

**A STUDY OF GENERAL CONTRACTORS' MANAGEMENT STRATEGIES:  
A TIME SERIES ANALYSIS OF THE ENR TOP INTERNATIONAL  
CONTRACTORS 225**

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**Abstract**

Today's construction market and industry are in a state of chaos throughout the world. The globalization of this market demands that national governments and construction contractors associations, as well as construction contractors, set in place effective strategies to overcome such turmoil. This paper examines the strategies used by major contractors. These contractors were selected from a series of international rankings, which was compiled and published by the U.S. based Engineering News Record. Starting with data from 2000, three trends were observed. Firstly, Chinese contractors stand out with strong performances. In the 2012 ranking, five out of the top 10 contractors were Chinese. Their growth is derived from China's high domestic demands. Secondly, while some American and European contractors have done well, others have not. Several firms increased their revenues and thus kept their top 10 statuses. The fates of European contractors seem to be related to how well they adjusted to the economic unification of the European Union. The last major trend is the disappearance of Japanese contractors, which used to always secure positions in the top 10 rankings until about 2005. Possible reasons for this change are: the drastic reduction of the Japanese domestic market due to an aging population with a declining birthrate, policy changes in public construction spending, and the contractors' delayed reactions to markets abroad. We analyze the management strategies used by major contractors and aim to speculate upon probable future trends.

**Keywords:** corporate strategy, general contractor, construction industry, construction market, engineering news record.

## 1. OVERVIEW OF THE STUDY

### 1.1. Background: The Rapidly Changing Global Construction Market

Today's construction market and industry are in a state of worldwide turmoil. The center of this global construction market is shifting rapidly from the U.S., Europe and Japan to China, South East Asia, the Middle East, Central Europe and Africa. Most notably, Japan's investment in the construction sector reached 84 trillion yen in 1992 and thus Japan became the world's largest construction market, surpassing those of the U.S. and the entire European Union (EU) at that time. However, with the burst of the Japanese bubble economy, the country's aging population with a declining birthrate, the reduction in public construction spending and the saturation of existing construction, Japan's investment declined to approximately 49% of its peak in 2010. The European and the American markets have also been struggling due to the global financial crisis, which began in the U.S. in 2007, and the European debt crisis, which started in 2009.

Figure 1 shows the changes in the size of various construction markets between 2008 and 2012, as well as their estimated size in 2013 (Ifo Institute, 2012). The countries shown in this figure contain the headquarters of the contractors that we selected for this study. While China's growth is outstanding, the world's major contractors continue to maintain their bases in their home countries where domestic markets are stagnated. New effective strategies must be set in place by these nations' public administrations, construction contractors associations and construction contractors so that they can adapt themselves to the changes in the construction market.

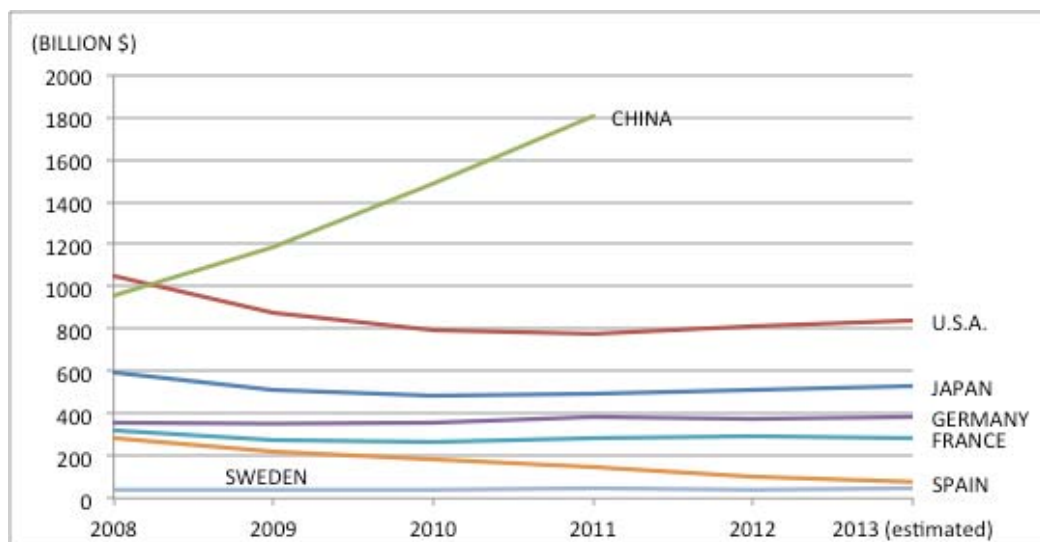


Figure1: Trends in Construction Spending

## **1.2. Objectives: Understanding the Strategies used by Successful Global Contractors**

The aim of this study was to understand the strategies used by the world's major contractors in the above-described context. Such contractors were selected from a series of international revenue-based rankings, compiled and published by the U.S. based Engineering News Record (hereafter referred to as the ENR Top 225). Because American and European advances in overseas operations are particularly remarkable, we examined the performances of some American and European contractors with growing revenues. Then, we extracted some of these contractors' salient points, which seemed most relevant to what Japanese contractors should take into account in order to better equip themselves for the coming years.

## **1.3. Methods: A Time Series Analysis of the ENR Top 225**

The ENR Top 225 contains two rankings. One is the ENR Top 225 International Contractors (hereafter referred to as the ENR Int'l Top 225), in which "companies are ranked according to construction revenue generated outside of each company's home country in U.S. \$ millions" (ENR, 2012). The other ranking is the ENR Top 225 Global Contractors (hereafter referred to as the ENR Global Top 225), which ranks contractors according to their total revenue (in millions of U.S. dollars), i.e., from both inside and outside each contractor's home country. Each contractor's domestic revenue can be calculated by subtracting the revenue listed in the first ranking from that in the second. Both of these rankings are based on revenues from the previous year. In both of these ENR Top 225 rankings, contractors' total revenues are divided into the following 10 sectors and the revenue from each sector is shown as a percentage: general building, manufacturing, power, water supply, sewerage/solid waste, industrial process, petroleum, transportation, hazardous waste, telecommunications and others.

Using data from these two ENR Top 225 rankings over a period of 13 years (from 2000 to 2012), we analyzed the management strategies adopted by the selected contractors. More specifically, we studied the changes over time in each contractor's rankings, the ratio of their overseas operations and their distribution of work among the 10 sectors.

## **2. TRENDS AMONG THE MAJOR CONTRACTORS**

### **2.1. Comparison of the 2000 and 2012 ENR Global Top 20 Rankings**

To keep our analysis results simple, we extracted and compared the top 20 contractors from the ENR Global Top 225 in 2000 and 2012 (see Tables 1 and 2 respectively). We found the following three significant changes between these two rankings at the beginning and the end of the 13-year period:

Firstly, Chinese contractors stand out due to their strong performances. In the 2012 ranking, five out of the top 10 contractors were Chinese. Their growth is mostly due to China's high

domestic demands, a phenomenon akin to that of Japanese contractors in 2000. The Chinese contractors' overseas activities are small in proportion to their overall operations, but they are not insignificant (in terms of monetary value) when compared to those of Japanese contractors in 2000. The main overseas destinations of the 52 Chinese contractors listed in the ENR Top 225 are Africa, Asia and the Middle East. Approximately 40% of the overall revenue earned by foreign contractors in Africa is attributed to the Chinese. This share exceeds that of all of the European contractors put together.

Secondly, while some American and European contractors have done well, others have not. Several contractors from the U.S., Germany, France and Spain increased their revenues and maintained their top 10 statuses. The fates of European contractors seem to be associated with how well they have adapted themselves to the economic unification of the EU. The introduction of the euro as a common currency, as well as the free movement of people, goods, capital and services within the EU, must have affected the European contractors during the years between 2000 and 2012. The GDP of the EU as a whole is around 2.5 times more than that of Japan, and it is comparable to that of the U.S. With respect to the construction market, the EU market was approximately four times larger than the Japanese market in 2008.

The last notable change is the disappearance of Japanese contractors, which used to always secure positions in the top 10 rankings until around 2005. The drastic reduction of the Japanese domestic market due to an ageing population with a declining birthrate, policy changes in public-sector construction spending and contractors' delayed reactions to the markets abroad are believed to be the main reasons for this deterioration. Prior to the Great East Japan Earthquake in March of 2011, the Japanese Ministry of Land, Infrastructure, Transport and Tourism used to urge large contractors to shift their focus abroad in order to resolve the problem of domestic supplier surplus in the construction industry. The market that these Japanese contractors have picked as their immediate target is the improvement of infrastructure in South East Asia. Because the European construction sector is also highly interested in this area, competition is expected to grow significantly fiercer in the coming years. In the meantime, the new need for reconstruction after the Great East Japan Earthquake and Japan's Liberal Democratic Party's take-over of political power in December of 2012 have brought many Japanese contractors' focuses back to the Japanese domestic civil construction sector. Therefore, the future of Japan's policies regarding the internationalization of its contractors and that of the Japanese construction sector's related strategies is not clear.

RANK	FIRM	NATIONALITY	REVENUE (MIL. \$)	
			TOTAL	INT'L
1	TAISEI CORP.	Japan	13,909	681
2	SHIMIZU CORP.	Japan	12,261	760
3	KAJIMA CORP.	Japan	11,591	1,097
4	BOUYGUES	France	11,462	5,007
5	BECHTEL	U.S.A.	11,240	7,442

6	OBUYASHI CORP.	Japan	10,538	843
7	TAKENAKA CORP.	Japan	9,258	691
8	VINCI	France	9,098	3,600
9	FLUOR CORP.	U.S.A.	8,707	4,669
10	KVAERNER PLC GROUP	U.K.	8,420	6,540
11	KUMAGAI GUMI CO. LTD.	Japan	8,407	782
12	SKANSKA AB	Sweden	8,232	5,984
13	HOCHTIEF AG	Germany	7,833	4,402
14	GROUPA GTM	France	7,591	3,162
15	KELLOGG BROWN & ROOT (KBR)	U.S.A.	6,399	4,721
16	TODA CORP.	Japan	5,680	89
17	EIFFAGE	France	5,645	708
18	BOVIS LEND LEASE	U.K.	5,341	4,113
19	NISHIMATSU CONSTRUCTION CO. LTD.	Japan	5,209	721
20	KINDEN CORP.	Japan	4,934	174

Table 1: 2000's Top 20 Contractors in the ENR Global Top 225 (in millions of U.S. dollars)

RANK	FIRM	NATIONALITY	REVENUE (MIL. \$)	
			TOTAL	INT'L
1	CHINA RAILWAY GROUP LTD.	China	79,852	2,827
2	CHINA RAILWAY CONSTRUCTION CORP. LTD.	China	77,947	3,782
3	CHINA STATE CONSTRUCTION ENG'G CORP. LTD.	China	68,326	4,510
4	VINCI	France	52,404	18,674
5	CHINA COMMUNICATIONS CONSTRUCTION GROUP LTD.	China	46,007	9,547
6	GRUPO ACS	Spain	42,083	31,148
7	HOCHTIEF AG	Germany	33,775	31,871
8	BOUYGUES	France	31,656	12,608
9	CHINA METALLURGICAL GROUP CORP.	China	31,529	2,623
10	BECHTEL	U.S.A.	25,005	16,700
11	LEIGHTON HOLDINGS LTD.	Australia	21,203	3,921
12	STRABAG SE	Austria	20,071	17,289
13	FLUOR CORP.	U.S.A.	18,685	13,527
14	SINOHYDRO GROUP LTD.	China	18,086	4,400
15	KAJIMA CORP.	Japan	16,790	2,456
16	SHANGHAI CONSTRUCTION GROUP	China	16,683	1,110
17	FCC, FOMENTO DE CONSTR. Y CONTRATAS SA	Spain	16,344	8,570
18	SKANSKA AB	Sweden	16,233	12,339
19	OBUYASHI CORP.	Japan	15,567	2,077
20	SHIMIZU CORP.	Japan	14,876	1,227

Table 2: 2012's Top 20 Contractors in the ENR Global Top 225 (in millions of U.S. dollars)

## **2.2. Changes Over Time in the Gross Sales of 17 Contractors**

Keeping in mind this study's objectives, we selected the following 17 contractors from Tables 1 and 2 for analysis:

- Bechtel and Fluor Corporation, two American contractors that are in the top 20 in both years' rankings; Bouygues and Vinci, two French contractors that are in the top 10 in both years; and Hochtief AG from Germany
  
- Grupo ACS, a Spanish contractor that grew rapidly and entered the top 10 in 2012
  
- Five from China: China Communications Construction Group Ltd., China Metallurgical Group Corporation, China Railway Construction Corporation Ltd., China Railway Group Ltd. and China State Construction Eng'g Corporation Ltd.
  
- Five large contractors from Japan: Kajima Corporation, Obayashi Corporation, Shimizu Corporation, Taisei Corporation and Takenaka Corporation
  
- Skanska AB from Sweden, which was included the top 10 ranking seven times over the 13-year period (though it was not included in the top 10 in 2000 or 2012). Despite the fact that this contractor is similar in size to the top Japanese contractors, its overseas business accounts for a higher share of its overall operations than those of its Japanese counterparts.

Figure 2 shows the changes in the total revenues of these 17 contractors over time. The Chinese contractors surpassed the Japanese around 2005, and outperformed the growing European contractors in 2009 when they stagnated due to the European debt crisis. Regardless of the global economic turmoil, China's investment in construction continued to grow with the aim to achieve a minimum standard of living in its urban societies. The two American contractors grew rather more moderately than the Europeans, but their performances also deteriorated when the global financial crisis sprang up in their own country. The Japanese contractors also showed moderate growth up to 2009, as that period coincided with Japan's second-generation baby boomers' house purchases. However, the performance of the Japanese contractors took a down swing in 2009 with the wake of the global financial crisis. Reconstruction projects after the Great East Japan Earthquake are the reason for the Japanese contractors' slight recovery in 2011. The Swedish contractor Skanska AB shows a trend similar to that of the Japanese contractors.

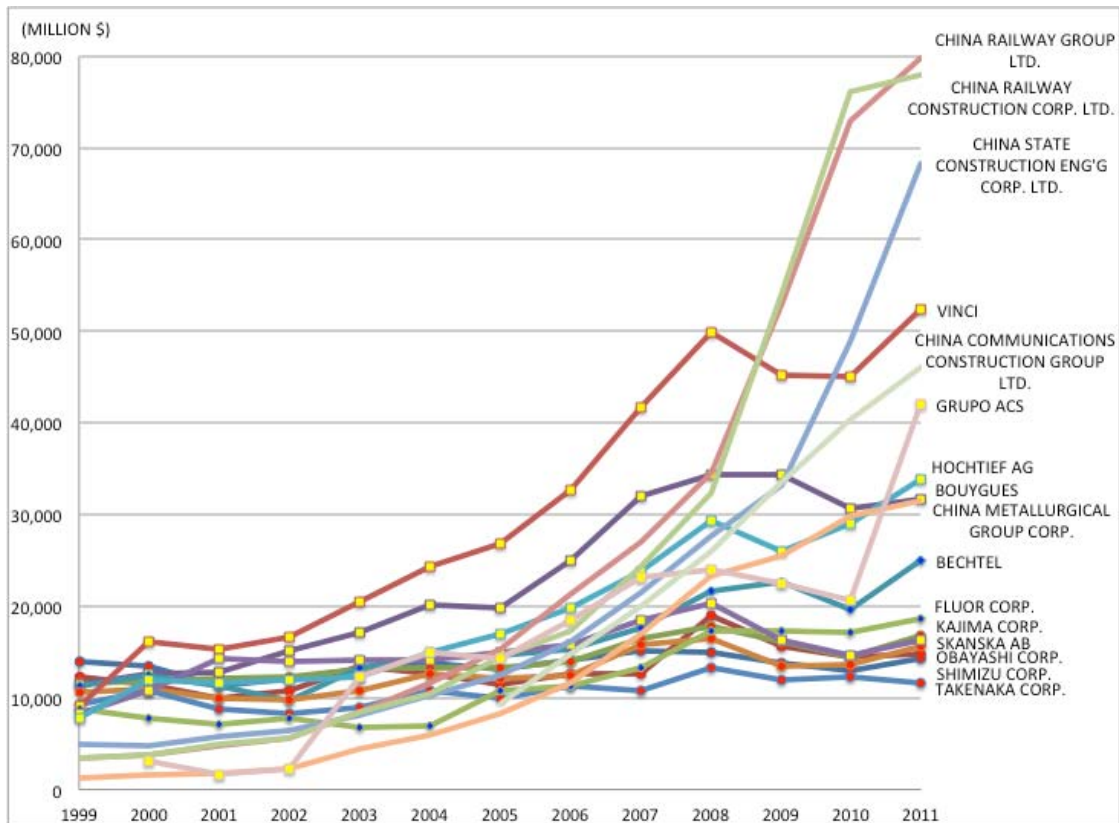


Figure 2: Changes Over Time in the 17 Contractors' Gross Sales (shown by their company names in 2012)

While Figure 2 shows the 17 contractors' total revenues in U.S. dollars, we must take into consideration currency exchange rates in order to more accurately study the performance of the Japanese contractors. Figure 3 compares the total revenue of the Taisei Corporation, the top Japanese firm in the ENR ranking of 2000, in yen and dollars. (The yen values come directly from Taisei's securities reports, and the dollar values directly from the ENR Top 225.) Using this company's revenue in 2002 as the baseline, i.e. 100%, its revenue in the two currencies are compared over time. The Japanese contractors drew 90% of their total revenues from domestic operations. Taisei's revenue in yen shows a more significant drop than its revenue shown in dollars.

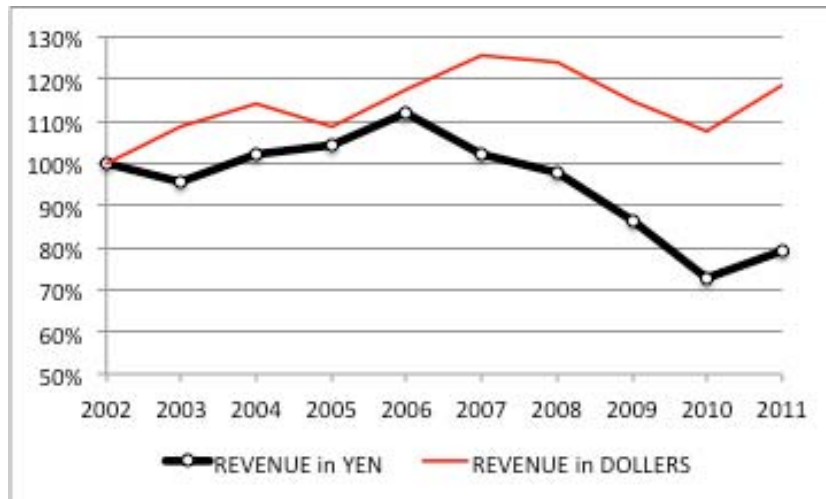


Figure 3: Changes Over Time in Taisei Corporation's Revenue in Yen (Security report) and in U.S. Dollars (ENR data), using its revenue from 2002 as the baseline

### 3. ANALYSIS OF THE MAIN TOPICS OF INTEREST

Based on the data from the 17 contractors, we extracted three topics of interest, which we will analyze in the following sub-sections.

#### 3.1. The Strategies Used by Grupo ACS and Hochtief AG, the Two Growing EU Contractors

Grupo ACS grew due to its domestic earnings in Spain until the onset of the global financial crisis. In 2007, this company's overseas work accounted for only 16% of its overall operations. Since then, however, the Spanish domestic market has shrunk radically (see Figure 1), and so did Grupo ACS's revenue in 2009 and 2010. Nevertheless, this company drastically increased the share of its overseas operations in 2011 and thus grew significantly in total revenue. In that same year, Grupo ACS acquired the majority of Hochtief AG's stock through a tender offer. (As mentioned earlier, Hochtief AG is a growing German contractor.) Despite the fact that Grupo ACS is a young company that was founded in 1997, it has been actively expanding its operations through business acquisitions from its start. Currently, this company operates as a corporate group of 10 companies in the areas of construction, environmental business, concession business and energy, and has approximately 140,000 employees worldwide. Hochtief AG and Grupo ACS were ranked first and second on 2012's ENR Top Int'l 225 in the regional categories of Asia and the U.S. Grupo ACS also claimed a large share of the Spanish-speaking Latin American construction market.



### 3.2. The Relationship Between the Reduction of Domestic Markets and the Shifting of the Contractors' Focuses to Overseas Operations

Figure 4 shows the changes in the ratios of the 17 contractors' overseas operations over time. How each country handles its overseas advances is apparent. The Chinese and Japanese contractors have low ratios of overseas operations, while the French maintain their ratios at around 40%. The Americans, on the other hand, have raised the percentages of their overseas work over the 13-year period.

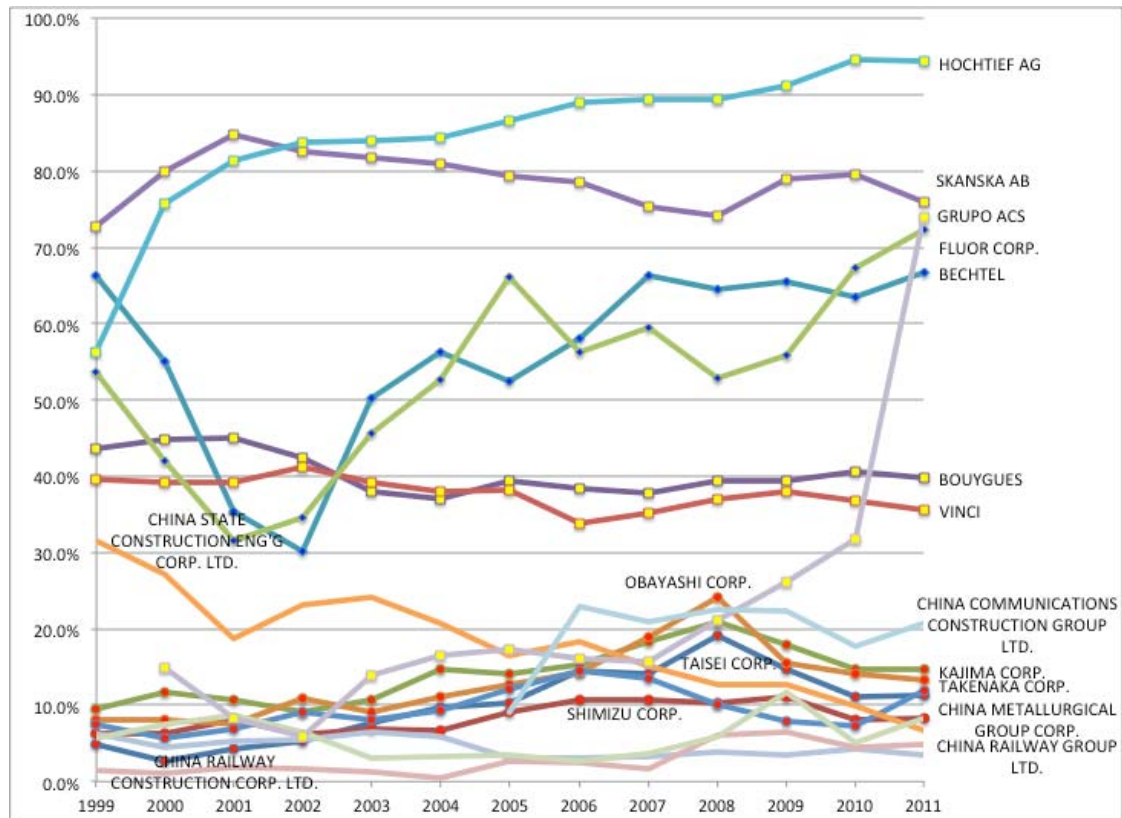


Figure 4: Changes Over Time in the 17 Contractors' Ratios of Overseas Operations (shown by their company names in 2012)

Until now, Japanese overseas advances have served to compensate for drops in domestic demands, which almost always have been high. Japanese contractors' aim was to allocate their excess labor abroad. Their advances in the Middle East after the 1970s energy crisis and in South East Asia in the first half of the 1980s are typical examples. The contractors that made these advances never fully developed their foreign operations, because they expected Japan's domestic market to recover quickly. Although these large contractors still have branch offices and affiliated local companies there, they mostly operate on a project-to-project basis by sending small numbers of managers from Japan to oversee the construction of local facilities for Japanese client firms that are expanding their businesses in those regions. Recently, Japan's Abe Administration decided to move forward with its intention to join the

Trans-Pacific Partnership (TPP). We wait with keen interest to see how Japanese contractors will react to this new development.

Hochtief AG and Skanska AB have consistently maintained high ratios of overseas operations over the 13 years. Skanska AB has had operations in 50 countries during the same period, and its ratio of overseas activities has been stable at around 80%. This contractor has two goals to achieve whenever they enter a foreign market. One is to become one of the top three construction contractors in that market. The second is to have a local base in every country where they have operations. These goals served as a driving force for this company to acquire businesses in Europe and the U.S. and to grow in revenue between 1998 and 2000. However, Skanska AB's revenue has not grown since the onset of the global financial crisis (see Figure 2). It will be interesting to observe how this company will maneuver to gain a foothold in newly developing markets that are replacing the U.S. and Europe.

### **3.3. Differences Between a Contractor's Strong and Weak Sectors, in Both Domestic and Overseas Markets**

Table 3 shows the by-sector components of the gross sales and the overseas sales of 12 contractors. The 12 companies are the result of eliminating the Chinese contractors from the 17 selected contractors. Each company's gross sales and their by-sector components were compared with their overseas sales, and the differences calculated. Cells with absolute values greater than 10 are marked with bold borders. We found that the European and American contractors with high ratios of overseas operations have similar distributions of revenue among the 10 sectors in their overseas and gross sales. In other words, these contractors are strong in the same sectors both domestically and abroad. In contrast, the Japanese contractors have smaller ratios of overseas revenue generated from building projects than they do overall. Instead, high proportions of their overseas sales come from civil engineering and infrastructure projects. In other words, the Japanese are using a strategy of reutilization abroad; they take advantage of technologies that have already been employed in Japan for their overseas projects. Such technologies include long span bridges, undersea tunnels, water and sewerage treatment and bullet trains.

FIRM	REVENUE \$ MIL.			GEN. BLDG.	MFG.	POWER	WATER SUPPLY	SEWER/WASTE	INDUS./PETRO.	TRANSP.	HAZ. WASTE	TELECOM	OTHER
HOCHTIEF AG	INT'L	31871	(A)	30	2	2	7	3	6	24	0	5	21
	TOTAL	33775	(B)	32	1	2	7	3	5	24	0	5	21
			(A) - (B)	-2	1	0	0	0	1	0	0	0	0
GRUPO ACS	INT'L	31148	(A)	25	1	13	6	3	5	26	0	4	17
	TOTAL	42083	(B)	22	1	14	6	6	6	29	0	3	13
			(A) - (B)	3	0	-1	0	-3	-1	-3	0	1	4
VINCI	INT'L	18674	(A)	13	0	12	2	0	8	51	1	5	8
	TOTAL	52404	(B)	16	0	12	2	0	4	39	1	5	21
			(A) - (B)	-3	0	0	0	0	4	12	0	0	-13
BECHTEL	INT'L	16700	(A)	0	0	0	0	0	70	30	0	0	0
	TOTAL	25005	(B)	0	0	17	0	0	54	22	5	2	0
			(A) - (B)	0	0	-17	0	0	16	8	-5	-2	0
BOUYGUES	INT'L	12608	(A)	29	0	3	1	1	2	60	1	0	3
	TOTAL	31656	(B)	38	0	5	1	1	3	49	0	1	2
			(A) - (B)	-9	0	-2	0	0	-1	11	1	-1	1
SKANSKA AB	INT'L	12339	(A)	47	3	2	3	3	5	31	0	3	3
	TOTAL	16233	(B)	53	2	2	3	2	4	29	0	3	2
			(A) - (B)	-6	1	0	0	1	1	2	0	0	1
KAJIMA CORP.	INT'L	2456	(A)	50	22	2	0	1	2	20	0	3	0
	TOTAL	16790	(B)	54	13	4	2	2	3	12	0	1	9
			(A) - (B)	-4	9	-2	-2	-1	-1	8	0	2	-9
OBAYASHI CORP.	INT'L	2077	(A)	38	10	4	12	2	0	30	0	2	2
	TOTAL	15567	(B)	59	8	3	3	1	7	15	0	2	2
			(A) - (B)	-21	2	1	9	1	-7	15	0	0	0
TAISEI CORP.	INT'L	1597	(A)	2	4	0	1	0	0	79	0	0	14
	TOTAL	14259	(B)	55	12	1	1	1	0	25	0	0	5
			(A) - (B)	-53	-8	-1	0	-1	0	54	0	0	9
TAKENAKA CORP.	INT'L	1397	(A)	11	48	0	0	36	0	0	0	0	5
	TOTAL	11675	(B)	77	15	0	0	5	0	0	0	0	3
			(A) - (B)	-66	33	0	0	31	0	0	0	0	2
SHIMIZU CORP.	INT'L	1227	(A)	36	29	9	3	0	18	4	0	0	1
	TOTAL	14876	(B)	56	9	3	2	1	9	8	1	4	7
			(A) - (B)	-20	20	6	1	-1	9	-4	-1	-4	-6
FLUOR CORP.	INT'L	13527	(A)	16	1	3	0	0	75	5	0	1	0
	TOTAL	18685	(B)	13	1	5	0	0	65	10	4	2	0
			(A) - (B)	3	0	-2	0	0	10	-5	-4	-1	0

Table 3: Comparison of the By-Sector Ratios of the Major European, American and Japanese Contractors' Gross and Overseas Sales

#### 4. CONCLUSIONS: RECOMMENDATIONS FOR JAPANESE CONTRACTORS

The reduction of Japan's construction market is an inevitable consequence of the country's economic and social maturity. In the coming years, Japanese contractors must use strategies that are based on that reality. They must gear themselves towards new markets: the reconstruction needs in the Japanese domestic market due to an aging population and a declining birthdate and overseas operations. This study mainly focused on the latter market, i.e. overseas. Below, we summarize the actions that we believe are necessary for Japanese contractors to succeed in foreign markets.

Japanese contractors depend highly on multi-layered subcontractors for on-site work in the domestic market. They base their project management on the close ties that they establish with their subcontractors. Thus far, they have applied the concept of "nurturing" similar production systems in their overseas operations. However, in order to adapt themselves quickly to the rapid changes in the market, Japanese contractors should consider the possibility of acquiring overseas businesses, as in the case of Grupo ACS and Hochtief AG. In the manufacturing industry, for instance, it is not unusual for foreign contractors to acquire local enterprises to facilitate their operations in new locations, as well as to merge and acquire businesses to develop new markets there. At the same time, it is important for

Japanese contractors to study the mechanisms that European contractors use to manage their corporate groups from their home headquarters while they expand their businesses through mergers and acquisitions internationally.

Some EU countries have regulations to limit the subcontracting of labor to one tier, thus forcing contractors to employ skilled workers directly. In the construction sector, where the amount of work fluctuates greatly, the direct employment of such workers is a burden on the contractors. However, EU contractors seem to reduce the impact of this burden by increasing their workers' on-site productivity. Japanese contractors must learn from such management strategies.

Lastly, we found that the top Japanese contractors are strong in different sectors overseas than in the Japanese domestic market. At present, their strengths abroad correspond to the areas that have already been thoroughly researched and implemented in Japan. In order to keep their strong footholds abroad, Japanese contractors must set in place mechanisms for research, development and implementation that are especially geared toward foreign markets.

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