

Construction Economy Report

No. 40

The Japanese Economy and Public Investment

**New Challenges for the Construction Industry
and
Effective Public Investment and Urban Renewal**

February 2003

Research Institute of Construction and Economy

(RICE)

Tokyo, JAPAN

**This is an English translation of a summarized report
in Japanese, announced in February 2003**

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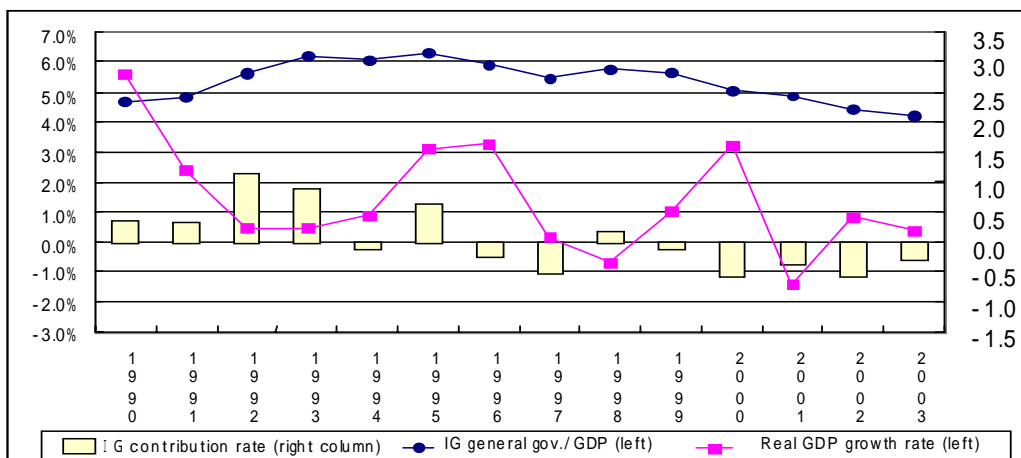
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1.1 Trends in the Japanese Economy and Construction Investment

- ◆ Research Institute of Construction and Economy (RICE) expects overall construction investment in FY2002 to fall significantly, by 6.0% in nominal terms over FY2001, to 56.7568 trillion yen a decline to below the 60-trillion-yen level for the first time in 16 years. A decrease of 9.1% is expected for government construction investment, due to a significant decline in national and local government spending.
- ◆ A further decline to 54.4831 trillion yen (a 4.0% year-on-year decline) is expected for FY2003, with a decline of 6.3% in government construction investment despite additional investment funded by the FY2002 Supplementary Budget. A decrease is expected in both private housing investment and private non-residential construction investment.
- ◆ The ratio of public capital formation (investment by government or 'IG') to GDP continued to fall, to a point as low as 4.2% in FY 2003. This is now significantly lower than the figures for the early 1990s (4.7%) when public investment was already being curbed. The IG contribution ratio to GDP is expected to be -0.6% for FY2002 and -0.3% for FY2003, recording negative rates for five consecutive years. The effect of this on the economy is cause for concern.
- ◆ While placing counter-deflationary measures at the top of its agenda, the government should turn to efficient public investment that has flow-on effects and can directly trigger demand as an important option in managing the country's economy and finances.

Trends in real GDP growth rate, ratio of public capital formation (IG) to GDP, and IG contribution rate



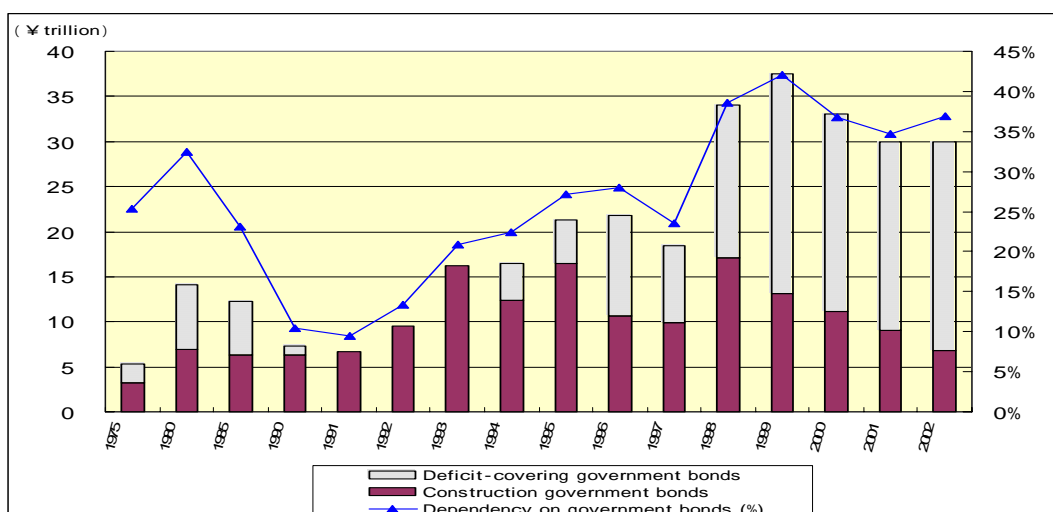
Figures final up to FY2001. Outlooks by RICE for FY2002 and FY2003.

1.2 Effective Public Investment

- ◆ The current issue of this Report (No. 40) examined recent criticisms of public investment in terms of: 1) how public investment is related to, and has effects on controlling fiscal deficit and stimulating the economy; 2) inflexible budget allocation; and 3) regionally imbalanced social infrastructure improvement.
- ◆ Results of recent opinion surveys indicate that citizens' need for social infrastructure improvement is diversifying. Effective improvement requires two-way communication between government and the people.
- ◆ In the European Union, the Structural Fund supports projects in areas that have greater needs. Italy enacted the Target Law to simplify major public works. This law aims to identify infrastructure of primary national interest and to speed up the procurement process.
- ◆ Three major goals of public investment in Japan proposed in this section are: 1) focused and efficient public investment in the national interest; 2) new role-sharing between national and local governments where local initiatives are valued; and 3) disclosure of the performance of social infrastructure improvement to the public.

- The national deficit is ballooning. During 1990 and FY2002 outstanding government construction bond debt increased by 2.2 times, while that of deficit-covering government bonds by 3.1 times, to 199 trillion yen.

Trends in government dependence on public bonds

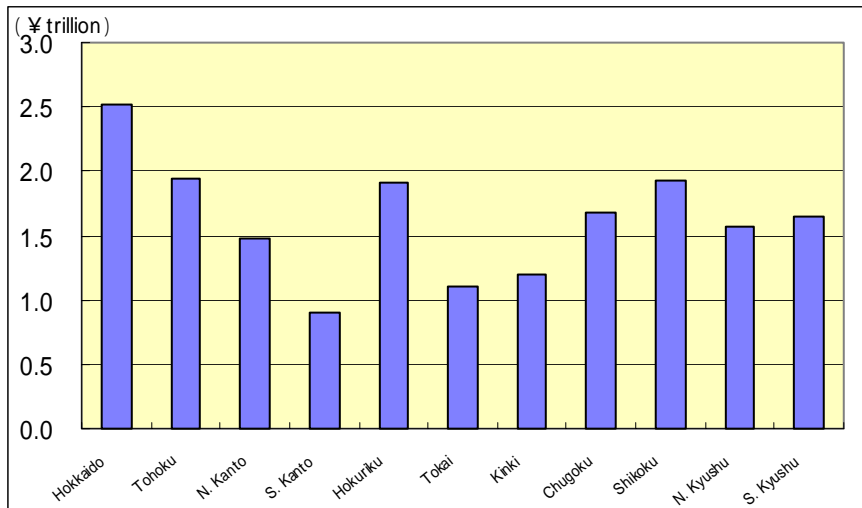


Note) Figure for FY2002 is of the preliminary budget.

- In terms of the multiplier effect, public investment is more effective, and can have a quicker stimulatory effect on the economy than tax cuts.

- Budget cuts of the past have tended to result in inflexible budget allocation. This problem has gradually been addressed. New measures have been introduced, including the cancellation of unnecessary public works and the evaluation of projects based on their performance.
- While the amount of social infrastructure stock per capita and the amount of social infrastructure stock per regional gross product are higher in provincial regions, the diffusion rates of amenities including sewer systems are higher in metropolitan regions. In the latter, social infrastructure that can stimulate the overall vitality of the country should be improved, whereas, in the former, infrastructure that supports the self-sustained development of the region should be improved, and existing stock should be more effectively utilized.

Amount of social infrastructure stock per ¥1 trillion of regional gross product



- In the European Union, the Structural Fund supports projects in areas that have greater needs. Projects are evaluated comprehensively by using indices of the project's input and output, direct effects and social/economic impact.

An example of project evaluation: roads

Stage	Goals	Index	Example (Road construction)	
			Purpose	Index
Input	-	Input index	-	Financial index
Output	Operational purpose	Output index	<ul style="list-style-type: none"> • Road construction 	<ul style="list-style-type: none"> • Length built • Progress level
Result	Concrete goals	Result index	<ul style="list-style-type: none"> • Reduction of travel time and transportation costs 	<ul style="list-style-type: none"> • Accessibility • Economy of time • Cost reduction
Impact	Overarching goals	Impact index	<ul style="list-style-type: none"> • Improved safety • Increased traffic and transportation • Increased economic and social activities 	<ul style="list-style-type: none"> • Traffic flow • Diversified production • Net job created • Regional gross product increase in terms of per capita and per employee

- Italy enacted the Target Law to simplify major public works in December 2001. The Law aims to identify large-scale and networked projects, simplify the planning and approval processes, and utilize private money.
- This Report proposes the following three goals of public investment in Japan.
 - a) Focused and efficient public investment of national interest. Choose high-priority projects that are in line with the country's development strategy, with emphasis on integration and coordination among projects.
 - b) Establish new role-sharing systems between national and local governments to promote local initiatives in regional policies. Create a program listing projects in the order of importance based on clear and objective standards.
 - c) Greater awareness by citizens of the effects and performance of social infrastructure improvement. Performance should be measured using clear indices before and after the project implementation. The results should be made public.

1.3 Efficient Management of Social Infrastructure and Better Systems

- ◆ Challenges faced by social infrastructure in Japan include: 1) how to increase stock under current budgetary constraints; 2) how to meet diversified and more advanced needs; and 3) how to increase accountability.
- ◆ New approaches to enable efficient and effective management of social infrastructure have been introduced in Japan. Asset Management, an approach used in the United States and other countries, is being introduced.
- ◆ A comprehensive management system is needed that can maintain and improve facilities and assets and increase service performance.

- **Social infrastructure management now, and in the future**
 - Japan's social infrastructure stock, rapidly accumulated during the high-growth period, is gradually reaching the end of its service life. For example, the number of bridges aged 50 years and over will rise by 4 times during the next decade, and will be 17 times the present total 20 years from now.
 - Stock maintenance will face financial and personnel constraints, in addition to the diversifying and more sophisticated needs of citizens and greater need for accountability.
 - Problems of maintenance, the solution of which used to rely on human experience and intuition, may be solved by advanced information technology.
- **Asset Management and other new approaches**
 - There are various approaches to manage social infrastructure more efficiently and effectively.
 - Cost based on the entire lifecycle of the infrastructure (Minimize maintenance and repair cost even if the construction cost is rather high)
 - Planning maintenance (Longer life through preventive measures, increased cost-efficiency)
 - Introduction of Asset Management (the Road Bureau of the Ministry of Land, Infrastructure and Transport (MLIT))
 - Commissioning to the private sector
 - Background: The Local Autonomy Law revised by the Ministry of Public Management, Home Affairs, Posts and Telecommunications
 - Examples: Sewer pipe performance management, privatization of port facilities and services
 - The U.S. Federal Highway Administration introduced an Asset Management System in the late 1990s. The system aims to “be data-based,” to “measure performance,” and to “improve continuously.”

- The U.K. introduced PFI, and now emphasizes utility value through the lifecycle of the infrastructure.
- **Integration and coordination through better systems**
 - Comprehensive management systems enabling continuous “maintenance and improvement of facilities and assets” and “increased service performance” should be developed.
Challenges include:
 - Clarify goals and strategies;
 - Reflect diversified values;
 - Data accumulation and performance measurement;
 - Integrate hierarchical social infrastructure, enable better communication in and out of the organization; and
 - Develop analytical and measuring tools.
 - These offer new business chances to private companies. The public sector should increase links with citizens, including NPOs.

Chapter 2

Trends in the Construction Industry and Bidding and Contracting Systems

2.1 Trends in Bidding and Contracting Systems

2.1.1 Dumping

- ◆ Cases of dumping of low-priced products and services are increasing or becoming apparent in recent years, due to the decline in construction investment and intensifying competition.
- ◆ The term “dumping” tends to be used for any significantly lower-priced bidding for public works projects. Although not all such bids can be categorized as “dumping” lower-priced bidding has disadvantages, including: 1) the deterioration of superior construction companies through shoddy construction and overcompetition; 2) strains upon subcontractors and workers; and 3) sub-standard safety.
- ◆ Measures to prevent these disadvantages include: 1) proper selection/combination of the Low Bidding Price Survey System and the Minimum Price System; 2) establishment of elimination standards, the requirement of submission of construction cost statements and estimates of subcontracting costs, stricter supervision of lower-priced bidding; 3) better screening of bidders; and 4) higher insurance coverage ratios and performance bonds.
- ◆ This Report proposes that middle- to long-term measures be taken to address issues that procurement authorities cannot challenge individually. These measures include "the establishment of a bond system that reflects financial risks at the time of bidding," and "an independent third-party evaluation organization to evaluate the ability of construction companies."

1. Lower-priced bidding is on the increase, but varies from one region to the next

The number of cases coming under the MLIT's low bidding price survey is increasing: about 2.4% in FY2001, compared with 1.7% in FY2000. The number of cases varies by region (about 7.5% according to MLIT's Kinki Regional Development Bureau and 0.9% according to the Chubu Regional Development Bureau) and by prefecture and city (according to surveys by local governments/entities).

2. Items covered in low bidding price surveys vary among local governments and cities (See Figure/Table 2-1-5 of the main report for details).

Most governments/entities cover major items when they each conducted the survey. Only 22% of respondents said they interviewed subcontractors and material suppliers, while 34% said they confirmed estimated from subcontractors and material suppliers. Additional surveys should be conducted to cover these kinds of companies since they are often the victims of lower-priced order taking.

3. Measures in response to lower-priced bidding have been considered in Europe; the issue is not apparent in the United States.

European countries are considering measures against problems associated with lower-priced contracting. The EU Procurement Directive has established a survey price system for “extraordinarily low-priced bidding.” In 1999 its working group proposed the introduction of a bond system setting plural standards for selecting bid winners. On the other hand problems of dumping have not been reported in the U.S. in recent years. The reasons include: 1) widespread use of bidding bond system; 2) contractor-subcontractor relationships different from those of Japan; and 3) the recent increase of construction investment.

2.1.2 . Payment practices in public works projects

- ◆ “Payment in advance and payment upon completion” is the most common practice when public procurers place orders, yet this often results in contractors lacking funds at the latter stages of construction work and subsequently paying their subcontractors in bills.
- ◆ If a lump sum is paid at the beginning of the project it will reduce the total funding costs to be borne by the public procurer (the less interest to be paid), and thus the total project cost (benefiting the national economy). It will also lead to better relations between the procurer and the contractor, and ensure proper execution of the project.
- ◆ This Report has made the following two proposals to reduce costs and to ensure the quality of public works projects.
 - 1) Public procurers should utilize the Interim Advance Payment System by eliminating factors hampering the proper use of this system and examining associated problems.
 - 2) The contractors receiving the interim advance should be required to pay their subcontractors in cash for their work.

- **The U.S. Prompt Payment Act**
 - This Act was enacted in 1982 to reduce costs to the Government for property and services.
 - Public procurer should pay within 14 days from the time they receive an invoice from the contractor.
 - The contractor should pay subcontractors within 7 days of the date they are paid by the public procurer. (Clause added for construction contracts by the 1988 amendment of the Act.)
- **Interim Advance Payment System**

- MILT (formerly the Ministry of Construction) introduced this system in 1972, based on the Cabinet Order Concerning the Budget, Auditing and Accounting.
- The Local Autonomy Law Enforcement Order was amended in February 1999, enabling local governments to introduce the System.
- Partial completion inspection is not required, thus there is no need to suspend the construction work, to prepare materials for inspection, and to confirm the costs of the parts completed at the time of inspection.

	Prefectures		Major cities	
	No.	Ratio(%)	No.	Ratio(%)
Introduced	33	71.7	5	45.5
Not introduced	11	23.9	5	45.5
Plan to introduce	1	2.2	0	0.0
Review ing	1	2.2	1	9.1
Other	0	0.0	0	0.0
Total	46	100.0	11	100.0

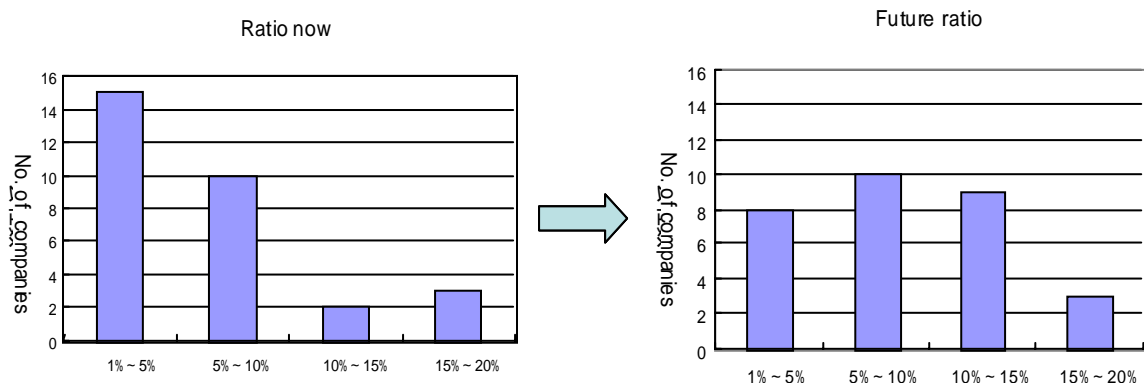
- **Problems associated with partial payment**
 - Unlike the situation in the United States and in most European countries, partial payment in Japan is paid not for the “work completed” but for the “(physical) part completed.” Such an approach requires more rigid inspection and delays the collection of funding for the construction work.
 - Even partial payment based on the “work completed” used in other industrialized countries is costly. The services of Construction Managers (CMr) and Quantity Surveyor (QS) are outsourced when making payment, and this requires both time and cost.
 - Japan uses a lump-sum method for construction contracts (lump-sum plus unit price method in the U.S. and Europe).
- **Factors hampering the use of the Interim Advance Payment System**
 - Public procurers who lack an understanding of the system often require contractors to submit unnecessary documents and go through unnecessary procedures.
- **Problems associated with the Interim Advance Payment System**
 - The necessity to examine and improve payment requirements, payment ratio to the contracted amount, and frequency of payment.

2.2 Internationalization of the Japanese Construction Industry

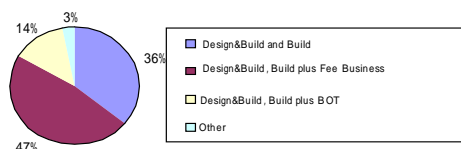
2.2.1 Japanese construction companies in overseas markets

- ◆ As the domestic construction market shrinks, construction companies are turning their eyes to the overseas market. Although Japanese general contractors are among the largest in the world, their overseas business sectors are extremely small. Many companies are planning to increase their proportion of overseas business.
- ◆ Overseas business has risks that are not found in the domestic market. Concerns over the low competitiveness of Japanese companies are expressed. A questionnaire survey revealed that respondents are aware of the problems, including a lack of experience, knowledge and personnel, and high personnel costs of Japanese workers. These problems place Japanese companies at a disadvantage, compared with European and American companies.
- ◆ Two keys to increasing the competitiveness of Japanese companies are:
 - 1) Localization: Japanese construction companies need to establish local offices and accumulate expertise on local management and business; and
 - 2) Strengthening fee business through recruiting and training personnel: Japanese construction companies lack commitment to for-fee business (e.g. PM and CM). They should change their mentality by recruiting and training personnel capable of handling various forms of contracts, and be able to meet diversified requests from clients.

- **The domestic construction market is shrinking and the overseas business is gaining importance. RICE conducted a questionnaire survey to member companies of the Overseas Construction Association. Many of the 30 respondents replied that they are planning to increase their ratio of overseas sales to total sales.**



- Half of the respondents are planning to enter for-fee businesses in the overseas market, in addition to traditional forms of contracts such as “design& build” and “build.”



2.2.2 Major U.S. and European construction companies

- ◆ Major U.S. and European construction companies are characterized by their wide coverage of both geographical and business areas, and their large number of employees.
- ◆ A financial analysis of four major European companies categorizes them into two groups: Hochtief and Skanska (engaged in active M&A globally), and Bouygues and Vince (a high proportion of business in Europe).
- ◆ The European construction market has matured. Major companies are restructuring and engaged in M&A to expand territory and scale, rather than to reduce the number of companies or save weak companies (two reasons are often stated as reasons for M&A in Japan).

Top Ten Construction Companies (in terms of global revenue; billions of yen)

1	Bouygues (France)	2,227.1
2	Skanska (Sweden)	2,078.2
3	Kajima (Japan)	2,060.4
4	Vince (France)	1,868.0
5	Taisei (Japan)	1,673.8
6	Bechtel (US)	1,628.5
7	Shimizu (Japan)	1,584.0
8	Obayashi (Japan)	1,403.7
9	Hochtief (Germany)	1,324.0
10	Takenaka (Japan)	1,226.4

Percentage of consolidated overseas sales amount (%)

	Average of five major Japanese companies	Bouygues	Skanska	Vince	Hochtief
FY2000	5.3	37.1	77.0	38.3	73.5
FY2001	6.0	37.2	82.2	38.3	83.3

Number of consolidated employees (unit: persons)

	Average of five major Japanese companies	Bouygues	Skanska	Vince	Hochtief
FY2000	15,286	118,645	63,368	122,070	41,004
FY2001	15,177	126,560	79,924	129,499	36,962

Notes:

- 1) Refer to annual reports of *Engineering News-Record* top ten companies.
- 2) Bechtel is not listed and its financial data was not available.

2.3 Environmental Concerns and Challenges Faced by the Construction Industry

- ◆ Measures against environmental risks, caused for example by construction by-products, are priority and pressing issues for the construction industry to protect the global environment.
- ◆ Many major construction companies have introduced ISO14001 environmental management systems. Some are introducing the Environment Report and the Environment Accounting.
- ◆ Multi-industry efforts to approach environmental issues represent a major business opportunity for the construction industry to use its technology and expertise.

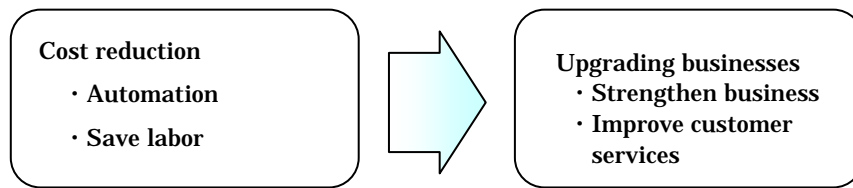
- Recent environmental issues
 - Japan ratified the Kyoto Protocol (June 2002). Business associations are calling for environmental protection. The Construction Waste Recycling Act was enacted and The Waste Management and Public Cleansing Law revised. Monitoring of illegal dumping of industrial waste was strengthened.
- Environmental measures taken by construction companies
 - Major construction companies are more aware of the environmental risks of construction by-products than ever before. In a survey conducted in October 2002 35 out of 46 responding companies said that they pay “particular attention when contracting processing and disposal of construction by-products”.
Note: The questionnaire survey sheet was sent to 63 construction companies, and 46 replied (a 73% collection rate).
 - In the previous survey 93% (43 companies) said they have been granted ISO14001. “Employees becoming more aware of the environment” was the most frequently mentioned (89% or 41 companies) merit of acquiring this certification. Some have introduced the Environment Report (52% or 24 companies) and the Environment Accounting (41% or 19 companies).

- ISO14001, Environment Report and Environment Accounting will be improved as part of the overall environmental management.
- **Environmental business**
 - Major construction companies expect that soil cleaning (80% or 37 companies) will be a promising business area. Other opportunities of business diversification are sought in recycling and reuse (52% or 24 companies), life extension of materials (46% or 21 companies), energy-saving systems (35% or 16 companies), disposal and treatment of waste (30% or 14 companies), and “heat island” mitigation measures (24% or 11 companies).
 - Departments specializing in environment-related business were set up by 57% (26 companies); moreover, 17% (8 companies) developed their department into an independent company.
 - These companies expect that the percentage of environment-related business out of their total sales will increase from 5% at present to about 11% in 5 years, and to about 18% in 10 years.
 - Global-scale energy measures and challenges utilizing the Kyoto Mechanism are expected to offer further opportunities for new environment-related business.

2.4 Effective IT Investment in the Construction Industry

- ◆ The purpose of information technology (IT) investment has expanded, from simply being a means “to reduce cost,” to “upgrading businesses.” Effective IT investment requires strategies and evaluation of the effects of investment.
- ◆ When establishing IT strategies, the company should have a clear understanding of the company's condition and ability and determine the direction in line with the overall business strategy.
- ◆ The effects of IT investment are evaluated from quantitative and qualitative aspects. Evaluation should cover the entire business process and both “effectiveness” and “efficiency” in upgrading the business.

- **IT investment and changing purposes**
 - Corporate spending on information technology sharply increased until FY1999, then leveled off from FY2000. A survey of 12 major companies indicates that their IT spending on average reached 2.5 billion yen, or 0.32% to 0.33% of annual revenue.
 - The purpose of IT investment has changed, from “cost reduction” through automating and laborsaving jobs, to “upgrading businesses” to strengthen business and improve customer services.



- **Issues for effective IT investment**

- **IT Strategy**

Companies should, in line with their overall business strategy, 1) determine the orientation of their IT investment, 2) have a clear understanding of the company's condition and ability; and 3) develop guidelines.

- **Evaluation**

a) Most major construction companies evaluate the investment effect from both quantitative and qualitative aspects.

[Results of a survey conducted on 12 major companies]

“We evaluate both quantitative and qualitative,” (9 companies) “quantitative,” (1 company) and “no evaluation made” (2 companies).

Quantitative: Direct effect on cost reduction, reduced work time converted to monetary value

Qualitative: Use indices of “usability,” “convenience” and “operability” for items difficult to be converted to monetary value

b) The evaluation of the use IT to enhance businesses should cover the entire business process, including measures of both the effectiveness and efficiency of IT.

[An example of effect measurement (U.K.)]

i) **Benefit of efficiency:** Benefits including cost and time reduction that can be measured in terms of monetary value (e.g. reduced number of files).

ii) **Benefit of effect:** Benefits including better information exchange that cannot be measured in terms of monetary value (e.g. speedy response to customers).

iii) **Benefit of performance:** Benefits that can greatly influence the long-term business performance (e.g. integrating construction production).

- **Other factors**

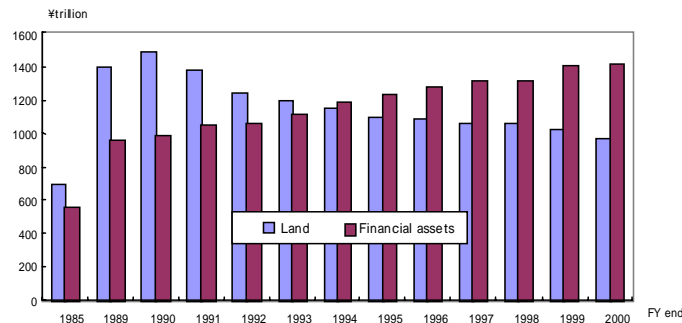
Computer literacy education and innovation of corporate culture are necessary to make IT truly effective.

3.1 Continuous City Renewal

- ◆ A continuous renewal of cities requires effective methods to finance private projects that are the foundation of urban renewal.
- ◆ The flow of money into real estate market has decreased in the wake of the collapse of the economic bubble, triggering a long-term decline in land price. A new mechanism of financing should be created.
- ◆ One promising financial source is private financial assets (1,400 trillion yen). The real estate security market, the J-REIT market in particular, should be improved and expanded to attractive private funds.

- **Need to attract private money**

The flow of money into real estate market has decreased in the years since the collapse of the bubble, and is one of the causes of the long-term decline in land price. On the other hand, financial assets held by individuals are increasing steadily. A mechanism to introduce this money to urban renewal projects and to real estate market should be created.



- **New scheme for financing**

- The following measures are needed to expand the J-REIT market (a new and promising financing method linking private financial assets) and the real estate market. The size of REIT market is about 400 to 500 billion yen in Japan, whereas that of the U.S. is about 20 trillion yen.

- **Measures**
 - a) Speed up the development of a real estate investment index
 - b) Expand J-REIT to cover commercial facilities and hospitals in addition to office buildings
 - c) Public sector support and marketing of REIT products
- **Expand the Urban Renewal Fund and use public money for suitable development projects and for the implementation of urban development projects.**
- **Help banks to utilize real estate collateral and dispose of bad debts.**

3.2 Urban Renewal Through Human Interaction

- ◆ A city has to be “attractive” to draw in people and sustain the development of the city.
- ◆ To raise cities’ status as international business centers and to attract investment, housing, education and other everyday factors of cities should be reviewed from the viewpoint of foreign business people.
- ◆ “Inbound tourism (receiving non-resident tourists and commercial visitors)” to showcase local culture and charm of cities, both large/metropolitan and small/provincial, should be used as a tool of urban renewal.
- ◆ New players in city planning, NPOs for example, are emerging. To better utilize their activities to stimulate continuous development, authorities should study ways to introduce schemes such as the Business Improvement District (BID) and Tax Increment Financing (TIF) of the US.

- **Investment flow into Japan and the number of foreign businesspeople**
 The percentage of direct investment (stock) into Japan as a proportion of the country's nominal GDP in 2000 was 1.1%, much lower than in other countries. The number of foreign businesspeople (the total of those residing in Japan under the status of “Investor/Business Manager”, “Law/Accounting Services” and “Intra-company Transferee)) peaked in 1998 and is on the decline.

(Unit: US\$1B)

	Japan	U.S.	U.K.	Germany	France	Canada	Australia
Dir. Investment Balance(A)	50.3	2736.90	456.7	422.1	702.7	194.3	111.3
Nominal GDP (B)	4454.60	9872.90	1407.80	1884.20	1310.50	703.9	361.3
A / B	1.1%	27.7%	32.4%	22.4%	53.6%	27.6%	30.8%

	1997	1998	1999	2000	2001
No. of residents	11,485	11,770	12,894	14,446	15,918
No of new entrants	5,657	5,979	5,890	5,778	4,942

- **International tourism and Japan**

In 1999, 163.6 million people traveled abroad from Japan. This number is ranked tenth among all countries. On the other hand only 4.44 million people visited Japan from overseas, down to 35th of the world. Income from international tourism, in terms of its ratio to the nominal GDP was a mere 0.1% in 2001.

2000 (\$US1 billion)			
Country	A/B (%)	Income from international tourism (A)	Nominal GDP (B)
Greece	8.1	9.2	113.32
Spain	5.6	31.5	560.89
Austria	5.3	10.0	188.73
Hong Kong	4.9	7.9	162.62
Turkey	3.8	7.6	199.90
Switzerland	3.1	7.5	239.46
Italy	2.6	27.5	1,073.96
France	2.4	30.7	1,294.24
Australia	2.1	8.0	388.47
Canada	1.5	10.7	700.58
China	1.5	16.2	1,079.95
Mexico	1.4	8.3	573.92
U.K.	1.4	19.5	1,427.47
Germany	1.0	17.9	1,866.13
U.S.	0.8	82.0	9,810.20
Japan	0.1	5.3	3,859.86

4.1 Trends in Overseas Construction Markets

- ◆ GDPs for the year 2001 by country and by region (Japan = 100) are as follows: 244.7 for the United States, 198.3 for Western Europe, 7.4 for Eastern Europe and 73.1 for Asia (figures for Western Europe, Eastern Europe and Asia are those of 2000).
- ◆ The size of construction investment, (Japan = 100) are 169.5 for the United States, 93.5 for Western Europe, 4.7 for Eastern Europe and 93.0 for Asia.
- ◆ The proportion of construction investment in total GDP was 12.1% for Japan, 15.3% for Asia. This figure was lower in the United States (8.4%), Western Europe (5.7%) and Eastern Europe (7.7%).

Construction Markets by Country and by Region

(Nominal value, converted to trillions of yen)

	Japan ¹ FY2001	United States 2001	Western Europe ² 2001	Eastern Europe ³ 2001	Asia ⁴ 2001
GDP	500.8 (100)	1,225.3 (244.7)	993.2 (198.3)	37.0 (7.4)	366.2 (73.1)
Construction Market	71.5 (100)	-	99.6 (139.4)	4.2 (5.9)	-
Proportion to GDP (%)	14.3	-	10.0	11.3	-
Construction Investment	60.4 (100)	102.4 (169.5)	56.5 (93.5)	2.9 (4.7)	56.2 (93.0)
Proportion to GDP (%)	12.1	8.4	5.7	7.7	15.3

Japan = 100

Notes

- 1 . Data for Japan is fiscal year (FY)-based. GDP is a forecast figure (by RICE), and the amount of construction investment is an outlook (by the Ministry of Land, Infrastructure and Transport).
- 2 . "Western Europe" consists of 15 countries: Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Italy, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the U.K.
- 3 . "Eastern Europe" consists of 4 countries: Czech Republic, Hungary, Poland and Slovakia.
- 4 . "Asia" includes 11 countries and one region: China, Hong Kong, Taiwan, India, Indonesia, Korea, Malaysia, The Philippines, Singapore, Sri Lanka, Vietnam and Thailand. Construction investment data for China is as of 1999 and for Indonesia and Vietnam are as of 1998, and as of 2000 for other countries. The amount of orders received for construction work is used instead of construction investment amount for Malaysia.

Trends in U.S. construction Investment

(Upper column: volume in \$1m, Lower column: increase rate over the previous year in %)

	1996	1997	1998 (r)	1999 (r)	2000 (r)	2001 (r)	2002 (p)	Composition ratio
New investment total	615,797	632,680	665,156	694,123	711,328	704,747	680,185	100.0
	8.0	2.7	5.1	4.4	2.5	-0.9	-3.5	
Private-sector	476,650	487,197	519,859	540,220	556,426	542,782	511,686	77.0
	9.1	2.2	6.7	3.9	3.0	-2.5	-5.7	
Housing	281,207	280,720	297,960	317,236	323,977	322,305	332,199	45.7
	11.6	-0.2	6.1	6.5	2.1	-0.5	3.1	
Non-housing, etc.	195,443	206,477	221,899	222,984	232,449	220,477	179,487	31.3
	5.8	5.6	7.5	0.5	4.2	-5.2	-18.6	
Public works	139,147	145,483	145,297	153,904	154,902	161,965	168,499	23.0
	4.3	4.6	-0.1	5.9	0.6	4.6	4.0	
Building	63,446	67,400	67,517	71,928	75,772	80,280	88,718	11.4
	7.4	6.2	0.2	6.5	5.3	5.9	10.5	
Civil engineering, etc	75,701	78,083	77,780	81,976	79,130	81,685	79,781	11.6
	1.8	3.1	-0.4	5.4	-3.5	3.2	-2.3	

Notes:

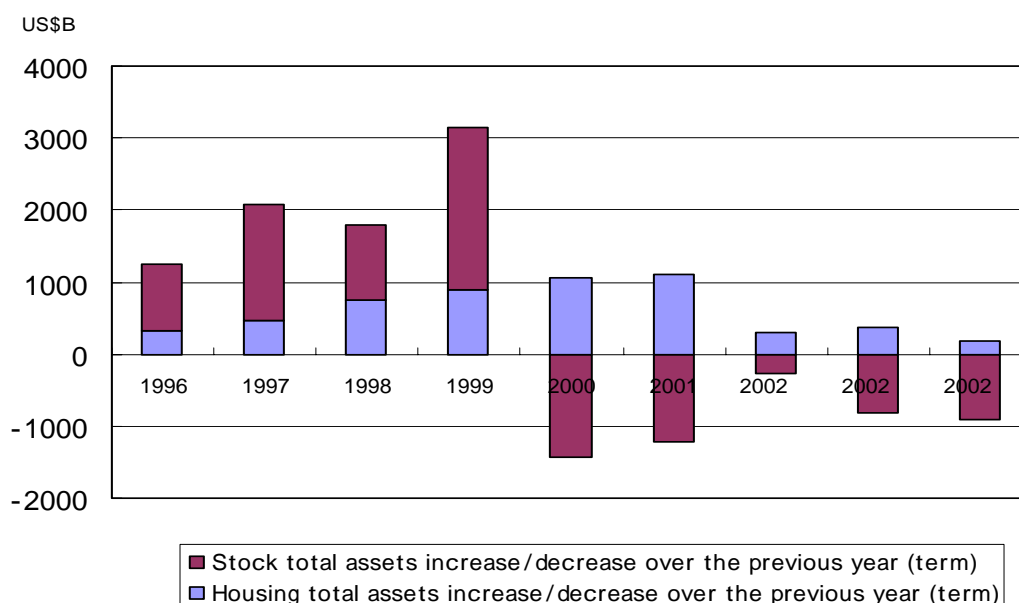
1. Amounts are of 1996 price.
2. (r); Revised, (p) Preliminary
3. Figures for 2002 are seasonally adjusted figures as of April converted to annual figures.

4.2 Trends in U.S. Social Infrastructure Improvement

4.2.1 US stock market negative wealth effect offset by a housing wealth effect

The decline in U.S. stock prices began with the collapse of the IT bubble in 2000. It is said that this stock market negative wealth effect was offset by the rise in housing values. The FRB's 2002 Third Quarter Report, however, warns that the increase in housing assets may no longer be able to sustain the negative wealth effect from shares. The prospects for the U.S. economy, in spite of President Bush's stimulative policies, are bleak, against a backdrop of increasing tension with Iraq and North Korea.

Trends in household housing and stock assets (change over the previous term of the previous year)



4.2.2 U.S. highways

Construction of the U.S. highway network that took nearly 50 years was more or less completed in 1993. Highways account for a mere 4% of the total road network but are responsible for 44% of the total travel and traffic, and are indispensable to the country's economic growth. Both federal and local governments are spending an enormous amount of tax money (centered on capital spending) on the improvement and maintenance of these highways, yet traffic congestion is worsening. To maintain and improve highways, the federal government plans to enact a new law to formulate a six-year program from FY2004 to FY2009 by significantly increasing transportation funding through tax increases and other measures.

- a) **Highway construction in the U.S., interstate highways in particular, began when President Eisenhower signed the 1956 Federal Highway Act and the Highway Revenue Act (establishing The Highway Trust Fund). Financed by gasoline and other tax revenues, the national network was completed in 1993.**
- b) **While highways account for a mere 4% of the total road length they are now responsible for 44% of total travel and traffic. Major roles of interstate highways have changed in the past 20 years, from long-distance travel/traffic, national defense and linking metropolitan regions and industrial zones, to intrastate travel and traffic. There is greater demand for highway-airport links due to the increase in air travel/transport.**

- c) The governments have invested an enormous amount of money in highways, centered on capital investment over the past 20 years. This investment was supported by tax income that increased by 4.6 times during the two decades, and gasoline tax earmarked for highway construction in particular.
- d) A survey by the U.S. Congress' General Accounting Office reports that in spite of massive investment, traffic congestion is worsening in metropolitan and other regions.
- e) The Bush Administration has enacted a new law consisting of a six-year program starting in FY2004. This law aims to significantly increase gasoline and other taxation to generate funding for congestion alleviation. We will have to wait until the 2004 State of the Union Address when the new policies will be reported, to find out how the cabinet will increase road-related tax while significantly reducing taxes to stimulate the economy.

4.2.3 Case study: Boston's "Big Dig Project"

Boston's "Big Dig Project" to expand the interstate highway by putting a portion of it underground is considered to be the most challenging infrastructure project of this century. Since its adoption 15 years ago, official cost estimates have increased by 6 times, making the project the subject of criticism in cost- and performance-conscious America. This Report has analyzed the problems behind this project, including: 1) congress-federal government relationship at the time of the project endorsement, 2) trends in power relationships between the federal government (project supervisor) and the state government (project initiator), and 3) problems inherent in U.S. systems including Construction Management (CM).

- a) The Big Dig Project is a massive highway and tunnel construction project that involves putting three miles of Interstate 93 under downtown Boston. It is considered to be the most challenging infrastructure project of this century. It aroused much controversy as a typical "pork barrel" project when it was first proposed. Even under the Reagan regime it was vetoed, but Congress overrode the veto and approved it.
- b) The initial budget estimate in 1985 following Congress approval was 2.2 billion dollars, but this has risen to 14 billion at present. The scheduled completion of 1998 has been pushed back to 2004.
- c) Behind the cost increases and schedule delays are several problems inherent in U.S. institutions and systems.
 - i) Despite the federal government's opposition to the plan, Congress had the power to approve it. The project was backed by a powerful Massachusetts-elect House Speaker of the time. There was no mechanism to check on the powers of Congress.

ii) The federal government, who would supervise the project and funding, had insufficient control over the state government who would spend the money and implement the project. This situation reflects the long-term and fateful power relationship between the federal government and the state governments in the U.S. and is one that is not found in Japan.

iii) As a lump-sum federal subsidy was allocated to the state government, it was impossible to keep tabs on how money would be spent on each component of the project, due to institutional constraints. After much criticism of this project, the federal government changed its subsidy method when the Transportation Equity Act for the 21st Century (TEA21) was enacted in 1997 to enable the federal government to check project spending above a certain scale.

iv) Construction Management (CM), which is now considered a new and promising project management method in Japan, is not a cure-all for controlling project costs. After Congress approved the project, the then Massachusetts State Secretary of Transportation expressed an optimistic view about hiring CM from the private sector, thinking that they would do a good job so as not to affect future marketing opportunities; however, cost estimates continued to swell and classification between public and private spending became blurred.