Social Overhead Capital and Public Enterprise in Korea*

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1. Introduction

The Korean economy has grown very fast for the last two decades since 1962 when the First Five Year Economic Development Plan was implemented. There is no denying that the steady growth has been made possible by the thrust and entrepreneurship of the private sector. This aspect needs no further elaboration. In so interpreting, one tends to neglect the role which the public sector has played in general, and the public enterprise in particular in the development and the structural transformation of Korean economy. It is indeed usually believed that the Korean economy, although it entails mixed-economy characteristics, is much more geared towards making use of the capitalistic principle of economic management than in some of developing economies.

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However, contrary to thus a commonly-held view, the contribution of public enterprise is no less important in Korea than, say, in India. The public enterprise value added in 1972 accounted for 8.6 per cent of GDP in Korea whereas it accounted for 9.4 per cent in India. The contribution of public enterprise in Korea's GDP was 9.6 per cent in 1980.

Korea's public enterprise is characterized by its high forward linkages, high capital intensity, large size, output-market concentration, protection of non-tradables and import substitution rather than export promotion.(1)

The past trend does not appear to suggest that the role of public enterprise in Korean economy has been on the eclipse but rather shows that the public enterprise contribution has maintained a more or less constant share of 8 to 9 per cent of GDP since early 1960s.

For the last few years we have witnessed a series of nation-wide discussion as to what sort of system the Korean economy should be led to. It can be safely stated that the national consensus has now been reached implicitly to replace the government-led economic system with a civilian-led or market-oriented economic system. Consequently this national consensus has a far-reaching implications for the role of public sector in general and public enterprise in particular in the future development of Korea's economic potentials.

The paper aims to review the economic role which the public enterprise has played in the Korea's economic development in general and in social overhead capital in particular, and then to make some suggestions for the reform of public enterprise. Before doing this, some economic theoretical aspect of public enterprise and social overhead capital needs to be elaborated.

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(1) L.P. Jones and I. Sakong, *Government, Business and Entrepreneurship in Economic Development: The Korean Case* (Cambridge: Harvard University Press, 1980), pp. 151-154.

2. Some Theoretical Exposition of Public Production and Social Overhead Capital

(1) The Case for Public Production

Public enterprise is a medium of public production and there are many different versions on the definition of public enterprise. The commonality in the definition of public enterprise is that it is engaged in public production. In the context of Korean practices, the public enterprise can be defined perhaps as follows.(2)

The public enterprise is a productive entity which is owned and/or controlled by public authorities and whose output is marketed. The ownership refers to more than 10 per cent of outstanding equity held by a public authority, either directly by the government or indirectly by other public authorities; the control means the power to appoint the top management and, through this, to affect the internal decision-making process of the public enterprise, and output is marketed if sales cover more than half of current costs.

What are then the conditions in which public sector production is more preferred to the private production? An economic theory tells us a few cases where the production by means of public enterprise is more required rather than it is left to the private sector.

The first is the case of production involving decreasing average costs. The welfare economic theory shows that the resources are efficiently allocated when price is equal to marginal cost. However, if the price is equalized to marginal cost in the case of production involving decreasing

(2) For this definition, see L.P. Jones, *Public Enterprise and Economic Development: The Korean Case* (Seoul: KDI, 1975), p. 23. Some other definitions include enterprises as composed of state enterprise directly under the government which have no independent legal status, government joint stock companies which are seperate juridical persons, and state banks. For this definition, see L. Johansen, *Public Economics*(Amsterdam: North Holland Publishing Co., 1965), p. 1.

cost, the unit price of quantity is not able to cover the unit cost, thus incurring losses. This is because the average cost is always higher than the marginal cost when it is decreasing.

In this case there are two alternatives, either to forego the optimal resource allocation and charge the mark-up pricing to cover the average cost or to cover the losses by the revenue that is raised elsewhere. Public enterprise can be brought in to secure an optimal allocation of resources in the case of decreasing average cost, and the losses can be covered by the general budget.

This is an important argument in favor of the public enterprise in many branches of economic activity, especially where the initial cost involved is of substantial sum. The public enterprise in the field of transport, communications and electricity falls into this category.

The second case is where there exists an externality in production and consumption. The indirect effects of production and consumption are the important element in determining the criteria of how to produce it; in the public or the private sector. The existence of externality causes a divergence between the private and the social cost as well as between the private and the special benefit. The public enterprise can be brought in to mitigate and neutralize these indirect effects.

In the case of external diseconomies where social cost exceeds private cost, there tends to be an over-production and when social benefit exceeds private benefit, there tends to be an under-production of products concerned than what is socially optimal. It is usually in the latter case that public intervention is required either by participating through direct public production or by giving fiscal incentives to the private sector to expand their activity in the production of externality-intensive products. Most of social overhead capital fall into this category.[3]

(3) As the pollution and other socil cost creating activities tend to rise during the process of the industrialization, a new kind of public enterprise i.e. to limit an over-production of external diseconomic-intensive products may start to be establishd.

The third case for public enterprise is in the area of production where the monopoly tends to arise if left to the hand of private sector. The economic welfare theory suggests that the optimality is displaced by the existence of monopoly. In this case it will be better for the government to monopolize the production activity, which may cause to reduce the welfare of the society as whole if left to the private sector. This includes the postal service, telephone and telegraph services, and various kinds of transport activity. In some cases the tobacco industry is nationalized; however, this is mainly due to the revenue consideration.

The fourth case for public production is to carry out some special long-term projects. The long-term project necessarily involves a high degree of uncertainty, which tends to be detrimental to the private investment. The uncertainty will be equally faced by the public enterprise but the government has some means of control to reduce the degree of uncertainty by, for example, reserving the right to produce only to the public enterprise or to use those products produced by the public enterprise for certain period in the future. This guarantee cannot be obtained by the private sector when investing in long-term projects.

(2) Some Characteristics of Social Overhead Capital

Social overhead capital (SOC) is a terminology that compares with the concept of directly productive capital (DPC). The SOC is not directly used in the production of goods and services as DPC but rather indirectly involved in the support and stimulation of the productive activity.[4]

Hirschman distinguished the economic activity into a directly productive activity and a supporting activity, defining the latter as social overhead capital. He includes in the narrow sense of social overhead capital, such activities as transport, communications, electricity. In broad sense are included such activities as education, health, medical care, welfare, national

(4) Social overhead capital was first conceptualized by A.O. Hirschman, see his *The Strategy of Economic Development* (New Haven: Yale University Press, 1967), pp. 83-97.

defence, law and order, and internal security.

Subsequently the OECD classified the SOC into economic SOC, social SOC, administrative SOC, and natural SOC. In actual fact the public activity is offering indirectly the infrastructure for the private sector activities, and in this sense, all the government activity can be encompassed in the concept of SOC. However this paper will confine itself with the economic SOC only.

There are several characteristics of social overhead capital and some of these are as follows.[5]

First characteristics is the lumpiness and indivisibility of SOC. As in the case of railway, ports, multi-purpose dam and electricity generating facilities, the capital needed for the project is usually of a large-scale and lumpy, and the benefits from the output which SOC helps produce are difficult to divide according to the number of users. This implies an existence of externality in SOC.

The second is the long gestation period. The construction of the various SOC facilities takes much time and it is usual that there exists a long time lag between the initiation of the projects and the production of output from these projects.

The third is the difficulty in the measurement and evaluation of the investment effects. Because of its lumpiness, SOC usually operates under the condition of decreasing cost. The phenomenon of increasing returns creates some difficulties in measuring the costs and benefits of SOC.

The fourth is that as social overhead investment, for example, in the case of multi-purpose dam, expressway, ports and subway is made with a long-term view that even if the initial investment effect of SOC is low, the facilities cannot be withdrawn within a short span of time.

The fifth is that SOC cannot depend entirely on the price mechanism for its investment, management and pricing activities. Usually the capital

(5) This aspect is rather well summarized in B. N. Song, *Korean Economy* (in Korean) (Seoul: Bakyoungsa, 1981), pp. 386-389.

coefficient of SOC is so high and the financial profitability tends to be so low that the private sector is reluctant to invest in this field.

The last is that SOC is impossible to import. Although some components of SOC such as equipment and facilities that are needed for construction can be imported, SOC itself cannot be imported. SOC is typically a domestic market-oriented industry.

3. Social Overhead Capital in Korea

The industrial origin of GDP at factor cost shows that the primary industry accounted for 41.4 per cent, the secondary for 14.6 per cent and the tertiary industry for 44.0 per cent, of which the social overhead capital accounted for 9.2 per cent of GDP in 1961. Within two decades, the share of the primary industry decreased to 17.8 per cent, with the secondary and the tertiary industry increasing respectively to 25.3 per cent and 56.8 per cent. This is shown in Table 1.

Social overhead capital including construction contributed to only 9.2 per cent of GDP in 1961 but its contribution increased to 19.0 per cent by 1980. The past trend of social overhead capital shows an increase in its contribution to GDP. Before 1965, the contribution to GDP of social overhead capital was less than 10 per cent but it started to increase during the latter half of 1960s reaching 14.3 per cent by 1970. Although the share of contribution fluctuated somewhat during the next seven years, it started to pick up again in 1978 when the social overhead capital accounted for 17.0 per cent of GDP. It has continued to increase since then.

The major policy instrument through which the government influences the investment activity of the public enterprise is the Financial Investment and Loan(FIL). FIL is divided into two parts; public sector investment and loan.

The financial investment is composed of direct investment allocated through the general account of the central government budget, direct

Table 1. Industrial Origin of Gross National Product (per cent)

	Total	Agri., forestry & fishery	Non agri., forestry & fishery	Mining & manufacturing	Mining & quarrying	Manufacturing	Social overhead capital & other services	Construction	Elec., gas & water	Transport, storage & comm.	Others
1962	100.0	43.3	56.7	11.1	2.0	9.1	45.6	2.4	0.4	2.1	40.7
1963	100.0	43.5	56.5	11.6	1.9	9.7	44.9	2.6	0.4	2.3	39.6
1964	100.0	45.9	54.1	11.7	2.0	9.7	42.4	2.6	0.4	2.4	37.0
1965	100.0	42.9	57.1	13.1	2.0	11.0	44.0	3.1	0.5	2.7	37.7
1966	100.0	42.5	57.5	13.4	1.9	11.5	44.1	3.3	0.5	3.0	37.3
1967	100.0	37.5	62.5	15.1	2.0	13.1	47.4	3.7	0.6	3.5	39.6
1968	100.0	34.2	65.8	16.7	1.8	15.0	49.1	4.6	0.7	4.1	39.7
1969	100.0	33.2	66.8	17.5	1.5	16.0	49.3	5.5	0.8	4.5	38.4
1970	100.0	30.4	69.6	19.5	1.6	17.8	50.1	5.4	0.9	5.0	38.8
1971	100.0	28.8	71.2	20.9	1.5	19.4	50.3	4.8	1.0	5.2	39.2
1972	100.0	27.8	72.2	22.3	1.4	20.9	49.9	4.5	1.0	5.4	38.9
1973	100.0	25.7	74.3	25.0	1.5	23.5	49.4	5.0	1.1	6.0	37.2
1974	100.0	25.4	74.6	26.6	1.4	25.2	48.0	4.8	1.2	5.9	36.1
1975	100.0	24.9	75.1	28.0	1.5	26.5	47.1	5.1	1.3	6.2	34.5
1976	100.0	24.0	76.0	29.5	1.3	28.2	46.5	5.0	1.3	6.3	33.9
1977	100.0	22.2	77.8	30.6	1.4	29.2	47.2	5.6	1.4	6.8	33.4
1978	100.0	19.1	80.9	32.9	1.3	31.6	48.0	6.3	1.5	7.2	33.0
1979	100.0	19.2	80.8	33.8	1.2	32.6	47.0	6.0	1.6	7.7	31.7
1980	100.0	15.9	84.1	35.7	1.2	34.4	48.4	6.4	1.8	8.5	31.7
1981	100.0	18.1	81.5	35.6	1.2	34.4	46.3	5.7	1.8	8.6	30.2

Source: EPB, *Major Statistics of Korean Economy 1982*, p. 36.

investment through the special account for public enterprise, equity investment through the general and special accounts, and equity investment in kind. The financial loan is composed of several funds. To it belongs the special account for loan management and the relending facilities of public foreign loans. Apart from these there are 13 government funds, of which the National Investment Fund is the largest.

The size of the investment and fund is shown in Table 2.

Table 2. Financial Investment and Loan

(billion won)

Investment and Loan	By Account	Investments in 1981	Ratio (%)	Remarks
Financial Investment	Direct Investment thru the General Account	1,863	27.1	Direct Investment
	Direct Investment thru Special Account	1,179	17.2	
	Equity Investment thru by the General and Special Account	377	5.5	
	Equity Investment in Kind	1,691	24.6	
	Sub-Total	5,110	74.4	
Financial Loan	Special Account for Loan Management	219	3.2	Definition of FIL in narrower sense
	Relending Facilities of Public Foreign Loans	575	8.4	
	National Investment Fund	543	7.9	
	Other 12 Funds	419	6.1	
	Sub-Total	1,756	25.6	
Total		6,866	100.0	

Source: *Financial Investment and Loan 1982* (in Korean) (Ministry of Finance), p. 14.

The financial investment accounted for 74.4 per cent, and the financial loan for 25.6 per cent of the total financial investment and loan of 6,866 billion won in 1981. In the financial loan, 13 loan funds together accounted for 14.0 per cent.[6]

(6) For a more detailed analysis of this aspect, see S.S. Han, "Twenty Years of Korea's Public Finance—With Particular Reference to Its Impact on Allocation and Distribution" (in Korean), *Korean Economic Journal* (forthcoming)

As shown in Table 3, during the First Five Year Plan Period (1962~66) the government contribution to the investment and loan activity amounted to 170 billion won, of which 43.3 per cent was allocated to the social overhead capital and other services, 30.3 per cent to the mining and manufacturing, and 26.4 per cent to the agriculture and fishery industries. On the whole, during the First Five Year Plan Period, the government investment and loan accounted for 5 per cent of GNP and 32.3 per cent of domestic fixed capital formation. This also accounted for 23.1 per cent of goverment expenditure during the period.

During the Second Five Year Plan Period(1967~71), the government investment and loan activity amounted to 770 billion won, of which 53.9 per cent was allocated to the social overhead capital and others, 20.3 per cent to the mining and manufacturing and 25.8 per cent to the agriculture and fishery industry. On the whole the public sector investment and loan activity accounted for 7.0 per cent of GNP and 29.2 per cent of domestic

Table 3. Financial Investment and Loan Allocation by Industry (1953~1980)

(100 million won)

Year / Industry	1953~1958				
	FIL(A)		FL(B)		(A)/(B)
		(%)		(%)	(%)
Agriculture and Fishery	128	28.2	56	32.5	43.8
Mining and Manufacturing					
Mining and Energy Development	36	8.0	36	20.8	100
Industrial Promotion	60	13.3	60	34.6	100
Sub-Total	96	21.3	96	55.4	100
SOC and Others					
Transport	55	12.1	6	3.3	10.9
Housing	14	3.1	13	7.3	92.9
Environment	14	3.1	0.18	0.1	1.3
Communications	3	0.6	0	0	0
Education	14	3.0	0	0	0
Distribution channel	—	—	—	—	—
Others	129	28.6	2	1.4	1.6
Sub-Total	229	50.5	21	13.3	9.2
Total	453	100	173	100	38.5

Year / Industry	1962~1966				
	FIL(A)		FL(B)		(A)/(B)
		(%)		(%)	(%)
Agriculture and Fishery	448	26.4	96	30.5	21.4
Mining and Manufacturing					
Mining and Energy Development	183	10.8	85	27.1	46.4
Industrial Promotion	333	19.5	63	20.0	18.9
Sub-Total	516	30.3	148	47.1	28.7
SOC and Others					
Transport	334	19.6	20	6.3	6.0
Housing	25	1.5	19	6.0	76.0
Environment	40	2.3	6	1.9	15.0
Communications	157	9.2	0	0	0
Education	97	5.7	0	0	0
Distribution channel	—	—	—	—	—
Others	80	5.0	26	8.2	32.5
Sub-Total	733	43.3	71	22.4	9.7
Total	1,697	100	314	100	18.4

Year / Industry	1967~1971				
	FIL(A)		FL(B)		(A)/(B)
		(%)		(%)	(%)
Agriculture and Fishery	1,988	25.8	530	36.8	26.7
Mining and Manufacturing					
Mining and Energy Development	497	6.5	284	19.6	57.1
Industrial Promotion	1,063	13.8	142	9.8	13.4
Sub-Total	1,560	20.3	426	29.4	27.3
SOC and Others					
Transport	1,864	24.3	172	11.9	9.2
Housing	62	0.8	39	2.7	62.9
Environment	216	2.8	60	4.1	27.8
Communications	682	8.9	—	—	0
Education	707	9.2	—	—	0
Distribution channel	5	—	5	0.3	100
Others	614	8.0	217	15.0	35.3
Sub-Total	4,150	53.9	493	33.8	11.9
Total	7,698	100	1,451	100	18.8

fixed capital formation during this period.

During the Third Five Year Plan Period(1972~76), the public sector investment and loan amounted to 3,016 billion won, of which 51.2 percent

Year / Industry	1972~1976 FIL(A)		FL(B)		(A)/(B)
		(%)		(%)	(%)
Agriculture and Fishery	6,678	22.1	1,747	28.7	26.2
Mining and Manufacturing					
Mining and Energy Development	2,188	7.3	421	6.9	19.2
Industrial Promotion	5,857	19.4	2,948	48.5	50.3
Sub-Total	8,045	26.7	3,369	55.4	41.9
SOC and Others					
Transport	5,278	17.5	686	11.3	13.0
Housing	274	0.1	60	1.0	21.9
Environment	1,035	3.4	98	1.6	9.5
Communications	3,978	13.2	—	—	—
Education	2,155	7.1	—	—	—
Distribution channel	1	—	1	0.0	100
Others	2,721	9.0	123	2.0	4.5
Sub-Total	15,441	51.2	968	15.9	6.3
Total	30,164	100	6,084	100	20.2

Year / Industry	1977~1980 FIL(A)		FL(B)		(A)/(B)
		(%)		(%)	(%)
Agriculture and Fishery	13,257	15.6	4,388	19.3	33.1
Mining and Manufacturing					
Mining and Energy Development	5,445	6.4	617	2.7	11.3
Industrial Promotion	17,427	20.5	14,146	62.3	81.2
Sub-Total	22,872	26.9	14,763	65.0	64.5
SOC and Others					
Transport	13,730	16.2	2,109	9.3	15.2
Housing	1,204	1.4	633	2.8	52.6
Environment	288	0.3	288	1.3	100
Communications	12,500	14.7	—	—	—
Education	7,554	8.5	—	—	—
Distribution channel	140	0.2	140	0.6	100
Others	13,454	15.8	398	1.6	3.0
Sub-Total	48,870	57.5	3,568	15.7	7.3
Total	85,000	100	22,720	100	26.7

Source: *White Paper on Financial Investment and Loan, 1982.*

was allocated to the social overhead capital and other services, 26.7 per cent to the mining and manufacturing, and 22.1 per cent to the agriculture and fishery industries. The financial investment and loan

accounted for 7.4 per cent of GNP and 30.2 per cent of the domestic fixed capital formation during this period.

During the the Fourth Five Year Plan Period(1977~1981), excepting 1981 the financial investment and loan amounted to 8,500 billion won, of which 57.5 per cent was allocated to social overhead capital and other services, 26.9 per cent to the mining and manufacturing, and 15.6 per cent to the agriculture and fishery industries. The financial investment and loan accounted for 8.2 per cent of GNP and 26.6 per cent of the domestic fixed capital formation during this period.

On the whole during the period between 1962 to 1980, a total of 12,366 billion won worth of financial investment and loan was disbursed by the government, of which 56 per cent was allocated to the social overhead capital and other services, 26.7 per cent to the mining and manufacturing and 17.3 per cent to the agriculture and fishery industries. Of the total investment and loan activities, the loan activity accounted for 24 per cent. The financial investment and loan accounted for 7.8 per cent of GNP, for 27.6 per cent of domestic fixed capital formation and for 35 per cent of the government expenditure during the period between 1962 and 1980.

There has not been any estimate of social overhead capital formation by the public sector in general and the public enterprise in particular. By making use of data on the ownership of industry as given in Table 7, I have estimated the share of public sector in SOC to be 7.8 per cent and that of public enterprise to be 4.9 per cent of GNP in 1977. This was obtained by multiplying the share of SOC in GNP (from Table 1) by the share of ownership (from Table 7).

For example, as 19.2 per cent of construction was owned by public enterprise and the share of construction in GNP was 5.6 per cent in 1977, the share of public enterprise construction was estimated to be 1.1 per cent of GNP ($19.2 \times 5.6 = 1.1$).

Based on a strong assumption that the ownership of industry by the public sector has not changed over two decades, I have made a series of

Table 4. Public Sector Contribution to Social Overhead Capital: An Estimate for 1962~81

(at 1975 constant prices as % of GNP)

Year	(1) Construction	(2) Elec. gas & Water	(3) Trans. Storage & Comm.	(4)* General Gov. Share (1)×0.004+(2)×0.181+(3)×0.42	(5)* Public Enterprise Share (1)×0.192+(2)×0.181+(3)×0.363	(6) Public Sector Share (4)+(5)	(7) Social Overhead Capital (1)+(2)+(3)	(8) (6)/(7) (%)
1962	2.4	0.4	2.1	0.96	1.55	2.51	4.9	51
1963	2.6	0.4	2.3	1.05	1.66	2.71	5.3	51
1964	2.6	0.4	2.4	1.09	1.70	2.79	5.4	52
1965	3.1	0.5	2.7	1.13	1.98	3.11	6.3	49
1966	3.3	0.5	3.0	1.36	2.13	3.49	6.8	51
Average (62~66)				1.12	1.80	2.92	5.7	51
1967	3.7	0.6	3.5	1.60	2.47	4.07	7.8	52
1968	4.6	0.7	4.1	1.87	2.94	4.81	9.4	51
1969	5.5	0.8	4.5	2.06	3.34	5.40	10.8	50
1970	5.4	0.9	5.0	2.28	3.59	5.87	11.3	52
1971	4.8	1.0	5.2	2.38	3.63	6.01	11.0	55
Average (67~71)				2.04	3.19	5.23	10.1	52
1972	4.5	1.0	5.4	2.47	3.64	6.10	10.9	56
1973	5.0	1.1	6.0	2.74	4.04	6.78	12.1	56
1974	4.8	1.2	5.9	2.71	4.04	6.75	11.9	57
1975	5.1	1.3	6.2	2.86	4.29	7.15	12.6	57
1976	5.0	1.3	6.3	2.90	4.31	7.21	12.6	57
Average (72~76)				2.74	4.06	6.80	12.0	57
1977	5.6	1.4	6.8	3.13	4.69	7.82	13.8	57
1978	6.3	1.5	7.2	3.32	5.05	8.37	15.0	56
1979	6.0	1.6	7.7	3.55	5.26	8.81	15.3	58
1980	6.4	1.8	8.5	3.92	5.79	9.71	16.7	58
1981(p)	5.7	1.8	8.6	3.96	5.69	9.65	16.1	60
Average (77-81)				3.58	5.30	8.88	15.4	58
Total				2.37	3.59	5.96	10.8	55

Sources: 1) EPB, *Major Statistics of Korean Economy* (1982)

2) EPB and BOK, *1977 National Wealth Survey of Korea* (1980)

Notes: 1) Col. (4) & (5) are estimated by making use of data on asset distribution by ownership as given in Source(2).

2) Estimates in Col. (8) refer to the ratio of public sector SOC to SOC.

estimate for 1962~81 of the share of public sector in general and public enterprise in particular. The result is shown in Table 4.

It can be seen from Table 4 that the average of public sector SOC was 6.0 per cent of GNP during the period between 1962 and 1981. The general government contribution was 2.4 per cent, and the public enterprise 3.6 per cent of GNP respectively. The public sector's contribution accounted for 55 per cent of the total SOC that was invested over the last 20 years.

It is also shown that the share in GNP of public sector as well as that of public enterprise SOC increased substantially over the last two decades. The public sector share of SOC in GNP was 5.7 per cent during the First Five Year Development Plan period. This was doubled to 10.1 per cent during the Second Five Year Plan period. By the Fourth Five Year Plan period it was almost trebled to 15.4 per cent.[7]

4. Economic Contribution of Public Enterprise

There were 72 public enterprises in Korea in 1981. They employed a total of 268,000 people and had a total budget of 14,955 billion won. In 1980 they contributed a total of 3,461 billion won worth of value added. The breakdown of the public enterprises is as shown in Table 5.

The Departmental Enterprise is composed of the Office of Monopoly, Office of Railway, Office of Supply, Ministry of Communications and Special Account of Grain Management. It is run as a part of the ministry concerned of the central government. It employed 116,000 people and accounted for 23 per cent of total budget in 1981 and 34 per cent of the

(7) There were 31 Government Funds, of which 13 Funds are involved in loan activities in 1981. Of the rest, 9 Funds are concerned with social welfare, 2 Funds with stock-piling of food and supplies and the rest 7 are miscellaneous funds such as Exchange Equalization Fund, Seed Fund, etc. For the detailed analysis of these funds, see *White Paper on Financial Investment and Loan 1982* (in Korean) (Ministry of Finance) (Seoul, 1982), p. 22.

Table 5. Public Enterprises in Korea (1931)

Types of Enterprise	Special Feasures	No. of Enter-prise	Employ-ment ('000s)	Budget (billion won)	Value Added[1] (billion won)
Departmental Enterprise	Enterprise run by ministry concerned	5	116	3,433 (23.0)	1,178 (34.0)
Autonomous Government Enterprise	Direct investment 50% plus equity share	24	77	6,937 (46.4)	1,159 (33.5)
Subsidiary of Autonomous Government Enterprise	Indirect investment through autonomous government enterprise	28	22	1,006 (6.7)	422 (12.2)
Other Government Enterprise	50% less equity share	15	53	3,579 (23.9)	702 (20.3)
Total		72	268	14,955 (100.0)	3,461 (100.0)

Sources: I. Sakong and D.H. Song, *Reform Proposal for the Management of Public Enterprise* (in Korean) (Policy Report 32-14) (Seoul: KDI, 1982), p. 4; Ministry of Finance, *Financial and Monetary Statistics* (August 1982), p. 53.

Note: 1. Figures for 1980.

value added of the whole public enterprise sector in 1980.

Ther were 24 autonomous government enterprises in 1981. The autonomous government enterprise is defined as where the government holding of the equity share is more than 50 per cent, and has taken the form of a direct investment. The major public enterprises belonging to this category are Korea Electric Power Company, Korea Industrial Development Bank, Medium and Small Enterprise Bank, National Citizens Bank, Korea Housing Corporation, Korea Highway Corporation, Korea Broadcasting Corporation and Korea Housing Bank. (For more details, see the Appendix)

They employed 77,000 people and accounted for 46.4 per cent of total budget in 1981 and accounted for 33.5 per cent of the value added of the public enterprise sector in 1980.

There were 28 subsidiaries of the government autonomous enterprises. The subsidiary is defined as an enterprise the equity of which the autonomous government enterprise hold; implying an indirect government holding of equity.

They employed 22,000 people and accounted for 6.7 per cent of total budget in 1981, and accounted for 12.2 per cent of value added in 1980.

There were 15 other government-related enterprises which are defined as where the government holding of equity share is less than 50 per cent. They employed 53,000 people and accounted for 23.9 per cent of budget in 1981, and for 20.3 per cent of value added in 1980.

The overall contribution of public enterprise to the value added in Korea accounted for 9.6 per cent of GDP and 11.6 per cent of non-agriculture GDP respectively in 1980. As is shown in Table 5, the average ratio of contribution of public enterprise to GDP during the period between 1963 to 1980 was roughly about 8 to 9 per cent.

One interesting aspect of public enterprise is found in Table 6, where the distribution of national wealth is shown by ownership and industry. The public enterprise owned 81.8 per cent of electricity, gas and water supply system, 36.3 per cent of transport, storage and communications and 19.2 per cent of construction in 1977. The public enterprise owned 14.4

Table 6. GDP and Value Added by Public Enterprise

(billion won: current prices)

	1963	1964	1970	1971	1972	1973
(1) Value Added by Public Enterprise	31.41	41.57	220.75	253.82	315.37	417.30
(2) GDP	469.40	678.05	2,405.05	2,976.55	3,676.22	4,808.64
(3) Non-agriculture GDP	253.45	346.27	1,695.20	2,103.32	2,637.93	3,538.77
(4) (1)/(2)(%)	6.7	6.1	9.2	8.5	8.6	8.7
(5) (1)/(3)(%)	12.4	12.0	13.0	12.1	12.0	11.8

	1974	1975	1976	1977	1980
(1) Value Added by Public Enterprise	537.56	737.52	1,014.58	1,191.16	—
(2) GDP	6,844.21	8,855.53	11,659.46	14,854.04	—
(3) Non-agriculture GDP	5,079.92	6,553.54	8,702.10	11,286.34	—
(4) (1)/(2)(%)	7.9	8.3	8.7	8.0	9.6
(5) (1)/(3)(%)	10.6	11.3	11.7	10.6	11.6

Source: I. Sakong, "Economic Role of Public Enterprise," *Korean Economic Review*, Vol. 1, No. 2 (June 1979), p. 4. except for 1980.

Table 7. Distribution of Asset by Industry and Ownership (1977)

(per cent)

Industry	Government Non-profit Making Organization	Public Enterprise	Private Enterprise	Total	Value of Asset (billion won)
Agriculture, Forestry and Fishery	21.5	0.0	78.5	100.0	4,869
Mining	0.0	10.2	89.8	100.0	331
Manufacturing	0.2	11.8	88.0	100.0	13,338
Electricity, Gas and Water Supply	18.1	81.8	0.1	100.0	2,073
Construction	0.4	19.2	80.3	100.0	1,179
Distribution, Food and Beverage and Lodging	18.4	0.1	81.4	100.0	4,703
Transport, Storage and Communications	42.0	36.3	21.7	100.0	5,517
Finance,Insurance, Real Estate and Others	10.4	2.8	86.8	100.0	3,439
Social and Individual Services	79.1	0.8	20.0	100.0	3,926
Total	20.6	14.4	65.0	100.0	39,374

Source: Economic Planning Board and Bank of Korea, *1977 National Wealth Survey of Korea* (1980), Vol. I.

Notes: 1. Household sector is not included.
2. Assets excluding land.

per cent of the industry on average whereas the non-profit making government organizations owned 20.6 per cent, and the private enterprise 65 per cent.

An estimate of industrial interdependence for several sectors of Korean economy reveals another interesting fact. The estimate of direct linkage shows that the public enterprise has substantially more forward linkage and backward linkage than the Korean economy as a whole and the Korean economy excluding primary sector.[8]

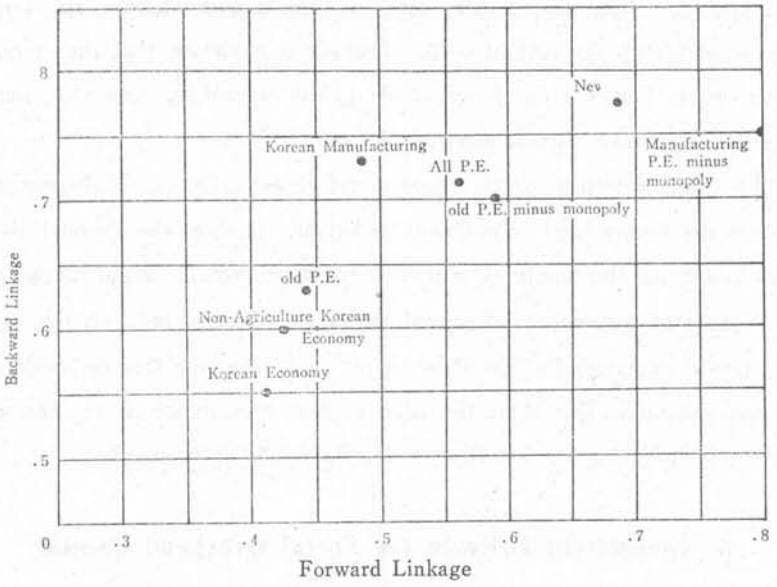
(8) There are two varieties of the linkage concept advanced by Hirschman. The first is an input-provision, derived demand, or backward linkage effect, i.e., every nonprimary activity, will induce attempts to supply through domestic production the inputs needed in that activity. The second is an output-utilization or forward linkage effect, i.e., every activity that does not by its nature cater exclusively to final demands will induce attempts to utilize its outputs as inputs in some new activities. See Hirschman, *Strategy of Economic Development*, p. 100.

Hirschman's concept of linkage is concerned with the divergence between

When the manufacturing public enterprise is compared with the manufacturing sector as a whole it shows that whereas the backward linkages of both are similar, the forward linkages are substantially higher in the manufacturing public enterprise. Another aspect to note is that the new public enterprises that were added as from 1961 exhibit substantially higher forward and backward linkages than the old public enterprises that existed before 1960. (9)

The result of industrial interdependence analysis is as shown in Figure 1.

Fig. 1. Direct Linkage Effects of Public Enterprise (1975)



Source: I. Sakong "Economic Role of Public Enterprise," (in Korean) *Korea Economic Review*, Vol. 1, No. 2 (June 1979), p. 5.

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the social and private benefits of an investment project. Enterprise with high linkages tend to generate an externality which invites government intervention.

(9) For the summary of this result, see I. Sakong, "Economic Role of Public Enterprise in Korea" (in Korean) *Korea Economic Review*, Vol. 1 No. 2 (June 1979), p. 6. As compared with the linkage aggregates, i.e., direct and indirect linkages, estimated by Jones, the above results show several differences. As for the aggregate linkages, see L.P. Jones, *Public Enterprise and Economic Development: The Korean Case* (Seoul: KDI, 1975), pp. 104-105.

It is interesting to note that although the forward linkage effects of public enterprise did not change much as compared with 1972, the backward linkages effects increased substantially in 1975, i.e., it shows an increase from .52 to .72. Although the backward linkage effects of the manufacturing public enterprise did not change, the forward linkage effects increased substantially by 1975, i.e. it shows an increase from .65 to .80 between 1972 to 1975. (10)

The balance of payment effects of the public enterprise appear to be relatively insignificant. The direct export of public enterprise sector accounted for less than 5 per cent of total export whereas the import accounted for 11 per cent in 1975. However it is shown that the implicit effect on the balance of payment of public enterprise, especially import substitution effects, was substantial in 1975. (11)

The public enterprise sector shows a rather asymmetrical phenomenon as regards the saving and investment behavior. During the period between 1970 and 1975, the public enterprise sector accounted for about 30 per cent on average of domestic fixed capital formation whereas the savings from this sector accounted for less than 10 per cent. The high ratio of investment to savings implies that there has been a great dependence on the external sources in financing the activity of Korea's public enterprise. (12)

5. Investment Criteria for Social Overhead Capital

When deciding on the criteria for social overhead investment, there are several factors to be taken into consideration. Unlike the private investment where the externality needs not to be taken into account of, the public investment has to take into account of this factor and therefore the financial analysis alone is usually found to be inadequate. Consequently a cost-benefit analysis has to be introduced where the cost and benefit are

(10) For the estimate in 1972, see L.P. Jones and I. Sakong, *op. cit.*, p. 152.
(11) I. Sakong, *op. cit.*, pp. 7-8.
(12) *Ibid.*, pp. 8-9.

measured in terms of social valuation.

The aim of a public enterprise should be to maximize;

social benefit minus social cost subject

to any relevant constraints.[13]

In the analysis of this kind, there are several factors that need to be considered. Firstly, it is the enumeration of benefits and costs. In doing so, private as well as social benefits and costs have to be included. In this connection the project life is also an important factor to be taken into consideration.

Secondly, it is how to evaluate benefits and costs in monetary units. In the valuation of benefits and costs not only the tangibles but also the intangibles must be included.

In evaluating the input and output, the most important concept in a country where the market mechanism does not operate properly is that of shadow prices. As the price mechanism usually does not fully function in most of the developing countries, it is quite natural that the shadow price has to be used in correctly reflecting the economic value of input as well as output. One good example is how to make use of labour cost when there exists a certain level of unemployment. The going wage might be positive but, for a society as a whole, the labor is costless and zero wage rate has to be used for planning purpose.

It is also usual in developing countries where the domestic currency is usually overvalued. Under such circumstances, the foreign currency is relatively cheaper and does not reflect the true picture. Hence a shadow

(13) For a classical summary on this problem, see P.D. Henderson, "Investment Criteria for Public Enterprise," *Bulletin of Oxford University Institute of Economics and Statistics*, Vol. 27 (1965), pp. 55-89. Reprinted in R. Turvey ed. *Public Enterprise* (London: Penguin Books, 1968), pp. 86-167. For a general manual on the project appraisal or cost-benefit analysis, see I.M.D. Little and J.A. Mirrless, *Manual of Industrial Analysis* (Paris: OECD, 1968), or "Project Appraisal and Planning for Developing *Countries* (New York: Basic Books, 1974); P. Dasgupta, A. Sen, and S. Marglin, *Guidelines for Project Evaluation* (UNIDO, 1972). For a manual on the project appraisal of social overhead capital, see EPB Bureau of Project Evaluation, *Economic Evaluation of Public Sector Investment Projects* (in Korean) (Seoul, 1979/10), especially pp. 166-242.

exchange rate is necessary to be made use of in evaluating the tradables whether they be used as injusts or fold as outputs.

Thirdly, it is how to choose an appropriate social discount rate. If the discount rate is too high, the present value of the future benefit will be lower, and if the discount rate is low, then the future benefit higher. For example, if the discount rate of 10 per cent and 20 per cent were applied to any benefits that would accrue from project A, then the present value of the next year's 100 million won will be 91 million won and 83 million won respectively.

Usually the market rate of interest does not reflect the capital scarcity but more often than not arbitrarily determined by the government monetary authority. Therefore this cannot be used as a proxy for social discount rate. There are two approaches for estimating the social discount rate; one is through identifying a social time preference rate, and the other through social opportunity cost rate.(14)

6. Conclusion

For the last few years national consensus has been building up slowly as regards the need for a switch from a government-managed to a market-oriented or civilian-led economic system. Consequently the future role and reform of public enterprise must be envisaged within this context.

There are two alternatives, progressive and conservative, that can be put forward when envisaging the future role and/or reforming the public enterprise in Korea.

The drastic approach is to replace the public with private enterprises.

(14) For a more detailed analysis of this aspect, see S.S. Han, "Economic Planning and the Cost Benefit Analysis," (in Korean) *Korean Economic Journal*. Vol. XVII, No. 3 (September 1978), pp. 378-82. One of the social discount rates proposed in Korea was 13% which was roughly similar to the rate of profitability in the private sector in 1975. For this, see B.Y. Koo, *Estimation of Shadow Prices in Korea* (in Korean) (EPB, Bureau of Project Evaluation, 1981), p. 84.

The most feasible area for this kind of denationalization appears to be in the manufacturing public enterprise sector.

As compared with, the social overhead capital, it is in the manufacturing sector where externality is least manifested. In this case the major constraint for the private sector is a lumpiness of investment size. If the lumpiness were the only constraint, there is no reason why the private sector could not replace the role played by public enterprise here. There are already several world-ranking private businesses in Korea, to which the investment size can be no more an obstacle.

The other alternative is to enhance the efficiency of public enterprise by reforming the internal management system. One of the peculiar aspects in the control of public enterprise in Korea is that whereas the private business is usually subject to an *ex post* control, the public enterprise is subject to an *ex ante* control. In addition to this, there are too many government agencies to which control public enterprises are subjected. The authorities include Economic Planning Board, relevant ministry, ministry of finance, office of supply and general auditing board among others.

There are several areas of reform for the internal management of public enterprise. A few examples will suffice.

The first is the problem of how to rationalize personnel management. The top management of public enterprise has been usually recruited from outside, which consequently resulted in an adverse effect on efficient management and in weakening the esprit de corps of those employed within.

The second is the lack of flexibility in budget management. The budget deliberation process usually takes a long time and the public enterprise can not meet the rapidly changing economic conditions under the inflexible budgetary system. To meet such changes as exchange rate, interest rate, oil prices, and others, the budgetary management must be made more flexible.

The third is the inflexibility in the supply of inputs and outputs. The

public process of purchase can take a long time and this always hampers the responsiveness of public enterprise vis-à-vis the changing business conditions.

The fourth is that there are too much overloading and overlapping of supervision and auditing. The government requires the public enterprise to submit unnecessary information, often duplicated. For example, Korea Electric Power Co. sent to the government a total of 8,447 copies of report and received 9,792 requests of information from the government in 1980.

The fifth problem area is that the performance evaluation system is irrational, and the incentive system inadequate.

In order to improve the present system and enhance the efficiency of public enterprise, there have been several suggestions. First of all, the government should endeavor to reduce the sphere of control in public enterprise activity. The area covers the personnel management, budget management, material management, auditing and supervisory function, and others.

It is also proposed by specialists that the Commission on Evaluation and Coordination of Public Enterprise should be established. The Commission should be concerned with the overall coordination on the management policy of public enterprise and with the review of major policies of public enterprise by making use of experts' knowledge.(15)

The improvement of evaluation and incentive system is also recommended by introducing an *ex post* rather than an *ex ante* system of evaluation, and by institutionalizing an appropriate reward scheme for the incentive system.

Lastly it may be advisable to reform the organization of top management and board of directors. Because of the high probability of outsiders being recruited to top management, they should be confined to the task of deciding on major policy issues and not meddle in the day-to-day business

(15) For this and other suggestions for improvement, see I. Sakong and D.H. Song, *Reform Proposal for the Management of Public Enterprise* (in Korean), Policy Report 82-14 (Seoul: KDI, 1982) pp. 177-28.

affairs of public enterprise leaving the details to the professional staff.

Korean economy is going through a transitional period and the public enterprise, forming an important part of it, cannot be left out as exception. It is for this reason that although the economic contribution of public enterprise is readily recognized, the in-depth review, proper evaluation and appropriate reform of the public enterprise sector are now more than called for.

Appendix: Autonomous Government Enterprise (as of September 1981)

	Date of Establishment	Employment	Paid-in Capital (billion won)	Budget (billion won)	Value Added (billion won)	Government Share (%)
Korea Industry Bank	'54. 4. 1	2,142	505	565	57	100.0
Medium and Small Enterprise Bank	'61. 8. 1	5,816	107	276	53	99.9
National Citizens Bank	'63. 2. 1	7,746	30	265	58	65.6
Korea Housing Bank	'67. 7. 1	5,182	12	216	38	85.4
Korea Stock Exchange	'56. 2. 11	369	3	6	0.5	64.9
Korea Electric Power Co.	'81. 12. 31	20,725	599	3,513	679	100.0
Daehan Coal Mining Corp.	'50. 11. 1	14,089	48	282	25	89.2
Korea Chemical Co.	'73. 4. 1	1,250	88	121	17	14.3
National Textbook Publishing Co.	'52. 7. 15	552	4	17	3	88.7
Korea Printing Agency	'50. 10. 1	3,054	7	57	24	100.0
Korea Mining Promotion Corp.	'67. 5. 30	392	40	15	5	93.3
Korea Oil Development Corp.	'79. 3. 3	270	17	5	0	100.0
Korea Highway Corp.	'69. 2. 15	2,262	114	73	40	89.1
Korea Housing Corp.	'62. 7. 1	2,092	135	443	49	94.3
Industrial Base Development Corp.	'74. 2. 1	1,227	140	173	31	93.6
Korea Land Develop. Corp.	'79. 3. 27	811	144	576	6	86.6
Agriculture & Fishery Development Corp.	'67. 12. 1	419	10	9	4	100.0
Agricultural Promotion Corp.	'70. 2. 7	2,485	10	150	17	100.0
Korea Dredging Corp.	—	929	5	12	9	—
Labor Welfare Corp.	'77. 6. 2	674	4	10	2	100.0
KOTRA	'62. 6. 21	514	0.5	19	6	100.0
International Tourism Corp.	'62. 6. 26	494	17	47	5	87.5
Korea Broadcasting Corp.	'73. 3. 1	3,493	34	84	29	100.0
Overseas Develop. Corp.	'76. 4. 20	229	1	3	1	100.0
Total		77,216	2,074	6,937	1,159	

Sources: Ministry of Finance, *Financial and Monetary Statistics* (1982/8) for the first and last columns. I. Sakong and D.H. Song, *Reform Proposal for the Management of Public Enterprise* (KDI, 1982) for the rest.

Note: Figures are rounded-off.