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**Nonprofit/For-Profit Status and Earning Differentials  
in the Japanese At-home Elderly Care Industry:  
Evidence from Micro-level Data on Home Helpers  
and Staff Nurses**

Haruko Noguchi and Satoshi Shimizutani

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Institute of Economic Research  
Hitotsubashi University  
Kunitachi, Tokyo, 186-8603 Japan  
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Nonprofit/For-Profit Status and Earning Differentials in the Japanese At-home Elderly Care  
Industry: Evidence from Micro-level Data on Home Helpers and Staff Nurses<sup>1</sup>

By

Haruko Noguchi and Satoshi Shimizutani

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Please address correspondence to:

**Haruko Noguchi**

Affiliation: Toyo Eiwa University, Faculty of Social Science, Kanagawa, Japan

Address: 32 Miho-cho, Midori-ku, Yokohama, Kanagawa, 226-0015, Japan

TEL: +81-45-922-5511(ext. 7273)

FAX: +81-45-922-5517

Email: [hnoguchi@newage3.stanford.edu](mailto:hnoguchi@newage3.stanford.edu)

**Satoshi Shimizutani**

Affiliation: Hitotsubashi University, Tokyo, Japan

Address: 2-1 Naka, Kunitachi-shi, Tokyo, 189-8603, Japan

TEL: +81-42-580-8369

FAX: +81-42-580-8333

Email: [sshimizu@ier.hit-u.ac.jp](mailto:sshimizu@ier.hit-u.ac.jp)

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## **Abstract**

In April 2000, Japan embarked on a reform of its health care market. Along with the introduction of the long-term care insurance scheme, the government for the first time allowed for-profit operators to compete head-on with non-profit operators in the provision of at-home care services. Taking advantage of a unique and rich micro-level survey, this study is the first to examine wage differentials between the nonprofit and the for-profit sector in Japan's nursing care industry, concentrating on home helpers and staff nurses. Controlling for nonrandom unobserved selection biases, our results show that a nonprofit wage premium exists. This finding supports the hypothesis that nonprofit providers operate under non-distributional constraints.

**Classification Code:** I11

**Key Words:** Japanese long-term care insurance, long-term care, nursing home, home helpers, staff nurses, nonprofit wage premium, quality of care, Heckman's two-stage approach

## 1. Introduction

In 2000, the Japanese government embarked on an ambitious program to reform the country's health care system. In addition to the introduction of a long-term care insurance scheme, the market for the provision of at-home care for the elderly was liberalized. Until 2000, at-home care for the elderly was provided under the state welfare program, with those qualifying being assigned to a nonprofit provider by local government officials. At-home care services by for-profit providers were not reimbursed by the government, so that only the wealthy were able to afford them, and the market was correspondingly small (Shimizutani and Noguchi, 2004; Mitchell et al., 2004). Following the reform, patients are now allowed to choose freely between nonprofit and for-profit providers and make a copayment of 10 percent of the cost, with the remainder covered by the long-term care health insurance, no matter what type of provider they choose. Thus, for the first time, for-profit providers are able to compete directly with nonprofit providers in the home-help market.

This situation provides an exceptional opportunity to test whether there is a nonprofit wage premium in the market for long-term care. Economic theory provides conflicting hypotheses regarding the wage setting behavior of different types of providers. On the one hand, information asymmetries prevent consumers from judging the quality of services in advance, providing incentives for opportunistic behavior by for-profit operators, which might be tempted to raise profits by lowering wages.<sup>2</sup> On the other hand, wages in the nonprofit sector might be lower, for example as a result of "labor donation." According to this hypothesis, employees in the nonprofit sector may be willing to accept lower wages in exchange for non-monetary benefits, such as the satisfaction derived from providing socially valuable services. The Japanese

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<sup>2</sup> Lower wages, in turn, might lead to a lower quality of services, and it is this potential problem of opportunistic behavior that provided the rationale for the traditional policy of barring for-profit providers from

at-home care market provides an ideal set-up for an examination of wage differentials between nonprofit and for-profit providers because output prices are regulated by the government and care users are guaranteed government-subsidized access to any type of provider.

Despite this innovative institutional change, surprisingly, there has been little research on nonprofit wage differentials in Japan. This study utilizes a large and unique employer-employee matched micro-level database to analyze sectoral wage differentials for home helpers and staff nurses, the occupational groups accounting for the largest portion - about 40 percent of all employees – in our dataset. Our empirical findings confirm the existence of a nonprofit wage premium in Japan’s at-home care market and thus offer important policy implications for the design of market competition in other regulated industries such as medical or educational services.

The paper is organized as follows. The next section briefly reviews the theoretical literature and previous research on earnings differentials. Section 3 provides an outline of Japan’s long-term care insurance program. Next, Section 4 describes the data for our empirical analysis. Section 5 presents the empirical results, evaluates which factors contribute to the wage differentials and discusses the findings. The last section concludes.

## **2. Review of the literature**

In contrast with the very limited number of studies on Japan, there is a large body of literature on nonprofit wage in the United States. Most of these studies test the competing hypotheses of a wage premium either in the nonprofit or in the for-profit sector.

The starting point of any discussion of this topic is usually the “contract failure” approach developed by Hansmann (1980), on which most subsequent studies are based.

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the long-term care market.

Hansmann argues that, due to the asymmetry of information between consumers and providers, consumers are not able to observe the quality of services. This situation provides room for opportunistic behavior by for-profit operators who might be tempted to raise profits by lowering the quality of services. In contrast, nonprofit operators, Hansmann argues, are subject to “non-distributional constraints,” i.e. they are prohibited from distributing net earnings and thus operating subject to very different incentives. The “non-distributional constraints” argument encompasses two earlier key hypotheses that seek to explain the (potential) existence of wage premiums in the nonprofit sectors. The first of these is labeled the “philanthropic wage-setting” hypothesis (Feldstein, 1971), or, in a later version, the “attenuated property rights” hypothesis (Borjas et al., 1983), suggesting that nonprofit managers have less incentive to lower wages since they do not have to make profits. The second hypothesis highlights the relation between wage setting and quality control. Newhouse (1970) argues that managers in the not-for-profit sector have less incentive to lower the quality of service provided since this is what their performance is judged on, or they desire to show professional excellence or technical virtuosity by stressing quality.<sup>3</sup>

However, there are also arguments giving reasons why nonprofit wages should in fact be lower than those in the for-profit sector. One example is the “labor donation” argument, which suggests that employees in the nonprofit sector place a lower value on money and a higher value on non-monetary benefits such as working conditions or social responsibility (Rose-Ackerman, 1996; Preston, 1989). Another explanation is that nonprofit enterprises are concentrated in less-profitable sectors (Lakdawall et al., 1998).

Many researchers have attempted to assess quantitatively wage and quality differentials

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<sup>3</sup> Yet another hypothesis suggests that the nonprofit wage premium can be attributed to the exemption from taxes or governments’ preferential treatment of the nonprofit sector (Frank and Salever, 1994).

between the two sectors. However, it seems fair to say that the empirical findings for the U.S. are inconclusive. While some studies observe a significant wage premium, others do not find a significant wage differential. One approach to tackle the question has been to investigate overall and within-industry wage differentials. Proceeding along these lines, Leete (2001), for example, examines economy-wide wage differentials between nonprofit and for-profit employees. Another approach is to investigate wage differentials in specific sectors. Research along these lines looking at the nursing home and day care industries, however, has failed to produce conclusive results.<sup>4</sup> Borjas et al. (1983), for example, find evidence of a wage premium in the nursing home industry and argue that this result is consistent with the attenuated property rights explanation. Similarly, Preston (1988) provides evidence suggesting that employees of federally regulated nonprofit daycare centers enjoy a wage premium.

Despite the academic and practical importance of the issue, there has been very little research on the existence (or otherwise) of wage premiums in the nonprofit sector in Japan, either in the elderly care market or elsewhere. A major reason for the lack of such research is the simple fact that there are few markets in Japan's service sector where both nonprofit and for-profit enterprises compete. Another reason, however, has been the lack of micro-level data allowing to control for heterogeneity in worker and establishment characteristics, which, as pointed out in previous research, is a crucial prerequisite for the examination of wage differentials. These problems have hampered any research into wage differentials between nonprofits and for-profits in Japan and as far as we know, the only study to date dealing with the issue is that by Noguchi et al. (2003), which found a nonprofit wage premium in the child-care industry.

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<sup>4</sup> Other applications can be found in studies by Weisbrod (1983) and Godderies (1988), who investigate wage differentials between private-profit and public-interest lawyers.

This study aims to fill some of this gap by looking at the nonprofit wage premium question in the market for at-home care for the elderly. The issue is of both academic and of practical interest, and the present study attempts not only to search for explanations of the wage differential between nonprofit and for-profit providers that we find; it also considers policy implications which might be relevant in designing market competition in other sectors where entry deregulation is expected in the future, such as medical services.

### **3. The Japanese at-home care industry**

Japan's market for elderly care underwent fundamental change following the introduction of the public long-term care insurance program in the 2000 (see Shimizutani and Noguchi, 2004; Mitchell et al. 2004). Before 2000, only lower-income households were eligible to receive elderly care services provided by local governments as part of the social welfare scheme. While the financial burden on users of such publicly provided services was negligible, households could not choose between providers or service contents and had to accept whatever the government determined. Private long-term care (LTC) providers were allowed to offer their services, but because users had to pay out of their own pockets, this was an option only for the wealthy and the market for privately provided care services was consequently small.

However, given the rapid aging of the Japanese population, the government introduced a new public insurance scheme pursuing the following four objectives (Ministry of Health, Labour and Welfare, 2002). First, the approach seeks to mitigate the burden of home care for the elderly traditionally borne by women. Second, the new system aims to make more transparent the relationship between benefits received and premiums paid. Third, by integrating what had been a vertically-divided system of health, medical, and welfare services, the new program was designed to provide a means by which customers would receive comprehensive



services from a variety of institutions of their choice. Fourth, by separating long-term care from health insurance coverage, the new insurance program seeks to reduce the number of cases of “social hospitalization” where elderly patients are hospitalized simply because of a lack of viable alternatives, which pushes up medical costs (Mitchell et al., 2004).

Under the new insurance program, once certified by the local government to be eligible for long-term care, all insured persons are entitled to use care services. The new scheme thus considerably widens the range and number of care receivers and explicitly intends to provide both in-home services (at-home care) as well as services at facilities (institutional care).<sup>5</sup> The insured are free to use elderly care from any provider, subject to a 10% copayment of officially fixed prices specific to each type of care service.<sup>6</sup>

Turning to financing, the Japanese public LTC system is a pay-as-you-go program. Half of the cost of this scheme is financed by the long-term care insurance contributions from the insured (aged 40 and over) and the remaining half is financed by general tax revenues (Shimizutani and Noguchi, 2004; Mitchell et al., 2004).

At the same time, in order to meet rapidly increasing care needs, entry regulations were changed to create a more market-oriented system of provision. That is, to stimulate the supply of elderly care services, for-profits are allowed to enter the at-home care market, though this is

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<sup>5</sup> At-home care services include (1) home-visit/day services (home-visit long-term care, home-visit bathing, home-visit rehabilitation, day rehabilitation (day care), home-visit nursing care, day service, welfare devices leasing); (2) short-stay service/short-stay care; (3) in-home medical care management counselling; (4) care service for the elderly with dementia; (5) care service provided in for-profit private homes for the elderly; (6) allowance for purchase of welfare devices; and (7) allowance for home renovation (handrails, removal of level differences, etc.). Institutional care is described according to three types of nursing homes: (1) long-term care welfare facilities for the elderly (special nursing homes for the elderly); (2) long-term care health facilities for the elderly; and (3) long-term care medical facilities for the elderly. The last type also includes sanatorium-type wards as well as wards for elderly patients with dementia, and hospitals with enhanced long-term care service provision. Medical care, *per se*, is not included in the LTC program but instead is offered under the national healthcare system (Mitchell et al., 2004).

<sup>6</sup> However, there is a limit to the amount of care that is covered by the insurance scheme. Any care services beyond that limit, which depends on the care category which a user is assigned by the government, must be

not the case for the institutional care market. Under the public elderly-care program, care providers are not able to set their prices freely since uniform nationwide rates are stipulated for all covered LTC services; in addition, services are standardized. The Ministry of Health, Labour and Welfare has assigned a given number of standard "units" for each particular service and then values each unit depending on the region to take regional wage differences into account.<sup>7</sup> Thus, the policy aims to introduce not price but quality competition in the market for at-home care.

#### **4. Data**

The empirical analysis of this study is based on the “Statistical Survey on Nursing Home Employees” (Jigyosho Ni Okeru Kaigo Rodo Jittai Chosa) conducted by the Care Worker Support Center Foundation (Kaigo Roudou Antei Center) in November 2000. The establishments in the sample are randomly chosen from all areas of Japan. The dataset provides information on various characteristics of both workers and facilities. The notable merit of this survey is that it collects information on wages and other characteristics from all employees in each establishment.<sup>8</sup> It contains observations on a total of 39,261 employees with various qualifications, out of which we extract observations on employees with qualifications as a home-helper or staff nurse, for a total of 6,075 home-helpers (24.3% of the total) and 3,686 staff nurses (14.8%) of the total. In the dataset, nursing care providers are divided into seven categories: for-profit providers, and six types of not-for-profit provider, i.e., social welfare corporations, medical corporations, authorized non-profit organizations (NPOs), Co-ops, agricultural cooperatives, and other charitable corporations. Our observations are distributed as

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paid for by the user at full cost up to “stop-loss” threshold called the “high-cost long-term care service limit.”

<sup>7</sup> Currently a unit is worth ¥10.00-10.72.

<sup>8</sup> However, if the number of employee was greater than 50, then the manager of the establishment randomly selected 50 employees for the survey.

follows: Of the 1,959 observations in the proprietary sector, 1,633 are home helpers, while 326 are staff nurses. Of the 7,802 observations in the nonprofit sector, 4442 are home helpers, while 3,360 are staff nurses.

Table 1 presents summary statistics of the characteristics of both employees and facilities. The statistics provide an indication of similarities and differences between the for-profit and the nonprofit sector in the Japanese nursing industry. The mean daily wage is approximately one percentage point higher in nonprofit than in proprietary facilities, though the difference is not statistically significant.<sup>9</sup> The first notable difference in worker characteristics is in the age structure. In the nonprofit sector, those aged 40 to 49 make up the largest age group in both occupations, while in the for-profit sector, 30 to 39-year-olds make up the largest group among staff nurses and 50 to 59-year-olds the largest group among home helpers. Unfortunately, we do not have information on factors such as experience, education, or marital and family status, which ideally should be controlled for. However, age can be used as a proxy for years of experience, while employees' qualifications may be taken to reflect education. Nonprofit facilities seem to prefer home helpers and staff nurses on a full-time basis. Consequently, the ratio of part-time regular home helpers is also higher in the not-for-profit sector, while proprietary operators favor part-time regular staff nurses.

We also examine various facility characteristics that might affect wage rates. First, looking at the number of employees, we do not observe a particular difference between the for-profit and the not-for-profit sector. Second, 70-80% of the facilities respond that they are currently hiring home helpers and staff nurses and the retention rate is high. However, for-profit

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<sup>9</sup> The mean daily wages for home helpers and staff nurses in for-profit homes are 8,688 yen and 8,685 yen respectively, while in not-for-profit homes they are 11,045 yen and 11,062 yen. Note that some workers are paid wages on a monthly or hourly basis. Since the data also include the number of working days and the length of working hours in September 2000, we calculated daily wages based on this information.

operators currently hiring workers report a higher turnover rate both for full-time and part-time workers. We also have several variables measuring the non-wage benefits provided by different types of facilities. For-profit providers more frequently offer non-wage benefits such as work-related accident compensation insurance and health insurance than nonprofit facilities. If we compare the benefits of full-time and part-time employees, most full-time employees are more likely than part-timers to be offered work-related accident compensation and health insurance by both types of providers. Finally, nonprofit providers offer various benefits, including professional training inside and outside the facility, additional pay on top of the basic salary, health examinations, subsidies for uniforms and equipment, and preventive care for work-related back pain and accidents.

##### 5. **Wage differentials between for-profit and nonprofit care providers**

This section uses the dataset to estimate the wage function to examine the earnings differentials between nonprofit and for-profit care providers. When assessing wage differentials between the for-profit and the not-for-profit sector, the selection bias of sector affiliation of workers and other unobservable characteristics that affect wage rates should be corrected for. Suppose that one type of provider offers higher wages for its employees. The wage differential cannot be totally attributed to providers' for-profit or nonprofit status, because the different providers may attract different types of employees, with different unobserved characteristics that account for higher or lower productivity and thus higher or lower observed wages. In order to address this selection bias, we apply Heckman's two-stage approach to obtain unbiased estimates of the parameters (Lee, 1978; Heckman, 1979; Willis and Rosen, 1979; Greene, 1981). We estimate the wage equation in the second stage separately for for-profit and nonprofit providers since wages in the two sectors are affected differently by the same worker characteristics as a

result of some of the organizational characteristics of nonprofits such as non-distributional constraints or preferable tax treatment.

Concretely, we estimate the following two equations simultaneously using the maximum likelihood method.

(1) First stage regression

$$Z_i^* = X_i \gamma + u_i$$

$$Z_i = 1 \quad \text{if } Z_i^* \geq 0 \quad \text{or} \quad -u_i \leq X_i \gamma$$

$$Z_i = 0 \quad \text{if } Z_i^* < 0 \quad \text{or} \quad -u_i > X_i \gamma$$

where  $Z_i$  is a dichotomous variable and takes 1 if a worker actually chooses to work for a for-profit operator and takes 0 if an employee works for a nonprofit operator.  $X_i$  refers to characteristics both of employees and of employers that might affect a worker's choice of sector and  $\gamma$  represents the coefficients.  $u_i$  is an error term following  $N(0, \sigma_u^2)$ .

(2) Second stage regression

$$W_i^1 = Y_i^1 \delta^1 + \lambda_i^1 \theta^1 + \omega_i^1 \quad (\text{for-profit})$$

$$W_i^2 = Y_i^2 \delta^2 + \lambda_i^2 \theta^2 + \omega_i^2 \quad (\text{nonprofit})$$

where  $W_i$  is the logarithm of the daily wage rate.  $Y_i$  refers to characteristics both of employees and of employers that might affect wage rates. Moreover,

$$\lambda_i^1 = -\phi(X_i \gamma / \sigma_u) / \Phi(X_i \gamma / \sigma_u) \quad \text{and} \quad \lambda_i^2 = \phi(X_i \gamma / \sigma_u) / [1 - \Phi(X_i \gamma / \sigma_u)]$$

$$\theta^1 = \sigma_{1u} / \sigma_u = \text{cov}(\omega_i^1, u_i) / \sigma_u \quad \text{and} \quad \theta^2 = \sigma_{2u} / \sigma_u = \text{cov}(\omega_i^2, u_i) / \sigma_u$$

where  $\lambda_i$  is the truncated mean and  $\phi$  and  $\Phi$  indicate the standard normal probability density and standard normal cumulative density functions, respectively. We assume

$E(\omega_i^1) = E(\omega_i^2) = 0$  where  $\omega_i$  is the error term.  $Y_i$  excludes several variables on non-wage

benefits included in  $X_i$  which explain employees choice of type of provider but not the wage rate. Both  $Y_i$  and  $X_i$  also include prefecture dummies to control for regional differences.<sup>10</sup>

Table 2 reports the estimated coefficients in the first and the second stage regressions. The results for home helpers and for staff nurses are reported in separate columns. The results of the sector allocation probit regression in columns (1) and (4) basically are a replication of the unadjusted comparison between the two sectors in Table 1. The other columns in Table 2 show the estimated coefficients of the wage equations for proprietary and not-for-profit operators, corrected for self-selection bias. Both for home-helpers and for staff nurses, wage rates are more correlated with age in the nonprofit sector than in the for-profit sector with wages for nonprofit sector employees peaking in the 50 to 59 age bracket. If we assume that workers' age is proportional to their years of experience, workers with more years of experiences tend to enjoy higher wage rates in the nonprofit sector. We also find that rewards for full-time and part-time regular workers are higher at not-for-profit providers than at proprietary providers.

Turning now to facility characteristics, we do not find a clear relationship between the number of employees and wage rates. Non-wage compensation appears to be a substitute. For example, home helpers' wages at proprietary providers are lower if these offer health insurance. Similarly, staff nurses' wages at not-for-profit providers are lower if these offer accident compensation insurance. Other non-wage compensation such as professional training also seems to be associated with lower wages, though most results on these variables are not statistically significant.

Using the estimates in Table 2, we apply a simple decomposition analysis to the wage differential in order to uncover the contribution of differences in factor endowments and in factor prices of key explanatory factors. The analysis follows Blinder (1973) and Oaxaca (1973) in

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<sup>10</sup> We constrain the coefficients on prefecture dummies to be equal in the regressions.

decomposing wage differentials to discern the relative strength of key explanatory variables in accounting for the wage differentials and the proportion of these effects due to sectoral differences in mean attributes and sectoral valuation of those attributes (coefficients) (Holtmann and Idson, 1993).

Concretely, we follow Reimers (1983), who takes the unweighted average of each sector's coefficient and mean:

$$(3) \quad LWAGE^2 - LWAGE^1 = 0.5 \sum (\beta^2 + \beta^1) (\bar{Y}^2 - \bar{Y}^1) + 0.5 \sum (\bar{Y}^2 + \bar{Y}^1) (\beta^2 - \beta^1)$$

where the left-hand side variables are the summations of the contributions of each explanatory variable.  $\beta$  is the estimated coefficient on each independent variable including the selectivity terms in the second stage regressions. A  $\bar{Y}$  with a bar on top stands for the mean of each explanatory variable.

The results are shown in Table 3. The table shows that the summation of wage differentials between the nonprofit and the for-profit sector over all explanatory variables is 1.8 percent (1,006 yen) for home helpers and 3.9 percent (884 yen) for staff nurses. If we decompose the sectoral wage differentials, we find that worker-related variables contribute to greater wage differentials (see item (5) both under home helpers and under staff nurses). If we decompose those contributions into the differences in attributes and coefficients, we find that the difference in coefficients accounts for the largest part of the nonprofit wage premium both for home-helpers and staff nurses. These worker-related variables include workers' age, their employment status (full-time or part-time), etc., which can be assumed to be related to productivity<sup>11</sup>

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<sup>11</sup> Because the long-term care industry is still dominated by the nonprofit sector in Japan, one may wonder if wage differentials are greater within the nonprofit sector than between the nonprofit and the for-profit sector. We therefore also examined wage differentials between workers in nursing homes run by social welfare cooperatives and those run by medical cooperatives, which occupy the largest proportions (65% and 21%) of

The results obtained in this study suggest that there clearly is a nonprofit wage premium in the Japanese long-term care market, and it is the higher valuation of a number of factors, including workers' age and status that contribute to this premium. These results are consistent with the "attenuated property rights" hypothesis which posits that nonprofit managers have less incentive to lower wages since they do not have to make profits.

In order to assess what the welfare implications of the nonprofit wage premium that we found are, it would be necessary to address whether the premium in the nonprofit sector is associated with a higher quality of care. While studies on the quality of care in the U.S. are inconclusive,<sup>12</sup> Suzuki (2002) and Shimizutani and Suzuki (2002) find evidence suggesting that in the Japanese long-term care industry the quality of services provided by for-profit providers is not significantly different from that provided by nonprofit counterparts. Combining the findings of those studies with the results of the present study, it appears that from a welfare perspective, the higher wages paid by nonprofits represent an inefficient use of resources.

## **6. Conclusion**

Unlike in the United States, the nursing care market in Japan until recently was heavily regulated, restricting access only to nonprofit providers. The introduction of long-term care

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total number of nonprofit long-term care providers. The results show that home helpers working for providers operated by social welfare cooperatives enjoy an 8.5 percentage point (792 yen) wage premium over those working for providers operated by medical corporations. In contrast, remuneration for staff nurses is 2.9 percentage points (321 yen) higher among those working for medical corporations than those working for social welfare cooperatives. The wage differential may be explained by the fact that long-term care facilities owned by medical cooperatives are more likely to focus on medical-related care such as outpatient clinical treatment and rehabilitation rather than on services catering to the daily needs of the elderly. Our results corroborate the existence of wage differentials within the nonprofit sector, but these differentials are not as large as the ones between the for-profit and the nonprofit sector.

<sup>12</sup> There are several studies that find a better quality of services leading to higher wage rates in the nonprofit sector, including Weisbrod (1988), Ullmann and Holtman (1985), Cohen and Spector (1996), Holtman and Idson (1993), and Gertler (1989). On the other hand, Gertler (1992) observes better quality in the for-profit sector. The overall inconclusiveness of these studies can be partly attributed to the lack of consensus on



insurance in 2000 finally allowed for-profit operators to enter at least the home-help market. Thus, for-profit and not-for-profit providers have just started to compete in the long-term care market in Japan. The reform was prompted by the governments' aim to increase the amount of care provision to meet the growing demand generated by the rapid aging of the population. Closely linked with this goal, however, was also the desire to foster competition between different types of providers in the elderly care market.

As we have shown in another paper (Noguchi and Shimizutani, 2005), following liberalization, for-profit providers have been able to make substantial inroads in the at-home care industry, and in the eyes of users, the quality of service provided by for-profit operators compares favorably with that of nonprofit operators. Given these findings, the results of this study yield important insights for the fine-tuning of government policy towards the deregulated market. Analyzing wage differentials between the for-profit and nonprofit sector in the at-home care market, this study provides empirical evidence indicating that there is a nonprofit wage premium, both before and after controlling for self-selection biases. Combining this finding with that of other studies on sectoral differences in the quality of services suggests that the nonprofit wage premium is not associated with a quality premium. Therefore, nonprofit operators' wage-setting might be philanthropic, and the nonprofit wage premium may be not be justified by quality differentials across the sectors, as the argument by Newhouse suggests. Rather, the nonprofit wage premium appears to be the result of "attenuated property rights" under non-distributional constraints.

The policy implications of this study are clear. For-profit nursing care providers, which were allowed to enter the long-term care market after 2000, offer equivalent quality of care at

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which variable is an appropriate proxy to measure quality, and different studies use different measures.

lower labor costs. Thus, the government should attempt to strengthen competition in the long-term care industry in order to make the care market more efficient, and it could try to do so by introducing policies that promote market entry by for-profit providers and help to overcome information asymmetries between service providers and consumers that retard the growth of the for-profit sector in this industry.

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**Table 1: Key variable definitions and summary statistics**

Definition	Home Helpers				Staff Nurses			
	For-profit (n=1,633)		Nonprofit (n=4,442)		For-profit (n=326)		Nonprofit (n=3,360)	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
*: Reference indicator to be excluded from regression								
<b>I. Employee characteristics</b>								
natural log of daily wage	9.020	(0.305)	9.031	(0.269)	9.262	(0.311)	9.271	(0.285)
=1 if male	0.108	(0.310)	0.081	(0.273)	a	0.025	(0.155)	0.046 (0.209) b
=1 if 20<=age<30 *	0.157	(0.364)	0.189	(0.391)	a	0.181	(0.386)	0.153 (0.360)
=1 if 30<=age<40	0.158	(0.365)	0.165	(0.372)		0.294	(0.457)	0.290 (0.454)
=1 if 40<=age<50	0.236	(0.425)	0.336	(0.472)	a	0.221	(0.415)	0.340 (0.474) a
=1 if 50<=age<60	0.256	(0.437)	0.244	(0.430)		0.166	(0.372)	0.154 (0.361)
=1 if 60<=age<70	0.116	(0.321)	0.025	(0.157)	a	0.058	(0.235)	0.033 (0.179) a
=1 if full-time	0.460	(0.499)	0.639	(0.480)	a	0.577	(0.495)	0.834 (0.372) a
=1 if part-time, but regular	0.157	(0.364)	0.200	(0.400)	a	0.156	(0.364)	0.089 (0.284) a
<b>II. Operator characteristics</b>								
=1 if total number of employees: <29 *	0.178	(0.383)	0.070	(0.254)	a	0.187	(0.391)	0.036 (0.186) a
=1 if total number of employees: 30-100	0.305	(0.461)	0.373	(0.484)	a	0.331	(0.471)	0.376 (0.485) c
=1 if total number of employees: 100-299	0.127	(0.333)	0.193	(0.395)	a	0.117	(0.321)	0.232 (0.422) a
=1 if total number of employees: 300-499	0.039	(0.194)	0.036	(0.185)		0.046	(0.210)	0.038 (0.191)
=1 if total number of employees: >=500	0.061	(0.240)	0.040	(0.195)	a	0.193	(0.395)	0.051 (0.219) a
=1 if provision of care plan making	0.745	(0.436)	0.874	(0.331)	a	0.859	(0.349)	0.864 (0.343)
=1 if provision of home-visit care	0.931	(0.253)	0.762	(0.426)	a	0.819	(0.386)	0.521 (0.500) a
=1 if provision of home-visit bathing	0.192	(0.394)	0.241	(0.428)	a	0.423	(0.495)	0.144 (0.351) a
=1 if provision of home-visit nursing	0.110	(0.313)	0.135	(0.342)	a	0.236	(0.425)	0.295 (0.456) a
=1 if provision of day care	0.118	(0.323)	0.642	(0.480)	a	0.230	(0.422)	0.592 (0.491) a
=1 if provision of day care rehabilitation	0.000	(0.000)	0.122	(0.328)	a	0.009	(0.096)	0.377 (0.485) a
=1 if provision of short-term stay	0.026	(0.158)	0.463	(0.499)	a	0.080	(0.271)	0.495 (0.500) a
=1 if provision of guidance in care management at home	0.007	(0.082)	0.060	(0.237)	a	0.000	(0.000)	0.156 (0.363) a
=1 if provision of rental care equipment	0.233	(0.423)	0.094	(0.292)	a	0.344	(0.476)	0.053 (0.223) a
=1 if work-related accident compensation insurance for full-time work	0.814	(0.389)	0.637	(0.481)	a	0.733	(0.443)	0.498 (0.500) a
=1 if work-related accident compensation insurance for part-time work	0.449	(0.498)	0.364	(0.481)	a	0.417	(0.494)	0.240 (0.427) a
=1 if health insurance for full-time workers	0.734	(0.442)	0.626	(0.484)	a	0.730	(0.445)	0.497 (0.500) a
=1 if health insurance for part-time workers	0.051	(0.221)	0.070	(0.256)	a	0.077	(0.267)	0.055 (0.228) c
=1 if professional training inside/outside the organization	0.716	(0.451)	0.825	(0.380)	a	0.727	(0.446)	0.868 (0.338) a
=1 if professional training outside the organization	0.112	(0.316)	0.119	(0.323)		0.104	(0.306)	0.088 (0.283)
=1 if no professional training	0.013	(0.115)	0.012	(0.111)		0.009	(0.096)	0.010 (0.099)
=1 if extra pay other than basic salary	0.653	(0.476)	0.766	(0.424)	a	0.653	(0.477)	0.810 (0.393) a
=1 if health examination	0.539	(0.499)	0.564	(0.496)	b	0.537	(0.499)	0.549 (0.498)
=1 if provision or subsidy for uniform or care equipment	0.765	(0.424)	0.873	(0.333)	a	0.859	(0.349)	0.887 (0.317) c
=1 if policy for preventing work-related back pain	0.254	(0.435)	0.439	(0.496)	a	0.316	(0.466)	0.401 (0.490) a
=1 if policy for preventing work-related accidents	0.214	(0.410)	0.246	(0.431)	a	0.230	(0.422)	0.233 (0.423)
=1 if professional training for managers in human resource division	0.242	(0.428)	0.303	(0.460)	a	0.175	(0.380)	0.309 (0.462) a
=1 if support for mental pressure at work	0.421	(0.494)	0.239	(0.427)	a	0.359	(0.480)	0.208 (0.406) a
=1 if hiring full-time workers and low staff turnover	0.707	(0.455)	0.705	(0.456)		0.690	(0.463)	0.777 (0.416) a
=1 if hiring full-time workers, but high staff turnover	0.121	(0.326)	0.069	(0.253)	a	0.178	(0.383)	0.076 (0.265) a
=1 if not hiring full-time workers *	0.055	(0.227)	0.099	(0.299)	a	0.031	(0.173)	0.035 (0.185)
=1 if hiring part-time workers and low staff turnover	0.532	(0.499)	0.591	(0.492)	a	0.445	(0.498)	0.616 (0.486) a
=1 if hiring part-time workers, but high staff turnover	0.219	(0.413)	0.157	(0.364)	a	0.206	(0.405)	0.146 (0.353) a
=1 if not hiring part-time workers *	0.026	(0.158)	0.042	(0.200)	a	0.012	(0.110)	0.021 (0.143)
Selectivity for daily wage (lambda profit)	0.290	(0.112)	0.010	(0.012)		0.029	(0.043)	-0.007 (0.026)

Note: a-c indicate statistically significant differences between the for-profit and nonprofit sector means at the 5%, 10%, and 15% levels, respectively, Based on F-statistics of ANOVA.

**Table 2: Wage and for-profit and nonprofit allocation regressions for home helpers and staff nurses**

Definition	Home helpers						Staff nurses											
	(1)		(2)		(3)		(4)		(5)		(6)							
	First stage		Second stage (For-profit)		Second stage (Nonprofit)		First stage		Second stage (For-profit)		Second stage (Nonprofit)							
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error						
=1 if male	0.204	(0.121)	b	0.138	(0.025)	a	0.050	(0.012)	a	-0.334	(0.315)	-0.028	(0.064)	0.037	(0.018)	a		
=1 if 30<=age<40	-0.264	(0.113)	a	-0.010	(0.026)	0.056	(0.010)	a	-0.051	(0.169)	-0.002	(0.029)	0.109	(0.012)	a			
=1 if 40<=age<50	-0.489	(0.105)	a	-0.045	(0.024)	0.067	(0.009)	a	-0.230	(0.169)	0.040	(0.031)	0.185	(0.011)	a			
=1 if 50<=age<60	-0.329	(0.111)	a	-0.012	(0.025)	0.127	(0.010)	a	-0.092	(0.190)	0.040	(0.033)	0.219	(0.014)	a			
=1 if 60<=age<70	0.044	(0.170)		0.289	(0.115)	a	0.090	(0.022)	a	-0.428	(0.282)	c	0.094	(0.048)	a	0.202	(0.023)	a
=1 if full-time	-0.363	(0.105)	a	0.184	(0.024)	a	0.317	(0.011)	a	-0.610	(0.231)	a	0.231	(0.042)	a	0.477	(0.022)	a
=1 if part-time, but regular	-0.335	(0.131)	a	0.063	(0.028)	a	0.074	(0.013)	a	-0.366	(0.257)		0.121	(0.046)	a	0.206	(0.024)	a
=1 if total number of employees: 30-100	-0.850	(0.112)	a	-0.068	(0.028)	a	-0.010	(0.009)		-0.094	(0.170)		0.175	(0.043)	a	-0.042	(0.010)	a
=1 if total number of employees: 100-299	-1.316	(0.143)	a	-0.116	(0.034)	a	-0.030	(0.011)	a	-1.071	(0.251)	a	0.147	(0.052)	a	0.033	(0.012)	a
=1 if total number of employees: 300-499	-0.890	(0.234)	a	-0.210	(0.068)	a	0.066	(0.023)	a	0.650	(0.319)	a	0.219	(0.093)	a	-0.025	(0.024)	
=1 if total number of employees: >=500	-0.114	(0.183)		0.106	(0.042)	a	0.050	(0.019)	a	0.210	(0.278)		0.123	(0.056)	a	0.096	(0.021)	a
=1 if work-related accident compensation insurance for full-time workers	0.943	(0.280)	a	0.159	(0.053)	a	0.144	(0.030)	a	-0.115	(0.410)		0.104	(0.085)		-0.067	(0.031)	a
=1 if work-related accident compensation insurance for part-time workers	-0.017	(0.107)		0.016	(0.031)		0.015	(0.009)		-0.363	(0.196)		0.015	(0.050)		-0.005	(0.014)	a
=1 if health insurance for full-time workers	1.512	(0.496)	a	-0.144	(0.037)	a	0.075	(0.049)		-0.045	(0.383)		-0.085	(0.079)		0.053	(0.030)	b
=1 if health insurance for part-time workers	7.376	(0.245)	a	-0.074	(0.058)		0.089	(0.021)	a	0.306	(0.264)		0.256	(0.064)	a	0.039	(0.019)	a
=1 if professional training inside/outside the organization	-0.361	(0.329)		-0.102	(0.074)		-0.037	(0.030)		-0.341	(0.214)	c	-0.060	(0.045)		0.018	(0.020)	
=1 if professional training outside the organization	0.264	(0.350)		-0.147	(0.080)	b	-0.029	(0.031)		0.151	(0.269)		-0.120	(0.055)	a	-0.013	(0.023)	
=1 if extra pay other than basic salary	0.016	(0.093)		-	-		-	-		-0.487	(0.148)	a	-	-		-	-	
=1 if health examination	0.079	(0.084)		-	-		-	-		-0.062	(0.132)		-	-		-	-	
=1 if provision or subsidy for uniform or care equipment	-0.152	(0.110)		-	-		-	-		0.432	(0.186)	a	-	-		-	-	
=1 if policy for preventing work-related back pain	-0.754	(0.099)	a	-	-		-	-		-0.496	(0.152)	a	-	-		-	-	
=1 if policy for preventing work-related accidents	-0.129	(0.098)		-	-		-	-		0.042	(0.169)		-	-		-	-	
=1 if professional training for managers in human resource division	0.156	(0.107)	c	-	-		-	-		-0.472	(0.164)	a	-	-		-	-	
=1 if support for mental pressure at work	0.418	(0.090)	a	-	-		-	-		0.303	(0.153)	a	-	-		-	-	
=1 if hiring full-time workers and low staff turnover	0.458	(0.109)	a	-0.062	(0.036)	b	-0.017	(0.010)	b	0.438	(0.219)	a	0.057	(0.053)		-0.010	(0.012)	
=1 if hiring full-time workers, but high staff turnover	1.377	(0.178)	a	0.058	(0.050)		-0.072	(0.016)	a	0.552	(0.286)	b	0.157	(0.061)	a	-0.042	(0.019)	a
=1 if hiring part-time workers and low staff turnover	0.091	(0.105)		0.046	(0.029)		0.012	(0.010)		-0.761	(0.152)	a	-0.057	(0.042)		-0.002	(0.010)	
=1 if hiring part-time workers, but high staff turnover	0.811	(0.145)	a	0.027	(0.036)		0.004	(0.013)		-0.500	(0.211)	a	0.013	(0.044)		-0.011	(0.014)	
Selectivity for daily wage (lambda profit)	-	-		0.290	(0.112)	a	0.206	(0.002)	a	-	-		0.154	(0.007)	a	0.216	(0.003)	a
Intercept	-4.085	(0.631)	a	8.372	(0.144)	a	8.802	(0.036)	a	-0.561	(0.981)		7.856	(0.198)	a	8.776	(0.099)	a
Log likelihood	-959.624			-877.089			-260.219			-359.223			-210.038			25.901		

See Table 1 for comments on variables.

Notes:

(1) All regressions are also controlled for contents of services performed by operators and regional dummies.

(2) Parameter estimates are reported with standard errors in parentheses. a-c denote significance levels of 5%, 10%, and 15%, respectively.



**Table 3: Decomposition analysis of nonprofit sectoral wage differentials, by type of employee**

	real value
<b><u>I. Home helpers</u></b>	
(1) The predicted wage for not-for-profit operators	<u>9650.694</u>
(2) The predicted wage for for-profit operators	<u>8644.670</u>
(3) The predicted wage differential due to attributes	<u>-33.919</u>
Variables related to workers	411.042
Variables related to operators	14.313
Variables related to other factors	-459.274
(4) The predicted wage differential due to coefficients	<u>1039.943</u>
Variables related to workers	627.306
Variables related to operators	-506.495
Variables related to other factors	919.132
(5) Total predicted wage differential	<u>1006.024</u>
between for-profit and nonprofit operators	
Variables related to workers	1038.347
Variables related to operators	-492.182
Variables related to other factors	459.858
<b><u>II. Staff nurses</u></b>	
(1) The predicted wage for not-for-profit operators	<u>11031.572</u>
(2) The predicted wage for for-profit operators	<u>10147.429</u>
(3) The predicted wage differential due to attributes	<u>-181.968</u>
Variables related to workers	1322.018
Variables related to operators	-162.095
Variables related to other factors	-1341.891
(4) The predicted wage differential due to coefficients	<u>1066.111</u>
Variables related to workers	2631.132
Variables related to operators	-1392.713
Variables related to other factors	-172.308
(5) Total predicted wage differential	<u>884.143</u>
between for-profit and nonprofit operators	
Variables related to workers	3953.150
Variables related to operators	-1554.808
Variables related to other factors	-1514.199

Note: (1)-(2)=(3)+(4)

The worker-related variables include sex, age and status (full-time or part-time).

The operator-related variables include all "operator variables" listed in Table 1.

"Variables related to other factors include intercepts and the selectivity term.