

The correlation between size of enterprises and profitability in the domestic construction companies

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ABSTRACT: In Japan, the construction investment market has been shrinking since its peak in 1990 when the investment value was 84,000,000,000,000 yen and it has shrunk down to a market of 48,000,000,000,000 yen in 2007, which is only 55% of the peak. However, the number of licensed building constructors and that of the workers in the industry has not caught up the market shrinkage at present. The number of licensed building constructors has decreased from 600,000 (2000), the peak, to only 520,000 (2007), which is 90% of that in the peak. Furthermore, the number of workers in the industry has decreased from 6,890,000 (1997), the peak, to only 5,620,000 (2007), which is just below 90% of that in the peak. Under such a circumstance, it is likely to become unable to avoid shakeouts / reorganizations in the construction industry ultimately. On the other hand, for some specific industries, it is known that there is a comparatively clear correlation between size of enterprises and profitability. For example, in the case of inland banks, when plotting each enterprise with profit ratio (current profit rate) in a vertical axis and size of enterprise (total capital used) in a horizontal axis, profit ratio becomes higher with an increase of size of enterprise to a certain level. However, when it exceeds the level, profit ratio turns worse and it rises again when it reaches at a next level. Such a tendency is called "fly fishing curve". This tendency is seen in the construction industry. It is necessary for construction companies whose profit ratio is severe to aim at expanding the size by integration or at shrinking the size by selection and centralization of specific segments. It will bring them a chance to find a direction of shakeouts / reorganizations in the construction industry.

KEYWORDS: construction companies, reorganizations in the construction industry, fly fishing curve

1. Status of domestic construction investment market

In Japan, the construction investment market has been shrinking since its peak in 1990 when the investment value was 84 billion yen and it has shrunk down to a market of 46 billion yen in 2007, which is only 55% of the peak (See Figure 1.1). However, the number of licensed building constructors and that of the workers in the industry has not caught up the market shrinkage at present.

The number of licensed building constructors has decreased from 600,000 (2000), the peak, to only 520,000 (2007), which is just below 90% of that at the peak. Furthermore, the number of workers in the industry has decreased from 6,890,000 (1997), the peak, to only 5,620,000 (2007), which is around 80% of that at the peak. In particular, looking at the number of licensed contractors for specific construction industries that are required when an original contractor executes the work with a subcontract for more than 30,000,000 yen (more

than 45,000,000 yen for construction work), it has been increasing from 33,000 in 1990 to 51,000 in 2005 in contradiction to the decrease of the construction investment.

Although it began decreasing after 2005, it is still 47,000 in 2009 (See Figure1.1). Making a trial calculation of construction investment per a specific constructor, it has been decreasing by over 60%,

from 2,500,000,000 yen in 1990 to 900,000,000 yen in 2009. Although the decreasing rate has been slowing down in these past several years, severe situations of the business environment in the construction industry have been shown (See Figure1.2). Of course, some researchers mention that "number" of companies itself is not a problem for the construction industry since constructors perform

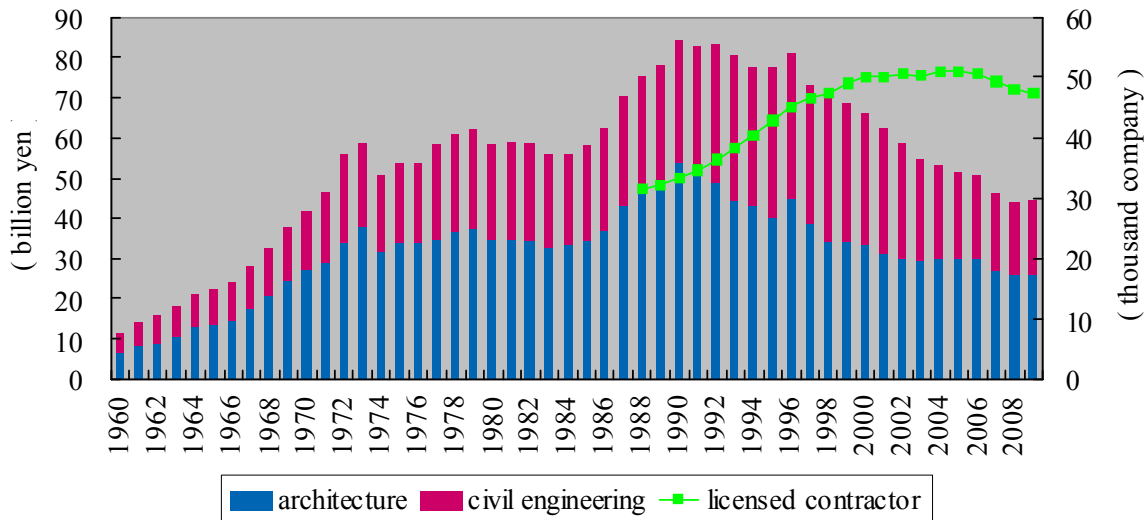


Figure1.1. Transition of domestic construction investment and the number of licensed specific construction contractors

- * Financial year for domestic construction investment and calendar year for the number of the specific licensed contractor.
- ** Domestic construction investment in 2007 is probable value and that in 2008 and 2009 is anticipated value.

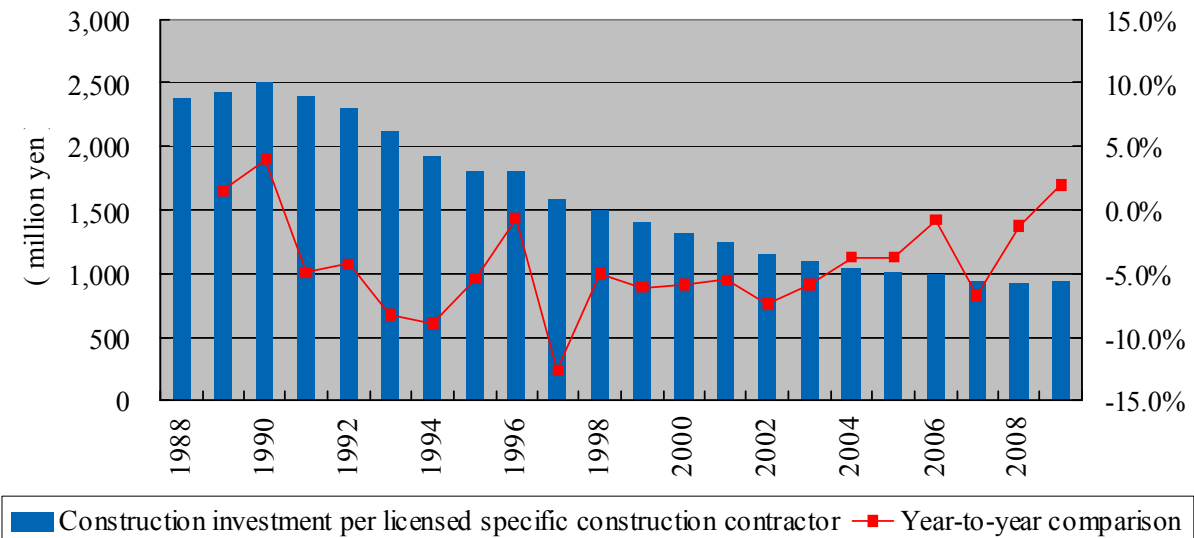


Figure2. Transition of construction investment per licensed specific construction contractor

- * Financial year for domestic construction investment and calendar year for the number of specific licensed contractors.
- ** Domestic construction investment in 2007 is probable value and that in 2008 and 2009 is anticipated value.

"individual commodity production" on the basis of contracts not like manufacturing enterprises having productive facilities. Here, looking at the number of construction industry workers, a similar tendency is seen, as expected.

Making a trial calculation of construction investment per construction industry worker, it has been decreasing by over 40%, from 143,000,000 yen in 1990 to 83,000,000 yen in 2009 (See Figure1.3). In this way, from a macroscopic viewpoint, an excess supply has been obviously continuing. However, from a microscopic view, as a fact, it is not necessarily the excess supply in aspects. For example, aging of craftsmen is becoming a serious problem year by year and raising / securing young and excellent craftsmen is a problem common throughout the industry. However, it is an excess supply from a macroscopic view and to secure basic quantity of constructing works is a serious problem from a microscopic view. Therefore, under such an environment, shakeout / reorganization in the construction field is going to be unavoidable.

2. Status of domestic general contractor

Like specific constructors mentioned above, an enterprise that receives a contract for various engineering works / construction works directly from the clients with a complete set as a original contractor and coordinates the entire works is generally called "General Contractor". Although it has been said that reorganization of general contractors would advance in these over 10-15 years, remarkable movement has almost not been seen. In "Consciousness research of companies for industry reorganization " practiced by Teikoku Databank, LTD, the rate of the construction companies that responded "industry reorganization has not been advancing" over the past five years was 65.3%, which was the highest among all types of industry. Although researchers are pointing out that there are various reasons for why reorganization has not been advancing, the bidding system in public works is pointed out as a reason peculiar to the construction industry. Under the system, "one company can divide itself or organize subsidiary companies though there are almost no advantages in

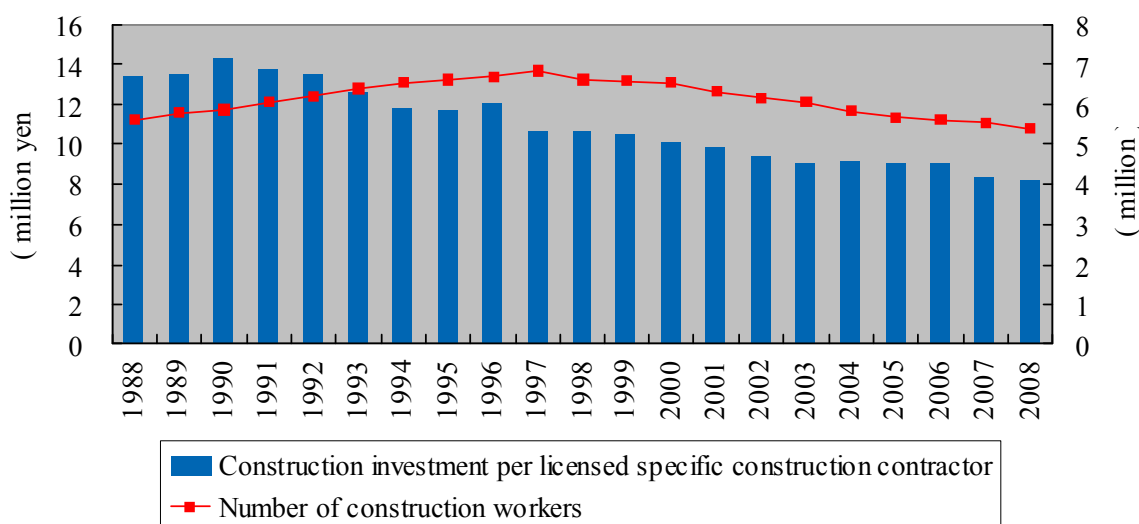


Figure1.3. Transition of the number of construction workers

- * Financial year for domestic construction investment and calendar year for the number of specific licensed contractors.
- ** Domestic construction investment in 2007 is probable value and that in 2008 and 2009 is anticipated value.

integrations of two companies for becoming one. 1+1 does not become 2 since bid opportunities are reduced." is a basic rule. In such a condition, large-scale bankruptcy of general contractors occurred successively in the first half of 2000's. Therefore, reorganization such as capital participations and business integrations has advanced for a certain degree. However, the present situation is greatly different from that in those days. Reorganization in the first half of 2000's was led by financial institutions as a creditor since the bad debts caused by real estate investments in the bubble years were actualized. However, after that, general contractors became very careful for real estate investments. Therefore, there are not many general contractors suffering from bad debts in recent years. Indeed, interest-bearing debt balances and ratio to net sale of major general contractors have been considerably falling after 2000 (See Figure 2.1). In recent years, the price competition rather intensifies while the domestic construction investment market is shrinking and decrease of the fundamental order entry / earning capacity is becoming a problem. In the bankruptcy status investigation result of member

firms that National Construction Industry Association in November 2008, "decrease of order" was 336 cases for the causes of bankruptcy, which was 70% of the total 449 cases. Moreover, although the ratio of gross profits to sales of major general contractors recovered temporarily in 2003, it fell again after 2005 and its level has become lower than that in the first half of 2000's in recent years (Figure 2.2). In other words, whereas the problem was of the balance sheet of interest-bearing debts in the first half of 2000's, it can be understood that it has been shifting to a problem in the profit and loss statement such as sales scale and profit ratio in recent years. Under the environment of the market shrinkage and excess supply mentioned above, as for the management problem of general contractors, maintenance of sales scale and profitability is becoming an important key.

3. Forecast of the domestic construction investment market

It is anticipated that such an environment will become severer and severer in the future. Japanese

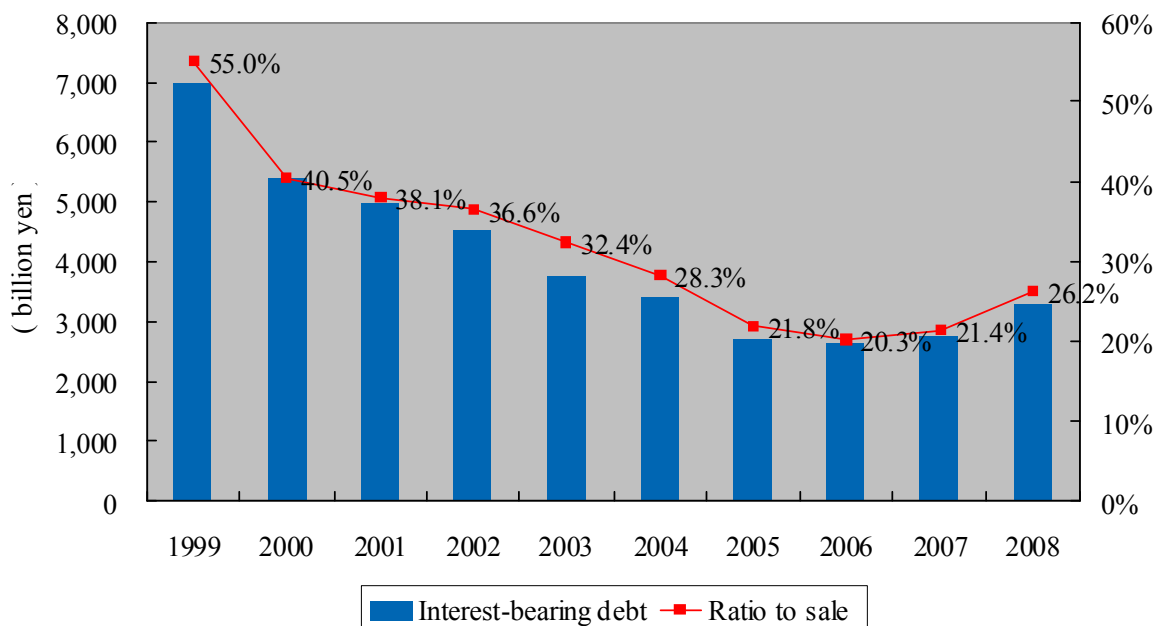


Figure 2.1. Transition of interest-bearing debt in major construction company (consolidated)

* Accounts for financial year

** Counted for 36 listed general contractors

population has already begun to fall. Focusing on the number of households, it is predicted that the number of households will rise until 2015 since the number of persons per household is shrinking (according to an estimation by National Institute of Population and Social Security Research). In other words, Japan is in a slightly peculiar state that the population is decreasing while the number of households is increasing. However, if even the number of households begins to decrease after 2015, consumption in families such as durable consumer goods like residence is greatly affected. It is presumed that shrinkage of the domestic market caused by the population decrease will become serious by decrease of the number of households after 2015. Nomura Research Institute, Ltd. predicts that the domestic construction investment market in 2015 where the number of households begins to decrease will be at a level lower than 45,000,000,000,000 yen (presented in July, 2008). Seeing a breakdown for applications in the prediction, office / factory / warehouse, which are the base of economic activities, will have slight increase or sidewise movement. In addition, aging

will progress even more so the number of hospitals will have a slight increase though residences / stores / schools will decrease by the direct effect of the population / household decrease. In fact, after presentation of the prediction, a global financial crisis occurred and also a change of government was realized in the country. Hence, it is presumed that the market shrinkage will be worsened faster than the predicted pace.

4. Reorganization in domestic demand oriented industry

For not only the construction industry but also the demand-oriented industry in Japan, which has entered into the period of population decrease, it cannot be expected to have growth in the form of share and expanding of market as before. On this account, regardless of an industry, companies that attempt to reorganize the industry take competitors' sales to own companies through M&A and reduce the number of competing companies to loose the competitive conditions so that they can obtain a power to control the market. In industry

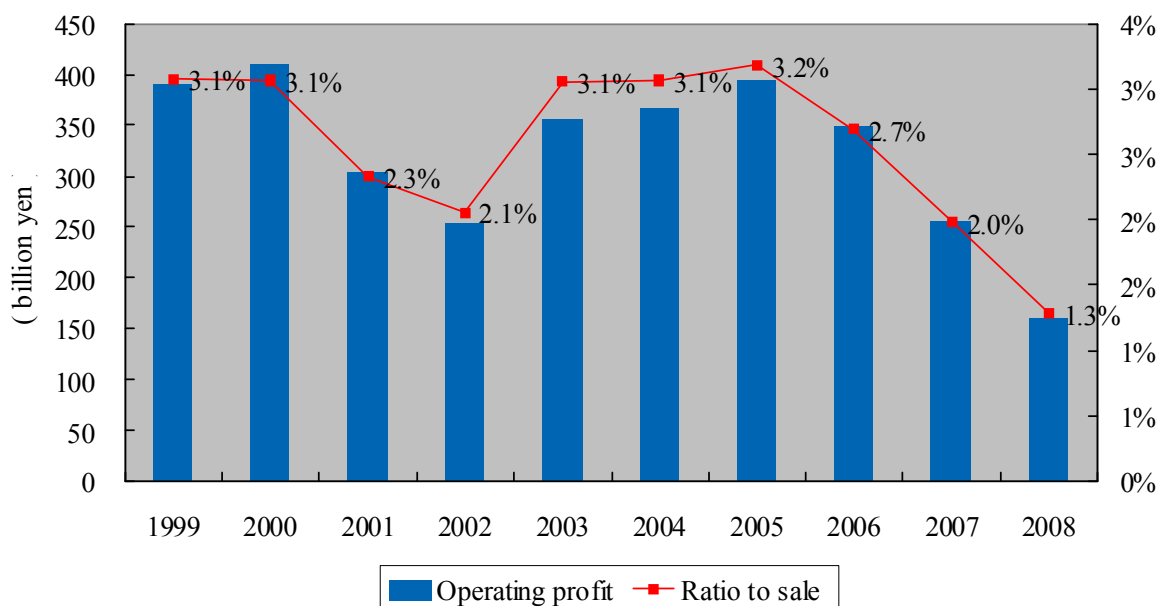


Figure 2.2. Transition of operating profit in major construction company (consolidated)

* Accounts for financial year

** Counted for 36 listed general contractor

reorganization, there is a case that a company can find the enterprise size to be targeted. It is said that "enterprise size / profitability curve" (fly fishing curve)" analysis is effective in such a case. Details of the analysis is described in "Industry reorganization from a viewpoint of M&A" published in the August edition of "Intelligent provisional calculations creation", Nomura Research Institute, Ltd. Some parts of the article are introduced here.

In some industries, a comparatively clear correlation is found between enterprise size and profitability. For example, in the case of inland banks, when plotting each company with profit ratio in a vertical axis (recurring profit rate) and enterprise size (total capital used) in a horizontal axis, profit ratio increases with an increase of the enterprise size to a certain level. However, the profit ratio turns worse when it exceeds the level and it tends to rise again when it reaches the next level. The approximation line with these plots connected resembles the curve of a fishing line when throwing a fly (lure) in fly fishing so it is called "fly fishing curve". For the domestic industries, other than banking circles, in the industries that are becoming a topic for industry reorganization such as supermarkets, food manufacturers, auto manufacturers, paper pulp manufacturers, a correlation is seen between enterprise size and profitability (of course. However, there are industries having low correlations between those such as consumer-electronics manufacturers).

If there are several optimal enterprise sizes that can maximize profit ratio for each enterprise size in an industry, industry reorganization that aims at realization of such an optimal enterprise size will possibly advance, the authors presume. If such a tendency can be found in the construction industry, the general contractors, whose maintenance of sales scale and profitability is becoming a problem, will need to aim at expanding scales by integration and cooperation or at degrading by selection and

centralization of specific segments (particular areas or specific works). The authors believe that it will be an incentive to draw directions of culling out / reorganization in the construction industry.

5. Fly fishing curve analysis for construction industry

In order to find correlations between enterprise size and profitability in the construction industry, a fly fishing curve analysis was performed for total 55 companies (51 domestic listed general contractors and 4 unlisted general contractors). Figure 5.1 shows plots of mean values of the total sales in the horizontal axis and those of operating profit margin in the vertical axis for the period from March, 07 to March, 09 periods (obtained by dividing the total operating profit for three years by the total sales for three years). The first peak of profit ratio is seen below 100,000,000,000 yen of the sales. The profit ratio decreases when the sales exceeds the level and it reaches the bottom around 300,000,000,000 yen. The second peak is seen around 1,500,000,000,000 yen, which is even larger scale and the top in the industry. In order to see this tendency little more clearly, the authors classified all 55 companies according to the scale of total sales.

General contractors with the sales of more than 200,000,000,000 yen were classified in a 100,000,000,000 yen unit and those with the sales of 21,000,000,000 yen were classified in a 21,000,000,000 yen unit. Figure 5.2 shows the plots of mean values of total sales and operating profit margin calculated according to each scale. Haseko Corp. was excluded from the calculation since the operating profit margin of it was higher than other general contractors (average sales of 525,000,000,000 yen for three years, 6.87% of operating profit margin). This company is excellent at obtaining the special command contracts, which

are not exposed to price competitions. They market at condominium developers proposing construction plans utilizing its ability of collecting estate information as a strong point. Hence, relatively high operating earning rate is realized in this company. We judged that this company is acquiring a special position in the field so it was excluded from the analysis subjects.

Extracting the sales below 100,000,000,000 yen where the first peak is seen, profit ratio for 50-70,000,000,000 yen is relatively higher (Figure 5.3). Most of the general contractors with the sales of 50-70,000,000,000 yen scale attempt business development rooted in each metropolis and districts and are proud of being "No. 1 in the local". In other words, it may be said that they adopt a strategy

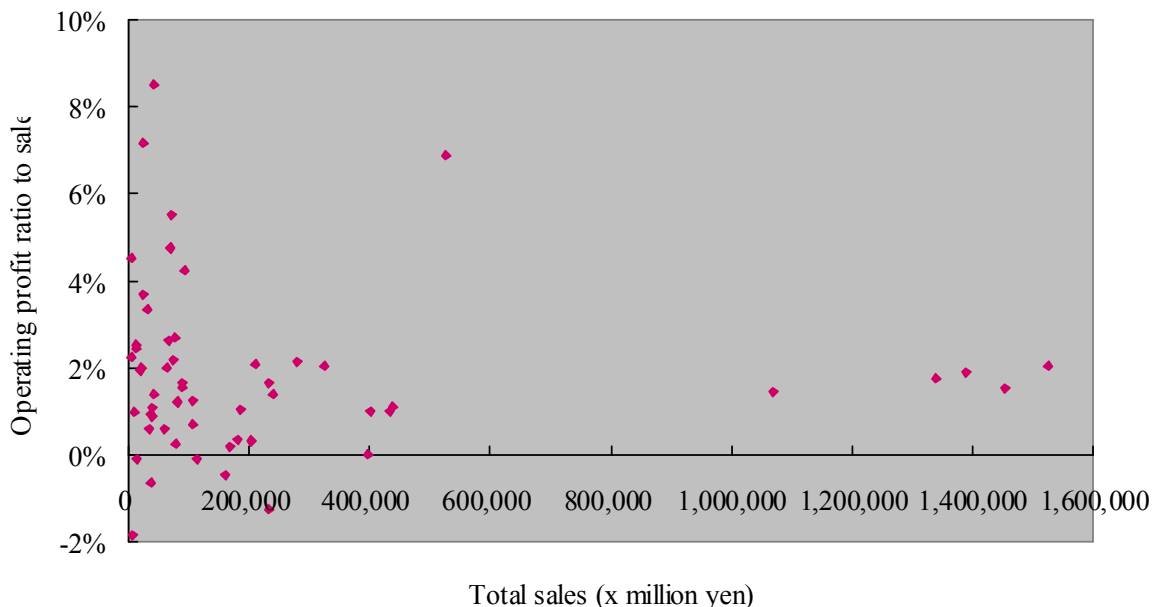


Figure5.1. Relation between sales and operating profit margin of general contractor (single)

* Average of 06-08

** Counted for 51 listed and 4 unlisted general contractors

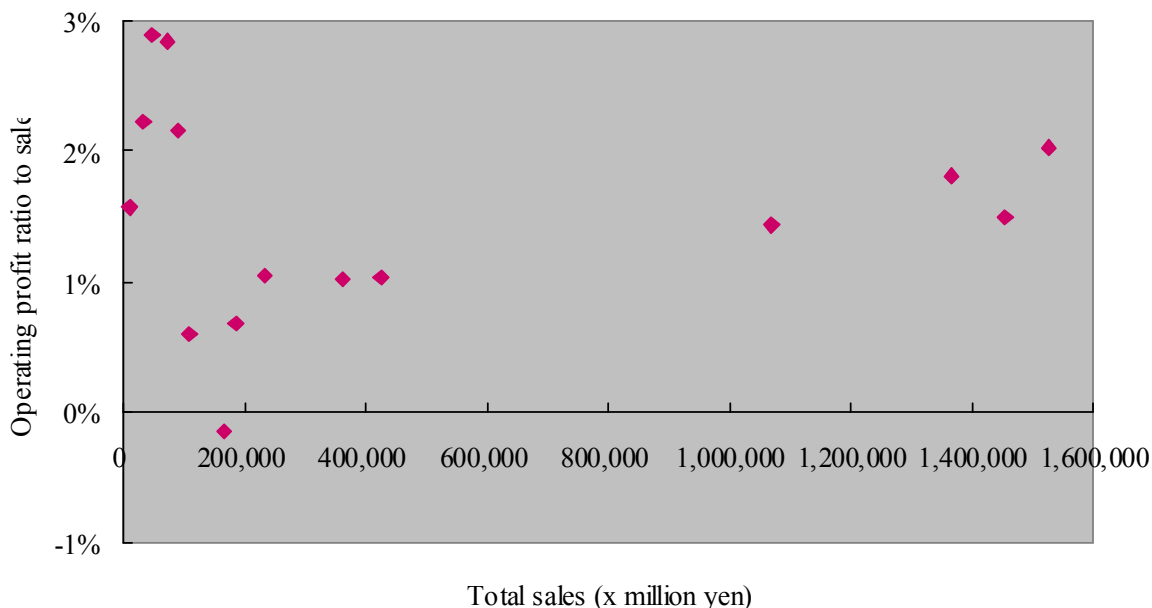


Figure5.2. Operating profit margin according to sales scale of general contractor (single)

* Average of 06-08

** Counted for 51 listed and 4 unlisted general contractors

specialized for each area. Next, extracting the sales 8,000,000, 000-50,000,000,000 yen where the profit ratio reaches the bottom, the profit ratio lowers in particular around 100-200 1,000,000,000 yen. Above all, for general contractors with the sales of 140-160,000,000,000 yen, the profit ratio becomes negative and it is understood that there is a

significant problem in the earning capacity. Moreover, the profit ratio of 200-450,000,000,000 yen is a low level comparing with the entire industry (Figure 5.4). Moreover, extracting the sales over 400,000,000,000 yen, the profit ratio rises as the sales rise towards the sales of 1,500,000,000,000 yen, which is the top in the industry (Figure 5.5). Among

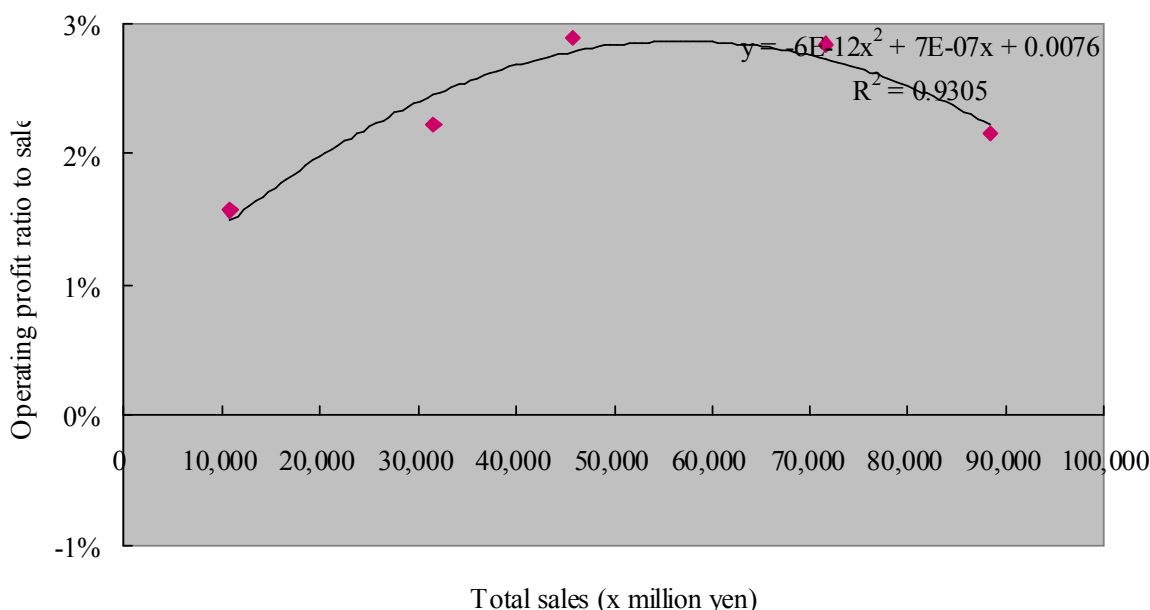


Figure 5.3. Operating profit margin according to sales scale (below 100,000,000,000 yen) of general contractor (single)

* Average of 06-08

** Counted for 51 listed and 4 unlisted general contractors

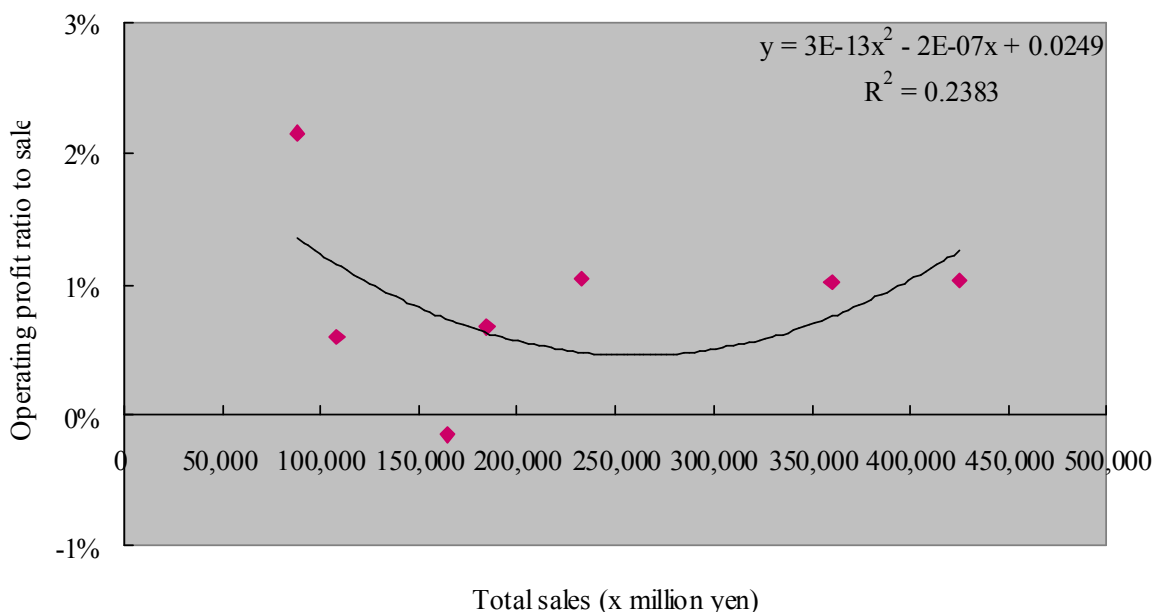


Figure 5.4. Operating profit margin according to sales scale (more than 80,000,000,000 yen and below 500,000,000,000 yen) of general contractor (single)

* Average of 06-08

** Counted for 51 listed and 4 unlisted general contractors

the general contractors, top companies in the industry called "super general contractors" are in this scale. They can deal all types of works in all over Japan and not only their achievements but also their technology overwhelms other general contractors as well. It is said that the Japanese general contractors have low overseas ratios comparing with those in other countries though the super general contractors have overseas ratios of around 20%. As above, "fly fishing curve" is seen also in the construction industry. In other words, profitability (profit ratio) links to enterprise size (sales) also in the construction industry and potential to raise profitability can be obtained in some cases by shifting positions in the industry. If there is adequacy at a certain level in this analysis, general contractors with severe profit ratios need to aim at expanding scales by integration and cooperation or at degrading with selection and centralization of specific segments (particular areas or specific works).

6. Meaning of industry reorganization in the construction industry

Since the domestic construction investment market began to shrink, various indications have been made for the possibility of general contractor reorganization. However, it has been common knowledge in the construction industry for a long time that integration between general contractors does not have advantages. Certainly, "individual commodity production" is the basic business style in construction contracts and we cannot expect great integration effects like those in other matured industries. In addition, the bidding system in the public engineering works mentioned above is also an inhibitory element. In the correlation analysis of enterprise size and profitability of general contractors, when introducing gross profit rate, not operating profit margin, as an index of profitability, it is difficult to find "fly fishing curve". Therefore, there are a few differences by sales scale for cost rate. However, while the domestic construction investment is shrinking and the earning capacity of general contractors are decreasing, ensuring of

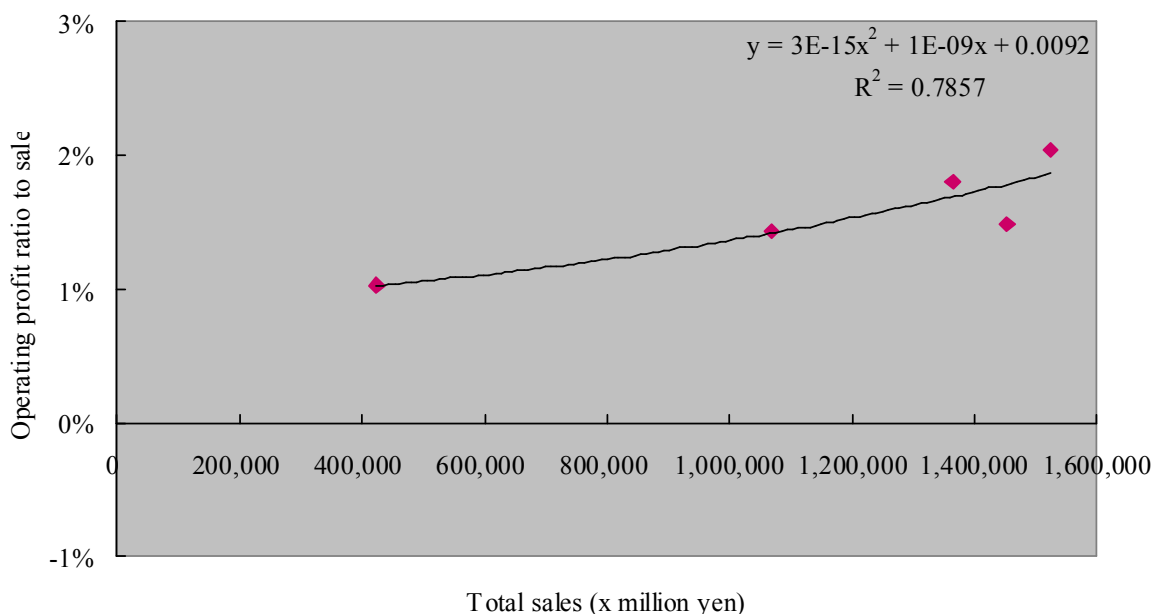


Figure 5.5. Operating profit margin according to sales scale (more than 400,000,000,000 yen) of general contractor (single)

* Average of 06-08

** Counted for 51 listed and 4 unlisted general contractors

works becomes important for maintaining and improving the earning capacity (from a viewpoint of securing works, seeking scales of specific segments can be an idea, in addition to seeking scales in every segments) and it can be said that clear differences might appear in selling and general administrative expenses. Ensuring quantity of works affects mobilization ability (= execution ability), the authors presume. In the circumstance that aging of craftsmen will advance and it will be even more difficult to ensure rich-experienced and excellent craftsmen in the future, negotiation ability for subcontractors will become a point. Subcontractors have an incentive to maintain relation with general contractors, which place orders stably over medium and long terms. Therefore, ensuring quantity of works will improve the earning capacity, the authors suppose. Moreover, in the aspect of ensuring material, although ensuring quantity of works is very attributive, it may work on predominantly. In other words, general contractors, which have negotiation ability for subcontractor, will be evaluated to have considerable execution ability if they can ensure works. Structural change is advancing in the realty business, which a reliable customer (= client) (it has lost the power that it used to have, however), and not only traditional general property companies but also new property companies / real estate fluidizing players / investment funds have gained power.

In such a stream, transparency of price and execution, and accountability for general contractors will be demanded even more in the future. The general contractors, which can surely ensure execution ability, will improve price negotiation ability while responding to needs from such clients, the authors presume. Moreover, improvement of investment capacity to research and development will be one of the effects of scale expansion (including the degradation specialized for segments). It will be a point to decide how achievements should be

ascertained and to what fields research and development expenses should be divided. Arranging research and development fields by integration and raising investment scales will possibly lead to a good achievement. Technology of domestic general contractors is very high comparing with those in the other countries and the engineering works that only major companies can receive contracts for are not necessarily a lot. However, investment capacity for research and development can affect the medium- and long-term competitiveness, the authors suppose. Moreover, effects obtained scale expansion will have a good impact on overseas deployment. As long as the domestic construction investment market shrinks, there will be no choice but to seriously work on overseas deployment. However, there are many problems on overseas deployment and it takes time to carry out. In addition, it will be necessary to take certain risks. In order to obtain basic ability to settle to work on and that to take some risks, it is meaningful to strengthen domestic operations first. Furthermore, as an advantage of scale expansion and segment specialization, a certain level of results can be expected for costs that are not always influenced by sales scale such as advertisement expenses. While the business environment worsens, the credit capability of general contractors tends to be focused. Considering the effect of the problems of the fabricated earthquake resistance, the importance of "brand authority" is going to be higher also in general contractors in the future, the authors presume.

As above, from viewpoints of (1) Execution ability / price negotiation ability, (2) Research and development investment capacity, (3) Basic ability for overseas deployment and (4) Brand investment ability, meaning of industry reorganization in the construction industry can be found. In particular, looking at "fly fishing curve" in the construction industry, the general contractors whose earning

capacity is low as around 10,000,000,000-40,000,000,000 yen will play an central role in the industry reorganization, the authors believe.