

Construction Economy Report

No. 53

The Japanese Economy and Public Investment

Seeking Directions for the Construction Industry in the Midst of “Change”

December 2009

Research Institute of Construction and Economy

(RICE)

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**This is an English translation of a summarized report in Japanese,
announced in October 2009**

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1.1.1 Trends in the Japanese economy and construction investment

This section summarizes forecasts of the macro economy and construction investment (FY2009 and FY2010) made by the Research Institute of Construction and Economy (RICE) and announced in October 2009¹. In September the Democratic Party of Japan (DPJ) took over the reins of government. The new government's budget outlook is still unclear; therefore, RICE has made its own estimates of the expected budget cuts planned by the new government for its forecast report, in addition to using data available in early October, including the quarterly estimates of GDP (QE; April-Jun 2009).

Construction investment in FY2009 is expected to be 43.19 trillion yen (a decrease of 8.6 from the previous year). The increase in government construction investment is expected to be only 6.8%, due to the cancellation of some projects that were scheduled to be implemented through a supplementary budget. A significant decrease is expected for private-sector housing investment (-13.6) due to the economic downturn and growing unemployment, despite the stimulating effects of housing loan tax credits and gift tax reductions. The economic downturn is expected to have a greater impact on private-sector non-housing investment (-22.0% overall; -27.2% for private-sector non-housing construction investment and -10.6 for private-sector civil engineering investment).

Construction investment in FY2010 is expected to be 41.6 trillion yen (a decrease of 3.7% from the previous fiscal year). Based on the assumptions made by RICE, government construction investment will fall 13.6% because the new (DPJ) government has indicated significant budget cuts compared with the initial budget. (Note: Budget requests made by ministries to the Ministry of Finance, as well as other more recent data, suggest further declines of several hundred billion yen for the FY2010 budget.) Although a recovering economy may help push up private-sector housing investment, this will not be high (7.6%) due to a decline in income and rising unemployment, and will likely be far below the level seen before the financial crisis. Private-sector non-housing construction investment will continue to stagnate as it will take more time for the effects of greater corporate capital expenditure to spread to construction investment. The expected decreases are -0.4% for private-sector non-housing construction investment and -2.0 for private-sector civil engineering investment. The real total of construction investment for FY2010 is forecast to be 40.6 trillion yen, which is lower than the amount spent 40 years ago (FY1970) of 41.64 trillion yen.

1. Report "Construction investment forecast based on the Construction Economy Model" announced by RICE on October 22, 2009.

Trends in construction investment (FY)

FY	Actual					Tentative		Forecast	
	1990	1995	2000	2005	2006	2007	2008	2009	2010
Nominal CI (Increase rate)	81,440 11.4%	79,167 0.3%	66,195 -3.4%	51,568 -2.4%	51,329 -0.5%	47,900 -6.7%	47,230 -1.4%	43,190 -8.6%	41,600 -3.7%
Nominal government CI (Increase rate) (Contribution rate)	25,748 6.0% 2.0	35,199 5.8% 2.5	29,960 -6.2% -2.9	18,974 -8.9% -3.5	17,797 -6.2% -2.3	17,150 -3.6% -1.3	17,390 1.4% 0.5	18,570 6.8% 2.5	16,040 -13.6% -5.9
Nominal private CI (Increase rate) (Contribution rate)	25,722 9.3% 3.0	24,313 -5.2% -1.7	20,276 -2.2% -0.7	18,426 0.3% 0.1	18,750 1.8% 0.6	16,600 -11.5% -4.2	15,930 -4.0% -1.4	13,770 -13.6% -4.6	14,820 7.6% 2.4
Nominal private NH CI (Increase rate) (Contribution rate)	29,970 18.4% 6.4	19,505 -1.8% -0.4	15,959 0.7% 0.2	14,170 4.0% 1.0	14,782 4.3% 1.2	14,150 -4.3% -1.2	13,910 -1.7% -0.5	10,850 -22.0% -6.5	10,740 -1.0% -0.3
Real CI (Increase rate)	85,442 7.6%	77,727 0.2%	66,195 -3.6%	51,520 -3.4%	50,600 -1.8%	46,099 -8.9%	44,345 -3.8%	41,950 -5.4%	40,600 -3.2%

(Units: billion yen. Real figures are based on 2000 prices)

Notes:

1. CI: construction investment NH: non-housing
2. Private NH CI = private non-housing construction investment + private civil engineering investment.
3. Data from the "FY2009 Construction Investment Outlook" by the MLIT up to FY2008.

Chapter 1 Trends in the Construction Investment

1.2 Developing environmental strategies and investment in the construction sector

Curbing global warming is one of the most pressing of environmental issues. Greenhouse gas emissions can be significantly reduced, and the construction industry can contribute to this reduction, by promoting energy saving in buildings.

The major player in the promotion of energy saving in buildings is the private sector, as the majority of existing buildings are privately owned. Public investment will play a leading role in regional policies, building a low-carbon-emitting city for example.

From the medium- to longer-term perspective, demand for construction works in the public sector is likely to decrease and in the private sector, there will be shift in demand for new construction to maintenance and repair. Construction companies should cope with these changes for survival.

Turning our eyes abroad, many countries are aggressively promoting greenhouse gas emission reductions by combining long-term investment into energy and other environmental sectors with short-term economic policies.

These “Green New Deal” policies commonly include: a) development and utilization of renewable energy; b) infrastructure improvement including railways and water supply; and c) the repair and renovation of buildings to make them use less energy. Construction investment makes up a high proportion of total investment.

While the industry faces falling demand for new buildings, the markets for repair and maintenance, environment-related businesses, renewing or renovating buildings to make them more energy efficient are promising and will likely expand. The same trends can be seen in other countries.

- Greenhouse gas emissions may be significantly reduced by making buildings and structures more energy efficient. If the Kyoto Protocol, now used as the benchmark, is replaced by a new and stricter post-Kyoto Protocol benchmarks, Japan may need to accelerate its energy-saving initiatives.

Amount of emission reduction by sector (in thousand tons of CO ₂)	Actual					Forecast				
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Non-housing buildings (energy saving)	6,300	8,000	10,200	13,300	—			28,700		
Housing (energy saving)	4,300	4,800	5,200	5,900	6,600			9,300		
Sewers (energy saving and new energy)	—	—	340	380	—	560	730	900	1,080	1,260
Construction work	—	—	—	—	120	140	170	200	230	270
Sewage sludge Treatment	390	440	430	530	—	910	1,080	1,260	1,270	1,290
Greening of cities	—	—	630	660	690	700	720	740	770	790

Source: “Progress of the Kyoto Protocol Target Achievement Plan” by the Global Warming Prevention Headquarters.

Environmental strategies involving, or may involve construction investment by country

Country	Environmental strategy with construction investment potential
US	Renovation to make buildings energy saving Renewable energy projects Smart grid initiatives Water-related infrastructure
China	Building infrastructure for rural villages (water supply, sewers, roads, electricity, irrigation) Building more waste water processing and waste disposal facilities and works to protect ecosystem New energy development plans
Korea	Restoration of four major rivers and improvement of surrounding areas Green transportation network
EU	Improvement of existing energy infrastructure Redevelopment of transportation infrastructure to make it more environmentally friendly Making buildings more energy efficient
UK	Renewable energy
Germany	Building renovation program to reduce CO ₂ emissions Renovation and repair to make public buildings more energy efficient

Chapter 2 Local Economies, Public Investment and the Construction Industry

2.1 Public investment and the construction industry in local economies

Trends in construction investment had traditionally showed a correlation with economic trends: construction investment tended to increase in most regions, along with the growth in the national economy as a whole. This time, however, it has been different. During the recent period of economic expansion that began in 2002, construction investment decreased in accordance with the government policy to reduce the budget deficit.

On the other hand, the amount, timing and the targets of public investment during recessions differ, depending on the economic situation at the time. During the recession following the collapse of the Japanese bubble economy, the government took swift measures to increase public spending when it was found that there was a limit to the effects of monetary policy.

Trends in construction output by region correlate with those of the economy. Immediately after the collapse of the bubble economy, output decreased or remained stagnant in urban regions due to a sharp decline in private-sector construction investment, whereas in the rural regions output continued to increase for a while as these regions were given priority in public investment projects to stimulate their economies. This is reflected in the trends of public-sector fixed capital formation.

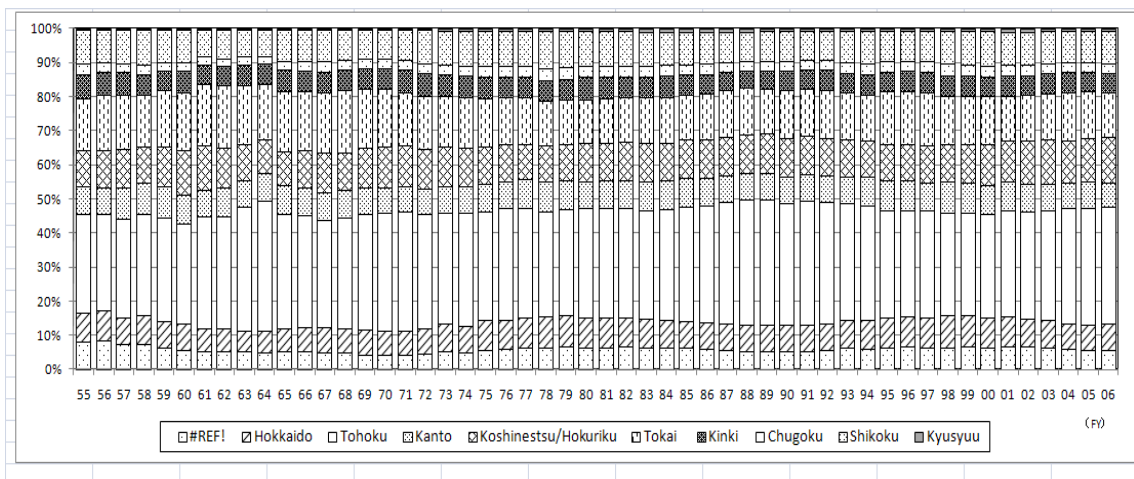
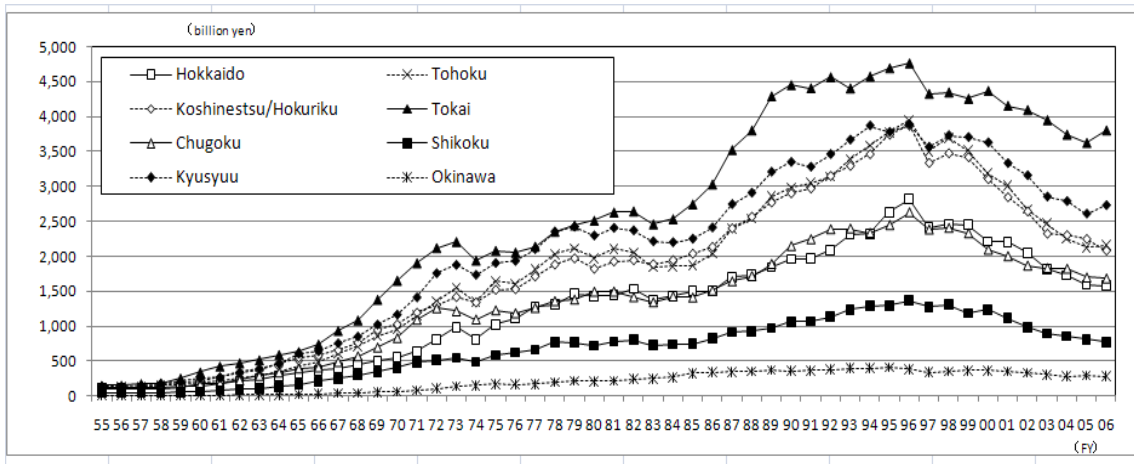
Construction output in FY2006 decreased to the level recorded from FY1985 to FY1988. While construction output decreased by over 40% from the peak year in most regions, the rate of decrease remained at 20.1% in the Tokai Region, indicating the relative strength of the local economy.

Levels of public-sector fixed capital formation in FY2006 matched those of the period from FY1971 to FY1977, down by 40% to over 50% from the peak period in all regions. We may need to go back to the early 1970s to examine the impact of this low level of public investment.

Construction bankruptcies continued to increase from FY1991 to FY1997 and remained high until FY2002. The bankruptcy rate was high among construction companies in the urban region immediately after the collapse of the bubble economy. Later, bankruptcies increased in rural regions even though construction investment increased. This can be attributed to losses caused by real estate business failure and financial institutions becoming more reluctant to lend to construction companies.

As trends in the construction investment vary from region to region, each regional construction market should be closely examined to find solutions tailored to the needs of that region.

Trends in construction output by selected regions (in real term) and the share of each region



Chapter 2 Local Economies, Public Investment and the Construction Industry

2.2 Degree of dependence on construction industry by region

The ratios of construction output to a region's GDP (i.e., the region's degree of dependence on its construction industry) during 1955 and 2006 were always higher in rural regions than in urban regions. The gap between urban and rural regions is even greater in terms of the ratio of public-sector fixed capital formation to the regional GDP. An examination of the degree of a prefecture's dependence on its construction industry reveals that "urban" prefectures with a high degree of urban economic activities tend to be less dependent on their construction industry, except for those prefectures that are focusing on building social infrastructure.

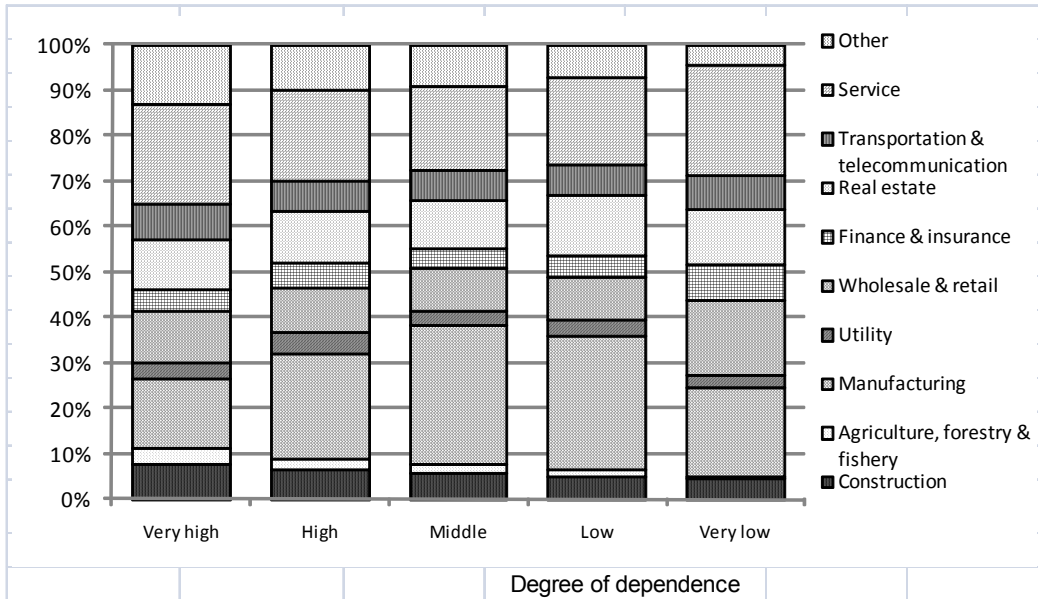
Trends in the ratio of construction workers to all workers used to lag behind that of the ratio of construction output to regional GDP, but caught up and surpassed this in the late 1970s. Since then, construction workers have generally been in oversupply.

RICE divided the prefectures into five groups, depending on their level of dependence on construction (very high, high, medium, low and very low) and analyzed each group's industrial composition. The "middle" group was the most highly dependent on manufacturing. In non-urban regions, manufacturing is the key industry supporting the local economy, and its strength has an impact on the level of that prefecture's dependence on the construction industry.

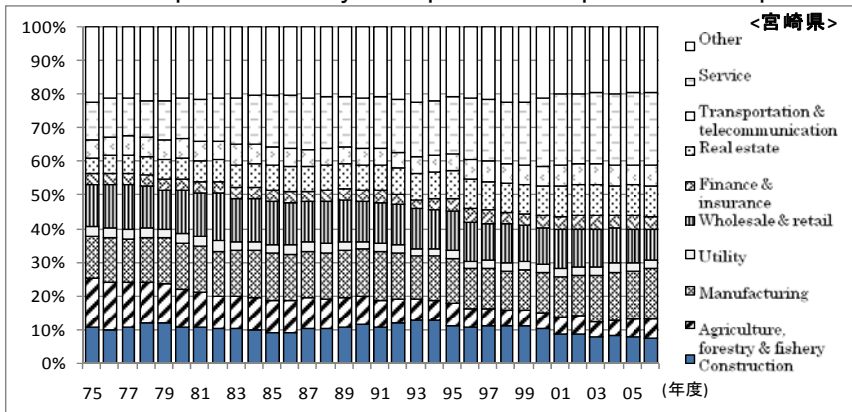
RICE has selected and compared two neighboring prefectures (Oita and Miyazaki) in Kyushu. Changes in the ratio of construction industry (A) and manufacturing (B) from 1975 to 2006 are as follows: from 12.9% to 5.7% (A) and from 16.7% to 28.3% (B) in Oita and from 11.9% to 7.8% (A) and 14.1% to 16.5% (B) in Miyazaki. Oita was more successful in inviting manufacturing companies to come and set up factories, which may have resulted in the prefecture's lower dependence on its local construction industry.

Manufacturing however, is facing fierce international competition. Not all regions can expect to invite manufacturing plants to come and sustain their local economies. Rural regions should consider other promising industries, for example, care and other services for senior citizens, and agriculture. The national government should continue to support regional efforts in industrial transformation, based on each region's needs and conditions.

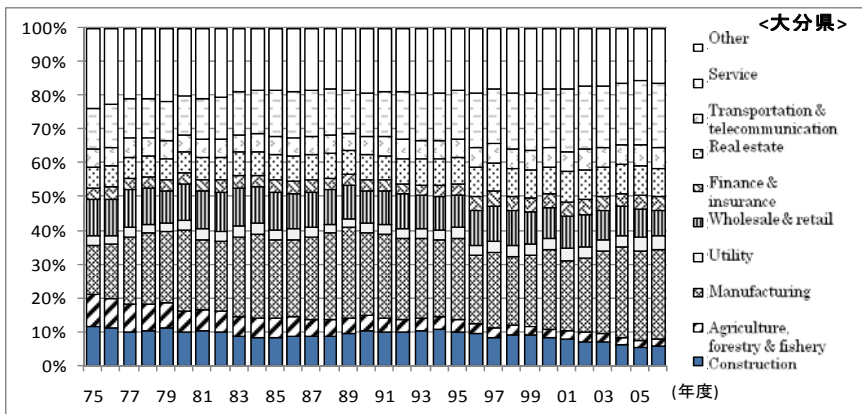
Degree of dependence on construction and nine other industries by region (ratio of the average amount from FY2004 to FY2008)



Industrial composition of Miyazaki prefecture's production output



Industrial composition of Oita prefecture's production output



Chapter 3 Studies of the Construction Industry

3.1 Making construction management “visible” and management innovations: Corporate management and “management accounting”

The Japanese construction industry has entered a period of more intense inter-corporate competition (market competition). Better management of corporate business will be the key to survival.

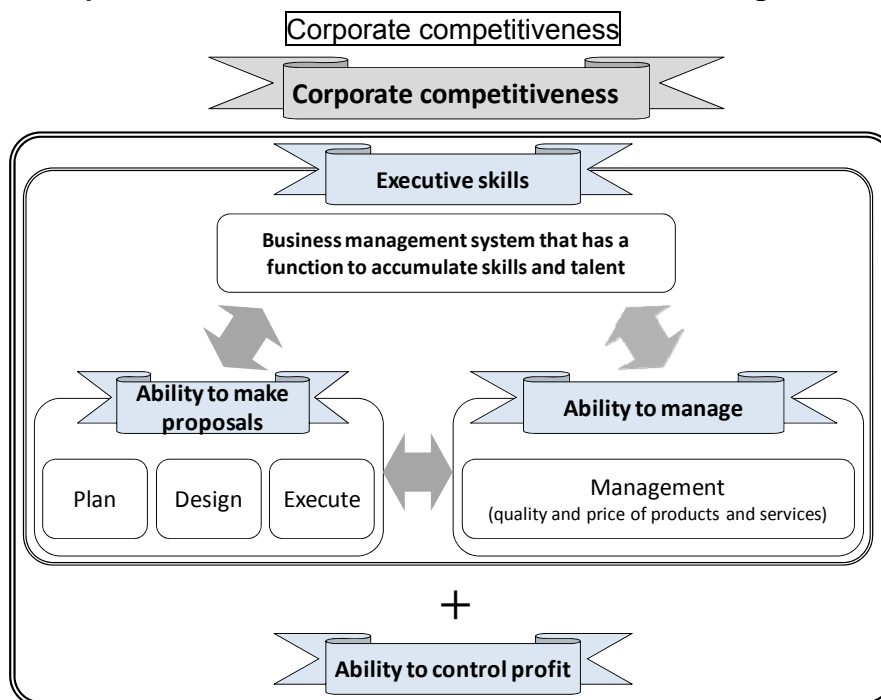
Management accounting provides accounting information to corporate managers to help them make informed business decisions and better manage their companies. To introduce management accounting, a company needs to: a) determine what businesses and activities a company is involved in; b) conduct a performance evaluation and a PDCA (Plan Do, Check, Act) checklist; and c) clarify managers' authority and duties. RICE conducted a survey of construction companies and asked them about their state of introduction of management accounting. Most companies answered that they are not taking any of these three steps.

The current contractor-subcontractor working relationship is the major reason why construction companies cannot adequately analyze their corporate activities. A company's core activity (its source of competitive advantage that should be maintained) is entrusted to a subcontractor and treated simply as a “cost.” In other words, the core business where management accounting should be applied is often outsourced.

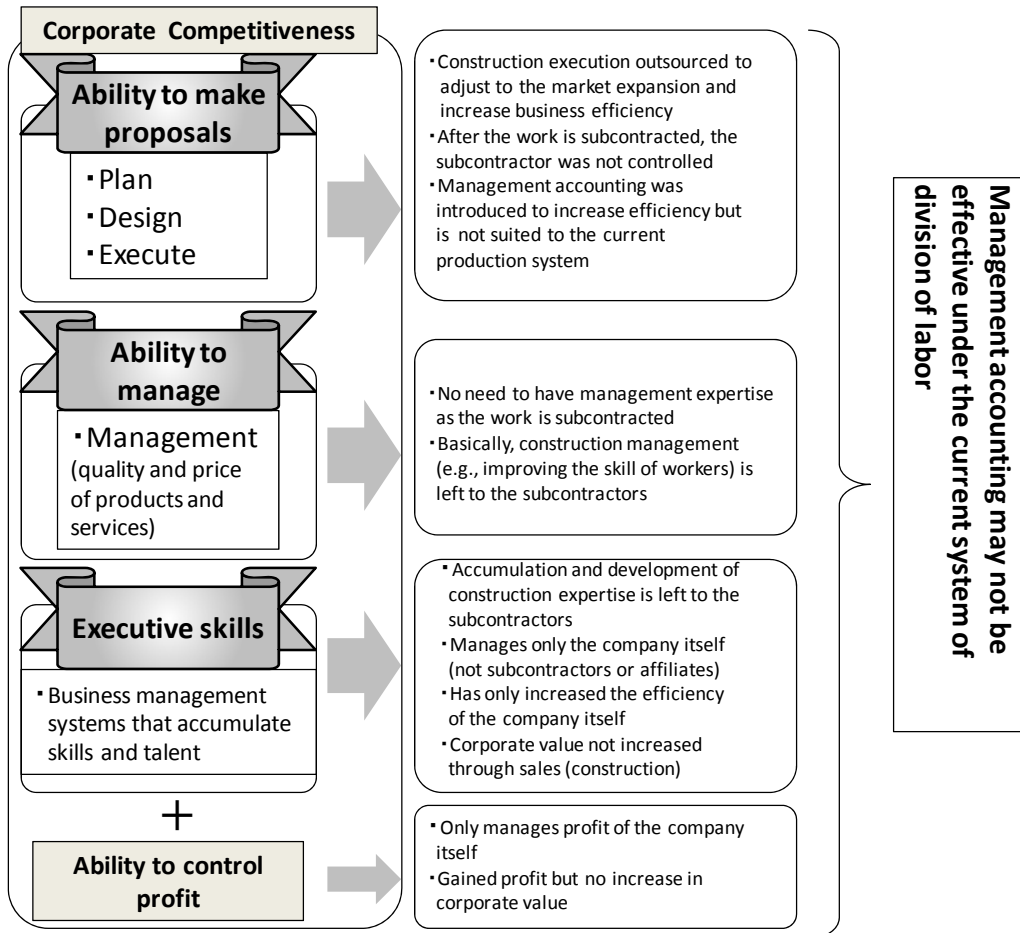
Construction companies should change their accounting policy from financial accounting (cost management) to management accounting (target costing) which is better suited to the new age of market competition.

Based on these assumptions, RICE has proposed a business model suited to management accounting.

Corporate competitiveness and a business model suited to management accounting




Factors hampering the introduction of management accounting



Comparison of business model (A model suited to general contractors and management accounting)


In-house vs. Outsourcing	Subcontractor's point of view	Management point of view
In-house only	Group companies	Fully controlled by the contractor
In-house + group company	Affiliated companies	
In-house (core elements of the project)	Companies having business relation	Controlled by the first-tier subcontractor (who would give the work to lower-tiered companies at its discretion)
In-house + group company (core elements of the project)	Emphasis on past business dealings	
Collaboration (division of labor)	Case-by-case (no fixed arrangements)	Totally independent



Current model of general contractors

In-house vs. Outsourcing	Subcontractor's point of view	Management point of view
In-house only	Group companies	Fully controlled by the contractor
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In-house (core elements of the project)	Companies having business relation	Controlled by the first-tier subcontractor (who would give the work to lower-tiered companies at its discretion)
In-house + group company (core elements of the project)	Emphasis on past business dealings	
Collaboration (division of labor)	Case-by-case (no fixed arrangements)	Totally independent

Business model most suited to management accounting



Chapter 3 Studies of the Construction Industry

3.2 Management innovation by creating a new construction production system:

Challenging intensifying inter-corporate competition

Construction companies in the age of intensifying inter-corporate competition should not simply sit back and wait for work to come to them. They should publicize how different they are from other companies and how their products and services are superior to the offerings of other companies in terms of quality and price. In other words, they need to be able to market themselves better in a competitive environment. There are several prerequisites: a) establish a framework to control the entire value chain in the process of construction production; b) establish a profit management system that can increase the potential of generating reasonable profit and; c) respect all workers involved in the construction production process in a framework to achieve both a) and b) above. Our analysis indicates that it is structurally difficult to achieve these goals under the current system of division of labor.

RICE proposed two new systems for creating a new production model that can maintain and improve a construction company's marketing abilities.

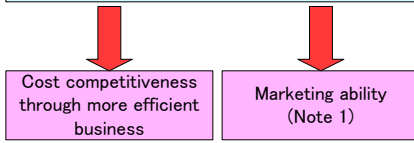
One is the "in-house system ("in-house only" and "core elements of the project implemented in-house") that does not outsource construction production to other companies (subcontractors). The other system calls for "full control by the contractor" or "share work with subcontractors" whereby work is outsourced to "group companies" or "affiliated companies" but controlled by the contractor for the prosperity and growth of all concerned.

Of the companies that RICE interviewed in its study, the growing companies tended to share characteristics found in these two systems.

Potential new production systems under tougher inter-corporate competition (proposed by RICE)

<Management strategy under intensifying inter-corporate competition>

Construction companies should identify their competitive edge in the construction production system



Cost competitiveness through more efficient business

Marketing ability (Note 1)

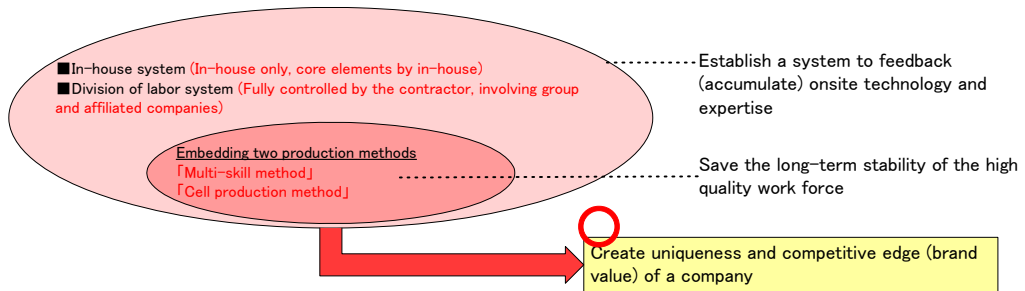
✗ Difficult or impossible under the present production system based on the division of labor

Note 1: Refers to the ability to compare production conditions (site, construction, specification, quality, performance and after-service of the product to be constructed) and the price, then negotiate and adjust with the client, give better satisfaction to the client than the competitors, and successfully win the contract (i.e., marketing and sales ability)

<Prerequisites for a construction company to have an adequate marketing and sales ability>

- a) Establish a framework to control the entire value chain during construction production
- b) Establish a profit management system that can improve the potential of generating necessary profit
- c) All workers involved in the construction production process are respected within a framework to achieve both a) and b).

<Two production system models>

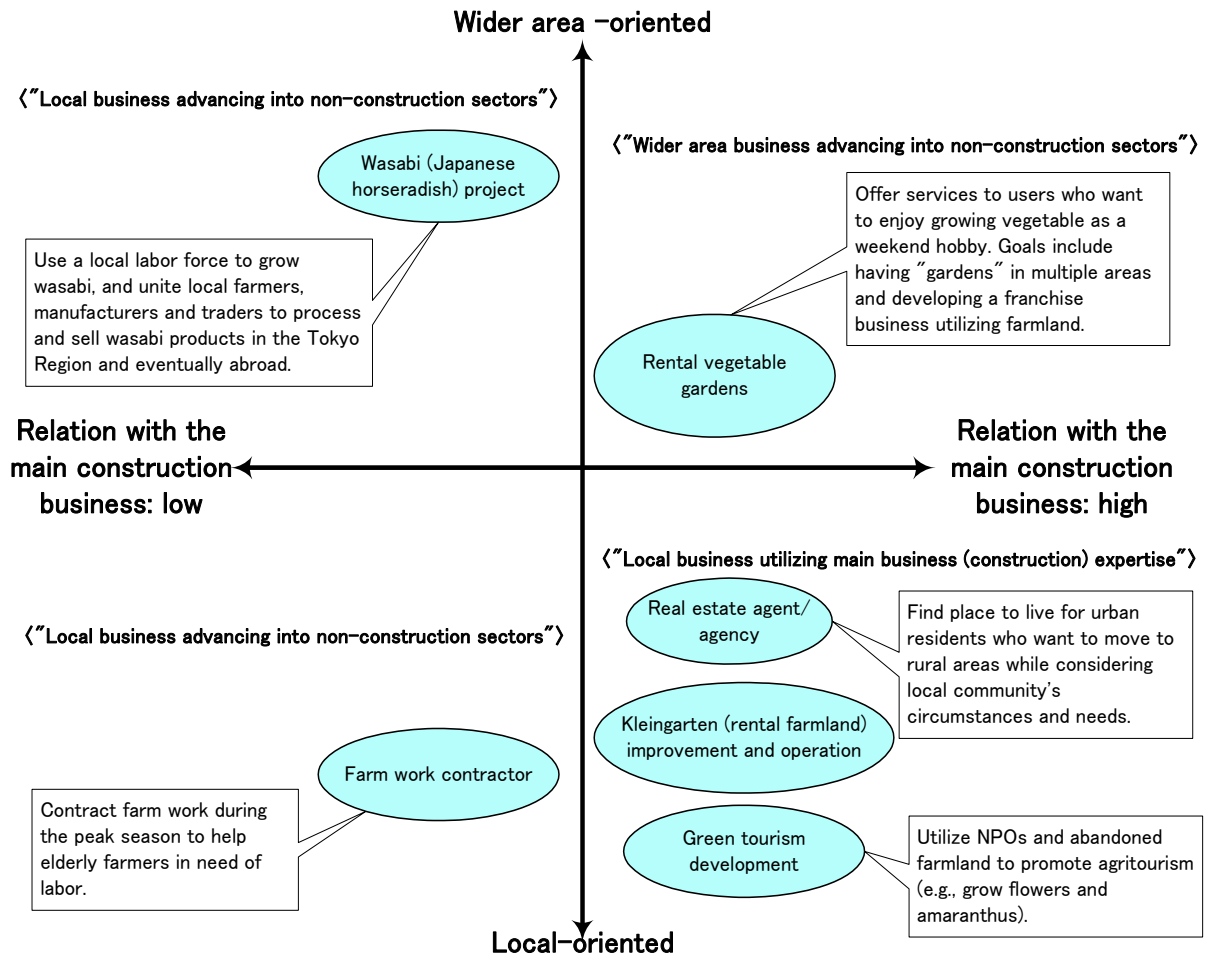


Chapter 4 National and Regional Planning

4.1 Construction business and inter-regional exchanges

- One high-priority issue in national planning is to promote inter-regional exchanges between urban and rural areas to revitalize regional communities.
- Construction companies are moving into businesses engaged in inter-regional exchanges. Traditionally, construction companies have commonly engaged in side-businesses allied to construction. Examples include quarrying, sale of construction materials, waste cartage and disposal, and other similar businesses. In recent years, however, construction companies have advanced into real estate and the management of hotels and traditional Japanese inns.
- Construction companies become involved in new businesses for various reasons. They may want to utilize under-used land for agriculture or other purposes. They may be seeking to reduce their dependence on public-sector investment. As they enter these businesses, however, they become involved in regional issues.
- RICE has classified inter-regional exchange businesses into four types depending on how close they are related to the core business of construction, and whether they are local (confined to the prefecture/region) or extend over wider areas (across several prefectures, the whole of Japan, or even overseas). These four categories are:
 - Local business utilizing main business (construction) expertise
 - Local business advancing into non-construction sectors
 - Wider area business utilizing main business (construction) expertise
 - Wider area business advancing into non-construction sectorsRICE then surveyed construction companies engaged in side businesses and plotted them on the chart below.
- RICE believes that construction companies can contribute to regional communities by expanding their businesses from contracted construction works to other promising businesses. These companies should endeavor to make these new businesses sustainable by cooperating with other players in the region (e.g., local governments and tourism organizations) and drawing from various funding sources.

Types of inter-regional exchange projects



Chapter 4 National and Regional Planning

4.2 Initiatives that lead to large-scale, stable exchanges among regions

The “Children to Rural Villages” exchange project is a farm (and fishery and forestry village) home-stay project to send pupils from 23,000 elementary schools all over Japan to spend time in farming, mountain and coastal fishery villages. Three ministries are promoting the project: the Ministry of Agriculture, Forestry and Fisheries (MAFF), the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the Ministry of Internal Affairs and Communications (MIC).

In the first year of the project (FY 2008) pupils from about 280 schools (a little over 1% of all elementary schools) were sent to 53 regions in 34 prefectures. Of this total of 280 schools, 178 were officially selected for the project and the rest participated on a voluntarily basis.

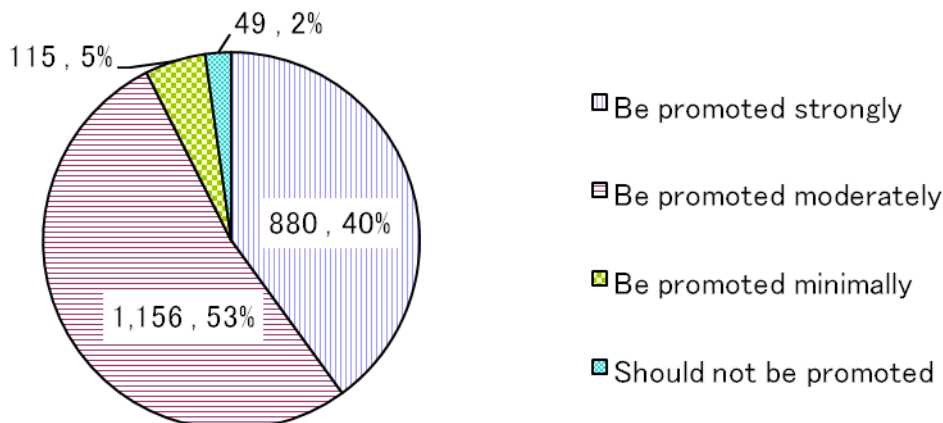
RICE conducted an Internet questionnaire survey about this farm stay program. Many respondents replied that they were aware of the educational effects of this kind of program. Most people say that a one-week stay is adequate, but that each students need to participate more than once to make the project more effective. Many people replied that they would support a longer stay if pupils could attend classes during their period away.

The project aims to expand the host areas to 500 regions, and involve all 1.2 million elementary school children in Japan in a one-week home-stay program.

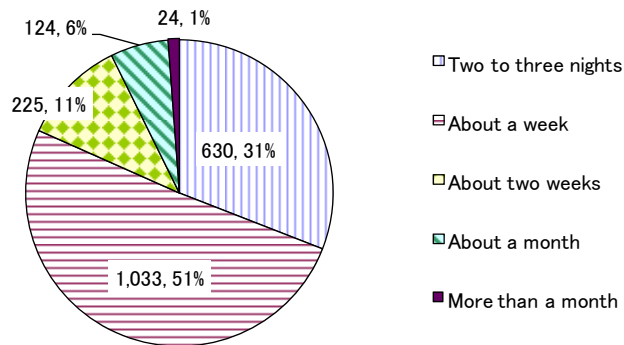
However, since the number of host areas is limited, each area will have to spend up to 6 months each year to host all the pupils that have been assigned to it. This is not feasible. The number of areas should be increased and they should be given financial support. This program is expected to stimulate the demand for the construction of new lodges, meeting places (for school lessons) and infrastructure and facilities, as well as the renovation and repair of existing facilities.

If children are to stay longer at their home-stays and participate in the program more than once, as indicated in the survey results, then demand for local construction of facilities is expected to be greater.

“I think the farm stay program should...”



“How long a home-stay do you think will be suitable from an educational point of view?”



[Estimates on the number of host areas required]

* If a one-week program that the government recommends is conducted by all elementary schools...

Total no. of fifth-graders	No. of areas X No. of pupils per school	Total no. of months that host areas should spend
1.2 million ÷	(500 areas×100 pupils/area) = 24 times/week	(Each area should spend 6 months)
1.2 million ÷	(750 areas×100 pupils/area) = 16 times/week	(Each area should spend 4 months)
1.2 million ÷	(1,000 areas×100 pupils/area) = 12 times/week	(Each area should spend 3 months)
1.2 million ÷	(1,250 areas×100 pupils/area) = 10 times/week	(Each area should spend 2.5 months)

[Examples of facilities that host areas should build/improve]

Lodges

Necessary remodeling and extension of farm houses, in case home-stays are chosen

Indoor facility for activities on rainy days

Chapter 5 Construction Industries Overseas

5.1 Trends in Public Private Partnership (PPP) in Europe and initiatives taken by major construction companies: comparison with Japan

The number of projects conducted under Public Private Partnerships or PPP utilizing private-sector business expertise and funds to promote infrastructure improvement is increasing.

Japan introduced the Private Finance Initiative (PFI), a form of PPP, about ten years ago. The annual budget for this initiative has expanded to about 500 billion yen. It is feared, however, that the PFI has lost some of its attractiveness and that businesses are reluctant to use it.

A small minority of the more than 200 projects managed under PFI are facing difficulties due to factors that include inadequate income and expenditure forecasts and a lack of management expertise.

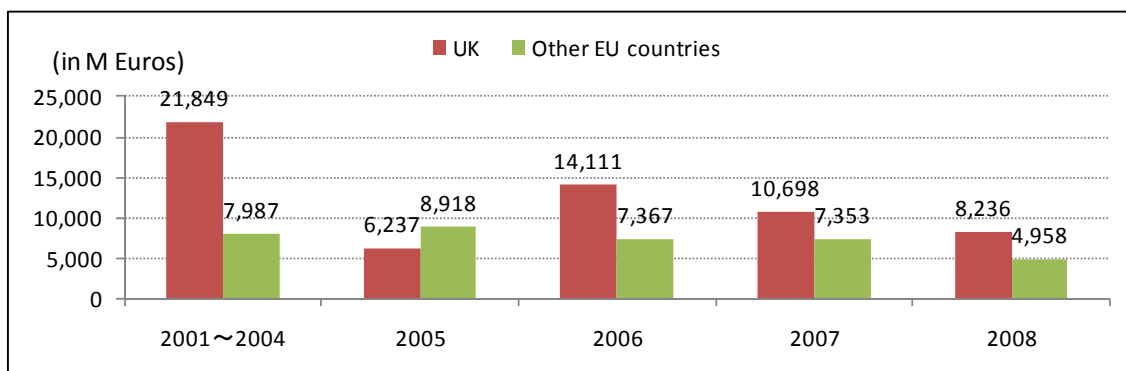
PPP schemes have been introduced in Europe, including the UK and France, to enable the public and private sectors to jointly and swiftly build or refurbish, finance and operate new or improved infrastructure. PPP include PFI projects where the public sector procures services from the private sector and financially independent concession projects.

Major European general contractors are engaged in PPP projects as profitable businesses. They seek profit from the entire lifecycle of buildings and facilities, from planning onto design, construction and management. On the other hand, Japanese contractors tend to focus on profits that can be gained from the construction of buildings and facilities only.

If Japanese contractors are planning to engage in PPP projects abroad at some point in the future, then they should consider broadening their businesses outwards from construction to include subsequent phases of the building/facility lifecycle.

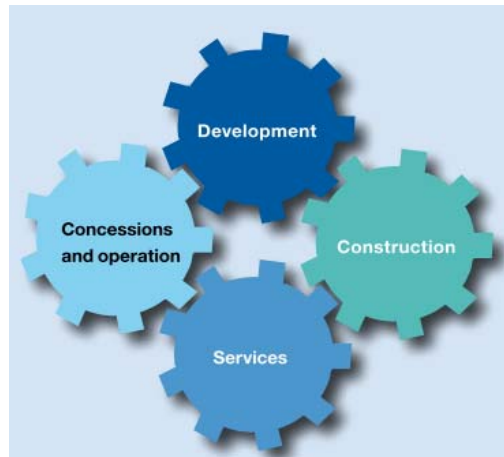
- PPP contracts concluded in Europe (in million Euros)

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- **A European Example of Management Strategy: Hochtief AG**

Hochtief closely coordinates various businesses, from real estate development (from planning, financial procurement and on to marketing), traditional construction works, and services (design, construction management or CM, asset management, facility management, energy management and insurance), to concessions (airport and other PPP projects).



Chapter 5 Construction Industries Overseas

5.2 Trends in overseas construction markets

Compared with GDP levels in Japan in 2008 (= 100), the figures in overseas markets are as follows: 271.1 for the United States, 357.8 for Europe and 197.5 for Asia. The construction investment-to-GDP ratio was higher in Asian countries than in other regions.

The US economy is in trouble, judging from by trends in GDP, construction investment and the number of housing starts in the private sector. The recession may worsen.

All European countries – west, central and eastern alike – have slipped into a serious recession. All economies are expected to shrink in 2009.

Although West European construction markets will remain stagnant, East European construction markets are expected to continue expanding in 2008 and beyond.

Compared with Europe, Asian economies (except for Japan) were in better condition in 2008. In particular, China, India and Vietnam recorded annual growth rates of 9.0%, 7.3%, and 6.2% respectively. Some other countries have recorded a decline since 2008.

China, Korea and Malaysia spend over 10% of their GDP on construction investment, whereas the rate is very low in Indonesia, Sri Lanka and Vietnam (a little over 1% of the country's GDP). Their economies however, are steadily growing in recent years and are promising markets on a mid- to-long term.

● Trends in GDP growth rate of selected countries

	2003	2004	2005	2006	2007	2008	Forecast 2009	Forecast 2010
US	2.5	3.6	3.1	2.7	2.1	0.4	-2.7	1.5
UK	2.8	3.0	2.2	2.9	2.6	0.7	-4.4	0.9
Euro countries	0.8	2.2	1.7	2.9	2.7	0.7	-4.2	0.3
Central and Easterr	4.8	7.3	6.0	6.6	5.5	3.0	-5.0	1.8
China	10.0	10.1	10.4	11.6	13.0	9.0	8.5	9.0
Hong Kong	3.0	8.5	7.1	7.0	6.4	2.4	-3.6	3.5
Taiwan	3.5	6.2	4.2	4.8	5.7	0.1	-4.1	3.7
India	6.9	7.9	9.2	9.8	9.4	7.3	5.4	6.4
Korea	2.8	4.6	4.0	5.2	5.1	2.2	-1.0	3.6
Sri Lanka	5.9	5.4	6.2	7.7	6.8	6.0	3.0	5.0
Indonesia	4.8	5.0	5.7	5.5	6.3	6.1	4.0	4.8
Malaysia	5.8	6.8	5.3	5.8	6.2	4.6	-3.6	2.5
The Philippines	4.9	6.4	5.0	5.3	7.1	3.8	1.0	3.2
Singapore	3.8	9.3	7.3	8.4	7.8	1.1	-3.3	4.1
Vietnam	7.3	7.8	8.4	8.2	8.5	6.2	4.6	5.3
Thailand	7.1	6.3	4.6	5.2	4.9	2.6	-3.5	3.7
Australia	3.0	3.8	2.8	2.8	4.0	2.4	0.7	2.0
New Zealand	4.1	4.5	2.8	2.0	3.2	0.2	-2.2	2.2
Japan	2.1	2.0	2.3	2.3	1.8	-3.2	-3.5	1.1

Source:

- 1) IMF "World Economic Outlook (WEO) Sustaining the Recovery, October 2009."
- 2) Economic and Social Research Institute (ESRI) of the Cabinet Office "FY2007 National Economic Accounts," and "April to June 2009 Quarterly Estimates of GDP (second quick estimates)."

Notes:

- 1) Real GDP growth rates except for Japan are based on figures listed in IMF's "World Economic Outlook (WEO): Sustaining the Recovery, October 2009." The figures for Japan are based on the two reports from ESRI (listed above) from 2003 to 2008, and estimates made by RICE for 2009 and 2010 ("Outlook for Construction Investment based on the Construction Economy Model (October 2010)").