

The Construction Sector Suffers from Declining Labor Productivity

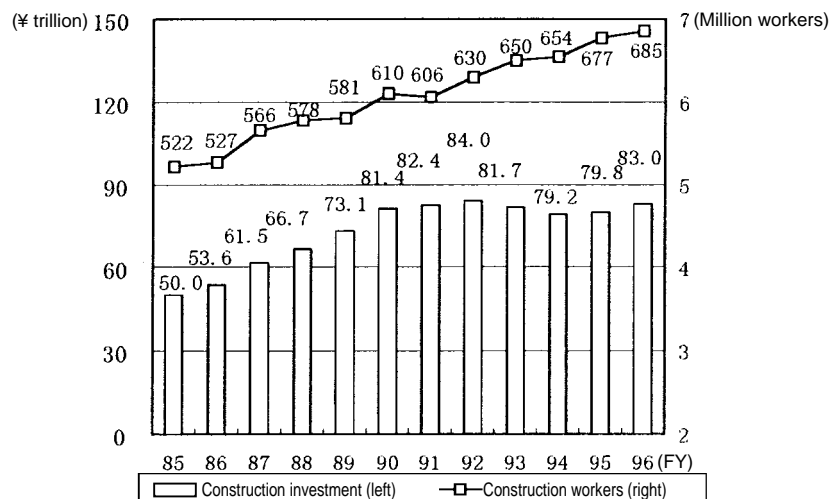
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Labor productivity in the construction sector has traditionally been low due to its labor intensive nature and multi-layered structure. This productivity has continued to slide in recent years, exacerbated by an influx of workers in the 1990s as the government tried to pump up the economy through public works spending. To survive recent public works spending cuts and an otherwise harsh business climate, the sector needs to pursue mechanization, standardize building components, trim indirect costs, and build an efficient framework to integrate specialized operators.

1. Construction Workers Kept Increasing After the Bubble Collapsed

Despite sluggish growth in private construction investment during the 1990s, the number of construction workers actually grew by 790,000 from 6.06 million in March 1992 to 6.85 million in March 1997. This reflects the increase in public works spending as part of the economic stimulus packages, which benefited regional construction industries and small and mid-size builders. The number of companies licensed by national and prefectural governments rose by 56,000 from 509,000 in March 1990 to 565,000 in March 1997 (Figure 1).

Figure 1 Construction Investment and Workers



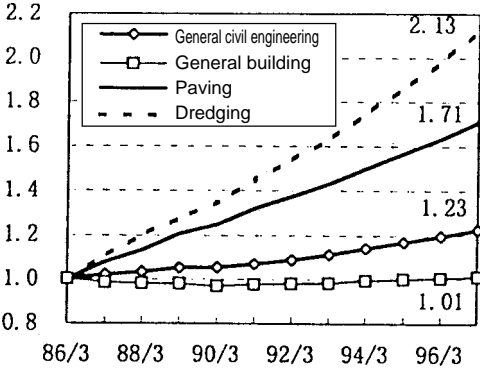
Note : Construction workers are counted at the of end of the fiscal year.

Construction investment figures for fiscal 1995 and 1996 are estimates.

Source : MOC, *Construction Investment Forecast*; MACA Statistics Bureau, *Labor Force Survey*.

Most of the growth in licensed builders since 1990 has come in the civil engineering field, particularly in dredging, paving, and general civil engineering. On the other hand, the number of licensed general construction companies has remained unchanged (Figure 2).

Figure 2 Licensed Operators by Industry Segment



Note: Values are indexed with March 1986 as 1.0.
 Source: MOC, *Status of Licensed Operators in the Construction Industry*.

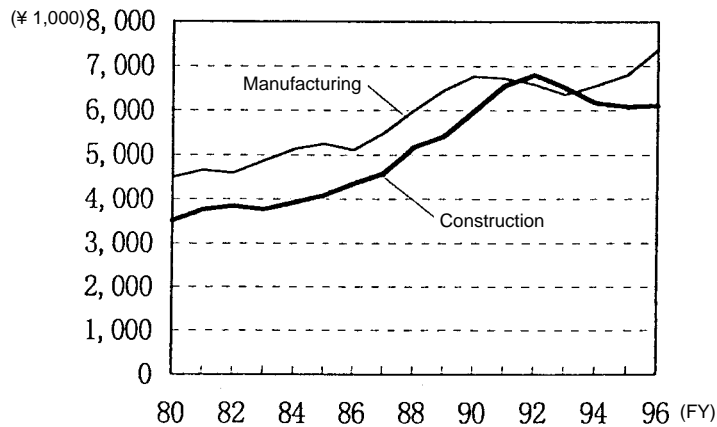
2. Declining Undertone of Labor Productivity

While construction investment has been sluggish since peaking in fiscal 1992, the large increase in construction workers centered around civil engineering has caused labor productivity in the overall construction sector to trend downward.

Net productivity, which measures the annual value added per employee, peaked in fiscal 1992 and has plunged since then. The decline in this productivity measure, which held firm even during the "construction winter" of the early 1980s, is the largest in the postwar era.

By comparison, the manufacturing sector has consistently maintained a high net productivity with the exception of fiscal 1992 and 1993. After bottoming out in fiscal 1993, net productivity rose above the bubble period level in fiscal 1996, indicating that the manufacturing sector's diligent restructuring efforts were paying off despite the strong yen and weak economy. As a result, by fiscal 1996 net productivity in construction amounted to only 83 percent of that in manufacturing (Figure 3).

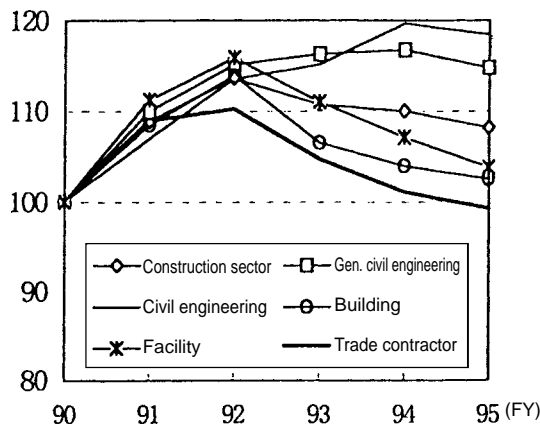
Figure 3 Value Added per Employee



Notes: Value added per employee = Value added / (No. of managers + No. of employees)
 Value added = Net operating profit (Operating profit - Interest expense) +
 Management salaries + Employee salaries + Employee welfare expense +
 Interest expense + Rent + Taxes
 Source: MOF, *Annual Statistics on Incorporated Enterprises*.

Moreover, by category of licensed operators, since fiscal 1990 net productivity has been particularly low among trade contractors, who mainly do subcontracted work. In fiscal 1995, it even dropped in civil engineering and general civil engineering despite the benefit of expanded public works investment, indicating that the construction labor force was greater than warranted by demand (Figure 4).

Figure 4 Value Added by Industry Segment



Notes: Value added per worker is indexed with fiscal 1990 as base year of 100.
 Value added per employee = Completed work - (Cost of materials, labor, outsourcing, and side business) / No. of employees.
 Industry segments are defined as follows.
 General civil engineering: Completed civil engineering work comprises 20-80% of overall work.
 Civil engineering: General civil engineering, paving, dredging, water works, landscaping.
 Building: General building.
 Facility work: Electrical work, sedge work, machinery installation, insulation work, telecommunications work, well drilling, fire safety equipment work, sanitation equipment work.

Trade contractor: Carpenter work, plastering, scaffolding/earthwork/concrete, stone-work, roofing, tile/brick/block work, steel structure work, reinforcing bar work, sheet metal work, glass work, painting, waterproofing, interior work, fitting work.
Source: MOC, *Business Analysis of the Construction Industry*.

Since fiscal 1997, cutbacks in public works investment and the persistent slump in private capital investment have made conspicuous the construction sector's falling labor productivity and excess employment, accentuating the sense of gloom in the business climate.

3. Why Labor Productivity Lags Behind Other Industries

The construction sector's low labor productivity relative to manufacturing over the long term can be attributed to the following problems unique to the construction sector.

(1) Built-to-order production

Due to the unique nature of each construction project and strong owner input in projects, it is difficult to standardize and rationalize work. Problems also arise while work is in progress, such as frequent specification changes and complaints.

(2) Labor intensiveness

Construction tends to be labor intensive because in addition to being built-to-order in different locations, construction work involves moving materials outdoors. In fiscal 1995, labor's relative share (proportion of labor cost in value added) was 80 percent for construction, compared to the average of 73 percent for all industries.

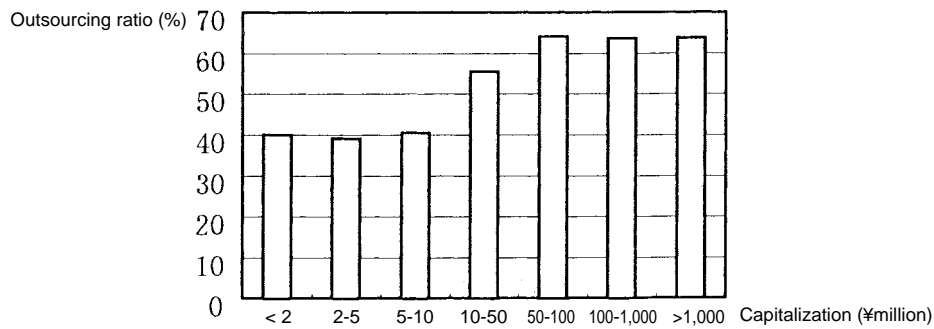
(3) Small company size

Of the 565,000 construction operators, only 6,061 companies are large companies with a capitalization of at least 100 million yen, while the other 90 percent are small and mid-sized companies and individual proprietorships. Thus the level of managerial expertise is rather low overall.

(4) Complex division of functions

The construction sector has a vertical structure in which the fifty largest general contractors receive one fourth of the 80 trillion yen in annual construction investment. Moreover, over 40 percent of the construction revenue of large general contractors as well as smaller operators is dedicated to outsourcing. For construction projects of all sizes, general contractors manage a complex multi-level structure of subcontractors to supply everything from manual laborers to specialists (Figure 5).

Figure 5 Outsourcing Ratio (by capitalization)



Note: Outsourcing ratio is the proportion of outsourcing cost in cost of completed work.
Source: MOC, *Business Analysis of the Construction Industry* (FY 1995).

However, many criticisms have been made of the multi-layer structure of subcontracting. In a survey by the Institute for Construction Economics, over half the construction operators who responded saw problems with the system: 22.3 percent said the system was necessary but inefficient, while 33.8 percent wanted to abolish the system (Table 1).

Table 1 On Multi-Layer Subcontracting

	Total number
The system is necessary and works well.	7.7%
The system is necessary but inefficient.	22.3%
The system is needed for now, but should be abolished in the future.	33.8%
The system has no problems if execution is properly managed.	36.2%
Total	100.0%

Source: Construction Economics Institute, *FY 1997 Survey of Construction Systems*.

(5) Seasonal fluctuations

Large seasonal fluctuations make it difficult to hire workers on an ongoing basis. Construction orders surge twice a year in March and September, with March orders in particular accounting for 16 percent of the annual total. Since temporary workers must be hired during the peaks, it is difficult to raise the overall skill level of workers.

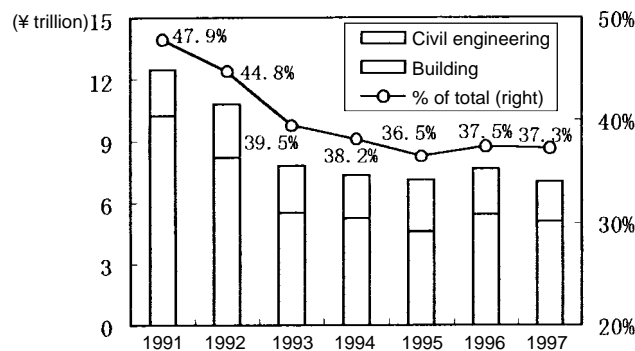
4. Decline in Labor Productivity After the Bubble

In addition to characteristics unique to the construction industry, the decline in labor productivity since fiscal 1992 can also be attributed to the smaller scale of construction projects, lower unit costs, and the preference given to small and mid-sized companies on public works orders.

(6) Fewer large-scale projects

After the bubble collapsed, there was a decline in large-scale building projects, particularly for commercial buildings in metropolitan areas. According to an MOC survey of the 50 largest general contractors, the value of construction orders larger than 1 billion yen fell from 12.5 trillion yen in 1991 to 7 trillion yen in 1997. As a result, the proportion of large construction projects in total orders fell from 47.9 percent to 37.3 percent. The decrease in large construction projects, which achieve high productivity through mechanization and automation, caused overall labor productivity to decline (Figure 6).

Figure 6 Decline in Large Construction Orders

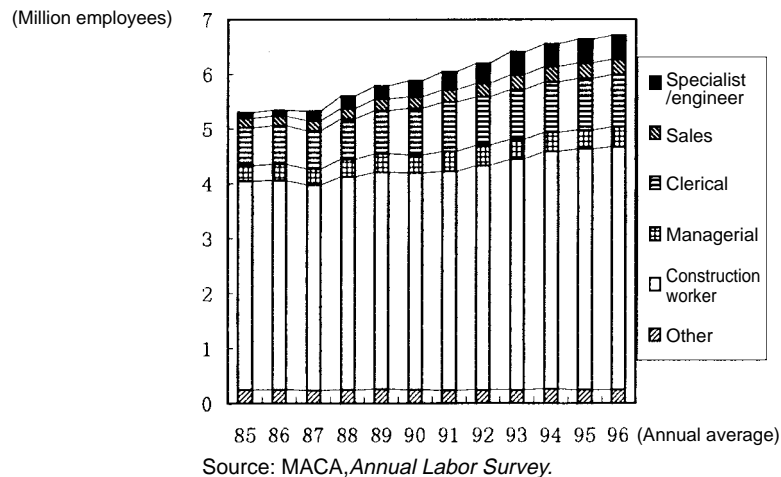


Note: Large construction orders are orders with a value of at least 1 billion.
Source: MOC, *Construction Orders Survey A*.

(7) Bloated staffs

After becoming bloated from the construction boom of the late 1980s, construction companies have been slow to streamline operations. According to a MACA labor force survey, while employment in the construction sector increased by 1.4 million from 1985 to 1996, most of this increase came in staff employees while construction workers, who account for two-thirds of employees, increased by only 620,000. R&D and sales departments remain over-staffed in the 1990s, pulling down overall labor productivity (Figure 7).

Figure 7 Employees in the Construction Sector



(8) Lower unit costs

In addition, budget tightening among customers has in turn put pressure on builders to reduce unit costs, resulting in lower value added.

(9) Reduced Efficiency Due to Policies Favoring Smaller Companies

The government's economic stimulus measures ensure a share of construction orders to small and mid-sized operators either by breaking down orders into manageable size or issuing orders to groups of companies. The excess use of scaled down orders impedes efficiency, and is thought to have contributed to the decline in labor productivity.

5. Raising Labor Productivity

In addition to greater cost transparency and environmental waste issues, labor productivity is a key issue facing the construction sector amid the bleak outlook for construction investment. The following issues need to be addressed.

(1) Mechanization and prefabrication

To reduce the use of labor, the construction sector has pursued mechanization and automation, development of new materials such as pre-cast concrete, and factory production of prefabricated units to simplify processes. The production system needs further improvement at the design and execution levels, and methods to shorten construction time without compromising safety. However, because mechanization essentially involves the transfer of technology from construction companies to machinery makers, efforts should be made to obtain a fair price for the technology, while at the same time developing proprietary technologies.

(2) Reduce indirect costs

As we mentioned earlier, in sharp contrast to the manufacturing sector's aggressive restructuring measures and rising labor productivity, the construction sector has lagged behind in restructuring unproductive areas. While this can be attributed to the priority on digesting the relatively high level of work in progress, it was not very adequate given the harsh business climate. In the future, management costs will need to be reduced in all areas by reviewing operations, building information networks and outsourcing, and either cutting or transferring personnel.

(3) Integrate specialized functions into the division of labor

In construction work, general contractors and specialized contractors are organized either vertically or horizontally. Thus improving the labor productivity of the construction sector overall requires the cooperation of many different operators.

The vertical subcontracting relationships centered around large general contractors are symbiotic in nature and based on long-term business ties. However, these relationships have begun changing in recent years due to intense competition, and the number of equal relationships is growing. Even if the present division of functions persists, productivity improvements can be achieved through greater specialization and uniqueness. A new structure would emerge that effectively integrates these strengths and contributes to higher labor productivity in the construction sector.

(4) Clarify roles

In addition to structural problems within the construction sector, labor productivity improvements are also affected by external problems such as relationships with customers and bidding and contracting procedures for public works projects. After fiscal restructuring prompted criticism of the efficiency and transparency of public works, in February 1998 the Central Construction Council issued proposals emphasizing engineering capabilities, including open competitive bidding with evaluation of engineering proposals for public works, and turnkey contracts that include both design and building. In the private sector, construction management services have gained the spotlight, wherein the customer hires a third party to do the architectural planning, select the builder, and negotiate building expenses. Signs of change have thus begun to appear in the roles of customers, builders, general contractors and specialized operators.

From the perspective of building social infrastructure efficiently, the improvement of labor productivity in the construction sector will lead to greater efficiency and international competitiveness of the overall economy, as well as to the long-term development of the construction industry. On the other hand, the construction sector has long absorbed excess workers from other industries, serving as an adjustment valve for employment. If efficiency in the construction sector is

pursued with the sole objective of improving labor productivity, small and mid-sized subcontractors will be hardest hit. Spending cuts will cause serious employment problems in areas that depend heavily on public works spending such as Hokkaido, Tohoku, and Okinawa. In these areas, the government needs to promote an environment that creates job opportunities and absorbs frictional unemployment generated by structural adjustment. Unlike conventional public works investment, which assumes an unchanging industrial structure, a new approach is needed that supports businesses in creating jobs over the long term and invigorating the economy.

With construction investment accounting for 15 percent of nominal GDP, the structural problems confronting the construction sector have a substantial impact on the national economy. For this reason, the construction sector and government both need to work on long-term solutions.