IMPORT SUBSTITUTION IN FOOD PROCESSING INDUSTRIES IN JORDAN 1968-1986

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Abstract

This study aims at measuring the levels of import substitution in Jordanian food processing industries during 1968-1986. Three subperiods are distinguished to measure the performance of import substitution in processed food, beverage, and tobacco and cigarette industries. The effect of import substitution on the pattern of growth in these industries is also evaluated. The availability of detailed data for the period of 1983-1986 enabled us to measure the performance of import substitution for each of the food processing industries according to four digit ISIC.

The results indicated a good import substitution performance in cigarette and tobacco and beverage industries and a relatively poor performance in the processed food industry during the study period. However, there was an improvement in the import substitution performance of the processed food industry during the 1982-1986 sub-period.

1- Introduction

The objective of this study is to examine the possibilities of import substitution in food processing industries in Jordan. To achieve this objective the levels of import substitution in food processing industries during 1968-1986 will be measured and the effect of the import substitution on the pattern of growth in these industries will be evaluated.

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Jordan, as a small developing country has been characterized by a high Import/Gross National Product (GNP) ratio accompanied with a weak productive sector and relatively stagnant exports. The Jordanian balance of trade has been in deficit since its creation in 1946, which has always been a constraint on Jordan’s development objectives.

In addition, during the last few years the development process in Jordan has been constrained by increasing foreign debt services and declining foreign exchange resources due to several reasons among which is the decline in the inflow of Arab aid and workers' remittances. The Jordanian economy was severely affected by the general decline in the economic activity in the region due to political instability and the recession that started in early 1980’s due to declining oil prices.

These developments have led recently to a high level of unemployment, low import capacity and a slow-down in most economic activities in the Jordanian economy.

In order to overcome this critical situation, it was recommended that Jordan should depend more on local potentials for growth and that self reliance effort should be emphasized to improve the productive sector in the country and reduce the pressure on foreign exchange reserves.

Jordanian imports include, in addition to capital and intermediate products, a high magnitude of luxury and consumption products of which food products constitute more than 50 percent. This implies the need for a policy of import rationalization aimed at restricting luxury and unnecessary imports and enhancing the domestic production of import substitutes for consumption goods, among them food products.

We believe that the comparative advantage of the Jordanian economy ensure the possibility for the enlargement and development of food processing industries to substitute a significant portion of food imports, or even to reach self sufficiency and exports of these products.

It may be argued that an import substitution strategy is suitable and advantageous given present conditions in the Jordanian economy as import substitution based on protection of local industries will enhance the domestic production and increase government revenues through import duties.
II. Import Substitution Industrialization Policy

In this section we will briefly discuss the main issues around the import substitution industrialization policy.

Import substitution at a simple product level refers to a policy that restricts or even eliminates the importation of the commodity, leaving the domestic market exclusively for domestic producers (Bruton, 1970, p.127).

One of the many issues regarding import substitution is to differentiate between import substitution as a natural process resulting from economic growth and change in supply conditions in the economy, and import substitution as a deliberate or forced policy aimed at accelerating growth by artificially affecting the productive capacity and supply conditions in the country to produce goods that are locally demanded and supplied from foreign sources.

Several reasons lead to import substitution as a natural process, among which is the imbalance between the country's import capacity in terms of foreign exchange and its import supply requirements which would lead to a natural evolution of import replacement. Similarly government policies that tax consumption with the aim of raising revenue to pay for government services, will indirectly increase the profitability of import replacement production (Clark, 1970, p. 17).

Import substitution as a deliberate and planned industrialization policy "refers to government actions that ban or restrict imports through tariffs, foreign exchange controls, import quotas and similar measures and thereby encourage the establishment of domestic production to supply substitutes" (Robock, 1970, p.357).

It is argued that an import substitution policy passes through two phases. In the first one the concentration is on consumption goods, while in the second phase the process goes through two parallel lines, first the established import substitution industries must enter the export markets and second, import substitution is shifted to the production of intermediate and capital goods.

Traditional primary goods exports of developing countries have been declining steadily. In addition, developing countries have not been able to penetrate the world export markets with their manufactured products. As a result, the limited inflow of foreign exchange earnings led these countries to concentrate on local markets and foreign exchange saving policies.
Many developing countries have adopted an import substitution industrialization policy to achieve the following objectives: by restricting imports this policy would direct resources to the production of the protected manufactured products which eventually lead to more investment in this sector and hence increase the share of industrial production in GDP achieving structural change in the economy.

Reducing import and directing resources to local production will save foreign exchange and help in easing the chronic balance of payment problem, such policy will also help in generating employment opportunities contributing to lower levels of unemployment. It is also argued that industrialization via import substitution have a dynamic effect on the economy by promoting further industrialization through backward and forward linkages (Hirshman, 1968). Finally, import substitution policy is used as a means of economic and political independence and increased self-sufficiency which will reduce the sensitivity of the economy to external disturbances.

With all of these positive effects the import substitution policy is not free of deficiencies and shortcomings. Firstly, an import substitution policy ignores the principle of comparative advantage and reduce specialization. Secondly, import substitution industries do not attempt to develop techniques suitable for local conditions or improve the relevance of imported technology to the local conditions. Generally capital intensive technology is used despite the abundance of labour. Thirdly, the overemphasis on saving foreign exchange and enhancing the balance of payments leads, in some cases, to establishment of high cost, inefficient, and irrelevant plants producing some luxury goods in these countries. Fourthly, the size of the local market, in most cases, necessitated establishment of industries with capacity below the level accepted by the economies of scale. Finally, implementation of protective measures may lead to a monopoly of local industries due to the absence of foreign competition which eventually lead to low productivity and high costs.

III. The Model

Most of the measures of import substitution are derived and developed from the principal one introduced by chenery (1960) in which he shows that a positive imports substitution occurs when the ratio of domestic production to total supply increased between two periods, or when the ratio of imports to total supply declines between two periods of time. Starting from this point and following Helliener's (1972, P. 127) definition of import substitution which states that "import
substitution is said to have occurred when the proportion of total supply of a particular commodity or group of commodities which is obtained through imports rather than domestic production has declined in the country concerned”, we can say that the change in the country's imports between two periods of time may be decomposed into two components, an element due to a change in total supply of the commodity and an element due to import substitution. This can be shown as follows:

Let us assume that

\[ M_t = \text{imports of the } i\text{'th commodity in period } t. \]

\[ S_t = \text{total supply of the } i\text{'th commodity in period } t, \text{ which is equal to imports plus domestic production of the commodity.} \]

so if

\[ M_1 / S_1 < M_0 / S_0 \]

Where (0) and (1) refer to the time periods being compared, then we can say that the import substitution occurred (James, 1979, P.89).

Let us denote the ratio of imports to total supply as (m) so

\[ m_t = M_t / S_t \]

then \( m_0 = M_0 / S_0 \) and \( m_1 = M_1 / S_1 \)

now we can write

\[ M_0 = m_0 S_0 \text{ and } M_1 = m_1 S_1 \]

The change in imports between time period \( t_0 \) and time period \( t_1 \) is

\[ \Delta M = M_1 - M_0 \]

So

\[ \Delta M = m_1 S_1 - m_0 S_0 \]
by adding and subtracting \( m_0 S_1 \) we obtain

\[
\Delta M = m_1 S_1 - m_0 S_0 + m_0 S_1 - m_0 S_1
\]

and by rearranging we have

\[
\Delta M = m_1 S_1 - m_0 S_1 + m_0 S_1 - m_0 S_1
\]

thus

\[
\Delta M = S_1 (m_1 - m_0) + m_0 (S_1 - S_0)
\]

The above equation shows the decomposition of \( \Delta M \) into its component parts. The first term in this equation \([S_1 (m_1 - m_0)]\) is an absolute measure of import substitution, this absolute measure gives the foreign exchange saved through the process of import substitution.

In order to compare the extent of import substitution between industries, time periods or countries, we need a relative measure. This can easily be obtained by dividing absolute import substitution by the change in domestic production (Helleiner, 1972, P. 96-97). So, the relative import substitution measure is:

\[
S_1 (m_1 - m_0) / Q_1 - Q_0
\]

Where
- \( Q_1 \) : domestic production in period 1
- \( Q_0 \) : domestic production in period 0

and

\[
Q_1 - Q_0 = S_1 (1 - m_1) - S_0 (1 - m_0)
\]

An alternative relative import substitution measure is obtained by the proportionate change in import ratio, that is

\[
\text{Import Substitution} = (m_1 - m_0) / m_0
\]
Each of the three measures of import substitution described above will be used in measuring import substitution in this paper.

IV. Empirical Results

In this section an attempt is made to measure the rate and extent of import substitution in food processing industries in Jordan during the period 1968-1986. Import substitution is measured for the whole period of the study and for three subperiods, namely (1968-1974), (1974-1982) and (1982-1986). The breakdown of the study period serves to reflect the effects of changing circumstances on import substitution. The second period was prolonged to cover the boom period in the Jordanian economy. The unavailability of data on domestic food processing industries production in detail over the study period limits the analysis to a three digit ISIC classification in which food processing industries are divided into three groups, i.e. food products, beverage and cigarette and tobacco.

Detailed data were available for the period (1983-1986) only, hence import substitution was measured over this period for each of the food processing industries, following a four digit ISIC. All the food processing industries according to ISIC existed in Jordan except preparing and preserving meat, canning and preserving fish and sugar refining industries.

Import substitution will be measured between two years, so let us denote the base year with (0) and terminal year with (1) and let us define the following terms:

\[ Q_0 \] : domestic production in year (0)

\[ Q_1 \] : domestic production in year (1)

\[ m_0 \] : the ratio of imports to total supply in year (0)

\[ m_1 \] : the ratio of imports to total supply in year (1)

\[ S_1 \] : total supply (imports + domestic production) in year (1).

Using the terms described above, import substitution is measured as follows:

i) \[ S_1 (m_1 - m_0) \]: This measure represents the difference between the expected value of imports in the terminal year if the (imports/total supply) ratio had stayed as it was in the base year \[ S_1 m_0 \], and the actual value of imports in the terminal year \[ S_1 m_1 \]. This measure shows the foreign exchange saved through the process of import substitution.

ii) \[ (m_1 - m_0) m_0 \]: The relative change in import ratio resulting from the import substitution process.
iii) \( S_1 (m_1 - m_0) / Q_1 - Q_0 \): The percentage of growth in domestic production attributed to the process of import substitution.

Since import substitution is defined by the preceding measures in terms of the change in the import ratio and since the effect of import substitution on this ratio is negative, i.e., when import substitution takes place the import ratio declines, then the above measures will give a negative value when progress in import substitution is made and a positive value when failure of import substitution or increasing import dependency occurs.


The variables used for measuring import substitution in food products in addition to import ratio and the ratio of imports to domestic production are given in table A.1.

This table shows that import ratio of processed food products has declined from 0.65 in 1968 to 0.57 in 1986, implying a successful import substitution during the whole period, however the decline in import ratio has been extremely modest and not continuous over the whole period. This ratio reached a peak of 0.71 in 1979 and showed an obvious declining trend over the period (1982-1986). The high import ratio in 1979 could partly be explained by poor rainfall, which has caused the agricultural production to decline by 25.6 percent.

The ratio of imports to domestic production shows that imports have amounted to 190 percent of domestic production in 1968 and declined to 132 percent of domestic production in 1986. This ratio has shown a continuous decline during the whole study period except in 1979 and 1982. Despite this decline imports were still larger that the domestic production of processed food products.

The levels of import substitution in food products during 1968-1986 and the foreign exchange saved through this substitution are shown in table 1. This table shows that food processing industries have achieved a relative success in replacing imports over the whole period. The absolute decline in import ratio (8.5 percent) between 1968 and 1986 implies an import substitution level of 13 percent. The foreign exchange saved through this process was 7,240 million JDs which imply
that 9.1 percent of growth in total production of this industry during the period was caused by import substitution.

### Table 1

**Import Substitution In Food Products In Jordan Over the Period 1968-1986**

<table>
<thead>
<tr>
<th>Period</th>
<th>((m_1 - m_0))</th>
<th>(\frac{m_1 - m_0}{m_0})</th>
<th>((m_1 - m_0)S_1)</th>
<th>(\frac{(m_1 - m_0)S_1}{Q_1 - Q_0})</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968-1974</td>
<td>-0.00269</td>
<td>-0.00410</td>
<td>-113.451</td>
<td>-0.01192</td>
</tr>
<tr>
<td>1974-1982</td>
<td>0.02553</td>
<td>0.039124</td>
<td>4092.288</td>
<td>0.110755</td>
</tr>
<tr>
<td>1982-1986</td>
<td>-0.10837</td>
<td>-0.15982</td>
<td>-21317.83</td>
<td>-0.64451</td>
</tr>
<tr>
<td>1968-1986</td>
<td>-0.08553</td>
<td>-0.13053</td>
<td>-7239.772</td>
<td>-0.09106</td>
</tr>
</tbody>
</table>

Source: The Calculations are Based on Table A.1.

In 1968-1974 the level of import substitution was only 0.4 percent which represents saving 113.4 thousand JDs of foreign exchange. The import substitution was responsible for only 1.2 percent of the growth in total production of processed food during this period. The low level of import substitution may be attributed to the unstable condition that the Jordanian economy passed through during this period, i.e., the loss of the West Bank in 1967, the 1968 war of attrition with Israel, the civil war in 1970 and the 1973 war with Israel. Given the difficult conditions and due to the fact that Jordan's agricultural production was adversely affected by the loss of the West Bank - which was providing Jordan with a substantial part of agricultural products and natural resources needs - the small success of import substitution strategy during this period is not surprising.

The second period (1974-1982) shows a negative import substitution or an extra import dependency of 3.9 percent which cost the country an extra payment of 4.1 million JDs of foreign exchange. The increasing import dependency amounted to 11.1 percent of the growth of total production of food processing industries during this period.

Several factors have contributed to this situation: first, high population growth due to both natural growth and inflow of Palestinian and Lebanese refugees, increased
the demand for food substantially. Second the oil boom increased the demand for Jordanian workers in the Gulf which in turn positively affected the per capita income in Jordan and the demand for high quality imported foodstuffs, to the detriment of lower quality local production. Third, the instability of supply of inputs from the agricultural sector weakened the ability of food processing industries to expand. (Al-Ahmad and Amerah 1983 P. 78). Finally, the tariff protection offered to food processing industries was substantially lowered since 1976 which resulted in low competitive power for domestic food products in the local market.

The measurement of import substitution over 1982 - 1986 shows that the performance of food processing industries in substituting imports was the best in this period compared to the other two periods. The import substitution level was 16 percent over this period and the foreign exchange saved through import substitution amounted to 21.317 million JDs as shown in table 1. The import substitution process was responsible for 64.4 percent of the total growth in processed food industries' output during the period.

During 1982 - 1986 there were a general slowdown in the main indicators of the Jordanian economy. Despite this unfavourable developments processed food industries were able to expand their production by 46 percent, achieving an average growth rate of 10.4 percent per annum. The effect of the slowdown in economic activities has been to limit imports of processed food to an absolute increase of only 3.1 percent or an average growth rate of 0.6 percent annually during this period, compared to an average growth rate of 16.5 percent annually during the boom period (table A1.). Hence these developments led to a substantial progress in the substitution performance of domestic food processing industries during 1982-1986.

**IV.2. Import Substitution In Beverage During 1968-86**

Table A.2. shows that the ratio of imports to total supply has declined from 0.19 to 0.10 during 68-74 while it increased from 0.10 to 0.15 during 1974-82 and then it showed a continuous decline during 1982-86 to reach its lowest value of 0.07 in 1985, later increasing to 0.10 in 1986.

The ratio of imports to domestic production has also declined from 24 percent to 11.5 percent between 1968 and 1986. The preceding ratios show that the beverage industry has achieved a considerably high level of import substitution during the
period 1968–86, and that only a small fraction of total supply of these products (10.3 percent) was provided by imports in 1986.

Table 2 shows the levels of imports substitution in beverage products during the study period. As in the case of processed food products a successful import substitution was attained during the 1968-74 and 1982-86 periods. While negative import substitution or import liberalization occurred during 1974-82.

An import substitution level of 46.5 percent was attained during the whole period with a saving of 1.438 million JDs of foreign exchange. This import substitution has accounted for 9.4 percent of growth in beverage production during the study period.

<table>
<thead>
<tr>
<th>Period</th>
<th>((m_1 - m_0))</th>
<th>(\frac{m_1 - m_0}{m_0})</th>
<th>((m_1 - m_0)S_1)</th>
<th>(\frac{(m_1 - m_0)S_1}{Q_1 - Q_0})</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968-1974</td>
<td>-0.08949</td>
<td>-0.46288</td>
<td>-214.499</td>
<td>-0.140655</td>
</tr>
<tr>
<td>1974-1982</td>
<td>0.04653</td>
<td>0.448093</td>
<td>807.236</td>
<td>0.064107</td>
</tr>
<tr>
<td>1982-1986</td>
<td>-0.04697</td>
<td>-0.31236</td>
<td>-751.226</td>
<td>*</td>
</tr>
<tr>
<td>1968-1986</td>
<td>-0.08993</td>
<td>-0.46516</td>
<td>-1438.318</td>
<td>-0.09449</td>
</tr>
</tbody>
</table>

* Total Production of Beverages Industry has Declined in 1986 by 400 Thousand JDs.
Source:—The Calculation are Based on Table A.2.

The level of import substitution obtained during the first period was similar to that obtained during the whole period in terms of the relative change in imports ratio. The saving of foreign exchange during this period amounted to 214.5 thousand JDs which contributed 14 percent of the growth in total production of beverage. In the second period (1974-82) the import ratio increased by 44.8 percent leading to the extra import dependency of 807.2 thousand JDs which reached 6.4 percent of the growth in total production of beverage (table 2).

In the period (1982-86) an import substitution level of 31 percent was obtained and 751.2 thousand JDs equivalent of foreign exchange was saved.
IV.3. Import Substitution in Cigarette and Tobacco During (1968-1986)

The basic data used in measuring import substitution in the cigarette and tobacco industry in Jordan is presented in table A.3. As evident from this table the imports ratio has declined from 26.7 percent in 1968 to reach 3.8 percent in 1986 indicating that this industry has been able to cover 96 percent of local demand for tobacco and cigarette in 1986. The import ratio has reached its lowest level of 1 percent in 1974.

The ratio of imports to domestic production shows a decline from 36.4 percent in 1968 to 4 percent in 1986 reflecting the ability of this industry to substitute the greatest part of imports during this period.

Table 3 shows that the import substitution level obtained during the whole period was 85.6 percent leading to a saving of 10.9 million JDs. The import substitution process was responsible for 25.4 percent of the total growth in tobacco and cigarette production during the whole period (1968-86).

The level of import substitution over the 1968-1974 period reached 95.2 percent with a saving of 1.5 million JDs equivalent of foreign exchange. The import substitution was responsible for 51 percent of the total growth in cigarette and tobacco production during this period. The following two periods, (1974-82) and (1982-86) have witnessed negative import substitution or import liberalization of 650 thousand JDs and 289.2 thousand JDs respectively.

Table 3
Import Substitution in Cigarettes and Tobacco Industry
in Jordan Over the Period 1968-1986

<table>
<thead>
<tr>
<th>Period</th>
<th>(m_1 - m_0)</th>
<th>(\frac{m_1 - m_0}{m_0})</th>
<th>((m_1 - m_0)S_1)</th>
<th>(\frac{(m_1 - m_0)S_1}{Q_1 - Q_0})</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968-1974</td>
<td>-0.25402</td>
<td>-0.95174</td>
<td>-1533 976</td>
<td>-0.53379</td>
</tr>
<tr>
<td>1974-1982</td>
<td>0.01954</td>
<td>1.517081</td>
<td>650.594</td>
<td>0.024780</td>
</tr>
<tr>
<td>1982-1986</td>
<td>0.00607</td>
<td>0.18723</td>
<td>289.241</td>
<td>0.021266</td>
</tr>
<tr>
<td>1968-1986</td>
<td>-0.22841</td>
<td>-0.85579</td>
<td>-10883.965</td>
<td>-0.254037</td>
</tr>
</tbody>
</table>

Source:– The Calculations are Based on Table A.3.
In addition to its success in substituting imports the export performance in the tobacco and cigarette industry was also quite good during the study period. The ratio of exports to total production in this industry has increased from 18.3 percent in 1986 to 23 percent in 1980, however this ratio declined thereafter to reach 15.2 percent in 1982 and only 2.8 percent in 1986. Accordingly the tobacco and cigarette industry may be regarded as one of Jordan's export industries until 1982, as economists consider any industry that exports more than 15 percent of its production as an export industry (Balassa and Associates 1971, P. 211 and 304).

It is worth noting here that the success of the tobacco and cigarette industry was due firstly to efficiency in this industry and secondly to high rates of effective protection offered to it, through banning imports in some years and increasing tariff rates in others (Al-Ahmad and Amerah, 1983, P. 76).


For more detailed analysis of import substitution performance we measure the levels of import substitution achieved in each of the different food industries that have existed in Jordan following a four digit International Standard Industrial Classification (ISIC). The unavailability of data over the whole study period limits the measurement for the period of 1983-86.

Table A.4 shows the basic data used in measuring import substitution in different food processing industries during 1983-86. It is evident from the table that the import ratio for seven out of nine food products has shown a decline during 1983-86 implying a successful import substitution. This ratio has increased for two of these products, namely, vegetables and animal oils and fats and prepared animal feeds implying a failure of import substitution policy and increased import dependency for the two products.

The ratio of imports to domestic production has also shown a decline for the seven processed food products that have achieved successful import substitution performance. The same ratio has shown an increasing trend for the vegetables and animal oils and fats and the prepared animal feeds industries. This ratio was greater than 1 in 1986 - implying that a larger share of the local market is still supplied by imports rather than domestic production - for dairy products, canning and preserving of fruits and vegetables, and animal oils and fats (table A.4).
Table 4
Import Substitution in the Different Processed Food Products in Jordan Over the Period 1983-1986

<table>
<thead>
<tr>
<th>Industry</th>
<th>$(m_1 - m_0) / m_0$</th>
<th>$(m_1 - m_0)S_1$</th>
<th>$(m_1 - m_0)S_1 / Q_1 - Q_0$</th>
<th>Rank in Import</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Dairy Products</td>
<td>-0.12172</td>
<td>-0.1691</td>
<td>-3367.871</td>
<td>4</td>
</tr>
<tr>
<td>-Canning &amp; Preserving of Fruits and Veg.</td>
<td>-0.18289</td>
<td>-0.25118</td>
<td>-2175.659</td>
<td>2</td>
</tr>
<tr>
<td>-Veg. &amp; Animal Oils &amp; Fats**</td>
<td>0.08571</td>
<td>0.08527</td>
<td>726.428</td>
<td>8</td>
</tr>
<tr>
<td>-Grain Mill Products</td>
<td>-0.01178</td>
<td>-0.03112</td>
<td>-372.123</td>
<td>7</td>
</tr>
<tr>
<td>-Bakery Products</td>
<td>-0.01243</td>
<td>-0.14738</td>
<td>-199.981</td>
<td>5</td>
</tr>
<tr>
<td>-Chocolate &amp; Sugar</td>
<td>-0.20241</td>
<td>0.33475</td>
<td>-5664.309</td>
<td>1</td>
</tr>
<tr>
<td>confec. &amp; FPNEC***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Prepared Animal Feeds</td>
<td>-0.10743</td>
<td>-0.33461</td>
<td>3398.045</td>
<td>9</td>
</tr>
<tr>
<td>-Alcoholic Beverages</td>
<td>-0.0417</td>
<td>-0.1268</td>
<td>-205.214</td>
<td>****</td>
</tr>
<tr>
<td>-Soft Drinks &amp; Carbonated Water</td>
<td>-0.00582</td>
<td>-0.21179</td>
<td>-64.634</td>
<td>3</td>
</tr>
</tbody>
</table>

Substitution:

* Ranked according to the relative decline in the import ratio $m_1 - m_0 / m_0$

** During the period 1984-1986

*** Food Products not Elsewhere Classified.

**** Total output have declined for alcoholic beverages and soft drinks and carbonated water in 1986 by 849 thousand and 1048 thousand JDs respectively.

Source: Based on Data of Table A.4

The levels of import substitution attained in different processed food products during 1983-1986 are given in table 4. The highest level of import substitution was in chocolate and sugar confectionery and food products not elsewhere classified. The relative decline in import ratio for these products was 33.5 percent with a saving of about 5.7 million JDs of foreign exchange. This import substitution was responsible for 59.4 percent of the growth in total production of these industries during 83-86. The domestic production of these industries has grown by 132.4 percent during the period 83-86.
Among the other food processing industries that witnessed a high level of import substitution during 1983-86 was the canning and preserving of fruits and vegetables industry which shows a 25.1 percent level of import substitution with savings of about 2.2 million JDs equivalent of foreign currency. 78.9 percent of the growth in this industry during 83-86 was directed to substitution of imports, while only 21.1 percent of this growth was caused by the growth in local demand and exports expansion.

The last column of table 4 shows the rank in import substitution of the different food processing industries according to the relative change in their import ratios. The lowest import substitution performances were found in the prepared animal feeds and vegetables and animal oils and fats industries. These two industries have shown an increasing import dependency of 33.5 percent and 8.5 percent and foreign exchange dissaving equivalent to 3.4 million JDs and 0.7 million JDs respectively.

Two of the food processing industries, namely alcoholic beverage and soft drinks and carbonated water, have shown successful import Substitution of 12.6 percent and 21.2 percent respectively, while their total production has declined by 19.5 percent and 8.8 percent respectively, over the period 1983-1986 (Table A.4). The decrease in the production of these industries could be explained by the decline in their exports in 1986 in addition to the slowdown of growth of local demand as a result of the downturn in economic activity. However, the decline in exports and local demand was partly compensated for by directing some of the production to substitute imports.

This means that import substitution occurred due to a shift in local demand from imported to locally produced products. It also means that, had no import substitution occurred, the decline in alcoholic beverage and soft drinks and carbonated water industries' production would have been more than the observed decline.

V. Conclusion

Import substitution achieved in food processing industries in terms of the relative decline in the ratio of imports to total supply were 13 percent, 46.5 percent, and 85.6 percent in processed food, beverage, and tobacco and cigarette industries respectively, during 1968-1986 period. The foreign exchange saved through the process of import substitution in the three groups of industries was equivalent to 7.239 million, 1.438 million, and 10.883 million JDs respectively.
These results show a good import substitution performance in cigarette and tobacco and beverage industries and relatively poor performance in the processed food industry during the study period. However, considering the sub periods there was an improvement in the import substitution performance of the processed food industry during 1982-1986 period.

With the exception of vegetables and animal oils and fats, and prepared animal food industries the ratio of imports to domestic production has declined in all other processed food products during 1983-1986 showing successful import substitution performance. The highest level of import substitution during this period has been achieved in chocolate and sugar confectionery and food products not elsewhere classified.

The analysis covered in this study suggests that there are good potentials for import substitution in Jordanian food processing industries. A large part of the domestic market can easily be satisfied by domestic production. However comprehensive feasibility studies are needed before any economic project is undertaken.

Government subsidies, in terms of tax exemption or tariff protection, may be needed to help these industries at least for an initial period of time until the industries are able to stand on their feet.

The Civil and Military Consumption associations as well as consumers cooperatives should encourage the sale of domestically produced food products in their stores.

The importation of foodstuffs should be limited to essential products that have no local substitutes.

The agricultural sector should be subsidised and encouraged to increase its production to substitute food imports and provide the inputs for local food processing industries.

Finally a national mass media campaign should be undertaken to educate people about the importance of encouraging local food production in order to achieve progress towards the national goals of food security and self dependence in food.
Appendix

Table A.1
Imports, Domestic Production, Total Supply, Import Ratio and the Ratio of Imports to Domestic Production of Food Products Industry in Jordan During 1968-1986 (000 JDs)

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Domestic Production</th>
<th>Total Supply</th>
<th>Imports/Total Supply</th>
<th>Imports/Domestic Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td>9779.3</td>
<td>5141</td>
<td>14911.3</td>
<td>0.65523</td>
<td>1.900</td>
</tr>
<tr>
<td>1974</td>
<td>27521.2</td>
<td>14654</td>
<td>42175.2</td>
<td>0.65254</td>
<td>1.878</td>
</tr>
<tr>
<td>1979</td>
<td>61937.9</td>
<td>25154</td>
<td>87091.9</td>
<td>0.71180</td>
<td>2.462</td>
</tr>
<tr>
<td>1980</td>
<td>71433.4</td>
<td>40504</td>
<td>111937.4</td>
<td>0.63815</td>
<td>1.764</td>
</tr>
<tr>
<td>1982</td>
<td>108690.3</td>
<td>51603</td>
<td>160293.3</td>
<td>0.67807</td>
<td>2.106</td>
</tr>
<tr>
<td>1983</td>
<td>82773.0</td>
<td>48542</td>
<td>131305.0</td>
<td>0.63031</td>
<td>1.705</td>
</tr>
<tr>
<td>1984</td>
<td>105347.8</td>
<td>68339</td>
<td>175120.8</td>
<td>0.60157</td>
<td>1.510</td>
</tr>
<tr>
<td>1985</td>
<td>110962.2</td>
<td>84531</td>
<td>195493.2</td>
<td>0.56760</td>
<td>1.313</td>
</tr>
<tr>
<td>1986</td>
<td>112067.4</td>
<td>84646</td>
<td>196713.4</td>
<td>0.55970</td>
<td>1.324</td>
</tr>
</tbody>
</table>

Sources:
### Table A.2
Imports, Domestic Production, Total Supply, Import Ratio and the Ratio of Imports to Domestic Production of Beverages Products in Jordan During 1968-1986

(000 JDs)

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Domestic Production</th>
<th>Total Supply</th>
<th>Imports/ Total Supply</th>
<th>Imports/ Domestic Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td>149.309</td>
<td>623</td>
<td>772.309</td>
<td>0.19330</td>
<td>0.240</td>
</tr>
<tr>
<td>1974</td>
<td>248.908</td>
<td>2148</td>
<td>2396.908</td>
<td>0.10384</td>
<td>0.116</td>
</tr>
<tr>
<td>1979</td>
<td>1709.437</td>
<td>11305</td>
<td>13014.437</td>
<td>0.13135</td>
<td>0.151</td>
</tr>
<tr>
<td>1980</td>
<td>1904.217</td>
<td>11666</td>
<td>13570.217</td>
<td>0.14032</td>
<td>0.163</td>
</tr>
<tr>
<td>1982</td>
<td>2608.729</td>
<td>14740</td>
<td>17348.729</td>
<td>0.15037</td>
<td>0.177</td>
</tr>
<tr>
<td>1983</td>
<td>2471.572</td>
<td>16270</td>
<td>18741.572</td>
<td>0.13188</td>
<td>0.152</td>
</tr>
<tr>
<td>1984</td>
<td>1734.307</td>
<td>17193</td>
<td>18931.307</td>
<td>0.09208</td>
<td>0.101</td>
</tr>
<tr>
<td>1985</td>
<td>1435.505</td>
<td>18659</td>
<td>20094.505</td>
<td>0.07144</td>
<td>0.077</td>
</tr>
<tr>
<td>1986</td>
<td>1653.749</td>
<td>14340</td>
<td>15993.749</td>
<td>0.10340</td>
<td>0.115</td>
</tr>
</tbody>
</table>

Sources: The same sources of Table A.1

### Table A.3
Imports, Domestic Production, Total Supply, Import Ratio and the Ratio of Imports to Domestic Production In Cigarettes and Tobacco Industry In Jordan During 1968-1986

(000 JDs)

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Domestic Production</th>
<th>Total Supply</th>
<th>Imports/ Total Supply</th>
<th>Imports/ Domestic Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td>1082.4</td>
<td>2973</td>
<td>4055.4</td>
<td>0.26690</td>
<td>0.364</td>
</tr>
<tr>
<td>1974</td>
<td>77.8</td>
<td>5961</td>
<td>6038.8</td>
<td>0.01288</td>
<td>0.013</td>
</tr>
<tr>
<td>1979</td>
<td>3207.9</td>
<td>17801</td>
<td>21008.9</td>
<td>0.15269</td>
<td>0.180</td>
</tr>
<tr>
<td>1980</td>
<td>3276.5</td>
<td>22204</td>
<td>25480.5</td>
<td>0.12859</td>
<td>0.147</td>
</tr>
<tr>
<td>1982</td>
<td>1079.5</td>
<td>32216</td>
<td>33295.5</td>
<td>0.03242</td>
<td>0.033</td>
</tr>
<tr>
<td>1983</td>
<td>2223.7</td>
<td>39316</td>
<td>41539.7</td>
<td>0.05353</td>
<td>0.056</td>
</tr>
<tr>
<td>1984</td>
<td>1264.9</td>
<td>43430</td>
<td>44694.9</td>
<td>0.02830</td>
<td>0.029</td>
</tr>
<tr>
<td>1985</td>
<td>1597.6</td>
<td>46854</td>
<td>48451.6</td>
<td>0.03297</td>
<td>0.034</td>
</tr>
<tr>
<td>1986</td>
<td>1834.0</td>
<td>45817</td>
<td>47651.0</td>
<td>0.03849</td>
<td>0.040</td>
</tr>
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</table>

Sources: The same sources of Table A.1
Table A.4
Imports, Domestic Production, Total Supply, Import Ratio and the Ratio of Imports to Domestic Production of the Different Processed Food Products in Jordan During 1983-1986

<table>
<thead>
<tr>
<th>Industry</th>
<th>Year</th>
<th>Imports</th>
<th>Domestic Production</th>
<th>Total Supply</th>
<th>Imports/ Domestic Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Dairy Products</td>
<td>1983</td>
<td>15094</td>
<td>5876</td>
<td>20970</td>
<td>0.71979</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>16548</td>
<td>11121</td>
<td>27669</td>
<td>0.59807</td>
</tr>
<tr>
<td>- Canning &amp; Preserving of Fruits and Veg.</td>
<td>1983</td>
<td>7102</td>
<td>2652</td>
<td>9754</td>
<td>0.72811</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>6486</td>
<td>5410</td>
<td>11896</td>
<td>0.54522</td>
</tr>
<tr>
<td>- Veg. &amp; Animal Oils &amp; Fats</td>
<td>1983</td>
<td>3939</td>
<td>1984</td>
<td>5923</td>
<td>0.66506</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>9245</td>
<td>3564</td>
<td>12809</td>
<td>0.72177</td>
</tr>
<tr>
<td>- Grain Mill Products</td>
<td>1983</td>
<td>7210</td>
<td>11837</td>
<td>19047</td>
<td>0.37854</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>11586</td>
<td>20004</td>
<td>31590</td>
<td>0.36676</td>
</tr>
<tr>
<td>- Bakery Products</td>
<td>1983</td>
<td>1051</td>
<td>11416</td>
<td>12467</td>
<td>0.08434</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>1156</td>
<td>14925</td>
<td>16081</td>
<td>0.07191</td>
</tr>
<tr>
<td>- Chocolate &amp; Sugar confec. &amp; FPNEC**</td>
<td>1983</td>
<td>11007</td>
<td>7197</td>
<td>18204</td>
<td>0.60465</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>11256</td>
<td>16728</td>
<td>27984</td>
<td>0.40224</td>
</tr>
<tr>
<td>- Prepared Animal Feeds</td>
<td>1983</td>
<td>4523</td>
<td>9564</td>
<td>14087</td>
<td>0.32106</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>13553</td>
<td>18077</td>
<td>31630</td>
<td>0.42849</td>
</tr>
<tr>
<td>- Alcoholic Beverages</td>
<td>1983</td>
<td>2135</td>
<td>4357</td>
<td>6492</td>
<td>0.32886</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>1414</td>
<td>3508</td>
<td>4921</td>
<td>0.28716</td>
</tr>
<tr>
<td>- Soft Drinks &amp; Carbonated Water</td>
<td>1983</td>
<td>337</td>
<td>11913</td>
<td>12250</td>
<td>0.02748</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>240</td>
<td>10865</td>
<td>11105</td>
<td>0.02166</td>
</tr>
</tbody>
</table>

* Total revenue of industry is being used as a proxy for total production due to lack of data.

** Food Products not Elsewhere Classified.

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