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Abstract

This paper investigates the scale of direct and indirect services trade, or services content, in Japanese trade between 1985 and 1995 using data from Japanese input-output tables. The empirical analysis reveals that the scale of R&D services in total services trade has been much higher throughout the period than has the scale of other services. Moreover, the R&D services content of Japanese merchandises exports amounted to 26,961 million US dollars in 1995, 84.3 percent of which was channeled through machinery exports. This result supports the assumption proposed by Coe and Helpman (1995) that R&D services are traded through machinery exports. (100 words)

Key words: Trade in Services, Services Content, R&D spillover
JEL classification code: F10, F14, O32

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Abstract

This paper investigates the scale of direct and indirect services trade, or services content, in Japanese trade between 1985 and 1995 using data from Japanese input-output tables. The empirical analysis reveals that the scale of R&D services in total services trade has been much higher throughout the period than has the scale of other services. Moreover, the R&D services content of Japanese merchandises exports amounted to 26,961 million US dollars in 1995, 84.3 percent of which was channeled through machinery exports. This result supports the assumption proposed by Coe and Helpman (1995) that R&D services are traded through machinery exports. (100 words)

1 Introduction

The expansion in world trade in services has been a major topic for research in recent years. Cross-country regression analyses have confirmed that the traditional Heckscher-Ohlin-Vanek (HOV) Theorem has some validity in explaining patterns of services trade, in that countries abundant in labor or in physical or human capital tend to export services that are intensive in that factor.[1] However, the evidence has been weaker than has the evidence on goods trade, suggesting that a more detailed analysis of services trade is needed.

One possible reason for the weak application of the HOV theorem to services trade is that most services are traded indirectly, in that they are embodied in goods trade. Services are intangible and non-storable, and although technological change has enabled more services to be traded directly, most are used as intermediate inputs to produce

[1] See, for example, Dick and Dicke (1979), Sapir and Lutz (1981), Sazanami and Urata (1990) and Urata and Kiyota (2001).

goods.[2] For instance, Japanese graduate students consume US research and education services through imports of US books, but such imports are reported entirely as goods trade rather than services trade. Another example is the importing of machinery from industrialized countries by developing countries, given that various technical services such as research and development (R&D) are embodied in the machinery. Studies of the services embodied in goods trade are therefore useful for shedding light on the true trade in services.

There has been a large number of studies of the factor content of trade, but only a few have analyzed the services embodied in goods trade. Tucker and Sundberg (1988) examined the trade of Singapore in 1973, and of Australia and Thailand in 1975. Their results indicated that half of Australian services exports were embodied in goods exports, but that the embodied services exports of Thailand and Singapore were relatively small. Grubel's (1988) study of Canadian services trade between 1973 and 1983 found that embodied services trade rapidly increased in that period and that the net surplus (exports minus imports) of indirect services trade was larger than the deficit of direct services trade in 1983. Sazanami and Urata (1990) obtained similar findings when analyzing Japanese and US indirect services trade, estimating that in both countries indirect services trade was so large that the total of direct and indirect services trade was in net surplus. Recent

[2]The importance of services trade as intermediate inputs and factors is also stressed by Markusen (1989) and Melvin (1989).

analysis by Urata and Kiyota (2001) extended the framework to six East Asian countries. Their results suggested that industrialized countries with large services sectors are net exporters of services via goods trade.

These existing studies have confirmed that the services trade embodied in goods trade is significant for Japan and other countries. This paper extends the analysis especially focusing on R&D using detailed Japanese input-output table between 1985 and 1995. The input-output table from Japan's Management and Coordination Agency. The detailed industrial classification (52 services industries out of a total 184 industries) is unchanged over the period and prices are indexed, which enables us to carry out a reliable time-series analysis of the input-output structure of services production and trade.

The paper is organized as follows. The next section explains the methodology to estimate the services content. The third section describes the data and some expected results. The fourth section presents the estimation results and a detailed analysis of R&D services is carried out in the fifth section. The final section concludes.

2 Methodolgy

This section presents a simple methodology to estimate services content. Suppose that services industries are indexed as $k+1, ..., I$. Industry i is in the goods sector (agriculture, manufacturing, etc.) if $i \leq k$ and is in the services sector if $i \geq k+1$. Let $S_{ti}^{h}(t \in \{x, m\})$ be the total (direct plus indirect) trade of service i in country h, where x and m are

exports and imports, respectively. S_{ti}^{Dh} and S_{ti}^{IDh} represent the direct and indirect trade of service i in country h, respectively, and $S_{ti}^{h} = S_{ti}^{Dh} + S_{ti}^{IDh}$.

Let $\mathbf{S}_t^{Dh}$ and $\mathbf{S}_t^{IDh}$ be the vectors of trade in direct and indirect services, respectively, in country h. Denote the trade vector in country h as $\mathbf{T}^h(\mathbf{T} \in \{\mathbf{EX}, \mathbf{IM}\})$, where $\mathbf{EX}$ and $\mathbf{IM}$ represent export and import vectors, respectively.

$$\mathbf{S}_t^h = \mathbf{S}_t^{Dh} + \mathbf{S}_t^{IDh} = \hat{\alpha}\mathbf{T}^h + \hat{\alpha}\mathbf{B}^h \cdot \hat{\beta}\mathbf{T}^h,$$

where $\hat{\alpha}$ is a diagonal matrix of α, which takes the value of 1 if $i \geq k+1$ and 0 if $i \leq k$ and $\mathbf{B}$ is a Leontief-inverse matrix. This paper calculates the services content of trade as net exports of direct and indirect services, which is similar to the calculation of the factor content of trade suggested by Leamer (1980) and Maskus (1985):

$$\mathbf{S}_x^h - \mathbf{S}_m^h = (\hat{\alpha}\mathbf{EX}^h + \hat{\alpha}\mathbf{B}^h \cdot \hat{\beta}\mathbf{EX}^h) - (\hat{\alpha}\mathbf{IM}^h + \hat{\alpha}\mathbf{B}^h \cdot \hat{\beta}\mathbf{IM}^h) \tag{1}$$

Denote the vector of services output in country h as $\mathbf{S}^h$. Let $(\hat{\mathbf{S}}^h)^{-1}$ be the diagonal matrix whose elements are the inverse of services output $1/S_i^h$. The content of a particular service in services trade can be estimated by assuming that its share of services trade is the same as its share of Japanese domestic output:[3]

$$(\hat{\mathbf{S}}^h)^{-1}\left[\mathbf{S}_x^h - \mathbf{S}_m^h\right] = (\hat{\mathbf{S}}^h)^{-1}\left[(\hat{\alpha}\mathbf{EX}^h + \hat{\alpha}\mathbf{B}^h \cdot \hat{\beta}\mathbf{EX}^h) - (\hat{\alpha}\mathbf{IM}^h + \hat{\alpha}\mathbf{B}^h \cdot \hat{\beta}\mathbf{IM}^h)\right]. \tag{2}$$

To compute the ranking of services in the services content of trade, we make use of the

[3]For the derivation of equation (2), see the appendix.

following expression:

$$(S^h_{xi} - S^h_{mi})/S^h_i > (S^h_{xj} - S^h_{mj})/S^h_j. \tag{3}$$

From (3), we have:

$$\left[(S^{Dh}_{xi} + S^{IDh}_{xi}) - (S^{Dh}_{mi} + S^{IDh}_{mi})\right]/S^h_i > \left[(S^{Dh}_{xj} + S^{IDh}_{xj}) - (S^{Dh}_{mj} + S^{IDh}_{mj})\right]/S^h_j. \tag{4}$$

Equation (4) indicates that service i is more intensively used in the net exports of country h than is service j.

Due to the difficulty in obtaining stock data, flow data from Japanese input-output tables for 1985, 1990 and 1995 are used for computing direct and indirect services trade. This in turn implies that, in contrast to factor content analysis, the analysis of services content will not necessarily reflect the abundance of particular services used in the domestic economy since some services are used in the production of other non-tradable services.[4] The rank indicates the intensity of services used in trade, and in part the international competitiveness of services, but not the abundance of services.

3 Data and expected results

3.1 Data description

The data used in the analysis come from the input-output tables published by the Management and Coordination Agency (2000) for the years 1985, 1990 and 1995. The industrial

[4]For more on the rank proposition, see, for instance, Bowen, Leamer and Sveikauskas (1987) and Kohler (1991).

classification is unchanged over the period and prices are indexed, which enables a reliable time-series analysis to be conducted.

The definition and sectoral coverage of trade in services in the input-output tables differ slightly from those used in the International Monetary Fund's *Balance of Payments Statistics* and by the World Trade Organization. For instance, the input-output tables do not include license fees or distinguish services provided or purchased by foreign affiliates in Japan from those provided or purchased by Japanese domestic companies.

Monetary values are converted from Japanese yen to US dollars using exchange rate data published by the IMF (2001). Although the input-output tables cover more than 500 industries, more aggregated data (for 184 industries including 52 services industries) are used to simplify the analysis.

Table 1 describes output and value added in Japan's services sector between 1985 and 1995, and Table 2 shows the trade in services. The share of each services industry's domestic production, value added and trade relative to total services is reported in Table 3. These tables confirm that domestic production, value added and trade expanded rapidly between 1985 and 1995 in the services sector. The average annual growth rates of production, value added, exports and imports in services between 1985 and 1990 were, respectively, 15.0 percent, 14.5 percent, 7.8 percent and 10.7 percent. Corresponding figures for the 1990 to 1995 period were 10.8 percent, 10.8 percent, 21.7 percent and 10.0

percent. Compared with average annual GDP growth of 4.5 percent between 1985 and 1990 (and 1.4 percent between 1990 and 1995), the growth rates of production, value added and trade in services were extremely high.[5]

=== Table 1 ===

=== Table 2 ===

=== Table 3 ===

An examination of the share of each services sector in the total reveals interesting differences between domestic production and trade.[6] Over the period, R&D services were consistently around 1.5 percent of both services production and value added, but appeared to be insignificant in services trade. Wholesale and retail services contributed the most to services output between 1985 and 1995. In 1995 wholesale services made up 10.7 percent of services production and 11.7 percent of value added, while retail services contributed 6.6 percent to production and 7.4 percent to value added. The shares of house rentals, construction and medical services were also high. The pattern of trade in these services varied significantly. While the wholesale sector contributed 34.7 percent to services exports, retail services were only 0.2 percent of services exports. Transport-related services such as ocean transport and air transport had relatively high shares. Financial services were also significant at 4.7 percent of production in 1995, and 4.9 percent of value

[5]The GDP growth rate is computed using GDP at market prices (in 1995 US dollars) from the World Bank (2000).

[6]Unless otherwise stated, the discussions in this section refer to the data for 1995.

added, and were also significant in trade at 5.6 percent of services exports and 9.4 percent of imports.

The ratio of net exports (exports minus imports) to total trade (exports plus imports) in services was quite high in 1985 (0.32) but was around zero in 1990 (-0.01) and 1995 (0.00). The net export ratio of financial services was negative throughout the period and the net export ratio of insurance services gradually declined. These results imply that Japanese services industries lost international competitiveness between 1985 and 1995.

3.2 Services likely to be significant in services trade

Research by Coe, Helpman and colleagues has suggested that OECD countries export R&D services thorough goods trade.[7] Since most of the Japanese current account surplus is from machinery exports, this suggests that Japan exports services that are intensive in R&D services and therefore that the ranking or intensity of R&D services in the total services content is likely to be high.

Japan has a large financial services sector. Over the period, Japanese financial services lost international competitiveness, and the net exports of the financial sector rapidly declined. A recent report by Toyokeizai (2001) described the withdrawal of Japanese financial subsidiaries from foreign countries, and the fall in the number of new entrants. Moreover, the non-performing loans weighted heavily on many Japanese banks after the

[7] See Coe and Helpman (1995), Coe, Helpman and Hoffmaister (1997), and Bayoumi, Coe and Helpman (1999).

burst of the asset market bubble. The intensity of financial services in the services content of trade is therefore expected to have declined between 1985 and 1995.

Traditional HOV regression analysis by Urata (1983) and Kimura and Kohama (1995) reveal that Japan exports goods that are human-capital intensive. This in turn implies that Japan exports education services through goods trade and that the ranking of school education is likely to be high.

As Deardorff (1985) suggests, transportation services are also likely to be important in goods trade since transportation is required for international trade in goods. Because Japan is an island country and a net exporter, the services content of air and ocean transportation services is likely to be high.

Japan's economic structure and recent research on services trade therefore suggest that four services were likely to have been key components of the services content of Japanese exports: R&D services, financial services, school education services and transportation services. Changing macroeconomic conditions after 1985 are likely to have generated shifts in the significance of these services.

4 The services content of Japanese trade, 1985-95

Tables 4, 5 and 6 illustrate the direct (S_t^D), indirect (S_t^{ID}) and net ($S_{nx} = (S_x^D + S_x^{ID}) - (S_m^D + S_m^{ID})$) services trade in Japan. Indirect services trade is defined as the services embodied in goods trade. These tables confirm that Japan's indirect services trade is

larger than its direct services trade. Indirect exports and imports of services were twice as large as direct exports and imports throughout the period (except for imports in 1995). In 1990 net indirect services exports were large enough to cover the deficit in direct services trade. Therefore, total (direct plus indirect) services trade was in net surplus during the period, which is consistent with the results of Grubel (1988), Sazanami and Urata (1990) and Urata and Kiyota (2001).

=== Table 4 ===

=== Table 5 ===

=== Table 6 ===

At a sectoral level, net exports of services (direct plus indirect), S_{nx}, are relatively large in the wholesale, ocean transport and R&D services sectors. Although wholesale and R&D services trade grew rapidly between 1985 and 1995, the composition of trade was quite different. Most of the net surplus in wholesale trade was from direct services trade, while all of the R&D services trade was from indirect trade.

Table 7 details the services content ratio for each of the services, S_{nx}/S, which is defined as net exports of direct and indirect services divided by domestic production. The services content ratio describes the intensity of those services in total services trade. The larger the ratio, the larger the intensity. The services content ratio for total services gradually decreased from 0.036 in 1985, to 0.013 in 1990 and to 0.007 in 1995. Since

services production and value added both increased over the period, this suggests that Japanese services lost international competitiveness.

=== Table 7 ===

Table 7 also indicates that Japan exports goods that are intensive in R&D services. This might be because Japanese companies are highly technological. Ocean transport services had the top ranking, but that of air transport services was low. This could be because of the way transport services trade is defined. For instance, when Japanese people fly Japan Airlines to Australia, transportation trade does not occur, but when they fly Qantas, Australia exports transportation services to Japan. Therefore, care is needed in discussing trade in transportation services.[8]

Education services were ranked low until after 1990. Until recently, Japanese companies provided in-house training to their graduate employees. The economic downturn has increased demand for employees who are already trained. The increased intensity of school education services has probably been the result of more school students completing school in order to go on to university.[9]

As expected, the ranking for financial services declined after 1985 from 15th to 31st in 1990 and to 44th in 1995. The declining significance of financial services in Japanese trade is a reflection of the poor performance of the financial sector since the start of the

[8]This issue is discussed in Snape (2001).

[9]According to the Minister's Secretariat of the Ministry of Education (2001), the number of Masters and Doctoral graduates in Japan rose from 18,872 in 1980 to 49,700 in 1995.

asset market bubble in the late 1980s.

In sum, the services content of trade is a reflection of what is happening in the domestic economy: competitive services are ranked highly while abundant but less competitive services are ranked lower. The services content analysis illustrates the international competitiveness of Japan's services.

5 Japanese machinery trade and R&D content

Recent empirical trade analyses of technology transfer by Coe and Helpman (1995), Lee (1995), Coe, Helpman and Hoffmaister (1997) and Bayoumi, Coe and Helpman (1999) stress the importance of machinery trade in explaining R&D spillovers. The key assumption in these studies is that technologies in the form of R&D services are embodied in machinery trade, which plays an important role as the source of technology transfer from the industrialized countries to the developing countries.

The previous section found that Japan exports R&D-intensive goods, although we focused on all goods rather than on machinery products. To examine the validity of the assumption suggested by Coe and Helpman, this section examines the R&D services content in the Japanese machinery trade. Based on the classifications of the Japanese input-output tables, we focus on four types of machinery trade: general machinery (boilers, turbines and engines, industrial robots, etc.), electronics machinery (household electrical equipment, semi-conductor devices and integrated circuits, etc.), transportation machin-

ery (passenger motor cars, aircraft and repair of aircraft, etc.) and precision machinery (photographic and optical instruments, watches and clocks, etc.).

Table 8 describes domestic production, value added and trade in machinery. Their shares in total manufacturing are reported in Table 9. As in services production and trade in Tables 1 and 2, machinery production and trade is also expanding, especially in the general machinery, electronics machinery and transportation machinery industries. Electronics machinery records extremely high growth in exports, with a 13.5 percent average annual growth rate. This growth is largely attributable to the expansion of semiconductor devices and integrated circuits (with an average annual growth rate of 29.9 percent).

=== Table 8 ===

=== Table 9 ===

Compared with domestic production and value added, the export shares of electronics machinery and transportation machinery in total manufacturing are relatively high. The export share of electronics machinery increased rapidly from 20.4 percent in 1985 to 34.2 percent in 1995 while the shares of general, transportation and precision machinery decreased slightly from 1985 to 1995. Moreover, the growth of services imports was more rapid than that of exports. Consequently, the net export ratio gradually declined from 0.78 in 1985 to 0.46 in 1995. The net export ratios for transportation and precision

machinery also indicate a decline over the period: from 0.90 in 1985 to 0.69 in 1995 for the former and from 0.61 in 1985 to 0.21 in 1995 for the latter.

Table 10 illustrates the research institute and R&D services content in machinery trade. The result for research institutes shows that the services content of machinery exports was consistently significant throughout the period. The indirect services embodied in all goods amounted to 512 million, 816 million and 1,690 million US dollars in 1985, 1990 and 1995, respectively. The machinery shares were 78.3 percent in 1985, 78.8 percent in 1990 and 78.0 percent in 1995. Most of the research institute services content is attributable to electronics machinery (36.9 percent in 1995) and transportation machinery (27.0 percent in 1995).

=== Table 10 ===

Table 10 also reveals that the R&D services content of Japanese machinery exports is extremely high and that machinery exports account for about 85 percent of all R&D services content. In 1995 the R&D services content in all goods amounted to 26,961 million US dollars, 84.3 percent of which is via machinery exports. Particularly notable are the value of electronics machinery and transportation machinery. Electronics machinery accounts for 13,001 million US dollars of the services content (48.2 percent of all R&D services content) and transportation machinery accounts for 6,430 million US dollars (23.8 percent of all R&D services content). This result strongly supports the assumption pro-

posed by Coe, Helpman and other researchers that R&D services are traded via machinery exports.

6 Concluding remarks

This paper reveals that the services content ratio was higher for R&D services than for other services during the period 1985 to 1995. The ranking of school education services gradually increased over the period while the ranking of financial services declined. These results indicate that Japan increased its exports of technology-intensive products throughout the period, moving away from goods intensive in financial services to those intensive in education services. The decline in the content of financial services, together with the fact that Japanese banking and insurance companies are rapidly withdrawing from foreign countries, attests to the decline in the international competitiveness of the financial sector. Structural reform in some services sectors is still proceeding and more reform is needed, especially in the financial sector.

The paper also examined the validity of the assumption proposed by Coe and Helpman that R&D services are traded through machinery exports. Our analysis reveals that the R&D services content of Japanese goods exports amounted to 26,961 million US dollars in 1995, 84.5 percent of which was from machinery exports. This result supports the empirical validity of the Coe and Helpman assumption.

A few words of caution are needed. The use of the input-output tables to estimate the

services content of exports may be problematic. Production technologies used in exports tend to be different from those used in the production of goods sold in the domestic market, but the tables do not distinguish between them. This is particularly likely to be a problem in the cases of transportation and distribution services. Export production uses fewer transportation services, retail services or wholesale services than does domestic production.

The services content of imports analyzed in this paper is the content used in the production of import-competing goods rather than imports. It would be difficult to calculate the services content of imports, as this would require the input-output tables of all exporting countries. However, this does not cause a problem if the production technologies, or input-output relations, are identical between countries, as is assumed in the HOV model.

The results for imports need to be carefully interpreted. Japan is a highly industrialized country, so the value added ratio (value added divided by domestic production) for exports is likely to be higher than that for imports, implying an underestimate of the services content of net exports. Again, a solution to this problem requires an analysis of all exporting countries' input-output tables or of the information on value added by country and commodity (industry).

The analysis in this paper could be extended in at least two directions. An international comparison would be very interesting, as the difference in R&D services content

between industrialized and developing countries would shed some light on technology transfer. Such a comparison would also contribute to the construction of world services trade data. Second, an analysis of other types of services, such as commercial presence, would be useful. This paper focuses only on direct and indirect services trade, but consumption abroad and commercial presence (through foreign direct investment) are likely to be other important modes of services trade. The input-output tables used in this paper cannot distinguish between foreign and Japanese affiliates in Japan, but such transactions are important, as the activities of multinational enterprises have expanded. Data availability and quality may hinder extending this work.

Appendix Deriviation of equation (2)

In deriving equation (2), the country index h is omitted to simplify the analysis, without loss of generality. The total (direct plus indirect) services content is defined as:

$$\hat{\mathbf{S}}^{-1}\mathbf{S}_t = \hat{\mathbf{S}}^{-1}\left[\mathbf{S}_t^D + \mathbf{S}_t^{ID}\right].$$

The direct services content is the direct trade in services divided by the domestic output of services:

$$\hat{\mathbf{S}}^{-1}\mathbf{S}_t^D = \hat{\mathbf{S}}^{-1}\left[\hat{\alpha}\mathbf{T}\right],$$

where $\hat{\alpha}$ is a diagonal matrix of α, which takes the value of 1 if $i \geq k+1$ and 0 if $i \leq k$. Since indirect services are defined as services through goods trade, the indirect services

content is formalized as:

$$\hat{\mathbf{S}}^{-1}\mathbf{S}_t^{ID} = \hat{\mathbf{S}}^{-1}\left[\hat{\alpha}(\mathbf{I}-\mathbf{A})^{-1}\cdot\hat{\beta}\mathbf{T}\right] = \hat{\mathbf{S}}^{-1}\left[\hat{\alpha}\mathbf{B}\cdot\hat{\beta}\mathbf{T}\right],$$

where $\hat{\beta}$ is a diagonal matrix of β, which takes the value of 1 if $i \leq k$ and 0 if $i \geq k+1$. From these equations, the total (direct plus indirect) services content of exports and imports becomes:

$$\hat{\mathbf{S}}^{-1}\left[\mathbf{S}_x - \mathbf{S}_m\right] = \hat{\mathbf{S}}^{-1}\left[(\hat{\alpha}\mathbf{EX} + \hat{\alpha}\mathbf{B}\cdot\hat{\beta}\mathbf{EX}) - (\hat{\alpha}\mathbf{IM} + \hat{\alpha}\mathbf{B}\cdot\hat{\beta}\mathbf{IM})\right]. \tag{2}$$

which corresponds to equation (2).

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Table 1: Domestic Production and Value Added of Services in Japan, 1985-1995

(million US dollars, 1995 constant prices)

	Domestic production (S)			Value added (vS)		
Industry	1985	1990	1995	1985	1990	1995
Residential construction	78,384	193,673	277,271	36,364	94,359	128,960
Non-residential construction	73,545	180,193	168,496	35,186	90,775	76,756
Repair of constructions	25,962	49,653	86,325	11,235	20,617	37,177
Public constructions	62,392	142,842	256,364	30,858	69,433	120,957
Other civil engineering and construction	36,402	79,891	148,703	16,387	35,203	68,267
Electric power	51,521	106,108	177,945	31,294	66,150	96,550
Gas supply	4,816	10,162	20,924	2,058	5,459	11,299
Steams and hot water supply	153	368	1,110	92	223	633
Water supply	12,990	26,701	48,467	8,251	16,620	30,506
Waste disposal services	14,474	24,136	32,901	12,774	20,628	23,970
Wholesale trade	138,041	318,663	671,922	90,217	212,145	472,271
Retail trade	119,059	246,403	415,911	80,914	177,671	301,110
Financial services	64,272	173,922	295,647	43,120	114,556	200,501
Insurance services	15,471	44,298	90,644	6,445	29,441	64,580
Real estate agencies and rental services	50,192	87,103	119,980	45,322	74,560	98,340
House rent	150,650	287,527	562,405	134,371	241,984	496,137
Railway passanger transport	21,832	41,926	64,854	11,520	21,209	34,142
Railway freight transport	728	1,441	1,972	172	662	992
Road passanger transport	20,523	34,744	48,916	16,321	27,312	38,518
Road freight transport	35,404	82,782	146,469	25,962	61,676	99,344
Ocean trasnport	12,297	14,339	19,160	5,571	2,942	3,054
Coastal and island water transport	4,669	9,122	13,907	2,985	5,816	7,858
Transport service in harbors	5,853	11,055	15,439	3,889	7,451	9,673
Air transport	5,085	12,943	25,668	1,086	4,071	9,293
Freight transportation	2,339	4,184	6,338	1,735	2,950	4,347
Storage facility service	4,848	10,279	17,060	2,987	6,220	11,398
Packing	7,601	10,223	18,217	4,801	5,547	9,940
Other transportation related services	14,473	29,697	56,802	10,687	20,156	39,079
Postal service	6,635	14,225	22,774	5,353	12,392	17,800
Telecommunication	16,559	39,827	105,010	11,669	29,141	75,172
Other service relating to communication	354	405	681	291	332	522
Broadcasting	7,516	16,047	28,485	4,645	8,491	13,380
Public administration (central)	30,327	49,425	94,181	20,126	28,395	55,953
Public administration (local)	51,210	99,269	184,545	40,216	77,882	136,813
School education	67,860	126,205	208,228	60,077	113,446	180,980
Social education and other education	7,969	16,380	28,104	5,725	11,291	19,365
Research institute	4,928	9,817	19,908	3,841	7,369	15,624
Research and development (intra-enterprise)	24,606	60,194	97,226	14,502	33,642	60,619
Medical service	82,813	161,964	316,970	54,422	91,144	174,854
Health	2,316	3,957	7,360	1,784	3,148	5,483
Social security	14,127	35,643	60,843	10,992	26,138	41,425
Other public service	24,288	29,355	49,529	18,496	19,176	32,663
Advertising agencies	20,069	51,465	73,918	7,421	19,574	23,085
Inguiry and information services	18,618	47,374	80,422	12,014	28,360	50,632
Goods renting and leasing (except car renting)	11,940	47,600	103,348	8,085	26,903	67,380
Car renting	1,008	4,240	10,019	389	2,786	7,701
Car repairing	27,203	45,325	72,776	18,808	25,006	34,334
Machine repairing	21,106	46,509	63,366	8,682	19,115	23,435
Other business services	62,586	152,078	262,653	41,909	111,526	185,578
Amusement and recreational services	48,668	114,219	143,707	34,519	80,963	97,420
Eating and drinking places	76,320	136,730	243,408	44,330	72,583	114,851
Hotel and lodging services	24,267	43,582	74,473	15,409	23,256	36,888
Other personal services	32,397	67,762	114,356	25,658	50,664	83,929
Services total	1,719,667	3,653,973	6,276,111	1,141,968	2,358,553	4,051,539

Notes: 1) Unit is 1 million US dollars (1995 constant prices), which is converted from the Japanese yen using the annual average exchange rate (rf) in the *IMF-IFS* .

2) Industrial classification is based on the source.

Sources: Management and Coordination Agency (2000) and IMF (2001).

Table 2: Trade in Services in Japan, 1985-1995

(million US dollars,1995 constant prices)

	1985			1990			1995		
Industry	Exports S^Dx	Imports S^Dm	Net exports S^Dnx	Exports S^Dx	Imports S^Dm	Net exports S^Dnx	Exports S^Dx	Imports S^Dm	Net exports S^Dnx
Residential construction	0	0	0	0	0	0	0	0	0
Non-residential construction	0	0	0	0	0	0	0	0	0
Repair of constructions	0	0	0	0	0	0	0	0	0
Public constructions	0	0	0	0	0	0	0	0	0
Other civil engineering and construction	0	0	0	0	0	0	0	0	0
Electric power	76	3	73	150	15	135	261	3	259
Gas supply	1	2	0	2	5	-3	1	10	-8
Steams and hot water supply	0	0	0	0	0	0	0	0	0
Water supply	1	3	-2	26	7	19	38	7	32
Waste disposal services	0	0	0	3	0	3	4	0	4
Wholesale trade	12,591	1,469	11,122	13,422	1,993	11,430	32,730	1,549	31,182
Retail trade	42	64	-22	134	1,009	-876	223	114	108
Financial services	917	1,624	-707	2,632	4,991	-2,358	5,251	8,809	-3,559
Insurance services	237	164	73	430	380	51	885	2,106	-1,221
Real estate agencies and rental services	0	0	0	0	0	0	0	0	0
House rent	5	12	-8	32	68	-36	55	48	7
Railway passanger transport	64	297	-233	202	550	-348	203	866	-664
Railway freight transport	21	0	21	7	0	7	65	0	65
Road passanger transport	64	570	-506	173	966	-793	224	1,359	-1,135
Road freight transport	1,500	0	1,500	3,601	0	3,601	4,410	0	4,410
Ocean trasnport	12,283	1,729	10,553	14,289	3,586	10,704	19,065	7,764	11,301
Coastal and island water transport	80	22	58	41	40	1	8	54	-46
Transport service in harbors	977	880	97	2,036	1,663	373	3,391	2,322	1,069
Air transport	942	2,148	-1,206	2,099	5,641	-3,542	4,389	11,668	-7,279
Freight transportation	100	0	100	109	0	109	226	0	226
Storage facility service	173	0	173	55	0	55	320	0	320
Packing	0	0	0	0	0	0	0	0	0
Other transportation related services	1,728	947	781	4,033	1,511	2,522	7,457	2,629	4,828
Postal service	15	93	-78	44	61	-17	98	79	19
Telecommunication	35	27	7	206	286	-80	411	719	-308
Other service relating to communication	0	0	0	0	0	0	0	0	0
Broadcasting	0	1	0	0	1	-1	0	0	0
Public administration (central)	0	0	0	0	0	0	0	0	0
Public administration (local)	0	0	0	0	0	0	0	0	0
School education	0	0	0	0	0	0	0	0	0
Social education and other education	0	0	0	0	1	-1	0	2	-1
Research institute	60	61	-1	75	129	-54	229	347	-118
Research and development (intra-enterprise)	0	0	0	0	0	0	0	0	0
Medical service	2	4	-2	1	7	-5	1	8	-7
Health	0	0	0	0	0	0	0	0	0
Social security	0	0	0	0	0	0	0	0	0
Other public service	213	291	-78	278	197	82	501	418	83
Advertising agencies	197	1,016	-818	510	2,177	-1,667	1,088	3,584	-2,496
Inguiry and information services	356	500	-144	636	1,433	-798	1,483	3,051	-1,568
Goods renting and leasing (except car renting)	143	234	-91	442	857	-415	1,093	2,411	-1,319
Car renting	0	0	0	0	0	0	0	0	0
Car repairing	1	1	0	2	2	0	1	3	-1
Machine repairing	0	0	0	0	0	0	0	0	0
Other business services	918	1,517	-599	1,974	3,752	-1,778	4,937	7,534	-2,596
Amusement and recreational services	58	316	-258	244	2,242	-1,998	284	2,327	-2,044
Eating and drinking places	336	1,415	-1,079	898	6,088	-5,190	1,375	10,148	-8,773
Hotel and lodging services	603	2,606	-2,002	1,877	11,245	-9,369	2,959	17,362	-14,403
Other personal services	20	17	4	25	42	-18	54	61	-7
Services total	37,369	19,102	18,267	55,206	56,598	-1,391	94,210	93,304	906

Notes: 1) S^Dx, S^Dm and S^Dnx (= S^Dx - S^Dm) mean direct exports, imports and net exports, respectively.
2) For other notes and sources, see Table 1.

Table 3: Structural Changes of Service Production and Trade in Japan, 1985-1995

	Share (%)												Net export ratio		
	Domestic production			Value added			Export			Imports					
Industry	1985	1990	1995	1985	1990	1995	1985	1990	1995	1985	1990	1995	1985	1990	1995
Residential construction	4.6	5.3	4.4	3.2	4.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
Non-residential construction	4.3	4.9	2.7	3.1	3.8	1.9	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
Repair of constructions	1.5	1.4	1.4	1.0	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
Public constructions	3.6	3.9	4.1	2.7	2.9	3.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
Other civil engineering and construction	2.1	2.2	2.4	1.4	1.5	1.7	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
Electric power	3.0	2.9	2.8	2.7	2.8	2.4	0.2	0.3	0.3	0.0	0.0	0.0	0.93	0.82	0.98
Gas supply	0.3	0.3	0.3	0.2	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	-0.08	-0.44	-0.75
Steams and hot water supply	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
Water supply	0.8	0.7	0.8	0.7	0.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0	-0.37	0.57	0.70
Waste disposal services	0.8	0.7	0.5	1.1	0.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	1.00	1.00
Wholesale trade	8.0	8.7	10.7	7.9	9.0	11.7	33.7	24.3	34.7	7.7	3.5	1.7	0.79	0.74	0.91
Retail trade	6.9	6.7	6.6	7.1	7.5	7.4	0.1	0.2	0.2	0.3	1.8	0.1	-0.20	-0.77	0.32
Financial services	3.7	4.8	4.7	3.8	4.9	4.9	2.5	4.8	5.6	8.5	8.8	9.4	-0.28	-0.31	-0.25
Insurance services	0.9	1.2	1.4	0.6	1.2	1.6	0.6	0.8	0.9	0.9	0.7	2.3	0.18	0.06	-0.41
Real estate agencies and rental services	2.9	2.4	1.9	4.0	3.2	2.4	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
House rent	8.8	7.9	9.0	11.8	10.3	12.2	0.0	0.1	0.1	0.1	0.1	0.1	-0.46	-0.36	0.07
Railway passanger transport	1.3	1.1	1.0	1.0	0.9	0.8	0.2	0.4	0.2	1.6	1.0	0.9	-0.65	-0.46	-0.62
Railway freight transport	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	1.00	1.00	1.00
Road passanger transport	1.2	1.0	0.8	1.4	1.2	1.0	0.2	0.3	0.2	3.0	1.7	1.5	-0.80	-0.70	-0.72
Road freight transport	2.1	2.3	2.3	2.3	2.6	2.5	4.0	6.5	4.7	0.0	0.0	0.0	1.00	1.00	1.00
Ocean trasnport	0.7	0.4	0.3	0.5	0.1	0.1	32.9	25.9	20.2	9.1	6.3	8.3	0.75	0.60	0.42
Coastal and island water transport	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.56	0.02	-0.75
Transport service in harbors	0.3	0.3	0.2	0.3	0.3	0.2	2.6	3.7	3.6	4.6	2.9	2.5	0.05	0.10	0.19
Air transport	0.3	0.4	0.4	0.1	0.2	0.2	2.5	3.8	4.7	11.2	10.0	12.5	-0.39	-0.46	-0.45
Freight transportation	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.2	0.2	0.0	0.0	0.0	1.00	1.00	1.00
Storage facility service	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.1	0.3	0.0	0.0	0.0	1.00	1.00	1.00
Packing	0.4	0.3	0.3	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
Other transportation related services	0.8	0.8	0.9	0.9	0.9	1.0	4.6	7.3	7.9	5.0	2.7	2.8	0.29	0.45	0.48
Postal service	0.4	0.4	0.4	0.5	0.5	0.4	0.0	0.1	0.1	0.5	0.1	0.1	-0.72	-0.16	0.11
Telecommunication	1.0	1.1	1.7	1.0	1.2	1.9	0.1	0.4	0.4	0.1	0.5	0.8	0.12	-0.16	-0.27
Other service relating to communication	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
Broadcasting	0.4	0.4	0.5	0.4	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	-0.37	-0.50	1.00
Public administration (central)	1.8	1.4	1.5	1.8	1.2	1.4	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
Public administration (local)	3.0	2.7	2.9	3.5	3.3	3.4	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
School education	3.9	3.5	3.3	5.3	4.8	4.5	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
Social education and other education	0.5	0.4	0.4	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	-0.68	-0.62
Research institute	0.3	0.3	0.3	0.3	0.3	0.4	0.2	0.1	0.2	0.3	0.2	0.4	-0.01	-0.26	-0.20
Research and development (intra-enterprise)	1.4	1.6	1.5	1.3	1.4	1.5	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
Medical service	4.8	4.4	5.1	4.8	3.9	4.3	0.0	0.0	0.0	0.0	0.0	0.0	-0.37	-0.66	-0.85
Health	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	n.a.	n.a.
Social security	0.8	1.0	1.0	1.0	1.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	-0.48	n.a.
Other public service	1.4	0.8	0.8	1.6	0.8	0.8	0.6	0.5	0.5	1.5	0.3	0.4	-0.15	0.17	0.09
Advertising agencies	1.2	1.4	1.2	0.6	0.8	0.6	0.5	0.9	1.2	5.3	3.8	3.8	-0.67	-0.62	-0.53
Inguiry and information services	1.1	1.3	1.3	1.1	1.2	1.2	1.0	1.2	1.6	2.6	2.5	3.3	-0.17	-0.39	-0.35
Goods renting and leasing (except car rentin	0.7	1.3	1.6	0.7	1.1	1.7	0.4	0.8	1.2	1.2	1.5	2.6	-0.24	-0.32	-0.38
Car renting	0.1	0.1	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	0.38	-0.88
Car repairing	1.6	1.2	1.2	1.6	1.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.15	0.07	-0.33
Machine repairing	1.2	1.3	1.0	0.8	0.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	n.a.	-0.52	-0.71
Other business services	3.6	4.2	4.2	3.7	4.7	4.6	2.5	3.6	5.2	7.9	6.6	8.1	-0.25	-0.31	-0.21
Amusement and recreational services	2.8	3.1	2.3	3.0	3.4	2.4	0.2	0.4	0.3	1.7	4.0	2.5	-0.69	-0.80	-0.78
Eating and drinking places	4.4	3.7	3.9	3.9	3.1	2.8	0.9	1.6	1.5	7.4	10.8	10.9	-0.62	-0.74	-0.76
Hotel and lodging services	1.4	1.2	1.2	1.3	1.0	0.9	1.6	3.4	3.1	13.6	19.9	18.6	-0.62	-0.71	-0.71
Other personal services	1.9	1.9	1.8	2.2	2.1	2.1	0.1	0.0	0.1	0.1	0.1	0.1	0.10	-0.26	-0.06
Services total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.32	-0.01	0.00

Notes: 1) n.a. means not available.

2) Net export ratio is defined as net exports (export - imports) divided by gross export (exports + imports).

3) For other notes and sources, see Table 1.

Table 4: Direct (S_t^D) and Indirect (S_t^{ID}) Service Trade in Japan, 1985

(million US dollars,1995 constant prices)

	[a]	[b]	[c] =[a]-[b]	[d]	[e]	[f] =[d]-[e]	[g] =[c]+[f]
	$S^D t$			$S^{ID} t$			Snx
Industry	$S^D x$	$S^D m$	$S^D nx$	$S^{ID} x$	$S^{ID} m$	$S^{ID} nx$	
Residential construction	0	0	0	0	0	0	0
Non-residential construction	0	0	0	0	0	0	0
Repair of constructions	0	0	0	1,840	908	931	931
Public constructions	0	0	0	0	0	0	0
Other civil engineering and construction	0	0	0	0	0	0	0
Electric power	76	3	73	8,427	5,461	2,967	3,039
Gas supply	1	2	0	225	62	163	162
Steams and hot water supply	0	0	0	12	5	7	7
Water supply	1	3	-2	689	409	280	278
Waste disposal services	0	0	0	833	463	370	370
Wholesale trade	12,591	1,469	11,122	12,920	4,415	8,505	19,627
Retail trade	42	64	-22	1,322	949	373	352
Financial services	917	1,624	-707	8,947	4,362	4,585	3,878
Insurance services	237	164	73	749	596	153	226
Real estate agencies and rental services	0	0	0	4,727	2,422	2,304	2,304
House rent	5	12	-8	0	0	0	-8
Railway passanger transport	64	297	-233	1,180	495	685	452
Railway freight transport	21	0	21	73	45	28	49
Road passanger transport	64	570	-506	1,077	461	616	110
Road freight transport	1,500	0	1,500	3,870	2,109	1,761	3,261
Ocean trasnport	12,283	1,729	10,553	1	0	1	10,554
Coastal and island water transport	80	22	58	703	394	309	367
Transport service in harbors	977	880	97	832	433	399	496
Air transport	942	2,148	-1,206	471	199	272	-934
Freight transportation	100	0	100	287	133	154	254
Storage facility service	173	0	173	453	253	199	373
Packing	0	0	0	1,610	393	1,218	1,218
Other transportation related services	1,728	947	781	756	503	253	1,034
Postal service	15	93	-78	577	267	310	232
Telecommunication	35	27	7	955	507	448	455
Other service relating to communication	0	0	0	17	9	8	8
Broadcasting	0	1	0	725	245	480	480
Public administration (central)	0	0	0	121	51	70	70
Public administration (local)	0	0	0	168	71	98	98
School education	0	0	0	0	0	0	0
Social education and other education	0	0	0	194	64	130	130
Research institute	60	61	-1	512	279	232	232
Research and development (intra-enterprise)	0	0	0	8,676	1,645	7,031	7,031
Medical service	2	4	-2	0	0	0	-2
Health	0	0	0	13	6	6	6
Social security	0	0	0	0	0	0	0
Other public service	213	291	-78	1,564	677	887	809
Advertising agencies	197	1,016	-818	2,617	878	1,739	921
Inguiry and information services	356	500	-144	1,192	377	815	671
Goods renting and leasing (except car renting)	143	234	-91	1,884	597	1,287	1,196
Car renting	0	0	0	61	62	-1	-1
Car repairing	1	1	0	1,172	1,092	80	81
Machine repairing	0	0	0	3,618	1,976	1,641	1,641
Other business services	918	1,517	-599	4,945	2,025	2,920	2,321
Amusement and recreational services	58	316	-258	145	50	95	-163
Eating and drinking places	336	1,415	-1,079	0	0	0	-1,079
Hotel and lodging services	603	2,606	-2,002	0	0	0	-2,002
Other personal services	20	17	4	10	4	7	10
Services total	34,760	18,031	16,729	81,169	36,352	44,817	61,545

Notes 1) Direct service exports and imports, $S^D x$ and $S^D m$, are from Table 2.

2) Indirect service exports and imports, $S^{ID} x$ and $S^{ID} m$, are defined as service trade embodied in goods trade.

3) $S^D nx$, $S^{ID} nx$ and Snx (= $S^D nx$ + $S^{ID} nx$) means net exports of direct, indirect and total (direct plus indirect) service trade, respectively. For more details, see text.

4) For other notes and sources, see Table 1.

Table 5: Direct (S_t^D) and Indirect (S_t^{ID}) Service Trade in Japan, 1990

(million US dollars,1995 constant prices)

	[a]	[b]	[c] =[a]-[b]	[d]	[e]	[f] =[d]-[e]	[g] =[c]+[f]
	$S^D t$			$S^{ID} t$			Snx
Industry	$S^D x$	$S^D m$	$S^D nx$	$S^{ID} x$	$S^{ID} m$	$S^{ID} nx$	
Residential construction	0	0	0	0	0	0	0
Non-residential construction	0	0	0	0	0	0	0
Repair of constructions	0	0	0	3,475	2,386	1,089	1,089
Public constructions	0	0	0	0	0	0	0
Other civil engineering and construction	0	0	0	0	0	0	0
Electric power	150	15	135	12,737	10,359	2,377	2,512
Gas supply	2	5	-3	373	188	185	182
Steams and hot water supply	0	0	0	40	26	13	13
Water supply	26	7	19	1,063	921	142	161
Waste disposal services	3	0	3	1,017	657	361	364
Wholesale trade	13,422	1,993	11,430	23,044	12,844	10,200	21,630
Retail trade	134	1,009	-876	1,991	1,850	141	-735
Financial services	2,632	4,991	-2,358	13,434	10,638	2,796	438
Insurance services	430	380	51	1,385	1,605	-221	-170
Real estate agencies and rental services	0	0	0	6,780	4,812	1,969	1,969
House rent	32	68	-36	0	0	0	-36
Railway passanger transport	202	550	-348	1,607	1,253	354	6
Railway freight transport	7	0	7	128	93	35	42
Road passanger transport	173	966	-793	1,067	757	310	-482
Road freight transport	3,601	0	3,601	6,121	4,946	1,175	4,776
Ocean trasnport	14,289	3,586	10,704	2	1	1	10,705
Coastal and island water transport	41	40	1	883	663	220	221
Transport service in harbors	2,036	1,663	373	1,097	1,098	-1	372
Air transport	2,099	5,641	-3,542	646	490	156	-3,386
Freight transportation	109	0	109	369	243	126	235
Storage facility service	55	0	55	952	818	133	188
Packing	0	0	0	1,422	584	838	838
Other transportation related services	4,033	1,511	2,522	1,097	1,130	-33	2,489
Postal service	44	61	-17	900	582	318	301
Telecommunication	206	286	-80	1,826	1,374	452	372
Other service relating to communication	0	0	0	18	13	5	5
Broadcasting	0	1	-1	1,210	666	545	544
Public administration (central)	0	0	0	5	3	2	2
Public administration (local)	0	0	0	225	142	83	83
School education	0	0	0	0	0	0	0
Social education and other education	0	1	-1	295	152	143	142
Research institute	75	129	-54	816	456	360	306
Research and development (intra-enterprise)	0	0	0	17,590	6,543	11,047	11,047
Medical service	1	7	-5	0	0	0	-5
Health	0	0	0	2	1	0	0
Social security	0	0	0	0	0	0	0
Other public service	278	197	82	648	504	144	226
Advertising agencies	510	2,177	-1,667	5,211	2,855	2,355	688
Inguiry and information services	636	1,433	-798	2,673	1,499	1,174	376
Goods renting and leasing (except car renting)	442	857	-415	5,529	2,821	2,708	2,293
Car renting	0	0	0	234	355	-121	-121
Car repairing	2	2	0	1,565	2,181	-616	-616
Machine repairing	0	0	0	6,509	4,577	1,932	1,932
Other business services	1,974	3,752	-1,778	9,070	5,454	3,616	1,838
Amusement and recreational services	244	2,242	-1,998	592	274	317	-1,681
Eating and drinking places	898	6,088	-5,190	0	0	0	-5,190
Hotel and lodging services	1,877	11,245	-9,369	0	0	0	-9,369
Other personal services	25	42	-18	276	168	108	91
Services total	50,689	50,945	-256	135,922	88,981	46,941	46,685

Table 6: Direct (S_t^D) and Indirect (S_t^{ID}) Service Trade in Japan, 1995

(million US dollars,1995 constant prices)

	[a]	[b]	[c] =[a]-[b]	[d]	[e]	[f] =[d]-[e]	[g] =[c]+[f]
	$S^D t$			$S^{ID} t$			Snx
Industry	$S^D x$	$S^D m$	$S^D nx$	$S^{ID} x$	$S^{ID} m$	$S^{ID} nx$	
Residential construction	0	0	0	0	0	0	0
Non-residential construction	0	0	0	0	0	0	0
Repair of constructions	0	0	0	5,547	4,424	1,123	1,123
Public constructions	0	0	0	0	0	0	0
Other civil engineering and construction	0	0	0	0	0	0	0
Electric power	261	3	259	18,260	16,216	2,044	2,303
Gas supply	1	10	-8	741	465	276	268
Steams and hot water supply	0	0	0	71	65	6	6
Water supply	38	7	32	1,692	1,606	86	118
Waste disposal services	4	0	4	849	740	108	113
Wholesale trade	32,730	1,549	31,182	39,942	30,742	9,201	40,382
Retail trade	223	114	108	2,695	3,332	-638	-529
Financial services	5,251	8,809	-3,559	20,759	19,808	952	-2,607
Insurance services	885	2,106	-1,221	1,806	2,344	-538	-1,759
Real estate agencies and rental services	0	0	0	7,906	7,131	775	775
House rent	55	48	7	0	0	0	7
Railway passanger transport	203	866	-664	2,188	1,989	199	-465
Railway freight transport	65	0	65	158	135	23	88
Road passanger transport	224	1,359	-1,135	1,350	1,169	182	-954
Road freight transport	4,410	0	4,410	8,190	7,666	524	4,935
Ocean trasnport	19,065	7,764	11,301	6	5	1	11,302
Coastal and island water transport	8	54	-46	1,328	1,180	148	101
Transport service in harbors	3,391	2,322	1,069	1,932	1,878	54	1,124
Air transport	4,389	11,668	-7,279	1,058	994	64	-7,215
Freight transportation	226	0	226	470	414	56	282
Storage facility service	320	0	320	1,287	1,518	-231	89
Packing	0	0	0	2,201	1,239	962	962
Other transportation related services	7,457	2,629	4,828	1,730	2,033	-303	4,525
Postal service	98	79	19	1,190	978	212	231
Telecommunication	411	719	-308	3,809	3,629	180	-128
Other service relating to communication	0	0	0	25	23	2	2
Broadcasting	0	0	0	1,682	1,272	410	410
Public administration (central)	0	0	0	174	154	20	20
Public administration (local)	0	0	0	404	357	47	47
School education	0	0	0	0	0	0	0
Social education and other education	0	2	-1	437	289	149	147
Research institute	229	347	-118	1,690	1,138	552	434
Research and development (intra-enterprise)	0	0	0	26,961	13,040	13,921	13,921
Medical service	1	8	-7	0	0	0	-7
Health	0	0	0	2	2	0	0
Social security	0	0	0	0	0	0	0
Other public service	501	418	83	961	878	83	166
Advertising agencies	1,088	3,584	-2,496	6,531	4,933	1,598	-898
Inguiry and information services	1,483	3,051	-1,568	3,765	2,718	1,047	-521
Goods renting and leasing (except car renting)	1,093	2,411	-1,319	10,946	7,612	3,334	2,015
Car renting	0	0	0	462	736	-275	-275
Car repairing	1	3	-1	2,108	3,116	-1,008	-1,009
Machine repairing	0	0	0	8,584	7,582	1,001	1,001
Other business services	4,937	7,534	-2,596	11,021	9,090	1,932	-665
Amusement and recreational services	284	2,327	-2,044	735	561	175	-1,869
Eating and drinking places	1,375	10,148	-8,773	0	0	0	-8,773
Hotel and lodging services	2,959	17,362	-14,403	0	0	0	-14,403
Other personal services	54	61	-7	397	310	88	80
Services total	93,720	87,362	6,358	212,680	172,915	39,765	46,124

Table 7: Service Contents of Japanese Trade with Intensity Rankings, 1985-1995

	1985		1990		1995	
Industry	Ratio =Snx / S	Rank	Ratio =Snx / S	Rank	Ratio =Snx / S	Rank
Residential construction	0.000	43	0.000	40	0.000	33
Non-residential construction	0.000	44	0.000	39	0.000	34
Repair of constructions	0.036	23	0.022	18	0.013	14
Public constructions	0.000	42	0.000	38	0.000	36
Other civil engineering and construction	0.000	46	0.000	37	0.000	37
Electric power	0.059	16	0.024	16	0.013	15
Gas supply	0.034	25	0.018	21	0.013	16
Steams and hot water supply	0.045	20	0.037	10	0.006	20
Water supply	0.021	30	0.006	30	0.002	26
Waste disposal services	0.026	28	0.015	22	0.003	23
Wholesale trade	0.142	4	0.068	5	0.060	5
Retail trade	0.003	36	-0.003	45	-0.001	40
Financial services	0.060	15	0.003	31	-0.009	44
Insurance services	0.015	33	-0.004	46	-0.019	48
Real estate agencies and rental services	0.046	18	0.023	17	0.006	19
House rent	0.000	48	0.000	44	0.000	31
Railway passanger transport	0.021	31	0.000	34	-0.007	43
Railway freight transport	0.068	13	0.029	14	0.045	7
Road passanger transport	0.005	34	-0.014	48	-0.019	49
Road freight transport	0.092	7	0.058	6	0.034	9
Ocean trasnport	0.858	1	0.747	1	0.590	1
Coastal and island water transport	0.079	9	0.024	15	0.007	18
Transport service in harbors	0.085	8	0.034	12	0.073	4
Air transport	-0.184	53	-0.262	53	-0.281	53
Freight transportation	0.109	5	0.056	7	0.045	8
Storage facility service	0.077	11	0.018	20	0.005	22
Packing	0.160	3	0.082	4	0.053	6
Other transportation related services	0.071	12	0.084	3	0.080	3
Postal service	0.035	24	0.021	19	0.010	17
Telecommunication	0.028	27	0.009	26	-0.001	39
Other service relating to communication	0.022	29	0.012	25	0.003	25
Broadcasting	0.064	14	0.034	11	0.014	13
Public administration (central)	0.002	38	0.000	36	0.000	29
Public administration (local)	0.002	39	0.001	33	0.000	28
School education	0.000	41	0.000	41	0.000	32
Social education and other education	0.016	32	0.009	27	0.005	21
Research institute	0.047	17	0.031	13	0.022	10
Research and development (intra-enterprise)	0.286	2	0.184	2	0.143	2
Medical service	0.000	47	0.000	43	0.000	38
Health	0.003	37	0.000	35	0.000	30
Social security	0.000	45	0.000	42	0.000	35
Other public service	0.033	26	0.008	29	0.003	24
Advertising agencies	0.046	19	0.013	23	-0.012	45
Inguiry and information services	0.036	22	0.008	28	-0.006	42
Goods renting and leasing (except car renting)	0.100	6	0.048	8	0.020	11
Car renting	-0.001	49	-0.028	50	-0.027	50
Car repairing	0.003	35	-0.014	47	-0.014	47
Machine repairing	0.078	10	0.042	9	0.016	12
Other business services	0.037	21	0.012	24	-0.003	41
Amusement and recreational services	-0.003	50	-0.015	49	-0.013	46
Eating and drinking places	-0.014	51	-0.038	51	-0.036	51
Hotel and lodging services	-0.083	52	-0.215	52	-0.193	52
Other personal services	0.000	40	0.001	32	0.001	27
Services total	0.036		0.013		0.007	

Notes: 1) Snx (= $S^{D}nx + S^{ID}nx$) and S mean net exports of total (direct plus indirect) service trade from Table 4 and domestic production from Table 1, respectively.

2) Rank is computed from Ratio (services content ratio).

3) For other notes and sources, see Table 1.

(million US dollars,1995 constant prices)

	Domestic production			Value added			Exports			Imports		
	1985	1990	1995	1985	1990	1995	1985	1990	1995	1985	1990	1995
General machinery	**99,897**	**222,186**	**302,733**	**42,015**	**94,093**	**116,744**	**22,183**	**40,165**	**64,779**	**2,685**	**7,712**	**11,460**
Boilers, turbines and engines	7,299	15,038	22,443	2,942	7,071	7,308	1,500	2,835	3,639	125	319	1,033
Conveyors	5,644	11,901	15,708	2,321	4,336	4,980	1,040	1,325	2,258	106	237	272
Refrigarators and air conditioning apparatus	3,313	8,093	12,278	977	2,620	4,103	356	827	1,381	55	148	345
Other general industrial machinery	17,173	38,857	50,561	7,840	17,538	20,176	2,962	6,924	10,451	521	1,487	1,932
Mining, civil engineering and construciton machinery	9,085	20,150	25,045	3,814	7,972	9,309	3,029	4,136	5,247	117	522	607
Chemical machinery	4,901	8,915	12,633	2,421	4,192	5,196	963	962	1,657	224	305	502
Industrial robot	1,256	3,606	5,575	475	1,468	2,086	243	691	2,350	0	0	0
Metal processing machinery and metal machine tools	11,401	24,410	24,948	4,806	10,694	11,435	2,366	4,007	6,212	269	752	605
Other special industrial machinery	16,544	36,490	52,777	7,095	16,093	20,777	3,533	10,392	17,650	729	2,537	3,590
Other general machines and parts	14,527	29,719	39,963	7,507	15,085	19,128	3,063	3,113	6,598	474	991	1,351
Office machines	6,433	17,191	23,701	1,344	4,497	6,459	2,949	4,544	6,613	49	317	923
Machinery for service industry	2,321	7,817	17,100	473	2,529	5,787	179	410	723	15	96	301
Electronics machinery	**115,560**	**304,594**	**535,674**	**27,486**	**95,276**	**186,746**	**28,299**	**68,956**	**135,715**	**3,431**	**14,201**	**50,072**
Household electric equipment	16,677	35,607	46,742	111	6,725	14,071	8,388	14,717	16,787	130	1,134	4,937
Parts and accessories of electric audio equipment	9,813	25,398	47,010	1,156	6,874	15,231	1,373	1,899	2,354	64	474	1,501
Electric computing equipment and accessory devices	14,709	45,794	84,319	4,533	11,476	20,976	4,541	15,437	26,904	865	4,030	15,331
Communication equipment	8,494	23,359	43,690	2,198	6,265	12,153	2,091	4,809	5,318	105	659	2,715
Applied electronic equipment	5,960	15,443	20,230	1,925	5,403	6,550	489	1,502	2,824	29	464	1,122
Electric measuring instrumrnts	4,145	8,400	13,498	1,931	3,479	4,782	1,102	2,352	4,989	378	1,302	2,472
Semi-conductor devices and integrated circuits	5,304	20,308	56,477	-752	4,649	26,247	1,359	6,791	30,257	235	1,451	11,736
Parts of other electric communication equipment	18,073	48,260	97,074	3,063	15,934	38,113	3,099	7,333	17,737	364	1,169	3,003
Heavy electrical equipment	17,857	41,462	60,444	7,787	18,222	24,696	4,000	7,506	13,773	597	1,713	3,699
Other electrical machinery	14,528	40,562	66,190	5,533	16,250	23,929	1,858	6,609	14,773	665	1,804	3,557
Transportation machinery	**135,857**	**310,582**	**444,990**	**34,652**	**77,476**	**106,915**	**44,177**	**76,405**	**95,686**	**2,296**	**10,343**	**17,278**
Passanger motor cars	28,144	86,483	114,896	2,965	12,854	18,685	17,353	38,941	37,643	500	4,733	10,005
Trucks, buses and other cars	19,472	28,817	35,975	4,057	5,093	5,832	9,260	9,391	10,089	33	190	201
Two-wheel motor vehicles	3,007	3,674	6,027	889	757	962	1,772	2,188	3,619	17	90	197
Motor vehicle parts and accessories	60,317	150,489	236,086	15,284	40,592	63,408	8,405	15,431	29,765	245	1,035	2,135
Ships and repair of ships	12,344	19,505	23,188	5,877	10,387	7,357	5,899	7,761	11,517	144	208	375
Railroad equipment and repair of railroad equipment	4,511	6,730	8,651	2,552	2,717	3,312	293	205	239	9	95	111
Aircrafts and repair of aircrafts	3,465	5,279	8,206	1,653	2,215	3,691	150	663	911	1,326	3,790	3,757
Other transport equipment	4,598	9,606	11,961	1,375	2,862	3,668	1,046	1,825	1,904	22	201	499
Precision machinery	**15,392**	**31,517**	**40,514**	**6,586**	**14,104**	**16,123**	**5,039**	**8,554**	**10,885**	**1,231**	**3,233**	**7,059**
Photographic and optical instruments	4,661	9,274	11,580	1,551	3,358	4,682	2,101	3,645	4,794	163	396	1,478
Watches and clocks	2,841	4,951	4,802	897	1,759	1,792	1,297	1,910	1,957	270	1,016	2,047
Other precision instruments	7,891	17,292	24,132	4,139	8,987	9,648	1,641	3,000	4,134	798	1,821	3,535
Manufacturing total	**1,055,414**	**2,211,005**	**3,322,576**	**363,720**	**792,532**	**1,184,380**	**138,908**	**250,806**	**396,456**	**42,183**	**131,836**	**262,982**

Notes and sources: See Table 1.

Table 9: Structural Changes of Machinery Production and Trade in Japan, 1985-1995

	Share (%)												Net export ratio		
	Domestic production			Value-added			Exports			Imports					
	1985	1990	1995	1985	1990	1995	1985	1990	1995	1985	1990	1995	1985	1990	1995
General machinery	**9.5**	**10.0**	**9.1**	**11.6**	**11.9**	**9.9**	**16.0**	**16.0**	**16.3**	**6.4**	**5.9**	**4.4**	**0.78**	**0.68**	**0.70**
Boilers, turbines and engines	0.7	0.7	0.7	0.8	0.9	0.6	1.1	1.1	0.9	0.3	0.2	0.4	0.85	0.80	0.56
Conveyors	0.5	0.5	0.5	0.6	0.5	0.4	0.7	0.5	0.6	0.3	0.2	0.1	0.82	0.70	0.78
Refrigarators and air conditioning apparatus	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.73	0.70	0.60
Other general industrial machinery	1.6	1.8	1.5	2.2	2.2	1.7	2.1	2.8	2.6	1.2	1.1	0.7	0.70	0.65	0.69
Mining, civil engineering and construciton machinery	0.9	0.9	0.8	1.0	1.0	0.8	2.2	1.6	1.3	0.3	0.4	0.2	0.93	0.78	0.79
Chemical machinery	0.5	0.4	0.4	0.7	0.5	0.4	0.7	0.4	0.4	0.5	0.2	0.2	0.62	0.52	0.54
Industrial robot	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.6	0.0	0.0	0.0	1.00	1.00	1.00
Metal processing machinery and metal machine tools	1.1	1.1	0.8	1.3	1.3	1.0	1.7	1.6	1.6	0.6	0.6	0.2	0.80	0.68	0.82
Other special industrial machinery	1.6	1.7	1.6	2.0	2.0	1.8	2.5	4.1	4.5	1.7	1.9	1.4	0.66	0.61	0.66
Other general machines and parts	1.4	1.3	1.2	2.1	1.9	1.6	2.2	1.2	1.7	1.1	0.8	0.5	0.73	0.52	0.66
Office machines	0.6	0.8	0.7	0.4	0.6	0.5	2.1	1.8	1.7	0.1	0.2	0.4	0.97	0.87	0.76
Machinery for service industry	0.2	0.4	0.5	0.1	0.3	0.5	0.1	0.2	0.2	0.0	0.1	0.1	0.84	0.62	0.41
Electronics machinery	**10.9**	**13.8**	**16.1**	**7.6**	**12.0**	**15.8**	**20.4**	**27.5**	**34.2**	**8.1**	**10.8**	**19.0**	**0.78**	**0.66**	**0.46**
Household electric equipment	1.6	1.6	1.4	0.0	0.8	1.2	6.0	5.9	4.2	0.3	0.9	1.9	0.97	0.86	0.55
Parts and accessories of electric audio equipment	0.9	1.1	1.4	0.3	0.9	1.3	1.0	0.8	0.6	0.2	0.4	0.6	0.91	0.60	0.22
Electric computing equipment and accessory devices	1.4	2.1	2.5	1.2	1.4	1.8	3.3	6.2	6.8	2.1	3.1	5.8	0.68	0.59	0.27
Communication equipment	0.8	1.1	1.3	0.6	0.8	1.0	1.5	1.9	1.3	0.2	0.5	1.0	0.90	0.76	0.32
Applied electronic equipment	0.6	0.7	0.6	0.5	0.7	0.6	0.4	0.6	0.7	0.1	0.4	0.4	0.89	0.53	0.43
Electric measuring instrumnts	0.4	0.4	0.4	0.5	0.4	0.4	0.8	0.9	1.3	0.9	1.0	0.9	0.49	0.29	0.34
Semi-conductor devices and integrated circuits	0.5	0.9	1.7	-0.2	0.6	2.2	1.0	2.7	7.6	0.6	1.1	4.5	0.71	0.65	0.44
Parts of other electric communication equipment	1.7	2.2	2.9	0.8	2.0	3.2	2.2	2.9	4.5	0.9	0.9	1.1	0.79	0.73	0.71
Heavy electrical equipment	1.7	1.9	1.8	2.1	2.3	2.1	2.9	3.0	3.5	1.4	1.3	1.4	0.74	0.63	0.58
Other electrical machinery	1.4	1.8	2.0	1.5	2.1	2.0	1.3	2.6	3.7	1.6	1.4	1.4	0.47	0.57	0.61
Transportation machinery	**12.9**	**14.0**	**13.4**	**9.5**	**9.8**	**9.0**	**31.8**	**30.5**	**24.1**	**5.4**	**7.8**	**6.6**	**0.90**	**0.76**	**0.69**
Passanger motor cars	2.7	3.9	3.5	0.8	1.6	1.6	12.5	15.5	9.5	1.2	3.6	3.8	0.94	0.78	0.58
Trucks, buses and other cars	1.8	1.3	1.1	1.1	0.6	0.5	6.7	3.7	2.5	0.1	0.1	0.1	0.99	0.96	0.96
Two-wheel motor vehicles	0.3	0.2	0.2	0.2	0.1	0.1	1.3	0.9	0.9	0.0	0.1	0.1	0.98	0.92	0.90
Motor vehicle parts and accessories	5.7	6.8	7.1	4.2	5.1	5.4	6.1	6.2	7.5	0.6	0.8	0.8	0.94	0.87	0.87
Ships and repair of ships	1.2	0.9	0.7	1.6	1.3	0.6	4.2	3.1	2.9	0.3	0.2	0.1	0.95	0.95	0.94
Railroad equipment and repair of railroad equipment	0.4	0.3	0.3	0.7	0.3	0.3	0.2	0.1	0.1	0.0	0.1	0.0	0.94	0.37	0.37
Aircrafts and repair of aircrafts	0.3	0.2	0.2	0.5	0.3	0.3	0.1	0.3	0.2	3.1	2.9	1.4	-0.80	-0.70	-0.61
Other transport equipment	0.4	0.4	0.4	0.4	0.4	0.3	0.8	0.7	0.5	0.1	0.2	0.2	0.96	0.80	0.58
Precision machinery	**1.5**	**1.4**	**1.2**	**1.8**	**1.8**	**1.4**	**3.6**	**3.4**	**2.7**	**2.9**	**2.5**	**2.7**	**0.61**	**0.45**	**0.21**
Photographic and optical instruments	0.4	0.4	0.3	0.4	0.4	0.4	1.5	1.5	1.2	0.4	0.3	0.6	0.86	0.80	0.53
Watches and clocks	0.3	0.2	0.1	0.2	0.2	0.2	0.9	0.8	0.5	0.6	0.8	0.8	0.65	0.31	-0.02
Other precision instruments	0.7	0.8	0.7	1.1	1.1	0.8	1.2	1.2	1.0	1.9	1.4	1.3	0.35	0.24	0.08
Manufacturing total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**0.53**	**0.31**	**0.20**

Notes and sources: See Table 1.

Table 10: R&D Contents of Japanese Machinery Trade, 1985-1995

Research institute	Exports		Imports		Total exports	Total imports	Domestic production	Service contents ratio
	$S^{D}x$ [A]	$S^{ID}x$ [B]	$S^{D}m$ [C]	$S^{ID}m$ [D]	Sx [E]=[A]+[B]	Sm [F]=[C]+[D]	S [G]	(Sx-Sm) / S [H]=([E]-[F]) / [G]
1985 All goods	**60**	**512 (100.0%)**	**61**	**279 (100.0%)**	**572**	**340**	**4,928**	**0.047**
Machinery total		**401 (78.3%)**		**44 (15.8%)**	**461**	**105**		**0.072**
General machinery		55 (10.7%)		5 (1.9%)	115	66		0.010
Electronics machinery		164 (32.1%)		18 (6.4%)	224	79		0.030
Transportation machinery		167 (32.6%)		16 (5.8%)	227	77		0.030
Precision machinery		15 (2.9%)		5 (1.7%)	75	65		0.002
1990 All goods	**75**	**816 (100.0%)**	**129**	**456 (100.0%)**	**891**	**585**	**9,817**	**0.031**
Machinery total		**643 (78.8%)**		**152 (33.3%)**	**719**	**281**		**0.045**
General machinery		104 (12.8%)		18 (4.0%)	180	148		0.003
Electronics machinery		268 (32.9%)		57 (12.4%)	344	186		0.016
Transportation machinery		252 (30.9%)		66 (14.6%)	328	196		0.013
Precision machinery		19 (2.3%)		11 (2.4%)	94	140		-0.005
1995 All goods	**229**	**1,690 (100.0%)**	**347**	**1,138 (100.0%)**	**1,919**	**1,485**	**19,908**	**0.022**
Machinery total		**1,318 (78.0%)**		**412 (36.2%)**	**1,547**	**759**		**0.040**
General machinery		200 (11.8%)		35 (3.1%)	429	382		0.002
Electronics machinery		623 (36.9%)		233 (20.5%)	852	580		0.014
Transportation machinery		457 (27.0%)		109 (9.6%)	686	456		0.012
Precision machinery		39 (2.3%)		35 (3.1%)	268	382		-0.006

Research and development (intra-enterprise)	Exports		Imports		Total exports	Total imports	Domestic production	Service contents ratio
	$S^{D}x$ [A]	$S^{ID}x$ [B]	$S^{D}m$ [C]	$S^{ID}m$ [D]	Sx [E]=[A]+[B]	Sm [F]=[C]+[D]	S [G]	(Sx-Sm) / S [H]=([E]-[F]) / [G]
1985 All goods	**0**	**8,676 (100.0%)**	**0**	**1,645 (100.0%)**	**8,676**	**1,645**	**24,606**	**0.286**
Machinery total		**7,357 (84.8%)**		**533 (32.4%)**	**7,357**	**533**		**0.277**
General machinery		1,011 (11.7%)		83 (5.1%)	1,011	83		0.038
Electronics machinery		3,019 (34.8%)		313 (19.0%)	3,019	313		0.110
Transportation machinery		3,194 (36.8%)		88 (5.3%)	3,194	88		0.126
Precision machinery		134 (1.5%)		49 (3.0%)	134	49		0.003
1990 All goods	**0**	**17,590 (100.0%)**	**0**	**6,543 (100.0%)**	**17,590**	**6,543**	**60,194**	**0.184**
Machinery total		**15,210 (86.5%)**		**3,037 (46.4%)**	**15,210**	**3,037**		**0.202**
General machinery		1,587 (9.0%)		248 (3.8%)	1,587	248		0.022
Electronics machinery		8,446 (48.0%)		1,810 (27.7%)	8,446	1,810		0.110
Transportation machinery		4,872 (27.7%)		800 (12.2%)	4,872	800		0.068
Precision machinery		306 (1.7%)		179 (2.7%)	306	179		0.002
1995 All goods	**0**	**26,961 (100.0%)**	**0**	**13,040 (100.0%)**	**29,961**	**13,040**	**97,226**	**0.174**
Machinery total		**22,724 (84.3%)**		**7,262 (55.7%)**	**22,724**	**7,262**		**0.159**
General machinery		2,847 (10.6%)		474 (3.6%)	2,847	474		0.024
Electronics machinery		13,001 (48.2%)		5,070 (38.9%)	13,001	5,070		0.082
Transportation machinery		6,430 (23.8%)		1,320 (10.1%)	6,430	1,320		0.053
Precision machinery		445 (1.7%)		397 (3.0%)	445	397		0.000

Notes and sources: See Table 4.