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Summary

The Korean economy maintained its buoyant tone during the second quarter of 2000, while consumer prices remained stable and the volume of the current account surplus increased slightly. Boosted by the high growth of equipment investment and exports, GDP increased by 9.6 per cent in the second quarter compared with the same quarter of the previous year. Viewing economic growth by sector of economic activity, strong growth continued in manufacturing; electricity, gas & water; and services. And construction showed some signs of escaping from its deep slump, but agriculture, forestry, and fishery shifted to a downward track.

Thanks to the business upswing, the employment situation improved sharply in the second quarter, with unemployment rate standing at 3.8 per cent, 1.3 percentage points lower than in the preceding quarter. The unemployment rate declined further during July, falling to 3.6 per cent, as the number of the persons in employment continued to increase.

The current account surplus registered a surplus of 2.73 billion dollars during the second quarter, widening by 1.67 billion dollars from the previous quarter, thanks to the sharp increase in the goods account surplus. In July, though, the volume of the current account surplus narrowed to about one half of its level in the previous month, standing at 0.81 billion dollars. Its contraction was due to the decrease in the scale of the goods account surplus stemming from increased imports in response to the increase in international oil prices. A sharply widened deficit on the service account was a further contributing factor.

Consumer prices increased slightly during the second quarter, their continued decrease during April and May being offset by a sharp rise during June. And

during July and August, consumer prices continued to increase due to the persistent upward trend in the prices of products of agriculture, animal husbandry and fishing, and the firm tone of those of manufactures.

In the financial market, the call rate fluctuated slightly around the 5 per cent mark from the second quarter onward. Market interest rates rose on rumors about a worsening in the financial situation of Hyundai Group at the end of May, but later they shifted to a downward trend after the government's announcement of a financial market stabilization package (June 19). In the latter part of July, they again showed a short-term rise due to factors including a decline in the credit rating of the Hyundai Group, but later they became stable thanks to an increased demand for bonds, mainly on the part of the investment trust companies.

Stock price indexes showed a sharply decreasing trend from the beginning of the second quarter due to the uncertainty surrounding the restructuring of the corporate and financial sectors. But later they rose steeply thanks to the increase in U.S. stock prices from the end of May and the improvement in the investment climate brought about by the summit talks between the two Koreas. But they shifted back to an overall weakening trend from July in response to selling pressure from foreign investors.

The Korean won firmed against the U.S. dollar in June to end the month at 1,110 won against the greenback as compared to 1,130 won in the late period of the previous month. This was attributable to the easing of the Hyundai Group's problems and to the increase in the inflow volume of foreign portfolio investment funds. During August, the won moved stably at around the 1,115 won level, but it then firmed slightly to end the month at 1,108.8 won per dollar as the inflow of foreign currencies increased with the expansion of exports.

The growth of M3 registered 5 per cent during the second quarter, decreasing slightly compared with the previous quarter owing to the persistent sharp decline in deposits at investment trust companies and merchant banking corporations. Meanwhile, the growth of MCT+, which includes all deposits in the banking industry, continued to accelerate, as it had in the previous quarter, fuelled by the increase in the money supply through the private & foreign sectors. Its rapid expansion continued during July and August.

Economic Movements

Economic Growth

GDP during the second quarter of 2000 increased by 9.6 per cent compared

with the same quarter of the previous year, led by a sustained increase in equipment investment and exports.

Boosted by favorable private consumption, final consumption expenditure recorded a rate of 7.7 per cent. Private consumption rose by 9.0 per cent on increased purchases of durables, including personal computers, mobile phones, passenger cars, and household electric & electronic appliances, and of semi-durables such as clothing. It was given further momentum by the constant increase in spending on services such as telecommunications and entertainment & culture.

Encouraged by brisk equipment investment and the improvement in construction investment centering on buildings, which showed signs of emerging from the doldrums, the growth rate of fixed investment increased by 12.9 per cent. The growth of equipment investment registered high rate of 41.3 per cent thanks to the increase in the investment in machinery and transportation equipment. Construction investment meanwhile decreased by 4.7 per cent, although the scale of its contraction was smaller than in the previous quarter. Its slower pace of decline reflected the much slower rate of decrease in construction investment in buildings prompted by a sharp increase in investment in those for non-residential use such as factories and schools, whose effects more than offset the acceleration in the rate of decrease in investment in SOC, such as airport facilities, civil engineering, and port facilities.

Exports of goods and services, in real terms, increased by 23.7 per cent thanks to the increase in the exports of computers, semiconductors, and terrestrial fixed-line & wireless communication equip-

[Table 1] Growth Rates by Component of Expenditure[1)]

Unit : per cent

	1998	1999					2000	
		Ⅰ	Ⅱ	Ⅲ	Ⅳ	Year	Ⅰ	Ⅱ
GDP	- 6.7	5.4	10.8	12.8	13.0	10.7	12.8	9.6
GNI	- 8.8	6.2	9.0	10.5	9.7	8.9	6.6	1.8
Final consumption expenditure	- 9.8	5.3	8.4	10.1	10.1	8.5	9.6	7.7
Private consumption	- 11.4	6.7	10.3	12.1	12.1	10.3	11.1	9.0
Government consumption	- 0.4	- 2.0	- 1.7	0.1	0.8	- 0.6	1.3	0.5
Gross fixed capital formation	- 21.2	- 4.2	4.9	7.0	7.6	4.1	22.4	12.9
Equipment	- 38.8	13.0	37.3	48.5	55.1	38.0	63.6	41.3
Construction	-10.1	- 13.6	- 8.5	- 9.8	- 10.2	- 10.3	- 7.0	- 4.7
Exports of goods and services	13.2	9.2	14.6	20.0	21.0	16.3	26.2	22.9
Imports of goods and services	- 22.4	27.3	28.3	32.3	28.0	28.9	31.9	19.8

Notes : 1) Rates of change compared with the same period of the previous year.
2) p : preliminary

ment. And imports of goods and services, in real terms, also increased by 19.8 per cent due to the expansion of imports of capital goods and raw materials sucked in by the business boom.

Considering by type of economic activity, high growth rates continued to be registered in manufacturing; electricity, gas and water; and services. While the rate of decrease in the growth of construction was shallower continuously, the growth rate in agriculture, forestry, and fishery shifted to a downward trend.

Manufacturing industry registered a 16.8 per cent growth rate over the same quarter of the previous year, leading overall economic growth. The growth rate of the footwear sector continued to decrease and there was a sharp slowdown in the rate of increase of the leather & fur and the transportation equipment sectors. In contrast, the growth rates of the electric and electronic sector, notably computers, semiconductors, the telecommunications equipment, and the industrial machinery sector, including lathes, milling machines, and the internal combustion engine all, continued to increase sharply thanks to the increase in the demand at home and abroad.

The electricity, gas, and water industry recorded a high growth rate of 11.9 per cent as the amount of electricity used in the production and service sectors and the amount of piped gas and tap water used in households and factories continued to increase.

The service industry , meanwhile, recorded a 10.2 per cent growth rate. The growth rate of transportation, storage, and communication sector reached 20.0 per cent, boosted by the more rapid growth of the communications sector centering on mobile phones and the internet. The volume of cargo and number of passengers carried increased in the transportation sector, and the volume of frozen products and agricultural products rose in storage sector. Owing to such factors as the briskness of exports and imports and of manufacturing industry products, the increase in spending on eating-out, and the rise in the number of domestic and foreign tourists, the wholesale & retail trade, restaurants & hotels sector recorded a 10.7 per cent growth rate. Despite the increase in the advertising revenues of broadcasting companies and in the number of private study-center students, sports spectators, and visitors to entertainment service places, however, the growth rate in social and personal services decreased sharply compared with the previous quarter. It stood at 3.7 per cent because of the suspension of service at medical clinics and hospitals. Brisk deals in housing & land and the business boom in the accounting services & advertising sectors, were largely offset by the lackluster business activity of non-bank financial institutions and securities companies which left only a net increase

[Table 2] Growth Rates by Sector of Economic Activity[1)]

Unit : per cent

	1998	1999					2000	
		Ⅰ	Ⅱ	Ⅲ	Ⅳ	Year	Ⅰ	Ⅱ
Agriculture, Forestry & Fishing	- 6.6	9.3	4.7	6.7	2.7	4.7	1.6	- 1.7
Manufacturing	- 7.4	10.7	21.5	27.3	27.2	21.8	23.0	16.8
Electricity, Gas & Water	0.6	4.5	8.5	8.5	15.4	9.1	18.0	11.9
Construction	- 8.6	- 14.2	- 7.1	- 9.5	- 10.5	- 10.1	- 8.1	- 4.4
Services	- 7.2	7.6	11.6	13.0	14.4	11.7	11.7	10.2
(Wholesale and retail trade, restaurants and hotels)	- 10.9	7.1	13.1	16.1	15.9	13.1	12.8	10.7
(Transport, storage and communication)	- 0.8	13.2	13.2	17.0	20.6	16.1	17.3	20.0
(Finance, insurance, real estate and business services)	- 1.9	3.1	7.5	5.6	5.5	5.4	6.0	2.3
(Community, social and personal services)	- 5.9	6.7	8.3	10.9	8.3	8.5	8.1	3.7
Government & Private Non-Profit Services	- 0.6	- 2.0	- 1.8	0.3	1.4	- 0.5	0.5	0.4

Notes :1) Rates of change compared with the same period of the previous year.
2) p : preliminary.

of 2.3 per cent in the finance, insurance, real estate and business service sector.

The overall growth rate of the construction industry was much less deeply negative, largely owing to notably less rapid decline in the building construction sector, whose effect were only partially counteracted by a slightly more rapid rate of decrease of engineering construction.

The agriculture, forestry, and fishery sector showed negative growth as inshore fisheries and marine aquaculture both suffered business setbacks, offsetting the growth in the livestock industry centering on pig and poultry raising.

Employment and Wages

The employment situation improved sharply during the second quarter. The number of persons unemployed, which stood at 840,000 decreased by 250,000 approximately compared with the previous quarter, and the unemployment rate correspondingly decreased by 1.3 percentage points to 3.8 per cent. This was caused by the sharp increase in the number of persons employed in the agriculture, forestry, and fishery; in the construction; and in the business, personal, and public service sectors prompted by the sustained business upturn and seasonal factors including the advent of the most active farming season. The employment situation remained favorable in July. Despite the decrease in the scale of public works, the number of persons employed increased steadily centering on manufacturing, construction, and the wholesale & retail, and restaurant & hotel sector due to the sustained business upturn. As a result, the number of unemployed persons decreased to 804,000 approximately and the unemployment

rate also declined to 3.6 per cent.

Per capita nominal wages rose by 8.7 per cent during the second quarter compared with the same quarter of the previous year, showing a relatively high rate of increase. Broken down by type of remuneration, overtime and bonus payments increased sharply whereas the rise in flat-rate wages remained moderate. And considered by industry, wages in the transportation, storage, and communication sector increased sharply and those in

[Table 3] Employment[1] Trends

Unit : million persons, per cent

	1999					2000		
	Ⅰ	Ⅱ	Ⅲ	Ⅳ	Year	Ⅰ	Ⅱ	Jul.
Economically active population [2]	20.9 (- 0.4)	21.8 (0.3)	21.9 (1.2)	22.0 (2.1)	21.6 (0.8)	21.4 (2.6)	22.1 (1.4)	22.3 (1.8)
Total number of persons in employment [2]	19.1 (- 3.3)	20.4 (0.6)	20.7 (3.2)	21.0 (5.2)	20.3 (1.4)	20.3 (6.3)	21.3 (4.4)	21.5 (4.6)
(Manufacturing)	3.8	3.9	4.0	4.2	4.0	4.2	4.2	4.3
(Construction)	1.3	1.5	1.6	1.6	1.5	1.4	1.6	1.7
(Wholesale, retail, restaurants, and hotels)	5.6	5.6	5.8	5.9	5.7	5.9	5.9	6.0
(Agriculture, forestry, and fishing)	1.8	2.6	2.6	2.4	2.3	1.9	2.5	2.5
(Business, personal, and community services)	4.6	4.7	4.7	4.8	4.7	4.8	5.0	4.9
Unemployed persons	1.7	1.4	1.2	1.0	1.4	1.1	0.8	0.8
Unemployment rate	8.4	6.6	5.6	4.6	6.3	5.1	3.8	3.6
(Seasonally adjusted)	(7.6)	(6.7)	(5.9)	(4.9)	(6.3)	(4.4)	(3.9)	(3.7)

Notes : 1) Actual figures.
2) Figures in parentheses refer to rates of change on a year-on-year basis.

[Table 4] Rates of Increase[1] of Nominal Wages

Unit : per cent

	1999					2000	
	Ⅰ	Ⅱ	Ⅲ	Ⅳ	Year	Ⅰ	Ⅱ
Nominal wages per worker	5.6	10.6	15.6	16.1	12.1	9.0	8.7
(Regular Payments)	3.3	6.3	5.9	8.9	6.1	5.9	6.6
(Overtime Payments)	20.8	33.6	32.4	32.5	30.1	14.7	13.2
(Special Cash Payments)	8.9	19.9	47.2	34.8	28.3	17.8	14.6
(Manufacturing)	9.0	13.9	19.3	16.4	14.9	9.6	8.4
(Construction)	4.3	8.4	21.3	15.9	12.6	12.2	6.7
(Transport, storage, communications)	9.1	17.7	15.0	24.8	16.7	11.2	14.6
(Electricity, gas & water)	- 0.1	33.1	1.4	32.1	15.1	3.3	1.7
(Finance, insurance and real estate)	7.1	11.1	21.7	24.7	16.1	12.3	8.4

Note : 1) Compared with the same period of the previous year.

manufacturing, and the finance, insurance, and real estate sector showed high rates of increase.

External Transactions

During the second quarter, exports amounted to 43.5 billion dollars, increasing slightly from the previous quarter, and the rate of increase in exports registered 21.6 per cent in value terms on a year-on-year basis. Broken down into commodity groups, the growth of exports of heavy industrial & chemical products accelerated to a rate of 26.2 per cent led by semiconductors, information & communication equipments and chemical products. The exports of light industrial products(excluding exports of gold) increased by 11.8 per cent, centering on textiles and clothing. By export-destinations, exports to Japan, China and U.S. continued to increase rapidly. And the exports during July rose by 23.2 per

[Table 5] **Exports by Sector and Destination**
(Customs-clearance Basis)

Unit : billion U.S. dollars

	1999					2000			
	Year	Ⅱ	Jan. - Jul.	Ⅲ	Ⅳ	Ⅰ	Ⅱ	Jul.	Jan. - Jul.
Exports	143.7	35.7	77.7	35.1	42.6	39.3	43.5	14.5	97.3
	(8.6)	(2.5)	(0.8)	(15.1)	(22.7)	(30.0)	(21.6)	(23.2)	(25.1)
Heavy industrial & Chemical products	103.2	25.2	54.8	25.1	31.5	29.1	31.8	10.6	71.5
	(15.0)	(6.0)	(7.5)	(22.5)	(27.4)	(35.9)	(26.2)	(30.2)	(30.6)
Semiconductors [1]	(10.8)	(12.3)	(14.1)	(13.4)	(5.4)	(0.3)	(19.1)	(25.7)	(11.8)
Information & communication equipment	(87.6)	(61.2)	(51.0)	(103.2)	(147.5)	(125.2)	(87.7)	(94.8)	(102.7)
Passenger cars	(15.3)	(16.5)	(18.2)	(49.3)	(- 1.6)	(51.4)	(- 6.5)	(5.3)	(13.8)
Iron & steel products	(- 7.3)	(- 17.4)	(- 16.0)	(- 1.3)	(9.1)	(20.4)	(17.2)	(10.3)	(17.4)
Chemical products	(4.3)	(- 8.0)	(- 6.5)	(15.5)	(24.1)	(39.4)	(48.2)	(24.6)	(40.7)
Ships	(- 6.5)	(- 23.3)	(- 11.4)	(- 15.1)	(10.1)	(44.0)	(7.1)	(38.0)	(22.8)
Light industrial products	29.7	8.1	17.6	7.3	7.6	7.0	8.3	2.7	18.0
	(- 8.5)	(- 5.6)	(- 11.7)	(- 7.0)	(- 0.5)	(2.0)	(2.4)	(2.5)	(2.2)
(excluding Gold)	(3.7)	(- 0.5)	(- 2.3)	(5.9)	(18.4)	(17.6)	(11.8)	(3.6)	(12.7)
Textiles	(1.9)	(- 4.0)	(- 7.2)	(3.8)	(28.0)	(18.5)	(12.8)	(1.0)	(12.8)
Clothing	(4.6)	(- 1.7)	(3.4)	(1.5)	(11.3)	(9.9)	(7.6)	(0.3)	(7.0)
Advanced Countries	(14.2)	(11.7)	(5.5)	(19.2)	(30.0)	(31.6)	(20.4)	(29.3)	(26.0)
U.S.	(29.2)	(26.0)	(20.6)	(28.8)	(47.3)	(39.1)	(24.8)	(31.4)	(31.2)
Japan	(29.6)	(15.5)	(13.2)	(39.3)	(56.9)	(49.9)	(38.6)	(35.2)	(42.6)
Developing Countries	(3.4)	(- 5.5)	(- 3.5)	(11.3)	(15.6)	(28.4)	(22.8)	(17.3)	(24.1)
China	(14.6)	(3.0)	(4.6)	(28.5)	(30.7)	(39.6)	(37.8)	(39.3)	(38.7)

Notes : 1) D-RAM modules, which were previously classified as semiconductors, have been classified as information & communication equipment (computer peripherals) since July, 1999. In case of including D-RAM modules in semiconductors, exports (increase rate of exports) of semiconductors amounted to 6.47 billion dollars (47.0%) in the second quarter of this year and to 2.41 billion dollars (56.1%) in July.
2) Figures in parentheses refer to the increase rates compared with the same period of the previous year (%).

cent, amounting to 14.5 billion dollars.

During the second quarter, imports recorded 39.8 billion dollars, close to the level during the previous quarter. Their rate of increase over the same quarter of the previous year eased to 38.3 per cent from 51.8 per cent in the first quarter, but they still showed a more rapid advance than exports. Broken down by type of products, imports of capital goods rose by 45.7 per cent, centering on electric & electronic products, and the imports of raw materials expanded by 42.0 per cent boosted mainly by continuous increase in crude oil imports. But the imports of consumer goods(excluding gold) rose by a more modest 26.8 per cent rate. Considering imports by use, those for domestic demand increased by 45.1%, showing a rate of increase that is 14.8 percentage points higher than the imports for export-use. During July, imports persisted the rapid growth of 39.9 percent.

The current account surplus for the second quarter widened slightly to 2.73 billion dollars from 1.67 billion dollars in the first quarter. By sub-accounts, the surplus on the goods account expanded to 4.75 billion dollars compared with the previous quarter's 2.46 billion dollars. But the deficit on the service account widened slightly to 0.98 billion dollars from 0.83 billion dollars in the first quarter due to the increase in patent and roy-

[Table 6] **Imports by Sector and Use**
(Customs-clearance Basis)

Unit : billion U.S. dollars

	1999					2000			
	Year	Ⅱ	Jan.- Jul.	Ⅲ	Ⅳ	Ⅰ	Ⅱ	Jul.	Jan. - Jul.
Imports	119.8	28.8	64.1	29.8	35.7	38.8	39.8	13.7	92.3
	(28.4)	(22.2)	(18.1)	(38.7)	(44.8)	(51.8)	(38.3)	(39.9)	(43.9)
Consumer Goods	14.0	4.0	8.4	3.2	3.5	3.6	4.1	1.3	9.0
	(10.7)	(18.2)	(20.0)	(4.5)	(- 2.9)	(5.2)	(4.2)	(21.8)	(6.9)
(excluding Gold)	(30.8)	(30.5)	(21.9)	(40.4)	(46.7)	(42.9)	(26.8)	(26.0)	(32.7)
Raw materials	57.3	13.4	30.0	14.4	17.6	19.5	19.0	6.8	45.3
	(25.6)	(17.5)	(9.8)	(38.7)	(54.0)	(64.5)	(42.0)	(42.2)	(50.9)
Crude oil	(31.5)	(14.6)	(1.2)	(55.3)	(87.6)	(134.3)	(80.9)	(108.6)	(105.9)
Iron & steel products	(43.1)	(20.5)	(15.5)	(68.1)	(110.4)	(55.2)	(43.9)	(32.2)	(46.7)
Chemical products	(22.9)	(18.0)	(13.9)	(30.6)	(40.0)	(33.3)	(24.4)	(15.7)	(26.6)
Capital goods	48.5	11.4	25.7	12.2	14.6	15.7	16.7	5.6	38.0
	(38.4)	(29.7)	(28.8)	(51.5)	(52.0)	(52.6)	(45.7)	(42.2)	(47.9)
Electric & electronic products	(46.7)	(38.0)	(40.2)	(60.8)	(53.8)	(50.2)	(46.4)	(40.3)	(47.0)
Machinery	(25.7)	(19.8)	(11.5)	(35.4)	(53.9)	(61.7)	(47.7)	(49.2)	(53.3)
For domestic demand	(32.6)	(30.1)	(17.5)	(51.9)	(55.3)	(62.4)	(45.1)	(42.7)	(51.5)
For export	(23.8)	(14.0)	(18.7)	(25.9)	(34.6)	(40.4)	(30.3)	(36.7)	(35.4)

Note : Figures in parentheses refer to the increase rates compared with the same period of the previous year (%).

[Table 7] Balance of Payment: Current Account

Unit : billion U.S. dollars

	1999					2000			
	Year	Ⅱ	Jan. - Jul.	Ⅲ	Ⅳ	Ⅰ	Ⅱ	Jul.	Jan. - Jul.
Current Account	24.48	6.15	14.98	6.60	5.68	1.67	2.73	0.81	5.21
Goods	28.37	7.90	17.40	6.92	6.78	2.46	4.75	1.28	8.49
Services	- 6.51	- 0.41	- 0.41	0.51	- 0.18	- 0.83	- 0.98	- 0.53	- 2.34
Income	- 5.16	- 1.78	- 3.22	- 0.93	- 1.29	- 0.21	- 1.09	0.05	- 1.25
Current transfers	1.92	0.44	1.21	0.56	0.36	0.25	0.05	0.01	0.31

alty payments.

For july, the current account surplus narrowed to 0.81 billion dollars from 1.5 billion dollars in the previous month. Its contraction was caused mainly by the reduced surplus on the goods account, stemming from the increase in international oil prices. The deficit on the income account also expanded to 1.1 billion dollars from 0.2 billion dollars as a result of the increase of interest and dividend payments.

Prices

Consumer prices, which had maintained a decreasing trend in April and May, shifted to an increasing trend in June, resulting in a slight overall upward movement during the second quarter. Their upward trend persisted throughout July and August.

Viewed by category in comparison to the last month of the previous period, prices of agricultural, livestock, and marine products showed a stable pattern in June but they turned to an increasing track from early July with reduced shipments from the main producing areas following poor harvests owing to torrential downpour. Prices of manufacturing industry products showed a strong upward trend from June, led by increase in the prices of petroleum products caused by the increase in the international oil prices. And Charges for services continued their rising trend from July onwards pushed upward by the hike of those for public services, such as medical insurance premiums and transport fares, and for house rental charges.

Core inflation, a measure which strips out the prices of petroleum fractions and agricultural products except cereals from the CPI, maintained its increasing trend due to persistent rise in charges for service centering on those for public services.

Producer prices shifted to a sharply increasing trend in June and maintained this track during July and August due to the increase in international oil prices and public utility charges.

Viewed by category in comparison to

[Table 8] Rates of Increase of Comsumer Prices[1)]

Unit : per cent

	1998	1999					2000				
	Year	Ⅰ	Ⅱ	Ⅲ	Ⅳ	Year	Ⅰ	Ⅱ	Jun.	Jul.	Aug.
Consumer Prices	4.0	0.5	- 0.5	0.9	0.4	1.4	0.8	0.1	0.5	0.3	0.8
	(7.5)	(0.7)	(0.6)	(0.7)	(1.3)	(0.8)	(1.5)	(1.4)	(2.2)	(2.9)	(2.7)
Agricultural, livestock, and marine products	7.7	5.1	- 4.5	5.9	- 1.0	5.3	1.4	- 2.1	0.3	0.7	1.2
Manufacturing products	4.3	- 0.5	0.8	0.5	0.7	1.6	- 0.2	0.3	1.2	- 0.1	1.0
Services	2.6	0.0	- 0.4	- 0.1	0.6	0.1	1.5	0.6	0.1	0.4	0.6
Core inflation[2)]	4.0	0.3	- 0.2	0.3	0.1	0.5	0.9	0.3	0.2	0.3	0.6
	(5.9)	(0.9)	(- 0.3)	(0.2)	(0.6)	(0.3)	(0.8)	(1.4)	(1.6)	(2.0)	(2.3)

Notes : 1) Comparison is with the last month of the preceding period. Figures in brackets refer to rates of increase over the corresponding period of the previous year.
2) CPI stripping out the prices of petroleum fractions and agricultural products except cereals.

the last month of the previous period, prices of agricultural, forest, and marine products showed a decreasing tendency in July as prices for fruit decreased thanks to increased crops. And this downturn trend continued in August due to shipments of newly harvested items. Prices of manufacturing industry products have continued on increasing trend since June, driven by the rises in the prices of petrochemical products, pulp & paper products, and primary metal products caused by higher international raw material prices. And charges for services have maintained an upward trend due to the increase in the various transport fares and automobile insurance premiums.

Export prices showed an increasing trend during May and June led by those for petroleum products, D-RAMs, and textiles. But they shifted to a decreasing

[Table 9] Rates of Increase of Producer Prices[1)]

Unit : per cent

	1998	1999					2000				
	Year	Ⅰ	Ⅱ	Ⅲ	Ⅳ	Year	Ⅰ	Ⅱ	Jun.	Jul.	Aug.
Producer Price	3.6	- 1.4	0.0	1.0	1.4	0.9	0.0	0.2	0.7	0.2	0.3
	(12.2)	(- 3.5)	(- 3.3)	(- 1.9)	(0.5)	(- 2.1)	(2.2)	(1.9)	(2.6)	(2.9)	(2.5)
Agricultural, forest and marine products	15.7	7.0	- 6.3	3.4	- 0.1	3.6	0.6	- 2.0	0.5	- 1.5	- 1.0
Manufacturing industry products	3.0	- 2.5	0.8	0.8	1.7	0.7	- 0.1	0.1	0.8	0.2	0.3
Electric power, water, and gas supply	6.2	0.3	- 1.1	0.7	5.4	5.4	2.0	1.5	0.0	0.0	0.0
Services	1.6	- 1.0	0.2	0.8	0.4	0.3	- 0.2	0.6	0.2	1.0	0.2

Note : 1) Comparison is with the last month of the preceding period. Figures in brackets refer to rates of increase over the corresponding period of the previous year.

[Table 10] Rates of Increase of Export and Import Prices[1)]

Unit : per cent

	1998	1999					2000				
	Year	Ⅰ	Ⅱ	Ⅲ	Ⅳ	Year	Ⅰ	Ⅱ	May	Jun.	Jul.
Export prices	- 17.8	- 1.6	- 4.0	4.1	- 2.0	- 3.7	- 0.1	- 0.6	0.4	0.3	- 0.5
Import prices	- 14.5	- 2.5	0.6	9.0	0.6	7.5	0.8	1.4	2.5	1.9	- 1.1

Note : 1) Comparison is with the last month of the preceding period.

path in July as the prices of petroleum products and textiles fell in response to weakening demand.

Import prices showed an increasing trend during May and June in response to higher international price of raw material prices and the weakening of the Korean won against the U.S. dollar. They subsequently shifted to a downward trend owing to the easing of the international raw material prices especially for crude oil, and the firming of the Korean won against the greenback.

Viewing real estate prices, housing prices and housing rents have either decreased or barely changed since May. But in the Seoul area both of them showed a rapidly increasing path in July due to the demand for moving during school vacations and to demand in advance of the autumn, which is favored for moving. In the meantime, the price of land during the second quarter increased by 0.4 per cent due to expectations of a business upturn in the real sector and in the property market continuing to show the mild upward momentum evident since the previous quarter.

[Table 11] Rates of Increase of Real Estate Prices[1)]

Unit : per cent

	1998	1999					2000				
	Year	Ⅰ	Ⅱ	Ⅲ	Ⅳ	Year	Ⅰ	Ⅱ	May	Jun.	Jul.
Housing prices	- 12.4	1.8	0.3	1.7	- 0.4	3.4	1.2	- 0.3	- 0.1	- 0.3	0.0
(Apartments in Seoul)	- 14.6	4.3	2.0	5.8	- 0.1	12.5	3.6	- 0.1	- 0.1	0.0	0.9
Housing rents	- 18.4	7.0	3.1	5.0	0.9	16.8	6.5	1.2	0.1	- 0.2	0.2
(Apartments in Seoul)	- 22.4	15.4	5.4	9.8	- 0.8	32.5	8.7	1.5	0.3	- 0.2	0.6
Land prices	- 13.6	0.4	0.8	0.8	0.9	2.9	0.5	0.4	–	–	–

Note : 1) Comparison is with the end of the preceding period.

Financial Developments

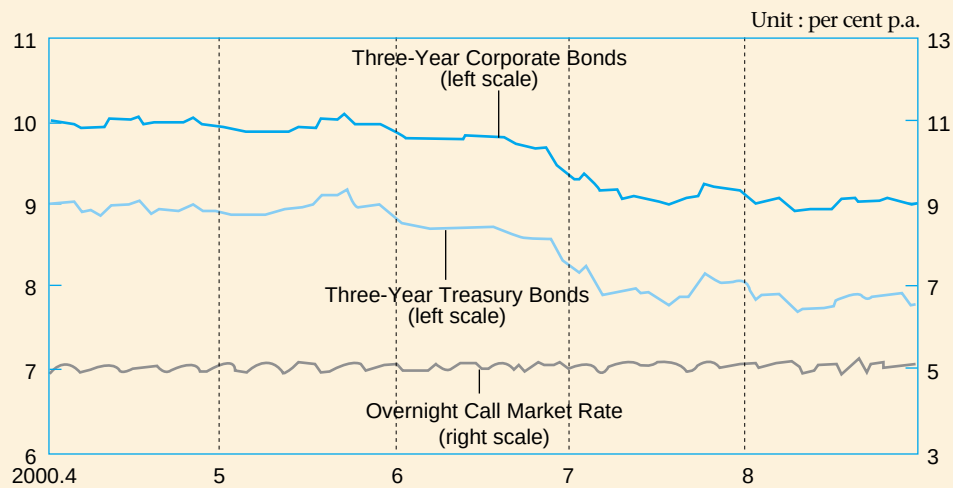
Financial Markets

During the second quarter, the overnight call rate hovered around the 5.0 per cent level. Meanwhile, long-term market interest rates such as yields on Treasury bonds and on corporate bonds rose temporarily at the end of May on expectations of an increased supply of bonds in response to financial restructuring and rumors about a worsening of the financial situation of the Hyundai Group. Toward the end of May, however, they shifted to a downward trend thanks to the alleviation of market uncertainty and the market's increased appetite for bonds. They fell especially sharply on expectations of an improved bond demand & supply conjuncture and enlarged demand for bonds following the announcement of financial market stabilization package(June 19). As of the end of the second quarter, yields on Treasury bonds and corporate bonds, therefore, stood at 8.31 per cent and 9.37 per cent respectively, representing decreases of 0.69 of a percentage point and 0.61 of a percentage point compared with the end of March.

From early July onwards, the call rate has stayed at 5.0 per cent mark on a monthly average, but the range of its fluctuation widened slightly. And long-term market interest rates showed a short-lived upward trend around the end of July due to the decline in the credit rating of the Hyundai Group, but later they eased steadily on the whole due to market's persistent appetite for bonds and to anticipations of a solution to Hyundai's troubles.

Deposits at banks continued to

[Chart 1] Market Interest Rates Movements



[Table 12] Growth of Deposits at Financial Institutions

(Change during the period)

Unit : billion won

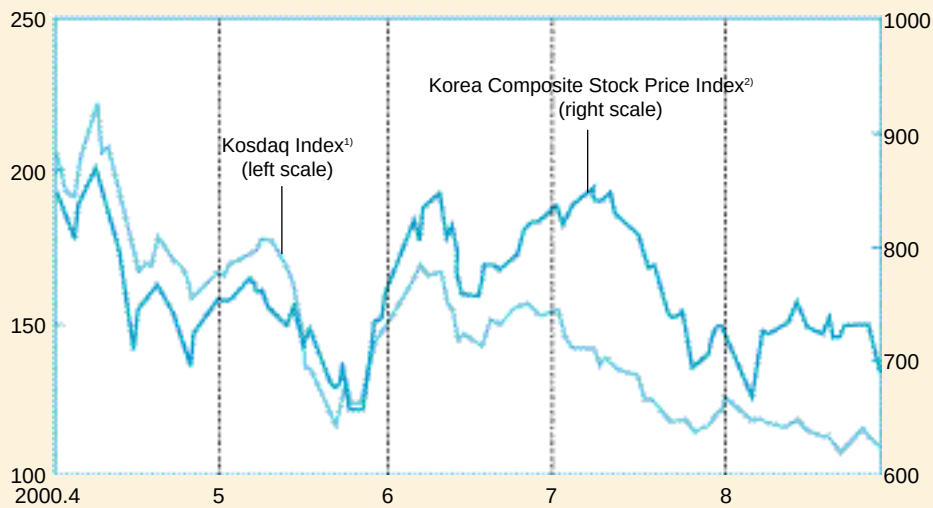
	1999		2000						
	Ⅲ	Ⅳ	Ⅰ	Ⅱ	Apr.	May	Jun.	Jul.	Aug.
Deposit money banks [1]	25,731	19,815	28,028	26,567	13,929	2,842	9,796	6,061	6,878
Money-in-trust	- 7,658	- 14,075	- 8,080	- 13,888	- 5,615	- 5,493	- 2,780	- 5,711	- 1,417
Investment trust companies	- 22,524	- 35,144	- 17,139	- 27,592	- 5,201	- 8,981	- 13,410	5,209	2,806
Merchant banking corporations	- 2,037	- 2,987	- 523	- 3,451	- 337	- 1,401	- 1,713	- 84	200

Note: 1) Bank deposits + CD + RP + Cover Bills

increase during the second quarter. This was attributable to ongoing portfolio shift out of investment trust companies and banks' trust account products into bank deposits and to the sharp increase in the money supply through the foreign channel. Over the same period, outflow of deposits from investment trust companies gathered pace due to anxieties about its restructuring and to withdrawal of funds by corporations prior to the semi-annual closing of accounts.

From July onwards, deposits at banks continued to increase due to the expanded taking of time deposits. Deposit-taking by investment trust companies, mean-

[Chart 2] Stock Price Movements



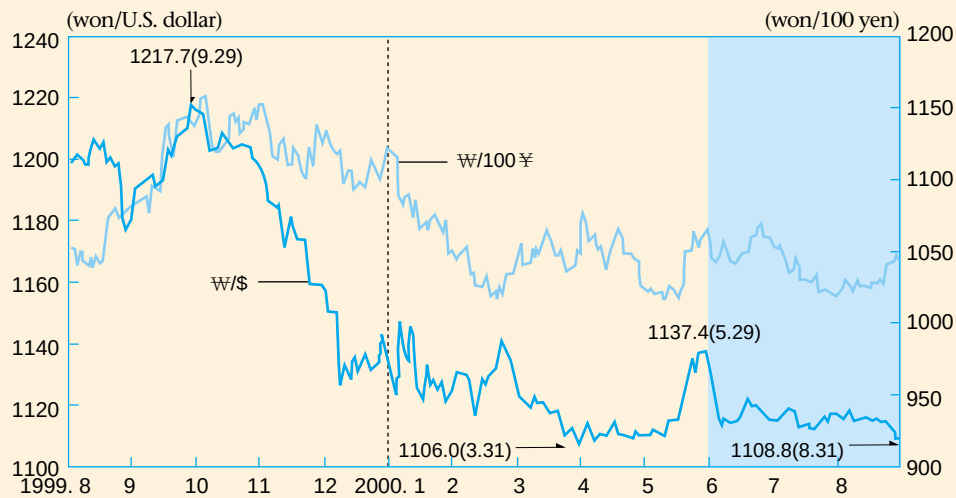
Notes: 1) 1986. 7.1 = 100
2) 1980. 1.4 = 100

while, shifted to an increasing trend boosted by more active sales of tax-exempt products

Stock prices fell steeply throughout the most of the second quarter, although they staged a short-lived rebound. The downward trend of stock price indexes became evident from the beginning of the quarter due to restructuring by investment trust companies and to the uncertainties posed by corporate and financial sector structural adjustment. In the last part of May, though, they rebounded sharply in sympathy with the surge in U.S. stock prices and respondency to the improved investment climate produced by the summit talks between the two Koreas. But stock price indexes fell back steeply from early July onwards amid a shift by foreign investors to a net selling trend and delay in the implementation of the government's financial market stabilization package. In August, it displayed only mild fluctuations around its persistent downward trend.

The Korean won strengthened sharply against the U.S. dollar in June to a level of 1,110 won per dollar as against 1,130 won in the late period of the previous month. It was resulted from the easing of Hyundai's problems and increased inflows of foreign portfolio investment funds. During July and August, the won continued to show stable movements, standing at around 1,115 won per dollar. But it then strengthened slightly to stand at 1,108.8 won per dollar at the end of August, due to the improved supply conditions in the Korean foreign exchange market caused by the increase in exports.

[Chart 3] Exchange Rate Trends of the Korean Won



Note : The won/dollar exchange rate is based on the market closing rate, and the won/100 yen exchange rate is based on the cross rate notified by the Korea Financial Telecommunications and Clearings Institute.

Against the Japanese yen, reflecting the movements of the yen/dollar rate in the international financial markets, the Korean won showed an appreciating trend in July, trading at 1,018.38 won per 100 yen at the end of July. From late August, though, it weakened to stand at 1,039.27 won per 100 yen as of the end of the month.

Monetary Aggregates

The growth rate of M3 during the second quarter decreased to 5.0 per cent compared with 5.3 per cent of the previous quarter. This reflected the steady pronounced decline in deposits at investment trust companies and merchant banking corporations. M2 growth rate, in contrast, accelerated sharply from the previous quarter due to an increase in credit to private sector, including loans to small & medium corporations and households, and an increase in the money supply through the foreign channel. The growth rate of MCT+, which embraces all deposits at banks, rose uninterruptedly led by the upward trend of the components of M2, which more than offset the effects of a decrease in sales of short-term market-rate linked deposit products such as CDs and RPs. From the beginning of July, the growth rates of M2 and MCT+ both showed a constant increase, bolstered by an expansion of credit to the private sector, but they both showed slightly in August on a month-on-month basis. In the meantime, the growth of reserve money decreased slightly to 22.0 per cent in the second quarter as compared with 23.1 per cent in the preceding quarter.

Corporate Fund Raising

There was a notable expansion of bank lending (including trust loans) during the second quarter compared with the preceding quarter due to the continuous increase in lending to small & medium

[Table 13] Monetary Aggregate Trends

(On the basis of daily average figures, campared with the same period of the previous year)

Unit : per cent

	1999		2000						
	Ⅲ	Ⅳ	Ⅰ	Ⅱ	Apr.	May	Jun.	Jul.	Aug.
M3	10.5	8.2	5.3	5.0	5.0	5.0	5.1	-	-
M2	25.3	26.4	27.7	33.2	29.6	33.6	36.3	37.8	35.1
MCT+	5.4	10.3	12.4	16.3	15.4	17.6	18.2	18.8	17.3
Reserve Money[1)]	18.0	18.4	23.1	22.0	21.4	21.8	22.6	24.4	21.4
	(22,097)	(23,960)	(25,689)	(25,528)	(25,472)	(25,508)	(25,604)	(26,497)	(26,172)

Note :1) Figures in parentheses indicate daily averages during the period(billion won).

corporations and households. In contrast, the issuance of CP decreased sharply during the second quarter . This was caused by a contraction in the issuance of new paper by large corporations and by the large-scale redemption of CP at the end of June by outstanding large companies in order to reduce their borrowings prior to the semi-annual closing of accounts. Meanwhile, the issuance of corporate bonds (excluding ABS) continued to decrease, but the scale of the slowdown also declined. The issuance of stocks increased compared with the previous quarter due to paid-in rights offerings by KOSDAQ-listed companies. Bank lending continued to expand from early July centering on loans to corporations. The issuance of CP meanwhile shifted to an upward trend thanks to its purchase by investment trust companies. Corporate bond issuance deepened its net redemption position in July but shifted to a large-scaled net issuance position in August owing to an expansion in the scale of that by large blue-chip companies and that of Primary CBO. The issuance of stocks showed an expansionary trend in July thanks to paid-in rights offerings by some companies, but it contracted again in August.

[Table 14] **Corporate Fund Raising**

(Change during the period)

Unit : billion won

	1999		2000						
	Ⅲ	Ⅳ	Ⅰ	Ⅱ	Apr.	May	Jun.	Jul.	Aug.
Bank loans[1]	16,102	9,754	12,639	21,314	9,275	6,980	5,059	6,989	4,929
Bank account loans	18,376	12,104	16,635	23,908	10,319	7,830	5,759	8,310	- 825
Trust account loans[2]	- 2,275	- 2,350	- 3,996	- 2,594	- 1,044	- 850	- 700	- 1,322	4,104
Net bond issuance[3]	- 2,836	- 5,504	- 4,036	- 2,452	- 892	- 523	- 1,037	- 2,517	2,736
Discount of CP[4]	- 5,099	- 14,039	8,405	- 7,095	768	- 1,752	- 6,111	2,522	350
Stock issuance[5]	8,400	13,911	2,176	3,773	969	1,489	1,315	2,008	385

Notes : 1) Excluding the changes on account books in connection with disposal of bad loans.
2) Excluding discount of CP
3) Excluding ABS and the amount dishonored by Daewoo Group and Samsung Motor. Including Primary CBO.
4) Based on the discount amount of CP by securities firms, bank trusts, and merchant banking corporations.
5) Including Kosdaq market (Excluding the stocks issued after 2000 by financial institutions)

Summary of Monetary Policy
Adopted by the Monetary Policy Committee

July ~ September 2000

Monetary Policy in July 2000*

While the economy has continued its expansion, the current account has continued to be in surplus. Consumer prices have risen significantly in June due to a hike in prices of petroleum-based products and farm-livestock-fisheries products.

In the financial markets, the indications of a credit crunch, which had mainly affected several of the large enterprises whose financial position was relatively weak, seemed to be gradually calming down. However, the apprehension resulting from the uncertainties surrounding corporate and financial restructuring still permeated the markets.

Taking these factors into consideration, the Monetary Policy Committee of the Bank of Korea has decided that the overnight call rate would be maintained at around its current level in July.

* Unofficial English translation based on the Korean original that was decided upon by the Monetary Policy Committee on July 6, 2000

It was noted that it would be essential to pay closer attention to price developments and to carry out corporate and financial restructuring consistently so that the instability in the financial markets can be resolved fundamentally at its sources.

In a related decision, it was resolved that the lending rate on the new Liquidity Adjustment Loans, which are scheduled to be introduced by the Bank of Korea on August 1, 2000, would be set at 4.5 per cent per annum.

Monetary Policy in August 2000*

The economy has maintained its expansion and the current account has continued in surplus. In July, however, consumer prices rose at a relatively high rate due to rises in prices of public services and farm-livestock-fisheries products. Moreover, there are many underlying factors such as additional rises in wages, prices of public services and raw materials, that could further push the prices up.

In the financial markets, financial intermediation contracted due to mounting apprehensions as Hyundai Group's liquidity problems reemerged in late July while some large enterprises still have difficulties in issuing corporate bonds and

* Unofficial English translation based on the Korean original that was decided upon by the Monetary Policy Committee on August 3, 2000

commercial paper.

Should financial instability prove prolonged, it may have a negative impact on the real sector by way, for example, of a decline in business and consumer confidence.

Although there seems to be a need to take control over aggregate demand as imbalances in the real sector enlarge, the Monetary Policy Committee of the Bank of Korea has decided that the overnight call rate would be maintained at around its current level in August focusing on stability of financial markets.

Although it is urgent to first stabilize the financial markets at present, the signs of higher inflation are becoming more evident. Therefore, consistent and rapid restructuring efforts have to be made in both the corporate and the financial sectors to create stable conditions for more flexible macroeconomic policies.

Monetary Policy in September 2000*

The economy has maintained its expansion and the current account has continued in surplus, but prices are showing an unstable pattern of movements.

Consumer prices have maintained a sharply rising trend over the last three

* Unofficial English translation based on the Korean original that was decided upon by the Monetary Policy Committee on September 7, 2000

months since June due to a surge of international oil prices and a series of hikes in public service charges.

While the major changes have taken place in the domestic and international environments including the steep rise in oil prices, financial market apprehensions have receded. Nevertheless, it is difficult to accept that there has been substantial improvements in the structural fragility of the financial markets.

Although the acceleration of the rate of price increases must be addressed urgently, the Monetary Policy Committee of the Bank of Korea has decided that the overnight call rate should be maintained at around its current level in September in view of the mood of uncertainty prevailing in the financial markets.

The Relationship between Business Survey Results and the Growth Rate of GDP : The Bank of Korea's Experience*

This paper aims to assess the value of the information in the survey data that the Bank of Korea has compiled, and its usefulness as an instrument of short-term business forecasting. For this purpose, we use a simple linear model and somewhat more complicated models, centering around the relationship between the survey series and the growth rate of GDP. The estimation results suggest that, as we find in within-sample fit measures, the survey series can offer additional information other than that on the past values of the annual change in GDP, and that it explains the economic growth rate better than the leading indicator, which is introduced as a comparison target. Moreover, the same results are obtained from assessing one-quarter-ahead forecasts in competing models.

* This paper has been written by Jong-Wook Kim, Industry Analysis Team, Research Department, the Bank of Korea. The views expressed herein are those of the author and do not necessarily reflect those of the Bank of Korea.

Ⅰ. Introduction

In general, businessmen interpret and predict business conditions about industries and the overall economy for the growth and effective operation of their own firms. Conversely, such interpretation and prediction themselves have an effect on the activities of firms, thereby influencing economic growth in the aggregate.

On the basis of this perception, we can simply and readily devise alternative sources indicating business conditions by way of surveying the opinions of businessmen, which it is difficult for the ordinary quantitative series to pick up. In Europe, especially, such business surveys are common, and many survey institutions have actively engaged in researches into how to improve the survey methods and obtain meaningful information on the business conditions through econometric models.

Meanwhile, the Bank of Korea(BOK) has been conducting a business survey since the second quarter of 1991, but has merely published the survey results so far. Now that the time series have accumulated to some extent, we need to evaluate the survey data in order to enhance the survey's utility instead of leaving it as it is. To this end, we are going to provide an empirical analysis drawing on the survey data that the BOK has compiled.

In Section II we explain the BOK's business survey method succinctly. Section III deals with some characteristics of the survey data, centering around the relationship between the survey series and the growth rate of GDP. Section IV sets up a basic model and somewhat more complicated models, and presents their estimation results. In the measure of fit and the test of forecast performance among the models, in particular, we analyze whether the survey results, when explaining and forecasting the growth rate of GDP, offer any information additional to that of lagged values of the annual change in GDP, and how closely the survey series is related to the GDP series, compared with the composite index. Finally, concluding remarks are presented along with a summary of the paper in Section Ⅴ.

Ⅱ. BOK's Business Survey Method

The BOK had introduced a business survey as early as in 1966, but suspended it in 1982, relaunching it in 1991 with the wider recognition of its usefulness as an instrument of short-term business forecasting.

As of the 3rd quarter of 1999, the sample size, which covers 2,893 firms, 1,721 in manufacturing and 1,172 in non-manufacturing, is large enough to reflect

business activities well. The industries surveyed are manufacturing, fishing, mining, electricity & gas, construction, wholesale & retail trade, restaurants & hotels, and other service industries.[1] Accordingly, the results of the BOK's survey comprehensively reflect the business fluctuations within the national economy. This contrasts with surveys by institutions that cover only manufacturing industries.

The population is 39,414 corporations, each of which has total annual sales of more than 1.5 billion won. The 2,893 corporations actually surveyed are selected in two stages. In the first stage, about 900 corporations are selected for a complete survey on the basis of their sales volume and market share. And in the second stage, stratified random sampling is used to select the remaining 2,000 corporations.

The survey consists of two kinds of variables, one being the judgement of the level, and the other the judgement of the direction of change. The former has five variables including the business situation and stocks of finished goods, while the latter has eight variables such as production and new orders. The BOK's Business Survey Index(BSI) is calculated for each qualitative question, and, unlike indexes in many other OECD countries, has equal weights of respondents. The final figure represents the percentage of "positive" minus "negative" in total responses by the following formula.

$$BSI = \frac{(Positive - Negative)}{Total\ respondents} \times 100 + 100$$

[Table 1] BOK's List of Variables

Classification	Variable	Judgement
Judgement of level	Business situation	Good, Normal, Bad
	Stocks of finished goods, Production capacity, Employment	Excessive, Proper, Insufficient
	Equipment investment (Compared with the original plan)	Increased, Same, Decreased
Judgement of direction of change (Compared with the previous year)	Production, New orders, Sales	Increased, Same, Decreased
	Capacity utilization	Up, Same, Down
Judgement of direction of change (Compared with the previous quarter)	Selling prices, Buying prices of raw materials	Up, Same, Down
	Profitability, Access to credit	Improved, Unchanged, Deteriorated

1) The BOK excludes agriculture, forestry, finance & insurance, etc., from the sample because of their weakly cyclical nature and the difficulty in surveying them.

A constant of 100 is added to avoid minus values. The BOK has used only qualitative assessments since 1993, when quantitative questions that asked for exact figures were discontinued to lessen the burden on respondents. And also, the BOK does not calculate a composite index derived from two or more survey questions relating to business conditions.

Each variable is surveyed quarterly, and the periods surveyed are the current quarter and the next quarter. The coverage of the samples is about 66 percent of the population in terms of sales, and the response rate is on average over 90 per cent.

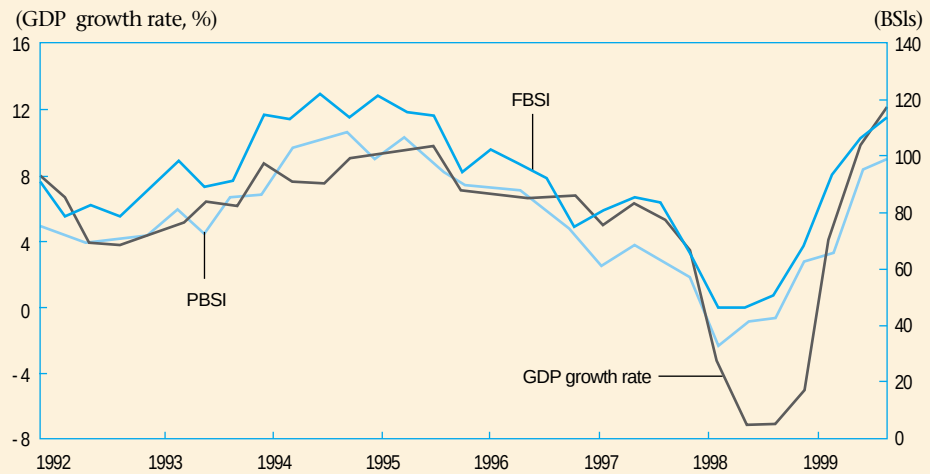
Ⅲ. Characteristics of the BSI[2)]

High Correlation between the BSI and GDP Growth Rate

The business situation, one of the BOK's survey variables, refers to an abstract concept that synthetically represents individual firms' performance of production, sales and profitability in their own business. The BOK compiles two BSIs as indexes concerning the business situation to utilize them in judging the national business activities of the current quarter(PBSI) and the next quarter(FBSI).

As shown in Chart 1, the two business

[Chart 1] Relationship between the BSI and GDP Growth Rate



2) The business situation BSI, the GDP growth rate, and the composite index calculated by combining several quantitative series are data during the period 1992:1-1999:3. The growth rate of GDP is the quarterly rate of change of GDP at 1995 prices, compared with the same period of the previous year, which is publicly announced by the Bank of Korea. Also, we use the composite index as the quarterly rate of change of the coincident or leading indicator compared with the same period of the previous year, on the basis of the quarterly average of monthly data released by the National Statistical Office.

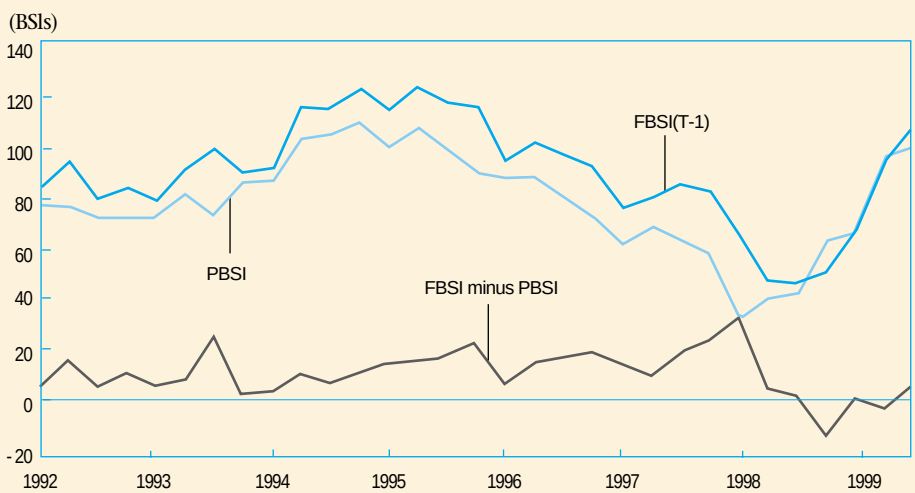
[Table 2] Correlation between the BSI and GDP Growth Rate

Variables	T-3	T-2	T-1	T	T+1
PBSI(Original index)	0.49	0.67	0.85	0.84	0.67
Coincident indicator	0.07	0.40	0.79	0.97	0.85
FBSI(Original Index)	0.42	0.68	0.88	0.86	0.62
Leading indicator	0.10	0.52	0.81	0.78	0.46

situation BSIs are closely linked with the representative business indicator, the growth rate of GDP. It is especially noteworthy that movements of the FBSI seem to lead those of the GDP growth rate about one quarter ahead, by and large.

Table 2 shows the cross correlation coefficients calculated for each lag and for each variable during the period 1992:1-1999:3. The PBSI captures the GDP growth rate at time T well with a correlation coefficient of 0.84, which is, however, lower by 0.13 of a percentage point when compared with the rate of change of the coincident indicator. On the other hand, the FBSI, irrespective of lags, shows a higher correlation than the rate of change of the leading indicator. Furthermore, the FBSI follows the year-to-year change of the GDP best with a lag of one quarter and a correlation coefficient of 0.88. Such results suggest that the FBSI, calculated at the end of every quarter, can be used as a useful instrument for forecasting the movements of the growth rate of GDP in the next quarter.

[Chart 2] Difference between PBSI and FBSI



Optimistic Expectations for the Future

Another characteristic of the two indexes concerning the business situation is that the FBSI generally exceeds the PBSI. Comparing the FBSI surveyed in the previous quarter with the PBSI calculated in the current quarter, during the period of analysis 1992:1-1999:3, the FBSI was greater than the PBSI 29 times out of 31 times. This result is interpreted as suggesting that firms surveyed tend to have a more optimistic attitude towards the future business situation than the current business situation.

In addition, the difference between the PBSI and the FBSI becomes greater when business is declining than when business is rising. Unusually, in recent years, the FBSI has been similar to the PBSI or below it, reflecting the fact that business conditions have rallied unexpectedly for one year and a half since the foreign currency crisis in 1997.

Responses Displaying Seasonal Pattern

In many cases, the survey results display seasonal patterns since quite a few respondents fail to notice seasonal factors when giving answers to the questionnaire.[3] Seasonally adjusted survey series have been released by the Philadelphia Fed in U.S., the ifo Institute in Germany, and the Economic Planning Agency in Japan among others, but not yet by the BOK.

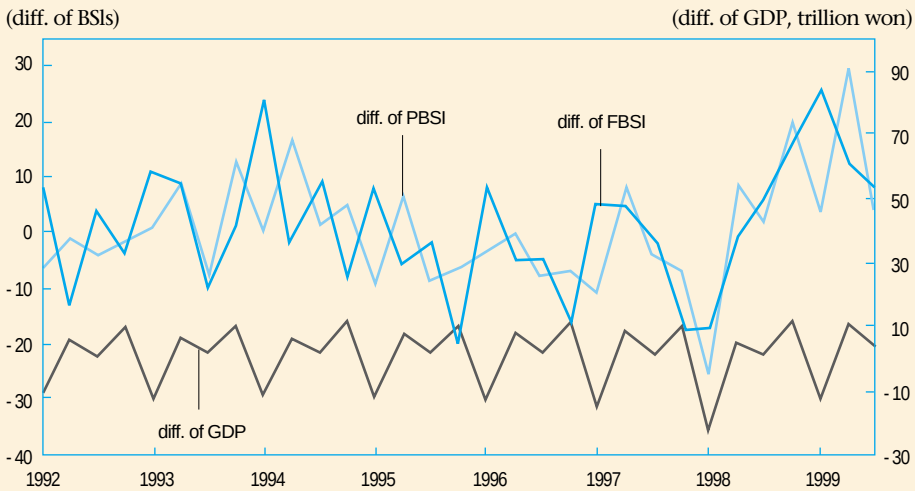
From Chart 3 it can be seen that there is noticeable seasonal variation in the BSI series. The striking features of the graph are that, the quarterly difference of the PBSI is great in the second quarter, and that the quarterly difference of the FBSI is great in the first quarter.

Specifically, looking into the quarterly changes of the BSIs in comparison with those of GDP, we find that the BSIs are connected with the seasonal pattern of GDP. In other words, the value of the PBSI in the first quarter and the value of the FBSI in the fourth quarter become low when GDP slows in the first quarter from the previous quarter, whereas the value of the PBSI in the second quarter and the value of the FBSI in the first quarter become high when GDP accelerates in the second quarter from the previous quarter.

3) BOK's questionnaire concerning the business situation is as follows:
- Assessment of business situation
(Please, give your judgement on the business situation of your firm "taking into account seasonal factors.")

Items	Current quarter	Next quarter(Forecast)
Business situation	Good ( ) Normal ( ) Bad ( )	Good ( ) Normal ( ) Bad ( )

[Chart 3] Seasonal Patterns in the BSI



Ⅳ. Models and the Results of Estimation

1. Simple Linear Model

Basically the business survey depends on respondents' subjective judgement. Some may question whether it is, therefore, meaningful to analyze qualitative appreciation quantitatively since it is not objective.

However, according to a number of studies over the past decades, the survey results based on individuals' subjective judgement may have almost the same validity as an ordinary series. At the aggregate level, assuming certain assumptions hold, it is possible to obtain quantitative measures of opinions averaged over individual respondents.

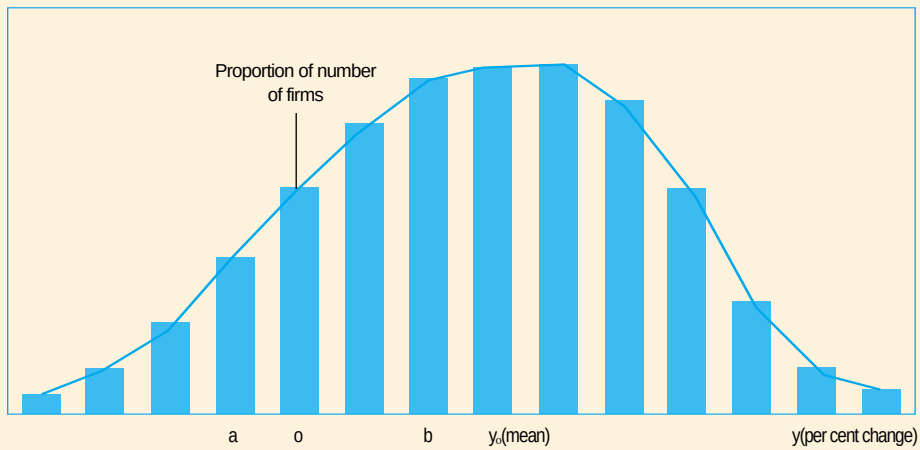
Suppose that all firms engage in production with the same weight, and that there is an indifference interval (a, b) such that the firms report "good" if the rate of growth of output exceeds b, "bad" if less than a, and "normal" if between a and b.

Since the variable measured vertically in Chart 4 is the proportion of the number of firms whose percentage change is y in production, the average in the production distribution, y_o , becomes the rate of growth of output in the overall economy.

Therefore, so long as the sample size is large enough, and the shape of the distribution and the indifference interval do not change markedly, indexes in the survey results will be positively correlated with shifts in the corresponding distribution, that is, the average change in production of firms.

Along the lines suggested by Theil(1952, 1966), Carlson and Parkin(1975), and

[Chart 4] Distribution of Rates of Change in Production



Pesaran(1987), the relationship between the survey results and the rate of change in production is introduced as follows :

$$y_o = k\,(x_1 - x_3) + m$$

where x_1, and x_3 denote the proportions of the firms which report "good," and "bad", respectively, in a business survey.[4)]

In the above equation, the average in the production distribution, y_o , is proportional to a kind of survey index, (x_1-x_3), while m is a constant representing the rate of change in production that equalizes the number of firms answering in "good" with that of firms answering in "bad."

By transforming (x_1-x_3) to fit in with the BOK's formula, we obtain the simple regression model.

$$y_o = k\left(\frac{BSI - 100}{100}\right) + m$$

Now, it is possible to estimate the relationship between the economic growth rate (YR) and the BSIs concerning the business situation. In the regression, we employ seasonally adjusted series by X-12 procedure instead of original indexes since the BSIs display seasonal patterns as shown in Section III.

$$YR_t = \underset{(14.4)}{10.0} + \underset{(9.0)}{21.5}\left(\frac{PBSI - 100}{100}\right)_t$$

$$\bar{R}^2 = 0.73, \quad D.W. = 0.72$$

$$YR_t = \underset{(15.6)}{7.4} + \underset{(9.9)}{21.0}\left(\frac{FBSI - 100}{100}\right)_{t-1}$$

$$\bar{R}^2 = 0.76, \quad D.W. = 0.63$$

4) In the appendix, a mathematical analysis is introduced of such a simple relationship between the survey results and the rate of change in production.

The figures in parentheses are t-statistics. According to the regression results, the coefficients of the two BSIs are almost the same, implying that the participants evaluate the fluctuation of the growth rate of GDP consistently. Moreover, each five point increase in the PBSI or the FBSI suggests about a one percentage point rise in the economic growth rate during the corresponding quarter. In the case of the constant term, the estimate obtained by using the PBSI is greater than obtained by using the FBSI, reflecting the evidence that firms surveyed usually have an optimistic attitude toward the business situation in the next quarter.

The Durbin-Watson statistics are too low, though, making it difficult to accept such a simple regression analysis as the best way. Therefore, it is desirable to try other regression models with an estimator of the autocorrelation of the residuals or lags of dependent variable.

2. Extended Model

The correlation and regression results suggest that the BSI tracks the growth rate of GDP well as a rule. We will, then, assess the value of the information in the BSI, looking into whether it provides any information additional to that of the past values of the annual change in GDP, and if it explains the economic growth rate better than the composite index.

In order to examine these questions, estimation methods that extend the above-mentioned simple regression model are used, namely, the autoregressive distributed lag model(ADL model) and the Theil-Nagar model. The AR model only with lags 1 and 2 of the growth rate of GDP serves as a baseline in the comparison with other ADL models including the BSI.[5] The Theil-Nagar model is used as a means of correcting for first order serially correlated errors in the simple regression model. Finally, we judge how well the BSI explains the economic growth rate, using the adjusted coefficient of determination($\overline{R}^2$) as a fit measure of the model.

The empirical results for the estimation period 1992:1-1999:3 are summarized in Table 3. When explaining the GDP growth rate with the ADL model, we can improve the fit of the model by including the BSI as an additional variable instead of only by lags 1 and 2 variables. In both of the reported regressions, the BSI is significant. The $\overline{R}^2$ increases 9 percentage points when the PBSI surveyed in the current quarter is added, and 6 percentage points when the FBSI surveyed in the previous

5) We first estimate the AR model with 6 lags of the growth rate of GDP to decide the optimal lag length, and then eliminate the longest lag to obtain a more parsimonious model that incorporates the main features of the variable. The Akaike Information Criterion(AIC) and Schwartz Criterion(SC) are employed as tools for the comparison of different models. Consequently, it turns out that a model with lags 1 and 2 of the growth rate of GDP minimizes these criteria.

[Table 3] **Empirical Results of BSIs**

(Estimation Period 1992:1-1999:3)

Model	Explanatory Variable	Results of Estimation	$\bar{R}^2$
ADL model	GDP growth rate (t-1, t-2)	$YR_t = 1.5 + 1.4YR_{t-1} - 0.7YR_{t-2}$ (2.5) (9.1) (4.3)	0.80
	GDP growth rate (t-1, t-2), PBSI(t)	$YR_t = 5.2 + 0.9YR_{t-1} - 0.4YR_{t-2} + 11.0WPBSI_t$ (5.6) (5.6) (3.3) (4.6)	0.89
	GDP growth rate (t-1, t-2), FBSI(t-1)	$YR_t = 5.0 + 0.8YR_{t-1} - 0.5YR_{t-2} + 12.7WFBSI_{t-1}$ (4.7) (4.0) (4.0) (3.7)	0.86
Theil-Nagar model	Coincident indicator (t, t-1)	$(YR_t - 0.2YR_{t-1}) = 1.1 + 0.9\,(PCI_t - 0.2PCI_{t-1})$ (4.3) (18.9)	0.95
	PBSI(t, t-1)	$(YR_t - 0.6YR_{t-1}) = 3.5 + 22.1\,(WPBSI_t - 0.6WPBSI_{t-1})$ (7.9) (6.1)	0.84
	Leading indicator (t-1,t-2)	$(YR_t - 0.6YR_{t-1}) = 0.3 + 0.7\,(FCI_{t-1} - 0.6FCI_{t-2})$ (0.5) (5.3)	0.81
	FBSI(t-1,t-2)	$(YR_t - 0.7YR_{t-1}) = 2.3 + 22.1\,(WFBSI_{t-1} - 0.7WFBSI_{t-2})$ (7.0) (7.1)	0.87

Notes : 1) Figures in parentheses are t-statistics.

2) YR : quarterly growth rate of GDP compared with the same period of the previous year, PCI/FCI : quarterly rate of change of the coincident indicator/the leading indicator compared with the same period of the previous year (on the basis of the quarterly average of monthly data),
WPBSI : (PBSI-100)/100, WFBSI : (FBSI-100)/100

3) In the Theil-Nagar model, the estimate of the autocorrelation coefficient $\hat{\rho}$ is computed as follows.

$$\hat{\rho} = \frac{n^2 (1 - d/2) + k^2}{n^2 - k^2}$$

d : Durbin-Watson statistic in simple least squares estimation,
n : Number of observations, k : Number of regressors
And then, in the second step, we estimate each coefficient for variables transformed by $\hat{\rho}$.

quarter is added. Such results demonstrate the BSI provides additional information other than that of lags of the economic growth rate in explaining the dependent variable.

And also, the fitted values of the Theil-Nagar model, with the PBSI as an explanatory variable, account for the variation of the GDP growth rate less well than those of the model with the coincident indicator, but the fitted values of the FBSI model explain it better than those of the leading indicator model. The $\bar{R}^2$ is higher by 6 percentage points when using the FBSI than when using the leading indicator.

3. Evaluation of Forecasts

From assessing the predictive accuracy of forecasting models, we can investigate more stringently the value of the BSI information in the sense that the within-sample fit measure of the dependent variable is not necessarily optimal when the model is directed toward forecasting. And also, it is very useful to predict correctly the growth rate of GDP using the

BSI calculated in the previous quarter, since the GDP figures are published some months after the given quarter.[6]

We start by estimating the ADL model and the Theil-Nagar model, which include the FBSI information available at time T-1, for the estimation period 1992:1-1995:4, and then, predict the growth rate of GDP one quarter ahead. Next, we re-estimate the models while adding data one quarter by one quarter to forecast the next quarter. In the results, we can assess the predicted values obtained through such reiterative procedures for the forecasting period 1996:1-1999:3.

Table 4 shows the RMSEs and MAEs of the competing models. The forecast performance is considerably improved by adding the FBSI to the lagged values of the dependent variables. In other words, during the period under consideration, the MAE of the AR model is 2.09 per cent, but it decreases 0.37 of a percentage point to 1.72 per cent when including the FBSI.

Also, the FBSI shows higher forecast performance than the leading indicator in the Theil-Nagar method. The MAE is 2.18 per cent in the model with the leading indicator as explanatory variable, but 1.61 per cent with the FBSI. That is to say, the FBSI produces forecasted values more accurate by 0.57 of a percentage point than the leading indicator. We confirm the same results when applying the RMSE criterion.

Meanwhile, Charts 5 and 6 show the actual and forecasted values during the forecasting period. Korea experienced an abrupt change in business conditions

[Table 4] One-Quarter-Ahead Forecasting Results of the BSI

(Forecasting Period 1996:1-1999:3)

Model	Explanatory Variables	RMSE	MAE
ADL	GDP growth rate(t-1, t-2)	3.18(4.47)	2.09(3.36)
model	GDP growth rate(t-1, t-2), FBSI(t-1)	2.75(3.88)	1.72(2.87)
Theil-Nagar	Leading indicator(t-1, t-2)	3.00(4.00)	2.18(3.07)
model	FBSI(t-1, t-2)	2.47(3.48)	1.61(2.66)

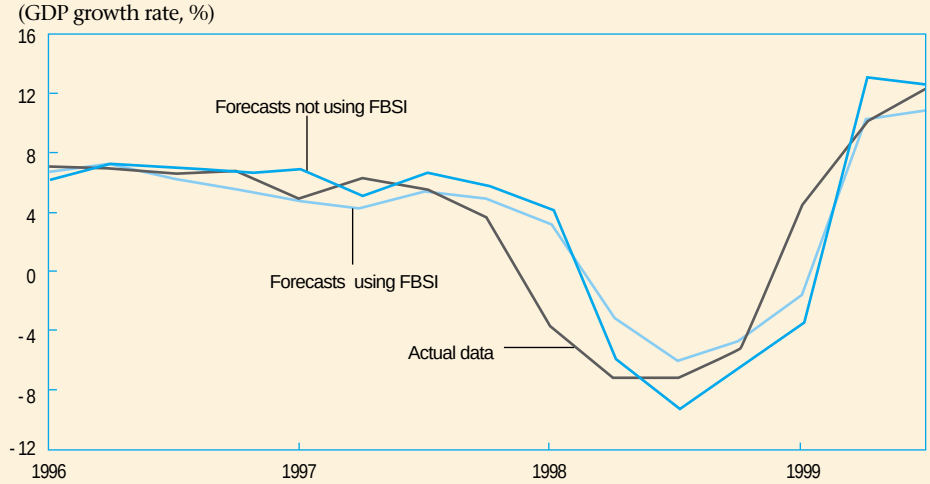
Note : 1) Figures in parentheses are measures for period 1998:1-1999: 3

6) The following table shows a time schedule for the release in Korea of the variables under consideration (based on 3rd quarter data).

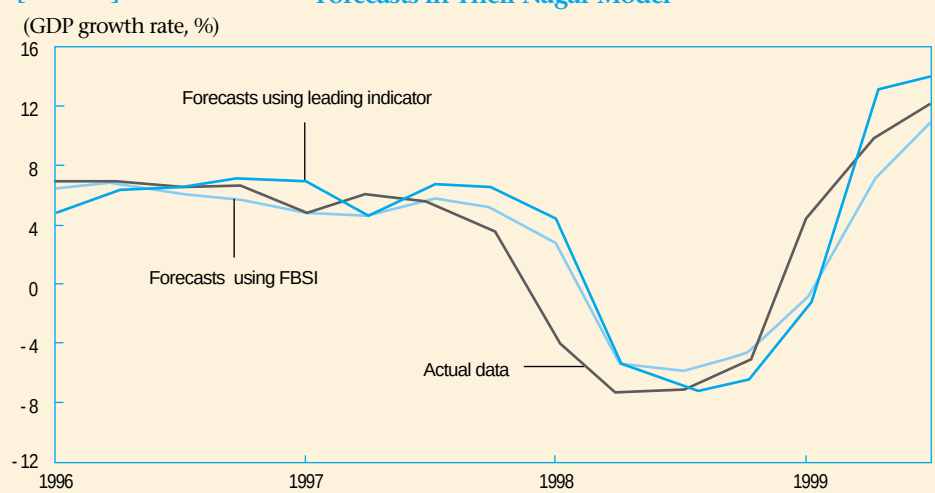
	GDP	Coincident indicator	PBSI	Leading indicator	FBSI
Publication cycle	Quarterly	Monthly	Quarterly	Monthly	Quarterly
Publication time	End of Nov.	End of Oct.	End of Sep.	End of Jul.	End of Jun.

Note : 1) The leading indicator and FBSI are presented on the basis of the data of previous quarter.

[Chart 5] Forecasts in ADL Model



[Chart 6] Forecasts in Theil-Nagar Model



after the foreign currency crisis broke out at the end of 1997. Accordingly, the forecast errors are enormous for the most recent two years. But, not surprisingly, the forecast errors were decreased markedly by the addition of the FBSI to the lagged values in this period as well.

Ⅴ. Summary and Conclusions

This paper set out to explain the BOK's business survey method and some characteristics of the survey results centering around the relationship between the

BOK's survey data and the economic growth rate, and then, conducted the estimation of various regression models.

As we find in within-sample fit measures, the survey series can offer information additional to that of the past values of the annual change in GDP, and explain the economic growth rate better than the leading indicator, which is introduced as a comparison target. Moreover, the same results are drawn from assessing one-quarter-ahead forecasts in competing models.

Since the survey results provide statistically significant information in explaining and forecasting movements of the economic growth rate, we should make more use of the business survey as a means of judging and predicting business conditions. At the same time, attempts should be made to enhance the predictive accuracy of the survey results by publishing a seasonally-adjusted series, assigning a weight to each firm, and developing a composite index.

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Appendix

Simple Linear Relationship between the Business Survey and the Rate of Change of Production

Suppose that y denotes a specific percentage change in production, and x denotes the proportion of the number of firms whose percentage change is y in production, we may regard the proportion x as a probability distribution f(y).

$$(1)\quad x = f(y) \qquad -\infty < y < \infty$$

And, if $p_1(y)$, $p_2(y)$ and $p_3(y)$ denote the probabilities that a firm experiencing y percent change in output, reports "good", "normal" or "bad", these three respective probabilities, known as response functions, add up to unity as follows :

$$(2)\quad p_1(y) + p_2(y) + p_3(y) \equiv 1 \qquad -\infty < y < \infty$$

$$\left(\frac{dp_1}{dy} \geq 0,\quad \frac{dp_3}{dy} \leq 0\right)$$

In this case, by integration concerning the response function and the production distribution, we have

$$(3)\quad x_i = \int_{-\infty}^{\infty} p_i(y)\, f(y)\, dy \qquad (i = 1, 2, 3)$$

where x_1, x_2 and x_3 are the proportions of the firms which report "good," "normal" and "bad", respectively, when their percentage change is y in production.

For the sake of simplicity, suppose that the production distribution is rectangular with mean y_o and range 2k.

$$(4)\quad f(y) = \begin{cases} \dfrac{1}{2k} & \text{if } y_o - k < y < y_o + k \\ 0 & \text{(elsewhere)} \end{cases}$$

Also, suppose that the response functions p_1 and p_3 are symmetric with mean m and

range 2[(1/a)-r]. Theil(1966) imposes a condition that the two response functions are symmetric with 0 at the center. But in this paper, we assume that they become symmetric with the constant m so that we can introduce a somewhat more realistic regression model.

$$(5)\ p_1(y) = \begin{cases} 0 & (\text{if } y < m-r) \\ a(y-m+r) & (\text{if } m-r < y < m-r+(\frac{1}{a})) \\ 1 & (\text{if } y > m-r+(\frac{1}{a})) \end{cases}$$

$$(6)\ p_3(y) = \begin{cases} 1 & (\text{if } y < m+r-(\frac{1}{a})) \\ -a(y-m-r) & (\text{if } m+r-(\frac{1}{a}) < y < m+r) \\ 0 & (\text{if } y > m+r) \end{cases}$$

Under the condition, $y_0-k \le m+r-(1/a) \le m-r+(1/a) \le y_0+k$, rewriting the equation (3) using (4), (5) and (6), the proportions of the firms that are expected to say "good" and "bad" about the business situation are as follows :

$$(7)\ x_1 = \frac{1}{2k}\left(y_o + k - m + r - \frac{1}{2a}\right)$$

$$(8)\ x_3 = \frac{1}{2k}\left(m + r - y_o + k - \frac{1}{2a}\right)$$

From (7) and (8), we can derive a simple linear relationship between the survey results and the rate of change of production.

$$(9)\ y_o = k(x_1 - x_3) + m$$

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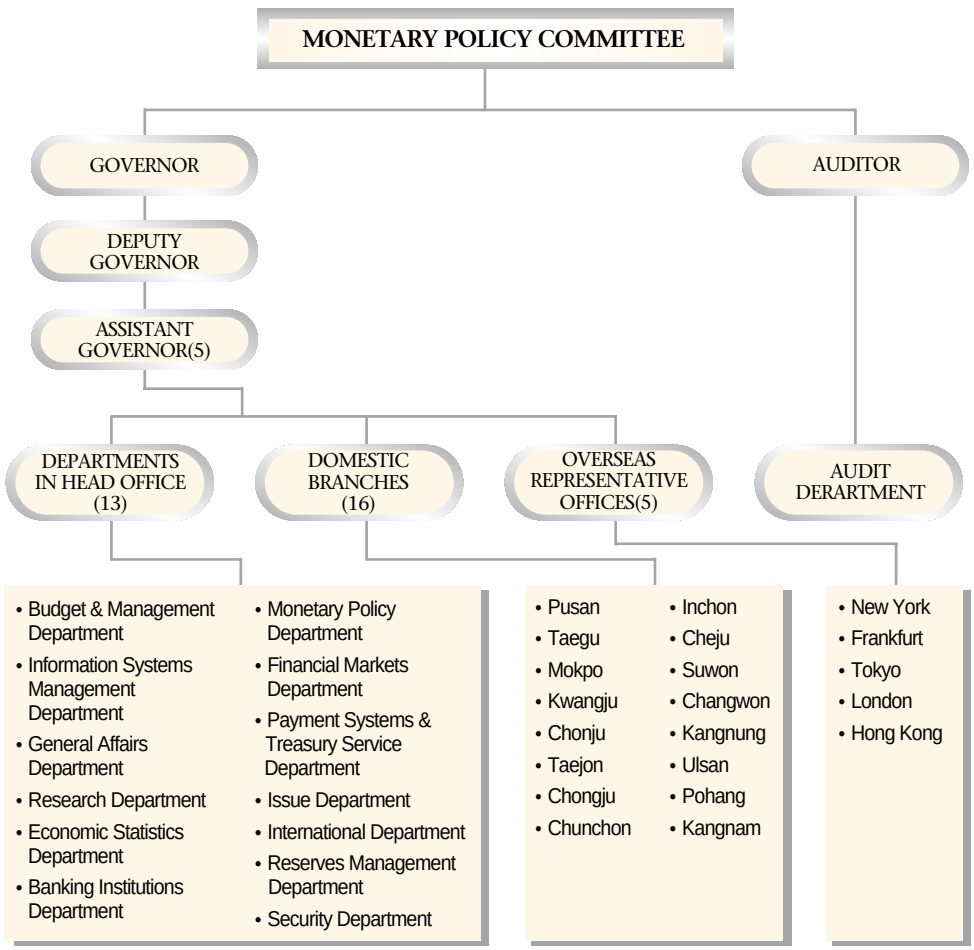

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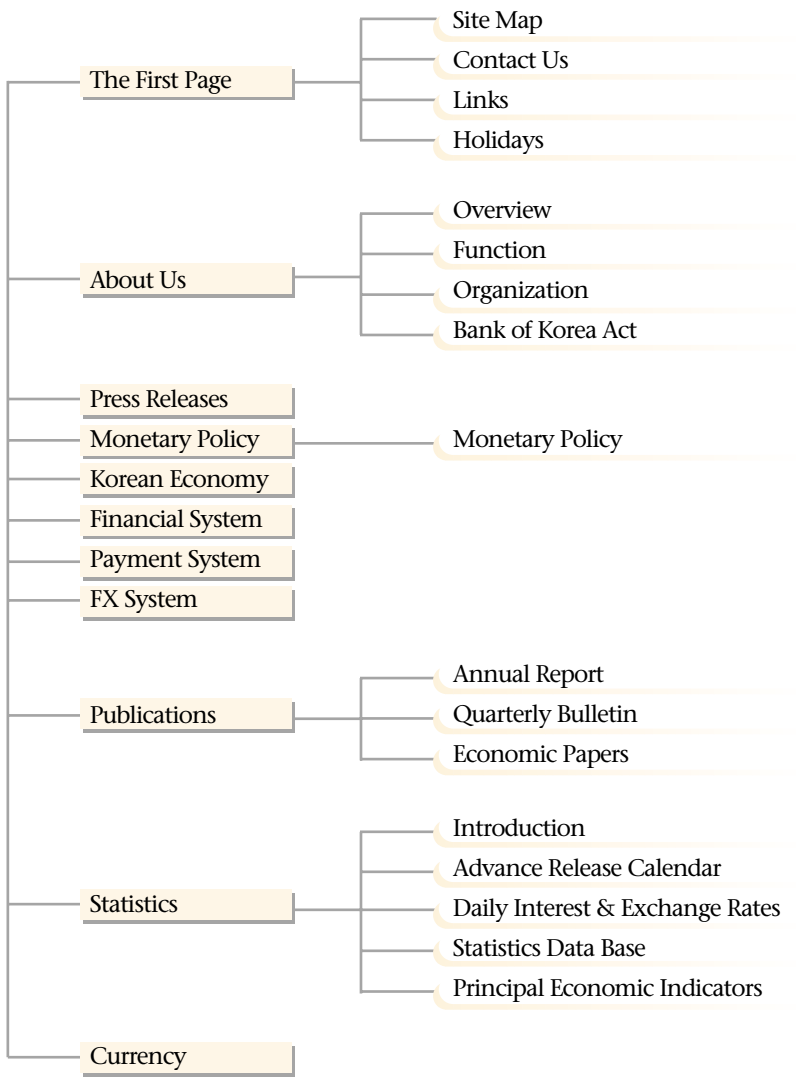

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Title	Frequency	Language	Dissemination Type*
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Quarterly Bulletin	Quarterly	English	P, O
Monthly Bulletin	Monthly	Korean	P, O
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