

**Construction Economy Report
No. 37**

**The Japanese Economy and Public Investment
A Construction Industry Faced with
Domestic and International Environmental Changes**

**Research Institute of Construction and Economy
(RICE)
Tokyo JAPAN**

**(This is an English translation of an original report in Japanese summarized
and released to the press on July 30, 2001.)**

CONTENTS

Chapter 1 Macroeconomics and Construction Investment	1
1.1 Trends in the Japanese Economy and Construction Investment	1
1.2 Trends in Public Investment by Local Government and by Region	2
Chapter 2 New Trends in Bidding and Contracting Systems for Construction Projects	4
2.1 Recent Trends in Bidding Systems	4
2.2 The CM Contracting System - for Greater Diversification in Contracting	4
Chapter 3 Construction Industry Trends	7
3.1 Recent Trends in Employment	7
3.2 The Effects of New Accounting Standards on the Construction Industry	9
3.3 Information Technology (IT) and the Construction Industry	10
3.4 On-site Production and Risk Management	11
Chapter 4 Overseas Trends	12
4.1 Trends in Overseas Construction Markets	12
4.2 Dot.Com Company Services in the US Construction Industry	13
4.3 U.S. Social Infrastructure Improvement	13

1.1 Trends in the Japanese Economy and Construction Investment**(GDP growth rate forecast (down 0.1% in FY2001 and up 0.4% in FY2002))**

RICE's Construction Economy Model predicts that Japanese GDP in FY2001 will decrease by 0.1% in real terms over the previous year – the first fall in three years.

While private consumption expenditure remains stagnant, exhausted private capital investment couple with a drop in both public-sector gross fixed capital formation and housing investment are pushing the economy over the brink into recession.

In FY2002, although public sector gross fixed capital formation and housing investment are expected to continue to decrease, private final consumption expenditure and steady private capital investment will both rise, leading to a 0.4% growth in GDP for the year.

(Nominal construction investment forecast (down 8.9% in FY2001 and down 5.4% in FY2002))

RICE expects overall construction investment in FY2001 to fall significantly by 6.9% in nominal terms over the previous year. This drop will be precipitated by an economic slowdown in all sectors: -7.3% for government construction investment, -0.4% for private housing investment (both recording decreases for two consecutive years), and -8.8% for private non-residential construction investment.

A nominal decline in overall construction investment of 5.4% is expected in FY2002. Government construction investment will plunge by 11.2% if expenditure for public works projects remains unchanged in the FY2002 government budget. Both private housing investment and private non-residential construction investment will continue to decrease – although the rate of decline may taper off.

(The simulated impact of a reduction in public works expenditure on the Japanese economy)

RICE simulated the impact of a reduction in public works expenditure on the Japanese economy. The results indicate that if the public works budget is reduced by 1 trillion yen in the FY2002 budget (from the FY2001 original budget), the growth rate will shrink from 0.4% to 0.1%. A budget cut of 500 billion yen is expected to reduce the growth rate to less than 0.3%.

(Public demand supports the Japanese economy)

Economic health and economic growth will support the implementation of structural reform and the disposal of bad debts. Policies to create public demand to support the economy should be considered in light of sluggish private demand coupled with the negative aspects of structural reform.

(More focused public investment)

If the purpose of public investment is to improve the life of the average Japanese citizen and support economic activities, the government should consider not only the scale of investment but also the focus. Firstly, investment should be targeted at economic areas

that have a high investment impact. Secondly, decision makers should closely examine the far-reaching effects of public works projects not just their immediate effects.

(Future fiscal management)

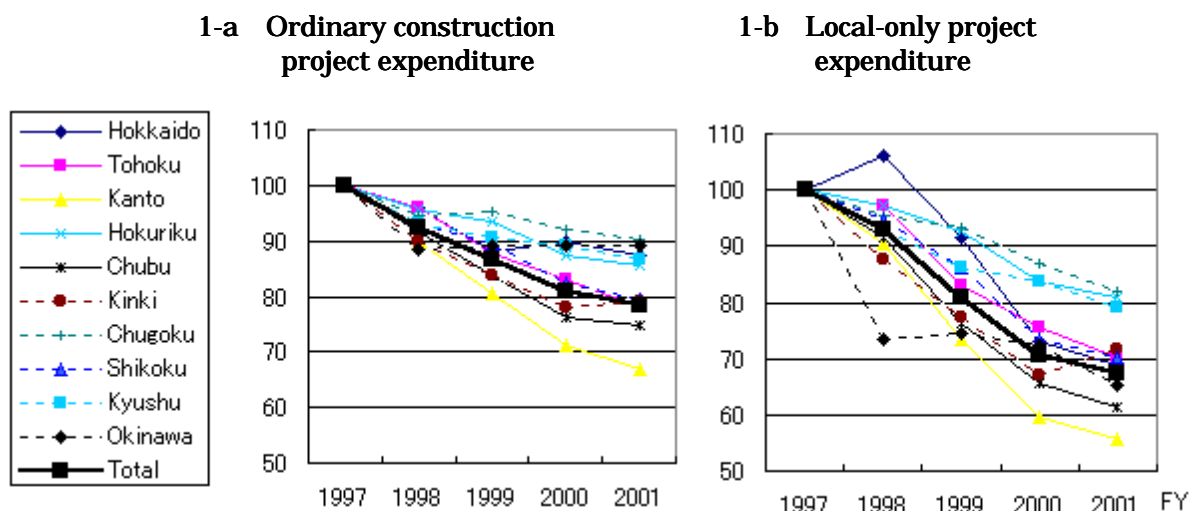
As the Japanese government takes a bold approach in allocating budget resources to focused areas, it should carefully consider the relationship between the budget and the Japanese economy and formulate a FY2002 budget of optimal size. In the FY2001 budget, greater public spending should remain an option to allow the government to swiftly respond to changing economic conditions.

1.2 Trends in Public Investment by Local Government and by Region

(Trends by region)

During the past five years, construction expenditure dropped significantly in prefectures with metropolitan regions, and less in other prefectures. This is because the numbers of projects conducted by local governments ("local-only" projects that have a larger share of public investment in metropolitan regions than in other regions relying on subsidized or national government-administered projects) are being reduced nationwide. As a whole, the rate of decrease at the prefectural level decelerated in FY2001. Although downward pressure will continue, there are positive signs due to fiscal improvement in some regions.

Figure 1. Trends in Ordinary Construction Project Expenditure by Prefecture



Note: FY1997 = 100

(The role of public works in regional economies)

Trends in public-sector fixed-capital formation and the amount of construction production suggest that provincial regions are more dependent on public works than metropolitan regions, both in terms of economic vitality and employment. The role of public works in the regional economy is increasing rapidly, particularly in provincial regions. As the role of construction production in the Japanese economy shrinks, regional construction industries are relying more on public works to survive.

Due to this close relationship between regional economies and public works it is feared that a rapid contraction in construction demand will have an adverse effect on regional economies and employment. The share of public works in local government budget should be determined in consideration to both the impact of public works on the local economy and the overall economic trends.

2.1 Recent Trends in Bidding Systems**(A new law on bidding, and the introduction of electronic bidding)**

Japan's first law governing the bidding process for public works contracts covering both the national and local governments ("Act for Promoting Proper Tendering and Contracting for Public Works") came into effect on April 2001. The purpose of the new Law is to: a) publicize the outlook on orders to be placed; b) publicize information on bidding and contracting; c) totally ban the subcontracting of the entire or major portion of public contracted work; and d) eliminate unfair practices.

Ministry of Land, Infrastructure and Transport will launch an electronic bidding system using the Internet in October 2001. The system will initially be applied to large projects (those having a budget of 200 million yen or greater) directly administered by the ministry. This new system will be gradually expanded to cover all public works projects, both national and local, by 2010. The success of these two initiatives will depend on the degree of commitment of local governments, since they collectively order nearly 70% of public works.

2.2 The CM Contracting System for Greater Diversification in Contracting**(Construction Management in the US)**

The history of Construction Management (CM) in the United States dates back to the 1960s. Within three decades CM developed into one of the three major construction contract methods. The other two are bulk contracting and design-build contracting. Sales of the top 100 CM companies (the majority of them are general contractors) occupied a significant share of the 139.5-billion-dollar sales total of the leading 100 construction companies in 2000. The totals were 5.6 billion dollars for "Pure" CM and 45.7 billion dollars for CM "At-Risk."

A survey conducted in spring this year revealed that the Pure CM method is used for US public works projects mainly to "supplement quantitatively and qualitatively the work of client" and CM At-Risk, to "deliver in time," and to "ensure quality." CM contractors of both types are generally responsible from design to building stages. Both the Pure CM method and CM At-Risk are systems that ensure the smooth execution of construction projects.

(CM in Japan)

Discussions on CM have recently begun in Japan, both in the public and private sectors. Since the early 1990s government councils have examined the advantages of CM from two standpoints; firstly, CM as a system that supports the orderer, and secondly, CM as being effective in the compilation of breakdowns of project costs. To date, however, CM has been used for only a limited number of construction projects.

CM will likely be used in the public sector by local governments that have fewer technical staff. The number of clients in the public sector who will choose CM to reduce and clarify costs is also expected to increase.

CM is attracting attention in the private sector, where many people are concerned

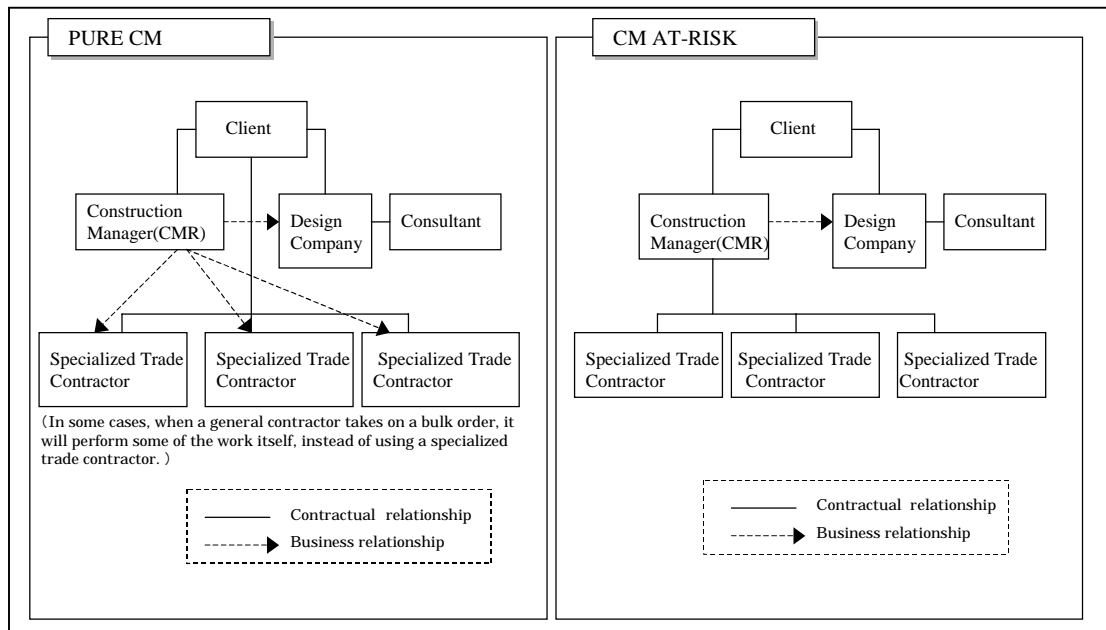
by the non-transparent cost structure of the bulk contracting by general contractors. CM will be used as one way to outsource construction work as to clarify and reduce costs.

(Guidelines need to be established for the introduction of CM to construction projects in Japan)

The main purpose of utilizing CM is to “supplement quantitatively and qualitatively the work of the client” both in the U.S. and in Japan. In the U.S., timely delivery and quality control are seen as advantages of CM, Japanese contractors and clients are more interested in the advantages of transparency of costs and cost reduction. These differences between the U.S. and Japan are due to differences in systems and the nature of construction contracts. In the U.S., the construction process is often delayed because contractors file complaints against the project book in bulk contracts. On the other hand, in Japan, bulk contracts in general do not specify the subcontracting details.

To achieve the successful introduction of CM into Japan, the government, the construction industry and others should establish a guideline to clarify several areas, among them: a) the types of CM; b) the scope and content of CM business; c) the responsibility of the client, designer, CM company, and construction company; d) how to solve conflicts of interest; e) the status of CM companies; f) the criteria and methods of screening; g) compensation (fee and cost) and h) insurance. Standard contract forms should be formulated, staff engaged in CM businesses should receive training, and institutional problems when applying CM to public works projects should be resolved. By taking these measures it is expected that CM will be established in this country as a viable construction contracting option for clients.

Fig. 2. Pure CM and C M At-Risk



Note: The Construction Management Association of America(CMAA), Associated General Contractors of America(AGC) and The American Institute of Architects(AIA) all have standard contract forms for the two types of CM shown above.

Chapter 3 Construction Industry Trends

3.1 Recent Trends in Employment

(Construction market trends)

The drop in construction investment since FY1996 has intensified competition among contractors, lowered the profitability of construction companies, reduced unit construction costs, reduced the number of new openings to job and triggered bankruptcies. Two factors responsible for the deterioration of the industry are tougher competition in the private sector and the greater number of local governments utilizing open competitive bidding (starting in 1993) following the lead of the national government.

Tougher competition has prompted more companies to take on projects knowing that they will bring no profits and to force their subcontractors to agree to low-paying contracts. Such behavior may have a serious impact on part-time and seasonal workers hired by subcontractors and working under unclear employment conditions.

Despite the decrease in construction investment, the number of licensed construction companies increased until FY1999. There are two major reasons for this. Firstly, the license period was extended from three to five years for renewals after December 1994 (so the number of companies losing the license due to expiration declined). Secondly, smaller companies were favored in public works projects. This attracted small- and medium-sized companies to construction market. The second trend is reflected in the greater proportion of smaller companies winning contracts from the government, the relative increase in the amount of orders to smaller companies, and the reduction in the scale of per construction projects ordered by local governments.

In FY2000 the amount of licensed construction companies decreased as profits shrank and the number of public works projects (local-only projects in particular) declined.

(Trends in the construction labor market and changes in the employment form)

The supply of and demand for labor in the construction market can be characterized as follows.

- (1) The proportion of workers entering and leaving the construction market remained high until the collapse of the bubble economy, but has been decreasing in recent years.
- (2) The years of continuous employment of construction workers in general are shorter than those in other industries and thus the industry is highly mobile.
- (3) Compared with many industries, it is easier to enter the construction labor market but more difficult to leave it.
- (4) There is an oversupply of clerical and managerial staff, but a shortage of technical and skilled staff.
- (5) Technicians in the construction industry are more easily able to transfer to other companies, therefore their wages and employment conditions are being reviewed.

It should be pointed out that the proportion occupied by labor in the construction industry remains high, suggesting that the restructuring of the industry in line with the decline in added value is inadequate.

(Over-employment in the construction industry and employment adjustment)

The number of construction workers peaked in 1997 and began to decline thereafter. The trends in the number of construction workers can be explained by using a regression with two descriptive variables: firstly, the amount of construction investment (in real terms); and secondly, the proportion of government construction investment. Forecasts of the number of construction workers during FY2001 and FY2003 made with this formula suggest that the number will drop to below 6 million in FY2003.

Efforts by banks to rid themselves of bad loans is likely to affect employment in the construction industry one of the major borrowers. If the writing off of duff loans forces construction companies to lower their labor share by 18.6%, that is the ratio of bad debt in construction industry, it is likely that between 40 thousand and 130 thousand workers will lose their jobs.

An analysis and comparison of employment adjustment speed of the construction industry and of the manufacturing industry indicates that the construction industry is much slower than the latter. The manufacturing industry must compete on the global market and must quickly respond to fluctuating exchange rates. The manufacturing sector also has a higher percentage of temporary workers, making employment control easier. The construction industry, on the other hand, has a lower degree of automation, relies on workers with special skills and expertise, and thus cannot make rapid employment adjustments.

The government will have to formulate labor and monetary policies, if an oversupply of workers poses problems to construction companies and the process of employment adjustment is prolonged due to decreased construction investment and bad-debt disposal. Possible labor policies should include job creation through the nurturing of new industries and the diversification of working patterns through deregulation. It is hoped that adequate monetary policy should be enforced lest real interest rates in lending and real wages in growing industries should remain high under the modern deflation economy.

(The outlook for employment in construction industry)

Maintenance of a healthy construction production system, in which the freedom and creativity of each worker is guaranteed, will be more important than ever before. The construction industry requires the following labor policies.

- (1) Better career services to enable workers to find jobs in other industries.
- (2) Promotion of the use of retirement allowance mutual aid systems for construction workers.
- (3) Better self-development, education and training programs by companies and the industry.
- (4) Reduction in the regulation of paid job introduction and temporary staffing.
- (5) Improvement and strengthening of systems that enable the transfer of skills and expertise.

3.2 The Effects of New Accounting Standards on the Construction Industry

(Market price accounting applied to mutual equity holdings)

The introduction of current-value accounting to mutual equity holdings and other securities in the fiscal year beginning April 1, 2001 will force financial statements to clarify hidden gains and losses in mutually held equities. A questionnaire survey conducted in 1999 by the Japan Institute of Labor shows that while only 16.7% of the construction companies surveyed answered that they had “gradually unwound mutual holdings” over the past three years to prepare for the new accounting standards, 50% replied that they “wanted to reduce mutual holdings from the present level” to make their capital investment more efficient under market price accounting.

The proportion of equity held mutually by construction companies out of their total assets is small about half of the all-industry average. Even by taking into consideration equity which began to be mutually held after the economic bubble period and thus are likely to be sources of latent losses market price accounting system will probably have only a small impact on construction companies.

(Accounting for impairment of fixed assets)

Accounting for impairment of fixed assets is now being examined in Japan. RICE has examined the trend of land price and the effect that this new system will have on construction companies. Land prices, which peaked in FY1990, dropped to the pre-FY1983 level by FY1999. This suggests that land purchased before the late 1980s is likely to be impaired. Land in this category accounts for more than half (60%) of land owned by large construction companies (those holding capital of 1 billion yen or more). Accounting for impairments of fixed assets is therefore likely to have a considerable impact on construction companies.

3.3 Information Technology (IT) and the Construction Industry

(A survey on IT in construction)

Many construction companies are using computers and information technology for their business and are well aware of benefits of IT. Many smaller construction companies however, are using computers as stand-alone machines, and many still do not use e-mail.

Respondents to RICE's IT survey cited the two major advantages of IT as being "increased job efficiency" and "sharing of information." Respondents perceived "increased maintenance and upgrading cost" as the leading drawback to IT use.

Many large- and medium-sized companies have already prepared using construction CALS/EC (Continuous Acquisition & Lifecycle Support/Electronic Commerce is promoted by MLIT), but few smaller companies have done so.

Most of the reasons given for the slow introduction of IT in the construction industry in Japan were related to the characteristics of the industry. Among these, the most frequently selected reason was "difficulties to standardize (IT) due to the multi-process and multi-material nature of construction."

(Innovative activities by local mid and small sized companies)

Tops interviewed in the survey all had a keen awareness of the crisis facing the Japanese construction industry. They were highly motivated to their own companies and considered the introduction of IT to be part of their corporate strategy.

They believe that IT should be utilized in the following ways: a) to understand business conditions on a real-time basis; b) strengthen ties with corporate and individual clients; c) compete with large companies; and d) collaborate with subcontractors to improve mutual performance.

Some examples of IT applications in the companies surveyed are as follows:

- (1) A top management and a CIO cooperated in establishing an ERP (enterprise resource planning) system by themselves that can coordinate the management of production, accounting and other jobs within the company. Daily construction data is input on-site so that the managerial sections can get a clear understanding of work progress. Through this process, the output efficiency of the company can be increased on a continuous basis, and management efficiency can be increased.
- (2) Generally, it is difficult for construction companies to give computer literacy training to all their workers at the same location on a continuous basis. One company is trying to solve this problem by distributing an e-mail magazine for employee education.
- (3) One company that is planning to enter the housing renovation market is utilizing its home page as a sales promotion tool.

(How smaller construction companies can utilize IT)

The introduction of IT is most effective when it goes hand-in-hand with organizational reform and a review of corporate business process. Thus, the promotion of IT is a major issue to be addressed in corporate strategy, and top management should provide clear direction. The first step for introduction and application of IT in companies might be to begin with the introduction of e-mail and other basic applications, and help make workers more aware of the benefits of IT.

3.4 Production on sites and Risk Management

(The uncertainty in construction and risk management)

Construction is affected by many uncertainties, including weather and other external factors, as well as factors inherent to the construction process itself. As mentioned in Construction Economy Report No. 35, the key to increasing construction efficiency is the minimization of the waste of time and resources arising from these uncertainties.

Recently, a new method has attracted attentions of people concerned, which controls uncertainties related to construction on site, and controls variations in costs, quality and the work period. Uncertainty factors are listed in advance of the commencement of the construction project, and are controlled to reduce and minimize their impact on the construction process. If we considered “uncertainties” as a kind of “risk,” this process might be regarded as “risk management.”

In common scene, risk management has been considered to be the part of corporate management, and to be systematized tools to control risks in business. Now-a-days it becomes a component of project management (PM) in Western countries.

Risk management on Japanese construction sites, on the other hand, is more “implicit,” and relies heavily on the experience and intuition of each engineer and worker. Japanese construction companies could learn lessons from the systematic and “explicit” approach used in Western countries, to improve and refine their management techniques.

(Risks in construction sites)

RICE surveyed site managers of large- and medium-sized construction companies. The respondents replied that construction usually begins before nearly a half of the information about the site conditions is obtained. The risks that are both frequent and have a high degree of impact are “coordination with the client” and “inadequate design.” These affect the entire on-site construction process.

Managers feel that the contractor is involved in all types of risk during the entire construction process. A survey of U.S. construction companies revealed that risks and risks to be borne are more clearly defined in the U.S., and the degree of risk bearing varies, depending on the type of risk involved.

(Overcoming risks and increasing production efficiency)

To increase production efficiency from the point of view of risk management, there are three major points to be done: a) clarification of risk bearing; b) risk reduction through obtaining information; and c) coping with risks by sharing information.

Risk can be reduced in the following ways. Firstly, by improving contract methods and clarifying where risks should be borne. Secondly, in the planning and designing stages, it is necessary to reduce risks by conducting better preliminary surveys, and by utilizing the expertise of specialized companies, and by creating a system in which information related to planning and designing can be communicated to the contractor. Thirdly, at the construction stages, coordination between the client and the contractor should be improved by integrating site information through the use of IT, and the construction team’s risk management ability should be improved by the sharing of information.

Chapter 4 Overseas Trends

4.1 Trends in Overseas Construction Markets

(The U.S., Europe and Japan)

GDPs for the year 2000 by country and by region (taking that of Japan to be 100) are as follows: 208.9 for the United States, 194.7 for Western Europe, 6.1 for Eastern Europe and 30.8 for Asia (figures for Western Europe, Eastern Europe and Asia are those of 1999).

The size of construction investment, (taking that of Japan to be 100) are 124.9 for the United States, 81.5 for Western Europe, 3.6 for Eastern Europe and 31.3 for Asia

The proportion of construction investment in total GDP was 13.7% for Japan, and 13.9% for Asia. This figure was lower in the United States, Western Europe and Eastern Europe (all within the 6–8% range.)

Table 1. Construction Markets by Country and by Region (nominal value, converted to trillions of yen)

	Japan FY2000	United States 2000	Western Europe 1999	Eastern Europe 1999	Asia 1999
GDP	513.9 (100)	1,073.7 (208.9)	1,000.5 (194.7)	31.6 (6.1)	158.5 (30.8)
Construction Market	86.2 (100)	-	99.8 (115.8)	3.6 (4.2)	-
Proportion to GDP (%)	16.8	-	10.0	11.5	-
Construction Investment	70.4 (100)	87.9 (124.9)	57.4 (81.5)	2.5 (3.6)	22.0 (31.3)
Proportion to GDP (%)	13.7	8.2	5.7	8.0	13.9

Japan = 100

(Investment in construction in the U.S., Europe and Japan)

There was a record-high nominal 3.1% increase in construction investment in the United States in March 2001. The level of U.S. construction investment in March 2001, seasonally adjusted at an annual rate (1996 prices), was 726 billion dollars. Both the amount of private-sector and public-sector construction stood at record levels, exceeding those of both the previous year and the previous term. Private-sector housing starts the same month stood at 1.613 million units (seasonally adjusted and annualized). This figure exceeded that of the previous year, when housing construction was sluggish, but was 1% lower than that of the previous month and of the same period in the previous year.

Construction markets grew by 2.8–2.9% in Western Europe and Eastern Europe in 2000. The size of the construction markets of 15 Western European countries in 2000 totaled 844.17 billion euro, and is expected to be up 2.8% from the previous year. “Construction market” refers to construction investment, and maintenance and repair

combined. The expected size of the construction markets of four Eastern European countries the same year was 30.74 billion euro, up 2.9% from the previous year.

4.2 Dot.Com Company Services in the US Construction Industry

Online construction services in the US began just two years ago. The November 2000 issue of *Constructor* published by The Associated General Contractors of America featured an article entitled “The Dot-Com Invasion: What Every Contractor Must Know” (http://www.agc.org/News_&_Bulletins/past_issues.asp). The article classified services available to contractors over the Internet into the following three basic categories: a) **Collaboration/project management** (where parties to the project can share project drawings and documents via the Internet); b) **E-commerce** (this facilitates business transactions over the Internet, including buying and selling of goods through exchanges, catalogs, and auctions; solicitation and collection of bids; and procurements); and c) **Information resource sites** (provides content or links to other services and sources of information).

The three main advantages that collaboration/project management sites offer are: a) time savings, b) improved workflow and c) general and administrative savings.

Construction companies typically do business using one of three e-commerce forums: exchanges, catalogs and auctions. Information resource sites, or portals, are used as “one-stop shops” to meet the needs of the contractor community, including collaboration, e-commerce and research requirements.

4.3 U.S. Social Infrastructure Improvement

Real-term federal expenditure for public infrastructure grew during most periods from 1956 to 1994. Since the start of federal budget surpluses, the US government has significantly increased investment in highways and mass transits covered by TEA-21 (the Transportation Equity Act for the 21st Century).

On the other hand, the proportion of federal spending on public infrastructure has fallen since late 1970s. Its proportion of total GDP, which peaked at 1.1% in 1980, has fallen quickly, as spending on Medicaid and in other areas has grown. The proportion of federal spending on public infrastructure dropped to 0.6% of GDP, and has leveled off at around this level.

Individuals and groups (e.g., Ralph Nader and the Rebuild America Coalition) have launched campaigns against the decline in spending on public infrastructure, claiming that it will have a negative influence on the growth of the economy, both in the public and private sectors. These groups claim that public investment is essential for greater economic productivity and to maintain the competitive ability of the United States.

Discussions on the increase/decrease in the level of public investment here in Japan too, should be conducted from a broader perspective by considering Japan’s long-term economic growth and global competitiveness.