Where,

$[q_1/Q_{it}]_t =$ targeted long-run market share,

Partial Adjustment Coefficient, expressed by the ratio of actual change to the targeted change in the dependent variable. The value of this ratio, shown in equation (3), ranges between zero and one.

Substituting equation (2) in equation (3) we get the following linear regression equation (4):

$[q_1/Q_{it}]_t = \gamma a + \gamma b [P_1/P_0]_{it} + [1-\gamma ] [q_1/Q_{it-1}] + T$

This equation leads us to the parameters of the Nerlove Model, based on which the long-run market share of the commodity in foreign markets can be predicted.

In the short-run, Market Share Elasticity for the Egyptian export commodity $[Ei1 ]$ to the relative price in the import country $[P_1/P_0 ]$ can be calculated using the following equation:

$Ei1 = \gamma b [P_1/P_0]_{it}/ [q_1/Q_{it}]$  

Where,

$b =$ regression coefficient of the variable $[P_1/P_0 ]$ in equation (4), estimated at the averages of the relative price $[P_1/P_0 ]$ and market share $[q_1/Q_{it}]$ of the importing country $[i]$ during the study period.

The estimated elasticity equals the price elasticity of demand for the export commodity, assuming Q remains constant. This means null changes in total imports of the commodity by country $[i]$ relative to minor changes in the import price of the Egyptian export commodity $[P_1 ]$ at the market of country $[i]$. In the long-run, price elasticity of the market share of the Egyptian commodity exported to country $[i]$ can be calculated as follows:

$Ei1/1-[1-\gamma ] = Ei2$

Where,

$Ei1 =$ estimated short-run price elasticity for country $[i]$.

$\gamma =$ estimated partial adjustment coefficient.
1. Model Estimation Results:

(a) Egyptian Geranium Oil:

This model helped in measuring the price elasticity of demand for geranium oil imports by international markets in the short run; and predicting the market share of Egyptian geranium oil exports in the long run; based on which the export policy for this important crop can be formulated on scientific bases. Model estimation results for the importing countries under study based on data of the period 1995-2013 are presented in Table [5]. The obtained results indicate negative values of the regression coefficient of the relative price \([P1/Po]_i\) in country (i), which is the price of Egyptian geranium oil/average price of total imports of geranium oil, except for England and Japan which regression coefficient of the relative price returned positive values.

Table 5: Regression Coefficients and Price Elasticity of Demand for Egyptian Geranium Oil over the Period 1995-2013 based on the applied Market Share Model.

<table>
<thead>
<tr>
<th>Import Country</th>
<th>Constant (\alpha)</th>
<th>Relative Price (b1)</th>
<th>Market Share lagged one year (b2)</th>
<th>Time (b3)</th>
<th>R2</th>
<th>F</th>
<th>Price Elasticity (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>0.047</td>
<td>-0.013 **</td>
<td>-0.480 *</td>
<td>-0.012</td>
<td>0.89</td>
<td>15.79 **</td>
<td>-0.856</td>
</tr>
<tr>
<td>Holland</td>
<td>0.65</td>
<td>-0.035 **</td>
<td>0.36</td>
<td>-0.024</td>
<td>0.73</td>
<td>2.29 **</td>
<td>-0.11</td>
</tr>
<tr>
<td>Germany</td>
<td>-0.356</td>
<td>-0.048 *</td>
<td>0.075</td>
<td>0.13</td>
<td>0.58</td>
<td>2.24 *</td>
<td>-0.165</td>
</tr>
<tr>
<td>Spain</td>
<td>-0.468</td>
<td>-0.022 *</td>
<td>-0.0309</td>
<td>0.039</td>
<td>0.62</td>
<td>3.92 **</td>
<td>-0.073</td>
</tr>
<tr>
<td>Italia</td>
<td>-0.001</td>
<td>-0.261 *</td>
<td>0.06</td>
<td>-</td>
<td>0.54</td>
<td>4.34 **</td>
<td>-1.02</td>
</tr>
<tr>
<td>England</td>
<td>-0.112</td>
<td>0.442 *</td>
<td>0.342</td>
<td>-</td>
<td>0.45</td>
<td>7.75 **</td>
<td>1.25</td>
</tr>
<tr>
<td>India</td>
<td>-0.02</td>
<td>-0.027 **</td>
<td>0.396 **</td>
<td>0.039</td>
<td>0.12</td>
<td>7.98 **</td>
<td>-0.038</td>
</tr>
<tr>
<td>Japan</td>
<td>0.332</td>
<td>0.379 *</td>
<td>-0.016</td>
<td>0.07</td>
<td>0.12</td>
<td>3.46 *</td>
<td>1.7</td>
</tr>
<tr>
<td>Malaysia</td>
<td>0.31</td>
<td>0.66</td>
<td>0.11</td>
<td>0.07</td>
<td>0.12</td>
<td>1.6</td>
<td>0.7</td>
</tr>
<tr>
<td>America</td>
<td>0.12</td>
<td>0.47</td>
<td>0.17</td>
<td>0.01</td>
<td>0.13</td>
<td>1.2</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Source: Calculated using equation (6) and Data Published in the FAO Trade Year Book.

* and **: significant at 1%, 5% level and respectively.
[ ] indicates either correlation between relative price and time, or lack of data.

The estimated short-run elasticities indicate that 1% change in the relative price leads to changing the market share of Egyptian geranium oil by -0.856%, -0.11%, 0.165%, and 0.073% in the markets of France, Holland, Germany, and Spain, respectively, which all proved statistically significant. In contrast, the estimated price elasticity for the Egypt's market share in the Italian market indicate that 1% change in the relative price leads to changing the market share of Egyptian geranium oil in that market by -1.02, which proved statistically significant. As for the English market, the estimated price elasticity indicate that 1% change in the relative price leads to an inverse change in the market share of Egyptian geranium oil in that market, but it did not prove statistically significant.

The market share of geranium oil in its international markets can be predicted by calculating the partial adjustment coefficient \(\gamma\) for the country cases that proved statistically significant, namely France, Holland, Germany, Spain, and Italy, which are among the main traditional import markets for the two crops under study. After that, \(\alpha\) and \(b\) can be estimated. The long-run econometric model takes the following form:

\[
[q1/Q]_t = \alpha + b \left[\frac{P1}{Po}\right]
\]

Where,

\[
[q1/Q]_t = \text{predicted market share,} \\
[\frac{P1}{Po}] = \text{relative price.}
\]

To calculate the predicted market share for Egyptian geranium oil in the main importing countries, we first calculate the predicted relative price \([P1/Po]\) by estimating the simple regression equations for the researched data. The predicted relative price is then substituted in the long-run econometric model to get the predicted market share in the desired future time period.

Results in Table (6) indicate that the market shares in France, Holland, Spain, and Italy are predicted to decline during 2018 and 2023 compared to the estimated average of the period 1995-2013, where they are predicted to reach 16%, 09%, 12%, and 58% by 2018 in the markets of the mentioned countries, respectively; while are predicted to reach 07%, 08%, 10%, and 53% in the markets of France, Holland, Germany, and Spain, by 2023, respectively. This can be explained by the predicted increase in the relative price of geranium oil by 2018 and 2023, compared to the relative price for the previous period's average for each of the mentioned countries.

The obtained results prove that the predicted market shares of geranium oil in its main foreign markets tend to decline, which can be explained by the decline in the competitive ability of its export price due to recording higher levels than the export prices of competing countries. This shall no doubt lead to losing a large part of the main traditional import markets of geranium oil in the long-run.

Therefore, the research recommends lowering the export price of Egyptian geranium oil in order to raise its competitive ability in the mentioned markets, which can be achieved by adopting production methods that lead to realizing economic efficiency through minimization of production cost, especially in New Lands. It is also...
recommended to focus on the markets of France, Holland, Germany, and Spain, in addition to improving production in terms of quantity and quality, in addition to devoting attention to newly developed markets like Malaysia and the USA, and opening new markets as alternatives for Egyptian exports of geranium oil in case Egypt’s market share in traditional markets decline due to turning to those new markets that enjoy a higher relative importance in terms of export price, which realizes a better return to the Egyptian society.

Table 6: Regression Coefficients of the Estimated Long-Run Econometric Model and Predicted Market Share Values of Egyptian Geranium Oil in main Import Markets Over the Period [1995-2013].

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>0.061</td>
<td>0.69</td>
<td>0.19</td>
<td>0.74</td>
<td>0.16</td>
<td>0.87</td>
<td>0.07</td>
</tr>
<tr>
<td>Holland</td>
<td>-0.49</td>
<td>0.96</td>
<td>0.21</td>
<td>1.09</td>
<td>0.09</td>
<td>1.28</td>
<td>0.08</td>
</tr>
<tr>
<td>Germany</td>
<td>-0.015</td>
<td>0.86</td>
<td>0.24</td>
<td>1.12</td>
<td>0.12</td>
<td>1.37</td>
<td>0.1</td>
</tr>
<tr>
<td>Spain</td>
<td>-0.014</td>
<td>0.97</td>
<td>0.71</td>
<td>1.4</td>
<td>0.58</td>
<td>1.7</td>
<td>0.53</td>
</tr>
</tbody>
</table>

(1) Calculated using simple regression equations for the period 1995-2013
(2) Calculated from the estimated long-run econometric Model for the period 1995-2013
Source: Calculated based on data in Table [5] and the collected primary data.

(b) Jasmine Paste:

The same model has been applied to measure the price elasticity of demand for Egyptian jasmine paste in main international markets in the short run, and to predict the market share of Egyptian jasmine paste exports in the long run, based on which the export policy for jasmine paste can be formulated on scientific bases. Model estimation results for the importing countries under study based on data of the period 1995-2013 are presented in Table (7). The obtained results indicate negative values of the regression coefficient of the relative price [P1/Po] in country (i), which is the price of Egyptian jasmine paste/average price of total imports of jasmine past, except for Greece, England, and Japan which regression coefficients of the relative price returned positive values.

The estimated short-run elasticities indicate that 1% change in the relative price leads to changing the market shares of Egyptian jasmine past by -0.74%, 0.17%, 0.25%, and 0.07% in France, Holland, Germany, and Greece, respectively, which all proved statistically significant. In contrast, the estimated price elasticity for the Italian market indicates that 1% change in the relative price leads to changing the market share of Egyptian geranium oil by 1.04 in that market, which proved statistically significant.

As for the estimated price elasticities for the markets of England and Japan, results indicate that 1% change in the relative price leads to inverse changes in the market shares of Egyptian jasmine past in these two markets.

Table 7: Regression Coefficients and Price Elasticity of Demand based on the Estimated Market Share Model for the Period [1995-2013].

<table>
<thead>
<tr>
<th>Import Country</th>
<th>Constant α</th>
<th>Relative Price b1</th>
<th>Market Share lagged one year b2</th>
<th>Time lag b3</th>
<th>R2</th>
<th>F</th>
<th>Price Elasticity E</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>0.014</td>
<td>-0.012***</td>
<td>-0.280**</td>
<td>-0.002</td>
<td>0.78</td>
<td>14.97**</td>
<td>0.14</td>
</tr>
<tr>
<td>Holland</td>
<td>0.15</td>
<td>-0.027***</td>
<td>0.26</td>
<td>-0.024</td>
<td>0.43</td>
<td>4.29**</td>
<td>-0.17</td>
</tr>
<tr>
<td>Germany</td>
<td>-0.256</td>
<td>-0.028**</td>
<td>0.075</td>
<td>0.029</td>
<td>0.29</td>
<td>3.92**</td>
<td>-0.07</td>
</tr>
<tr>
<td>Greece</td>
<td>-0.168</td>
<td>0.023**</td>
<td>-0.208</td>
<td>0.049</td>
<td>0.42</td>
<td>2.46**</td>
<td>0.65</td>
</tr>
<tr>
<td>Italy</td>
<td>-0.007</td>
<td>-0.171*</td>
<td>0.08</td>
<td>-</td>
<td>0.74</td>
<td>4.34**</td>
<td>-0.04</td>
</tr>
<tr>
<td>England</td>
<td>-0.122</td>
<td>0.242</td>
<td>0.342</td>
<td>-</td>
<td>0.65</td>
<td>2.75*</td>
<td>1.27</td>
</tr>
<tr>
<td>USA</td>
<td>-0.06</td>
<td>-0.027**</td>
<td>0.498**</td>
<td>-</td>
<td>0.62</td>
<td>8.98**</td>
<td>-0.028</td>
</tr>
<tr>
<td>Japan</td>
<td>-0.332</td>
<td>0.179</td>
<td>-0.11</td>
<td>0.049</td>
<td>0.42</td>
<td>2.46**</td>
<td>0.817</td>
</tr>
</tbody>
</table>

Source: Calculated using equation [6] and Data Published in the FAO Trade Yearbook.
* and **: significant at 1%, 5% level and respectively.
[- ] indicates either correlation between relative price and time, or lack of data.

The market shares of jasmine paste in its international markets can be predicted using the results of the third estimated model by calculating the partial adjustment coefficient γ for the country cases that proved statistically significant, the most important of which is France. After that, α and b can be estimated. The long-run econometric model takes the following form:

\[ q1/Q^*t = \alpha + b \times \frac{P1}{Po} \]

Where,

\[ q1/Q^*t = \text{predicted market share of jasmine paste in main import markets}, \]

\[ \frac{P1}{Po} = \text{relative price: Egyptian export price/average export price of competing countries in the import country (i)}. \]

To calculate the predicted market share for jasmine paste in the main four importing countries, we first calculate the predicted relative price value \[ \frac{P1}{Po} \] by estimating the simple regression equations for the
researched data, then substitute the predicted relative price in the long-run econometric model to get the predicted market share in the desired future time period.

Results in Table [8] indicate that Egypt's market shares in France, Holland, Spain, and Italy are predicted to decline during 2018 and 2023 compared to their estimated averages for the period 1995-2013, where they are predicted to reach 17%, 18%, 13%, and 68% by 2018 in the markets of the mentioned countries, respectively; while are predicted to reach 09%, 09%, 1%, and 67% in the same markets by 2023 in case the same production and export policies remain unchanged, compared to the market shares in the same countries during the period 1995-2013, estimated at 18%, 31%, 64%, and 91%, respectively. This can be explained by the predicted increase in the relative price of jasmine paste by 2018 and 2023, compared to the relative price for the previous period's average for each of the mentioned countries.

The obtained results prove that the predicted market shares of jasmine paste in its main foreign markets tend to decline, which can be explained by the decline in the competitive ability of its export price due to recording higher levels than the export price of competing countries. This shall no doubt lead to losing a large part of the main traditional import markets of jasmine paste in the long-run.

Therefore, the research recommends lowering the export prices of Egyptian jasmine paste in order to raise its competitive ability in the mentioned markets, especially the EU markets, which can be achieved by adopting production methods that lead to improving the productivity of these two crops to help in meeting the demanded quantities thus raise its competitive ability in import markets, and in the same time minimize its extraction and processing costs. It is also recommended to exert efforts to achieve production efficiency by minimizing the production cost through adopting production, processing, and export technologies that eventually lead to minimizing Egypt’s relative export prices.

Another important recommendation is to adopt a better export policy that maintains the uniqueness of Egyptian production and expands the production of such important crops in New Lands, in addition to continuing production in Old Lands in the same time. In addition, processing and distillation processes must be saved from being monopolized by a few individuals. It is also necessary to disseminate awareness about clean production methods and practices since it is well known that the determinants of a country’s competitive position are: 

1. Relative price; 
2. The ability to cover export requirements; and 
3. Trying hard to realize efficiency in performing export operations and satisfy the required quality standards, especially if the commodity is not exported in the raw form but is subjected to different operations, like distillation and processing. It is also important to satisfy the required environmental conditions; maintain old markets; and expand in the export markets to face the continuous increase in competition facing most of the Egyptian exports, especially that facing the exports of medicinal and aromatic plants.

### Table 8: Regression Coefficients and Predicted Market Shares of Egyptian Jasmine Paste based on the Estimated Long-Run Econometric Model for the Period [1995-2013]

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>-0.041</td>
<td>-0.017</td>
<td>0.68</td>
<td>0.18</td>
<td>0.69</td>
<td>0.17</td>
<td>0.62</td>
</tr>
<tr>
<td>Holland</td>
<td>-0.59</td>
<td>-0.018</td>
<td>0.96</td>
<td>0.31</td>
<td>1.18</td>
<td>0.18</td>
<td>1.38</td>
</tr>
<tr>
<td>Germany</td>
<td>-0.015</td>
<td>-0.048</td>
<td>0.87</td>
<td>0.64</td>
<td>1.12</td>
<td>0.13</td>
<td>1.67</td>
</tr>
<tr>
<td>Spain</td>
<td>-0.013</td>
<td>-0.034</td>
<td>0.68</td>
<td>0.91</td>
<td>1.6</td>
<td>0.68</td>
<td>1.73</td>
</tr>
</tbody>
</table>

(1) Calculated using simple regression equations for the period 1995-2013
(2) Calculated from the estimated long-run econometric Model for the period 1995-2013

Source: Calculated based on data in Table [3].

**Main Obstacles Facing The Production And Exports Of The Study Crops And Suggested Solutions:**

Results of applying Rapid Rural Appraisal on a group of exporters, factories extracting medicinal oils and pastes, producers of geranium and jasmine crops in both New and Old Lands, and some Governmental export institutions, indicate the following main problems and obstacles facing foreign marketing of the two crops:

1. Low standards of filling and packing, resulting in low quality standards.
2. Lack of clear export plans; and lack of integrated marketing information.
3. Most of the produced crops do not satisfy the required international standards.
4. The high cost of production and shipping, which makes the relative prices of most Egyptian exports of medicinal and aromatic plants continuously higher compared to those of the competing countries, especially for the two study crops.
5. Export Development Bank has no role in export funding.
6. Low awareness of the proper post-harvesting operations regarding the two study crops until reaching the factory and exporting.
7. There is a necessity to mechanize the production of these crops that require intensive labor, resulting in higher production costs thus higher relative export prices.

Accordingly, the research suggests the following group of recommendations:
1. Selecting good varieties, proper land, and the farming methods that make it possible to satisfy the conditions of the importing countries that require certain varieties from certain lands.
2. Organizing sufficient training on post-harvest, preparation, and drying operations, taking into consideration satisfying the required standards in each step and operation.
3. Activating the role of the Export Development Bank in providing export funds that are sufficient and in the same time appropriate for the export activity. It is worth mentioned that the recently issued group of ministerial decrees are expected to promote the export process and serve exporters.

Summary and Recommendations:

Egyptian exports of aromatic and medicinal plants occupy a distinguished position among major agricultural crops. During the period 2001-2013, average exports value amounted to LE 34.98 million representing 1.34% and 5.01% of agricultural and horticultural exports values, estimated at LE 2618.5 million and LE 697.95 million, respectively. However, some obstacles stand in the way of exporting and marketing aromatic and medicinal plants, such as the instability of quantities produced for exports, and the sharp competition from other countries in the export markets of medicinal and aromatic plants.

The issue of developing Egyptian exports, and identifying the obstacles and constraints it faces is one of the most important issues Egypt devotes attention to due to the fact that exports play an effective role in reducing the deficit in the Balance Of Payment and promoting economic development.

It is worth noting that medicinal and aromatic plants, especially those under study, are considered promising in the global markets, especially the EU market. And despite receiving great attention, Egypt faces a lot of problems in exporting medicinal and aromatic plants. On the one side, Egypt has to face the external demand for these plants and competition in foreign export markets; and on the other side Egypt has to address the problem of dealing with the actual state and special nature of these plants. In recent years, demand for medicinal and aromatic plants has been increasing due to the increasing use of their extracts in the processing of drugs used in treating several diseases. They also face sharp competition and require receiving great attention to improve the applied technologies of production and genetics, in addition to improving the adopted farming and handling methods of such sensitive plants.

The research investigates the problems of instability in Egyptian exports of medicinal and aromatic plant; and the low share of medicinal and aromatic plants in international markets.

The research aims to identify the main factors influencing foreign demand for the aromatic and medicinal plants under study, namely geranium oil and jasmine paste; to estimate Egypt's market share of these plants in export markets and future expectations in main foreign markets; in addition to identifying the main obstacles influencing the production and exports of medicinal and aromatic plants.

As regards the methodology and sources of data, the research applied descriptive and quantitative analysis methods including mathematical and statistical tools like simple and multiple regression in the linear and double log forms, in addition to applying some econometric analysis models to analyze foreign demand for geranium oil and jasmine paste like Direct Demand Model, Substitution Model, and Market Share Model. The research relied on data published by the Central Agency for Public Mobilization and Statistics [CAPMAS], Food and Agriculture Organization of the United Nations [FAO], the Central Administration for Agricultural Economics, World Bank Reports, in addition to previously conducted research studies.

Findings showed that the relative prices of both crops are increasing year-over-year in most of the export markets, which adversely affects their market shares, where the results of applying the third model to estimate the current market shares and future predictions in main export markets indicated that the share of geranium oil in the markets of France, Holland, Spain, and Italy are predicted to decline by 16%, 09%, 12%, and 58% in 2018, respectively; while are predicted to decline by 07%, 0.08%, 0.10%, and 0.53% in the markets of France, Holland, Spain, and Italy in 2023, respectively, compared to the estimated average of the period 1995-2013.

Therefore, the research recommends applying all the possible economic efficiency methods in all stages, starting from cultivation until reaching the hands of the exporter, in order to lower the export prices of geranium oil and jasmine paste thus raise their competitive ability in export markets, which allows entering new markets and keeping the old ones.

Findings also indicated that Egypt's market shares in France, Holland, Spain, and Italy are predicted to decline during 2018 and 2023 compared to the estimated averages for the period 1995-2013, where they are predicted to reach 0.17%, 0.18%, 0.13%, and 0.68% by 2018 in the markets of the mentioned countries, respectively; while are predicted to reach 0.09%, 0.09%, 0.01%, and 0.67% in the same markets by 2023 compared to the market shares in the same countries during the period 1995-2013. This can be explained by the higher export prices of jasmine paste relative to the export prices of competing countries.

Therefore, the research recommends lowering the export prices of Egyptian jasmine paste exported to the markets of the mentioned countries in order to raise its competitive ability, which can be achieved by applying all the possible economic efficiency methods in all stages and channels, starting from cultivation until reaching
the hands of the exporter. Needless to say, estimation of the trends of relative export prices must be based on accurate data.

In addition, findings indicated that most of the estimated functions of foreign demand for geranium oil and jasmine paste in most of their import markets came in line with the logic of economic theory.

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