

RECENT INDUSTRIAL ADJUSTMENTS OF KOREAN ECONOMY AND UNDERLYING POLICY REFORMS

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I. INTRODUCTION

THIS paper purports to highlight salient features of industrial adjustment of the Korean economy in the eighties and investigate the underlying policy reforms, particularly price stabilization, reshaping of incentive schemes in tax and tariff institutions, and trade liberalization, that underpinned the comparatively successful adjustment of the Korean economy to the external shocks arising from the second oil crisis and subsequent worldwide economic recession and bolstered the enhancement of Korea's industrial structure in the eighties.

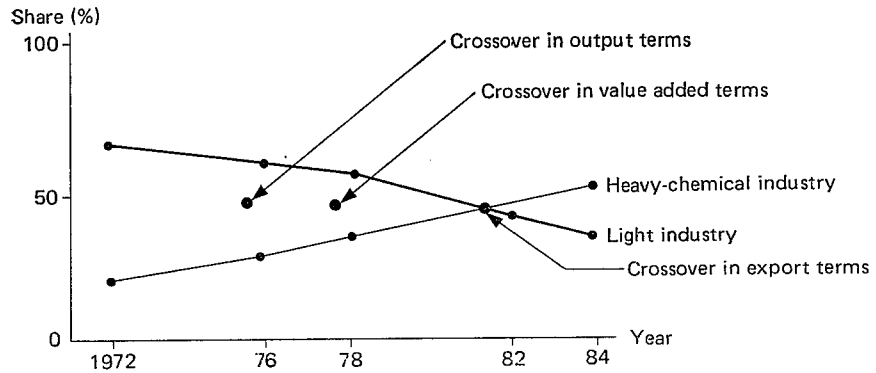
Since our interest lies in revealing some aspects of industrial adjustments and investigating major underlying policy factors, research was conducted in the following two ways. Firstly, attempts were undertaken to add depth to our understanding of aspects of industrial adjustments that had taken place in the eighties, i.e., heavy-chemical dominance over light industries and enhanced mobility of production factors among industrial sectors. Secondly, investigations are undertaken to enhance our understanding of three major underpinnings of policy reforms in the eighties, namely, price stabilization and restructured financial incentive schemes, reshaping of incentive schemes in tax and tariff institutions, and trade liberalization, in an effort to detect underlying policy factors that contributed to successful industrial adjustment and the enhancement of industrial structure in the eighties.

Section II is devoted to the study of aspects of industrial adjustment and Section III investigates three major policy reforms in the eighties and their industrial impact, particularly upon the management behavior of business firms. Finally, Section IV presents the conclusions of the paper.

II. SALIENT FEATURES OF INDUSTRIAL ADJUSTMENT

Deterioration of the business environment effected by the worldwide recession of the early eighties and the devastating competitiveness of manufacturing industries due to the excessive industrialization drive in the seventies, caused sluggishness in the industrial activities of the early eighties in Korea. Despite the slowdown of industrial growth, however, a careful investigation of industrial indicators on industrial performances in the eighties and a comparison of such indicators between the seventies and eighties seem to reveal two salient features of industrial activity in the eighties as distinguished from previous periods; i.e., growing dominance

Fig. 1. Trend of Share Composition between Heavy-Chemical and Light Industry Groups in Korean Export



Source: Production data base of National Bureau of Statistics, Economic Planning Board.

Note: Crossovers in output and value added terms are depicted in the footnote 2.

of heavy-chemical industries over light industries in industrial activities and demonstrated enhancement in the mobility of production factors among industrial sectors.

In order to compare the eighties with previous periods, the seventies and eighties are divided into three parts, namely, the period of pre-industrialization drive, the period of industrialization drive, and the period of stabilization launch. Demarcation lines for partitioning are drawn from the period of the industrialization drive beginning in 1974 or 1975 and ending in 1980 or 1981. For the sake of easy identification, these three distinguishing periods are named stages I, II, and III respectively.¹

Table I compares growth rates of industrial activities between heavy and light industry groups. Annual growth rate in manufacturing for the third stage registers the lowest among the three stages either in growth rates of output or value added or export, reflecting the deterioration in the business environment at that moment. A salient feature revealed in Table I is the sweeping dominance of the heavy-chemical industry group over the light industry group in growth rates of output, value added, and export amounts through all three stages. Due to the continuous higher growth of the heavy-chemical industries, the dominance in the share composition has been shifted from the light industry group to the heavy-chemical

¹ In this paper, there are a few occasions of inconsistencies in the compartmentalization of years at the border line when distinguishing stages I, II, and III. For instance, the year 1974 is sometimes included in stage I and sometimes included in stage II. Likewise, 1980 sometimes in stage II and sometimes in stage III. Such inconsistencies had to occur to meet the needs for convenience in data procession though it is kept within limits so as not to violate original intention of partitioning.

TABLE I
COMPARISON OF INDUSTRIAL GROWTH BETWEEN INDUSTRY GROUPS

	Stage I (1971-75)		Stage II (1976-80)		Stage III (1981-83)		Industries Showing Above-Average Performances in Stage III			
	Manufac- turing	Light Industry	Heavy Industry	Manufac- turing	Light Industry	Heavy Industry	Light Industry	Heavy Industry		
Output	19.3	16.5	22.6	13.7	10.5	16.6	7.0	5.0	8.5	Other chemical products, non-metallic mineral, iron and steel basic, nonferrous metal basic, metal products, machinery, electrical machinery, transport equipment
Value added	19.2	15.8	24.4	13.4	10.1	17.0	6.9	4.7	8.9	Other chemical products, iron and steel basic, nonferrous metal basic, metal products, machinery, electrical machinery, transport equipment
Export	50.2	43.6	69.0	26.4	22.4	32.8	12.3	3.5	21.6	Petroleum products, metal products, machinery, electrical machinery, transport equipment

Source: Production data base of National Bureau of Statistics, Economic Planning Board.

Note: Classification of industries was carried out on a rather ad hoc basis by following the conventional scheme often adopted in government documents, i.e., identifying the heavy-chemical industries first and regarding the rest as light industries.

industry group initially in gross output terms in 1975 followed by value added terms in 1977 and finally in export terms in 1981. Figure 1 depicts successive crossovers in relative share composition between the heavy-chemical and light industry groups, beginning with crossover in output terms, followed by value added terms and finally by export terms.²

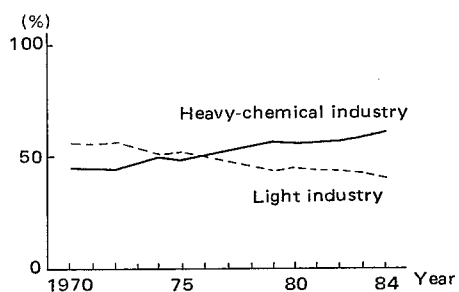
Understanding the nature of structural adjustment of industries, however, requires information on the patterns of firm-level behavior of each individual industry in response to new developments in the external environment in the eighties, such as stabilization of prices or trade liberalization. Two financial indicators, debt-equity ratio and normal profit rate to total assets, were computed for each of the thirty industries classified by the KSIC (Korea Standard Industrial Classification) three-digit codes for years 1975 to 1984 to measure the responsiveness of Korean manufacturing industries in their structural adjustment to the new economic environment which has developed since the second oil crisis.

Table II shows an yearly computation of means and variances of debt-equity ratio and normal profit rate in the distribution among thirty industries. Manufacturing industries have shown remarkable success in reducing the debt ratio in a fairly short period, from its peak level of 487.9 per cent in 1980 to 342.7 per cent in 1984. In a later section, the causal relationship between implementation of stabilization policy and steep decline in debt-equity ratio of manufacturing industries in the eighties will be illuminated. Profitability of manufacturing business faced rapid deterioration right after the second oil shock, and the ratio of normal profits to total assets for the manufacturing sector registered -0.2 per cent in 1980 and 0.0 per cent in 1981. The ratio, however, picked up after touching the bottom to record 3.4 per cent in 1984.

In order to visualize the process of structural adjustment in the eighties, scatter diagrams were drawn in Figures 2, 3, and 4, depicting debt ratio in the ordinate and profit rate in the abscissa with each point in a coordinate representing a manufacturing industry classified by the KSIC three-digit code. The distribution

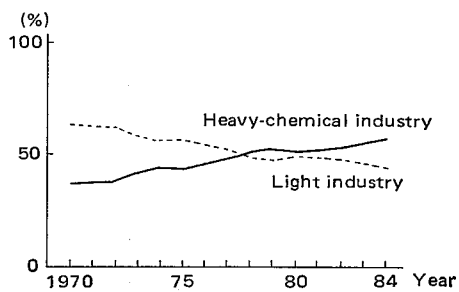
² Crossovers in output and value added terms are depicted in the following figures.

Trend of Share Composition between Heavy-Chemical and Light Industry Groups in Korean Manufacturing Output



Source: Bank of Korea, *National Income Accounts*, various issues.

Trend of Share Composition between Heavy-Chemical and Light Industry Groups in the Value Added Production of Korean Manufacturing



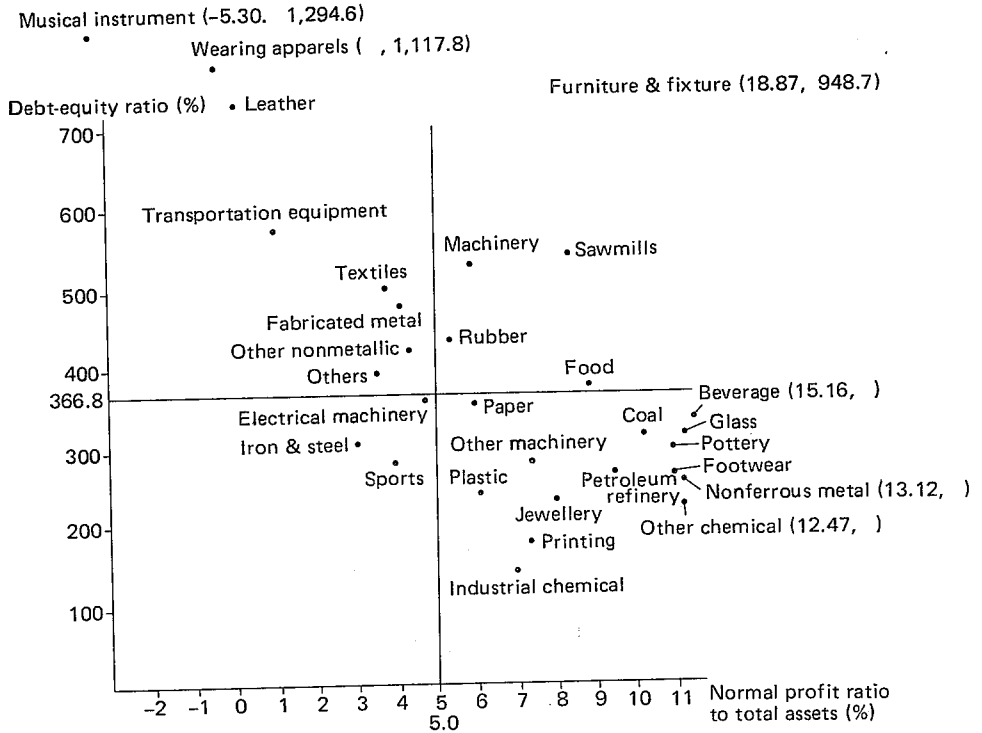
Source: Bank of Korea, *National Income Accounts*, various issues.

TABLE II
 MEAN AND VARIANCE OF DEBT-EQUITY RATIO AND NORMAL PROFIT RATE IN THE DISTRIBUTION
 AMONG THIRTY INDUSTRIES

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Debt ratio (%)	339.4	364.6	350.7	366.8	377.1	487.9	451.5	385.8	360.3	342.7
Variance	14,677.7	15,798.2	15,360.9	28,968.2	29,216.0	34,402.4	37,452.9	23,850.7	31,369.0	29,769.4
Normal profit rate										
to total assets (%)	3.9	4.6	4.5	5.0	3.4	-0.2	0.0	1.0	3.3	3.4
Variance	19.4	29.8	31.9	18.1	14.7	22.8	21.8	12.0	11.4	10.1

Source: [1, various issues].

Fig. 2. Distribution of Debt Ratios and Normal Profit Rates of Manufacturing Industries, 1978



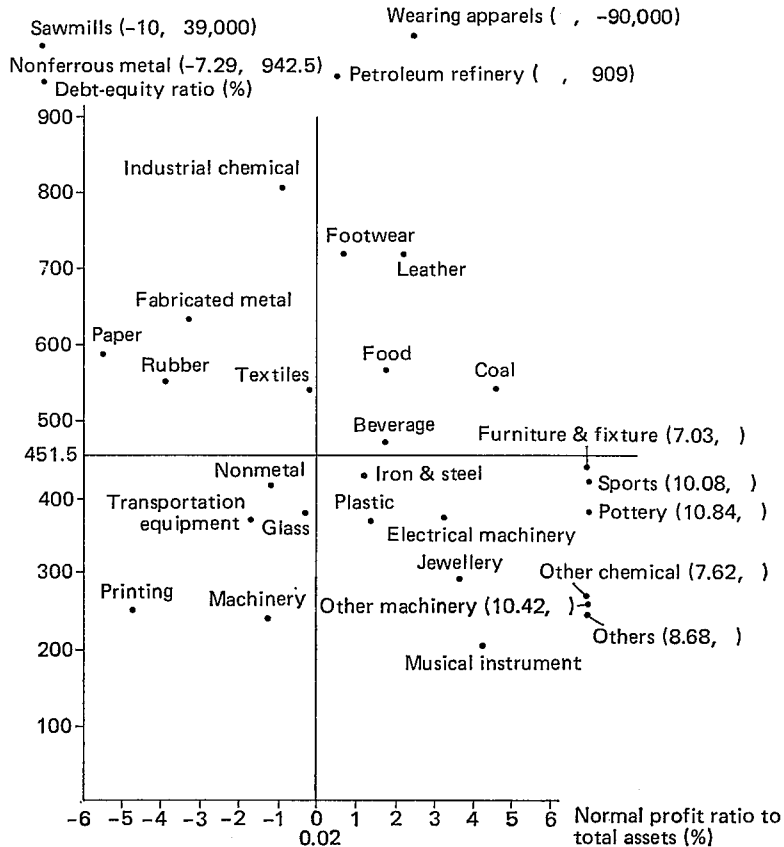
Source: [1, 1978 edition].

of points reflects the distribution of debt ratios or profit rates among industries. A striking feature easily recognized from the comparison of the scatter diagrams is the change in concentration in point distribution between years. The figures reveal that the point distribution is most highly concentrated in 1984 and most widely scattered in 1981, whilst that for 1978 remains inbetween.

Variances were computed to measure the dispersion of the distribution of points depicting respective industrial profit rates and debt ratios and the *F*-test was applied to both distributions for hypothesis testing. No definitive pattern is discerned from the yearly series of variances for debt ratio. A significant concentration in the point distribution, however, is observed in the eighties from the series of variances for profit rates. In the significance level of 95 per cent, the distribution of profit rates by industry in the seventies turns out to be more widely dispersed than the distribution in 1984.

Profit rates tend to show larger differences among industries as higher impediments to the efficient functioning of price mechanisms, such as price destabilization or proliferation of rent-seeking activities due to excessive use of investment incen-

Fig. 3. Distribution of Debt Ratios and Normal Profit Rates of Manufacturing Industries, 1981



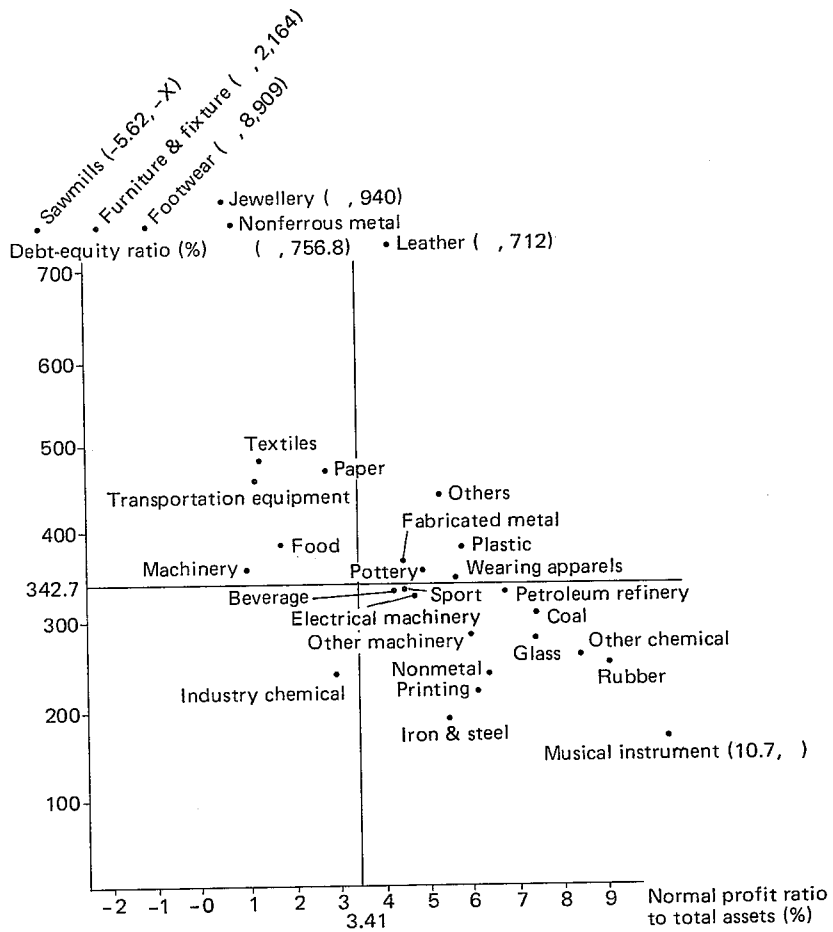
Source: [1, 1981 edition].

tive schemes, hinder smooth flows of resources from industries yielding low levels of profit to those with higher ones. This paper therefore conjectures that the concentration process in the distribution of profit rates in the eighties is attributable to the reinvigorated functioning of price mechanisms and subsequent enhancements in the mobility of production factors among industrial sectors after the successful implementation of price stabilization and progressive divergence from the abuse of incentive schemes such as excessive industry-specific protection or subsidization.

III. DETECTION OF UNDERLYING POLICY FACTORS

In an effort to detect the underlying policy factors that contributed to the featuring of two salient aspects of industrial adjustment, namely a robust advancement in the technological and capital contents of the industry featured by the outperforming

Fig. 4. Distribution of Debt Ratios and Normal Profit Rates of Manufacturing Industries, 1984



Source: [1, 1984 edition].

Note: X means unboundedly high debt-equity ratio.

of heavy-chemical industries over light industries and demonstrated enhancements in the mobility of production factors among industrial sectors, critical reviews were attempted on policy reforms undertaken in the late seventies and eighties to systematically understand policy reforms in the current context and investigate operational aspects of policy reforms in details of industrial adjustment and business conduct.

A. An Overview of Policy Reforms

A series of economic policies launched in the late seventies and eighties was devised to address different aspects of the economy but seem to share similar

policy objectives and produce interactive and mutually reinforcing effects.³ In macroeconomic management, price stabilization was successfully achieved and broke the still chronic inflation of the Korean economy. Incentive schemes in tax or tariff institutions were reshaped to renovate the previous approach of directly supporting specific industries perceived to be strategic, into the functional approach of providing incentive measures to any industry performing required areas of function such as R&D activities. Also, the first serious attempts were made to launch an import liberalization program, and liberalization has been successively implemented since 1978.⁴

Though discussion in this paper is confined to implementational aspects and policy impact of these three policy reforms, the significance of policy coordination together with following other steps should be properly assessed as integrating links to help the successful implementation of main policy reforms. Currency devaluation has been pursued successively since 1980 after the period of arbitrarily highly overvalued currency of the seventies. As other essential coordinating steps to ensure the success of policy reforms, particularly in connection with the implementation of import liberalization, investment realignments or rationalization measures calling for government-business coordination were implemented to deal with the aftermath of duplicative investment or excessive investments of the heavy-chemical industrial drive policy of the seventies. At the same time, the government made efforts to secure the continuous construction of industrial infrastructures in conjunction with the development of industries.⁵

B. *Price Stabilization and Financial Incentives*

The attainment of price stabilization may be one of the most important economic achievements of the eighties, having a profound impact on all economic activities. Unprecedentedly, price was stabilized within two or three years from the rampant inflation of 38.9 per cent in 1980 to 4.7 per cent in 1982 and 0.2 per cent in 1983 in the wholesale price index as Table III reveals.⁶ As prices stabilized, the real rate of interest was most significantly affected, demonstrating an upward movement to a positive level even in the case of export financing, known to be the cheapest of policy loans.⁷ Table III shows no positive real interest rate in export financing all through the seventies with the single exception of 0.5 per cent in 1973. Real interest rates of other policy and general bank loans, mostly remaining in the negative regions, were positive from 1976 to 1978 but never reached such a high level as in 1983 and 1984.

On the other hand, the financial markets in Korea are generally considered imperfect in the sense that credit rationing is the dominant mode of allocating financial resources. Access to bank loans inhabits preferential benefits due to the

³ See [6] for detailed information on policy measures implemented during the late seventies and early eighties.

⁴ Compared to the success story of macroeconomic management in Korea, a contrasting example is revealed from the unsuccessful case of economic reform in Chile. See [2].

⁵ See [3]. [6] [8] for detailed discussion of these other policy steps.

⁶ For more information and discussions on the issue, consult [7]. [8] [9].

⁷ For detailed information, see [5].

TABLE III
TRENDS OF FINANCIAL INCENTIVE EFFECTS

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Inflation rate (WPI)	8.7	13.8	6.0	42.1	26.5	12.2	9.0	11.6	18.8	38.9	20.4	4.7	0.2	0.7
Nominal exchange rate (won/U.S.\$)	373.2	398.9	397.5	484.0	484	484	484	484	484	659.9	700.5	748.8	795.5	827.5
Interest rate:														
General bank loan				15.5	15.5	18.0	16.0	19.0	19.0	20.0	17.0	10.0	10.0	10.0
Facility investment loan from KDB ^a	12.0	11.0	10.0	10.0	12.0	12.5	13.0	14.0	15.0	21.0	18.5	13.0	10.0	10.0
Export financing	6.0	6.0	6.5	9.0	8.0	7.5	8.0	8.5	9.0	15.0	15.0	11.0	10.0	10.0
Curb market loan	46.4	39.0	33.3	40.6	41.6	40.5	38.1	41.2	42.4	44.9	35.3	30.6	25.8	24.7
LIBOR rate ^b	6.5	6.0	10.3	10.1	6.6	5.1	7.3	12.1	15.0	18.1	14.0	9.3	9.9	8.8
Benefits of financial availability: ^c														
General bank loan				25.1	25.8	22.5	22.1	22.2	23.4	24.9	18.3	20.6	15.8	14.7
Export financing	40.4	33.0	26.8	31.6	33.3	33.0	30.1	32.7	33.4	29.9	30.3	19.6	15.8	14.7
Real interest rate: ^d														
General bank loan				-26.6	-11.0	5.8	7.0	7.4	0.2	-18.9	-3.4	5.3	9.8	9.3
Export financing	-2.6	-7.8	0.5	-33.1	-18.5	-4.7	-1.0	-3.1	-9.8	-23.9	-5.4	6.3	9.8	9.3
Real exchange rate ^e				131.70	110.01	102.27	102.44	105.82	97.06	100.00	97.68	96.55	103.45	106.91

^a Korea Development Bank.

^b London Interbank.

^c Curb market interest rate minus interest rate of the loan concerned.

^d Interest rate of the loan concerned minus WPI.

^e Real effective exchange rate index computed at the Korea Development Institute with the trade volumes of majority trading partner countries as weights.

cheap terms of loan, usually much lower than the social opportunity cost of capital. The magnitude of preferential benefits arising from the availability of bank loans, either general bank loans or policy loans, is usually measured by the differential between the interest rates for bank loans and the rates for curb market loan. Table III reveals that the benefits of financial availability, substantially high in the seventies, faced a drastic decline in the eighties. The hike of real interest rates for bank loans reduced the attractiveness of bank loans and induced investors to further their efforts to find internal sources for financing their projects. The drop of debt-equity ratio in the manufacturing sector in the eighties, as shown in Table II, seems largely caused by the rising cost of bank loans.

The decline in the magnitude of preferential benefits arising from the availability of bank loans implies a lessening of the gap between the user's cost of preferential loans from the bank and the social opportunity cost of the capital. It left less room for firms to engage in rent-seeking activities, such as unprofitable exporting with the sole view to obtaining additional bank credit, and eventually contributed to the improvement of the allocative efficiency of national resources. Since price stabilization itself is conducive to revitalizing price mechanisms in the allocation of resources, the discouragement of rent-seeking activities and the reduction of X-inefficiency through lessening of the gap between the preferential rates on bank loans and the social opportunity of capital gave rise to a new era highlighted by the efficient functioning of price mechanisms and the improved distribution of resources in the eighties.

Table III contains numbers shaping the uprising trend of real interest rates, registering 9.8 per cent in 1983, a jump from the low -18.9 per cent in 1980 in the case of general bank loans. The numbers in the table show an even bigger upsurge in the case of export financing. On the other hand, measures of the magnitude of benefits stemming from capital availability reveal a submerging trend from 23.4 per cent in 1979 to the lowest ever, 14.7 per cent in 1984, in the case of general bank loans. The numbers in the table show an even deeper plunge in the size of benefits in the case of export financing.

A real interest rate hike and a substantial drop in the size of preferential benefits from credit availability have brought fundamental changes in firms' behavior in financial management. As revealed in Table II, the debt-equity ratio in the manufacturing sector declined rapidly from 487.9 per cent in 1980 to 342.7 per cent in 1984. In the eighties, internal financing became a major source of corporate financing management, reaching approximate parity in relative significance to aggregate external financing.

Table IV discloses that in the manufacturing sector, the share of internal financing in total corporate financing soared from 27.3 per cent in 1979 and 16.8 per cent in 1980 to 49.2 per cent in 1983 and 46.8 per cent in 1984. In 1980, bank loans supplied 28.9 per cent of the total corporate financial needs in the manufacturing sector, whereas the share declined to 18.0 per cent in 1984.

In this connection, the newly staged changes in corporate financial behavior dealing with foreign loans attract our attention. The redemption of foreign loans in the eighties as seen in Table IV seems to be prompted by a drop in domestic nominal interest rates and persisting high interest rates in the overseas financial

TABLE IV
SOURCES OF CORPORATE FINANCING: MANUFACTURING

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Internal financing	51.8	39.5	28.8	27.1	36.2	31.2	31.5	27.3	16.8	37.1	38.7	49.2	46.8
External financing	48.2	60.5	71.2	72.9	63.8	68.8	68.5	72.7	83.2	62.9	61.3	50.8	53.2
Bank loans	22.6	30.9	30.3	9.9	24.4	22.6	27.7	6.3	28.9	21.6	10.8	12.0	18.0
Foreign loans	9.5	3.7	13.2	14.5	5.9	10.9	5.2	2.2	11.4	-3.4	-1.2	-3.6	-1.4

Sources: Bank of Korea, *Monthly Bulletin*, various issues; [1, various issues].

market together with the uncertainty in the exchange rate arising from repeated attempts at devaluation.

As already discussed, price stabilization was instrumental in lessening the gap between the interest rates for preferential bank loans and the social opportunity cost of capital, contributing significantly to the reduction of rent-seeking activities linked to the availability of bank loans. Moreover, price stabilization tends to strengthen price credibility in the market as a positive reference signal to the private sector facing up to economic decisions, contributing to the enhancement in the functioning of price mechanisms. The significant reduction of variance in the distribution of normal profit rates for manufacturing industries, as revealed in Table II, seems to confirm the above-mentioned hypothesis, because the reduction of disturbance in the distribution of profit rates indicates an improved functioning of the market mechanism.

C. *Reshaping of Incentive Schemes in Tax Institutions*

Two incentive schemes are considered the mainstay of preferential tax treatments to encourage investment in industrial activities. One is preferential taxation treatment of investments in strategic industries, and the other is preferential tax treatment of investments in R&D activities. These two schemes distinguish themselves by the way preferential benefits are given. In the former case, which is often called the industry-specific approach, the benefit-receiving industries, i.e., strategic industries, are officially designated. On the other hand, in the latter case, eligibility for the preferential treatment of investments in R&D activities is determined by the type of business activity, not by the name of the industry, namely whether it would be perceived to be R&D activity. This is often called functional approach.

The tax incentive scheme has developed institutionally during the past one and a half decades with changing emphasis between the two types of approach: industry-specific approach and functional approach.⁸ Periodic trichotomization of the seventies and eighties, as attempted in Section II, is instrumental to understanding the changing patterns of tax incentive schemes. Details of institutional changes in preferential tax treatment for investments in strategic industries are listed in Table V and those for R&D expenditures in Table VI.

The heavy-chemical industrialization drive draws demarcation lines in the trichotomization of the seventies and eighties. Stage I would be the pre-industrialization period, covering up to 1974. During this period, preferential treatments in taxation were available for investments in heavy industries, though they were treated individually for each industry considered strategic, without an integrated blueprint designing all preferential tax treatments in a systematic way.

The period of industrialization drive is named stage II, spanning the years from 1975 to 1980. During this period, the integrated plan of an incentive system was mapped out in an effort to give firm footing to strategic industries, mainly of the heavy-chemical class, and efforts were stepped up to launch various

⁸ [4] would serve as guiding references for detailed information.

TABLE V
PREFERENTIAL TAX TREATMENT FOR STRATEGIC INDUSTRIES

	Stage I (-1974)	Stage II (1975-80)	Stage III (1981-)
Benefiting industries	<ul style="list-style-type: none"> • Key industries receiving preferential treatment: shipbuilding, iron and steel, chemical fertilizer, power generation plant, synthetic fibres, motor vehicles, machinery, electronics, petroleum refining, industrial chemical pulp, pulp 	<ul style="list-style-type: none"> • Strategic industry formally defined: petrochemicals, shipbuilding, machinery, electronics, iron and steel, petroleum refining, power-generation-plant, chemical fertilizer, defence industry, aviation industry 	<ul style="list-style-type: none"> • Industries receiving preferential treatment: naphtha cracking, iron and steel, machinery, electronics, shipbuilding, aviation industry
Types of preferential treatment	<ul style="list-style-type: none"> • Investment tax credit • Income tax deduction • Corporation or business tax exemption 	<ul style="list-style-type: none"> • Direct forms of preference: investment tax credit, income tax deduction, corporation or business tax exemption • Indirect forms of preference: preferential depreciation, tax-free reserves for investment 	<ul style="list-style-type: none"> • Direct forms of preference: investment tax credit • Indirect forms of preference: preferential depreciation, tax-free reserves for investment
Changing features of preferential preferences	<ul style="list-style-type: none"> • Types of preferential tax treatment different for each benefiting industry • Direct forms of tax credit or tax exemption preferred 	<ul style="list-style-type: none"> • Tax holidays rather than tax exemption • Direct as well as indirect forms in operation • Industries receiving preferential tax treatment formally defined as strategic industries 	<ul style="list-style-type: none"> • Indirect forms of preferential treatment becoming dominant over direct forms

Source: Construction of table carried out based upon information collected from the publications of the Ministry of Finance.

TABLE VI
PREFERENTIAL TAX TREATMENT FOR R & D EXPENDITURES

	Stage I (-1974)	Stage II (1975-80)	Stage III (1981-)
R & D expenditures receiving preferential treatment	<ul style="list-style-type: none"> • Foreign engineer's wage income • Corporation tax of research institutes • Venture business 	<ul style="list-style-type: none"> • Foreign engineer's wage income • Corporation tax of research institutes • Reserved funds for technology development • Venture business 	<ul style="list-style-type: none"> • Foreign engineer's wage income • Corporation tax of research institutes • Reserved funds for technology development • Research facility investments • Job training expenses • Venture business
Types of preferential tax institution	<ul style="list-style-type: none"> • Tax credit or exemption 	<ul style="list-style-type: none"> • Tax credit or exemption • Tax-free reserves for expenses in technology development 	<ul style="list-style-type: none"> • Tax credit or exemption • Tax-free reserves for expenses in technology development • Preferential depreciation
Characteristics of tax incentives	<ul style="list-style-type: none"> • Preferential treatment applying only to a few selected and exceptional cases 	<ul style="list-style-type: none"> • Tax preferences generally applying to R & D activities in indirect forms such as tax-free reserves 	<ul style="list-style-type: none"> • Pan-industry type functional approach in tax preferences rather than industry specific one • Indirect forms of tax preferences such as tax-free reserves and preferential depreciation

Source: Construction of table carried out based upon information collected from the publications of the Ministry of Finance.

incentive schemes to promote investments in such industries.⁹ As a part of these efforts, preferential tax treatment of individual industries was strengthened into an integrated form to establish the system of tax incentive schemes for investments in strategic industries.

Stage III spans the years from 1981 on. A distinctive feature of tax incentive schemes in stage III is the growing dominance of the functional approach in tax incentive schemes over industry-specific incentives. During this period, the number of industries classified as strategic decreased, and measures adopted for preferential tax treatment changed into indirect forms such as tax-free reserves for investment from direct forms such as tax deductions or tax holidays. Figure 5 compares the magnitude of incentive effects of the preferential treatment for investments in strategic industries with that for investments in R & D expenditures, both of which were calculated by applying appropriate formulae.¹⁰

According to Figure 5, the incentive effect of preferential treatment for investments in strategic industries, though showing a fluctuating trend, reaches the peak of its trend and demonstrates its dominating strength over other incentive schemes in the late seventies, but leads to a drastic decline with ratchet-like oscillation in the eighties. On the other hand, the magnitude of the incentive benefits on R & D shows a steadily increasing trend in the seventies and reveals a rapid upturn in the eighties, eventually surpassing the incentive effects on strategic industries to become the dominant form of tax incentive.

All these developments seem to confirm the view that the institutional reshaping of the tax incentive scheme has contributed to the reduction of distortionary factors in the price mechanism, helped reinvigorate the efficient functioning thereof, left less room for rent-seeking activities, and encouraged investments to promote technological development and enhance industrial structure.

⁹ Detailed information on implementation process of heavy-chemical industrial drive would be obtained from [3].

¹⁰ The following is the formulae used for the computation of incentive benefits.

Tax deduction or tax credit:

$$\text{Preferential benefits} = R \cdot t.$$

Accelerated depreciation:

$$A = 0.1 P \cdot t \left\{ 1 + \sum_{i=1}^q [1/(1+r)^i] \right\},$$

$$B = 0.2 P \cdot t \left\{ 1 + \sum_{i=1}^q [1/(1+r)^i] \right\},$$

$$\text{Preferential benefits} = B - A.$$

Tax-free reserves for investment funds (in case of taxation after two-year deferral):

$$\text{Preferential benefits} = Y \cdot t [1 - 1/(1+r)^2],$$

where R = amounts of income or investment receiving the benefits of tax-credit,

t = marginal corporate tax rate,

A = ordinary depreciation (ten years),

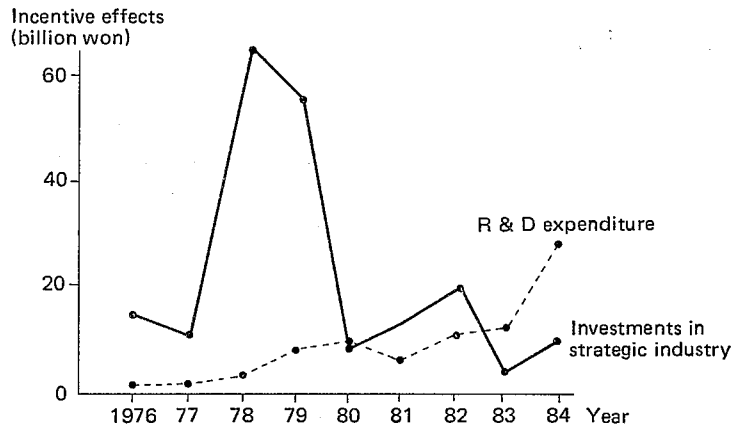
B = preferential depreciation (five years),

P = price of investment goods,

r = interest rate,

Y = yearly tax-free reserves.

Fig. 5. Comparisons of Incentive Effects of Preferential Treatment of Investments in Strategic Industries with Those of R & D Expenditure



Source: Based upon information collected from the publications of the Ministry of Finance.

D. Reshaping Incentive Schemes in Tariff Imposition

As in the tariff incentive scheme, preferential treatments in tariff imposition are incentive measures designed to promote industrial development in specific industries by alleviating the burden of duties levied on imports. Again, the stages approach is adopted to reveal the distinctive features of the institutional changes in each period. Due to a lack of coincidence in the timing of the institutional changes in tariff imposition, periodical partitioning for each stage does not exactly coincide with that of tax incentive schemes. Particularly, stage III starts rather late in 1984.

Typical type of institutional layout for preferential treatments is tariff deduction, whose rates decline along the progression of stages. Table VII shows the ranges of deduction rate in each stage. Deduction rates, though different according to the type of industry or level of working tariff rates, were found to be kept within certain boundaries. Ranges of deduction rates registered 80–100 per cent in stage I, 70–90 per cent in stage II, and 55–65 per cent in stage III, clearly indicating a falling trend.

The feature differentiating the stages is the types of industries receiving preferential treatments at each stage. In stage I, the selection of industries for preferential treatment was made from a group of key industries presumed to play a pivotal role in the future, though each industry was considered individually with no integrating program linking them as a group. Preferential treatment in tariff imposition was applied to the imports of facility equipment, machinery, raw materials, parts, and components to be used by the selected industries.

In stage II, however, the heavy-chemical industrialization policy emerged as an integrating program providing terms of reference to determine eligibility of indus-

TABLE VII
PREFERENTIAL TREATMENTS IN TARIFF IMPOSITION

	Stage I (-1974)	Stage II (1975-83)	Stage III (1984-)
Preferentially treated industries	<ul style="list-style-type: none"> • Key industries: facility equipment, machine, raw material, parts, components 	<ul style="list-style-type: none"> • Strategic industries: facility equipment, machine, raw material, parts, components 	<ul style="list-style-type: none"> • Technologically leading industries: facility equipment, machine
Types of preferences	<ul style="list-style-type: none"> • Tariff exemption or deduction: deduction rate of 80-100% 	<ul style="list-style-type: none"> • Tariff deduction: deduction rate of 70-90% 	<ul style="list-style-type: none"> • Tariff deduction: deduction rate of 55-65%
Characteristics of preferences	<ul style="list-style-type: none"> • Individual key industries being treated independently without integrating program • Tariff exemption and high rate of tariff deduction being typical modes 	<ul style="list-style-type: none"> • Strategic industries formally defined under integrated program of heavy-chemical industrialization • Tariff deduction being typical mode 	<ul style="list-style-type: none"> • Technologically leading industries replacing the role of strategic industries • Tariff reduction rate gradually reduced

Source: Construction of table carried out based upon information collected from the publications of the Ministry of Finance.

TABLE
IMPORT TRENDS OF

	1978		1979		1980	
	Amounts (U.S. \$ Million)	Annual Growth (%)	Amounts (U.S. \$ Million)	Annual Growth (%)	Amounts (U.S. \$ Million)	Annual Growth (%)
Total imports (A)	14,972	38.5	20,339	38.5	22,292	9.6
Imports of items liberalized in 1978 ^a	2,667	52.8	3,528	32.3	3,184	-9.7
Imports of items liberalized in 1979	337	13.7	434	28.9	392	-9.7
Imports of items liberalized in 1980	433	38.3	533	23.2	463	-13.2
Imports of items liberalized in 1981	486	113.0	4,092	742.7	455	-88.9
Imports of items liberalized in 1982	491	261.9	223	-54.6	178	-19.9
Imports of items liberalized in 1983	n.a.	—	n.a.	—	n.a.	—
Imports of items liberalized in 1984	n.a.	—	n.a.	—	n.a.	—
Imports of total liberalized items (B)	2,667		3,692		4,039	
B/A (%)	17.8		18.2		18.1	
Liberalization ratio ^b	64.9		67.6		68.6	

Source: Dongguk University, "Interim Report on the Evaluation of Economic Effects of

^a Including items liberalized before 1978.

^b Number of liberalized items divided by number of total items classified in CCCN eight-

tries for preferential treatments in the selection process of strategic industries. The number of preferentially treated industries decreased in stage II compared to stage I, and selected industries shared the common character of being in the heavy-chemical class. Just as in stage I, preferential treatment in tariff imposition in stage II was applied to the imports of facility equipment, machinery, raw materials, parts, and components for use by the selected industries.

In stage III, after the revision of the tariff act in 1983, fundamental changes took place in the mode of implementation of the tariff incentive scheme, as had occurred in tax the incentive scheme. Up to stage II, industries deserving preferential treatment were selected by the industry specific approach. In stage III, however, the functional approach replaced the industry-specific approach and whether or not an industry belonged to the technologically leading class became the criteria to determine its eligibility for preferential treatment in tariff imposition. In stage III, preferential treatment was applied only to the imports of facility equipment or machinery of technologically leading industries.

VIII

THE LIBERALIZED ITEMS

1981		1982		1983		1984	
Amounts (U.S. \$ Million)	Annual Growth (%)	Amounts (U.S. \$ Million)	Annual Growth (%)	Amounts (U.S. \$ Million)	Annual Growth (%)	Amounts (U.S. \$ Million)	Annual Growth (%)
26,132	17.2	24,251	-7.2	26,192	8.0	30,631	16.9
3,389	6.4	3,149	-7.1	4,832	53.4	4,933	2.1
409	4.4	368	-10.0	483	31.0	828	71.4
670	44.7	553	-17.5	533	-13.7	444	-16.8
459	0.7	348	-24.0	649	86.2	683	5.2
324	81.8	418	28.8	446	6.7	389	-12.8
1,125	—	976	-13.3	1,022	4.7	1,484	45.2
497	—	539	8.5	617	14.3	939	52.2
4,927		4,836		7,985		9,700	
18.9		20.0		30.5		31.7	
74.7		76.6		80.4		84.8	

Import Liberalization," mimeographed, 1985; [11].

digit level.

E. Import Liberalization

Liberalization efforts could be traced back to 1967 when the negative list system, which places import restrictions only on items specifically listed in the system, replaced the positive list system, which states which items are importable with all other items under restriction. After the negative list system was successfully implemented, trade liberalization was about to follow, but the recession caused by the oil shock of the early 1970s setback the attempt. By 1977, however, improved balance of payments secured room for the nation to take steps toward import liberalization and the prevalent inflation at that time demonstrated the urgent need for its immediate implementation.

The bottom row of Table VIII shows the trend in import liberalization ratios, which were generated by dividing the number of liberalized items by the number of total items classified in CCCN eight-digit level. The figures reveal the rapid rise in liberalization ratios, increasing to 84.8 per cent in 1984 from 64.9 per cent in 1978. The share of liberalized items in the total amounts of imports, however,

show far lower figures than import liberalization ratios, indicating that major import items are still excluded from the liberalization list. As demonstrated in the second row from the bottom of Table VIII the share of liberalized items in total imports had steadily increased from 17.8 per cent in 1978 to 20.0 per cent in 1982. In 1983, the share jumped by about 20 per cent to 30.5 per cent, the biggest upsurge per annum since the initial implementation in 1978.

In Table VIII, import trends of items liberalized since 1978 are tracked by groups according to the year of liberalization. Numbers in the upper triangle are import trends of liberalized items grouped according to the year of liberalization, revealing the amounts of import and year-to-year growth rate of each group. The most striking observation of import trends is the stable pattern of import surge which import trends of yearly groups had displayed after the lift of quantitative import control. Imports seemed to surge right after market opening as growth rates for the year of liberalization indicate, though import surges were later followed by downward adjustment. Exceptions are import trends of liberalized groups implemented in 1980 and 1981, revealing negative 13.2 per cent of annual import growth in 1980 for the 1980 liberalized group and 0.7 per cent annual import growth in 1981 for the 1981 liberalized group. Substantial import hikes are seen to precede liberalization in both cases. Moreover, 1980 was the year when domestic political and economic instability as well as the external impact of the oil shock prevented import trends from showing a normal pattern of response.

According to the interim report of a survey¹¹ designed to investigate the effects of import liberalization on industrial adjustments, a summary of which is presented in Table IX, the industries put in a position to feel competitive pressures from abroad due to the implementation of liberalization had to face significant changes in the business environment and to undertake changes in management behavior. Table IX reveals that among the favorable effects of liberalization leading to the strengthening of competitiveness of industries concerned, the following are the major features: strengthened marketing efforts, improvement of product quality, technological enhancement, localization of parts and components, cost reducing efforts, enhanced efficiency in production lines, increasing facility investment, developing overseas market, and furthering product differentiation.

On the other hand, import liberalization forced some industries to undertake structural adjustments and even close down a number of businesses. Some of the negative effects on domestic industries arising from liberalization are as follows: contraction of production capacity of industries concerned, sales decline, business bankruptcy, dumping attempts by foreign exporters, and excessive import surges.

The generally favorable effects on the majority of industries by liberalization of imports and the moderate pattern of industrial adjustments seem to suggest that import liberalization was managed in a conservative way and minimized the industrial structure adjustment costs of opening markets.

Such conservative management of implementing programs for import liberalization could be perceived in two ways. Firstly, the effective level of import liberalization measured in terms of the share of liberalized items in total imports should lie much below the liberalization ratio computed by dividing the number

¹¹ See [10] for details of information.

TABLE IX
EVALUATION OF LIBERALIZATION EFFECTS ON INDUSTRIAL ADJUSTMENTS

	Favorable Effects	Unfavorable Effects	Other Remarks
Electrical machinery and electronics:			
Home vacuum cleaner	PQI, LPC		
Storage battery	PD		
Hair dryer	LPC		
Tape recorder	NPD, PQI		
Cassette player	NPD, CR		
Electric shaver		CPC	Penetration of domestic market by Dutch, Phillips
Calculator (some models)		SD	Due to import surge
Steel & metal products:			
Steel bar & section steel	PQI, CR		Cost reduction by 10%
Diamond tools	TE, PQI		
Tinned plates and sheets	CR		Pohang Iron & Steel Co.'s supply price lower than import price from Japan by 20%
Machine tool:			
Parts and components of liquids pumps	TE, LPC		Domestic small and medium firms doubled R & D efforts to substitute imports
Furnaces and ovens, nonelectrical	CR, PQI, NPD		
Telephone switching systems and exchanges	CR, PQI, NPD		
Apparatus for treatment of materials by change of temperature	TE		
Parts and components of pumps for internal combustion engine	LPC		Local suppliers dominated domestic market due to large-scale buyers' non-discrimination policy against local small and medium manufacturer
Cameras for films of a width 16 mm		BB	Korea Optical went bankrupt due to import surge
Chemical & petrochemical:			
Styrene-monomer			Strengthened competitiveness of downstream products due to cheap import of styrene-monomer

TABLE IX (Continued)

	Favorable Effects	Unfavorable Effects	Other Remarks
Polypropylene			Not much affected after the liberalization due to an easy local production process
Mixed alkyl-benzens and mixed naphthalene		DAFE	
Glass tableware		BB	21 firms went bankrupt during 1980-81 period
Glass inners for vacuum flasks		BB	3 firms went bankrupt in January 1982

Textile & clothing:			
Women's, girls' & infants' under garments	NPD, PD		
Outer garments of cotton fabrics	PQI, SME		
Raw furskins		EIS	
Furskins of mink		EIS	
Agricultural & mining:			
Magnesium oxide and magnesia clinker	FI, TE		Imports decreased after the liberalization
Lemon & lime		EIS	
Miscellaneous:			
Neckties, fluorescent lamp	NPD, PQI, TE		
Fishing tools	CR		
Spectacle frames	DOM, EEPL, CR		

Source: [10].

Note: SME=strengthened marketing efforts, PQI=improvements in product quality, TE=technological enhancement, LPC=localization of parts and components, CR=cost reduction, EEPL=enhanced efficiency at production lines, FI=facility investments, DOM=developing overseas market, PD=product differentiation, CPC=contraction of production capacity, SD=sales decline, BB=business bankruptcy, DAFE=dumping attempts by foreign exporters, EIS=excessive import surge, NPD=new product development.

of liberalized items by the total number of importable items as listed in the bottom row of Table VIII. Secondly, supplementary measures accompanying liberalization have been effectively administered to control an excessive upsurge of imports after the liberalization. Flexible management of tariff rates applied to liberalized items, an import surveillance system to prevent an excessive upsurge of imports, and a program for regional diversification in the composition of import-partner countries are known to be three of the major supplementary measures.

IV. CONCLUDING REMARKS

In this paper, two salient features have been highlighted to uncover fundamental aspects of industrial adjustment of the Korean economy in the early eighties, i.e., advancement in industrial structure towards demonstrated heavy-chemical dominance over light industries and enhanced mobility of production factors among industrial sectors. Of these two features, the latter is conjectured to be the consequence of reinvigorated functioning of price mechanism in the market. Institutional incentive measures, incorporated in financial or tax and tariff institutions, are found to be streamlined to a less distortionary functional fashion, from distortionary industry-specific type, after going through policy reform procedures in the eighties, while still holding effective components affecting the direction of investments towards the desired pattern of industrial restructuring.

Price stabilization, reshaping of incentive schemes in tax and tariff institutions, and trade liberalization are regarded as three major institutional underpinnings supporting policy reforms in the eighties. Attempts were undertaken to understand three major institutional underpinnings of policy reforms in a refined and well-structured pattern by following the stages approach.

Much credit for successful adjustments should be given to price stabilization in the eighties, which contributed to the drastic reduction of rent-seeking activities and the reinforced functionings of price mechanisms so as to increase flexibility in industrial adjustment, encourage rational behavior of firms, and raise the competitiveness of domestic industries. The reshaping of incentive schemes from the industry-specific approach to the functional one in tax and tariff institutions seems to have reinforced the functioning of the price mechanism. Successive attempts to launch import liberalization turned out to have yielded various rational responses from business firms and induced industrial adjustments to take place in a moderate manner, thus contributing to the enhanced adjustment of industrial structure in terms of technological and capital content of the industry.

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