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勞工改變工作型態對其薪資之影響

The Wage Difference after Job Status Changing

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摘要

在台灣，臨時性雇用佔總就業比例在 2012 年大約為 5.3%，而且這個比例近年來有持續上升的趨勢。當勞工的工作型態從臨時性轉換到非臨時性雇用或是從非臨時性轉換到臨時性雇用時，勞工的薪水會因此而有明顯地差距。本研究利用人力運用調查之下的擬追蹤資料，檢驗勞工改變其工作型態與其薪水變化之間的關係。實證結果顯示從臨時性轉換到非臨時性工作之勞工，其薪水有顯著地上升；而從非臨時性轉換到臨時性工作之勞工，其薪水會受到顯著地傷害。女性從臨時性轉換到非臨時性工作，可以享有較多的薪水增加，但是男性從非臨時性轉換到臨時性工作時，薪水會受到較多的傷害。而年齡介於 40 至 60 歲之間的勞工，薪水下降較其他年齡層的勞工多；而較年輕的勞工其薪水增加較多。

關鍵字：臨時性工作、臨時性勞工、工作型態、台灣

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Abstract

In Taiwan, the proportion of temporary employment is about 5.3% (as of 2012) and this ratio has been growing gradually in recent years. Wage differences are caused by change of job status from non-temporary to temporary and vice-versa. Using data from the Manpower Utilization Quasi-Longitudinal Survey, the results confirm that workers switching from non-temporary to temporary jobs suffer significant erosion of income and workers switching from temporary jobs to non-temporary jobs receive significant income gain. Women benefit more when changing from temporary employment to non-temporary, while men suffer more when transiting from non-temporary to temporary jobs. The wage loss for workers' in age group 40 to 50 is larger than workers in other age groups and younger workers receive greater income gains.

Key words: Temporary workers; Temporary jobs; Job status; Taiwan

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Introduction

Temporary jobs are now a more popular form of employment than ever before and this phenomenon has spread across several countries. Temporary employment has grown rapidly over the past three decades in the United States (Autor, 2003); the proportion of temporary agency workers in Europe reached 2% in 2007 (CIETT, 2010). This kind of employment is more flexible but this flexibility is also a matter of concern in that workers employed in temporary jobs need to take the risk of being unstable and vulnerable.

The firms in Taiwan have been facing the pressure of global competition in the 1990s and nonstandard employment has increased remarkably because of the flexibility it offers in the labor market. In order to cut costs, firms lay off part of their fulltime employees and hire temporary workers to meet their needs (Bridges, 1994). The statistics show that in Taiwan, the ratio of nonstandard employment has risen from 2.39% in 2001 to 4.46% in 2006 and further to 8.8% in 2010. Recently, a type of atypical employment, temporary employment, has grown gradually (Hsiao, 2013).

Different from previous research that has focused upon wage differentials between temporary and non-temporary workers, this study examines the difference in income when workers change their job status in Taiwan. Since temporary employment has become so prevalent, it is more possible for workers once employed in temporary job, i.e. change of the job status can happen frequently. Then, how much do the workers gain when the job status changes from temporary to non-temporary? Conversely, do they lose out big when switched from non-temporary to temporary jobs? To address this issue, data of the Manpower Utilization Quasi-Longitudinal Survey were obtained from the Directorate-General of

Budget, Accounting & Statistics, Executive Yuan, Taiwan. I estimate the amount of income workers lose or gain from change in job status and also examine the impact of gender and different age groups.

The results suggest that compared to workers employed in non-temporary jobs for two consecutive years, workers who switch from non-temporary jobs to temporary jobs suffer significant income losses and workers who switch from temporary jobs to non-temporary jobs receive significant income gain.

Furthermore, the impact of change of job status varies across genders. For male workers, changing from non-temporary to temporary means a significant damage in the monthly wage, but there is no significant change for female workers. Female workers gain significantly from change of job status from temporary to non-temporary, while male workers do not. This may be caused by the role genders play in the family and the impact of having taken temporary jobs previously.

Workers of age between 40 and 60 suffer more severe wage loss when changing from non-temporary to temporary jobs. Workers in this age group reach the top of the wage level and their wages are affected more when they move from non-temporary to temporary jobs.

The main hypotheses and the background information on temporary employment are next presented. Then the data set and descriptive statistics are introduced, followed by empirical strategy and analysis of job status changes and income differences. The final section concludes.

Literature Review

The number of temporary workers has risen dramatically in the past couple of decades or so. In Britain, about 7% of male employees and 10% of female employees are in temporary jobs and the proportion stayed steady during the 1990s (Booth, Francesconi, and Frank, 2002). Temporary employment has grown at a fast pace over the past 30 years in US (Autor, 2003). In addition to these two countries which have flexible labor markets, this phenomenon has also spread to countries having low flexibility markets. In 2007, about 2% of the EU working population was employed by temporary agencies (CIETT, 2010). Jahn and Pozzoli (2011) reported that in Germany, the temporary agency employment was only about 1% of the workforce in 2000 but by 2008, about 3% of workers held temporary jobs.

In Taiwan too, the increase of atypical employment is obvious. Ko and Yeh (2013) stated that since the 1980s, Taiwan's labor market has encountered organizational downsizing and a dramatic increase in nonstandard employment. And in the late 1990s, when Taiwanese business faced growing competition from globalization, the increasing need for more flexible labor norms was felt, in order to cut costs and remain competitive. Firms in Taiwan, when facing economic pressure, lay off part of employees and recruit nonstandard workers to reduce wage cost (Bridges, 1994). This kind of employment is different from the traditional one. It is more flexible but it also means less stability and more vulnerability. Official statistics show that in Taiwan, the proportion of nonstandard employment rose from 2.39% in 2001 to 4.64% in 2006 and further to 8.8% by 2010 (Hsiao, 2013). After the financial crisis in 2007, a type of atypical employment, temporary employment, has grown gradually.

The term nonstandard employment includes many different kinds of workers. According to Kalleberg (2002), part-time work, temporary agency employment, short-term employment, contingent work and independent contracting constitute non-standard employment. Part-time work has regular wage employment but work hours are fewer than standard work. Every country has different criteria to define part time work. For example, general definition in United States is working less than 35 hours and in Canada and the United Kingdom it is working less than 30 hours. Temporary agency employment is a complex form of employment, because it involves three parties: business, temporary agency and the worker. Businesses are the clients of temporary agencies which hire workers to work for these businesses. That means, businesses are the ones who supervise these workers but they are not the employers. Short-term employment means workers are directly hired by employers but only for a short time. It may be a fixed-term contract or be on an on-call basis. Contingent work is characterized as *“any job in which an individual does not have an implicit or explicit contract for long-term employment or one in which the minimum hours worked can vary in a nonsystematic manner”* (Polivka and Nardone, 1989: 11). Independent contractors are a group of workers that are self-employed and sell their services to clients for a fixed-term period (Connelly and Gallagher, 2004). These kind of workers bear the economic risk of their employment. In this research, I focus on all types of atypical employments mentioned above except part-time employment, and I use the term “temporary workers” to represent these workers.

Although the proportion of temporary workers is not large, it can still affect labor market because of its specific traits. On the one hand, the usage of temporary employment still produces some benefits. The benefits mainly come from the flexibility, which implies lower costs for firms and fulfilling the temporary vacancies. On the other hand, temporary

jobs usually have been seen as “bad jobs”. Jahn and Pozzoli (2011) stated that the temporary employment sector contains a larger portion of disadvantaged workers and they also suffer from bad working conditions, so the increase of this kind of job raises some concerns from public.

The primary reason why firms prefer to use temporary workers is the flexibility such hiring offers. The contracts for temporary jobs are usually for short terms and firms can hire workers to fill temporary vacancies caused by permanent workers retiring or leaving, or to use them as a “buffer stock” (Addison, Cotti, and Surfield, 2013). The demand for temporary workers is higher during expansions and they usually are the first group to be laid off during recessions (Houseman, Kalleberg, and Erickcek, 2003). If employers use temporary workers as a “buffer stock” because of economic uncertainty, there must be some other reasons that explain the increasing proportion of temporary workers.

Houseman et al. (2003) stated that it is not easy for employers to find a qualified worker for permanent employment, so before they find a suitable one, they employ some temporary workers to fill the vacancies. Also, employers like to screen workers before they become permanent employees and therefore they hire employees as temporary workers at first. While some people, like the retired workers who still want to work, or women who require to take care of their family, need more flexibility on their work volunteer to be employed in this form (Kalleberg, 2000). For workers, temporary jobs are easier to get and people suffering from unemployment may get this kind of jobs and increase income. So, workers benefit in the situation where temporary jobs substitute for unemployment (Autor and Houseman, 2010). There is also an evidence showing another advantage of using temporary workers for firms. Amiti and Wei (2004) suggested that the presence of temporary workers makes the

permanent workers fear substitution by temporary workers and become more productive.

However, there are many concerns about drawbacks of temporary jobs. Lack of employment stability is the primary problem. Other main problems are temporary workers getting lower wages, lack of opportunity for promotion and lower job satisfaction. These problems are triggered by or linked to flexibility. For temporary workers, a fixed-term contract is less desirable compared to a permanent contract since it is uncertain whether they would continue to hold the position when the contract is terminated. In this case, temporary workers have less enthusiasm to invest in specific human capital and employers are less likely to provide job training (Booth et al., 2002). There is evidence that shows that employers provide 12 weeks for regular workers, while only 2 weeks of training for temporary workers (Lautsch, 2002). Lack of training may have a negative influence on workers performance (Virtanen, Kivimäki, Virtanen, Elovainio, and Vahtera, 2003). Qualifications for this kind of job are low and usually only workers who are low-skilled and equipped with general human capital apply (Houseman et al., 2003).

Hsiao (2013) stated that since temporary workers do not have long-term contracts and change jobs frequently, employers expect no loyalty from temporary workers who usually find it difficult to get promotions. Obviously, employers usually do not promote workers with short-term contracts as they have less firm-specific human capital and have no sense of loyalty to the firm. In some situations, employers use them to do some short-term tasks or fill positions temporarily, so they do not offer many opportunities for promotions (Houseman, 2005). Thus, all descriptions of temporary workers mentioned above may be the reasons why this kind of workers face difficulties in getting promotion.

Besides, workers taking up temporary jobs may suffer lower job satisfaction. Kaiser (2007) mentioned that job satisfaction is crucial to an individual's well-being and also an important indicator of both the economy and the society. There is evidence to show that the presence of temporary agency workers is linked to lower job satisfaction and higher job anxiety among employees (Bryson, 2012). Connelly and Gallagher (2004) stated that job satisfaction is related to volition. Ellingson, Gruys, and Sackett (1998) found that workers who take up temporary jobs involuntarily have negative job satisfaction, while those who take up temporary jobs voluntarily do not. In addition, temporary workers have little legal protection. There is no legislation specifically for temporary workers, and they may suffer dismissal without any severance payment (Booth et al., 2002; Hsiao, 2013).

Work conditions and well-being of standard workers can be affected by nonstandard workers (Connelly and Gallagher, 2004). It is a burden for standard workers to work with nonstandard workers because of their low skill and short tenures. Every job needs a minimum period of time for one to fit in, but the turnover rate of temporary workers is high, which means standard workers usually have to work with people not familiar with their duties. The evidence also shows that employers tend to assign simpler work to temporary workers because they lack firm-specific human capital (Lautsch, 2002). This results in standard workers having to bear heavier responsibilities. Ko and Yeh (2013) found that regular employees have lower job satisfaction in organizations using nonstandard workers.

Wage penalty is another issue for temporary workers. Some empirical evidence is there showing that wage gap between permanent workers and temporary workers is found in many countries. Booth et al. (2002) found that temporary workers receive lower wages than permanent employees in Britain. The wage penalty between temporary agency workers and

permanent workers in Portugal is 2 percent (Böheim and Cardoso, 2009). The evidence in Germany is more striking as the wage differential between temporary agency workers and permanent workers is 15% (Jahn, 2010). Temporary agency workers and short-term workers have low pay and lack benefits such as health insurance and pension in United States (Kalleberg, Reskin, and Hudson, 2000).

There are some possible reasons that explain the wage penalty. First, some workers taking up temporary jobs may perceive a chance to transit into a permanent job; temporary workers have to pay some cost for that opportunity (Jahn, 2010). Whether temporary jobs are stepping stones or dead ends is a vigorous debate. The evidence is mixed for positive and negative effects and part of the reason may be limited scope of the supporting data (Addison et al., in press)

Workers employed in temporary jobs with fixed contracts can have a chance to get permanent jobs in Britain (Booth et al., 2002) and in Portugal (Portugal and Varejão, 2009). Evidence from the United States shows that temporary jobs are stepping stones to standard jobs, and the wage gap vanishes over time (Addison et al., in press). In Denmark, there is a positive stepping-stone effect of temporary agency employment when the labor market is tight (Jahn and Rosholm, 2010), though some negative effects are also felt. Autor and Houseman (2010) found that the temporary-help placement provides no net positive effects for wages, employment and labor market advancement of low-skilled workers. The evidence in the Netherlands also shows no increasing probability of workers getting a chance to transit from unemployment to regular jobs (De Graaf-Zijl, Van den Berg, and Heyma, 2011).

The human capital accumulation is an important factor for workers' wages. Compared

to regular workers, temporary workers invest less in firm-specific human capital and usually have low skills, and that is why employers do not offer high paying jobs to such employees (Houseman et al., 2003). In contrast, in the United States, temporary help firms offer free computer training to workers and this training helps them accumulate more human capital than other workers who are without any training and may help them receive an increased wage in post-temp jobs (Autor, 2001). This implies that if workers can accumulate human capital, they can earn more in subsequent jobs. Workers in long-term employment arrangement reveal their specific knowledge and invest more in firm-specific human capital, and employers are more willing to invest in general human capital in case of these workers. Also, temporary workers are assumed to be less productive (Kandel and Pearson, 2001).

Finally, most people who take up temporary jobs do not have many alternatives, so they have low bargaining power on wages (Blank, 1998). Temporary agency workers have lower bargaining power than standard workers because they lack protection of the law and they receive low benefits (Kalleberg et al., 2000). Jahn and Pozzoli (2011) stated that temporary workers can accumulate human capital through temporary jobs but they are still stigmatized by the employers at the very beginning when they transit into permanent work in Germany.

This paper examines the size of wage gap between temporary and standard workers after the job status changes. As mentioned above, workers who are able to transit from temporary jobs to permanent jobs usually suffer from wage penalty. Many empirical researches on the wage gap have observed samples over long periods of time, about two to three years, to examine whether workers can accumulate human capital in temporary jobs. If the wage gap lasts permanently, then it can be concluded that temporary jobs cannot help accumulate human capital, and the wage penalty may come from having less human capital than standard

workers. Also, some researchers have focused upon the stepping stones effect of temporary work. Workers may have some chance to get permanent jobs after taking up temporary work, so they have to pay some price for it. However, adequate and appropriate data are not available to check the stepping stone effect and the observed periods have been too short to examine the human capital theory. Thus, the bargaining power may be the suitable explanation.



Data Sources and Descriptive Statistics

This study uses the Manpower Utilization Quasi-Longitudinal Survey data from the Directorate-General of Budget, Accounting & Statistics, Executive Yuan in Taiwan. This survey is a part of the Manpower Utilization Survey conducted every year since 1978. According to the introduction of the survey, about one half of respondents are replaced each year and the selected households are surveyed twice in two consecutive years. Survey Research Data Archive (SRDA) incorporates the data from the same respondents in the two years into a new database, Manpower Utilization Quasi-Longitudinal Survey.

This survey covers civilians in Taiwan who are 15 years or older in age. People who are still receiving formal education and who have careers in the military are not included. Reported data include person-level information of respondents, such as gender, age, occupation, educational level and monthly earnings and also some information about workers' employment, such as work hours and job status. I use the data from 2008 to 2012 because there is no information about workers' job status before 2008, which makes the identification of temporary workers impossible.

Workers are divided into two types of job status, temporary jobs and non-temporary. As mentioned above, the atypical works contain many different forms of jobs, and according to the questionnaire in this survey, I can only focus on temporary and dispatched jobs and use "temporary jobs" to represent both of them. Whether a worker is employed in a temporary form can be established but whether a worker is a temporary agency worker, independent contracting worker or has a short-term employment cannot be established.

Table 1
Summary of the data pooling from 2008 - 2011

Variable	N	Mean	Std. Dev.	Min	Max
(S_1) Temp to Temp	45844	0.013	0.12	0	1
(S_2) Temp to Non-temp	45844	0.023	0.15	0	1
(S_3) Non-temp to Temp	45844	0.017	0.13	0	1
(S_4) Non-temp to Non-temp	45844	0.946	0.23	0	1
Monthly income in the first year	45844	37391.38	26877.01	620.82	1043806
Monthly income in the second year	45844	37547.17	27510.57	500	1033855
Monthly income difference	45844	155.77	20492.18	-940421	986883.3
Work hours in first year	45844	44.52	8.35	2	118
Work hour in second year	45844	44.11	8.04	2	112
Sex	45844	0.61	0.49	0	1
Age	45844	40.71	11.41	15	92
Years of education	45844	12.69	3.58	0	23
Married	45844	0.64	0.48	0	1

Each observation in the sample has data of two consecutive years, so all items are segregated by job status, that is, all of them are divided into four groups: (S_1) workers employed in temporary jobs for two consecutive years; (S_2) workers employed in temporary jobs in the first year but who switched to non-temporary job in the second year; (S_3) workers employed in non-temporary jobs in the first year but switched to temporary jobs in the second year; and (S_4) workers employed in non-temporary jobs for two consecutive years.

Some data that are unreasonable or not suitable for this study are dropped from the data set. For example, respondents who have no records of work hours or monthly income, or whose records show that the work hour or monthly income are zero or deficit are excluded. In addition, if the information about a respondent's personal characteristics, like age, educational level, gender or regional location, etc., is missing then that respondent too is excluded from the data set.

Before using more advanced econometrics approach to examine the hypotheses, we can take a look at the summary of the data and the difference between the proportions of the four groups. There are some basic findings in this section: (i) the portion of workers taking up non-temporary jobs is declining; (ii) among workers taking up temporary jobs for two consecutive years the percentage of females is larger than males; (iii) in the group in which workers had non-temporary jobs in the first year and switched to temporary jobs in the second, the percentage of males is larger than females; (iv) the group in which workers were employed in non-temporary jobs has the highest proportion of married persons, as well as the highest educational level; and (v) there is a gap in average monthly income in the second year between workers with temporary and non-temporary jobs in the first year though these workers had the same form of employment in the second year.

Table 1 presents the summary of the variables used in the empirical analysis. After pooling all available data from 2008 to 2011, there are 45844 respondents. The first four variables are the four groups segregated by job status, and the following variables are the workers' income information and their characteristics. The education level is represented by school years, marital status is single or married, and Table 1 shows the married ones.

There are also some variables that are included in the model, such as location and industry. Location means the administrative region in Taiwan, so the values of the variable are from 1 to 20 to represent the different administrative regions. Values of the variable Industry are 1 to 3, corresponding to the three sectors of the economy. The summary of these two variables is not included in Table 1 since the mean and standard error of these two variables are meaningless.

Variable	08-09	09-10	10-11	11-12	Total
(S ₁) Temp to Temp	1.07%	1.36%	1.19%	1.94%	1.39%
(S ₂) Temp to Non-temp	2.42%	1.73%	2.35%	2.55%	2.25%
(S ₃) Non-temp to Temp	1.54%	1.58%	1.65%	2.10%	1.72%
(S ₄) Non-temp to Non-temp	95.04%	95.33%	94.81%	93.41%	94.63%
N	11322	11387	11193	11942	45844

Variable	08-09	09-10	10-11	11-12	Total
(S ₁) Temp to Temp	0.99%	1.36%	1.12%	1.87%	1.34%
(S ₂) Temp to Non-temp	2.21%	1.60%	2.32%	2.59%	2.19%
(S ₃) Non-temp to Temp	1.77%	1.73%	1.92%	2.02%	1.86%
(S ₄) Non-temp to Non-temp	95.03%	95.31%	94.64%	93.53%	94.61%
N	6964	6887	6808	7291	27950

Variable	08-09	09-10	10-11	11-12	Total
(S ₁) Temp to Temp	1.15%	1.36%	1.30%	2.06%	1.48%
(S ₂) Temp to Non-temp	2.64%	1.93%	2.39%	2.47%	2.36%
(S ₃) Non-temp to Temp	1.17%	1.36%	1.23%	2.24%	1.51%
(S ₄) Non-temp to Non-temp	95.04%	95.36%	95.07%	93.23%	94.66%
N	4358	4500	4385	4651	17894

Proportions of the population with each type of job status from 2008 to 2012 are shown in Table 2. Over 2008 to 2012, the average percentage of workers who have taken up temporary jobs at least once is about 5%. The percentage of workers with non-temporary employment in two consecutive years is decreasing gradually. That is, there are more and more workers who have taken up temporary jobs in their careers. In each group, the proportion of males is larger than females; on average, about 61% are male and 39% female.

This implies that in the labor market, male workers outnumber female workers.

Proportions of male and female workers by job status and the year of survey are also shown in Tables 3 and 4. The most apparent difference appears in group S_1 and group S_3 . The proportion of females in group S_1 is higher than males; this can be explained by the role of females in the family in Taiwan. Most female workers in Taiwan are asked to take care of their families, so temporary work is a good choice for them. However, the proportion of males in group S_3 is higher than females. In Taiwan, males usually are the bread winners in the family, so they prefer jobs that are stable and can pay higher wages. But the trend of using fixed-term contract has become more common and many male workers are also forced to accept temporary jobs.

Table 5 summarizes demographic characteristics of each group (by employment type). The average age of workers who were employed in temporary jobs for two consecutive years is the highest among all groups. For the group employed in non-temporary work for two consecutive years, the proportion of married workers is the highest among all groups, and workers in this group also have higher levels of education. Workers in this group are the ones that receive the highest monthly income among all the groups, and this can be attributed to their characteristics. Workers who get married may have stronger motivation to obtain stable jobs and having higher education may help them acquire better jobs.

In Tables 6 and 7, the average work hour and average monthly income are shown. In the first wave, year 2008 to 2009, work hours in 2009 for all groups are smaller than in 2008. Also, the monthly incomes for all groups decrease in the second year, that is, the monthly income in 2008 is higher than in 2009. The reason for the work hours and monthly income

Table 5**Summary statistics of the four groups separated by job status**

	(S ₁) Temp to Temp	(S ₂) Temp to Non-temp	(S ₃) Non-temp to Temp	(S ₄) Non-temp to Non-temp
Age	42.18	39.95	40.91	40.72
Single (%)	39.59	44.14	43.04	36.05
Married (%)	60.41	55.86	56.96	63.95
< High school (%)	53.05	42.3	49.62	23.36
High school (%)	31.14	35.43	32.78	34.87
College (%)	15.18	20.62	15.7	36.75
> College (%)	0.63	1.65	1.9	5.02
N	639	1,033	790	43,382

decreasing probably is the impact of the financial crisis. The financial crisis led to a long period of recession, and the contraction of economic activities may have caused wages to drop. So the influence of financial crisis makes the average work hours decline in 2009, and also induces the group which may have wage decrease in the second year.

In Table 6, the average work hours for non-temporary workers are a little higher than for temporary workers, so the difference between monthly income of temporary and non-temporary workers may not have been caused by the difference in work hours. There are big gaps between average work hours for different groups even they have the same form of employment in the same year. For example, temporary workers' average work hours, in the wave 08-09 in 2009 for group S_1 is 37.87 hours and for group S_3 it is 37.84, and in the wave 09-10 in 2009 for group S_1 it is 40.17 hours and for group S_2 is 38.34 hours.

Table 7 reports the average monthly income for each group and each wave of survey from 2008 to 2012. The figures in Table 5 are adjusted by using the average consumer price index from IMF based on the year 2012. For group S_2 , workers who had temporary jobs in

Table 6**Average Work Hours**

	2008	2009	2009	2010	2010	2011	2011	2012
(S ₁) Temp to Temp	42.56	37.87	40.17	40.37	39.35	39.67	32.63	32.34
(S ₂) Temp to Non-temp	42.15	41.27	38.34	41.09	40.92	42.26	36.80	39.79
(S ₃) Non-temp to Temp	44.91	37.84	41.63	40.55	41.26	40.13	39.48	36.66
(S ₄) Non-temp to Non-temp	45.66	44.08	44.03	44.48	44.90	44.75	44.61	44.24

Table 7**Average Monthly Income**

	2008	2009	2009	2010
(S ₁) Temp to Temp	24948.41	23304.62	23894.3	24624.44
(S ₂) Temp to Non-temp	26804.96	26654.26	22936.53	25112.67
(S ₃) Non-temp to Temp	29928.71	25386.59	26044.15	24654.01
(S ₄) Non-temp to Non-temp	38647.46	37932.45	37406	38597.61
	2010	2011	2011	2012
(S ₁) Temp to Temp	23611.71	23162.39	21542.2	21360.95
(S ₂) Temp to Non-temp	25717.95	26407.79	22323.65	25096.64
(S ₃) Non-temp to Temp	28462.77	26303.7	25403.04	24657.17
(S ₄) Non-temp to Non-temp	38345.08	38834.99	37986.24	37726.31

the first year and then switched to non-temporary jobs had wage increases for these four waves of survey except 08-09.

Table 7 also shows that comparing group S_2 and group S_4 , workers in these two groups take up non-temporary jobs in the second year, while workers in group S_2 take up temporary jobs in the first year and workers in group S_4 had non-temporary jobs in the first year. Although all these workers were employed in non-temporary work in the second year, their monthly wages in the second year have a large gap. The monthly wages of workers who take up temporary work in the first year are about 10,000 NTD less than workers who

take up non-temporary work in the first year itself.

Comparing group S_1 and group S_3 , the workers in these two groups both taking temporary jobs in the second year, while workers in group S_1 taking temporary jobs in the first year and workers in group S_3 taking non-temporary jobs in the first year. Workers who took up non-temporary work in the first year earned more money than the ones who took up temporary work in the first year, even though all these workers were employed in temporary jobs in the second year. The job status in the past may influence the pay that employers are willing to offer.

This can be explained by the signals that employers receive from workers' previous jobs. Because employers do not know the workers' real abilities, they can only use some relevant information to conjecture. This may also make workers having temporary work experience have lower bargaining power on wages and receive wages lower than workers having non-temporary work experience.

Empirical Model and Results

The analysis uses the following model to examine the size of wage gap between the two consecutive years for each group after the employment form changes. The primary empirical model is:

$$Y_i = \alpha + \beta_1 S_{1i} + \beta_2 S_{2i} + \beta_3 S_{3i} + X_i' \lambda + \varepsilon_i \quad , i = 1, \dots, N \quad (1)$$

Where Y_i is the difference between wages in the two consecutive years for respondent i , that is, the monthly income in the second year minus the monthly income in the first year for each individual. The variables, S_i , are a set of dummies indicating the group each individual i belongs:

S_{1i} : This variable indicates workers employed in temporary work for two consecutive years, worker i .

S_{2i} : This variable indicates workers employed in temporary work in the first year but switching to non-temporary work in the second year, worker i .

S_{3i} : This variable indicates workers employed in non-temporary work in the first year but switching to temporary work in the second year, worker i .

And β_1, β_2 and β_3 are the impacts of these groups by job status. One job status dummy is dropped from the equation, the group where workers were employed in non-temporary work for two consecutive years.

The vector X_i contains the characteristics of individual i : sex, age and its square, marital status, educational level, geographic location, years, and the industry of the job, and all these are used to control for the individuals' characteristics.

Table 8 presents OLS estimates for difference between wages in two consecutive years and the groups by job status and the characteristics of samples. Column (I) reports the estimation without controls. For workers in group S_2 , who had temporary work in the first year and switched to non-temporary work in the second year, change of job status seems to bring benefits to monthly income. The average monthly income for workers in group S_2 is \$1,194 NTD, about 4.98% of average monthly income, larger than workers employed in non-temporary jobs for two consecutive years.

Workers in group S_3 taking up non-temporary work in the first year and switching to temporary work in the second year earned less after the change of job status. The estimate shows that the average monthly income in group S_3 is \$2,234 NTD, about 5.9% of the monthly income, less than workers taking up non-temporary jobs for two consecutive years.

Column (II) in Table 8 shows estimation with control variables. The estimates in the two columns do not considerably differ from each other. Compared to workers employed in non-temporary jobs for two consecutive years, the average monthly income for workers in group S_2 is larger by \$1,296 NTD, and the average monthly income in group S_3 is lower by \$2,197NTD. The changes take up about 5.4% of the average monthly income for group S_2 and about 5.8% for group S_3 .

Using the OLS estimates to examine the relationship between the change of job status and monthly income, the results show that change of the form of employment may hurt wages, especially after switching job from non-temporary to temporary while change from temporary to non-temporary benefits the workers.

	(I) OLS estimation without controls	(II) OLS estimation with controls	(III) IV estimation with controls
(S ₁) Temp to Temp	-462.2* (257.50)	-367 (266.10)	-718.6* (403.40)
(S ₂) Temp to Non-temp	1,194*** (355.50)	1,296*** (359.70)	1,510** (710.70)
(S ₃) Non-temp to Temp	-2,234*** (327.90)	-2,197*** (332.20)	-2,476*** (499.90)
Age		25.53 (62.37)	25.92 (62.33)
Age square		-0.65 (0.78)	-0.655 (0.78)
Edu		18.35 (29.61)	17.19 (29.98)
Male		-21.39 (175.80)	-21.4 (175.80)
Married		-144.8 (196.80)	-147.3 (196.40)
Location		included	Included
Industry		included	Included
Years		included	Included
constant	173.8* (100.60)	-654.2 (1393.00)	-783.2 (1427.00)
R ²	0.0003	0.0013	.
Hansen J statistic			117.47
Kleibergen-Paaprk Wald F statistic			9.278
N	45844	45844	45844

NOTE: The OLS estimation using the robust option, that is, the standard error concerns the heterogeneity and lack of normality. The instrumental variables estimation using heteroskedasticity-based instruments and the robust option.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

However, when there exists endogeneity in the model, the OLS estimation can become biased and inconsistent. The non-zero correlation between the disturbance ε and job status causes endogeneity. Some variables correlated with the independent variable in the model are omitted because these variables are unobserved, for example, work attitude.

Work attitude influences both workers' decision about choosing job status and their monthly wages. Proactive workers usually prefer stable jobs and they expect employee training, struggle for promotions, have higher job satisfaction and care about work circumstances. Thus, non-temporary jobs are more suitable for them. This kind of workers take up non-temporary jobs or strive for switching to non-temporary jobs. Also, workers who are proactive apply themselves to their tasks and this may make them get higher paid. On the other hand, preferences of passive workers in terms of stable jobs, opportunities of promotion or any other work condition are not quite clear. So it is more likely that this kind of workers accept temporary jobs. The passive work attitude also induces lower monthly incomes since they pay less attention to their work.

In this case, work attitude is a determinant of employment form and the wage level, that is, it simultaneously affects the dependent and independent variables in the model and it should not be left out. However, work attitude is a subjective cognition which is not easy to determine and there is no information about it in the database. Therefore, work attitude is an unobserved variable and causes omitted variable bias.

When there exists endogeneity in the model, the instrumental variables can be used to eliminate the bias. To serve as valid instruments for the endogenous variables, instrumental variables must satisfy two conditions. First, the instruments must be exogenous, that is, the

covariance between the instrument and the disturbance ε should be zero. In addition, the instrument must be correlated with the endogenous variable, which means that the covariance between the instrument and the endogenous variables should not be zero.

In order to deal with the endogeneity in the model, finding a valid instrument is a good way. The model for adding instrumental variables can be rewritten as:

$$Y_i = \alpha_{1i} + \beta_1 S_{1i} + \beta_2 S_{2i} + \beta_3 S_{3i} + X_i' \lambda + \varepsilon_i \quad , i = 1, \dots, N \quad (2)$$

$$S_{1i} = \alpha_{2i} + z_{1i}' \gamma_1 + \varepsilon_{1i}$$

$$S_{2i} = \alpha_{3i} + z_{2i}' \gamma_2 + \varepsilon_{2i}$$

$$S_{3i} = \alpha_{4i} + z_{3i}' \gamma_3 + \varepsilon_{3i}$$

where z_{1i} , z_{2i} , and z_{3i} are the instruments and ε_i , ε_{1i} , ε_{2i} , and ε_{3i} are the disturbances in the model.

In this study, the suitable instrument needs to be uncorrelated with the disturbance ε_i and be correlated with the job status. However, no appropriate instruments could be found in the data set. Thus, in this study, the method provided by Lewbel (2012) is used to create instruments.

Lewbel assumes that the

$$E(X_i \varepsilon_i) = 0,$$

$$E(X_i \varepsilon_{ji}) = 0, j = 1, 2, 3, 4; i = 1, \dots, I$$

$$\text{Cov}(z_{1i}, \varepsilon_i \varepsilon_{1i}) = 0,$$

$$\text{Cov}(z_{2i}, \varepsilon_i \varepsilon_{2i}) = 0,$$

$$\text{Cov}(z_{3i}, \varepsilon_i \varepsilon_{3i}) = 0, i = 1, \dots, I$$

And ε_i and its variance-covariance matrix have heteroskedasticity.

In the study, there are three endogenous regressors, S_{1i} , S_{2i} and S_{3i} , but I cannot find any available instruments. Under the assumptions mentioned above, Lewbel (2012) indicates that the instruments can be created from the residuals of the first-stage regression and included as exogenous variables. The constructed instruments are as shown below:

$$\begin{aligned} z_{1i} &= (X_i - \bar{X})e_1, \\ z_{2i} &= (X_i - \bar{X})e_2, \\ z_{3i} &= (X_i - \bar{X})e_3. \end{aligned}$$

where e_1 , e_2 , and e_3 are the residuals from the first-stage regression of the endogenous regressors S_{1i} , S_{2i} and S_{3i} on all exogenous regressors.

Column (III) of Table 8 shows instrumental variables estimates of Equation (2) for the impact of job status on income differences. The estimates reveal that the average monthly income of workers employed in temporary jobs for two consecutive years are \$718.6 NTD less than workers who were employed in non-temporary jobs for two consecutive years, about 3% of the average monthly income. Average monthly income of workers who had non-temporary jobs in the first year and changed job status to temporary jobs in the second year is \$2,476 NTD less than workers who had non-temporary jobs for two consecutive years, about 6.5% of average monthly income, workers who had temporary jobs in the first year and changed job status to non-temporary jobs in the second year is \$1,510 NTD more than workers who had non-temporary jobs for two consecutive years, about 6.2% of average monthly income.

The Hansen J statistic for testing the over-identification for all instruments is 117.47, and the p-value is 0.0093. At 95% confidence level, the null hypothesis that the model is valid is rejected, which means the instruments set is not that appropriate. Weak identification test is about instrument relevance and an instrument is considered weak when the correlation between the instrument and the endogenous variable is weak. The Kleibergen-Paaprk Wald F-statistic is used for checking whether weak identification exists and the rule of thumb indicates that the F-statistic should be greater than 10 or we have to worry about weak instruments. The Kleibergen-Paaprk Wald F-statistic in the model is 9.057, and according to the rule of thumb mentioned above, weak identification may occur. Weak instruments bring about biased results, so the IV estimation shows incorrect coefficients and significances.

Table 9 presents the estimated impact of job status change on monthly income difference for different age groups. For workers in group S_3 , there are statistically significant at an error level of 5 percentage or less for all age groups except over sixty years of age. Workers who are under forty years of age suffer lower damage than those who are over forty years of age, and the differences between workers over and below forty years of age are higher than \$1,000 NTD.

Younger workers have less work experience and usually receive lower wages than older ones, so when they change their job status from non-temporary to temporary, the wage difference is smaller than older workers. Workers who are beyond forty years of age suffer about \$3,000 NTD wage loss when they change their jobs forms from non-temporary to temporary, which is apparently greater than workers less than forty years of age suffer.

Almost all workers significantly suffer from wage loss after change from non-temporary to temporary job and the income loss gets worse as the age increases, as shown

Table 9

The monthly income difference and change in job status by age

IV estimation with controls

	(I)	(II)	(III)	(IV)	(V)
	Age <30	Age ≥ 30 and < 40	Age ≥ 40 and < 50	Age ≥ 50 and < 60	Age ≥ 60
(S ₁) Temp to Temp	-674.5 (465.70)	-1,355* (780.00)	-798.9 (675.00)	-63.5 (701.00)	-392.6 (1478.00)
(S ₂) Temp to Non-temp	2,991*** (752.50)	1,320* (716.90)	1,543 (1501.00)	276.8 (919.30)	-71.04 (1655.00)
(S ₃) Non-temp to Temp	-1,672** (684.20)	-1,998*** (644.60)	-3,030*** (943.30)	-3,153*** (982.20)	1,039 (2872.00)
Age	-30.16 (362.70)	-1,179 (875.80)	453.4 (2668.00)	1,609 (3092.00)	1,701 (2160.00)
Age square	0.13 (7.79)	16.47 (12.68)	-4.256 (30.29)	-15.48 (28.72)	-12.74 (15.19)
Edu	-8.87 (34.58)	45.01 (54.11)	30.12 (65.80)	23.57 (52.12)	78.6 (161.90)
Male	69.26 (255.30)	-276.6 (210.90)	146.8 (474.00)	-192.4 (453.40)	1,388 (1419.00)
Married	-94.08 (362.20)	18.81 (206.70)	-386.3 (583.50)	-92.19 (424.90)	-353.5 (1221.00)
Location	included	included	Included	included	included
Industry	included	included	Included	included	included
Years	included	included	Included	included	included
constant	532.9 (4044.00)	19,916 (14906.00)	-11,103 (58451.00)	-41,447 (82970.00)	-56,313 (78338.00)
Hansen J statistic	88.53	90.65	102.93	81.60	74.78
Kleibergen-Paaprk statistic	WaldF 5.82	6.04	10.30	3.87	20.84
N	9035	13016	12860	8551	2382

NOTE: The instrumental variables estimation using heteroskedasticity-based instruments and the robust option. The robust option means that the standard error concerns the heterogeneity and lack of normality.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

in Table 9, though there is no significant change for workers over sixty years of age. One possible explanation for this result may be that there are few observations for this group which leads to no significance. The other explanation is about their work experiences and bargaining power. Workers beyond sixty years of age have rich work experience so employers would not take them as less productive workers. Also, these workers usually employed in temporary jobs voluntarily, thus they still have bargaining power on their wage.

Workers under forty years of age receive significant wage increase after moving from temporary to non-temporary jobs. Young workers are more amenable to take up temporary jobs and they often change their jobs. Because of lack of work experience and stability, young workers receive lower wages. So when they switch to non-temporary jobs, they can significantly benefit from it. But the amount of wage increase for workers between thirty and forty years of age is smaller than workers under thirty years of age, implying that this impact decreases as age increases (Table 9). There is no evidence of workers over forty years old gaining from job status changing from temporary to non-temporary. Table 10 shows the OLS estimation of the monthly income difference by change in job status by age. The outcomes are basically same as the IV estimation.

The p-values of Hansen J statistic are not significant for any of the age groups, suggesting that the null hypothesis of over-identification for all instruments cannot be rejected and this model is valid. The Kleibergen-Paaprk Wald F-statistic needs to be larger than ten or there would be no evidence to state that weak instruments do not exist. In Table 9, only the over 60 years age group has an adequately large F-statistic to reject the null hypothesis; in all other groups weak instruments may exist and lead to biased results.

Table 10

The monthly income difference and change in job status by age

OLS estimation with controls

	(I)	(II)	(III)	(IV)	(V)
	Age <30	Age ≥ 30 and < 40	Age ≥ 40 and < 50	Age ≥ 50 and < 60	Age ≥ 60
(S ₁) Temp to Temp	-307.6 (459.70)	-1,062* (641.80)	-129.8 (564.10)	-278.3 (560.70)	435.2 (1262.4)
(S ₂) Temp to Non-temp	2226*** (486.90)	1735*** (463.60)	569.9 (1070.00)	376.5 (593.70)	1356.83 (1378.21)
(S ₃) Non-temp to Temp	-2091*** (639.10)	-2071*** (614.40)	-2657*** (716.80)	-2169*** (734.90)	1003.87 (2490.63)
Age	-71.73 (362.10)	-1180 (876.90)	464 (2670.00)	1602 (3098.00)	1686.66 (2178.47)
Age square	0.898 (7.79)	16.49 (12.70)	-4.371 (30.32)	-15.42 (28.77)	-12.63 (15.32)
Edu	-9.559 (34.63)	47.1 (53.88)	29.39 (65.86)	25.5 (51.48)	80.64 (162.75)
Male	67.92 (255.70)	-277.7 (211.20)	148 (475.10)	-194.8 (454.80)	1378.32 (1430.26)
Married	-98 (362.60)	21.33 (207.00)	-385.3 (586.00)	-81.76 (424.50)	-273.84 (1230.65)
Location	included	included	Included	included	included
Industry	included	included	Included	included	included
Years	included	included	Included	included	included
constant	1378 (4068)	22010 (14919)	-12418 (58372)	-39732 (83103)	-60,024.3 (78419.89)
R-squared	0.008	0.005	0.003	0.005	0.013
N	9035	13016	12860	8551	2382

NOTE: The OLS estimation using robust option, which means that the standard error concerns the heterogeneity and lack of normality.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 11

The monthly income difference and change in job status by gender

	OLS estimation		IV estimation	
	(I)Female	(II)Male	(III)Female	(IV)Male
(S ₁) Temp to Temp	-384.9 (335.40)	-301.5 (391.10)	-677.6 (480.50)	-626.4 (546.30)
(S ₂) Temp to Non-temp	1,980*** (302.40)	921.5 (579.60)	2,061*** (484.90)	1,137 (957.20)
(S ₃) Non-temp to Temp	-809.7* (420.40)	-2,897*** (462.20)	-68.35 (709.80)	-3,519*** (641.60)
Age	23.5 (46.87)	19.6 (90.57)	24.06 (46.81)	20.58 (90.49)
Age square	-0.534 (0.61)	-0.645 (1.08)	-0.539 (0.60)	-0.658 (1.08)
Edu	34 (34.59)	10.09 (42.71)	34.85 (34.53)	7.648 (43.29)
Married	-318.1* (175.50)	-30.62 (329.80)	-315.4* (175.40)	-37.26 (328.60)
Location	included	Included	included	included
Industry	included	Included	included	included
Years	included	Included	included	included
constant	1,015 (1268.00)	340.9 (2124.00)	-546 (1314.00)	-1,361 (2119.00)
R-squared	0.003	0.004	.	.
Hansen J statistic	.	.	85.77	103.72
Kleibergen-Paaprk statistic	WaldF	.	6	8.66
N	17,894	27,950	17,894	27,950

NOTE: The instrumental variables estimation using heteroskedasticity-based instruments and the robust option.

The robust option means that the standard error concerns the heterogeneity and lack of normality.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

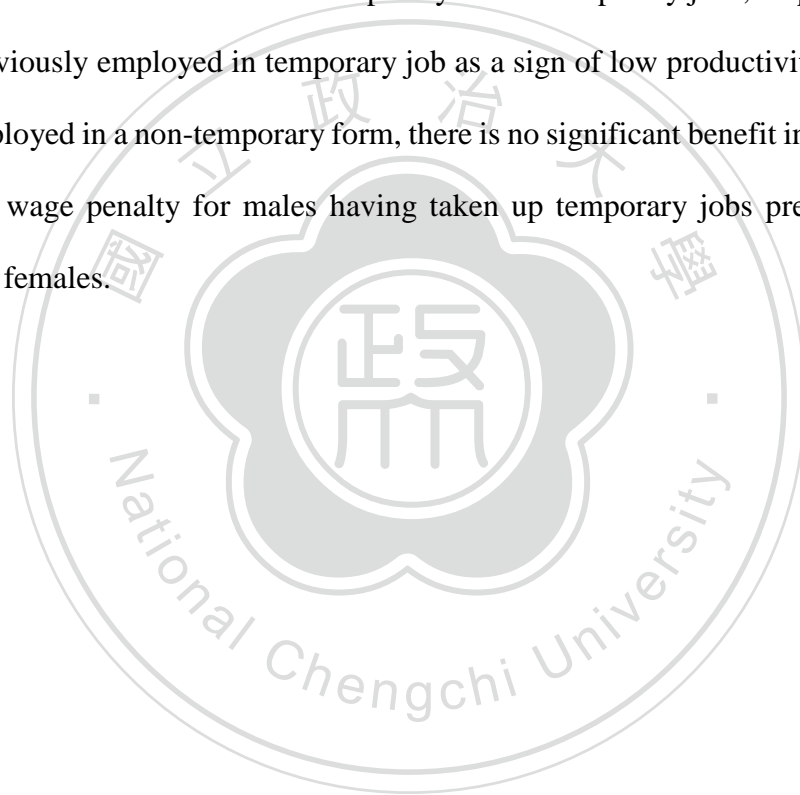
Table 11 reports estimated coefficients of the impact of job status changing on monthly income for male and female workers and the results show that the impacts are different for the two genders. The IV estimates show that for male workers, changing from non-temporary to temporary results in significant damage to the monthly wage. On average, they suffer about \$3,519 NTD wage loss. This loss accounts for 8.47% of monthly income, which is really a considerable damage to male workers. While for female workers, there is no evidence showing that changing job status from non-temporary to temporary does significant harm to their monthly income. There is about \$2,061 NTD average increase in monthly income, which is about 10.5% of monthly income, when female workers change from temporary to non-temporary but no evidence shows the same result for male workers.

The influence of job status change differs across genders mainly due to the standard roles in economics of the family. In most cases, wife is the one staying home and taking care of children. Thus, women leave labor force or take up temporary jobs. Women take temporary jobs because of flexibility, which allows them to work at home or the time for work does not have to be a period of long and continuous hours. So women still have the bargaining power and employers do not take them as less productive workers who cannot find better jobs. Therefore, the wage loss for women on change of job status from non-temporary to temporary does not show a significant decrease.

When female workers switch from temporary to non-temporary jobs, their wage can significantly increase. Becoming non-temporary workers means that these female workers' productivity is approved and because of the family role, females take temporary jobs do not lead to severe discrimination thus employers are willing to offer these female workers higher wage.

In contrast, male workers changing job status from non-temporary to temporary usually do not do so voluntarily and this makes the circumstance different from female workers. Employers see these male workers as less skilled or having lower productivity and therefore are not willing to offer good pay. As a result, male workers suffer severe wage loss when switching from non-temporary jobs to temporary jobs.

When male workers move from temporary to non-temporary jobs, employers see these workers previously employed in temporary job as a sign of low productivity, so even when they are employed in a non-temporary form, there is no significant benefit in terms of wages. That is, the wage penalty for males having taken up temporary jobs previously is more serious than females.



Conclusions

The increase in number of temporary workers in Taiwan has led to concerns about its influence on workers. Employment of temporary form really increases labor market flexibility and brings about benefits for employers and some workers. Employers can use temporary workers to meet temporary needs to reduce cost. Some workers take up temporary jobs because they need short-term contract or some other kind of flexibility that only temporary jobs can provide. But this kind of employment form leads to damage to workers. Workers in temporary jobs usually have lower wages, less chance for promotion, lower job satisfaction and this may influence the wages in subsequent jobs also.

Using the OLS estimation and Lewbel's (2012) method, which is used to create instruments to resolve endogeneity, this paper investigates the impact of change in job status on monthly income in Taiwan. Different from previous empirical studies, workers are divided into only two forms of employment, temporary and non-temporary jobs. For comparing the differences between them, this study divides all workers into four groups according to their job status in two consecutive years and examines the size of income change caused by the change in job status.

The results suggest that on average, compared to workers having had non-temporary jobs for two consecutive years, workers who move from non-temporary to temporary jobs suffer significant income losses, \$2,197 NTD, about 5.8% of the average monthly income. Workers who move from temporary to non-temporary jobs receive significant additional income of \$1,296 NTD a month, about 5.4% of the average income.

Moreover, the influence of job status changing varies across gender. Female workers do not suffer significant income loss when changing job status from non-temporary to temporary, and can receive significant benefits when they switch from temporary to non-temporary jobs. The traditional family role makes them give up their current jobs for staying at home or taking up temporary jobs to take care of the family, so they take up temporary jobs voluntarily and have bargaining power on wages.

For male workers, changing from non-temporary to temporary does significant damage to the monthly wage, but there is no significant benefit from switching from temporary to non-temporary jobs. Men are less inclined to take up temporary jobs since they usually are the breadwinners in the family. So when they accept temporary jobs it means they have few alternatives, implying low bargaining power. In addition, having taken a temporary job previously is a signal of less productive workers.

Workers' between 40 and 60 years of age suffer more severe wage loss than those under forty years when changing from non-temporary to temporary jobs. Workers in this age group reach the top of the wage level and have much more influence on their wages when switching job status from non-temporary to temporary. Young workers receive significant income increase when they change job status from temporary to non-temporary. Lack of experience and stability result in young workers not getting good pay. Once they become non-temporary workers, they obtain the recognition from employers and get higher income.

Workers suffer income loss due to lack of productivity and receive less or even no job training during temporary jobs, which makes temporary workers become further disadvantaged. Government can provide some professional training or some subsidies for

firms to offer job training to these workers, especially workers whose age between 40 to 60 and who suffer severe wage loss. Thus workers who prefer temporary jobs to enjoy flexibility and since they do not need to pay for much in wages when they want to switch to non-temporary jobs.

Temporary employment is a relatively new phenomenon and the laws and regulations need to become more complete. Moreover, government should make sure the regulations are implemented by firms in order to protect the rights of temporary workers.



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