ERF WORKING PAPER SERIES

SOURCES OF STRUCTURAL CHANGE WITHIN AN INPUT-OUTPUT ANALYSIS FRAMEWORK: THE CASE OF KUWAIT 1983-1995

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Working Paper 0301

Abstract

The state of Kuwait, like other developing countries, aims at diversifying its economy. This paper examines the sources of structural change as a means of diversification. An Input-output (I-O) decomposition analysis, among others, is used to cover the period 1983-1995. The results show that among these sources domestic demand plays a vital role, followed by export demand, import substitution, and technical change, respectively. Other indicators for testing structural change are used. These include: forward and backward linkages, and the share of consumer, intermediate, and investment activities in total manufacturing value added. The other two indicators also reveal modest structural change.

1. Introduction

The state of Kuwait, like other small oil exporting countries, seeks to diversify its economy through different means. Since the first economic plan of 1967/1968-1971/1972, the state of Kuwait placed emphasis on the economic diversification objective. Both private and public – owned activities were addressed to achieve the objective.

This paper examines the reality of diversification by means of structural change between the years 1983 and 1995. The selection of the two years is based on: (a) their comparability in terms of aggregation, and (b) the availability of the price indices needed to value both tables in constant prices. The 1995 I-O is the latest officially issued table in the state of Kuwait.

A decomposition analysis is used to measure the sources of structural change between the two years. These sources are: domestic demand, export demand, import substitution, and technical change. The paper concludes that domestic demand played a vital role, followed by export demand, import substitution, and technical change.

2. Structural Change

The term of "structure" refers to either the internal composition of a system, that is, an economic system, or to interactive relations between the system components (University of Washington, 2002). Structural change, accordingly, refers to the changes in such internal composition and/or patterns of interdependence. According to the Palgrave Dictionary of Economics (Eatwell, et. al, 1991, p.523), two approaches exist in the economic literature to view the terms of structural change. The first, based mainly on the work of Chenery-Syrquin aims at constructing a general theory of structural change. In their work on "Pattern of Development 1957-1970," they succeeded in describing multi-sided patterns of structural change that some hundred countries commonly experienced along with economic growth as "stylized facts". The second approach uses particular theories to explain the development pattern of a similar group of countries, whether in terms of economic conditions or systems. A prominent example, in this respect, is the work of Arthur Lewis on industrialization through unlimited supply of labor.

As mentioned above, structural change is concerned with relations between economic system components. To tackle such relations properly, the I-O table is considered to be the most suitable tools to assess structural change and its sources. The disaggregated table, whether in terms of intermediate inputs, final demand components, and value-added factor, makes it a manageable tool to trace almost all economic variables responsible for structural change. These variables include, among others, technological change, import-substitution, final demand, product mix, economic growth, and value-added.

The literature on the use of I-O within the framework of structural change is, indeed, very rich. The prominent work of Chenery (1979, pp.108-142) rests upon decomposing growth of each sector into four sources: domestic demand, export expansion, import substitution, and technological change. From a policy analysis point of view, Chenery pointed out two advantages associated with this type of decomposition. First, the provision of a quantitative framework to assess different development strategies over time and among countries; and, second, the determination of the relative importance attached to every source of growth.[1]

Dietzenbacher and Los (2000, p.308), indicate that using the I-O technique to decompose the sources of structural change gives access to quantify the underlying sources of change in a number of variables. These include output, value added, energy, labor requirement, volume of imports, output of services industries, and total input requirement.

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[1] Chenery re-asserts the distinction between structure of the economy and the structure of the model (i.e. structural parameters) (Ibid, footnote 33, p.109).

Another way of measuring structural change, within the I-O framework, is through Multiplier Product Matrix (MPM) (Guo and Planting, 2001, pp.6-8). MPM is a measure of relationships industries based on measuring backward and forward linkages simultaneously. [2]

Sources of Structural Change, within the I-O framework, can be identified using different approaches, depending on the degree of disaggregation (total transactions matrix or local/import matrices, and disaggregation of final demand and value added columns and row vectors, respectively). According to the Scottish experience, these sources were disaggregated into four: rate of growth, differentiation in industrial rates of growth, changes in relative importance of intermediate and value added inputs, and the changes in the relative importance of individual intermediate inputs (Dewhurst, 1993, pp.42-44).

In the Chilean case, the sources were classified into: demand expansion, export expansion, the contribution of import substitution in final and intermediate demand, and technical coefficients (Albala-Bertranda, 1999, pp.303-306).

The methodology used in this paper is based on the contribution of Miguel and Albala-Bertrand (1999, p.305), where the changes in output can be decomposed as follows:

$$\Delta X = B_0 \hat{U}_0^F \Delta F + B_0 \Delta E + B_0 \Delta \hat{U}^F F_1 + B_0 \Delta \hat{U}^W W_1 i + B_0 \hat{U}_0^W \Delta A X_1 \quad (1)$$

Each of the five elements on the right-hand side of the above equation represents a direct and indirect of final demand component for the output.

Where:

ΔX = Change in Output

$B = (I - \hat{U}_0^W A)^{-1}$

I = Unity Matrix

A = Technical Coefficient Matrix

$\hat{U}^W = (I - \hat{M}^F)$

$\hat{M}^W$ = Diagonal Matrix of Imported Intermediate Input

F = Domestic Final Demand Column Vector

E = Export Column Demand Vector

$\hat{U}^F = (I - \hat{M}^F)$

$\hat{M}^F$ = Diagonal Matrix of Imported Final Demand (Competitive Imports)

W_i = Intermediate Demand Matrix

X = Output Column Vector

0, 1 = Refers to the years: 1983 and 1995, respectively

Accordingly, the terms of the above equation have the following meanings:

[2] $MPM = 1/V \begin{bmatrix} b_{1*} \\ b_{2*} \\ \vdots \\ b_{n*} \end{bmatrix} (b_{*1} \quad b_{*2} \quad \ldots \quad b_{*n})$,

where V= the row and columns of Leontief inverse matrix (LIM), b_{i*} = the row sum of LIM, and b_{*j} = the column sum of LIM (Ibid., p.7).

$B_0 \hat{U}_0^F \Delta F$ = Contribution of Domestic Demand

$B_0 \Delta E$ = Contribution of Export Demand

$B_0 \Delta \hat{U}^F F_1$ = Contribution of Import Substitution of Final Demand

$B_0 \Delta \hat{U}^W W_1 i$ = Contribution of Import Substitution of Intermediate Imports

$B_0 \hat{U}_0^W ?AX_1$ = Contribution of Technical Coefficients.

Since Kuwait's I-O tables do not distinguish between domestic and imported intermediate goods, this paper makes two modifications in the above-mentioned equation: First, discarding the term $(\hat{U}^W)$ and instead assuming that A matrix includes both domestic and imported intermediate consumption, which is the case in the Kuwaiti's I-O tables. Second, the paper does not count for the terms $\left(B_0 ? \hat{U}^W W_i\right)$ due to absence of $(\hat{U}^W)$. As for the contribution of the technical coefficient for output change, matrix A is taken to count for both domestic and imported intermediate goods, as mentioned above.

3. Data

The two Kuwaiti I-O tables of 1983 and 1995 were used to measure the structural change during this period. All government services and non-profit organizations saving household and services to households were added together to form a 29x29 I-O table. Petroleum refining, and other chemical products (ISIC 353 and 35-353), real estate, business services, and machinery equipment rental and leasing (ISIC 831 and 832 + 833) were also aggregated,. Table (1) shows the layout of the aggregation structure.

Table (2) illustrates the price indices used to convert both tables of 1983 and 1995 into constant prices (1980 = 1). Since, no export prices index is published by the Kuwaiti Central Statistical Office, an oil export prices index was constructed to stand for the total export price index. This is justified on the grounds that oil export represents (89.2 percent) and (94.4 percent) of total export in 1983 and 1995 respectively (Annual Statistical Abstract, 1996, p. 183).

4. Results

General Trends: At the outset, structural change can be tentatively assessed by the means of changes in forward and backward linkages coefficients (Guo and Planting, 2001, p.2). Tables (3) and (4) show the results of applying equations (2) and (3). In the case of Kuwait both types of linkages witnessed, during the period in question, a general decline. The lowest backward linkage (0.5739) was for crude oil and natural gas in 1983, decreased to (0.4724) in 1995; while the highest linkage (1.6126) was linkage to financial institutions in 1983, decreased to (1.5859) in 1995. Similarly, the lowest forward linkage (0.5594) was for fishing in 1983, decreased to (0.4760) in 1995; while the highest forward linkage (2.0610) was for crude oil and natural gas in 1983, increased to (2.7311) in 1995. Out of 29 activities only (8) activities showed an increase in their value of linkage coefficients: electricity and gas, government services, producers of private non-profit services to households domestic services, and other producers, other manufacturers, petroleum refining and other chemical products except petroleum refining, other mining and quarrying, water, real estate and business services, and personal services. For the remaining 21 activities, (of which 7 are manufacturing activities) the value of coefficients decreased.

Since the first five year economic plan of 1967/1968 – 1971/1972, manufacturing activities were addressed to lead the diversification process of the Kuwaiti economy.[3] Excluding petroleum refining and other chemical products, and other manufacturing, all other

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[3] This role has continued with the recent economic development plan 2001/2002 – 2005/2006, with special emphasis on the privatization objective of manufacturing, and other non-crude oil activities (Ministry of Planning 2001, pp.49-56).

manufacturing activities have not shown a level of strong linkages to reflect the diversification objective.

$$\text{Forward Linkage} = r_j = \frac{\sum_{i=1} r_{ij}}{n} \Big/ \frac{\sum_i \sum_j r_{ij}}{n^2} \quad (2)$$

where r_{ij} = direct and indirect requirements of activity (i) to produce one unit of activity (j)

n = number of activities.

i,j=1,.., 29

$$\text{Backward Linkage} = r_i = \frac{\sum_{j=1} r_{ij}}{n} \Big/ \frac{\sum_i \sum_j r_{ij}}{n^2} \quad (3)$$

Where r_{ij} = direct and indirect requirements of activity (i) to produce one unit of activity (j)

n= number of activities.

i,j=1,.., 29

By and large, manufacturing activities linkages lost ground in favor of non-manufacturing ones. This is true, whether in terms of forward linkages, (where financial institutions, crude oil and natural gas, communications, water, real estate and business services, and transport and storage, showed increases in these types of linkage), or in terms of backward linkages, (where electricity and gas, government services, water, real estate and business services, and personal services expressed a higher values of these linkages).

Besides forward and backward linkages approach, structural change can, generally, be assessed with reference to the coefficients of structural change in industrial value added. Equation (4) is used to measure these coefficients:

$$COS? = \frac{A_1B_1 + A_2B_2 + \ldots A_nB_n}{\sqrt{A_1^2 + A_2^2 + \ldots A_n^2}\sqrt{B_1^2 + B_2^2 + \ldots B_n^2}} \quad (4)$$

Where (A_1, A_2, … A_n) and (B_1, B_2, … B_n) represent the relative share of each International Standard International Classification (ISIC) in total industrial value added in the years 1983 and 1995, respectively. The farther the value of COS? is from 1, the greater the structural change and vice versa (Girgis, 1986, p.22).

Table (5) shows the values of the value added structural change for the different categories of the Kuwaiti manufacturing activities for the period 1983-1995.

It is evident that no structural change is noticed for the three individual activities and for manufacturing activities as a whole. This result is supported by the same conclusion for the period 1971-1980 (Girgis, op.cit., p.22). That is to say that since 1971 up until 1995, manufacturing value added had not experienced tangible structural change.[4]

5. Main Sources of Output Change

5.1 Actual Trend

The official figures released on gross domestic product, by origin, during 1983-1995, showed that sectoral structural change had been in favor of crude oil activity. Based on 1984 prices, the share of the latter activity in GDP increased from 50.98 percent to 63.06 percent. On the

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[4] The corresponding coefficients of Girgis (1986) were: 0.972, 0.982, 0.590, and 0.979, respectively. When assigning the manufacturing sector by reference to a number of economic variables, our industrial census is net (which include all size of enterprises). But when using an agreed upon criteria to measure non-performing enterprises (from different activities) only long enterprises are included.

contrary, the share of manufacturing activities as a whole, had declined from 4.88 percent to 3.88. Whereas the share of oil-based manufacturing activities, that is, petroleum refining and other chemical products, had increased slightly from 1.74 percent to 2.1 percent. All shares of other individual manufacturing activities had declined. This trend applied to the rest of non-manufacturing activities, that is, services, except government services, which increased from 6.45 percent to 10.25 percent.

Against the expectations of Kuwaiti economic plans, manufacturing activities do not act as a vehicle towards diversification, and then structural change, as is the case in the process of economic transformation. According to Syrquin and Chenery (1989, pp.163-166), Kuwait can be classified under "outward, primary-oriented economies". The authors believe that "most mineral (oil) exporters evidenced some signs of Dutch Disease in the wake of sharp increases in the price of energy. The share of mining in output increased at the expense of both manufacturing and agriculture" (Ibid., p.166). In his early works, Chenery also noted that structural change through industrialization involves: (a) a raise in relative importance of manufacturing; (b) a change in the composition of industrial output; and (c) a change in production techniques (technical coefficients as proxy) and source of supply of individual commodities (Chenery, 1960, p.635). Apart from a slightly statistically significant effect of technical coefficient, item (c) and items (a) and (b) had not materialized effectively during 1983-1995.

5.2 Calculated Trends

Using equation (1), as suggested by Albala-Bertrand (1999, pp.303-305), table (6) represents the main finding of the sources of output structural change. Before analyzing these findings, a caveat is needed. As pointed out earlier, since Kuwaiti I-O tables do not distinguish between local and imported intermediate matrices, one cannot count for the contribution of import substitution of intermediate goods, and the contribution of changes in I-O coefficients by origin (local and imported). Therefore, the fourth item of the Albala-Bertrand's formula was dropped, keeping the first three items, which stand for the following sources: domestic, export, and import substitution of final demand, and technical coefficients (local plus import).

Table 6 reveals that domestic demand played a prominent role as a main source of output structural change during 1983-1995, followed by export demand, import substitution, and technical coefficient effect. Among manufacturing activities, the source of structural change had almost been shared by domestic, and export demand (59 percent and 68 percent respectively). Food and tobacco is another peculiar activity, which is driven by domestic and export demand alike. This activity absorbs the third highest intermediate inputs in 1999 (Central Statistical Office, 1998, pp.1-2). On the contrary, the import intermediate ratio is the fourth highest in 1995, (table 8).

Speaking of services, communication is the leading activity where domestic demand is in control. Despite zero exports of this activity, the effect of export demand is the highest. This is explained mainly by the structure of inter-industry activities (for the two years, 1983 and 1995, communication maintained the second highest backward linkage of 0.6065 and 0.4948 respectively, (table 4)). As for financial institutions, domestic demand maintained the decisive impact (to what extent this will be the case after Kuwaiti banks open for foreign competition is left to be answered). In case of insurance, domestic factor was no longer the main determinant factor of structural change where export is the main factor. Therefore, after liberalizing financial activities in Kuwait, completion should be less severe on insurance, compared with banking. Education and health activities, were driven by domestic demand.

Unlike developed and newly industrialized countries, technical coefficients play the lowest role in output change. National wise, the share of technical coefficient reached (3.8 percent), and the higher percentages were exercised by utilities, that is, Electricity, gas and water (14.9 percent), and financial activities, that is, financial institutions and insurance (14.2 percent).

To test the statistical significance of technical coefficients, the following test statistics is used (Bhatta, 2002, p.10):

$$\frac{\overline{D}}{S_D\sqrt{n}}$$

where ($\overline{D}$) refers to the average difference in Leontief inverse matrix element values (1983 and 1998), (S_D) the standard deviation of the differences, and n to number of data points (29 x 29 = 841). The statistics shows a calculated value of (-6.01) which is statistically significant at different levels.

As shown in table (6), domestic demand played a positive role in changing the output of 24 activities, with the highest percentage contributions, followed by the role of export demand, and to a lesser extent by import substitution, and technical coefficients. These conclusions do not change drastically, in table (7), where aggregated activities are used. Domestic demand and export demand are still the main source behind sectoral structural change.

Within the activities listed in table (6), some have a special role, one of which is activity 9, petroleum refining and other chemical products. This activity had the highest improvement in forward linkages (1983-1995), and the fourth highest improvement in backward linkages during the same period, (table 4). It absorbed about 13.2 percent of labor employed in all ISIC activity in 1995 (manufacture of fabricated metal products, machinery and equipment; textile, weaving apparel and leather industries; and manufacturing of food, beverages and tobacco, absorbed 20 percent, 17 percent and 14 percent respectively). Activity 9 also absorbed about 73 percent of intermediate input used in all ISIC activity (Central Statistical Office, 1998, pp.1-2). Moreover, this activity showed one of the lowest import/intermediate ratio, 0.925 (table 8), compared with 5.670 in agriculture and fishing, 2.607 in food, beverage and tobacco, and 6.309 in textile, weaving and apparel, in 1995. In addition, activity 9 was driven by export demand as a main driving force behind its structural changes.

6. Concluding Remarks

Against the economic objectives set for the Kuwaiti economy, manufacturing activities are not playing the expected role in diversifying the income sources on the economy. Despite the actual increase in the share of petroleum refining and other chemical products in GDP, the share of other manufacturing activities showed a declining trend.

Using a decomposed input-output analysis, this paper attributes the change in output, during the period 1983-1995 to a number of economic factors. Despite the high degree of openness and the historical adoption of an import substitution strategy, domestic demand acts as prominent factor behind GDP change in most manifesting activities. By re-grouping these activities into broad categories, the influence of the factors remains the same.

Unless a breakthrough in the non-oil based manufacturing exports does happen, local absorption will continue controlling the level of non-oil manufacturing activities. If this will be the case, an activity-based assessment is needed to estimate the coefficients of main explanatory variables affecting the behavior of local consumption and investment of the commodities produced by these activities. In parallel, technical change should be encouraged, along with export promotion, to reach the diversification objective by employing all sources of structural change.

To achieve a fair conclusion on the competitiveness state of this activity, oil inputs should be valuad at world market prices.

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Table 1: I-O Aggregation

Sl.No.	ISIC, Rev.2	ACTIVITY
1	11	Agriculture and Livestock
2	13	Fishing
3	22	Crude Petroleum and Natural Gas
4	29	Other Mining and Quarrying
5	31	Food, Beverage and Tobacco
6	32	Textile and Weaving Apparel
7	33	Wood and Wood Products
8	34	Paper Products and Printing & Publishing
9	35 + 35-353	Petroleum Refining, and Other Chemical Products, except Petroleum Refining
10	36	Non-Metallic Products
11	37	Basic Metal Products
12	38	Fabricated Metal Products
13	39	Other Manufactures
14	41	Electricity and Gas
15	42	Water
16	50	Construction
17	51 + 52	Wholesale and Retail Trade
18	53	Hotels and Restaurants
19	71	Transport and Storage
20	72	Communication
21	81	Financial Institutions
22	82	Insurance
23	831 + 832 + 833	Real Estate and Business Services
24	92	Sanitary Services
25	931-932	Education Services
26	933	Medical and Health Services
27	94	Recreational and Cultural Services
28	95	Personal and Household Services
29	95	Government Services, Producers of Private Non-Profit Services to Households, Domestic Services, and Other Producers

Table 2: Price Indices of Intermediate Consumer, Capital, Imported, and Exported Goods & Services

Items	Price Index	
	1983	**1995**
Intermediate Goods	1.03	1.57
Capital Goods	1.09	1.74
Consumer Goods	1.11	1.71
Imported Goods	1.08	1.65
Exports(1)	1.17	0.56
Wholesale Price Index	1.09	1.61

Sources: The Economist Intelligence Unit (1980), Quarterly Economic Review: Kuwait, Annual Supplement, London.
United Nations Conference on Trade and Development (1991), Commodity Yearbook 1991, New York.
Energy Information Administration (2002), International Energy Database, April.
Notes: (1) Calculated based on the optimal price index formula, using oil export quantities and prices as proxy :

Optimal Prices Index = $\sqrt{\text{LapeyresPrice Index} \times \text{PaschePrice Index}}$

Table 3: Forward Linkages 1983–1995 Constant Price (1980=1)

1983		
Activities		**rj**
2	Fishing	0.5594
26	Medical & Health Services	0.5609
29	Government Services, Producers of Private, Non-Profit Services, and other Producers	0.5630
25	Education Services	0.5710
24	Sanitary Services	0.5818
14	Electricity & Gas	0.6136
15	Water	0.6145
13	Other Manufactures	0.6159
28	Personal and Household Services	0.6164
27	Recreational, Cultural, Services	0.6357
20	Communication	0.6627
6	Textiles & Wearing Apparel	0.6963
4	Other Mining & Quarrying	0.6990
18	Hotels & Restaurants	0.7198
16	Construction	0.8269
1	Agriculture and Livestock	0.8454
7	Wood & Wood Products	0.8536
22	Insurance	0.9370
8	Paper Products and Printing & Publishing	0.9733
10	Non Metallic Products	1.0304
5	Food Beverages &Tobacco	1.0946
21	Financial Institutions	1.3945
17	Whole Sale & Retail Trade	1.5451
19	Transport & Storage	1.6010
23	Real Estate and Business Services, Machinery equipment, rental and leasing	1.6473
9	Petroleum Refining Product and Other Chemical except Petroleum refining	1.7021
12	Fabricated Metal Products	1.7884
11	Basic Metal Products	1.9893
3	Crude Petroleum & Natural Gas	2.0610

Table 3:Cont'd.

Activities		rj
27	Recreational, Cultural, Services	0.4630
26	Medical & Health Services	0.4674
22	Insurance	0.4690
25	Education Services	0.4745
2	Fishing	0.4766
29	Government Services, Producers of Private, Non-Profit Services, and other Producers	0.4772
13	Other Manufactures	0.4846
24	Sanitary Services	0.5334
14	Electricity & Gas	0.5366
28	Personal and Household Services	0.5870
6	Textiles & Wearing Apparel	0.6010
1	Agriculture and Livestock	0.6184
18	Hotels & Restaurants	0.6225
16	Construction	0.6245
15	Water	0.6419
7	Wood & Wood Product	0.6572
4	Other Mining & Quarrying	0.7031
20	Communication	0.7613
10	Non Metallic Products	0.8860
5	Food Beverages &Tobacco	0.8990
8	Paper Products and Printing & Publishing	1.1401
17	Whole Sale & Retail Trade	1.1590
19	Transport & Storage	1.6123
23	Real Estate and Business Services, Machinery equipment, rental and leasing	1.6615
11	Basic Metal Products	1.8226
12	Fabricated Metal Products	2.0515
21	Financial Institutions	2.0849
3	Crude Petroleum & Natural Gas	2.7311
9	Petroleum Refining Product and Other Chemical except Petroleum refining	2.7528

Table 4: Backward Linkages 1983 ± 1995 Constant Price (1980=1)

1983		
Activities		**ri**
3	Crude Petroleum & Natural Gas	0.5739
20	Communication	0.6065
23	Real Estate and Business Services, Machinery equipment, rental and leasing	0.6491
28	Personal and Household Services	0.7497
2	Fishing	0.7800
6	Textiles & Wearing Apparel	0.8419
26	Medical & Health Services	0.8639
29	Government Services, Producers of Private, Non-Profit Services, and other Producers	0.9056
22	Insurance	0.9217
4	Other Mining & Quarrying	0.9516
15	Water	0.9603
19	Transport & Storage	0.9955
13	Other Manufactures	0.9972
18	Hotels & Restaurants	1.0464
9	Petroleum Refining Product and Other Chemical except Petroleum refining	1.0584
8	Paper Products and Printing & Publishing	1.0764
7	Wood & Wood Products	1.1373
14	Electricity & Gas	1.1753
27	Recreational, Cultural, Services	1.1788
11	Basic Metal Products	1.1924
12	Fabricated Metal Products	1.2234
16	Construction	1.2409
10	Non Metallic Products	1.2594
5	Food Beverages &Tobacco	1.2692
1	Agriculture and Livestock	1.3642
21	Financial Institutions	1.6126

1995		
Activities		**ri**
3	Crude Petroleum & Natural Gas	0.4724
20	Communication	0.4948
22	Insurance	0.5306
25	Education Services	0.6671
24	Sanitary Services	0.6794
26	Medical & Health Services	0.7897
6	Textiles & Wearing Apparel	0.8127
23	Real Estate and Business Services, Machinery equipment, rental and leasing	0.8475
1	Agriculture and Livestock	0.8664
19	Transport & Storage	0.8769
18	Hotels & Restaurants	0.8781
27	Recreational, Cultural, Services	0.8928
5	Food Beverages &Tobacco	1.0051
11	Basic Metal Products	1.0356
8	Paper Products and Printing & Publishing	1.0514
16	Construction	1.0545
7	Wood & Wood Products	1.0551
12	Fabricated Metal Products	1.1382
10	Non Metallic Products	1.1623
15	Water	1.1765
4	Other Mining & Quarrying	1.1839
9	Petroleum Refining Product and Other Chemical except Petroleum refining	1.3056
29	Government Services, Producers of Private, Non-Profit Services, and other Producers	1.3468
13	Other Manufactures	1.4231
21	Financial Institutions	1.5857
14	Electricity & Gas	2.4736

Table 5: Coefficients of Structural Change in Manufacturing Value Added 1983-1995

Manufacturing Activities	Coefficients
Consumer Activities	0.996
Intermediate Activities	0.984
Investment Activities	0.9999
All Manufacturing Activities	0.958

Source: Central Statistical Office, 1995, p.77.
Central Statistical Office, 1983, p.75.

Table 6: Percentage Share of Domestic, Export, and Import Substitution of Final Demand in Output Change, 1983-1995 (%)

No.	ISIC	Activity	Domestic Demand %	Export Demand %	Import Substitution %	Technical Coeff. Demand %
1	11	Agriculture and Livestock	75.835	25.324	1.524	-2.683
2	13	Fishing	-40.654	58.379	-1.409	83.684
3	22	Crude Petroleum & natural Gas	3.526	87.335	0.075	9.064
4	29	Other mining and quarrying	-230.533	-131.142	1.283	460.392
5	31	Food Beverage and Tobacco	58.726	62.658	5.040	-26.423
6	32	Textiles & Wearing Apparel	54.167	44.712	-1.253	2.374
7	33	Wood & Wood Products	45.732	78.888	-0.637	-23.982
8	34	Paper products & Printing & Publishing	144.798	81.247	3.438	-129.483
9	35/35-353	Petroleum Refining Product & Other Chemical except Petroleum refining	6.412	93.667	0.147	-0.226
10	36	Non Metallic Products	49.108	44.672	0.110	6.110
11	37	Basic Metal Products	-70.825	-87.098	1.488	256.435
12	38	Fabricated Metal Products	35.671	37.022	-0.970	28.276
13	39	Other Manufactures	-143.248	201.968	3.863	37.416
14	41	Electricity & Gas	95.532	47.648	-0.208	-42.972
15	42	Water	99.679	53.212	0.011	-52.901
16	50	Construction	73.112	8.449	-0.019	18.458
17	51/52	Whole Sale & Retail Trade	44.208	49.892	-0.067	5.967
18	53	Hotels & Restaurants	79.014	51.983	-0.373	-30.624
19	71	Transport & Storage	62.725	40.562	-0.171	-3.116
20	72	Communication	1232.332	1579.580	-12.832	-2699.080
21	81	Financial Institutions	118.392	8.071	0.002	-26.465
22	82	Insurance	21.584	54.057	-0.134	24.493
23	831/832/833	Real Estate and Business Services, Machinery Equipment, rental and leasing	67.689	18.986	-0.134	13.459
24	92	Sanitary Services	74.378	46.803	-0.115	-21.066
25	931-932	Education Services	173.024	-55.706	0.037	-17.355
26	933	Medical & Health Services	81.262	1.228	-0.007	17.517
27	94	Recreational, Cultural Services	-4671.154	1451.538	8.077	3311.538
28	95	Personal and Household Services	298.440	42.375	-0.270	-240.545
29		Government Services, producers of Private, Non-Profit Services, and other producers	98.867	3.996	0.000	-2.862

Table 7: Aggregate Sources of Structural Change 1983-1995(%)

ISIC	No.	Activity	Domestic Demand %	Export Demand %	Import Substitution %	Technical Coeff. Demand %
11/13	1-2	Agriculture & Fishing	79.31	24.34	1.61	-5.26
22/29	3-4	Crude Oil, Natural Gas & Other Minings	4.41	88.16	0.07	7.37
31-34/10-13	5-8,10-13	None- Oil Manufacturing	65.34	73.69	-1.04	-37.99
35/35-353	9	Oil Manufacturing	6.41	93.67	0.15	-0.23
41/42	14-15	Utilities	74.44	10.68	-0.02	14.90
50	16	Construction	44.21	49.89	-0.07	5.97
51-52/53/71/72	19-20	Distribution	80.75	33.47	-0.14	-14.07
81/82	21-22	Financial	64.22	21.63	-0.13	14.29
831/832/833	23	Real Estate	74.38	46.80	-0.12	-21.07
92/831-932/933/94/95	24-29	Other Services	100.17	4.64	0.00	-4.81
	1-29	Total	39.79	64.17	-0.13	-3.83

Table 8:

No.	ISIC	Activity	Import 95 1	Intermediated 83 2	Import 83 3
1	11	Agriculture & Livestock	151852	26782	142988
2	13	Fishing	1724	2096	135
3	22	Crude Petroleum & natural Gas	0	874795	0
4	29	Other mining & quarrying	9415	43207	4885
5	31	Food Beverage & Tobacco	222509	83415	163325
6	32	Textiles & Wearing Apparel	213701	33871	256981
7	33	Wood & Wood Products	62515	27899	80133
8	34	Paper products & Printing & Publishing	64588	63005	33179
9	35/35-353	Petroleum Refining Product & Other Chemical except Petroleum refining	310354	335432	200092
10	36	Non Metallic Products	112909	175156	86293
11	37	Basic Metal Products	121985	114420	-126890
12	38	Fabricated Metal Products	1295885	678254	1397264
13	39	Other Manufactures	84351	14067	48767
14	41	Electricity & Gas	0	19108	0
15	42	Water	0	26632	0
16	50	Construction	0	28642	0
17	51/52	Whole Sale & Retail Trade	0	155278	0
18	53	Hotels & Restaurants	0	43677	0
19	71	Transport & Storage	87427	185710	61713
20	72	Communication	0	55665	0
21	81	Financial Institutions	0	241050	0
22	82	Insurance	0	3355	0
23	831/832/833	Real Estate & Business Services, Machinery Equipment, rental & leasing	62500	317650	64000
24	92	Sanitary Services	0	21095	0
25	931-932	Education Services	0	3430	0
26	933	Medical & Health Services	0	413	0
27	94	Recreational, Cultural Services	522	57	0
28	95	Personal & Household Services	0	52390	0
29		Government Services, producers of Private, Non-Profit Services, & other producers	0	83047	409100

Table 8: Cont'd.

No.	ISIC	Activity	Intermediate 83 4	95 1/2	83 3/4
1	11	Agriculture & Livestock	20441	5.670	7.135
2	13	Fishing	553	0.823	0.244
3	22	Crude Petroleum & natural Gas	1518850	0.000	0.000
4	29	Other mining & quarrying	15942	0.218	0.306
5	31	Food Beverage & Tobacco	36281	2.667	4.502
6	32	Textiles & Wearing Apparel	22541	6.309	11.401
7	33	Wood & Wood Products	43809	2.241	1.829
8	34	Paper products & Printing & Publishing	45909	1.025	0.723
9	35/35-353	Petroleum Refining Product & Other Chemical except Petroleum refining	392089	0.925	0.510
10	36	Non Metallic Products	153571	0.645	0.562
11	37	Basic Metal Products	106669	1.066	-1.190
12	38	Fabricated Metal Products	300964	1.911	4.643
13	39	Other Manufactures	6649	5.996	7.334
14	41	Electricity & Gas	11409	0.000	0.000
15	42	Water	13672	0.000	0.000
16	50	Construction	69925	0.000	0.000
17	51/52	Whole Sale & Retail Trade	144588	0.000	0.000
18	53	Hotels & Restaurants	28731	0.000	0.000
19	71	Transport & Storage	164995	0.471	0.374
20	72	Communication	28424	0.000	0.000
21	81	Financial Institutions	162261	0.000	0.000
22	82	Insurance	23723	0.000	0.000
23	831/832/833	Real Estate & Business Services, Machinery Equipment, rental & leasing	244552	0.197	0.262
24	92	Sanitary Services	11777	0.000	0.000
25	931-932	Education Services	4562	0.000	0.000
26	933	Medical & Health Services	408	0.00	0.00
27	94	Recreational, Cultural Services	1940	9.158	0.000
28	95	Personal & Household Services	14121	0.000	0.000
29		Government Services, producers of Private, Non-Profit Services, & other producers	24000	0.000	17.046

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As of August 1998, financial support towards the ERF Working Papers Series from the Commission of the European Communities (through the FEMISE Program) is gratefully acknowledged. The views expressed in the Working Papers are those of the authors and do not necessarily reflect the views of the European Commission.

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