

**Factor markets and their institutions in traditional Japan (I):
Labour**

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Tokugawa Japan was a land of peasants. They were family-farm cultivators. Although the proportion of land under tenancy increased over time, there was no tendency towards consolidation of family farms. This social group of peasant families accounted for 80 per cent of the population. This percentage suggests that the size of the workforce in industry and trade was small and occupational differentiation limited, hence, one may argue, it is likely that market forces hardly operated in the allocation of labour during Tokugawa times. However, given the recent consensus that Tokugawa Japan achieved Smithian growth with rural industrialisation and agricultural output growth as major engines of growth, how could this picture of a factor market be consistent with the Smithian scenario? In order to answer this question, the paper will go over both rural and urban labour markets in the period before the age of the factory, examining how large the markets were, how they operated, and how skills were formed in different sectors of the economy.

The rural sector

Perhaps the best numerical evidence we have for the structure of the workforce in a traditional rural setting is the 1879 pilot census for Yamanashi prefecture (Tōkei-in 1882. See Saito 1986, 1998, Umemura 1969, 1980). This was a comprehensive survey of population taken by a group of Meiji-government statisticians in the hope that the exercise would be a preparation for the taking of a national census. Yamanashi (formerly Kai province) was chosen for the pilot study because the prefecture was relatively small with population of 397,000, geographically compact with no change made in administrative boundaries at the time of the Meiji Restoration, and retained much of traditional characteristics

from the Tokugawa past. Caution must be made, however. One is that two decades had already passed since the opening of the Treaty ports, which led to a spectacular rise of the silk trade in rural provinces. Yamanashi was one of such silk-producing provinces, specialised more and more in the supply of cocoons, on the one hand, and in the making of fabrics, on the other, than in the production of raw silk. The other is that the workforce of the Yamanashi region was not entirely unscathed by the Meiji government's westernisation programmes. By 1879 there were a small but sizeable number of firms and offices which may be classified as belonging to the 'modern' sector, a majority of which were found in the tertiary industry.

The census report of 1879 allows us to have a glimpse into the structure of a traditional rural workforce. Table 1 shows the distribution of the gainfully occupied between the three industrial sectors at the end of the 1870s, as well as the size and proportion of workers who worked for wages and salaries across the three industries.

First, one may notice that the total number of working females (109,736) was not much different from that of males (129,757), implying that the rate of female workforce participation was high. With respect to the population aged 15 and over, the female proportion was 82 per cent while the male proportion was as high as 99 per cent. Both percentages may have been slightly overstated since it is likely that there were some under-15-year-olds who had already started working. Even if this possibility is taken into account, however, the proportion of women working was unmistakably high and suggests that a vast majority of married women were in the workforce.

Second, column (1) of the table indicates that the structure of the Yamanashi economy was very much agricultural. 86 per cent of the 129,757 males were found in agriculture and forestry. The percentage was somewhat lower for females (75 per cent of the 109,736) as comparatively more were found in manufacturing. The latter is associated with the fact that this was a silk region where both reeling and weaving were carried out almost exclusively by females. Out of the 24,796 gainfully occupied females 16,763 were in textiles, of which silk reeling and weaving alone accounted for 15,694 (94 per cent). Altogether, however, about 80 per cent of the working population were in agriculture, which happens to fit with the aforementioned share of the peasantry in the Tokugawa population.

Third, column (3) of the table shows that the overall proportion of the employed was as low as 4 per cent. In the case of the tertiary sector the level was rather

exceptionally high, but it was due to the sizeable existence of male office workers, on the one hand, and of female domestic servants, on the other. Men in public administration and education amounted to 1,178, 43 per cent of the male wage/salary earners, while 660 domestic servants alone accounted for 65 per cent of the female figure. In agriculture and manufacturing, on the other hand, men and women working for wages were either exceptional or small in absolute numbers.

However, it should be noted that Table 1 is based solely on their principal occupation. In fact, many of the Yamanashi people were returned as having *dual occupation*. As Thomas Smith, Shunsaku Nishikawa and others have already pointed out, by-employment was widespread in the late-Tokugawa countryside (Smith 1969/88, Nishikawa 1978, 1987), and it is likely that the phenomena became more pronounced in the silk-producing regions after the opening of the country into world trade.

Table 2 looks at this aspect of Yamanashi's workforce of the 1870s. According to column (1) of the table, 26 per cent of the working population were dually occupied, which reflected that about a quarter of both male and female agricultural population had a non-agricultural side occupation. Sericultural work was regarded by Meiji contemporaries as the farm family's by-employment, but in table 2 the combination of farming and sericulture is not considered a dual occupation. If it were to be added in the side occupation category, the proportion dually occupied would become much higher. Such dual occupation was less frequent in the manufacturing and service sectors. Column (2) reveals that in the non-agricultural activities, generally, there were more part-time, by-employment workers than those whose principal occupation was in the said sectors. This is particularly marked for males. In manufacturing and mining, there were 72 per cent more part-time male workers than those whose principal pursuit was recorded in industry and mining. In the case of female by-employment the ratios in the column do not exceed 100, which is because many of them returned their side occupation as in the agricultural sector. In fact, of the 16,763 female principal textile workers 9,752 (58 per cent) were engaged in the raising of silk worms as a side occupation. They were wives and daughters of the farm households. All this, therefore, indicates that the peasant family was the major supplier of by-employments to manufacturing, commerce and other service occupations, while much less wage labour was supplied from the farm household.

However, wage workers did exist. They were found not just in towns but in rural villages as well, and it is important to get to know what sort of people they were,

and where they came from. Although it is not possible to obtain further break-downs from the published census report, four village census returns that survived in exceptional circumstances enable us to examine what sort of farm household supplied wage workers to the labour market (for the source material, see Saito 1986).

The four villages were located in a sericultural area, with 94 per cent of the population belonging to the farm household. Many villagers combined rice cultivation with sericulture, as a result of which fewer-than-average industrial by-employments were found in the villages. A rather exceptionally high percentage for male landlord family members (59 per cent) was accounted for by their commercial orientation: many of them were merchants as well. The proportion of female farm family members having non-agricultural, domestic by-employment, such as reeling and weaving, was in the range of 13-22 per cent, and the wealthier the family the less likely to get engaged in non-agricultural by-employment. Yet those who worked for wages, either full-time or part-time, were even fewer. Only 64 males (7 per cent) and 39 females (4 per cent) worked for wages. The farm households supplied a less than half share of each number, and most of whom came from poorer families of tenant cultivators. Another source of wage labour was from day labourers' families, who represented only 2 per cent of the population and were, unlike farm households, all female- or child-headed households.

It is worth noting that there were two different kinds of workers of employee status: workers employed by the day and those on a longer-term contract. The latter were usually live-in servants and apprentices. Their historical origins were hereditary family subordinates (called *nago* or *fudai*) and those who may be described as in 'pawn service', i.e. whose labour service was considered the interest of money that his or her parents borrowed. Both kinds of service declined in importance and developed into wage labour on a shorter contract during the course of the Tokugawa period (Nagata 2004). The change was particularly pronounced in the case of farm servants. Consequently, in the Meiji period it was usually the case that demand for outside labour by wealthier farmers was met by live-in farm servants on a yearly contract and by those employed by the day.

The Yamanashi census allows us to differentiate day labourers from the live-in type, although in the case of manufacturing and service occupations, some casual employees may have been included in the latter category. In agriculture, according to Table 4, the number of day labourers was not much different from that of live-in servants. There were comparatively more servants in the case of men and slightly

more day labourers in the case of women, but the overall ratio was about fifty-fifty. In manufacturing, commerce and other service occupations, on the other hand, no day labourer existed. There is evidence that the House of Mitsui in Kyoto employed day labourers regularly, and it is not unlikely that in Yamanashi towns too, there were such labourers. In other words, those employed by the day are likely to have been included in the 'servant' group since 'apprentices and employees (*yatoi*)' was a category label found in the census report. But '*yatoi*' is so general a word that it is difficult to know exactly how many workers were actually employed on a daily basis. We would probably have to assume that a majority of those in the 'servant' group were in fact apprentices and live-in clerks of traditional type, including even head clerks who may have lived out of the master's household. In the case of men in the tertiary sector, there were a sizeable number of 'others'. Many of them were in fact in public administration, which was a new category in the Meiji period.

All in all, the Yamanashi evidence supports the view that the extent of the Tokugawa labour market was rather limited. If all the 'servants' were lumped together and, considering that a vast majority of them were unmarried, and were compared with Yamanashi's unmarried population in the 15-24 age group, the total, 4,383 and 2,322 respectively, would mean that 15 per cent of the male and 13 per cent of the female population experienced live-in service at least some point in their life course. These percentages are unmistakably lower than those for early modern English youths, whom Peter Laslett labelled as life-cycle servants (Laslett 1972, p.82, Laslett 1983, Kussmaul 1981), but cannot be regarded as negligible. What separates rural Japanese youths from their English counterparts is that Japanese live-in service was not a step to another life-cycle stage in which they got married and formed a labourer's family. Instead, Japanese servants became self-employed when married.

The urban sector

Although there were no 'day labourers' recorded in Yamanashi's commercial and industrial sectors, cities and towns of the Tokugawa period were full of *casual labour*. Indeed, it seems that the urban workforce was being casualised during the latter half of the Tokugawa period. Elsewhere I demonstrated based on a sample of population registers in the 1860s that the proportion of servants to the town population hardly reached 10 per cent in provincial towns and all Edo boroughs (Saito 1990). It is true that many towns lost population over the same period (Smith 1973/88, Saito 2002, pp.28-37), but the proportion of servants in the population did decline in those cases, suggesting that casual work increased in the

urban labour market. According to a statistics compiled from household registers of Tokyo (formerly Edo) in 1873, which classified family heads into five occupational groups, the largest group was 'miscellaneous occupations' (collectively called *zatsugyō*) including, not just day labourers, but hawkers, petty stallholders, street entertainers and waste pickers as well. The latter kinds of people are likely to have been classified in the self-employed category in later Meiji statistics. At any rate, it is those people whose numbers increased in towns of the late Tokugawa period.

However, the aforementioned samples of urban population registers indicate that there was a trend in an opposite direction. In Osaka and in one central Edo borough, where many Osaka and Kyoto merchants had branch shops, the proportion of live-in servants in population seems to have increased. The level reached was well over 10 per cent but varied between 25 and 50 per cent. Higher percentages were found in wealthy areas. In circles of tradesmen the employment of servants expanded in the eighteenth and early nineteenth centuries as the size of their business operations grew. Mitsui's Echigoya, for example, owned nine shops in Kyoto, Osaka and Edo, employing a total of 1,020 servants. They were all male and lived in the master's household. Their number did not include kitchen and other household staff but covered business apprentices and clerks only. The merchants not only employed large numbers but also kept them longer. Indeed there was a clear tendency for the average length of their live-in service to get longer. Case studies show that successful servants who reached the status of head clerk (*bantō*) or who were allowed to establish his own business spent more than 20 years in the master's household. They entered the house as an apprentice (*detch*) at the age of 12 or 13, promoted to a shop assistant (*tedai*), and to various positions before joining the management. This did not mean that all apprentices were guaranteed life-long employment. On the contrary, according to Mitsui's records, internal competition was rather tough. Four in nine dropped out before the age of 18 and only one in ten reached the position of head clerk. This mercantile version of apprenticeship developed into a system of on-the-job training and internal promotion. In other words, eighteenth- and nineteenth-century Osaka witnessed the rise of an internal labour market in the merchant houses (Saito 2002, pp.107-122; see also Saito 1990).

Significant as the mercantile system of apprenticeship as a historic precursor of the present-day Japanese style of employment, however, it seems that the tendency of casualisation outweighed that of the internal labour market during the latter half of the Tokugawa period. In quantitative terms, those involved in the former outnumbered those in the latter system and the gap must have widened

over time.

The workings of the labour markets

There was a widely held view among economists that pre-World War II Japan was in a regime of the Lewisian unlimited supply of labour (Lewis 1954, Ohkawa 1965, Minami 1973). According to this interpretation, when there was disguised unemployment in agriculture, the supply price of labour to the non-agricultural sector was determined not by marginal but by average productivity of the farm household. Recently Konosuke Odaka revisited the issue and confirmed that wage earnings of the farm servant employed on a yearly contract were roughly comparable to average, rather than marginal, productivity of agriculture in the period 1906-40 (Odaka 2004). It is noted, however, that while the finding is consistent with the previous interpretations, it is at odd with another finding with respect to the period before the Meiji Restoration. Odaka cites the work by Shunsaku Nishikawa on a regional economy called Chōshū in the 1840s, which shows that the average wage rate for the unskilled working for salt farms was close to marginal labour productivity in farming derived from production function estimates based on other sources (Nishikawa 1978). Although no data on agricultural wage rates are available for the area in question, Nishikawa notes that salt workers were seasonal, and were supplied from nearby farm households. It is therefore likely that there was a mechanism by which agricultural and non-agricultural wages, on the one hand, and marginal productivity of agricultural production, on the other, were equilibrated with each other.

Seemingly, this is a puzzle. However, one can question the validity of the finding for the early twentieth century. First, production elasticity of labour used to calculate the average and marginal productivity figures for the 1906-40 period is 0.34, perhaps too low compared with the Nishikawa estimates of 0.49-54 for Chōshū of the 1840s and even with an alternative estimate of 0.4 derived from data for the early 1930s (Hayami et al. 1975, pp.89-102). Second, the choice of the live-in farm servant for comparison is questionable. As noted earlier, farm live-in service based on a yearly contract was declining in the long run, and it may be that the input of their labour was less sensible to changing circumstances than that of workers employed by the day. Third, there are other findings for the late Tokugawa period that wage rates of both agricultural and urban day labourers came very close to each other in the Kyoto-Osaka area, and that the long-term rate of increase in agricultural wages was almost equal to that of farm output in real terms over the entire 1700-1870 period (Saito 1978, 2005).

As long as the peasant farm household was an independent decision-making unit of production, therefore, the rural labour market, however limited its extent was, must have worked reasonably well. And this gave rise to the emergence of a well-integrated labour market between the peasant farm household and non-farm sectors within a regional setting. Indeed, as early as the late eighteenth century, such labour market workings in a pre-factory setting attracted Adam Smith's attention. In a chapter on wages in his *Wealth of Nations*, he examined the effects of harvest on wages for servants and journeymen:

'In years of plenty, servants frequently leave their masters, and trust their subsistence to what they can make by their own industry. ...The price of labour, therefore, frequently rises in cheap years.

'In years of scarcity, the difficulty and uncertainty of subsistence make all such people eager to return to service. ...[As a result] wages of both servants and journeymen frequently sink in dear years' (Smith 1776/1976, I, p.101).

His account tells us that their parental household's ability to produce 'subsistence' determined their asking price in the labour market, the reasoning which can easily be re-stated and generalised in marginal productivity terms. Furthermore, it is this reasoning that, unlike the Lewisian model of unlimited supply of labour, enables the market wage rate for the non-farm unskilled to keep pace with output growth in agriculture.

As for the workforce in the houses of urban merchants, however, the workings became very different. The rise of the internal labour market must have affected the ways in which apprentices were recruited. In Osaka, for example, as the institution of internal promotion took root, it became less and less likely for the apprentices to be in-migrants from the rural areas. Instead, most of them were supplied from the families of urban merchants. In the case of a wealthy money changer, Kōnoike, documents covering the 1801-48 period indicate that 43 per cent of the new recruits were sons of Kōnoike's branch families and former employees, 37 per cent from urban communities of Osaka and Kyoto, and only 18 per cent from rural areas. Another Osaka evidence reveals that most of those rural-born apprentices were likely to be sons of merchants, not of farmers. Even in Edo branch shops of Osaka merchants were found virtually no local-born apprentices. They were all employed at the headquarters in Osaka or Kyoto, and then sent to Edo.

During the latter half of the Tokugawa period, there emerged numerous job agents (called *kuchiire*). According to a contemporary book on the two cities, Edo and

Osaka, most of those agents acted as go-between in labour markets for seasonal and casual workers in, for example, construction work. In contrast, wrote the author, it was rare for the Osaka merchant houses to rely on such employment agents (quoted in Saito 2002, pp.86-88). Unlike the casual labour market, therefore, the urban market for shop apprentices and clerks became increasingly closed.

Skill formation

Undoubtedly the rise of the internal labour market in the form of merchant apprenticeship was associated with the need for the formation of skills *within the firm*. Many of the merchant houses in Osaka and Kyoto were organisationally large, having a multiple departmental structure. Their apprentices and shop clerks were required to go round all the departments and, if successful, they were allowed to climb the ladder step by step before reaching the rank of head clerk. A head clerk required all-round and, perhaps, firm-specific training for him to be able to run a shop or a franchised business.

Apprenticeship as a model of skill formation institution is a system which combines two separate elements. The core element is on-the-job training that allows the guild to restrict entry into the trade, while the system assumes that once qualified, they set forth into the outside labour market. Set against this model, the type of merchant apprenticeship that developed in the Osaka-Kyoto world may be seen as a variant that *internalised* the latter element. However, this distinct system of skill formation gained significance in a much later period of twentieth-century industrialisation. More important in the Tokugawa period were traditional skills found in craft occupations and also in the farm household since it was their members who supplied a major workforce to expanding rural industries.

In the Tokugawa period, there existed urban craft guilds. The guild functioned much the same way as in the European past: it was an institution that controlled the trade within the town, as well as a system of training craft skills. Because of this training system Tokugawa Japan produced a good deal of fine arts and handicrafts such as lacquer ware and ceramics. As a body of exercising restrictive power over the trade, however, the Tokugawa craft guild was not much effective. Especially in the building and metal trades which were much larger than the artistic craft occupations, it seems that they failed to regulate market wages and to restrict entry into the trade. For example, just after a devastating earthquake of 1855 in Edo, while guild-regulated wage rates for carpenters were kept fixed, the market rates reported to city authorities were five times as high as the

regulated wage levels (Saito 1998, pp.34-35). Such wage hike must have attracted a number of rural carpenters into the city labour market.

The Yamanashi census of 1879 reveals that there were a sizeable group of rural craftsmen working either full-time or part-time. Since it is difficult to tell from the census occupational tables who were 'traditional' craftsmen and who were not, Table 5 gives a select list of such craft occupations. With the exception of two female smiths, they were all male. If those working on the side were excluded, they would represent only 7 per cent of the total male workforce in manufacturing and mining. However, it should be realised, first, that in many trades there were more craftsmen who reported that they worked on the side with their main occupation in agriculture. Most specialised of the six craft occupations listed in the table were cabinet makers and smiths. In those trades there were fewer part-timers. However, in all the building trades and in coopers' trade, there were on average twice as many as such part-timers than the principally occupied craftsmen. Those craft occupations were peasant family by-employments.

Second, Table 5 also lists the number of apprentices in each trade. The highest proportions of apprentices were found in the carpentry and smithy, i.e. 11-12 per cent in the case of principally occupied craftsmen. Even these percentages suggest that only one in seven or eight masters took an apprentice. But in other craft occupations, the percentages were far lower and the chance to find an apprentice among part-time craftsmen was virtually nil. Given a possibility that among 'apprentices and employees' there were some who did not enjoy apprentice status, the overall impression is that formal apprenticeship was not an important medium of transmitting skills from generation to generation. Since it was in industries outside the craft sector that expanded in the period of rural industrialisation, and since each craftsman's occupation was to be handed to his son, it may be that in all these craft occupations the intra-family transmission of skills was more important than formal apprenticeship, irrespective of whether they were full-time or part-time craftsmen.

The Tokugawa farm household was a place in which skills were taught. As for agriculture, having compared with other rice growing societies, Koji Tanaka maintains that Japanese farming methods were not just more labour-intensive but also substantially more skill-intensive. Indeed, there is evidence that in many villages competition was held for ploughing, transplanting and other farming activities, suggesting that although there was no formal training institution, skills were highly appreciated socially (Tanaka 1987). Moreover, according to Thomas Smith, the farm household taught its family members time discipline and

co-ordination skills. Based on farm manuals published in Tokugawa times and a couple of farm diaries, he argued that since each crop entailed a number of 'narrowly timed tasks' and since double-cropping was virtually the norm, the cropping decisions 'set a work schedule for an entire growing season', It was even more complicated by the spread of by-employment. The farm household had to shift family labour 'back and forth from farming to by-employments, not only seasonally but from day to day and within the day, and also to use the off-farm earnings of individuals for the benefit of the farm and the family. This flexibility encouraged the spread of by-employments and thus put even tighter pressure on agriculture' (Smith 1986/88, pp.206, 214).

In the farm sector too, therefore, labour was allocated *internally* and skills formed *internally*. But co-ordination skills and time discipline they learnt in the farm household may well have been transferable to a non-agricultural world, and to an emerging industrial sector in a later period.

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Table 1. Occupational structure and the proportions employed: Yamanashi, 1879

	Number of persons occupied (1)	Of whom employed (2)	% employed (3)
<i>Total occupied</i>	239,493 (100)	8,876	4
Agriculture and forestry	194,338 (81)	4,057	2
Manufacturing and mining	31,188 (13)	1,067	3
Commerce, transport and other occupations	13,967 (6)	3,752	27
<i>Males</i>	129,757 (100)	6,014	5
Agriculture and forestry	112,065 (86)	2,838	3
Manufacturing and mining	6,392 (5)	433	7
Commerce, transport and other occupations	11,300 (9)	2,743	24
<i>Females</i>	109,736 (100)	2,862	3
Agriculture and forestry	82,273 (75)	1,219	1
Manufacturing and mining	24,796 (23)	634	3
Commerce, transport and other occupations	2,667 (2)	1,009	38

Source: Tōkei-in (1882).

Table 2. The structure of dual occupation: Yamanashi, 1879

	% having side occupation	Ratio of those working on the side to the principally occupied
	(1)	(2)
<i>Total</i>	<i>26</i>	<i>26</i>
Agriculture and forestry	25	8
Manufacturing and mining	39	105
Commerce, transport and other occupations	9	106
<i>Males</i>	<i>23</i>	<i>23</i>
Agriculture and forestry	26	4
Manufacturing and mining	5	172
Commerce, transport and other occupations	9	126
<i>Females</i>	<i>30</i>	<i>30</i>
Agriculture and forestry	25	12
Manufacturing and mining	48	88
Commerce, transport and other occupations	10	20

Source: Tōkei-in (1882).

Table 3. Social class of village populations working for wages: four Yamanashi villages, 1879

Social class of household	Number of Persons	% engaged in	
		non-wage, non-agricultural work	wage work
	(1)	(2)	(3)
<i>Males</i>			
Landlord	56	59	2
Farmer	815	11	3
Owner	214	11	0
Part owner	225	9	1
Tenant	376	12	6
Farm labourer	29	0	100
Non-agricultural	30	67	30
<i>Total</i>	<i>930</i>	<i>15</i>	<i>7</i>
<hr style="border-top: 1px dashed black;"/>			
<i>Females</i>			
Landlord	45	9	0
Farmer	867	19	2
Owner	223	13	0
Part owner	249	20	1
Tenant	395	22	4
Farm labourer	17	0	76
Non-agricultural	31	20	23
<i>Total</i>	<i>960</i>	<i>18</i>	<i>4</i>

Source: Tōkei-in (1882).

Table 4. The structure of the wage-earning workforce: Yamanashi, 1879

	Principally occupied	As side occupation	Both combined
<i>Males</i>	<i>6,014</i>	<i>2,850</i>	<i>8,864</i>
Agriculture and forestry			
Servants (incl. apprentices, clerks and employees)	1,623	310	1,933
Day labourers	1,208	503	1,711
Others	7	2	9
Manufacturing and mining			
Servants (incl. apprentices, clerks and employees)	433	208	641
Day labourers	—	—	—
Others	—	1	1
Commerce, transport, etc.			
Servants (incl. apprentices, clerks and employees)	1,463	346	1,809
Day labourers	—	—	—
Others	1,280	1,282	2,562
<i>Females</i>	<i>2,862</i>	<i>201</i>	<i>3,063</i>
Agriculture and forestry			
Servants (incl. apprentices, clerks and employees)	591	31	622
Day labourers	628	87	715
Others	—	—	—
Manufacturing and mining			
Servants (incl. apprentices, clerks and employees)	634	38	672
Day labourers	—	—	—
Others	—	—	—
Commerce, transport, etc.			
Servants (incl. apprentices, clerks and employees)	985	43	1,028
Day labourers	—	—	—
Others	24	2	26

Source: Tōkei-in (1882).

Table 5. Traditional craftsmen: select examples, Yamanashi, 1879

	Craftsmen	Apprentices/employees	% employed (2)/[(1)+(2)]
	(1)	(2)	(3)
<i>Building</i>			
Carpenter	1,242	19	12
Working on the side	2,337	4	0.2
Plasterer	135	3	2
Working on the side	357	1	0.3
Mason	88	0	0
Working on the side	237	0	0
<i>Total</i>	<i>4,396</i>	<i>27</i>	<i>1</i>
<i>Woodwork</i>			
Cabinetmaker	162	8	5
Working on the side	58	0	0
Cooper	264	8	3
Working on the side	478	1	0.2
<i>Total</i>	<i>962</i>	<i>17</i>	<i>2</i>
<i>Metal</i>			
Smith	330	40	11
Working on the side	198	5	2
<i>Total</i>	<i>528</i>	<i>45</i>	<i>8</i>

Source: Tōkei-in (1882).

Note: 330 smiths include 2 females.