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Good Jobs and Bad Jobs in Japan: 1982-2007*

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Abstract

Governments around the world are increasingly aware of the need to promote the creation of not just more jobs, but also better jobs. This paper provides new evidence and insights on changes (and lack thereof) in Japan's labor market segmentation between the primary (good job) segment and the secondary (bad job) segment over the last twenty-five years. During this time, the Japanese economy transitioned from a high-growth era to the Lost Decade to a quiet recovery. Specifically, we take advantage of the Japanese government's recent relaxation of its data release policy, and analyze micro data from the Employment Status Survey (ESS) from 1982-2007. First, the literature often defines the primary secondary segments, using information on whether or not a worker is on a fixed-term contract or on an indefinite contract. We provide new evidence that such a *de jure* definition of labor market segmentation is less useful than an alternative *de fact* definition—whether a worker is termed a standard employee (seishain) in the place of his or her employment. Second, using our preferred *de facto* definition, we confirm that the size of the good job segment relative to the bad job segment has been indeed falling steadily over the last three decades. However, when we take into consideration transition from self-employment to employment, the most significant compositional shift of the Japanese labor market over the last decades is found to be a steady and substantive shift from self-employment to the bad job segment. Such a shift is found to be particularly notable for women, dwarfing any transition from the good job segment to the bad job segment. We further find evidence that such a compositional change from self-employment to the bad job segment is likely to be a shift from one type of bad jobs to another type of bad jobs rather than from good jobs to bad jobs. As such, our findings cast doubt on the popular narrative of the steady deterioration of job quality. However, for one particular group of Japanese workers – youth – we find compelling evidence in support of the popular narrative. This is especially true for the progress that young women made in enhancing their share of standard employment during Japan's high growth decade in the 1980s; it was found to be entirely undone during the Lost Decade. Lastly, we provide evidence pointing to globalization as a possible underlying force behind the changes in the compositional shift of the Japanese labor market. (JEL: J63, J64, J41)
Key words: job quality, good jobs and bad jobs, labor market segmentation, Japan

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1. Introduction

How to create more jobs has been at the forefront of public policy discussions around the world. However, policy makers are increasingly aware of the importance of paying more attention to the issue of job quality (OECD, 2014). This paper provides new evidence and insights on changes (and lack thereof) in job quality in Japan over the last three decades. We do so by taking advantage of the Japanese government's recent relaxation of the data release policy, and analyzing micro data from the Employment Status Survey (ESS) over 1982-2007.

According to the recent good job/bad job framework (see, for instance, Kalleberg, Reskin, and Hudson, 2000 and Kalleberg, 2011), "good jobs" provide workers with high wage/benefit, strong job security, control over own work, and opportunity for training and development, while workers on "bad jobs" receive low wage/inadequate benefit, are subject to weak job security, lack control over own work, and are afforded only limited opportunity for training and development. Acemoglu (2001) also offers a theoretical model of the determination of the composition of "good jobs" and "bad job" in the economy.

To describe "good jobs" and "bad jobs" in the Japanese context, we will need to begin with a somewhat detailed description of Japan's celebrated High Performance Work System (HPWS). In Japan's HPWS, first, front-line workers not only produce output but also engage in problem solving activities and generate valuable local knowledge through their collective efforts in team and share it with management. Workers also deal with local shocks often autonomously through collaboration among themselves. Second, to sustain the interest and desire of workers to take full advantage of such problem solving activities on top of their regular production activities, the firm often pays efficiency wage (high wage/benefits). Furthermore, the interest alignment between workers and the firm is fostered by (i) financial participation schemes by which the financial wellbeing of workers is more tied to the final wellbeing of the firm; and (ii)

information sharing mechanisms through which management shares important information with workers, and fosters their loyalty and commitment to the firm. Third, in the High Performance Work System workers are often provided with strong job security which will enable them to take advantage of the aforementioned opportunities wholeheartedly without fearing any job loss. Finally, careful screening and training are integral part of the High Performance Work System (see, for instance, Ichniowski, Shaw and Prennushi, 1997).

The High Performance Work System emerged first in Japan in the 1960s and diffused widely among Japanese firms in the late 1960s and the 1970s. Many firms in the West (in particular U.S. manufacturing firms) started to experiment with a similar system as part of their effort to match the Japanese challenge in the global market (see, for instance, Kato and Morishima, 2002 and Ichniowski and Shaw, 2003).[1]

However, not all Japanese workers work under such a system. There is a sizable pool of workers who works outside of the system and constitutes the secondary segment of the Japanese labor market. In fact, such secondary-segment workers often function as a shock absorber in economic downturns by being the first to let go and thereby ensuring strong job security of the primary segment workers. Such secondary segment workers are said to be paid lower wages, enjoy less generous benefit, less control over their work, weaker job security and more limited training opportunities than those primary segment workers (see for instance Koike, 2005 and Rebick, 2005).

In short, the primary segment workers (who work under the High Performance Work System) and the secondary segment workers (who tend to function as a shock absorber to ensure job security of the primary segment workers) fit well the descriptions of “good jobs” versus “bad jobs” workers in the aforementioned good job/bad job framework .

[1] For more detailed analysis of the rise of the High Performance Work System in Japan, see Koike, 2005, Aoki, 2000, Itoh, 1994, Morita, 2001; 2005, Moriguchi and Ono, 2004 and Rebick, 2005).

One of the most popular narratives concerning trends in the Japanese economy is that Japan's once celebrated HPWS with "good jobs" has become less pervasive due to technological change and/or international competition, and that there has been a significant shift of employment from the primary "good job" segment toward the secondary "bad job" segment. This narrative has been influential in Japan's policy making and political discourse. For instance, the Japanese parliament passed three major Amendments to the Dispatch Act in 1999, 2006 and 2015, in part motivated by popular demand for reversing the shift from "good jobs" to "bad jobs". Furthermore, based primarily on this narrative, OECD has been repeatedly recommending the Japanese government to reduce the disparity between the primary and secondary segments of the Japanese labor market (see, for instance, OECD, 2006, 2008, 2012, and 2015).

Rigorous studies of such labor market segmentation in Japan in the past naturally focused on the evolution of the primary segment relative to the secondary segment of the Japanese labor market over time, and provided evidence in support of the popular narrative—general shift of employment from "good jobs" to "bad jobs" (see, for instance, Asano, Ito, and Kawaguchi, 2013).

In this paper we demonstrate that prior discussions on labor market segmentation and the "shift of employment toward bad jobs" neglect an important change in the Japanese economy---rapidly shrinking self-employment sector, and that once such changes in self-employment are taken into consideration, a distinctly different picture on the evolution of overall job quality and a more nuanced policy implication will emerge. Furthermore, we provide evidence pointing to globalization as a possible underlying force behind the trends in job quality of Japanese workers over the last three decades.

Our study of job quality and labor market segmentation in Japan also has broader implications. First, our findings provide fresh insight on income inequality which has been

discussed extensively among scholars and policy makers around the world lately (see, for instance, Atkinson, Piketty and Saez, 2011, Moriguchi and Saez, 2008, Moriguchi, 2010, Piketty, 2014, 2015). The literature on income inequality in Japan often considers labor market segmentation as a major source of income inequality (see, for instance, Ota, 2006, and Ohtake, 2008). This paper makes a valuable contribution to one of the most important public policy debates of our time---growing income inequality by providing much-needed rigorous evidence on changes (or lack thereof) in the nature and scope of Japan's labor market segmentation over the last twenty five years.

Moreover, labor market segmentation has been blamed for income inequality not only in Japan but also in other industrialized countries (see, for instance, OECD, 2015). To this end, our findings on Japan can inform policy makers elsewhere, in particular in Europe where similar labor market segmentation tends to be pervasive.

Second, one of the most pressing issues facing advanced market economies is to assess the long-term effects on their labor markets of the financial meltdown in the fall of 2008 and the subsequent Great Recession.[2] To respond to the urgent need to inform policy makers on such an important issue, researchers have been undertaking various research projects. Reflecting the persistence of high unemployment rates in the U.S. and most other major advanced market economies, much of such recent research naturally focuses on job loss and long-term unemployment (see for example Farber, 2011; 2012, David and von Wachter, 2011; and Schmieder, von Wachter, and Bender, 2012).

Thus far researchers have not paid as much attention to long-term structural effects on the labor market of the Great Recession. For instance, it will be of great relevance and interest to policy makers to find out whether the Great Recession resulted in a significant change in the

[2] Though the Great Recession in the U.S. officially ended in 2009, we refer to the ongoing economic stagnation with persistent high unemployment rates as the Great Recession in this paper.

nature and quality of jobs as opposed to the quantity of jobs. More specifically we address the question of whether the Great Recession results in the replacement of "good jobs" with "bad jobs."[3]

Since structural changes such as the replacement of "good jobs" with "bad jobs" tend to occur gradually over many years, it is somewhat premature to study fully the long-term consequences of the Great Recession for the labor market structure.

Fortunately, there was another Great Recession across the Pacific two decades ago. At the end of 1980s, the financial and real estate bubble were burst rather violently in Japan, which set the country into a prolonged economic stagnation, or the "Lost Decade". Some important differences between Japan's lost decade and the Great Recession nothwithstanding, there are some intriguing similarities (Koo, 2008). A number of serious attempts have been made to contrast the Great Recession to Japan's "Lost Decade" in the 1990s, in search for historical lessons with regard to the causes and consequences of such severe and prolonged recession as well as appropriate policy responses (see, for instance, Hamada, Kashyap, and Weinstein, 2011 and Hoshi and Kashyap, 2010). This paper provides the first rigorous evidence on changes in job quality (or lack thereof) during Japan's Great Recession which began in early 1990s and lasted for a decade.

2. Measuring the size of the good-job and bad-job sectors in Japan

Measuring the size of the primary ("good job") and secondary ("bad job") segments of the labor market with precision presents a major methodological challenge. Fortunately due to

[3] The creation of "good jobs" and "bad job" during the Great Recession became a hot political issue during the last presidential election in the U.S. For instance, Governor Perry buttressed his presidential candidacy by often citing his strong job creation record in the state of Texas during the Great Recession, while his opponents argued that the bulk of jobs created in Texas during the Great Recession were "bad job".

the aforementioned segmented labor market institutions in Japan, there are a couple of reasonable solutions in the context of Japan. is a major challenge. The first method is based on the specific term of each worker's employment contract, and defines primary-segment workers as those on indefinite contracts and secondary –segment workers as those on fixed-term contracts.[4]

The second method is based on a custom in the place of each worker's actual employment. Specifically if a worker is termed "seishain (standard employee)" in the place of his/her employment, he/she is considered a primary-segment worker. Otherwise he/she is deemed a secondary-segment worker.

The first definition is based on the specific term (contract length) of each worker's legal employment contract, whereas the second definition is based on a custom/practice in the place of each worker's employment (or how the worker is actually termed in the place of his/her employment). To this end, we can interpret the first and second definitions as *de jure* and *de facto* definitions of the primary and secondary segments of the Japanese labor market.

It matters greatly which definition we use in studying the size of the secondary segment of the Japanese labor market. We draw Figure 1 using time-series data from the Labor Force Survey. First, the size of the secondary segment of the Japanese labor market as a percentage of total employment will be substantially greater when we use the de facto definition than when we use the de jure definition. Second and perhaps more importantly, the size of the secondary segment (measured by the de facto definition) as a percentage of total employment has been

[4] As discussed in Kambayashi and Kato (2011a), prior to its 1998 revision, Japan's Labor Standards Law prohibited Japanese firms from offering multi-year fixed-term contracts. Hence all fixed-year contracts were one year or less. Since then Japanese firms have started to use multi-year contracts. To reflect this new regulatory environment, the Employment Status Survey (our primary data source for this paper's analysis) modified its *de jure* definition of the primary sector labor force and include such multi-year contracts (typically two to three years) workers, beginning with the 2007 ESS. As such, strictly speaking, starting with the most recent ESS (2007), employees on indefinite contracts include a small number of employees on multi-year contracts.

rising steadily over the last twenty five years, whereas the size of the secondary segment (measured by the de jure definition) remained constant and only started to rise during Japan's Lost Decade.

Furthermore, in principle, it is possible for a worker termed "standard employee" in the place of his/her employment to be legally on a fixed-term contract (standard employees on fixed-term contracts). Likewise, conceivably a worker on an indefinite contact is not termed "standard employee" in the place of his/her employment (nonstandard employees on indefinite contracts). As shown below, nonstandard employees on indefinite contracts have become increasingly popular over the years, and ultimately have outnumbered nonstandard employees on fixed-term contracts (often considered the most natural form of contingent work).[5] The rising popularity of such hybrid types makes it important to take into consideration both definitions fully.

To further demonstrate the importance of paying particular attention to the definitional issue, we estimate the effects on worker outcomes of being a secondary-segment worker *de jure* (legally on fixed-term contracts) and *de facto* (not called standard employees in the place of employment).

We begin with a probit model of job loss rate and test whether being termed a standard employee in the workplace or being legally on an indefinite contract is more strongly associated with job security.[6] Specifically we use the Employment Status Survey (ESS) for the most recent year (2007), and create a dummy variable, jobloss=1 if an employee lost a job as a result of the employer's decision unrelated to his/her individual performance (such as downsizing and

[5] The relevant literature is relatively small yet rich in content (e.g., Houseman and Osawa, 2003, Ozeki and Wakisaka, 2006, Honda, 2006, Esteban-Pretel, Nakajima, and Tanaka, 2011, Asano, Ito and Kawaguchi, 2013). However, on our reading of the literature, no prior study examines those hybrid groups and uncovers the relative importance of holding the title of "seiki no jyuugyouin" and being on indefinite contracts.

[6] Farber (2009) estimates a similar probit model for the U.S., and we apply a similar specification to our Japanese job loss data.

"recommended" early retirement; bankruptcy and plant closing; and poor business performance) during the previous year, 0 otherwise.[7] The Employment Status Survey (ESS) is the Japanese counterpart of CPS tenure supplements of the U.S.[8] Due to the prevailing practice of mandatory retirement in Japan which was originally set at 55 (and then raised to 60 in the 1990s and 65 in the 2000s), we focus on age 18 to 54.

Table 1 presents summary statistics where fixedterm=1 if an employee was on a fixed-term contract (as opposed to an indefinite contract) in the previous year, zero otherwise; nonstandard=1 if an employee was not termed a standard employee in the previous year, zero otherwise; female=1 if an employee is female, zero otherwise; age=years of age; ten0to4=1 if an employee's tenure with the firm was less than 5 years in the previous year, zero otherwise; ten5to9=1 if an employee's tenure with the firm was between 5 and 9 years in the previous year, zero otherwise; ten10to14=1 if an employee's tenure with the firm was between 10 and 14 years in the previous year, zero otherwise; and ten15+=1 if an employee's tenure with the firm was greater than 14 years in the previous year, zero otherwise; juniorhigh=1 if an employee's highest educational attainment was junior high school in the previous year, zero otherwise; highschool=1 if an employee's highest educational attainment was high school in the previous year, zero otherwise; juniorcollege=1 if an employee's highest educational attainment was 2-year junior college in the previous year, zero otherwise; university=1 if an employee's highest educational attainment was 4-year university in the previous year, zero otherwise. Note that in creating these variables for employees who lost jobs, we use information on their previous jobs from which they separated.

As shown in the table, the average annual job loss rate for Japanese employees age 18-54

[7] We focus on employees in this section, and hence self-employed individuals are excluded from the data. Our key results change little even if we include self-employed individuals as shown in section 5.

[8] One major difference between the ESS and CPS is its size. The ESS contains almost nine times more households than CPS.

was 3.7 percent in 2007. The proportion of employees on fixed-term contracts was around 7 percent, while the proportion of nonstandard employees was over 20 percent. Around 40 percent were female. The average age was 38, and the majority of them were high school graduates.[9]

Table 2 presents the probit estimates of job loss probability as a function of the aforementioned variables as well as other control variables (firm size, industry, occupation and location). Nearly all coefficients are estimated precisely. Most importantly the estimated coefficients on fixedterm and nonstandard are positive and statistically significant at the 1 percent level, confirming that employees on fixed-term contracts and nonstandard employees are indeed more likely to lose jobs and therefore enjoy less job security. The marginal effect estimates for fixedterm and nonstandard suggest that being not termed a standard employee in the workplace is substantially more detrimental for job security than being on a fixed-term contract.

As expected, employees with longer tenure are found to be less likely to lose jobs; and more educated employees are found to be less likely to lose jobs. The estimated coefficient on age and its marginal effect are positive and significant at the 1 percent level, suggesting that once tenure is controlled for, older workers are more likely than younger workers to be mid-career hires, and thereby face weaker job security in Japan (Kambayashi and Kato, 2011b). The estimated coefficient on female and its marginal effect are negative and statistically significant at the 1 percent level. Once obtaining the status of standard employment and being on indefinite contracts, female employees are actually less likely to lose jobs than their male counterparts. We suspect that this may be due to sorting – those female employees who earned the status of standard employment on indefinite contracts in spite of various challenges associated with being

[9] Unfortunately we are unable to use the ESS for earlier years, for the labor turnover module of the ESS for earlier years does not provide data on whether or not an employee was nonstandard employees during the previous year.

female employees possess unusual gifts that are not fully accounted for by our set of control variables. At any rate, considering the rather small size of the estimated marginal effect of female, we may not want to overstate such sorting story.

To confirm that our key finding is not gender-specific, we repeat the same analysis for male and female employees separately. Tables 3 and 4 summarize the results for male and female employees. Reassuringly for both the male sample and the female sample the marginal effects on job loss rate of not holding the status of standard employment remain significant and considerably larger than the marginal effects on job loss rate of being on fixed-term contracts (in fact for female employees, the marginal effect of being on fixed-term contracts is no longer statistically significantly different from zero). As such, our main finding of the relative importance of holding the status of standard employment to being on indefinite contracts is upheld regardless of gender.

Next we estimate a standard Mincerian wage equation with log of hourly wage as a function of a variety of individual and firm characteristics, augmented by fixedterm and nonstandard (two variables to identify the secondary-segment workers).[10] As in the case of job loss, we show the results for all employees first (Table 5) and then for male and female employees separately (Tables 6 and 7). Good news about the wage regressions is that unlike in the case of job loss, we need data only on current jobs and hence we will not need to rely on any data on previous jobs from the labor turnover module of the ESS for which information on the status of standard employment is not available for earlier years. As such we are able to estimate the wage equation for 2007 as well as for earlier years (1982, 1987, 1992, 1997, and 2002).

As shown in Table 5, the estimated coefficients on nonstandard are consistently negative

[10] As in the case of many surveys of individuals in Japan, the ESS collects only categorical earnings data. We calculate hourly wage by dividing median of each category of annual earnings by annual working hours which we also derived from two additional categorical data on annual working days and weekly working hours.

and significant at the 1 percent level for each year over the last twenty five years. In contrast, the estimated coefficients on fixedterm are much smaller and mostly insignificant. The size of the wage penalty for not holding the status of standard employment has been considerable, rising from 16% in 1982 to 26% in 1997 and falling to 21% in 2007. Note that the estimated wage penalty for nonstandard employment is conditional on age, age^2, tenure, tenure^2, education, industry, occupation, firm size, and location as well as female. The estimated coefficients on female are negative and significant at the 1 percent level consistently for all years. The gender pay gap is sizable even after controlling for age, age^2, tenure, tenure^2, education, industry, occupation, firm size, location, as well as fixedterm and nonstandard. In 1982, it was almost 40 percent and has been falling steadily to almost 30 percent in 2007. Tables 6 and 7 again confirm that the relative importance of being termed standard employees in the workplace to being on indefinite contracts for wage is not gender-specific.

Finally, in 2007, the ESS began collecting data on the incidence of company-sponsored training and development. We use the 2007 ESS and estimate a probit model of the incidence of company-sponsored training and development program – probability that an employee participates in a company-sponsored training and development program as a function of fixedterm, nonstandard and other control variables. Tables 8-10 present the marginal effect estimates for the overall sample, the male sample, and the female sample respectively. As shown in the tables, again what really matters is whether or not an employee is called a standard employee in the place of employment not whether he/she is on an indefinite contract or on a fixed-term contract. This is true regardless of gender. Specifically the estimated marginal effect of nonstandard suggests that after controlling for the same set of control variables, being not a standard employee makes an employee a 7 percentage-point less likely to participate in a company-sponsored training and development program, which is not trivial considering that the

likelihood of the average employee participating in such a training is about 42 percent.

In sum, we find consistent evidence that insofar as worker outcomes (job security, wage, and training and development opportunities) are concerned, being termed a standard employee in the workplace matters much more than being legally on an indefinite contract. Put differently, being a secondary-segment worker *de facto* is much more strongly associated with weaker job security, lower wage, and less training and development – "bad jobs" than being a secondary-segment worker *de jure*.[11]

3. Did the composition of employment shift toward "bad jobs"?

Following the aforementioned good job/bad job framework, we expand the scope of the analysis to include self-employment (Kalleberg, Reskin and Hudson, 2000). Specifically we divide the population aged 18-70 into the following groups: (i) standard employees on indefinite contracts (employees on the standard employment track and on indefinite contracts); (ii) nonstandard employees on fixed-term contracts (employees not on the standard employment track and on fixed-term contracts); (iii) standard employees on fixed-term contracts (employees on the standard employment track yet on fixed-term contracts); (iv) nonstandard employees on indefinite contracts (employees not on the standard employment track yet on indefinite contracts); (v) self-employed; and (vi) others (primarily those not in the labor force).

As mentioned earlier, much of the relevant literature on the Japanese labor market ignores the self-employment sector when studying the relative size of the secondary segment of

[11] We study job quality by focusing on the three main objective measures of worker outcomes--wage, job security, and training/development opportunity. The concept of job quality entails other domains such as autonomy. An alternative and equally valid approach would be to ask the workers to sum up all relevant domains of their jobs themselves and come up with their own overall job satisfaction scores. Unfortunately there is no reliable data on job satisfaction for a sufficiently large representative sample of Japanese workers that allow us to examine job satisfaction for different groups of workers such as standard employees on indefinite contracts; nonstandard employees on fixed contracts; other hybrids; and self-employed.

the Japanese labor market. As shown in Figures 1, ignoring the self-employment sector and focusing on non-standard employment as a percentage of total employment will lead to a rather obvious conclusion of a steady deterioration of job quality in Japan. However, as we will demonstrate below, the size of the self-employment sector has been shrinking significantly over time, and much of Japan's self-employment can be considered "bad jobs". As such, taking self-employment into consideration can potentially lead to a vastly different conclusion on trends in the overall job quality of Japanese workers.

From the ESS for 1982-2007 we calculate the proportion of each of the six categories of the Japanese population (excluding those younger than 18 and older than 80) for 1982, 1985, 1992, 1997, 2002, and 2007. Figure 2 shows such proportions including both male and female, while Figures 3 and 4 show them for male and female separately. First, overall the proportion of standard employees on indefinite contracts (who will be clearly identified as primary "good job" segment workers by either of the two definitions discussed in the previous section) displays rather remarkable stability over time (40.7 percent in 1982 and 38.3 percent in 2007). During Japan's Great Recession, it did fall somewhat yet the magnitude of the fall was modest (42.7 percent in 1992 to 37.9 percent in 2002). To be consistent, the proportion of nonstandard employees on fixed-term contracts who will be unambiguously identified as secondary "bad job" segment workers by either definition also remained relatively stable throughout the period. During Japan's Great Recession, there was a corresponding moderate increase in the proportion of such secondary segment workers from 6.1 to 8.1 percent.

The most noticeable shift, however, took place among self-employed and nonstandard employees on indefinite contracts. Self-employed workers as a percentage of the population aged 19-70 were over 20 percent in 1982 and since then they declined precipitously and reached below 12 percent by 2007. In contrast Figure 2 shows a remarkable increase in the proportion of

nonstandard employees on indefinite contracts. In 1982 such a hybrid type was almost non-existent yet by 2007 it reached the prominent status of 13 percent which actually exceeded the prevalence of self-employed. As shown in the previous section, being a secondary-segment worker *de facto* is far more strongly associated with weaker job security, lower wage, and less training and development – "bad jobs" than being a secondary-segment worker *de jure*. Thus, we determine that nonstandard employees on indefinite contracts -- the rapidly rising hybrid type is much closer to "bad jobs".

When we disaggregate Figure 2 by gender, a sharper picture on the sources of the decline in the relative importance of the "good job" sector emerges. For the male population, as shown in Figure 3, there is no downward trend in the relative importance of the good job sector. Furthermore, rather astonishingly during Japan's Lost Decade standard employees on indefinite contracts as a percentage of the population aged 18-70 did not fall at all (actually rose from 58.3 in 1992 to 58.9 percent in 2002). Insofar as male workers are concerned, evidence does not support the popular narrative of significant shift of the Japanese labor force from the primary to the secondary segment. Note that the share of male standard employees on indefinite contracts subsequently fell during Japan's longest uninterrupted positive (though modest) growth in the postwar era and reached 53.4 percent in 2007 and that correspondingly the aforementioned hybrid (nonstandard employees on indefinite contracts) surged from 2.9 percent in 2002 to 7.2 percent in 2007.

Figure 4 (as contrasted to Figure 3) reveals some intriguing gender differences. During the decade preceding its Great Recession (the heyday of the "Japanese miracle"), Japanese women increased their entry into the primary segment steadily (the percentage of female standard employees on indefinite contracts rose from 23.8 in 1982 to 26.6 percent in 1992). However, during the Great Recession, they lost what they had gained and the proportion of

female standard employees on indefinite contracts fell from 26.6 in 1992 to 22.1 in 2002. There was a corresponding increase in the proportion of the hybrid (nonstandard employees on indefinite contracts) from 8.6 to 13.9 percent.

Meanwhile, self-employment as a percentage of the female population has been falling steadily over the last twenty five years from close to 20 percent in 1982 down to 8 percent in 2007. Back in 1982 self-employment was the second most common mode of work for women, and nonstandard employment on indefinite contracts was almost unheard of. By 2007, they traded places completely--nonstandard employment on indefinite contracts became the second most common mode of work for women after standard employment on indefinite contracts, whereas self-employment became one of the least common modes of work for women.

As discussed before, the recent literature on contingent work in Japan often ignores the steadily diminishing importance of self-employment over the last twenty five years. An increase in nonstandard employment does not necessarily mean a decrease in standard employment. In the case of Japanese women, in 1992 (the beginning of Japan's Lost Decade), nonstandard employment (including both indefinite and fixed-term contracts) constituted 17 percent of the total female population aged 18-70. By the end of the Lost Decade, nonstandard employment as a percentage of the total female population rose to almost 25 percent. In other words, during Japan's Lost Decade, nonstandard employment rose by 8 percentage points. However, it does not mean that standard employment as a percentage of the total population fell by 8 percentage points. It actually declined only by 4.5 percentage points. Much of the discrepancy was due to a considerable fall in self-employment.

4. Is substitution of nonstandard employment for self-employment a shift toward "bad jobs"?

As shown in the previous section, a shift from standard employment to nonstandard

employment can be legitimately considered a shift from “good jobs” to “bad jobs”. However, a shift from self-employment to nonstandard employment does not necessarily mean a shift from “good jobs” to “bad jobs”, and it may well be a movement from “bad jobs” to “bad jobs”, as stipulated in the good job/bad job framework (Kalleberg, Reskin and Hudson, 2000).

To shed light on the nature of the aforementioned shift of the female population from self-employment to nonstandard employment, we use all female workers including self-employed, and estimate a Mincerian earnings equation. Note that we focus on the female population since the compositional shift from self-employment to nonstandard employment is far more important among women than among men. The dependent variable is log of hourly earnings and our key independent variables are a set of four dummy variables: (i) “nonstandard and fixed” which takes a value of one if the female worker is a nonstandard employee on a fixed contract, zero otherwise; (ii) “nonstandard and indefinite” which takes a value of one if the female worker is a nonstandard employee on an indefinite contract, zero otherwise; (iii) “standard and fixed” which takes a value of one if the female worker is a standard employee on a fixed contract, zero otherwise; and (iv) “self-employed” which takes a value of one if the female worker is self-employed, zero otherwise (the omitted reference is “standard and indefinite” which takes a value of one if the female worker is a standard employee on an indefinite contract, zero otherwise). As in the case of the previous section, we control for age, age^2, tenure, tenure^2, education, industry, occupation, firm size, and location.

The results are summarized in Table 11. The estimated coefficients on the employment status dummy variables are all statistically significant at the 1 percent level. The estimated coefficients on “self-employed” and “nonstandard and indefinite” suggest that for all years except for 1992 self-employed women on average earns (per hour) significantly less than women who are nonstandard employees on indefinite contracts, after controlling for a variety of

individual and firm characteristics.[12] For instance, in 2007, self-employed women earned over 40 percent less than female standard employees on indefinite contracts, while female nonstandard employees on indefinite contracts earned about 20 percent less than female standard employees on indefinite contracts. As such, in 2007, substitution of nonstandard employment on indefinite contracts for self-employment represented a rise (rather than a fall) of hourly earnings.

However, hourly earnings may not be entirely comparable between self-employed and employed women. As such, the above conclusion ought not to be considered definitive. Nonetheless, our analysis at least suggests that the compositional shift from self-employment to nonstandard employment among Japanese women over the last twenty five years may not be a shift from good jobs to bad jobs, rather a change from one type of bad jobs to another type of bad jobs.[13]

Finally, we explore to what extent the aforementioned compositional shift from self-employment to nonstandard employment on indefinite contracts among Japanese women results from the direct transition of the same women from self-employment to nonstandard employment on indefinite contracts. To shed light on this, we pool all years of the ESS and create an annual transition matrix (Table 12). As shown in the table, the most common destination for women who transition from self-employment is non-employment. More importantly the direct transition of the same women from self-employment to nonstandard employment on indefinite contracts is rare (Since employees on indefinite contracts include both standard and nonstandard employees on indefinite contracts, the fraction of self-employed job changers who transitioned to

[12] The estimated coefficients on self-employed are found to be statistically significantly different from those on nonstandard and indefinite.

[13] We also ran similar regressions, using hours worked instead of log of hourly earnings as the dependent variable. Conditional on a variety of individual and firm characteristics, nonstandard employees on indefinite contracts are found to work significantly fewer hours than standard employees on indefinite contracts, whereas self-employed women are found to work as many hours as standard employees on indefinite contracts.

nonstandard employees on indefinite contracts are even smaller).[14] The aforementioned compositional shift from self-employment to nonstandard employment on indefinite contract does not seem to be a result of the direct transitions of the same women from self-employment to nonstandard employment. Rather it is more consistent with an intergenerational transition--aging women working for their small family businesses (such as selling rice balls, candies, and soft drinks at their corner stores) retire (and hence transition to non-employment), while a growing number of younger women enter the labor market as nonstandard employees on indefinite contracts, as shown in the next section.

It is beyond the scope of this paper to identify the underlying causes of the compositional shift of female employment from self-employment to nonstandard employment on indefinite contracts. We speculate that the replacement of small family businesses with large corporations may be the underlying cause of the observed compositional change in female employment from self-employment to nonstandard employment on indefinite contracts. For instance, it is plausible that large retail chains (e.g., Seven Elevens) have been replacing small mom and pop stores, and that aging women working for such family businesses as self-employed workers retire and close their mom and pop stores.[15] Meanwhile, their daughters work for large retail chains as "part-timers" who are non-standard employees yet are on indefinite contracts. Such "part timers" are expected to work for the firm for an extended length of time yet receive lower wage with limited benefits, enjoy less job security, and often do not qualify for a variety of HRM programs (e.g., training and development programs) that are open only to standard employees. To shed light on this, we calculate the change in the proportion of nonstandard employees on indefinite contracts from 1982 to 2002 and the change in the proportion of self-employment over the same time

[14] The ESS does not allow us to separate job changers who transitioned to nonstandard employees on indefinite contracts from job changers who transitioned to standard employees on indefinite contracts.

[15] A similar story was presented and documented by Haltiwanger, Jarmin, and Krizan (2010).

period for different industries, and plot them in Figure 5. The scatter diagram points to a negative correlation between the change in the proportion of nonstandard employees on indefinite contracts from 1982 to 2002 and the change in the proportion of self-employment over the same time period. As such, those industries with large reductions in the proportion of self-employment over the 20 years period appear to be also those with large increases in the proportion of nonstandard employment with indefinite contracts. In other words, the compositional change of employment from self-employment to nonstandard employment may well be taking place largely within the industry. Such within-industry changes are consistent with our speculation that the changing market structure of some industries from mom and pop stores to large oligopolists may be behind the observed shift of women from self-employment to nonstandard employment.

5. What about youth?

Finally, another popular narrative with regard to the victims of Japan's Lost Decade concerns youth (see, for instance, Genda, 2003). To this end, we repeat the same analysis, limiting the sample to the relevant youth population aged 22-30. Figures 6-8 summarize the results. Overall, we find evidence in favor of this popular narrative. As shown in Figure 5, among youth, there was a ten-percentage point drop in standard employees on indefinite contracts as a percentage of the population during the Great Recession (63.5 in 1992 to 53.8 percent in 2002). There was a corresponding rise in nonstandard employees on indefinite contracts as well as nonstandard employees on fixed-term contract. Japan's Lost Decade was indeed accompanied by a shift of the composition of youth employment toward "bad jobs."

An intriguing historical gender difference is revealed in Figures 6 and 7. Among male youth, the proportion of standard employees on indefinite contracts remained quite high around 76-77 percent during Japan's growth decade preceding the Lost Decade. During the Lost Decade,

however, it declined by about 10 percentage points, and during the post-Lost Decade recovery period, there was no recovery in the proportion of standard employees on indefinite contracts. In contrast, during Japan's growth decade of 1982-1992, young women in Japan had a significant stride toward "good jobs" – standard employees on indefinite contracts as a percentage of the relevant population rose by about ten percentage points from below 40 percent in 1982 to close to 50 percent in 1992. It appears as if nearly all of such gains were lost during Japan's Lost Decade. Meanwhile, nonstandard employment (including both indefinite and fixed contract jobs) as a percentage of the population surged from 6.2 to 14.6 percent and from 6.4 to 10.7 percent respectively.

In sum, it is the case that for both genders the composition of youth employment shifted significantly toward "bad jobs" during Japan's Great Recession. For young women in Japan, such a loss of "good jobs" during Japan's Great Recession meant a complete undoing of progress they had made during the preceding decade.

6. Is Globalization a Possible Culprit?

In this section we explore globalization as a possible underlying force behind the compositional shift of the Japanese labor market as documented in the previous sections---rising non-standard employment and falling self-employment. The literature on the use of contingent work such as non-standard employment often argues that the firm is more likely to use such alternative work arrangements when faced with intensified competition which leads to rising need to reduce cost and increase flexibility, or timely labor input adjustment. In addition, such alternative employment arrangements are more pervasive among firms for which it is easier and less costly to observe and monitor worker performance (see, for instance, Houseman, Kalleberg and Erickcek, 2003; Cappelli and Keller, 2013).

Moreover, the literature sometimes suggests without providing rigorous evidence that globalization can be an underlying force for rising non-standard employment and deteriorating job quality (see, for instance, Houseman and Osawa, 2003, Kim and Kim, 2003, Kalleberg and Hewison, 2013). In essence, as the domestic market becomes more liberalized and foreign firms with more flexible work arrangements compete more intensively for the same customers, Japanese firms that traditionally rely more on stable standard employment are forced to increase the use of non-standard employment.

To explore if the documented shift of the composition of the Japanese labor market has something to do with globalization, using ESS 1982-2002 we first combine industry groups (2-digit) with occupation groups (1-digit), and create 258 unique combinations of industry and occupation groups which we call "jobs" henceforth.[16] Using jobs as the unit of analysis, we estimate the following equation:

$$(1) nonstandard_{it} = \beta \cdot trade_{jt} + \gamma \cdot capital_{jt} + \delta \cdot task_{it} + (fixed\ effects) + (year\ effects) + \varepsilon_{it}$$

where $nonstandard_{it}$=the proportion of non-standard employees of job i in year t; $trade_{jt}$=the degree of exposure to globalization of industry j in year t; $capital_{jt}$=capital stock of industry j in year t; and $task_{it}$=task scores of job i in year t. For $trade_{jt}$, we use industry-level data from Japan Industrial Productivity Database 2015 (JIP 2015) and calculate $import_{jt}$=import as a share of final demand for industry j in year t and $export_{jt}$=export as a share of total output for industry j in year t. To control for technological changes ($capital_{jt}$), we again use JIP 2015 and calculate IT stock per employee of industry i in year t and non-IT stock per employee of industry i in year t. To further control for possible changes in the nature of jobs over time, we consider job i's task score in year t (see appendix for the construction of task score). We consider $task_{it}$ for the following

[16] Unfortunately ESS does not allow for more detailed industry and occupation classifications.

three broad categories of tasks: Routine tasks, Non-routine manual tasks, and Non-routine analytical/interaction tasks. To account for unobserved heterogeneity of jobs, we include job fixed effects. Lastly year effects are included in order to control for any shocks that are common to all jobs.

As discussed in previous sections, the rising share of non-standard employment is negatively correlated with the falling share of self-employment. It is plausible that the increasing availability of workers who exit from the self-employment sector makes it easier for Japanese firms to increase the use of non-standard employment. To see if our fixed effect estimates of Eq. (1) change, we augment Eq. (1) with selfemployed_{it}=the proportion of self-employed of job i in year t.

$$(2) nonstandard_{it} = \beta \cdot trade_{jt} + \gamma \cdot capital_{jt} + \delta \cdot task_{it} + \theta selfemployed_{it} + (fixed\ effects) + (year\ effects) + \varepsilon_{it}$$

It turns out that the compositional shift of employment over the last twenty five years varies greatly from highly unskilled jobs to highly skilled jobs. We use ESS 1982 and calculate mean education level of all workers for each job, and based on each job's mean education level we group all jobs into the five categories, 1st bin to 5th bin. For example, 1st bin contains all jobs with their mean education levels are below the tenth quintile of education level of all workers. All five bins have an equal size of employment. Note that the number of jobs for each bin differs since the employment size of each job varies substantially.

Figure 9 shows vividly that the rising non-standard employment and the falling self-employment are far from common trends across jobs of differing educational levels. The falling self-employment is largely a phenomenon of the most unskilled jobs, whereas the rising non-standard employment does not apply to the most skilled jobs as well as the least skilled jobs.

Based on the observed considerable heterogeneity of the compositional shift of

employment among jobs with different skill/educational levels, we expect that interplay between globalization and changes in the incidence of non-standard employment may be also heterogeneous among jobs with different skills/educational levels. To this end, we estimate Eq. (1) as well as Eq. (2) for each of the five job groups (1^{st} bin to 5^{th} bin) separately.

Table 13 presents the fixed effect estimates of Eq. (1) and Eq. (2) when we use $import_{it}$ for the trade variable. The estimated coefficients on $import_{it}$ for the baseline model without $selfemployed_{it}$ are positive and statistically significant at the 5 percent level for the least skilled job (1^{st} bin) and at the 1 percent level for the second least skilled job (2^{nd} bin). It suggests that for unskilled jobs, rising competition from import is significantly associated with rising non-standard employment. Note that the observed positive and significant association between globalization (measured by import) and the rising non-standard employment for unskilled jobs is conditional on the task characteristics of these jobs. In other words, workers performing those unskilled jobs are more likely to be non-standard employees when their industries are faced with greater competition from import even if what they actually do in their jobs (tasks) is unchanged.

The estimated coefficients on $import_{it}$ for those unskilled jobs are not only statistically significant but also economically meaningful. For instance, for the least skilled job, based on changes in mean values of import from 1982 to 2002 and the estimated coefficients, we calculate that close to 30 percent of changes in $nonstandard_{it}$ from 1982 to 2002 can be explained by changes in $import_{it}$.

In contrast, no such significant association between globalization (measured by import) and the proportion of non-standard employment is found for the other three job groups. It suggests that exposure to greater competition from import may lead to the rising incidence of non-standard employment and hence diminishing job quality for unskilled jobs but not for skilled jobs.

When adding $selfemployed_{it}$, the estimated coefficients on $import_{it}$ for the least skilled and second least skilled jobs remain positive and statistically significant, pointing to the robustness of the positive association between globalization measured by import and non-standard employment for unskilled jobs. As expected, the size of the coefficients falls when we account for the negative association between $selfemployed_{it}$ and $nonstandard_{it}$. For example, for the least skilled jobs, the estimated coefficient on $import_{it}$ now accounts for 18 percent rather than close to 30 percent of total changes in $nonstandard_{it}$.

The fixed effect estimates of Eq. (1) and Eq. (2) with export as the trade variable are shown in Table 14. Unlike import, the estimated coefficients on export are estimated with less precision, providing little coherent story. It appears as if changes in exposure to overseas market have less to do with the incidence of non-standard employment than changes in competition from import in the domestic market. Finally we consider both import and export simultaneously. Reassuringly our key results on import are found to change little even when we consider export together with import.

7. Concluding remarks: Summary, Interpretations, and Policy Implications

Taken advantage of the Japanese government's recent relaxation of the data release policy, we have provided fresh evidence on one of the most commonly-held and influential view on changes in the Japanese economy—the deterioration of overall job quality of Japanese workers over the last twenty five years in general and during Japan's Lost Decade in particular. We have demonstrated that seemingly conclusive evidence in support of the conventional wisdom turns out to be less definitive once we take into consideration Japan's self-employment sector which was sizable initially and then has been shrinking steadily over time. Specifically we have found no evidence on the long-term deterioration of overall job quality for the male

population. Perhaps most intriguing is that Japan's Lost Decade did not cause any shift of male employment toward "bad jobs". However, the composition of female employment appeared to have shifted significantly toward "bad jobs", and such a shift occurred primarily through an increased use of a hybrid employment contract of nonstandard employment on indefinite (open-ended) contracts. Nonetheless, a closer look at the data (including self-employment) has revealed that the increasing use of the hybrid contracts (nonstandard employment on indefinite contracts) does not necessarily mean the decreasing use of standard employment contracts, and that the most notable compositional change in female employment turned out to be a shift of female employment from self-employment to nonstandard employment on indefinite contracts. Our regression analysis has yielded evidence suggesting that the compositional shift of female employment from self-employment to nonstandard employment on indefinite contracts is likely to be a shift from "bad jobs" to "bad jobs".

Overall, our analysis casts doubt on the popular narrative that Japanese employment has been shifting toward "bad jobs" over 1982-2007. However, insofar as youth is concerned, we have found evidence in favor of the popular narrative, indeed—youth employment shifted significantly toward "bad jobs" during Japan's Great Recession (1992-2002). Particularly young women in Japan made considerable progress in shifting the composition of their employment toward "good jobs" during Japan's growth decade preceding the Lost Decade. Unfortunately our evidence indicates that such progress was entirely undone during the Great Recession.

Let us conclude by discussing some policy implications. First, one of the most powerful narratives about the evolution of the Japanese labor market is the rising importance of the secondary segment with bad jobs characterized by low wages, weak job security, and limited scope for training and career development. Such long-term deterioration of job quality of Japanese workers caused by rigid labor market segmentation has been blamed for a number of

key challenges that Japan faces, including rising income inequality, poverty, and stagnant fertility rate (see, for instance, Ministry of Health, Labour, and Welfare, 2013). Our study cautions that in designing policy responses to issues surrounding labor market segmentation, policy makers ought to include the self-employment sector in their scope of policy-making. Specifically we have shown that the most important compositional shift of employment in Japan over the last twenty five years appears to be a shift from self-employment to a hybrid form of employment (non-standard employment yet on indefinite contracts) rather than a shift from standard employment to non-standard employment as the popular narrative suggests. The precise nature of such a shift remains unknown yet our preliminary analysis suggests that the shift from self-employment to non-standard employment on indefinite contracts may not represent the deterioration of job quality. More data and rigorous analysis of the nature, causes and effects of the transition from self-employment to non-standard employment are urgently needed. To this end, we have built on the methodology developed by the literature on polarization (e.g., Autor, Levy, and Murnane, 2002; and Autor and Dorn, 2013) and have explored globalization as a possible culprit for the documented compositional shifts of the Japanese labor market, and have found some evidence in support of the role of globalization (import) as an underlying force.

A quick comparison of OECD harmonized unemployment rates among major advanced economies over the last twenty five years gives us an impression that Japan has done rather well in terms of the quantity of jobs in general and has weathered her own Great Recession in particular. When we go beyond the quantity of jobs and start analyzing the quality of jobs, however, a more nuanced assessment of the labor market outcome emerges – heterogeneous labor market effects of the Great Recession.

For policy makers who are concerned about the long-term effect on the labor market of the recent financial crisis and ensuing global Great Recession, Japan's Lost Decade offers a

valuable lesson. Obviously the Great Recession affects the quantity of jobs, and policy makers ought to pay immediate attention to such quantity effects. It is, however, quite plausible that the Great Recession may have more long-term structural effects on the nature and quality of jobs. Such quality effects may appear only after a long gestation period and can be difficult to detect. Nonetheless precisely because of their potentially profound consequences for the wellbeing of workers and the society, policy makers may need to be particularly cognizant of the long-term effects of the Great Recession on the structure of the labor market in general and any shifts of the composition of employment in particular.

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Table 1 Summary Statistics for Probit Analysis of Job Loss in 2007

	observation	mean
jobloss	151208	0.037
fixedterm	151208	0.071
nonstandard	151208	0.212
female	151208	0.393
age	151208	37.846
$age^2/100$	151208	15.358
ten0to4	151208	0.284
ten5to9 (base)	151208	0.219
ten10to14	151208	0.139
ten15+	151208	0.358
juniorhigh (base)	151208	0.061
highschool	151208	0.621
juniorcollege	151208	0.091
university	151208	0.227

Source: the Employment Status Survey, 2007.
Note: The sample consists of all job holders aged 18 to 54 as of October, 2006. For variable definitions, please see the text.

Table 2 Probit Estimates of the Determinants of Job Loss Probability in 2007: All employees
Dependent Variable: Jobloss=1 if the employee lost a job during the previous year, 0 otherwise

	Coeff.	s.e.		M.E.	s.e.	
fixedterm	0.053	0.023	**	0.003	0.002	**
nonstandard	0.208	0.018	***	0.014	0.001	***
female	-0.051	0.017	***	-0.003	0.001	***
age	0.072	0.005	***	0.004	0.000	***
age2	-0.083	0.007	***	-0.005	0.000	***
ten0to4	0.309	0.017	***	0.022	0.001	***
ten10to14	-0.053	0.022	**	-0.003	0.001	**
ten15+	-0.332	0.021	***	-0.019	0.001	***
highschool	-0.045	0.024	*	-0.003	0.002	*
juniorcollege	-0.044	0.032		-0.003	0.002	
university	-0.120	0.030	***	-0.007	0.002	***
obs			151208			
obs prob			0.037			

Source: the Employment Status Survey, 2007.
Notes: For variable definitions, please see the text. The omitted tenure category is 5-9 years of tenure (ten5to9). The omitted educational attainment category is junior high school or less. Firm size, industry, occupation and location are also controlled for.
***significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Table 3 Probit Estimates of the Determinants of Job Loss Probability in 2007: Male employees
Dependent Variable: Jobloss=1 if the employee lost a job during the previous year, 0 otherwise

	Coeff.	s.e.		M.E.	s.e.	
fixedterm	0.122	0.042	***	0.007	0.003	***
nonstandard	0.218	0.031	***	0.013	0.002	***
age	0.077	0.008	***	0.004	0.000	***
age2	-0.083	0.010	***	-0.004	0.001	***
ten0to4	0.314	0.024	***	0.019	0.002	***
ten10to14	-0.114	0.031	**	-0.005	0.001	**
ten15+	-0.426	0.028	***	-0.021	0.001	***
highschool	-0.035	0.031		-0.002	0.002	
juniorcollege	-0.044	0.057		-0.002	0.003	
university	-0.107	0.037	***	-0.005	0.002	***
obs			91769			
obs prob			0.031			

Source: the Employment Status Survey, 2007.
Notes: For variable definitions, please see the text. The omitted tenure category is 5-9 years of tenure (ten5to9). The omitted educational attainment category is junior high school or less. Firm size, industry, occupation and location are also controlled for.
***significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Table 4 Probit Estimates of the Determinants of Job Loss Probability in 2007: Female employees
Dependent Variable: Jobloss=1 if the employee lost a job during the previous year, 0 otherwise

	Coeff.	s.e.		M.E.	s.e.	
fixedterm	0.033	0.027		0.003	0.002	
nonstandard	0.223	0.023	***	0.018	0.002	***
age	0.072	0.008	***	0.006	0.001	***
age2	-0.090	0.010	***	-0.007	0.001	***
ten0to4	0.295	0.024	***	0.025	0.002	***
ten10to14	0.029	0.033		0.002	0.003	
ten15+	-0.195	0.034	***	-0.014	0.002	***
highschool	-0.035	0.040		-0.003	0.003	
juniorcollege	-0.032	0.046		-0.002	0.003	
university	-0.102	0.052	**	-0.007	0.003	**
obs			59439			
obs prob			0.046			

Source: the Employment Status Survey, 2007.
Notes: For variable definitions, please see the text. The omitted tenure category is 5-9 years of tenure (ten5to9). The omitted educational attainment category is junior high school or less. Firm size, industry, occupation and location are also controlled for.
***significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Table 5 OLS Estimates on the effects on log of hourly wage of being on fixed-term contracts and being not on the standard employment track over 1982-2007: all employees

	(1)	(2)	(3)	(4)	(5)	(6)
Year	1982	1987	1992	1997	2002	2007
Dependent variable	ln (hourly wage)					
fixedterm	-0.034 ***	0.004	0.000	0.015 ***	0.001	0.018 ***
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)
nonstandard	-0.160 ***	-0.173 ***	-0.227 ***	-0.256 ***	-0.220 ***	-0.208 ***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
female	-0.391 ***	-0.365 ***	-0.373 ***	-0.351***	-0.331 ***	-0.292 ***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Observations	310930	312896	405155	393614	342259	346561
Adj. R-squared	0.587	0.568	0.562	0.556	0.522	0.461

Source: the Employment Status Survey, 1982, 1987, 1992, 1997, 2002, and 2007.
Notes: For variable definitions, please see the text. All regressions include the following controls: age, age^2, tenure, tenure^2, education, industry, occupation, firm size, and location. Standard errors in parentheses.
***significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Table 6 OLS OLS Estimates on the effects on log of hourly wage of being on fixed-term contracts and being not on the standard employment track over 1982-2007: male employees

	(1)	(2)	(3)	(4)	(5)	(6)
Year	1982	1987	1992	1997	2002	2007
Dependent variable	ln (hourly wage)					
fixedterm	-0.047 ***	-0.019 ***	-0.035 ***	-0.011 **	-0.002	0.032 ***
	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
nonstandard	-0.110 ***	-0.122 ***	-0.135 ***	-0.187 ***	-0.196 ***	-0.221 ***
	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
Observations	209643	207336	260917	253691	217403	214729
Adj. R-squared	0.545	0.539	0.525	0.529	0.508	0.460

Source: the Employment Status Survey, 1982, 1987, 1992, 1997, 2002, and 2007.
Notes: For variable definitions, please see the text. All regressions include the following controls: age, age^2, tenure, tenure^2, education, industry, occupation, firm size, and location. Standard errors in parentheses.
***significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Table 7. OLS Estimates on the effects on log of hourly wage of being on fixed-term contracts and being not on the standard employment track over 1982-2007: female employees

	(1)	(2)	(3)	(4)	(5)	(6)
Year	1982	1987	1992	1997	2002	2007
Dependent variable	ln (hourly wage)					
fixedterm	-0.033 ***	-0.008	-0.015 ***	-0.009 *	-0.020 ***	-0.012 **
	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
nonstandard	-0.160 ***	-0.151 ***	-0.228 ***	-0.243 ***	-0.213 ***	-0.185 ***
	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
Observations	101287	105560	144238	139923	124856	131832
Adj. R-squared	0.432	0.421	0.427	0.434	0.412	0.351

Source: the Employment Status Survey, 1982, 1987, 1992, 1997, 2002, and 2007.
Notes: For variable definitions, please see the text. All regressions include the following controls: age, age^2, tenure, tenure^2, education, industry, occupation, firm size, and location. Standard errors in parentheses.
***significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Table 8 Probit Estimates on the marginal effects on the incidence of company-sponsored training of being on fixed-term contracts and being not on the standard employment track in 2007: All employees

Dependent variables	Prob (participation in company-sponsored training and development program)
fixedterm	0.004
	(0.004)
nonstandard	-0.072 ***
	(0.003)
female	-0.007 ***
	(0.002)
Observations	345238
Pseudo R-squared	0.139
Obs. Probability	0.417
Predicted Probability	0.403

Source: the Employment Status Survey, 2007.
Notes: For variable definitions, please see the text. All regressions include the following controls: age, age^2, tenure, tenure^2, education, industry, occupation, firm size, location, hourly wage, annual hours worked, and intention to quit. Standard errors in parentheses.
***significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Table 9 Probit Estimates on the marginal effects on the incidence of company-sponsored training of being on fixed-term contracts and being not on the standard employment track in 2007: male employees

Dependent variables	Prob (participation in company-sponsored training and development program)
fixedterm	-0.003
	(0.006)
nonstandard	-0.071 ***
	(0.004)
Observations	213936
Pseudo R-squared	0.116
Obs. Probability	0.425
Predicted Probability	0.414

Source: the Employment Status Survey, 2007.
Notes: For variable definitions, please see the text. All regressions include the following controls: age, age^2, tenure, tenure^2, education, industry, occupation, firm size, location, hourly wage, annual hours worked, and intention to quit. Standard errors in parentheses.
***significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Table 10 Probit Estimates on the marginal effects on the incidence of company-sponsored training of being on fixed-term contracts and being not on the standard employment track in 2007: female employees

Dependent variables	Prob (participation in company-sponsored training and development program)
fixedterm	0.002
	(0.005)
nonstandard	-0.058 ***
	(0.004)
Observations	131302
Pseudo R-squared	0.187
Obs. Probability	0.404
Predicted Probability	0.384

Source: the Employment Status Survey, 2007.
Notes: For variable definitions, please see the text. All regressions include the following controls: age, age^2, tenure, tenure^2, education, industry, occupation, firm size, location, hourly wage, annual hours worked, and intention to quit. Standard errors in parentheses.
***significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Table 11 OLS Estimates on the effects on log of hourly earnings of being a nonstandard employee on an indefinite contract vs. being self-employed over 1982-2007: women

	(1)	(2)	(3)	(4)	(5)
	1982	1987	1992	2002	2007
dependent variable	ln(hourly earnings)				
nonstandard and fixed-term	-0.184***	-0.168***	-0.240***	-0.217***	-0.186***
	(0.008)	(0.006)	(0.005)	(0.005)	(0.004)
nonstandard and indefinite	-0.202***	-0.165***	-0.244***	-0.232***	-0.196***
	(0.007)	(0.006)	(0.006)	(0.005)	(0.006)
standard and fixed-term	-0.102***	-0.130***	-0.103***	-0.231***	-0.262***
	(0.019)	(0.023)	(0.019)	(0.025)	(0.029)
self-employed	-0.299***	-0.270***	-0.188***	-0.272***	-0.429***
	(0.007)	(0.007)	(0.006)	(0.007)	(0.007)
# of obs	131672	134009	178286	149678	149918
ajdusted R-sq	0.447	0.4301	0.4193	0.4153	0.407

Source: the Employment Status Survey, 1982, 1987, 1992, 1997, 2002, and 2007.

Notes: For variable definitions, please see the text. All regressions include the following controls: age, age^2, tenure, tenure^2, education, industry, occupation, firm size, and location. Standard errors in parentheses.

***significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Table 12 Annual Transition Matrix of Women

		current status				
		indefinite contract	fixed contract	self-employed	Non-employment	total
previous status	indefinite contract	37.03	0.33	0.17	2.79	40.31
	fixed contract	0.23	4.56	0.03	1.04	5.87
	self-employed	0.09	0.04	14.48	0.49	15.10
	Non-employment	2.64	1.32	0.48	34.28	38.72
	total	40.00	6.24	15.16	38.60	100.00

Source: the Employment Status Survey, 1982, 1987, 1992, 1997, 2002, and 2007.

Table 13 Fixed Effect Estimates of the Relationship between Share of Non-standard employees and Globalization: Import

estimation method	FE																			
unit of observation	job by year																			
dependent variable	Share of Non-standard Employees																			
	(1)		(2)		(3)	(4)		(5)		(6)		(7)		(8)		(9)		(10)		
sample	1st bin		2nd bin		3rd bin	4th bin		5th bin		1st bin		2nd bin		3rd bin		4th bin		5th bin		
share of self-employed										-0.545	***	-0.247		-0.418	***	-0.452	**	-0.143	**	
										(0.181)		(0.167)		(0.062)		(0.180)		(0.065)		
import	0.110	**	0.095	***	-0.193	-0.047		-0.013		0.070	*	0.082	***	0.049		-0.043		-0.008		
	(0.048)		(0.014)		(0.167)	(0.061)		(0.015)		(0.038)		(0.020)		(0.100)		(0.058)		(0.015)		
ln(IT stock per worker)	-0.007		-0.012		-0.001	-0.026	**	0.042	**	-0.014		-0.001		-0.001		-0.019	*	0.041	*	
	(0.017)		(0.020)		(0.029)	(0.012)		(0.020)		(0.012)		(0.018)		(0.017)		(0.010)		(0.022)		
ln(non-IT stock per worker)	0.028		-0.062	*	-0.058	-0.041		-0.048	**	0.004		-0.074	**	-0.046		-0.031		-0.041		
	(0.023)		(0.035)		(0.055)	(0.057)		(0.023)		(0.011)		(0.033)		(0.030)		(0.049)		(0.025)		
R-squared	0.8832		0.9478		0.9298	0.9166		0.8759		0.9236		0.9512		0.964		0.9285		0.8791		
# of observation	295		190		140	263		335		295		190		140		263		335		
# of job	61		38		28	56		67		61		38		28		56		67		

Sources: the Employment Status Survey (ESS), 1982, 1987, 1992, 1997, 2002, and 2007, Japan Industrial Productivity Database 2015 (JIP 2015), *Career Matrix* complied by JILPT (CMX), and Population Census 1985, 1990, 1995, 2000 and 2005.

Notes: For variable definitions, please see the text. All regressions include the following controls: share of routine tasks; year effects; and job fixed effects. Standard errors clustered at job in parentheses.

***significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Table 14 Fixed Effect Estimates of the Relationship between Share of Non-standard employees and Globalization: Export

estimation method	*FE*									
unit of observation	job by year									
dependent variable	share of defacto nonstandard employees									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
sample	1st bin	2nd bin	3rd bin	4th bin	5th bin	1st bin	2nd bin	3rd bin	4th bin	5th bin
share of self-employed						-0.665 ***	-0.248	-0.427 ***	-0.453 **	-0.139
						(0.195)	(0.168)	(0.050)	(0.180)	(0.065)
export	0.238	-0.418 *	-0.101	-0.037	-0.169	0.520 ***	-0.303	0.254 **	-0.056	-0.154
	(0.159)	(0.238)	(0.447)	(0.242)	(0.103)	(0.156)	(0.224)	(0.110)	(0.249)	(0.108)
ln(IT stock per worker)	-0.005	-0.010	0.009	-0.028 **	0.041 **	-0.018 *	0.000	-0.005	-0.020 **	0.041
	(0.018)	(0.025)	(0.024)	(0.012)	(0.020)	(0.011)	(0.021)	(0.015)	(0.010)	(0.021)
ln(non-IT stock per worker)	0.028	-0.049	-0.088 *	-0.041	-0.048 **	0.003	-0.064 *	-0.042 *	-0.031	-0.041
	(0.028)	(0.039)	(0.045)	(0.057)	(0.022)	(0.012)	(0.037)	(0.022)	(0.049)	(0.024)
R-squared	0.8832	0.9478	0.9298	0.9166	0.8759	0.9236	0.9512	0.964	0.9285	0.8791
# of observation	295	190	140	263	335	295	190	140	263	335
# of job	61	38	28	56	67	61	38	28	56	67

Sources: the Employment Status Survey (ESS), 1982, 1987, 1992, 1997, 2002, and 2007, Japan Industrial Productivity Database 2015 (JIP 2015), *Career Matrix* complied by JILPT (CMX), and Population Census 1985, 1990, 1995, 2000 and 2005.
Notes: For variable definitions, please see the text. All regressions include the following controls: share of routine tasks; year effects; and job fixed effects. Standard errors clustered at job in parentheses.
***significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Table 15 Fixed Effect Estimates of the Relationship between Share of Non-standard employees and Globalization: Import and Export

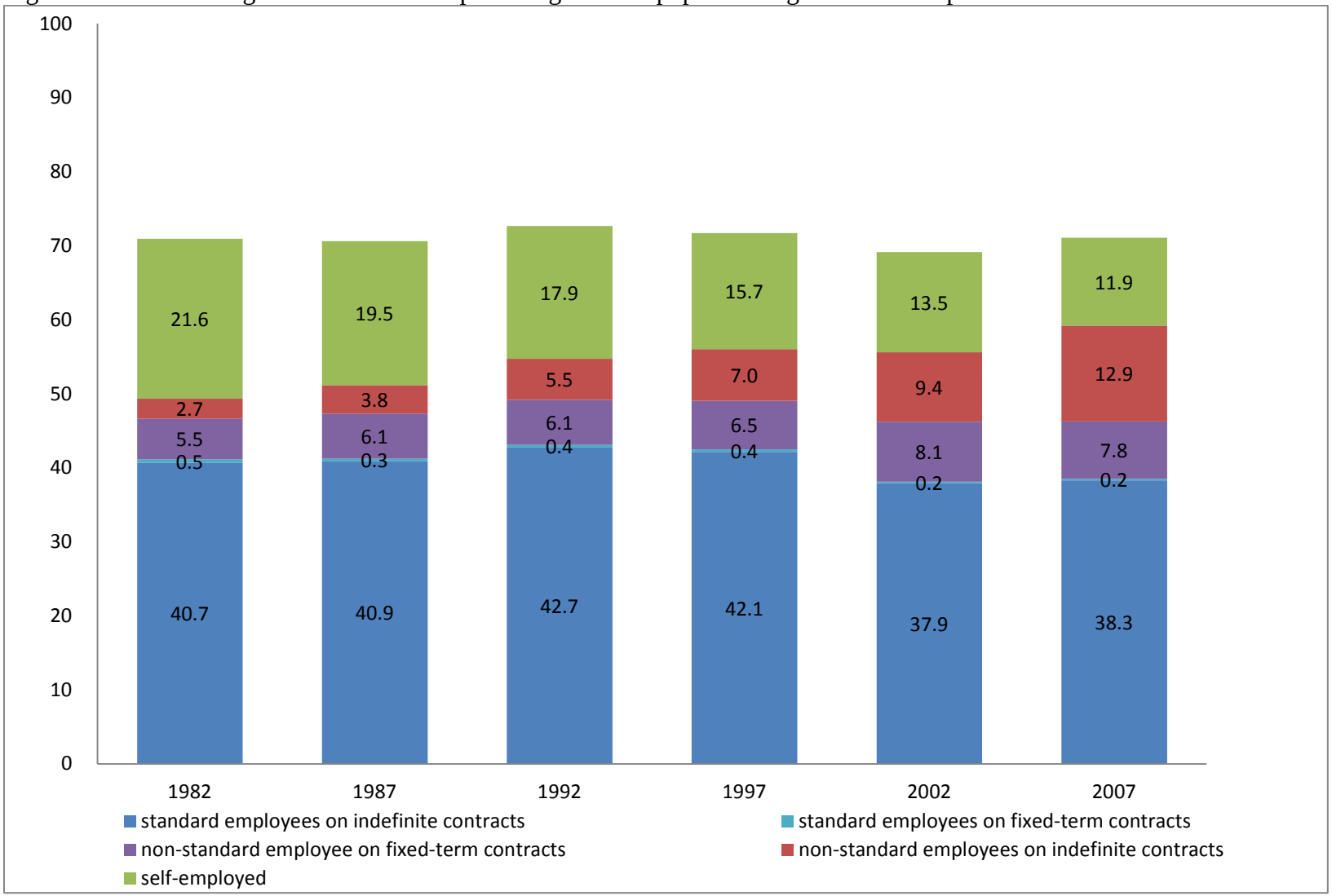
estimation method	*FE*									
unit of observation	job by year									
dependent variable	share of defacto nonstandard employees									
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
sample	1st bin	2nd bin	3rd bin	4th bin	5th bin	1st bin	2nd bin	3rd bin	4th bin	5th bin
share of self-employed						-0.611 ***	-0.204	-0.421 ***	-0.452 **	-0.139 **
						(0.197)	(0.152)	(0.058)	(0.180)	(0.066)
import	0.107 **	0.103 ***	-0.277	-0.047	-0.006	0.050	0.090 ***	-0.052	-0.041	-0.001
	(0.050)	(0.017)	(0.196)	(0.059)	(0.014)	(0.036)	(0.021)	(0.145)	(0.058)	(0.014)
export	0.073	-0.470 *	0.256	0.006	-0.163	0.420 **	-0.369	0.316	-0.018	-0.152
	(0.194)	2.000	(0.511)	(0.236)	(0.098)	(0.191)	1.680	(0.195)	(0.252)	(0.103)
ln(IT stock per worker)	-0.008	-0.010	-0.006	-0.041 *	0.042 *	-0.018	-0.002	-0.007	-0.031 *	0.041 *
	(0.019)	(0.022)	(0.032)	(0.012)	(0.020)	(0.012)	(0.019)	(0.019)	(0.011)	(0.021)
ln(non-IT stock per worker)	0.029	-0.049	-0.050	-0.041	-0.048 *	0.005	-0.062 *	-0.036	-0.031	-0.041 *
	(0.024)	(0.035)	(0.056)	(0.057)	(0.022)	(0.012)	(0.031)	(0.034)	(0.049)	(0.024)
R-squared	0.898	0.955	0.933	0.917	0.876	0.924	0.951	0.964	0.929	0.879
# of observation	295	190	140	263	335	295	190	140	263	335
# of job	61	38	28	56	67	61	38	28	56	67

Sources: the Employment Status Survey (ESS), 1982, 1987, 1992, 1997, 2002, and 2007, Japan Industrial Productivity Database 2015 (JIP 2015), *Career Matrix* complied by JILPT (CMX), and Population Census 1985, 1990, 1995, 2000 and 2005.
Notes: For variable definitions, please see the text. All regressions include the following controls: share of routine tasks; year effects; and job fixed effects. Standard errors clustered at job in parentheses.
***significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Figure 1 Size of the Secondary Segment of the Japanese Labor Market as a Percentage of Total Employment over the last 25 years: Using two alternative definitions

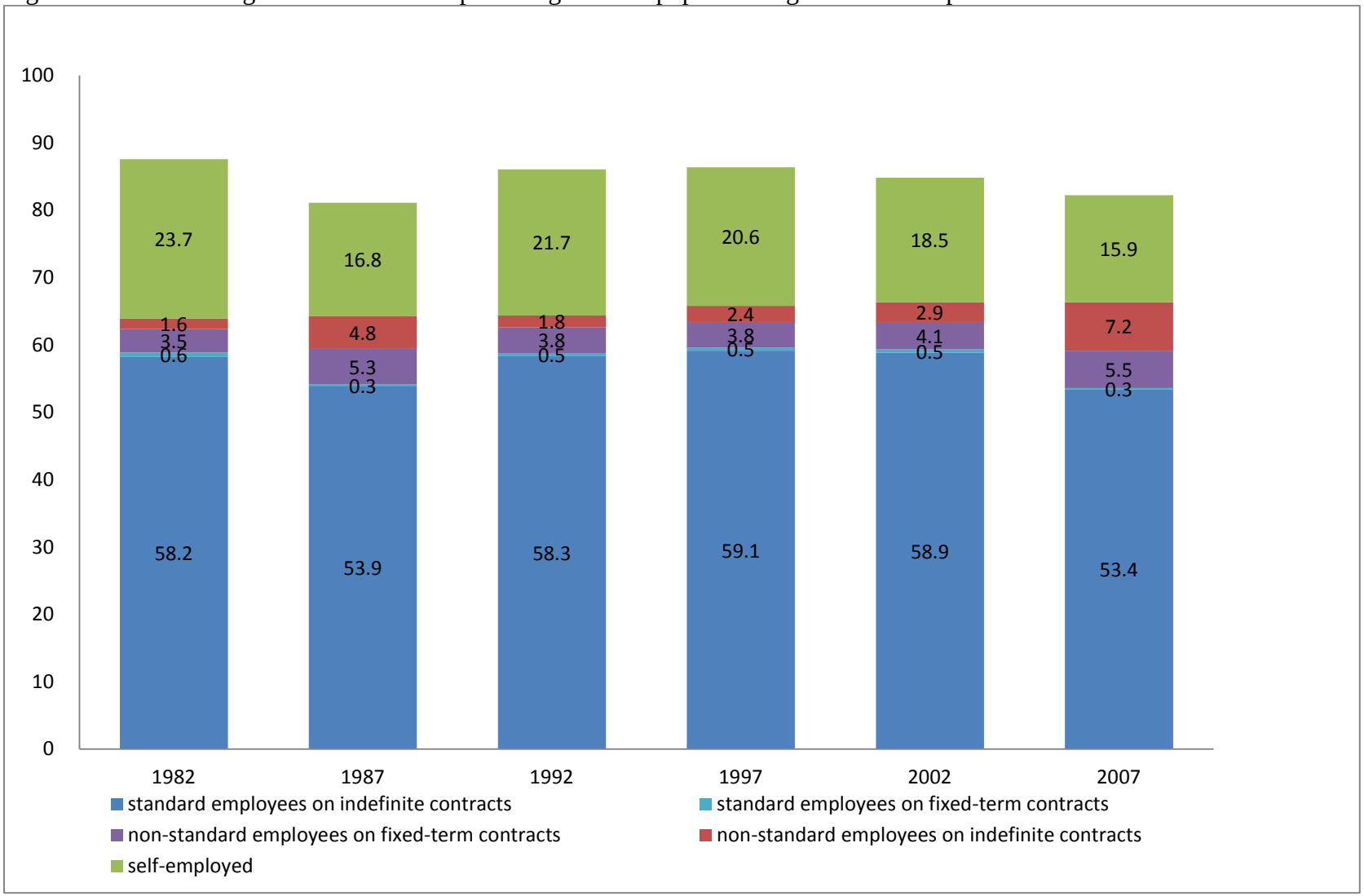
Source: the Labor Force Survey. The data on the proportion of the secondary segment employment using the *de jure* definition are from Basic Tabulation Historical Data 4. The data on the proportion of the secondary segment employment using the *de facto* definition are from Detailed Tabulation Historical Data 9.

Figure 2 Different categories of workers as percentages of the population aged 18-70 in Japan: 1982-2007



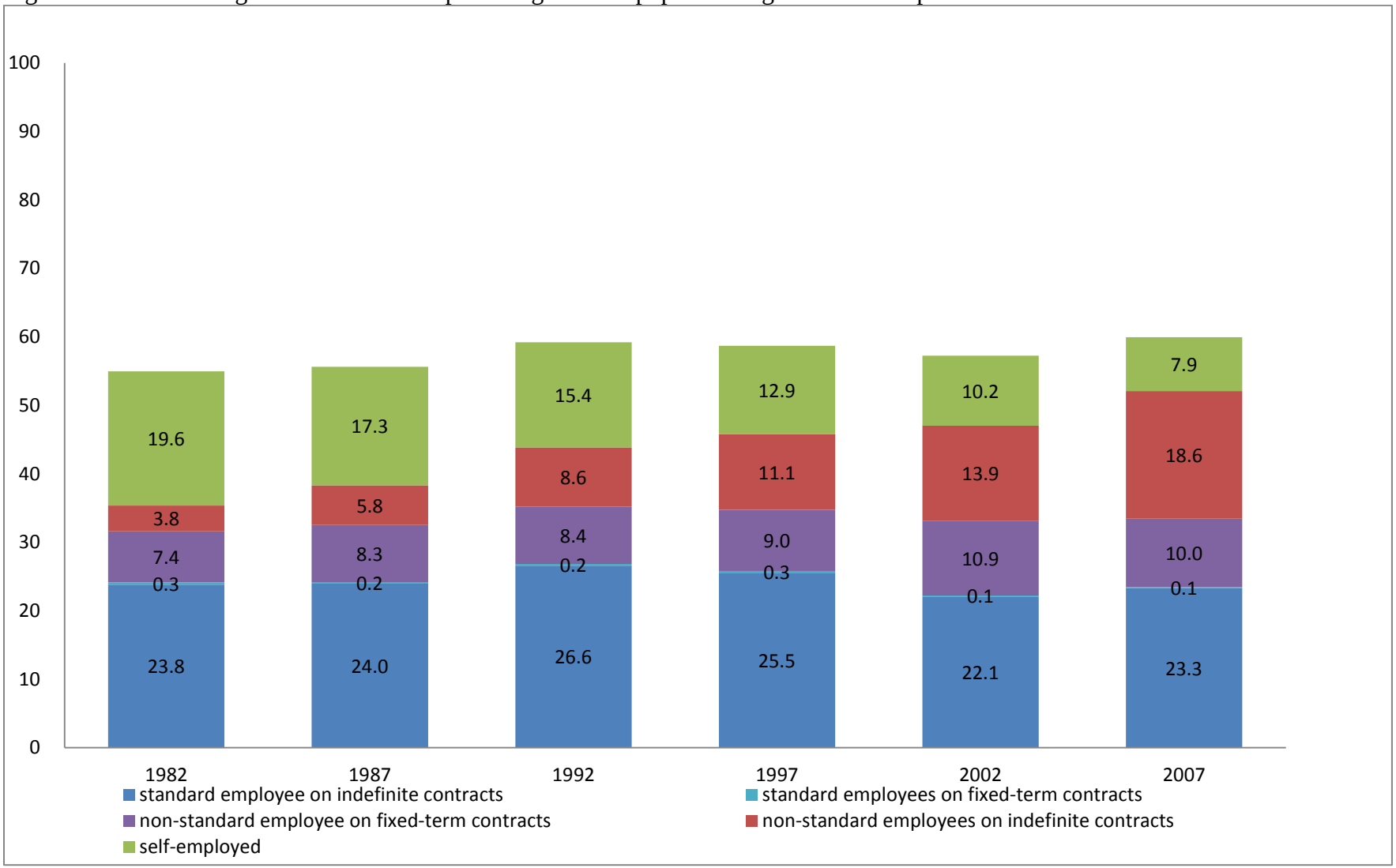
Source: the Employment Status Survey, 1982, 1987, 1992, 1997, 2002, and 2007.

Figure 3 Different categories of workers as percentages of the population aged 18-70 in Japan: 1982-2007 and male



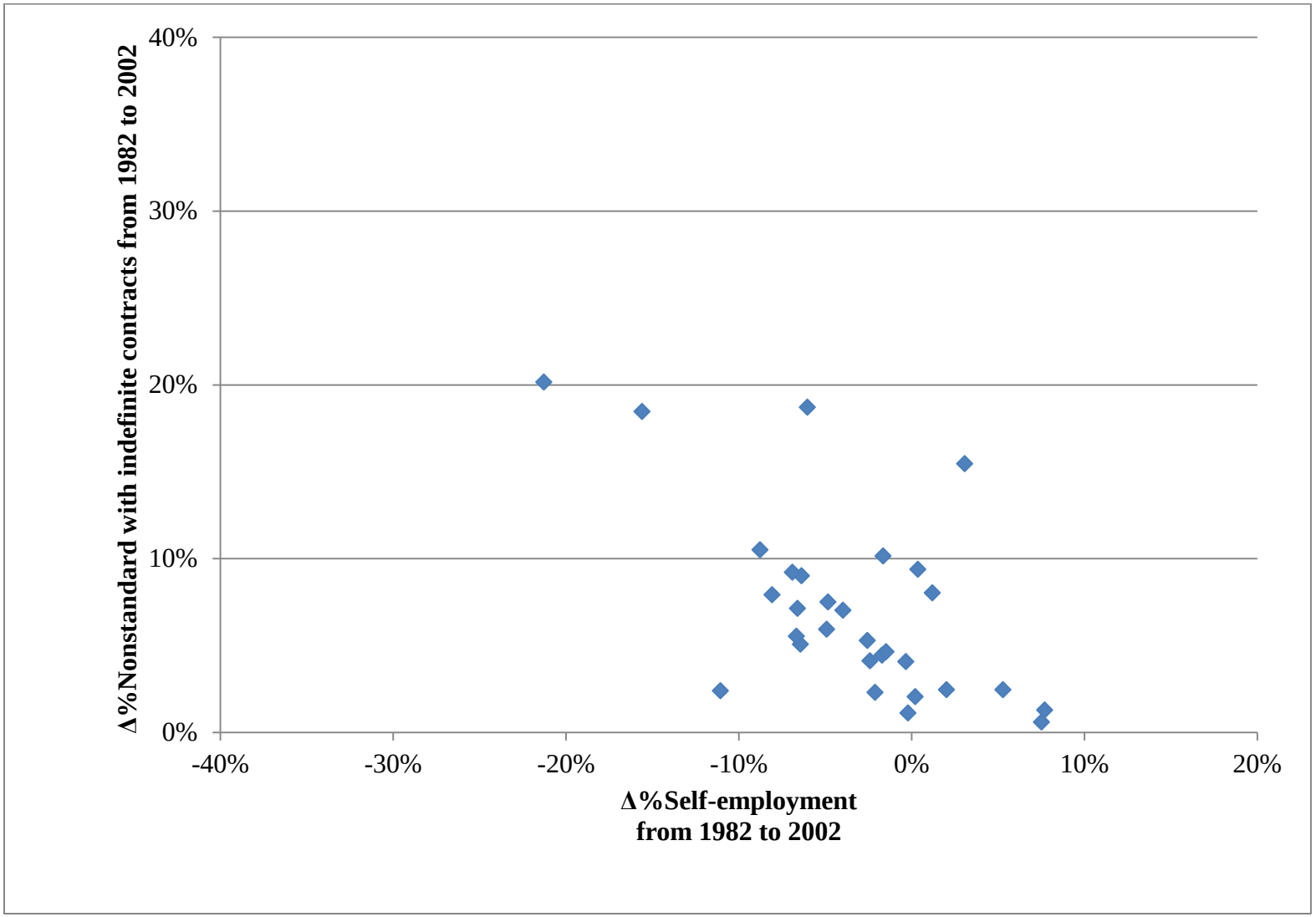
Source: the Employment Status Survey, 1982, 1987, 1992, 1997, 2002, and 2007.

Figure 4 Different categories of workers as percentages of the population aged 18-70 in Japan: 1982-2007 and female



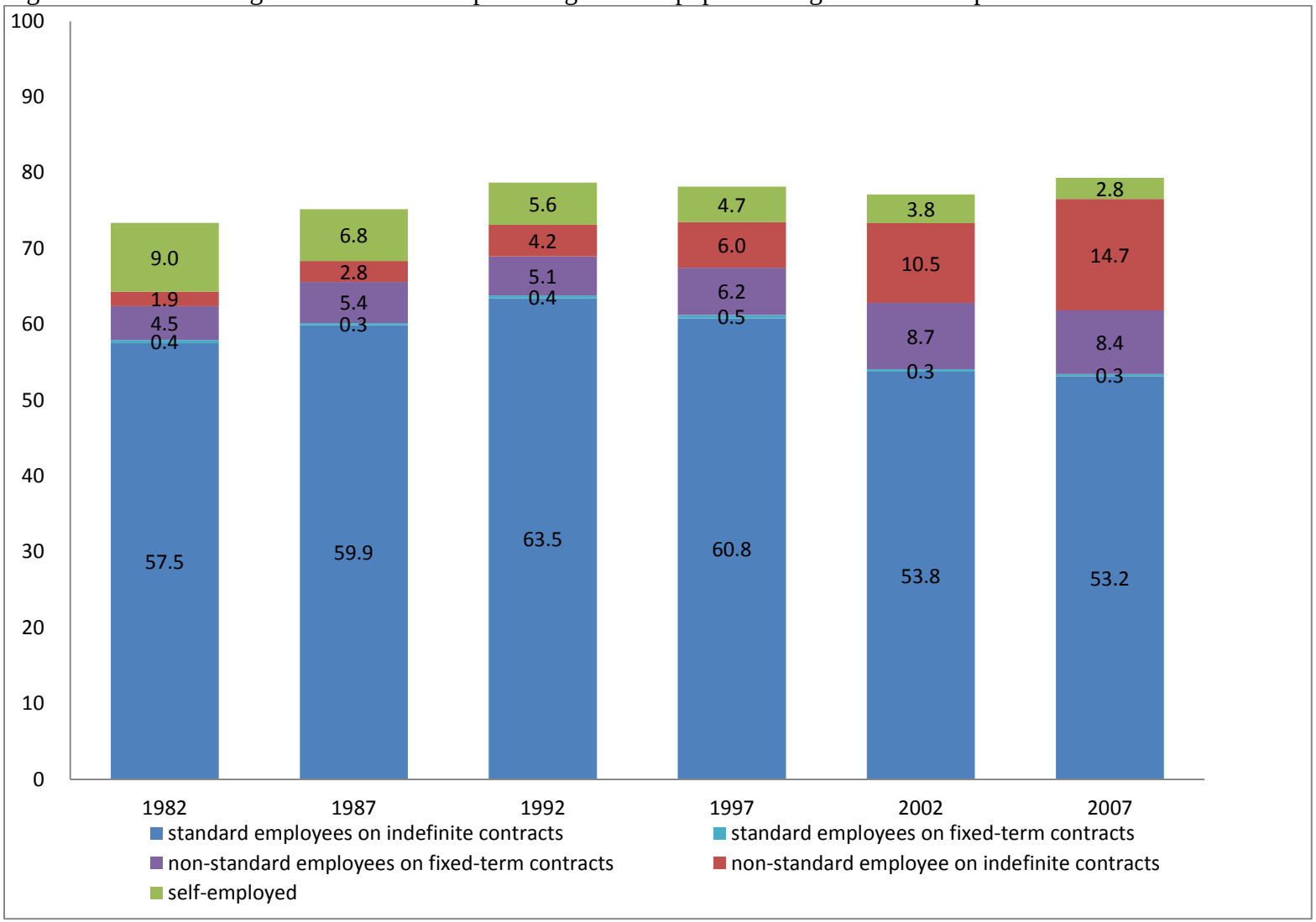
Source: the Employment Status Survey, 1982, 1987, 1992, 1997, 2002, and 2007.

Figure 5 Scatter Diagram with Δ%Nonstandard Employment with Indefinite Contracts over 1982-2002 and Δ%Self-employment over 1982-2002 for Different Industries



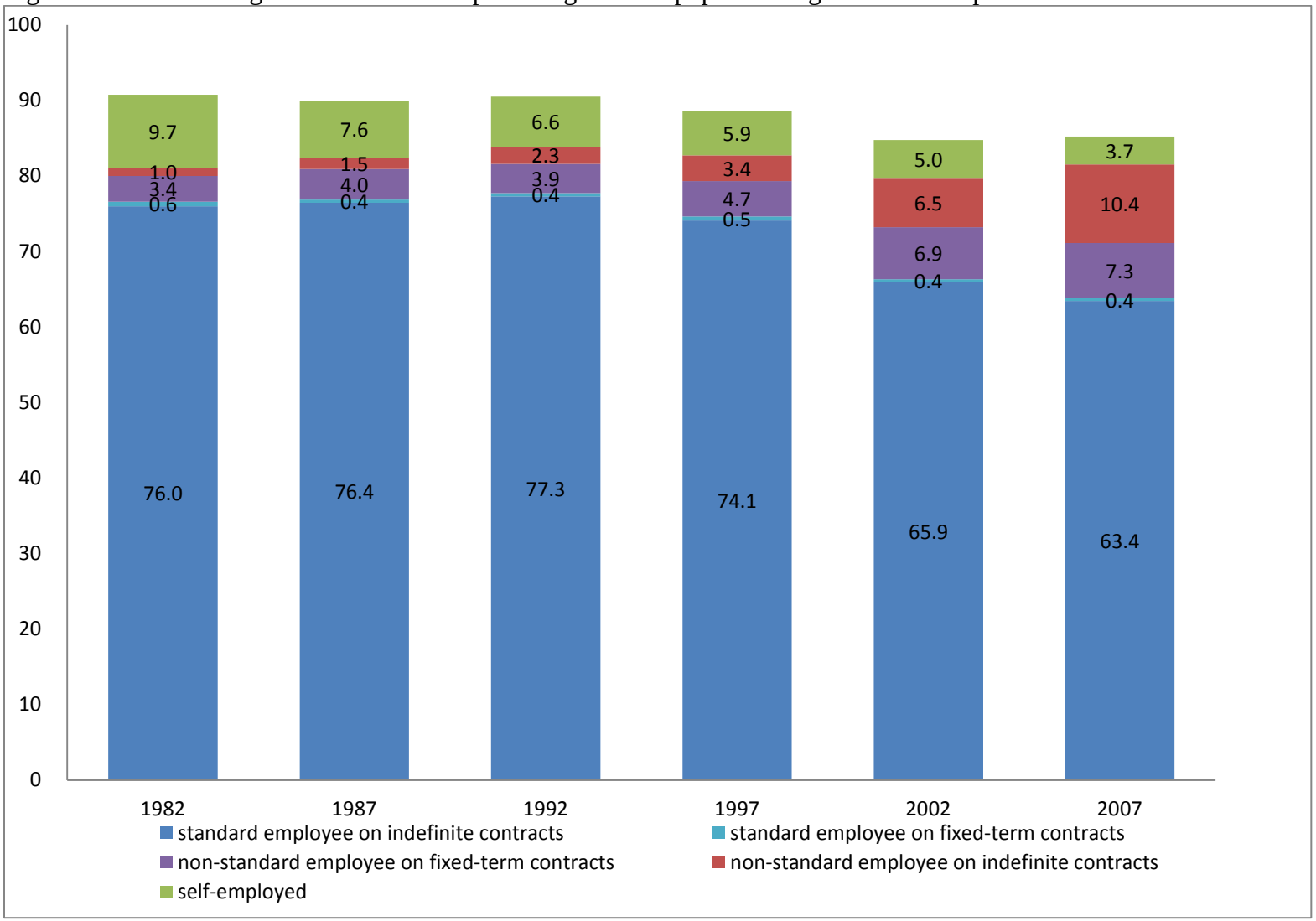
Source: the Employment Status Survey, 1982 and 2007.

Figure 6 Different categories of workers as percentages of the population aged 22-30 in Japan: 1982-2007



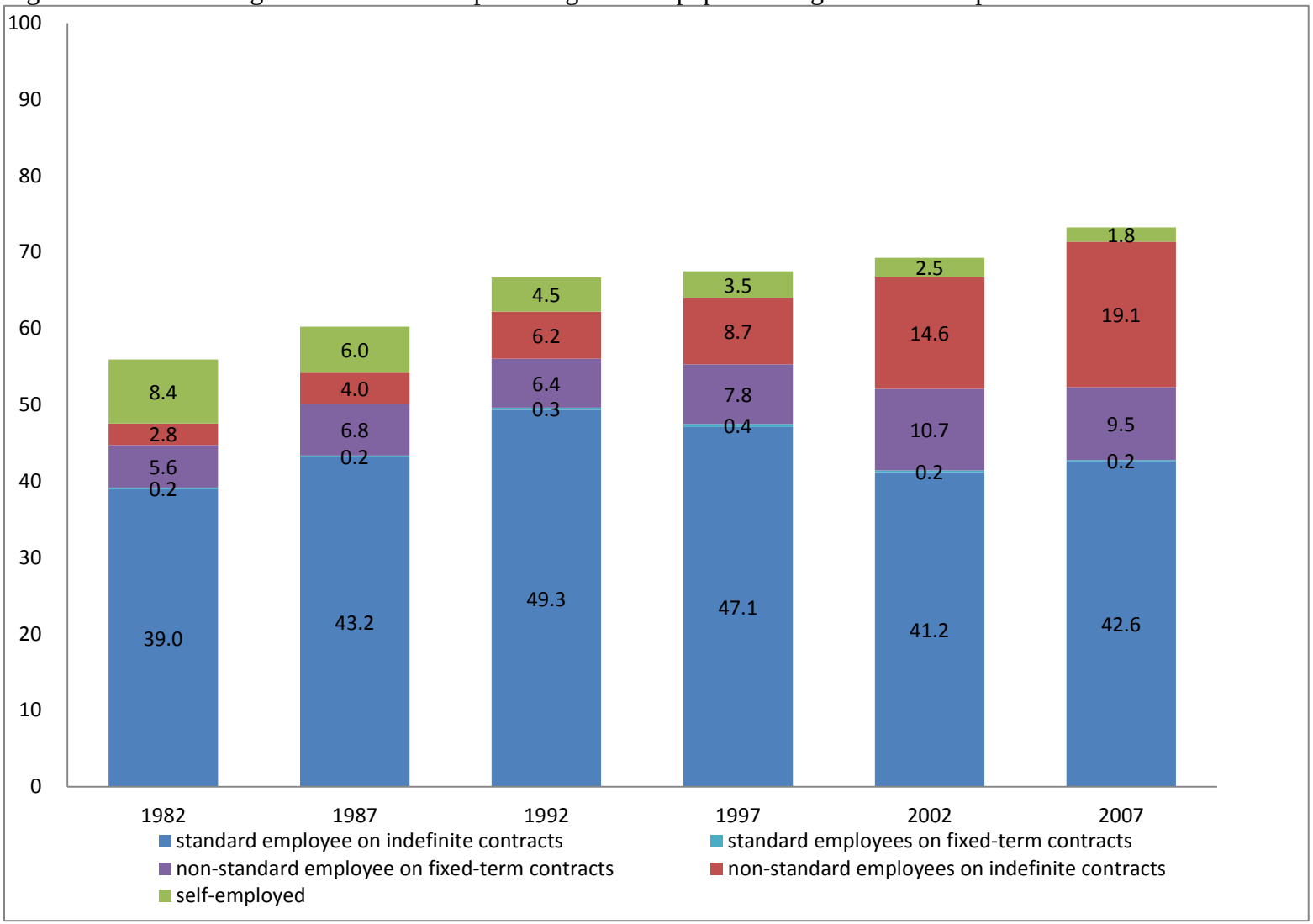
Source: the Employment Status Survey, 1982, 1987, 1992, 1997, 2002, and 2007.

Figure 7 Different categories of workers as percentages of the population aged 22-30 in Japan: 1982-2007 and male



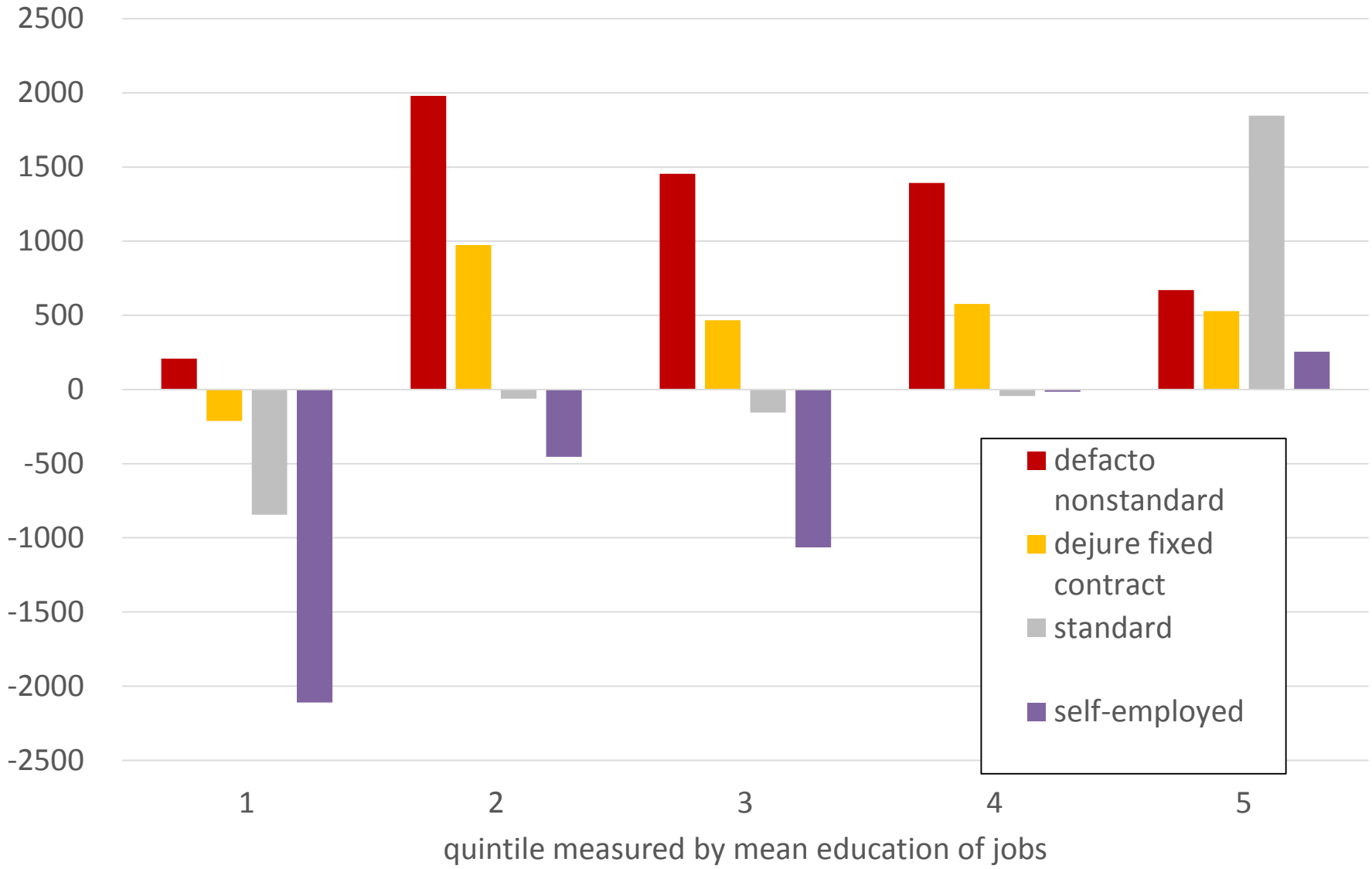
Source: the Employment Status Survey, 1982, 1987, 1992, 1997, 2002, and 2007.

Figure 8 Different categories of workers as percentages of the population aged 22-30 in Japan: 1982-2007 and female



Source: the Employment Status Survey, 1982, 1987, 1992, 1997, 2002, and 2007.

Figure 9 Changes in Employment from 1982 to 2002 for Jobs with Different Skill Levels (measured by mean education level)



Appendix A the construction of task score

The task score is from *Career Matrix* complied by JILPT (CMX). While the original score is measured for each detailed occupation (280 occupation), we aggregate this score into one-digit occupation by using 1985, 1990, 1995, 2000 and 2005 population census; namely, when we define task score for each 3-digit occupation k as $taskscore_k$ from CMX, the aggregated task score for each job $task_{it}$ is defined as

$$task_{it} \equiv \sum_{k \epsilon i} w_{kt} taskscore_k$$

where w_{kt} is the size of 3-digit occupation in employment in year t which is obtained from Population Census (Long-term table No.9).

The original score of CMX is a vector of 35 tasks. We then convert the 35 tasks into Non-routine Analytical task (NA), Non-routine Interactive task (NI), Routine-Cognitive task (RC), Routine-Manual task (RM), and Non-routine Manual task (NM) as typically done in the literature.