The Effect of European Single Market on the Korea-EC Trade Pattern[*]

Sung Lin Na
and
Kyttack Hong[**]

The purpose of this paper is to estimate the ex-ante effect of EC 1992 Project on Korean export to EC. By using the traditional methodology of customs union, the price effect (i.e. EC's market integration effect) is estimated. According to this effect, the completion of EC single market in 1992 would reduce Korean export to EC by 2.42% in the short term and by 5.45-5.82% in the long term. Then, the non-price effect (i.e. EC's trade protectionism effect) is inferred from the recent Korean export data to EC. The result shows that the non-price protectionist measure of EC would reduce the share of Korean export commodities on EC's import restriction list in total Korean export to EC by about 10% every year. Considering the growing protectionism of EC, this implies that the latter effect would be much more serious than the former effect.

I. Introduction

The 1992 Project aims at creating a true common market in which goods, services and capital and move freely between member countries without being subject to any frontier controls. EC has been trying to improve the internal welfare through the balanced growth between member countries ever since its creation in 1958 by the Treaty of Rome. It had, by abolishing internal tariffs and import quotas, completed the Customs Union by 1968. In spite of such achievement, it has failed to achieve its

the trade creation and the trade diversion created by the customs union removing all the tariff barriers. However, the former is different from the latter in that in the former case the prices of a member country concerned will change as well due to the reduction of production costs whereas they do not in the latter case. Furthermore, as far as each member country is concerned, the benefit achieved by abolishing non-tariff barriers will be large than that achieved in the case of abolition of the tariffs. This is because the former would not incur the loss of tariff revenue.

In addition to the above direct effects, the integration of markets through the abolition of non-tariff barriers will bring about an indirect effect of utilising economies of scale and reduction of X-inefficiency and monopolistic power. Often this indirect effect can be more important than the direct effect.

In order to estimate the above effects, this study adopts a partial equilibrium analysis in that it considers the production, consumption and the trade flow of goods in a single good market both before the introduction of 1992 project and after its completion. This study is also one of comparative statics, not trying the dynamic analysis of the transitional period between the initial steady state before the introduction of the 1992 project and the final steady state after its completion. Further weakness of this study is that it abstracts from both balance of payments effects and growth effects. Needless to say, inclusion of these effects may change the results of this study considerably. However, at the same time, it will complicate the analysis often beyond its manageability. Finally, this study is one of ex-ante studies which will estimate the ex-ante effect of 1992 Project since the project has not been completed as yet.

The results of this study are as follows. The price effect of EC market integration, namely the price reduction effect of EC goods due to the 1992 Project would not be so large as many people often worry about. According to the estimation of this study, the immediate, static effect of price reduction of EC goods due to the 1992 Project will reduce Korean exports to EC by 2.42% on average. Even the long-term, dynamic effect of economies of scale and increased competition will only reduce the export by 5.45-5.82% on average. Based on this quantitative result, our conclusion is that the fundamental reason for Korean export campanies' concerns about the 1992 Project must be sought for in some other area. We claim that the non-price effect of EC integration, such as the external non-tariff barriers imposed by each member country or at EC level will be more important. This sort of import restrictions are certainly different from the 1992 Project itself. In that sense we need to distinguish the 1992 Project from the EC's protectionist measures. However, they are just like

Figure 1

Trade Diversion and Trade Creation Effects due to the Abolition of Internal Non-Tariff Barriers
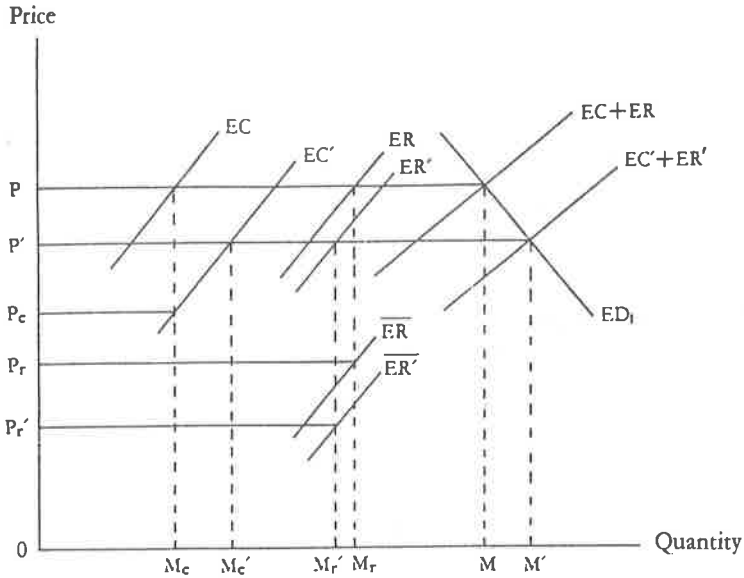
of non-tariff barriers respectively. The equilibrium price before the abolition of non-tariff barriers is P and the country J imports OM. The import from other member countries is OM_c and that from the non-EC countries is OM_r. However, the equilibrium price after the abolition of non-tariff barriers becomes P' and J's import increases by MM' to OM'. So, the import from the member countries increases by M_cM_c' (trade creation effect) and the import from the non-EC countries changes by $M_r'M_r$ (trade diversion effect + external trade creation effect).

We are mainly concerned with trade diversion effect and external trade creation effect. In order to estimate such effects, we now make use of the methodology used by Johnson (1964) and Krause (1968) which carried out the ex-ante estimation of the formation of EC on the US export to EC.

Let us denote the change of Korean export of a certain good(i) to a member country of EC by its proportional variation. We must note that such a proportional change will be affected by two factors. One is by the

statistical analysis and NACE for industrial classification. NIMEXE is mainly used for custom's statistics. In this study, we are going to use the NIMEXE data of EUROSTAT. This is because these data classify most systematically and consistently for our purpose the time series data for the trade between EC member countries, and between EC member countries and non-EC member countries. This classification has gone through several modifications in the meantime and experienced major changes around 1972 when UK, Ireland and Denmark joined EC and recently in 1988. To avoid such a revisional problem this study mainly uses the data between 1972 and 1987.

It is nature to calculate for the entire Korean export items in estimating the change in the Korean export to EC. However, for the sake of manageability, we will only focus on the main export items to EC market which comprise of 81.3% of the total export in 1987. This consists of the following 13 items based on the NIMEXE 2-digits:

NIMEXE	Items
24	tobacco
42	articles of leather, saddlerly & harness
56	man-made fibre
60	knitted & crocheted goods
61	articles of apparel & clothing accessories
64	footwear, gaiters & the likes: parts thereof
73	iron & steel and articles thereof
84	boilers, machinery & mechanical appliances
85	electrical machinery & equipments: parts
87	vehicles
89	ships, boats & floating structure
92	musical instruments: sound recorders or reproducers; television image & sound recorders or reproducers
97	toys, games & sports requisites; parts thereof.

The analysis based on the NIMEXE 2-digits is efficient in terms of saving time. However, it has a problem of aggregation because all the sub-items in each 2-digit item are not necessarily homogeneous. This may render the results of such an analysis meaningless. For example, NIMEXE 87 includes every kind of land transportation equipments excluding trains, which also include not only luxury goods but low-quality goods. This makes it difficult for us to treat all the sub-items in NIMEXE 2-digit as a single good. We may use the more detailed NIMEXE classification (for example NIMEXE 4 or 6-digit). However, in that case, the quantity and value of each item become so small that the analysis becomes meaningless. We leave the possibility of exploiting the tradeoff between the

tariff barriers. The results based on this approach will be given in section IV.

The second approach is to use the price convergence hypothesis. This hypothesis assumes that the prices of each EC member country would converge to a certain level through the price arbitrage which results from the free movement of goods and labour. Such a level varies depending on the degree of existing non-tariff barriers (refer to section 5 for more detailed explanation). In order to find the converged price, we need to know the degree of dispersion in the base year (1987) for each member country. There are two ways for this. One is to calculate the price of ith good for each member country by dividing the country's total export value of the good by its total export volume. The other is to use existing survey data on the dispersion of prices. The former turned out to be inappropriate because of the two wide variance of the prices. Therefore this study uses the survey data for 1987 prices. The problem with this survey data is that its data are not one-to-one corresponding to our NIMEXE classification because they are based on NACE classification. However, since both classifications include similar commodities in each group, we assume that it would not be too much a problem to use NACE as an approximation for our NIMEXE. Appendix 1 shows the degree of price dispersion for the 13 commodity groups we consider in this study. The results based on this approach will be given in section IV.

B. The Derivation of $\hat{\pi}$

Since there is no change in Korean export prices, the rate of change in π depends on that of EC member countries' prices, namely

$$(2) \qquad \hat{\pi} + \hat{P}_k - \hat{P}_{EC} = -\hat{P}_{EC}$$

where P_{EC} is a weighted average with the weight depending on each member country's export volume. The price of each member country can be derived as in (2) above.

C. The Estimation of ε_{sik}

Market share elasticities (ε_{sik}) can be estimated applying Hickman-Lau (1973) and Kim (1987). Let us define the notations as follows:

S_{ik}: the market share of Korean export in the ith good import market of EC member country j (= X_{ik}/X_i);

P_{NEC}: the average export price of non-EC countries (excluding Korea).

Table 3.2

EC's Non-Tariff Barriers Against
Korean Export and Dummies
(1972-1987)

NIMEXE	Dummy Period (country)	Reasons for Dummies
man-made fibre (56)	entire period (all member)	bilateral quota according to Korea-EC agreement (seller's quota)
clothes (61)	85-87 (France)	1985-1987 country quota for silk
footwear (64)	78 (all member) 79-87 (UK) 81-87 (France) 87 (Italy)	78.4-78.10 (mandatory licensing system) VER since 1979 VER since 4. 1981. (10% increase every year based on 1981) safeguard measure
steel (73)	78 (UK) 83-87 (all mem.)	prior inspection system for tablewear 1983-1987 VER (according to Korea-EC steel agreement)
electric equip-ment (85)	78, 85-87 (UK) 83-87 (France)	1977-78 import quota against Korean B/W TV (decided at the end of 1977) 1985-87 TV VER 1983-88 country quota against Korean TV 1986-87 total quota against electric & electronic machinery, 1987 Radio quota
92	86 (all member)	1986. 1. VTR tariff increase (8% to 14%) 1986. 1 post import inspection for VTR
97	84-86 (France)	1984-86 unilateral country quota

EC which results in the serious lack of time series data. This assumption may possibly underestimate Korea's export of vehicles to EC later on.

D. *The Estimation of η_{xi} for Each EC Member Country*

For this estimation, we may use the following regression equation where Y denotes the GDP of a member country:

$$\log X_i = \log \beta_0 + \beta_1 \log(P/P_j) + \beta_2 \log Y.$$

However, in this study, we are going to use the existing estimated data

IV. The Effects of EC 1992 on Korea-EC Trade Pattern: Empirical Results

In the preceding section, we set up the model and obtained the necessary data, in order to calculate the effect of EC 1992 on Korean export to EC. In this section, we now calculate such effects based on that model.

We use two distinct approaches depending on the price changes of EC member countries. This type of approach is necessary because it is impossible to calculate the exact values for the rate of reduction in EC member countries' prices.

The first approach is to use the results of the existing partial equilibrium analysis and the second to use the hypothesis of price conversion. The former is used by EC regional economists who were asked by EC Commission to analysis the effects of 1992 on the prices of EC goods. They use the partial equilibrium model to calculate such effects. The latter, often applied in EC Commission's studies, uses the hypothesis that the successful integration of European markets will converge all the different prices to a certain level. The latter tends to overestimate such effects than the former in that it assumes the complete integration of markets. To compare the results from these two different approaches would complement the deficiency of data.

A. *The Partial Equilibrium Approach*

There have already been several studies regarding the effects on the cost reduction of the removal of non-tariff barriers by 1992 project. One of them, a case study for each different industry, estimates the costs of existing non-tariff barriers in each industrial sector and then adds up the estimated figures for each type of non-tariff barrier. According to this study, the cost reduction by the abolition of non-tariff barriers amounts to ECU 70 bn,[2] excluding any double counting. The second study, a survey method, quantifies the expected cost reduction effect by questioning the managers of each industry about the possible effects of the removal of non-tariff barriers. The result suggests 1.7% cost reduction on average.[3] The third study, a partial equilibrium study, quantities such cost reduction effects by using the traditional custom union study which analyses the effects of removing the tariff barriers. Our study uses the results of this third study.

---

[2] Refer to Table A.1 in Davenport & Cawley (1988).
[3] Refer to Table A.2 in Davenport & Cawley (1988).

the costs of both exporters and importers, which benefits the purchasers of consumption and production goods because the reduced prices. In the economy as a whole, the expenditure on these goods will increase or the surplus resources can be used for the production of other goods. The estimation for such trading costs reduction effect for each commodity group is shown in Table 4.1. Davenport & Cawley estimates this effect based on the formality costs at the frontier by Ernst & Whinney (1987) and on EC Commission's survey on companies' estimation for the costs of barriers. This study uses the maximum values of Davenport & Cawley's estimates. Together with the costs reduction effects, Table 4.1 also shows price reduction effects. The latter is the data we need for the calculation in this study. According to Davenport & Cawley, the price reduction effect has the following relationship with the cost reduction effect:

$$(4) \qquad \text{price reduction } (\%) = \frac{e_c s_c}{e_c s_c + e_r s_r - n} \times \text{cost reduction } (\%)$$

where

e_r: export supply elasticity of non-member countries

s_r: the share of non-member countries in the import of a importing member country in the base year

e_c: export supply elasticity of a member country

s_c: the share of an exporting member country in the import of an importing member country in the base year

n: import demand elasticity of an importing country.

(1.b) The Production Costs Reduction Effect

A typical example of increasing production costs is the barriers which restrict the market entry or competition. The restriction on government procurement not only excludes cheap imports but keeps the domestic prices above the competitive prices. The different technical restriction in each country and the restrictive policies in service sectors incurs similar effects. Since the removal of such barriers brings the effect of reducing production costs horizontally across the entire EC industries, Davenport & Cawley does not find the effects for each member country but estimateds such effects for each industry. The results are shwon in Table 4.2.

(1.c) The Static 'Economies of Scale' Effect

The product increase from the two proceding costs reduction effects brings the immediate reduction in average production costs for the existing plant size without restructuring the industry concerned. Pratten

(1987) calculates 'economies of scale' parameters relating between the change in product volume and unit costs under a few simplifying assumptions regarding plant cost function. The Table 4.3 below shows the results for costs and prices reduction effects, applying 'economies of scale' parameters to the change in product volume of each EC industry due to the preceding costs reduction effects.

Table 4.3

THE STATIC 'ECONOMIES OF SCALE' EFFECT

NIMEXE	Change in total product (%)	EOS[2] parameter	cost reduction (%)	price reduction coefficient	price reduction (%)
24	0.3	0.03	−0.01	0.66	−0.007
42	2.2	0.03	−0.06	0.65	−0.04
56	1.8	0.03	−0.05	0.67	−0.03
60	1.8	0.03	−0.05	0.67	−0.03
61	1.8	0.03	−0.05	0.67	−0.03
64	1.8	0.04	−0.07	0.77	−0.05
73	1.4	0.06	−0.08	0.87	−0.07
84	1.4	0.06	−0.08	0.87	−0.07
85	2.6	0.08	−0.21	0.72	−0.15
87	2.0	0.14	−0.28	0.71	−0.20
89	2.2	0.12	−0.26	0.68	−0.18
92	4.6	0.04	−0.18	0.48	−0.08
97	4.6	0.04	−0.18	0.48	−0.08

Notes: The approximation values are used for 64, 84, 92 and 97 as in Table 4.2 above due to the deficiency of data.

1) % reduction of production cost per 1% increase in product volume.

2) as coefficients calculating the % reduction of prices from 1% reduction of costs, they are derived by calculating the ratio of (price reduction/cost reduction) from Table A5 in Davenport & Cawley (1988).

(1.d) The Total Static Effects

Now we can calculate the total static effects by combining the costs reduction effects from the above three static effects and price reduction effects. Table 4.4 below shows the price reduction effects for each member country incurred by the total static effects for each commodity group.

(1.e) The Static Effect of 1992 Project on Korean Export to EC

Table 4.5

VALUES OF π AND P'

NIMEXE	π						P'					
	D	F	T	UK	NL	BL	D	F	I	UK	NL	BL
24	2.19	2.16	2.17	2.27	2.60	2.07	1.76	.18	.42	1.11	.73	1.50
42	1.54	1.56	1.62	1.58	1.63	1.63	1.33	.95	.95	1.16	1.06	.59
56	1.42	1.39	1.34	1.38	1.37	1.36	.38	.19	.64	.46	.48	.39
60	1.43	1.40	1.42	1.42	1.38	1.46	.52	.51	.71	.79	.65	.22
61	1.45	1.41	1.44	1.42	1.37	1.46	.81	.79	.75	.81	.70	.31
64	1.92	1.90	1.94	1.91	1.89	1.94	.53	.55	1.21	.69	.66	.32
73	3.01	3.12	3.05	3.06	3.13	2.86	1.26	.21	.97	.97	.11	.59
84	3.10	3.21	3.20	3.03	3.23	3.17	1.75	.66	1.04	1.58	.78	.85
85	2.42	2.39	2.36	2.36	2.39	2.36	1.24	.81	.92	1.57	.95	.71
87	3.03	2.95	2.88	2.86	2.94	2.91	.76	.33	.51	.86	.46	.79
89	1.68	1.67	1.67	1.69	1.70	1.64	.57	.79	1.24	.51	1.01	.38
92	1.59	1.60	1.59	1.60	1.58	1.60	1.13	.73	.88	1.07	.78	.40
97	1.72	1.70	1.70	1.71	1.70	1.71	1.21	.64	1.22	1.20	.72	.63

Table 4.6

THE CHANGE IN KOREAN EXPORT TO EC
DUE TO THE STATIC EFFECT OF 1992: RATES OF CHANGES (%)

NIMEXE	D	F	I	UK	NL	BL	EC 7 Average
24	−1.76	−.18	−.42	−1.11	−.73	−2.39	−1.49
42	−1.33	−1.81	−1.57	−1.16	−1.06	−.59	−1.33
56	−2.02	−2.29	−3.25	−1.09	−2.19	−1.20	−2.22
60	−3.19	−3.94	−3.44	−.79	−1.04	−1.33	−2.25
61	−3.73	−1.35	−1.70	−3.28	−1.11	−.59	−2.85
64	−6.91	−2.63	−4.00	−2.30	−1.53	−2.28	−3.43
73	−2.72	−1.02	−3.75	−2.42	−2.04	−1.59	−2.44
84	−2.97	−1.38	−2.32	−1.89	−.70	−.94	−1.90
85	−3.78	−2.01	−2.46	−3.19	−2.51	−1.91	−3.08
87	−1.38	−.60	−.61	−1.20	−.51	−1.03	− .95
89	−1.81	−2.37	−3.23	−1.43	−2.53	−1.03	−1.44
92	−5.43	−2.52	−1.97	−1.07	−1.37	−3.96	−2.63
97	−3.03	−.76	−1.22	−1.20	−.65	−.82	−1.61
Average	−3.19	−2.01	−2.53	−2.08	−1.35	−1.52	−2.42

The dynamic effect of costs reduction is a long-term market integration effect resulting from the removal of various types of barriers and can be divided into 'economies of scale' effect and 'increased competition' effect. The former effect can be achieved by restructuring of the industry, namely closing down inefficient factories and investing into new, more efficient factories. On the other hand, the latter effect can be achieved by more fierce competition which removes the X-inefficiencies and monopolistic rents. It will normally take a few years before the effect of such market integration can be realized.

Unfortunately, no traditional methods exist to quantity such market integration effects. Such effects depend on the extent to which the increased competition 1) readjusts the location and structure for the economies of scale and 2) removes the excessive factor costs expenditure resulting from X-inefficiencies and monopolistic market structure. In this sense, to estimate such dynamic effects would be more speculative than to estimate the static effects. The study of Harris & Cox (1984) on the US-Canada customs union shows that the market integration effects will magnify the direct effect of removing barriers by several times. In the original study on the effect of EC customs union, Balassa (1974) estimates such ratio to be approximately 5:1.

The market integration effect of removing non-tariff barriers can be measured in proportion to the previous static effects. This is based on the assumption that the indirect benefits from the 'economies of scale' and the increased competition will be larger in the following sectors: namely 1) sectors where the non-tariff barriers allow the survival of technically and economically inefficient companies, 2) sectors where monopolistic rents exist due to the market concentration, and 3) sectors where potential economies of scale is possible.

Therefore, the indirect benefit is calculated, with the direct benefit as a basis, by using 'scaling coefficients' which are an increasing function of the 'degree of concentration' and the 'potential economies of scale.' The values of scaling coefficients consists of 9 groups, from 1 which represents the low concentration and the low 'economies of scale' to 9 which represents the high concentration and the high 'economies of scale.' Examples are food stuffs and automobiles for the former and the latter respectively. These scaling coefficients, which are shown in Table 4.8 below, are derived from the model of Smith & Venables (1987) for 20 industries according to NACE/CLIO classification.

If we calculate the prices reduction effects through the dynamic effects by applying these scaling coefficients to our 13 industries (refer to Table A.2 in Emerson (1988) for the values of scaling coefficients), the results

Table 4.10

THE CHANGE IN KOREAN EXPORT TO EC TO
THE DYNAMIC EFFECT OF 1992: RATES OF CHANGE (%)

NIMEXE	D	F	I	UK	NL	BL	EC 7 Average
24	−11.47	−1.19	−2.76	−7.23	−4.72	−15.52	−9.66
42	−2.65	−3.61	−3.13	−2.33	−2.13	−1.18	−2.67
56	−14.14	−16.00	−22.72	−7.63	−15.30	−8.40	−15.58
60	−6.39	−7.87	−6.88	−1.59	−2.08	−2.67	−4.50
61	−7.45	−2.70	−3.40	−6.57	−2.22	−1.17	−5.70
64	−13.83	−5.26	−8.01	−4.60	−3.05	−4.56	−6.87
73	−6.79	−2.54	−9.37	−6.04	−5.10	−3.98	−6.10
84	−13.37	−6.20	−10.43	−8.52	−3.14	−4.23	−8.55
85	−7.56	−4.01	−4.93	−6.39	−5.01	−3.83	−6.16
87	−9.63	−4.22	−4.28	−8.43	−3.55	−7.19	−6.68
89	−8.17	−10.66	−14.55	−6.42	−11.39	−4.63	−6.47
92	−10.86	−5.04	−3.93	−2.15	−2.73	−7.92	−5.27
97	−7.58	−1.91	−3.04	−2.99	−1.63	−2.06	−4.03
Average	−7.27	−4.92	−6.67	−5.34	−3.20	−3.72	−5.82

Table 4.11

THE CHANGE IN KOREAN EXPORT TO EC DUE
TO THE DYNAMIC EFFECT OF 1992: CHANGES IN VOLUME (UNIT = $10,000)

NIMEXE	D	F	I	UK	NL	BL	EC 7 total
24	−510.95	.00	.00	−138.36	−41.85	−25.78	−716.93
42	−1,075.57	−268.95	−79.80	−273.19	−92.01	−11.08	−1,800.60
56	−282.42	−206.05	−484.58	−96.11	−91.49	−34.16	−1,194.83
60	−809.73	−507.03	−110.73	−178.93	−129.01	−21.02	−1,756.45
61	−2,571.06	−187.16	−112.48	−1,083,67	−224.02	−30.40	−4,208.78
64	−869.32	−539.26	−642.45	−411.73	−98.62	−76.21	−2,637.59
73	−549.55	−32.22	−126.16	−155.02	−61.25	−77.41	−1,001.62
84	−1,316.69	−930.29	−420.98	−1,747.31	−96.70	−25.92	−4,537.89
85	−3,082.74	−681.58	−407.60	−2,061.68	−428.43	−132.95	−6,794.98
87	−167.54	−34.57	−57.96	−469.44	−111.90	−37.03	−878.43
89	.00	.00	−.16	−100.51	−1.76	−.11	−102.53
92	−1.353.90	−382.57	−215.40	−330.44	−163.27	−75.53	−2,521.12
97	−521.96	−78.36	−99.06	−159.31	−27.64	−31.14	−917.47
Total	−13,111.4	−3,848.04	−2,757.36	−7,205.71	−1,567.94	−578.74	−29,069.1

second lowest prices within EC. Emerson set up several different hypothesis depending on the extent of this convergence. In this study, we unify his various hypotheses into one as below.

Before doing that, we need to set up a criterion based on which we can judge the extent of internal non-tariff barriers. There are two types of available data for that. One is the result of a survey conducted by EC Commission against EC companies with regard to the possible effects of the removal of non-tariff barriers (refer to 'Research on the Costs of non-Europe, Vol. 3). The other, which is also used by Emerson, is to use the degree of price variation based on 1987 Eurostat price survey against 9 EC countries and the data of consulting companies. The former surveys the negative effects of non-tariff barriers for each good and the effects of their removal on production costs. Depending on the extent of such effects, we can judge whether the current internal non-tariff barriers are high or low. The latter expresses the extent of price variation for 320 commodities by 'coefficients of variation,' based on the assumption that the higher the current internal non-tariff barriers are the larger the price variation among the member countries.

Table 4.12 below shows the extent of internal non-tariff barriers for 13 goods concerned in this study, combining the above two data sets. In this table, coefficient of variation is calculated from the price differences for each good among 9 EC countries (refer to Appendix 1). The 'significance coefficient' and the 'price reduction coefficient' of non-tariff barriers are calculated based on the survey results in the "Cost of non-Europe, Vol 3." With regard to the former 'significance coefficient,' Tables 1.6.1-19 in the same book show the significance of each non-tariff barrier for each commodity group by coefficient ranging 0 (not significant) to 100 (very significant). The coefficients shown in the Table are the simple average for the coefficients of each non-tariff barrier. The latter 'price reduction coefficient' is shown in Tables 2.6.1-19 in the same book. It is achieved in the following manner. We first expresses the significance for the removal of non-tariff barriers in terms of its influence on the increase or decrease of production costs by coefficients ranging from 0 (not significant) to 100 (very significant). It is then calculated by multiplying the cost reduction case by −0.5 (somewhat important) or 1.0 (very important) and by multiplying the cost increase case by 0.5 (somewhat important) or 1.0 (very important).

It may be somewhat arbitrary to judge whether the non-tariff barriers are high or low based on the coefficients in the above table. Emerson assumes that the non-tariff barriers are high for any good whose coefficient of variation is above 13.0. In this study, we assume that the non-

(2) For the good whose non-tariff barriers are very high, the price of a member country whose price is higher than the average of the two lowest prices within EC would converge to that average. On the other hand, the price lower than that average would not change.

(3) For the good whose non-tariff barriers are high, the price of a member country whose price is higher than the average of the two lowest prices within EC would be reduced by the difference between that average and itself.

We not calculate the price reduction effects for each good and for each member country according to this price conversion hypothesis. The results are in Table 4.13.

Table 4.13

THE RATES OF PRICE CHANGE FOR EACH MEMBER COUNTRY:
PRICE CONVERSION HYPOTHESIS

NIMEXE	D	F	I	UK	NL	BL
24	−39.47	.00	.00	−19.29	−32.52	−12.00
42	.00	−29.31	−17.07	.00	.00	.00
56	−5.21	.00	.00	.00	.00	−18.90
60	−9.86	−11.16	−12.52	−3.65	.00	−15.18
61	−6.80	−2.15	−4.58	.00	.00	−12.59
64	−7.71	−6.43	−2.10	.00	−4.22	−15.51
73	.00	−5.93	.00	−2.34	−5.57	.00
84	−7.79	−8.16	−13.55	−1.94	−12.81	.00
85	.00	−9.99	−9.17	.00	.00	.00
87	−6.82	−5.34	−6.82	−12.51	−1.95	.00
89	.00	.00	−10.87	−7.66	.00	−2.44
92	−3.85	−1.77	.00	.00	.00	−5.75
97	−1.57	−12.74	.00	−12.89	.00	−8.84

Based on these results, we can also calculate the values of π and $\hat{P}'$. By substituting these values together with import demand elasticities and Korea's market share elasticities, we can finally calculate the effect of 1992 on Korean export to EC according to the price conversion hypothesis. The final results are shown in Tables 4.14 and 4.15 in terms of rate of change and change in volume.

Let us compare these results to those of the partial equilibrium analysis. While the results are not consistent between the two hypotheses in terms of individual goods, the price conversion hypothesis shows larger export reduction (5.45%) than the static effect (2.42%) of partial equilibrium hypothesis but shows similar results to the dynamic effect (5.82%) of the latter hypothesis. This is natural in the sense that the price conversion hypothesis assumes the higher degree of market integration than the partial equilibrium hypothesis. What is interesting is that the export reduction effect of the price conversion hypothesis shows similar results to that of the partial equilibrium hypothesis.

C. The Interpretation of Empirical Results

In the preceding two sections, we have analysed the ex-ante effects of 1992 project on Korean export to 7 major EC countries, using two different approaches. If we now combine the two results for 7 EC countries, the results are as in Table 4.16. Table 4.16 shows the rate of change and Table 4.17 the change in export volume.

The implication of these results are as follows:

Table 4.16

THE EFFECT OF 1992 ON KOREAN EXPORT TO EC:
RATES OF CHANGE (%)

MIMEXE	Partial eq. Analysis		Price Conversion Hypothesis
	Static	Dynamic	
24	−1.49	−9.66	−26.25
42	−1.33	−2.67	−1.35
56	−2.22	−15.58	−5.98
60	−2.25	−4.50	−12.29
61	−2.85	−5.70	−10.82
64	−3.43	−6.87	−9.73
73	−2.44	−6.10	0.08
84	−1.90	−8.55	−1.92
85	−3.08	−6.16	−2.48
87	−0.95	−6.68	−5.40
89	−1.44	−6.47	−20.84
92	−1.61	−5.27	−3.17
97	−1.61	−4.03	−4.55
Average	−2.42	−5.82	−5.45

Table 4.18

THE IMPACT OF 1992 ON KOREAN EXPORT PATTERN TO EC
(UNIT = $10,000 (%))

NIMEXE	Export Volume in 1987	Export Volume After 1992		
		Partial eq. Static	Analysis Dynamic	Price Conversion Hypothesis
24	7,152	7,046	6,429	5,275
	(1,01)	(1.02)	(0.97)	(0.79)
42	70,727	69,787	68,839	69,772
	(10.01)	(10.12)	(10.34)	(10.44)
56	8,331	8,147	7,033	7,833
	(1.18)	(1.18)	(1.06)	(1.17)
60	40,231	39,326	37,557	35,287
	(5.69)	(5.70)	(5.64)	(5.28)
61	77,792	75,575	73,358	69,375
	(11.01)	(10.96)	(11.02)	(10.38)
64	42,322	40,870	39,414	38,204
	(5.99)	(5.93)	(5.92)	(5.72)
73	18,132	17,690	17,027	18,119
	(2.57)	(2.57)	(2.56)	(2.71)
84	65,186	63,948	59,613	63,935
	(9.22)	(9.27)	(8.96)	(9.57)
85	131,399	127,352	123,305	128,140
	(18.59)	(18.47)	(18.53)	(19.18)
87	14,417	14,280	13,454	13,639
	(2.04)	(2.07)	(2.02)	(2.04)
89	19,805	19,520	18,524	15,677
	(2.80)	(2.83)	(2.78)	(2.35)
92	54,059	52,638	51,211	52,346
	(7.65)	(7.63)	(7.69)	(7.83)
97	24,369	23,977	23,387	23,260
	(3.45)	(3.48)	(3.51)	(3.48)
Total	573,926	560,037	540,523	542,647
	(81.21)	(81.21)	(81.21)	(81.21)
Total export	706,704	689,602	665,574	668,189
	(100,00)	(100.00)	(100.00)	(100.00)

Note: The figures in ( ) show occupation rates.

porting goods under EC's import restriction in the total Korean export to EC.

As can be seen in this table, the share of export goods under EC's import restriction in the total Korean export to EC is declining considerably. Even though it may be difficult to compare these figures with the export reduction due to the 1992 project itself discussed in the preceding sections, it is true that this reduction is much larger than the latter. This implies that the effects of external non-trade barriers including import restrictions are much more important than those direct effects of 1992 project itself.

This argument can also be supported by a more analytic study. While studying the effects of UK's trade restriction on footwear against the non-member countries, Winters & Takacs (1989) estimated that the 25% reduction VER imposed by UK on Korean footwear had the effect of raising Korean prices by 28%. If we apply these results to the equation (2.1) under the assumption that the prices of footwear produced by other countries do not change, such VER measure would reduce Korean export of footwear to UK by 23.5%.

VI. Conclusion

The conclusion of this study is that the negative effect of 1992 project in terms of Korean export to EC is not from its price effect (i.e. market integration effect) but from its non-price effect (i.e. EC's trade protectionism including the imposition of external non-tariff barriers). According to the former price effect, the completion of EC single market through the removal of internal non-tariff barriers would reduce Korean export to EC by 2.42% in the short term and by 5.45-5.82% in the long term. On the other hand, the latter protectionist measure has reduced the occupation ratio for Korean export goods under EC's import restriction in total Korean export to EC by about 10% every year. This implies that the latter effect is much more serious than the former effect.

Germany	56	−4.07	−0.58	0.77			0.40	1.45	OLS
		(−24.37)	(−0.56)	(0.84)					
	60	−3.14	−1.07	4.18			0.82	1.60	AR1
		(−34.06)	(−2.41)	(4.97)					
	61	−1.01	−0.79	4.75			0.27	1.83	OLS
		(−0.67)	(−0.23)	(0.66)					
	64	−8.36	−7.72	1.61	0.22	−0.52	0.72	1.73	OLS
		(−8.23)	(−3.14)	(1.45)	(4.64)	(−0.86)			
	73	−6.35	−0.19	−0.64			0.41	1.26	AR1
		(−15.17)	(−0.56)	(−0.30)					
	85	−6.32	−0.55	2.95			0.06	1.36	OLS
		(−3.83)	(−0.56)	(0.91)					
	92	−5.10	−1.65	1.64			0.31	0.86	OLS
		(−12.90)	(−1.91)	(1.42)					
France	42	−2.37	−0.55	0.53			0.89	1.51	AR1
		(−13.67)	(−0.74)	(0.71)					
	56	−5.17	−1.41	5.44			0.64	2.26	AR1
		(−9.47)	(−1.28)	(2.56)					
	60	−4.17	−2.19	2.23	0.05		0.51	1.24	OLS
		(−16.40)	(−1.99)	(2.04)	(2.21)				
	64	−3.17	−0.89	3.24	0.12	−0.54	0.72	1.81	OLS
		(−2.76)	(−1.63)	(−2.25)	(3.13)	(−1.67)			
	73	−8.38	−0.22	−0.24			0.45	2.67	AR1
		(−28.40)	(−1.01)	(−0.64)					
	84	−12.06	−0.10	10.10			0.16	0.46	OLS
		(−4.30)	(−0.95)	(1.47)					
	85	−4.37	−0.16	−1.51		0.57	0.92	1.78	AR1
		(−11.88)	(−0.50)	(−1.37)		(1.72)			
	92	−4.72	−1.04	1.05			0.40	0.91	OLS
		(−15.97)	(−2.96)	(1.00)					
Italy	42	−3.24	−0.39	1.30			0.77	2.19	AR1
		(−15.04)	(−1.36)	(2.25)					
	56	−0.27	−1.77	3.80			0.81	1.70	AR1
		(−3.93)	(−2.78)	(5.42)					
	60	−5.13	−1.71	−0.97			0.29	0.81	OLS
		(−5.66)	(−1.12)	(−0.38)					
	61	−4.27	−0.45	0.62			0.45	1.77	AR1
		(−4.56)	(−0.45)	(0.05)					
	64	−4.24	−1.19	1.29	0.20	−0.23	0.80	1.19	OLS
		(−9.73)	(−1.21)	(1.17)	(5.10)	(−0.59)			
	73	−5.56	−0.91	0.89			0.65	2.17	AR1
		(−11.54)	(−2.92)	(0.71)					

References

Balassa, B., "Trade Creation and Trade Diversion in the European Common Market," *Economic Journal*, 1967.

_____, "Trade Creation and Trade Diversion in the Common Market," *Manchester School of Economic and Social Studies*, 42, 1974.

Davenport, M. and R. Cawley, "Partial Equilibrium Calculations of the Impacts of Internal Market Barriers in the European Community," *Research on the 'Cost of Non-Europe,'* 2, 8, 1988.

EC, *EUROSTAT,* NIMEXE, Z (export), 1972-1987.

EC Commission, *Research on the 'Cost of Non-Europe,'* 1-13.

Ernst & Whinney, *The Cost of Non-Europe: Border Related Controls and Administrative Formalities,* European Commission, 1987.

Emerson M. and et. al., *The Economics of 1992,* Oxford, 1988.

Harris, R. and D. Cox, *Trade and Industrial Policy and Canadian Manufacturing,* Toronto, Ontario Economic, Council, 1984.

Hickman, B. and L. Lau, "Elasticities of Substitution and Export Demands in a World Trade Model,' *European Economic Review,* 4, 1973.

Johnson, H., "The International Competitive Position of the US and the Balance of Payments Prospect for 1968,' *Review of Economics and Statistics,* 46, 1964.

Kim, J.W., "The Trade Structure between Korea and Japan — An Analysis of Bilateral Trade in a World Trade Framework,' *KDI Working Paper,* No. 8710, 1987.

Krause, L.B., *European Economic Integration and the United States,* The Brookings Institution, Washington, 1968.

Stern R., Francis J. and Schmacher, B. *Price Elasticities in International Trade,* Macmillan, London.

Smith, A. and A. Venables, "The Costs of Non-Europe: An Assessment Based on a Formal Model of Imperfect Competition and Economies of Scale, *Research on the 'Cost of Non-Europe,'* 2, 5, 1988.

Williamson, J.A. B., "The Impact of Customs Unions on Trade in Manufacturers,' *Oxford Economic Paper,* 23, 3, 1971.

Winters A. and W. Takacs, "Labour Adjustment and British Footwear Protection,' unpublished paper, 1989.