Good afternoon.
My name is Jun Iwamatsu. I am a Japanese and senior researcher at Research Institute on Building Cost (RIBC).
And he is Shuichi Okuda, senior executive director. Thank you very much for giving us an opportunity to present today.
The title of our paper is “An Analysis of Profitability of Japanese Construction Enterprise Micro Data”.
At first, let me introduce our institution. RIBC is a non-profit, government-related research institute, and it is founded in 1992 under the former Minister of Construction. (the present Minister of Land, Infrastructure, Transport and Tourism: MLIT)

The field of our work is mainly research on Building cost management & Estimating system, and also providing the Building Cost Estimation Systems to the central and local government.
In recent Japan, statistical digital data which cover plenty of construction enterprises become available. This research uses them to understand the overall picture of the construction industry.

Especially, the Business Evaluation Results (BERs) created and released under the Construction Business Act is used. Since most public purchasers use this evaluation results, many of construction enterprises take it every year. The number of micro data obtained as of March 2012 is 147,152.

In larger sample analysis of micro data, the variance information is always acquired. Therefore, various fruits are expectable.

In the research, we use financial statement information. The financial analysis about the profitability indices is conducted.
Before going to the main subject, let’s see the overview of current Japanese construction industry. According to the Financial Statements Statistics of Corporations, by the Ministry of Finance, the profitability indices of the construction industry are relatively low compared with manufacturing industry etc. For example, as for the Operating profit to sales, Average of Manufacturing Industry is 3.42%, on the other hand, Construction Industry is only 1.41%.
This figure shows construction investment and no. of construction enterprises. The blue line shows the construction investment which become half the size of the peak, and the red line shows the number of approved construction enterprises which did not decline like blue line. That has resulted the supply and demand gap after the bubble economy in the 1990s in Japan. In this situation, Japanese construction enterprises have to compete fiercely to win the contract.
According to the FSSC statistics, Transitions of major profitability indices of Japanese construction industry shows:

“Operating profit ratios” (blue line) is decreasing after the bubble economy of the 1990s, and it is 1.42% in 2010.

“Net profit ratios” shows minus around 2000, and 0.387% in 2010.

“Equity turnover” is decreasing as “ratio of net worth” is increasing after the bubble economy.

The reason is to be said the Balance sheet adjustment, and the Bank’s financing policy change at that time.
To see from the international viewpoint, we did Japan versus Europe comparison of top construction enterprises by using the journal article data of each region. This table shows the number of large enterprises of each country, and statistical distribution of turnover. EU sum total turnover of top 200 enterprises is 61 trillion yen, and Japan top 50’s subtotal is 16 trillion yen. French max turnover is VINCI(4.2 trillion yen), and Japanese max is Shimizu construction company(1.4 trillion yen).

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EU sum total: 41,997 yen, Japan Top 50 subtotal: 16,507 yen, Japan Top 100 subtotal: 13,127 yen, Japan Top 150 subtotal: 10,266 yen.
With using the other net profit data, we calculated net profit to sales value of each region, and statistically compared.
As it is very clear to see the median value of the two tables, the Japan keeps relatively low value than the European countries in recent years.
Let’s move on to the today’s main subject.
We use Business Evaluation Results (BERs) as micro data. “Micro data” means the data of the respondent level which is not aggregated. It treats various contents of the construction enterprise, and the data scale is quiet large.
The contents of the data released are corporate profiles, evaluation points, completed work amount and number of engineers, labour welfare situations, and financial conditions.
The BERs includes some kind of data which cannot be said as a construction enterprise. Some famous trading enterprises, electric makers, etc. are on the list. It is not good to recognize these to be the construction enterprise.
Therefore, the principal occupation ratios (POR) are calculated from the rate of the completed work amount (CWA) to sales. We analyze 80% or more data and others throw away.

The BERs data includes some kind of data which cannot be said as a construction enterprise. Some famous trading enterprises, electric makers, etc. are on the list. For example, Toshiba and Hitachi. It is not good to recognize these to be the construction enterprise.
Therefore, the principal occupation ratios (POR) are calculated from the rate of the completed work amount (CWA) to sales. We analyze 80% or more data and others throw away.
BERs Data’s coverage is very high. This figure is the structure of Japanese construction industry. The pink area means approved construction enterprises which is about 500 thousand. And the green area means the BERs Data which is about 150 thousand. Most public purchaser uses the Business Evaluation Results i.e. BERs. Therefore, active construction enterprises are covered. In Japan, there is two types of construction approval licenser. One is nation-wide MLIT Minister’s approval, and another is local level Prefecture governor’s approval.
These histograms are drawn by those two licensors. Principal occupation ratios i.e. POR means the value of Construction sales divided by All sales of an enterprise. The red thin vertical line in these figure is the mean value of each category. As you see the mode is 100% in both histograms. And you can also see there are some enterprises which have relatively low POR value. Some famous trading company (Mitsui Bussan), electrical maker company (Hitachi), etc. are on the BERs enterprise list. It is not good to recognize these low POR data to be the construction enterprise. Therefore, we analyzed 80% or more POR value data and others should be omitted. The table below is the number of usable data in this analysis. The valid BERs data is 117 thousand. We analyzed these data.
This Figure is Scatter diagram of Completed Work Amount (x-axis) and Principal Occupation Ratio (y-axis) by 2 permission classifications. In this figure all the BERs data over 150 thousand enterprises are plotted. The 5 points in the right upward side is so called “Japan’s Big 5”. As you know, these are Kajima, Shimizu, Obayashi, Taisei and Takenaka.

You can also see that the blue points have relatively high completed work amounts. As mentioned, less than 80% of POR are omitted. Omitted part seems to be a large portion, but it is about 20% of all.

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You can also see that nation-wide MLIT Minister’s approval enterprises which are blue points, are relatively have high completed work amounts.
We used two analysis attributes category. One is classifications of work. We divided into these 8 types of work. Such as 00. General construction, 01.Civil engineering, 02.Building, 08.Electrical, 09.Piping, 13.Paving, 20 Machinery installation, 22.Telecommunications, and Others (all 29 classification). The above 8 types of BERs has relatively high coverage and position in the industry.

**capital class:** the following three are established by this analysis, usually used in the common statistics in Japan

1. **Large Enterprises:** Capital is more than 1 billion yen
2. **Middle-sized Enterprises:** Capital is less than 1 billion and more than 100 million yen
3. **SMEs:** Capital is less than 100 million yen
This table is representative values of 6 profitability indices of valid BERs data. It is aggregated in the total number, and by the enterprise scale and by the main work types.
In our paper, 2 profitability indices are investigated in detail. The one is Gross profit to sale. It is the source of competitive strength of an enterprise. The figure is plotted by capital class. As you notice, SMEs data have so many outliers.

Figure 4: CWA and Gross profit to sales by the scale of enterprise (Valid BERs data; n=105,090)
This figure is also drawn the Gross profit to sale ratios according to main construction types. Some differences can be found in data number. And, “00 General construction” has little variation, but others have much variation and outliers.
A scatter diagram of assets turnover and ordinary profit to sales is shown. Each enterprise data should be fastened by this mathematical expression. The median of assets turnover is 1.557 times, and that of ordinary profit to sales is 0.586%. Ordinary profit to assets can be seen with the level of hyperbolic curve drawn based on this identity formula. The median is 0.905%. But, as you can notice, there is no settlements. There are many outliers to each median values, especially in SMEs.
Profitability indices varies considerably. So, there should be prudence to show the amount of variance in the presentation of each index level.

Moreover, there are many outliers especially in SEMs. There are credibility problems of accounting numerical value.

It is very important for QS to catch the conditions of profitability of construction industry. In the Pacific and Asian nations, there might exist differences of accessibility to the financial information of construction enterprises.

It would be useful to exchange information of this kind by the cooperation of the member QS.
Thank you for listening.
Please contact us. We are happy to discuss in the E-mail.

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