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RETIREMENT EXPECTATIONS OF OLDER SELF-EMPLOYED WORKERS IN KOREA: COMPARISON WITH WAGE AND SALARY WORKERS

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This paper explores how retirement expectations differ between the self-employed (SE) and wage and salary earners (WS) and why they differ. The results generally confirm the widely held belief that the SE expect to remain in the labor market longer than the WS. Differences in retirement incomes, health, productivity, job characteristics, and the presence of compulsory retirement in the workplaces of WS do not explain the observed disparity in the retirement expectations by employment status. This study suggests that the difference between the SE and WS in the quality of matching between the job and the worker is an important factor explaining the later retirement of the SE compared to the WS. Some implications of this study are discussed with regard to the causes of differences in labor force participation at an older age across times and countries, and the direction of labor-market reform in boosting the employment of the elderly population.

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I. INTRODUCTION

This paper explores the retirement behaviors of older, non-farm, self-employed workers in Korea, focusing on the question of how retirement expectations differ between the self-employed (SE) and wage earners (WS) and why they differ. Addressing these issues is important for understanding current patterns and anticipating future changes in the labor-market activity of the elderly population at large in Korea. As will be discussed below in detail, the SE accounts for a much larger fraction of the labor force in Korea, especially among the older, male population, than in other nations in a comparable phase of economic development. It has also been observed that a considerable number of wage and salary workers switch to self-employment after leaving or losing their lifetime jobs. It is widely believed that self-employment is a more favorable type of work for older persons than wage and salary employment because of its more flexible nature. Accordingly, policy makers in Korea regard job creation in the self-employment sector as a possible way of boosting the employment of older people.

Studying the patterns of work and retirement of the self-employed is also a key to understanding some peculiar features of old labor in Korea that distinguish it from other Organization for Economic Co-operation and Development (OECD) countries. Korea is one of the nations that boast a relatively high labor force participation rate (LFPR hereafter) for older workers. The higher proportion of self-employment in the elderly workforce is one of the major explanations for the high rate of economic activity among older persons, along with the relatively immature social insurance programs in Korea. Furthermore, the LFPR of older men in Korea actually increased substantially from the mid-1960s to 1997, in sharp contrast to the historical experiences of most other OECD countries. This rise is largely attributable to the increase in the participation rate of older men in rural areas, where a much higher proportion of older workers are self-employed (Lee 2007). Korea appears to be distinct from other developed countries not only in the relative size of its self-employed workforce, but also in its structure and job characteristics. It is therefore intriguing to see how much of the particularly high LFPR of older people in Korea compared to that of other OECD countries is attributable to the

different degrees and natures of self-employment.

This paper is based on newly collected data, entitled "The Korean Longitudinal Study of Aging" (KLoSA), along with other existing sources such as micro-samples of the Population and Housing Census (Census) and the Korea Labor and Income Panel Study (KLIPS). The key advantage of using KLoSA over other data pertaining to employment and retirement of older people in Korea is the greater number of aged persons included in the data. The majority of empirical works on retirement behaviors produced so far have utilized recently surveyed panel data sets, especially the KLIPS (Park 2001, 2003; Chang 2002; Kim and Yoo 2004; Sung and Ahn 2006; Choi 2006). Although the variables related to employment offered by KLoSA and KLIPS are similar, KLoSA provides a much larger sample of individuals aged 45 and older than KLIPS does. This large sample enables one to analyze the retirement decisions separately for individuals of different personal characteristics or employment status, thereby considering more completely the issue of potential heterogeneity in retirement behaviors. Although a number of previous studies have tackled the question of diversity in the retirement process (Park 2001, 2003), they were unavoidably restricted by the small sample size of the data. To my knowledge, no study has analyzed and compared the retirement behaviors of such narrowly defined populations as the non-farm SE workers and WS workers.

II. BACKGROUND

One of the most notable labor-market changes in developed countries over the last several decades has been the sharp decline in the LFPR of older males.[1] Early retirement, defined as leaving the labor force permanently before reaching age 65, also became common in most OECD countries over the last four decades. In Germany, Belgium, the Netherlands, and France, the LFPR of men age 60 to 64 fell from over 70

[1] In the countries that became industrialized first, the long-term decrease in labor market activity of elderly males began even earlier. In the US, nearly four out of five men age 65 and older were gainfully employed in 1880. Today, less than 20 percent of males of this age participate in the labor market. Similar trends in the LFPR of older men are observed for Great Britain and Germany for the same period (Costa 1998). For discussions of the long-term trend of the LFPR of older males prior to 1940, see Long (1958), Moen (1994), Carter and Sutch (1996), and Lee (1998b, 1999, 2002).

percent in the 1960s to around 20 to 30 percent in 1995. Other countries, such as the US, Sweden, Spain, and Italy, experienced a relatively modest but still substantial rise in early retirement during the same period. Japan is an exception among the OECD countries, exhibiting a relatively stable LFPR for men age 60 to 64 over time (Gruber and Wise 1999).[2]

As the increase in the relative size of the aged population accelerated, this changing retirement behavior has become a major social issue in developed countries. It is feared that the decline in the labor-market activity of this growing age group will aggravate the problems anticipated to arise from population aging, such as labor shortages and financial pressure on pension funds.[3] A key policy measure proposed in response to the potential labor-market problems associated with an aging society is to boost the employment of older workers. A better understanding of the labor-market behavior of older individuals will provide a useful basis for making effective policies. As a result, the determining factors of retirement decisions and the causes of the secular decline in the LFPR of older men have attracted attention from many economists in recent years.

A particularly large number of studies have focused on the impact of the implementation and expansion of social insurance programs, especially social security, on labor-force participation of older men (Boskin 1977; Parsons 1980 1991; Hurd and Boskin 1984; Krueger and Pischke 1992; Lee 1998a; Gruber and Wise 1999, 2004; Friedberg and Webb 2005). Other supply-side factors of retirement decisions, such as health, asset price, and various social insurance programs other than pensions, have also drawn a great deal of attention (McGarry 2004;

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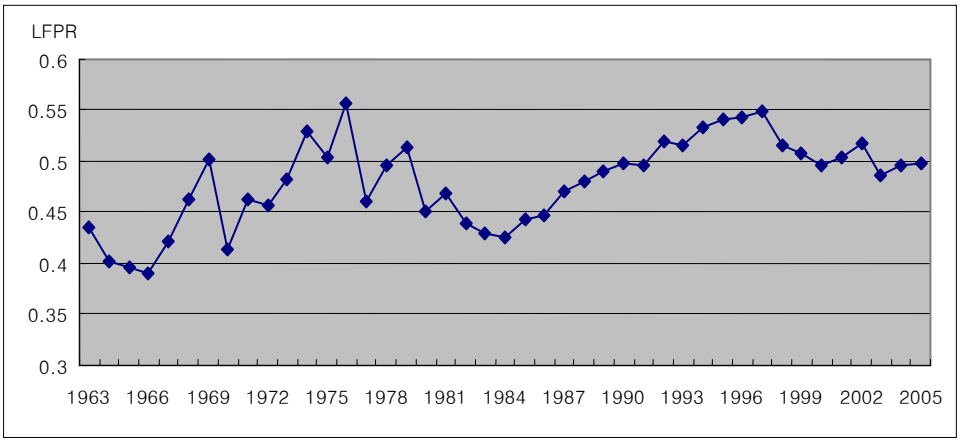
[2] Although the exceptionally high participation rate of older men and the relatively slow decline of labor-market activity of the aged in Japan are similar to the Korean case, compared to the cases of other OECD countries, the two neighboring countries' experiences are considerably different. For those age 60 and older as a whole, the LFPR in Japan exhibits a long-term declining trend since 1970, only briefly interrupted by a modest rise during the early 1990s. Participation rates have resumed their long-term decline trend, and the decline has been much steeper for men age 65 and over than for men age 60 to 64 (OECD 2004). The short-lived rebound in employment of older men in Japan from 1990 to 1993 may be attributable to (a) the increase in the mandatory retirement age and its spillover effects on older workers, (b) the government policy of subsidizing the hiring of older workers, (c) the strong labor demand in the Japanese economy from the late 1980s to the early 1990s, and (d) the reforms in Employment Pension Insurance (Abe 2001).

[3] According to the estimate of Lee (2001), the expected length of male retirement in the US has increased sevenfold since 1850, representing up to 30 percent of the remaining life of the current labor-market cohort.

Gruber and Madrian 1995; Coile and Levine 2006). Moreover, a growing number of studies that examine the roles of demand-side factors, such as employment conditions, changing industrial structure, and technology (Hurd and McGarry 1993; Hurd 1996; Friedberg 2001) have also been conducted.

[Figure 1] Labor Force Participation Rate of Men Age 60 and Older



The long-term trend and the level of LFPR of older men in Korea are distinct from those of other OECD countries. First, as presented in Figure 1, the LFPR of older men increased substantially from the mid-1960s to 1997. The rise of LFPR among elderly men during this period is observed for all ages greater than 50 (Lee 2007). This pattern is in sharp contrast to the historical experiences of most other OECD countries, where the LFPR of older males declined rapidly over the last several decades. After the Asian Financial Crisis of 1997, however, the LFPR of older Korean males fell dramatically, presumably due to the adverse impact of the crisis on the labor market. The rise in the LFPR of older males prior to 1997 is largely attributable to the increase in the participation rate of older men in rural areas, where a much greater proportion of older workers is self-employed. Lee (2007) suggests that the acceleration of population aging in rural areas due to the selective out-migration of younger persons was the major cause of the sharp increase in the LFPR of older males in rural areas. It is likely that the relative decline of the rural economy in the course of industrialization made it increasingly difficult for the rural

elderly population to save for retirement.

[Table 1] Changing Composition of Employment Status for Workers by Age

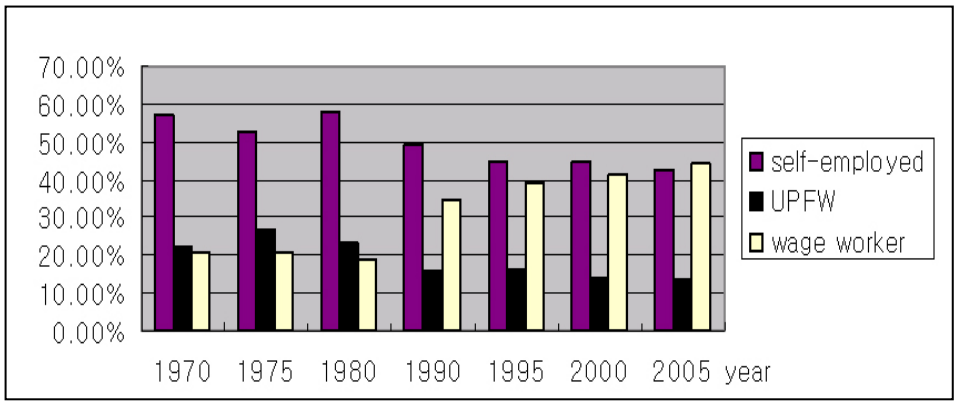
Year	Age	All			Male			Female		
		SE	UPFW	WS	SE	UPFW	WS	SE	UPFW	WS
1970	All	34.67%	26.05%	38.82%	43.92%	11.90%	43.63%	17.65%	52.09%	29.97%
	45+	56.96%	22.26%	20.50%	71.62%	2.96%	25.10%	28.30%	59.99%	11.51%
	60+	62.81%	25.89%	10.96%	79.63%	8.14%	11.91%	27.77%	62.90%	8.99%
1975	All	30.80%	28.47%	40.72%	39.66%	13.16%	47.18%	17.11%	52.14%	30.74%
	45+	52.48%	27.06%	20.45%	69.35%	2.99%	27.64%	27.52%	62.66%	9.80%
	65+	60.05%	32.67%	7.25%	78.55%	13.33%	8.09%	28.18%	65.99%	5.81%
1980	All	35.45%	21.13%	43.42%	44.47%	8.57%	46.96%	19.80%	42.92%	37.29%
	45+	57.66%	23.39%	18.95%	72.59%	2.27%	25.15%	32.69%	58.72%	8.59%
	65+	68.94%	26.42%	4.64%	86.49%	8.33%	5.18%	35.68%	60.70%	3.62%
1985	All	29.60%	10.65%	59.75%	34.88%	2.53%	62.60%	19.20%	26.68%	54.12%
	45+	49.42%	15.75%	34.83%	58.54%	0.70%	40.76%	31.84%	44.77%	23.39%
	65+	73.38%	17.95%	8.66%	87.93%	3.11%	8.97%	45.57%	46.35%	8.09%
1990	All	29.60%	10.65%	59.75%	34.88%	2.53%	62.60%	19.20%	26.68%	54.12%
	45+	49.42%	15.75%	34.83%	58.54%	0.70%	40.76%	31.84%	44.77%	23.39%
	65+	73.38%	17.95%	8.66%	87.93%	3.11%	8.97%	45.57%	46.35%	8.09%
1995	All	28.71%	10.51%	60.77%	34.30%	1.94%	63.75%	18.44%	26.26%	55.30%
	45+	44.93%	16.06%	39.02%	53.99%	0.95%	45.05%	28.31%	43.75%	27.95%
	65+	65.10%	22.58%	12.32%	82.27%	3.52%	14.21%	40.94%	49.42%	9.64%
2000	All	28.59%	8.79%	62.62%	34.36%	1.64%	64.00%	18.96%	20.73%	60.31%
	45+	44.60%	14.12%	41.28%	53.25%	1.26%	45.49%	29.64%	36.35%	34.01%
	65+	64.04%	22.40%	13.56%	80.94%	3.55%	15.50%	42.56%	46.35%	11.09%
2005	All	27.60%	7.42%	64.97%	33.37%	1.36%	65.26%	18.29%	17.21%	64.50%
	45+	42.46%	13.49%	44.04%	51.71%	0.98%	47.30%	21.59%	41.72%	36.69%
	65+	60.62%	24.35%	15.03%	79.15%	2.18%	18.66%	19.14%	73.97%	6.89%

Source: Korea National Statistical Office, *Population and Housing Census Report* for each year.

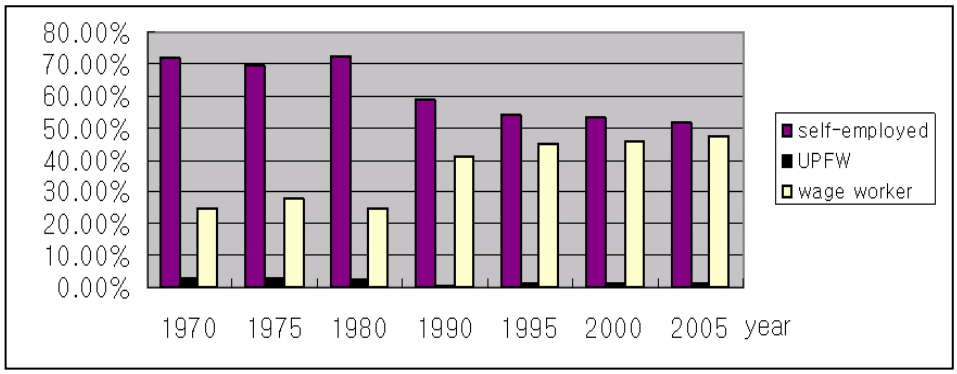
Second, the extent of labor-market activity of older men in Korea is substantially greater than that of other OECD countries. The unused productive capacity for Korean men age 50 to 69, a measure of the extent of labor-market non-participation, was 25 percent in 1995, much lower than that of Belgium (60 percent); Italy, France, Netherlands (55 percent); the UK (50 percent); Spain, Germany, Canada (more than 45 percent); the

US and Sweden (nearly 40 percent).[4] Only the unused capacity for Japan (23 percent) was similar to that of Korea (Gruber and Wise 1999). Due to the dramatic decline in the LFPR of older males after the Financial Crisis, the unused productive capacity rose to 35 percent by 2000. However, it is still lower than those in other OECD countries.

[Figure 2-A] Changing Composition of Employment Status (All, age 45+)

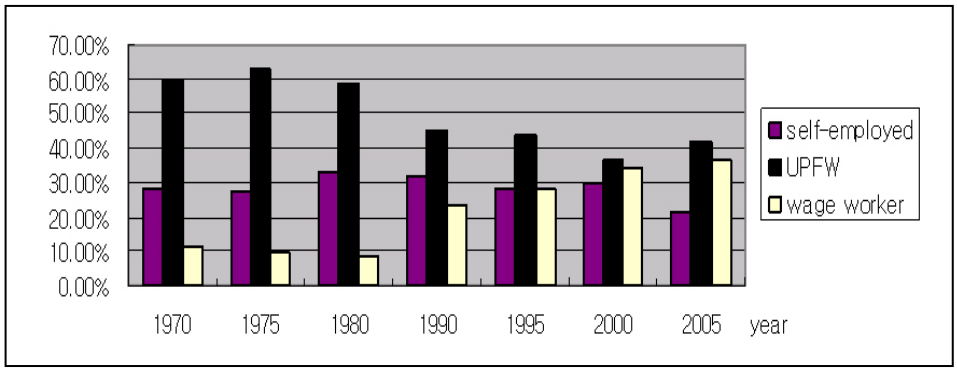


[Figure 2-B] Changing Composition of Employment Status (Male, age 45+)



[4] Consider the height above the LFPR curve, which is the proportion of men not working at a given age (1-LFPR). Loosely speaking, this measure can be referred to as the unused productive capacity at that age. If the unused capacity is added up over all ages, we find the area above the age-LFPR profile. Dividing this by the total area of the figure (1×30) yields a rough measure of the unused productive capacity over the age range 50 to 79 as a percentage of the total labor capacity in that age range. The concept and method of estimating this measure comes from Gruber and Wise (1999).

[Figure 2-C] Changing Composition of Employment Status (Female, age 45+)



The relatively high proportion of self-employed workers is one of the major explanations for the high rate of economic activity among the elderly, along with the relatively immature social insurance programs. The self-employed account for a much higher proportion of the labor force in Korea than in other nations in a comparable phase of economic development. As presented in Table 1, the percentage of the labor force engaged in self-employment has declined in the course of industrialization and economic growth. However, the proportion of those who were self-employed in 2005 was still as high as 28 percent for all workers and 33 percent for male workers. Since 1990, the relative number of self-employed has not declined; some studies even reported that it has bounced back since the 1990s, especially after the Financial Crisis.[5]

For older persons, in particular, self-employment is a predominant form of work in Korea. More than half of male workers age 45 and older are self-employed (Table 1 and Figure 2-B). The relative importance of self-employment among older workers is also visible if only the non-farm sector is considered. In 2005, self-employed workers accounted for 41 percent of male non-farm workers age 45 and older (Table 2). Of the male

[5] There is a growing number of studies on self-employed workers in Korea, reflecting a reversal in the trend of their relative importance in the labor market (Ryoo and Choi 1999, 2000; Ahn 2000; Keum and Cho 2000; Cheon 2003; Ryoo 2005). The long-term trend and structural changes in self-employment in Korea have been documented in these studies. The increase in the proportion of those who were self-employed in the 1990s may be explained by the following two rather different stories: (1) an increase in the entry of middle-aged wage and salary workers into self-employment due to rising unemployment and deterioration in job security (Sung and Ahn 2004; Cheon 2003) and (2) a long-term rise in the attractiveness of self-employment jobs (Ryoo and Choi 2000; Ryoo 2005).

workers age 65 and older, 49 percent were self-employed in 2005. Although not as important a form of employment as it is for males, self-employment also accounts for a considerable fraction of the female workforce. In 2005, 28 percent of female non-farm workers age 45 were self-employed (Table 2).

[Table 2] Changing Composition of Employment Status for Non-farm Workers Age 45 and Older

Year	Age	All			Male			Female		
		SE	UPFW	WS	SE	UPFW	WS	SE	UPFW	WS
1980	45+	59.98%	0.66%	19.36%	72.78%	2.41%	24.81%	35.99%	54.87%	9.15%
	45 - 49	52.41%	19.77%	27.82%	62.69%	1.61%	35.70%	32.59%	54.77%	12.64%
	50 - 54	57.24%	20.81%	21.94%	69.68%	1.40%	28.91%	35.65%	54.50%	9.85%
	55 - 59	65.50%	20.58%	13.92%	80.00%	2.06%	17.95%	39.68%	53.58%	6.74%
	60-64	71.01%	21.45%	7.54%	87.66%	3.49%	8.84%	37.73%	57.34%	4.92%
	65+	72.50%	22.92%	4.59%	87.34%	7.40%	5.26%	40.52%	56.35%	3.14%
2005	45+	36.87%	5.91%	57.23%	41.19%	0.69%	58.12%	27.93%	16.69%	55.38%
	45 - 49	34.31%	6.13%	59.57%	39.58%	0.49%	59.93%	24.65%	16.46%	58.89%
	50 - 54	36.68%	6.00%	57.32%	41.07%	0.57%	58.36%	27.41%	17.46%	55.13%
	55 - 59	38.62%	5.37%	56.01%	42.02%	0.77%	57.20%	30.19%	16.78%	53.04%
	60 - 64	39.40%	5.29%	55.32%	42.28%	1.00%	56.72%	32.26%	15.90%	51.84%
	65+	47.26%	6.34%	46.40%	48.65%	1.81%	49.54%	44.39%	15.73%	39.88%

Source: Korea National Statistical Office, Micro-Samples of the 1980 and 2005 Population and Housing Census.

Self-employed workers tend to remain in the labor market longer than wage and salary workers, perhaps because of the more flexible nature of their work. Hurd (1996) noted that labor-market rigidities caused by various factors, such as team production, fixed costs of employment, and social security, force many older wage workers to choose between full-time work and complete retirement. Because of the difficulties in adjusting the hours of work and wages in accordance with one's changing tastes and productivity associated with aging, wage earners retire earlier than they would if gradual retirement was an option. One study suggests that more than half of prime-age, male, wage and salary workers in the US indicated that they could not work less if they wanted to in their current job (Gustman and Steinmeier 1985). Another study shows that some wage and salary workers partially retire at old age, but only by

transferring to a different job, because most workers are not free to change work efforts in their main job (Gustman and Steinmeier 1984). This study also found that partial retirement outside of the main job is important even for those who do not face mandatory retirement, thus suggesting the potential importance of constraints requiring a minimum number of hours worked at the main job.

On the other hand, by having such an option, self-employed workers can retire later than wage workers. Quinn, Burkhauser, and Myers (1990) found that the majority of the older, self-employed workforce either reduced their work hours at their career job or became part-time workers, while wage or salary workers mainly left the labor force. In the early 20th century in the US, self-employed farmers were much less likely to retire than non-farm wage earners (Lee 2002). It has been reported that gradual retirement was a possible option for self-employed farmers, because they were able to reduce the hours and intensity of their work by adjusting acreage and crop-mix or by adopting mechanization (Pedersen 1950).

III. CONCEPTUAL FRAMEWORK AND METHODS

The standard model of retirement behavior views a person as choosing either to continue to work or to leave the labor force by comparing his or her utility associated with each option. The probability of retirement at a point in time may be modeled as determined by the expected net gains from retirement, denoted by R^*. The value of retirement is written as a linear function of a set of individual and job characteristics in the following reduced form specification:

$$R_i^* = \alpha(\overline{Z} - Z_i) + \beta N_i + \gamma X_i + \varphi B_i + \varepsilon_i \quad (1)$$

This paper hypothesizes that the costs and benefits of retirement are determined by the discrepancy between the amounts of minimum work effort (such as hours and intensity of work) required by a worker's job (denoted by $\overline{Z}$) and the desirable amount of work effort that the worker would choose under no restriction (denoted by Z_i). $\overline{Z}$ is determined by various job-specific demand-side factors, such as production technology,

managerial practices, and labor-market conditions. On the other hand, Z_i is determined by the tastes and productivity of the worker. The value of retirement is also determined by the demographic and job characteristics of the worker (denoted by X_i and B_i, respectively) not fully captured by the term $(\overline{Z} - Z_i)$, as well as retirement incomes (denoted by vector N_i).

Aging diminishes a worker's physical strength and functional ability, and reduces his or her taste for work. These changes associated with aging decrease the desirable amount of work effort (Z_i). As long as the minimum work effort required by the job ($\overline{Z}$) remains fixed, the discrepancy $(\overline{Z} - Z_i)$ increases, raising the value of retirement. Thus, the size of $(\overline{Z} - Z_i)$ depends on (1) the quality of matching between the worker and the job in the first place, and (2) the ability of the worker to change the required work effort ($\overline{Z}$), either within the same job or by switching jobs.

In this model, the difference in the probability of retirement between the SE and WS workers is attributed to the differences by employment type in the following factors: (1) retirement incomes (N_i), (2) demographic and job characteristics (X_i and B_i) representing tastes for work and institutional pressure toward involuntary retirement, respectively, and (3) the quality of matching between the worker and the job $(\overline{Z} - Z_i)$.

Based on this simple model, the following hypotheses are offered to explain the difference in retirement expectations between the SE and WS: (1) The SE are poorer than the WS, and thus have to work longer to accumulate enough money for retirement (referred to as **H1**); (2) the SE are healthier and more productive than the WS, and therefore, can work until a later age (**H2**); (3) job characteristics are more favorable for the SE than for the WS (**H3**); (4) the SE can work longer than the WS because of the absence of a mandatory or conventionally determined age of retirement (**H4**); (5) because working conditions and the required minimum amount of work effort are more heterogeneous across jobs in SE than in WS positions, it is relatively easy for the SE (especially those who have an unusual preference or capacity) to find a job with which they

are well matched (**H5**); (6) due to greater job flexibility, the SE can adjust their work efforts in accordance with changes in their taste and productivity (**H6**); and (7) if it is difficult to change work effort within the occupation or industry, then the SE can more easily switch to a less demanding job than the WS (**H7**). Of course, these explanations are neither exhaustive nor necessarily mutually exclusive.

In the balance of this paper, I examine the extent of the difference in the probability of retirement between the SE and WS, and determine which of the seven hypotheses introduced above best explains the observed disparity. Before doing so, the measures of retirement expectations used in this study, namely, the subjective probability of continuing to work until a certain age, must be explained. Because only the first wave has been surveyed so far, KLoSA is currently a cross-sectional dataset, and will remain so until the completion of the second-wave survey, which is planned for 2009. Thus, the currently available data do not allow me to observe the actual changes in labor-market status, such as leaving the labor force, between two different points in time. Fortunately, KLoSA does offer some variables regarding retirement expectations.

There are questions about the subjective probabilities of a series of events to which respondents are asked to mark on a scale ranging from 0 to 100, with the numbers near 100 indicating a greater possibility. These include the following questions about the subjective probability of continuing work until a certain age: “If you are between the ages of 45-49 (ages 50-54; 55 and older) and currently working, [you] can still work until [you] turn 55 (60 for men aged 50-54; for the next five years for men age 55 and older).” Another question pertaining to the retirement plan asks “At what age do you plan to retire?” If the respondent planned on working as long as he or she was physically capable, then it was marked “0” instead of the anticipated age of retirement. This study I relies mainly on the first index for measures of retirement expectations of the SE and WS, because the variable on the expected age of retirement is available only for a fraction of the respondents who reported it.

The subjective probability of continuing to work until a given age has been utilized as a measure of retirement expectation by previous studies

based on the Health and Retirement Study (McGarry 2004, Benitez-Silva and Dwyer 2004). Some advantages and drawbacks of using this index have already been suggested. For example, McGarry (2004), who focused on the effect of self-reported health at retirement, maintained that the potential "justification bias" (a bias arising from the phenomenon that individuals often provide failing health as a socially acceptable excuse for retirement) could be avoided by analyzing the retirement expectations instead of the actual retirement behaviors. On the other hand, this measure has shortcomings, because it is available only for active workers and may not represent the actual probability of retirement.

Even if a measure of retirement expectations is used, there is an additional drawback resulting from the cross-sectional nature of the data. The error term in Equation 1 (ε_i) could include unobserved individual heterogeneity that is correlated with both the measure of retirement expectations and its explanatory variable. For example, individual differences in tastes for work may affect both the expected probability of continuing to work and financial variables such as income and wealth. The inability to control for this individual heterogeneity could lead to an omitted variable bias in cross-section analyses. Panel data would enable one to mitigate this problem by conducting fixed effect analyses, as in previous research using the Health and Retirement Study (HRS) (McGarry 2004). Having no such data, this paper cannot contend with the heterogeneity in this study. Some symptoms of this bias that actually appeared in the regression results will be discussed below.

Another weakness of the analyses provided below is that employment status is treated as an exogenous variable. Given that occupational choice is selective, the SE and WS should be different in observable and unobservable personal characteristics that are related to retirement expectations. Under this circumstance, the estimated coefficient for employment status is subject to an endogeneity bias. This problem could be mitigated by either analyzing the retirement expectations of job switchers or by employing instrumental variable estimations. Unfortunately, the data allow neither method. The KLoSA, currently a cross-section al dataset, does not provide information on employment history. It is difficult to obtain a legitimate instrumental variable that is

correlated with employment status and uncorrelated with retirement expectations from the data.

IV. DIFFERENCES IN THE RETIREMENT EXPECTATIONS BETWEEN THE SELF-EMPLOYED AND WAGE AND SALARY WORKERS

The first task of this paper is to compare the measures of retirement expectations between the SE and WS. Table 3 offers the following indices of retirement expectations for (1) the entire sample, (2) the SE, (3) WS, and (4) the WS who are not subject to mandatory retirement; a) the subjective probability that individuals age 45 to 49 will continue to work until age 55 (denoted by P_{55}), b) the subjective probability that individuals age 50 to 54 will continue to work until age 60 (denoted by P_{60}), c) the subjective probability that individuals age 60 and older work will work an additional five years (denoted by P_{5years}), d) the percentage of individuals who plan to work as long as they are physically capable (Plan on working), and e) the mean expected age of retirement for persons who do not plan to continue to work (Retirement age).

[Table 3] Expectation of Timing of Retirement by Employment Status

	All		SE		WS		WS No mandatory retirement	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std
P_{55}	84.5	21.8	86.6	21.0	83.1	22.2	80.3	22.2
P_{60}	80.2	24.3	83.5	21.5	77.4	26.2	75.5	25.5
$P_{+5\ years}$	64.2	30.2	67.6	29.1	59.3	31.0	58.9	29.6
Plan to work	52.2	50.5	58.6	49.3	46.4	49.9	56.6	49.6
Retirement age	64.1	6.9	67.0	7.2	62.1	5.8	63.7	6.3

Note: P55 refers to the subjective probability of continuing to work until age 55 for individuals age 45 to 49. P60 refers to the subjective probability of continuing to work until age 60 for individuals age 50 to 54. P+5 years refers to the subjective probability of continuing to work for five more years for individuals age 55 and older. “Plan to work” stands for the fraction of employees who plan to work as long as they are capable. The expected age of retirement was calculated for persons who explicitly report the age, excluding those who report that they plan to work as long as they are still capable.

The result reported in Table 3 generally confirms the widely held belief that the SE expect to remain in the labor market longer than the WS. All five measures of continuing to work are substantially higher for the SE than for WS. The three subjective probabilities ($P_{55,}$ P_{60}, and P_{5years}) indicate that the difference in P between the SE and WS is larger for older workers than for younger workers. The difference in P_{5years} by employment type is 8.3 points, whereas the difference in P_{55} is only 3.5 points. A majority (59 percent) of the SE responded that they planned to work as long as they were physically capable, while only 46 percent of WS did so. If they are not planning to retire, the SE expects to retire five years later than the WS.

Perhaps, the most popular explanation for why the SE retire later than the WS is that many WS face compulsory retirement.[6] However, compulsory retirement does not account for the difference between the SE and WS in the expected timing of retirement. The final column of Table 3 presents the measures of retirement expectations for WS who are employed in a workplace having neither a mandatory retirement age nor customary retirement age. The result suggests that the SE expect to remain in the workforce longer, even compared to the subgroup of WS who are not subject to mandatory retirement. P_{55} and P_{60} for WS with no mandatory retirement are actually lower, not higher, than those for all WS. This suggests that institutional pressure toward involuntary retirement is not a significant reason for the later retirement of the SE compared to the WS, as widely believed.

The next question is how much of the disparity in retirement expectations between the SE and WS can be explained by differences in the following two factors: (1) retirement incomes (N_i in Equation 1) and (2) demographic and job characteristics (X_i and B_i in Equation 1), representing labor productivity and tastes for work, respectively. To tackle this question, ordinary least squares (OLS) regressions are conducted to analyze the determinants of the subjective probabilities of continuing to

[6] A majority of Korean firms, especially large corporations, practice the mandatory retirement system. The most common retirement age is 55. Cho and Kim (2005) suggest that in recent years, especially after the Financial Crisis, mandatory retirement plays a major role in adjusting employment to resolve the personnel backlog and to control increasing wage costs.

work.[7] The special focus of this regression analysis is whether or not the SE's advantages over the WS in retirement expectations remain unchanged or are reduced if these two factors are controlled for.

I perform three OLS regressions, employing each of the three subjective probabilities of continuing to work; P_{55}, P_{60}, and P_{5years}. The following explanatory variables are included in the regressions: self-employment (SELFEMP), sex (MALE), age (AGE), years of schooling (SCHOOL), marital status (MARRIED), age difference between the husband and wife for married respondents (AGEGAP), the number of children by age (CHD_ADU, CHD_KID), dummy variables on self-reported health (HL_EXCEL, HL_GOOD, HL_NORMAL, HL_FAIR, HL_POOR), amount of net wealth (WEALTH), amount of family income (FINCOME), hourly wages (HWAGE), weekly hours of work (HOURS), and hours squared (HOURSSQ).[8] The definitions of all explanatory variables used in the regression analyses are reported in Table 4.

Age, years of schooling, hourly wage, and health are proxy variables for the individual's productivity in the labor market that determine the opportunity cost of retirement. Wealth and family incomes are measures of future retirement incomes. Since the dependent variable is related to expectations of retirement in the future, hourly wages could also be regarded as an index of retirement income. Health, family structure, and hours of work are believed to be associated with the preference for work. Variables on marital status, age gap between husband and wife, and the number of children are included to capture the potential effect of dependents or family support. A larger family, for example, will require a greater household income. On the other hand, that family will have

[7] A referee rightly pointed out that the error term of the regression equation may not be normally distributed, because the dependent variable is bound between 0 and 100. Following the referee's suggestion, I performed regressions using the logistic transformation of the subjective probability as the dependent variable so that it ranges from negative infinity to positive infinity. The result, not reported here but available from the author upon request, provides very similar implications to the result reported here, except that the coefficient for SELFEMP misses statistical significance by a relatively small margin where P_{55} is used as the dependent variable. In general, the new model performs poorly compared to the original one; its R-square is about half that of the original regression.

[8] A large number of studies have investigated the determinants of the timing of retirement (Parson 1980, Hurd and Boskin 1984, Krueger and Pischke 1992, Costa 1998, McGarry 2004). A number of variables widely used in these studies are considered in this research's analyses.

greater potential for earnings from more family members. Therefore, the sign of the effect of the family size will depend on the two different influences. For married persons, AGEGAP should be related to the demand for life-cycle savings.[9]

[Table 4] Definition of Variables Used in the Regression Analysis

Variable	Definition
SELFEMP	= 1 if the person is self-employed, = 0 otherwise
MALE	= 1 if the person is male, = 0 otherwise
AGE	Age
SCHOOL	years of schooling
MARRIED	= 1 if the person is married, = 0 otherwise.
AGEGAP	Age of the person age of the spouse if married; 0 if not married
CHD_ADU	number of children age 18 and older
CHD_KID	number of children under age 18
HL_EXCEL	= 1 if self-reported health is very good, = 0 otherwise
HL_GOOD	= 1 if self-reported health is good, = 0 otherwise
HL_FAIR	= 1 if self-reported health is fair, = 0 otherwise
HL_POOR	= 1 if self-reported health is poor, = 0 otherwise
WEALTH	= 1 if self-reported health is very poor, = 0 otherwise
FINCOME	total household income (10,000 Won)
HWAGE	hourly wages
HOURS	weekly hours of work
HOURSSQ	square of weekly hours of work
PJOBSAT	predicted probability of being satisfied with his or her job

Source: Korean Longitudinal Study of Aging, 2006 Baseline Survey.

In addition to the above explanatory variables, this paper considers a series of variables on job characteristics based on questions about the respondent's opinion regarding his or her job. These variables include: (1) My job requires lots of physical effort (PHYSICAL); (2) My job requires lifting heavy loads (BURDEN); (3) My job requires stooping, kneeling, or crouching (BENDING); (4) My job requires good eyesight (EYESIGHT); (5) My job requires intense concentration or attention

[9] There is no a priori theory to tell the exact functional forms of the model. Thus, this paper tried various alternative specifications in the regression analyses, the results of which are not reported here. For example, dummy variables are used for the following categories of educational attainment: (1) no schooling, (2) elementary school, (3) middle school, (4) high school, and (5) college. Continuous variables were included in various forms, such as polynomials and logarithms. Unless otherwise noted, the main implications of the results based on various specifications were generally similar to the results of the baseline regressions reported in the paper.

(CONCENTRATION); (6) My job requires skill in dealing with other people (HUMAN); (7) My job requires me to work with a computer (COMPUTER); (8) My job requires me to do more difficult things than I am used to (HARDER); (9) I am satisfied with the income I receive from my current job (EARNSAT); (10) My job is stable (JOBSTABLE); (11) I am satisfied with the working environment of my job (ENVISAT); (12) I am satisfied with the job I do at my current job (WORKSAT); (13) My job is stressful (STRESS); (14) I am satisfied with my current job (JOBSAT); (15) (LOWEDUREQ); (16) (HIGHEDUREQ); (17) (LOWSKILLREQ); and (18) (HIGHSKILLREQ). This paper constructed dummy variables that have the value of "1" if the response to the question was positive (either "always or almost all of the time" or "most of the time") and "0" otherwise (either "some of the time" or "none or almost none of the time").

All the job characteristics represented by these variables are highly correlated with one another because a good (bad) job often has all kinds of favorable (unfavorable) features at the same time. Thus, it would not be straightforward to interpret the result if all these variables are included in the regression simultaneously. For this reason, a composite index is chosen to represent the quality of job that a person has. JOBSAT is perhaps the most comprehensive measure of job quality, because it is determined by all aspects of the job. In the actual regression analyses, this paper employs the predicted probability that a worker is satisfied with his or her job instead of JOBSAT. Compared to JOBSAT itself, it is highly probable that this predicted measure would better capture the overall features of the job and is less subject to possible scaling errors made by the individual respondent. This paper estimates this measure by regressing JOBSAT on the other 15 variables pertaining to job characteristics. The result of this regression is reported in the Appendix Table.[10]

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[10] The regression result, reported in the Appendix Table, suggests that JOBSAT is a good proxy measure of overall job quality. It is well explained by other job characteristics variables, as indicated by the high R-square (0.528). The regression coefficients have generally predictable signs. For example, all major components of job quality (satisfactions from earning, job stability, work environment, the nature of and work) have strong positive effects on JOBSAT. On the other hand, STRESS has a powerful negative relationship with JOBSAT.

[Table 5] Results of OLS Regressions: Correlates of the Subjective Probability of Continuing to Work

	(1) Ages 45 to 49 Probability of Working until age 55 (Dependant Mean = 84.504)			(2) Ages 50 to 54 Probability of Working at age 60 (Dependent Mean = 80.183)			(3) Ages 55 and older Probability of Working for five years (Dependent Mean = 64.175)		
	Mean	Coefficient	P-value	Mean	Coefficient	P-value	Mean	Coefficient	P-value
INTERCEPT		**67.1465**	0.0043		**39.3310**	0.0045		**114.3561**	<0.0001
SELFEMP	0.401	**3.8194**	0.0095	0.454	**5.5939**	<0.0001	0.589	**12.2996**	<0.0001
MALE	0.524	**3.1515**	0.0262	0.514	0.7304	0.5812	0.611	1.8474	0.3569
AGE	46.191	-0.1041	0.8338	53.253	**0.6957**	0.0045	65.456	**-0.9699**	0.0001
SCHOOL	12.127	0.3315	0.1805	10.402	**0.3883**	0.0599	7.648	0.3491	0.1382
MARRIED	0.903	-2.0953	0.3936	0.908	0.7649	0.7389	0.835	2.5494	0.3634
AGEGAP	-0.284	0.2171	0.2651	0.580	**0.3640**	0.0130	2.043	-0.0974	0.6526
CHD_ADU	1.047	1.1663	0.2547	2.111	0.1801	0.8132	3.376	-0.2710	0.7068
CHD_KID	0.898	0.8980	0.3720	0.152	-2.5633	0.1146	0.005	10.5481	0.2717
HL_EXCEL	0.081	2.8201	0.3030	0.056	1.8810	0.5268	0.028	4.2275	0.4760
HL_GOOD	0.591	**-2.6443**	0.0977	0.536	-0.1751	0.9073	0.377	**4.0464**	0.0688
HL_FAIR	0.066	-4.9043	0.1007	0.107	-2.9982	0.2014	0.203	**-8.6629**	0.0009
HL_POOR	0.002	-21.7346	0.1547	0.010	-0.7315	0.9099	0.039	**-15.5661**	0.0022
WEALTH	15.460	**0.0419**	0.0959	18.073	**0.0237**	0.0781	15.014	0.0377	0.1066
FINCOME	4014.250	-0.0000	0.6270	2803.390	0.0000	0.7771	1738.970	-0.0000	0.8670
HWAGE	1.250	0.5191	0.3139	1.140	-0.1309	0.7337	0.931	**-0.5363**	0.0179
HOURS	49.363	**0.3046**	0.0581	48.788	**-0.4167**	0.0041	47.371	-0.2611	0.1402
HOURSSQ	2718.140	-0.0019	0.2379	2688.730	**0.0045**	0.0013	2678.000	**0.0032**	0.0882
PJOBSAT	0.624	**8.6347**	<0.0001	0.608	**7.4541**	0.0001	0.553	**11.0222**	<0.0001
N	1030			1338			943		
R-Square	0.0693			0.0673			0.1475		
F-value (P-value)	4.19 (<0.0001)			5.30 (<0.0001)			8.89 (<0.0001)		

Note. The sample is limited to individuals age 45 to 49 for (1), 50 to 54 for (2), and 55 and older for (3). The dependent variable is the subjective probability of continuing to work until a given age (55 for regression 1, and age 60 for regression 2) or for five years (regression 3). The coefficients written in bold numbers are statistically significant at the 10-percent level.

Table 5 presents the results of OLS regressions that analyze the correlates of the subjective probability of continuing to work for the three age groups. The primary focus of these regression analyses is how the coefficients for SELFEMP compare with the differences in the subjective probabilities between the SE and WS, as reported in Table 3. The results suggest that the SE expect to work longer than the WS, even if

demographic, financial, and job characteristics are controlled for. The controlled differences in the subjective probabilities by employment type, offered by the regression results, are actually larger than the uncontrolled differences, as reported in Table 3. Similar regression analyses are also conducted, utilizing a sample composed of all the SE and WS who are not subject to mandatory retirement. This is to compare the retirement expectations between the SE and WS after eliminating the influences of compulsory retirement. The results, not reported here, also reveal much higher probabilities of continuing to work among the SE compared to the WS.[11]

These results offer a partial answer to the question raised above regarding which factors are responsible for the later retirement of the SE in comparison with the WS. Differences in various personal characteristics (such as sex, age, education, and family structure), retirement incomes (measured by current wealth, family incomes, and wages), and some average job characteristics (hours of work and overall job satisfaction) do not explain why the SE remain in the workforce longer. The presence of compulsory retirement in many firms in which WS are employed cannot account for the differences in the timing of retirement by employment type either. Thus, of the seven possible explanations given above (**H1**-**H7**), the first four (**H1**-**H4**) do not appear to explain well the differences in the retirement expectations between the SE and WS.

Along with a self-employment dummy, the predicted job satisfaction (PJOBSAT) is a powerful predictor of retirement expectations for all three age groups. As expected, employees who are more satisfied with their jobs expect to work longer than less satisfied workers. A qualification is in order regarding the result for AGE, which shows mixed signs. For P_{55} and P_{60}, the coefficients for AGE should largely capture cohort effect, because they measure subjective probabilities of working until the given ages (55 and 60). In the case of $P5_{years}$, on the other hand, the coefficient for AGE should reflect both cohort and age effects,

[11] The conclusion that the SE expect to work longer than the WS is highly robust to changes in specification. Some short regressions, in which only selected explanatory variables are included, and extended regressions, in which all the variables on job characteristics are included, instead of PJOBSAT, qualitatively provide the same outcomes.

because it conveys the subjective probability of working for five years, not of working until a given age. Thus, it is not surprising that the effect of age is significantly positive for P_{60} and significantly negative for $P5_{years}$. The result for WEALTH, the sign of which is positive (not negative, as expected), also needs some qualifications. This paper suspects that this is a clearly revealed symptom of bias resulting from individual heterogeneity, as explained above. For example, a worker who has stronger tastes for work (not fully captured by the explanatory variables considered in this study) is likely to have accumulated a greater amount of wealth and will expect to work until a later age than a person with weaker preferences for work. This conjecture is supported by a preliminary result that the effect of wealth on the subjective probability of continuing to work becomes negative if this potential bias is corrected by employing an instrumental variable estimation.[12]

V. QUALITY OF MATCHING BETWEEN THE JOB AND THE WORKER

The results of the preceding section leave the different quality of job matching, denoted as $(\overline{Z} - Z_i)$ in Equation (1), as the only remaining hypothesis to explain the difference in retirement expectations between the SE and WS. A major obstacle to examining the roles played by the quality of job matching is that it is difficult to construct a direct measure of $(\overline{Z} - Z_i)$ from available data. Some of the variables on job characteristics, especially the measures of job satisfaction, could be related to the quality of matching between the worker and the job, as well as the average quality of the job. This is especially likely to be true if the respondents evaluate their jobs based on their own subjective feelings. However, if the respondents objectively compare their own jobs with others' in determining the scale their job satisfaction, then their answers

[12] I use variables regarding the place of residence and residence in an apartment as instruments. A larger fraction of individual wealth is composed of housing wealth, while real estate value greatly differs by place of residence. In addition, it is known that apartments are more expensive than other types of houses with comparable characteristics. On the other hand, the place of residence and type of housing are not likely to be strongly correlated with unobservable individual characteristics that influence labor-force participation decisions at an older age. Thus, the selected instrumental variables should be reasonable, if not perfect.

should reflect some average quality of the job rather than the quality of matching.

With no direct measure of the quality of job matching, indirect pieces of evidence, namely, dispersions of hours and wages, and the interactions between job characteristics and employment status are utilized. First, the dispersions of work efforts and rewards between the SE and WS are compared. Suppose, for instance, that the SE have a wider range of combinations of minimum work efforts ($\overline{Z}$) and wages than do the WS because self-employment offers more heterogeneous jobs than wage and salary employment or because the SE can choose their work efforts more freely than the WS. If so, then the SE's hours of work and wages should be more greatly dispersed than those of the WS.

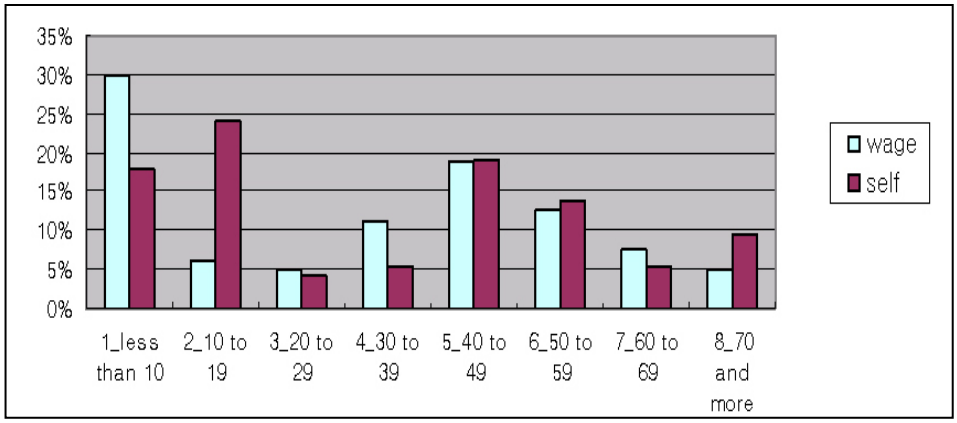
[Table 6] Comparison of Dispersions of Individual and Job Characteristics between the WS and SE.

		Mean		Standard Deviation		Ratio of Std
	Individual and Job Characteristics	(1) WS	(2) SE	(3) WS	(4) SE	(4) / (3)
All	Years of schooling	10.543	9.697	4.083	4.371	1.071
	Self-reported health	2.497	2.586	0.812	0.861	1.060
	Weekly hours of work	47.267	49.991	15.919	20.582	1.293
	Monthly earnings	166.033	177.113	127.032	319.509	2.515
	Hourly wages	0.984	1.273	0.899	3.855	4.288
		Mean		Standard Deviation		Ratio of Std
	Individual and Job Characteristics	(1) WS	(2) SE	(3) WS	(4) SE	(4) / (3)
Young (45-54)	Years of schooling	11.573	11.501	3.577	3.126	0.874
	Self-reported health	2.392	2.336	0.758	0.738	0.974
	Weekly hours of work	47.293	51.601	13.540	20.462	1.511
	Monthly earnings	190.888	226.248	132.077	419.359	3.175
	Hourly wages	1.093	1.431	0.860	2.606	3.034
		Mean		Standard Deviation		Ratio of Std
	Individual and Job Characteristics	(1) WS	(2) SE	(3) WS	(4) SE	(4) / (3)
Old (55 and older)	Years of schooling	8.759	7.980	4.288	4.685	1.093
	Self-reported health	2.679	2.824	0.869	0.901	1.037
	Weekly hours of work	47.221	48.457	19.382	20.591	1.062
	Monthly earnings	123.002	130.000	104.745	164.122	1.567
	Hourly wages	0.800	1.120	0.935	4.751	5.081

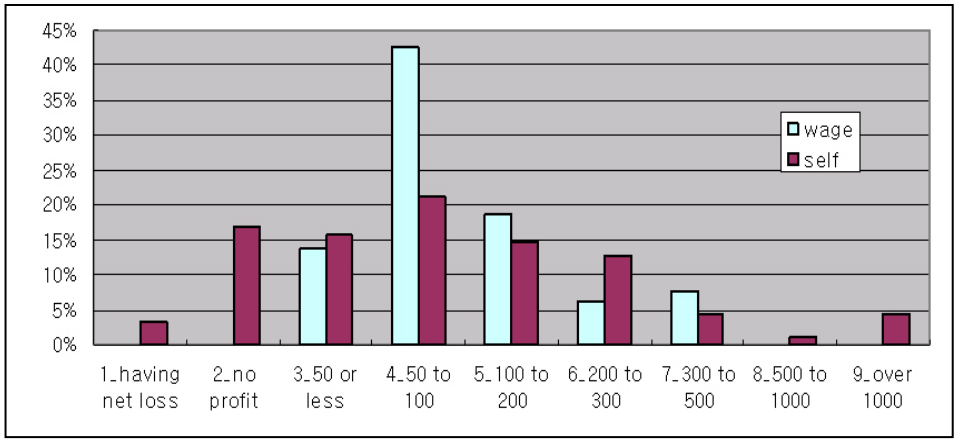
Note. Monthly earnings and hourly wages are measured in 10,000 won.

Table 6 provides the standard deviations of weekly hours of work, monthly earnings, and hourly wages for the SE and WS. Figures 3-A and 3-B graphically compare the distributions of weekly hours of work and monthly earnings between the SE and WS. The result of Table 6 suggests that the SE's hours and earnings are much more widely dispersed compared to those of the WS. The result remains unchanged if other measures of dispersion, such as the coefficient of variation, are employed. The figures also show that the SE are more likely to work extremely long or short hours and to receive very low or high earnings than the WS. These results support, if not prove, the hypothesis that the SE retire later than the WS because they are better matched to their jobs than the SE are.

[Figure 3-A] Hours of Work Per Week



[Figure 3-B] Average Monthly Earnings



[Table 7] OLS Regressions: Correlates of the Subjective Probability of Continuing to Work for Self-Employed Workers

	(1) Ages 45 to 49 Probability of Working at age 55			(2) Ages 50 to 54 Probability of Working at age 60			(3) Ages 55 and older Probability of Working for five years		
	Mean	Coefficient	P-value	Mean	Coefficient	P-value	Mean	Coefficient	P-value
INTERCEPT		**103.5703**	0.0035		**46.2654**	0.0123		**133.8831**	<0.0001
MALE	0.524	2.2089	0.3165	0.527	0.9333	0.5997	0.668	-0.7112	0.7922
AGE	46.226	-0.7278	0.3245	53.513	**0.7221**	0.0277	66.395	**-1.1151**	<0.0001
SCHOOL	11.979	0.0715	0.8618	10.485	-0.2148	0.4423	7.175	**0.7522**	0.0100
MARRIED	0.902	-1.3686	0.7183	0.914	-0.1229	0.9783	0.836	2.2975	0.5249
AGEGAP	-0.082	**0.5645**	0.0648	0.809	0.1982	0.3493	2.103	0.0737	0.8049
CHD_ADU	1.110	**3.3810**	0.0468	2.177	-0.0515	0.9584	3.649	-0.5835	0.4975
CHD_KID	0.828	1.3954	0.3919	0.176	-1.8142	0.3584	0.005	9.1120	0.4585
HL_EXCEL	0.098	**8.4155**	0.0345	0.053	-0.0955	0.9809	0.024	-10.5603	0.1916
HL_GOOD	0.585	-1.9804	0.4281	0.555	0.5389	0.7899	0.332	2.2365	0.4333
HL_FAIR	0.063	0.7593	0.8770	0.100	**-7.3559**	0.0219	0.233	**-8.7819**	0.0045
HL_POOR	0.002	-34.2783	0.1041	0.011	2.7868	0.7346	0.042	**-16.9998**	0.0057
WEALTH	15.360	0.0289	0.3898	18.579	0.0346	0.2452	16.290	**0.0394**	0.0995
FINCOME	5458.000	-0.0000	0.4501	2757.520	0.0000	0.7091	1588.150	-0.0007	0.1800
HWAGE	1.441	-0.0838	0.8789	1.2969	-0.0860	0.8099	1.1079	**-0.4293**	0.0506
HOURS	52.259	0.3043	0.1004	50.608	-0.2182	0.1752	47.551	-0.0302	0.8997
HOURSSQ	3179.430	-0.0022	0.2215	2963.660	0.0024	0.1234	2683.820	0.0009	0.7270
PJOBSAT	0.582	3.9229	0.2099	0.585	**8.6854**	0.0008	0.555	**9.7121**	0.0053
N	408			593			545		
R-Square	0.0728			0.0549			0.1839		
F-value (P-value)	1.81 (0.0255)			1.97 (0.0114)			7.00 (<0.0001)		

Note. The sample is limited to self-employed workers age 45 to 49 for (1), 50 to 54 for (2), and 55 and older for (3). The dependent variable is the subjective probability of continuing to work until a given age (55 for regression 1, and 60 for regression 2) or for five years (regression 3). The coefficients written in bold numbers are statistically significant at the 10-percent level.

Another indirect test is related to the interactions of employment status and work requirement in determining retirement expectations. If the SE are better able to match the requirements of their jobs with their physical capacity and tastes for work than the WS are, their retirement decisions (or retirement expectations) should be more weakly influenced by job characteristics related to work requirements. A similar rationale has been adopted by a previous study in interpreting the link between health and

retirement. After finding no relationship between measures of the physical difficulty of the job and the probability of continuing to work, Hurd and McGarry (1999) suggest that individuals may indeed match with jobs that accord with their abilities.[13]

[Table 8] OLS Regressions: Correlates of the Subjective Probability of Continuing to Work for Wage and Salary Workers

	(1) Ages 45 to 49 Probability of Working at age 55 (Dependant Mean = 83.089)			(2) Ages 50 to 54 Probability of Working at age 60 (Dependant Mean = 77.403)			(3) Ages 55 and older Probability of Working for five years (Dependent Mean = 59.322)		
	Mean	Coefficient	P-value	Mean	Coefficient	P-value	Mean	Coefficient	P-value
INTERCEPT		35.7910	0.2624		38.778	0.0605		**115.9716**	<0.0001
MALE	0.524	**3.4056**	0.0660	0.503	0.9011	0.6421	0.530	4.4797	0.1484
AGE	46.167	0.5410	0.4204	53.037	**0.7312**	0.0416	64.109	**-0.8651**	0.0302
SCHOOL	12.226	0.0344	0.9182	10.333	**0.8363**	0.0082	8.327	-0.0279	0.9465
MARRIED	0.903	-3.2787	0.3084	0.902	1.4705	0.6608	0.833	3.8663	0.3980
AGEGAP	-0.420	-0.1039	0.6911	0.390	**0.4347**	0.0352	1.956	-0.2201	0.4916
CHD_ADU	1.005	-0.5086	0.6947	2.055	0.1664	0.8850	2.983	0.2670	0.8358
CHD_KID	0.945	1.0132	0.4309	0.132	-3.2122	0.2226	0.005	17.5528	0.2532
HL_EXCEL	0.069	-2.6437	0.4843	0.058	3.8687	0.3725	0.034	**19.5801**	0.0276
HL_GOOD	0.594	**-3.4116**	0.0987	0.521	-0.0531	0.9808	0.441	**6.3947**	0.0744
HL_FAIR	0.069	**-8.5342**	0.0239	0.112	-0.6834	0.8397	0.160	**-8.8019**	0.0603
HL_POOR	0.002	-7.0514	0.7507	0.009	-4.6062	0.6421	0.034	-13.4579	0.1264
WEALTH	15.528	0.0360	0.3531	17.653	0.0206	0.2043	13.182	0.0956	0.2099
FINCOME	3048.000	0.0004	0.3192	2841.500	-0.0000	0.9335	1955.520	0.0001	0.6826
HWAGE	1.125	**3.6178**	0.0194	1.016	0.0023	0.9988	0.688	**-5.4130**	0.0110
HOURS	47.424	0.3281	0.2980	47.262	**-0.6846**	0.0097	47.112	**-0.6871**	0.0249
HOURSSQ	2409.410	-0.0012	0.7164	2458.24	**0.0074**	0.0039	2669.630	**0.0065**	0.0287
PJOBSAT	0.651	**10.4037**	0.0002	0.627	**5.9582**	0.0451	0.551	**15.8905**	0.0006
N	621			744			397		
R-Square	0.1002			0.0674			0.1206		
F-value (P-value)	3.96 (<0.0001)			2.77 (0.0002)			3.07 (<0.0001)		

Note. The sample is limited to wage and salary workers age 45 to 49 for (1), 50 to 54 for (2), and 55 and older for (3). The dependent variable is the subjective probability of continuing to work until a given age (55 for regression 1, and 60 for regression 2) or for five years (regression 3). The coefficients written in bold numbers are statistically significant at the 10-percent level.

[13] Cited from McGarry (2004).

To test this hypothesis, I conduct regression analyses separately for the SE (reported in Table 7) and the WS (Table 8), similar to those reported in Table 5, except that the self-employment dummy is excluded. The results suggest that the SE's retirement expectations are not strongly related to hours of work or wages. For the SE, coefficients for HOURS and HOURSSQ are insignificant for all three age groups. The estimated parameter for HWAGE is significant only for the workers age 55 and older. On the other hand, the retirement expectations of WS are more strongly affected by hours of work and wages than are the SE. HOURS and HOURSSQ have significant effects on the subjective probabilities of continued work for the two age groups (age 50 to 54 and age 55 and older). The effect of hourly wages is statistically significant for the relatively younger (age 45 to 49) and older workers (age 55 to 59). This result is consistent with the hypothesis that the quality of matching between the job and the worker is better for the SE than for the WS.

The results suggested above may not decisively prove that the different quality of job matching is the most important explanation for the observed disparity in retirement expectations of the SE and WS. However, given that the other major possible factors cannot account for the phenomenon, the above results strongly suggest that the different quality of matching between the job and the worker should be an important factor in the differences in retirement expectations between the SE and WS.

The next question is how to explain the differences in the quality of job matching by employment status. Several possible explanations have been suggested above as follows: (1) because working conditions and the demanded amount of work effort are more heterogeneous across jobs in self-employment than in wage and salary positions, it is relatively easy for the SE to find a job well matched to them (H5); (2) the SE can adjust their work efforts in the same job (H6); and (3) the SE can more easily switch to a less demanding job than the WS can (H7).

It is very difficult to determine how well H5 explains the observed differences in retirement expectations between the SE and WS. It would be useful to examine how new labor-market entrants choose their jobs, and how the different features of employment status affect this process. However, such evidence is difficult to obtain. It would also be suggestive

to look at how the quality of job matching changes with age.[14] Given that we only have circumstantial evidence as to whether or not the SE are better matched to their jobs than the WS, it is even more difficult to establish how the differences in the quality of job matching change with age. For these reasons, evaluating the relative importance of H5 in this study is not attempted.[15]

Finally, I attempt to determine the relative importance of H6 and H7. More specifically, the question of whether or not older SE are more likely to change their hours of work than are WS is examined, and, if so, whether the difference in the probability of changing hours is attributable to the difference in the likelihood of changing hours within the same job or to job changes. Since panel data are needed for this analysis, I use the KLIPS for 2000 and 2003. The probability of diminishing hours of work by 20 percent or more between 2000 and 2003 is employed as the measure of the ability of changing work effort in accordance with aging. The individuals who were included in both the 2000 and 2003 KLIPS, were age 45 to 54 in 2000, and were employed in both years are included in the analysis.

The probability that the workers of a particular type reduced the hours of work by 20 percent or more between 2000 and 2003, denoted as P_j, can be presented as the weighted average of the probabilities of workers who had remained in the same workplace (P_j^N) and of those who had switched to another workplace (P_j^M), with the probability of staying in the same workplaces (ϕ) used as the weight to be applied to the first

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[14] If H5 is true, then the difference in the quality of job matching between the SE and WS should be large in the first place and should not change much with age. On the other hand, if either H6 or H7 is true, it is likely that the differences in the quality job matching between the SE and WS will increase with age because the SE are better able to make adjustments to cope with the influence of aging than are the WS under this hypothesis.

[15] As a highly preliminary test, this paper examines how the disparity between the SE and WS in the standard deviation of the hours of work differs between younger workers (age 25 to 44) and older workers (age 45 and older). Because KLoSA only includes individuals aged 45 and older, the 2003 KLIPS is utilized for this analysis. The standard deviation of hours of work is similar between younger and older workers, suggesting that, as H5 implies, the SE are more likely to find jobs that are better matched to them than the WS can, thanks to the availability of more heterogeneous jobs. However, the evidence by which H5 can be verified is way too circumstantial. Moreover, a potential cohort effect could be mixed with the age effect we are trying to observe, thereby making it difficult to interpret the result.

probability.

$$P_j = \phi P_j^N + (1-\phi) P_j^M \tag{2}$$

The difference between the SE and the WS in the probability of diminishing the hours by 20 percent or more (denoted as $\Delta P = P_S - P_W$) can be decomposed as:

$$\Delta P = (P^N - P^M)\Delta\phi + \phi\Delta P^N + (1-\phi)\Delta P^M \tag{3}$$

In Equation (3), *S* denotes the SE, *W* denotes WS, $\Delta\phi = \phi_S - \phi_W$, and $\Delta P^N = P_S^N - P_W^N$. The first term on the right-hand side of (3) represents the effect of the different probability of switching jobs between the SE and WS. The second and third terms show the effects of different probabilities of diminishing the hours among non-movers and movers between the SE and WS. If the different flexibility in changing jobs played an important role, as suggested by H7, then the magnitude of the first term should be relatively large. If the disparate flexibility of changing work efforts within a job was the major factor, as H6 suggests, the second and third term should be relatively large.

The estimates of the parameters given in Equation (3) and the result of decomposition are presented in Table 9 for three age groups: age 45-49, ages 50-54, and all ages from 45-54. The results suggest that the SE were more likely than the WS to reduce their hours of work by 20 percent or more. The difference between the SE and WS in the likelihood of diminishing work effort was larger for workers age 50 to 54 (about 15 percentage points) than for those age 45 to 49 (7 percentage points). This suggests that the differences in retirement expectations between the SE and WS are, at least in part, attributable to the different probability of adjusting work efforts by employment status.

More significantly, the results suggest that the difference in the probability of diminishing the hours between the SE and WS is explained entirely by the disparity in the within-job flexibility between the SE and the WS. In particular, the difference in the probability of changing hours among the non-movers is the predominant factor that explains why the SE

age 50 and older were more likely to decrease their hours of work than the WS were. This result is consistent with the finding of Gustman and Steinmeier (1984). They found that partial retirement is quite common among wage and salary workers in the United States. Their study also suggested that most of the partial retirement of wage and salary workers in the United States takes place outside the main job because most workers are not free to retire partially in the job, they hold at prime age. Thus it is not surprising that the difference in the probability of diminishing hours between the SE and the WS is largely explained by disparate within-job flexibility.

[Table 9] Decomposition of the Difference between Self-employees and Wage and Salary Workers in the Probability of Diminishing the Hours of Work by 20 Percent or More from 2000 to 2003.

Variable	Age 45-49	Age 50-54	Age 45-54
P_S	0.242	0.321	0.278
P_w	0.171	0.173	0.172
ϕ_S	0.852	0.868	0.859
ϕ_W	0.840	0.843	0.841
ϕ	0.843	0.854	0.849
P_S^N	0.220	0.326	0.269
P_S^M	0.368	0.286	0.333
P_W^N	0.177	0.140	0.161
P_W^M	0.143	0.350	0.229
P^N	0.195	0.226	0.207
P^M	0.234	0.323	0.272
ΔP	0.071	0.148	0.106
$(P^N - P^M)\Delta\phi$	-0.000	-0.002	-0.001
$\phi\Delta P^N$	0.036	0.159	0.092
$(1-\phi)\Delta P^M$	0.035	-0.009	0.016

Note. See text for the definition of each variable. The parameters are calculated from the 2000 and 2003 Korea Labor and Income Panel Study.

Another study by Gustman and Steinmeier (1985) found that partial retirement has a negative effect on the wage rate, and that the decline in wage rate associated with shorter hours of work is greater for partial retirement in a different job than in a job previously held. This suggests that, when it comes to modifying work efforts at an old age, self-employment offers more attractive options than do wage and salary jobs,

not only in the possibility of such an adjustment, but also in the costs associated with it.

VI. CONCLUSIONS AND IMPLICATIONS

I have explored in this paper how retirement expectations differ between those who are self-employed and those who are wage and salary earners and why they differ by employment status. The results given in this paper generally confirm the widely held belief that the SE expect to remain in the labor market longer than do the WS. The subjective probabilities of working until age 55 and 60 for workers age 45 to 49 and 50 to 54, respectively, and the probability of continuing to work for five years for employees age 55 and older are all substantially higher for the SE than for the WS. The percentage of workers who plan to work as long as they are physically capable is much higher for the SE than for the WS. For those who explicitly report the expected age of retirement, the anticipated age of retirement for the SE is higher than that of the WS by four years.

Seven possible hypotheses have been suggested to explain the difference in retirement expectations between the SE and the WS, namely, H1 though H7 as follows: H1) the SE are poorer than the WS, and thus have to work longer to accumulate enough money for retirement; H2) the SE are healthier and more productive than the WS, and therefore, can work until a later age; H3) job characteristics are more favorable for the SE than for the WS; H4) the SE can work longer than the WS because of the absence of a mandatory or conventionally determined age of retirement; H5) because working conditions and the required minimum amount of work effort are more heterogeneous across jobs in SE than in WS positions, it is relatively easy for the SE to find a job well matched to them; H6) due to greater job flexibility, the SE can adjust their work efforts in accordance with changes in tastes and productivity; and H7) if it is difficult to change work effort within the occupation or industry, then the SE can more easily switch to a less demanding job than can the WS.

The results of this study suggest that the first four hypotheses (H1 to H4) do not explain the observed differences in retirement expectations between the SE and the WS. If the differences in personal and job

characteristics such as health, education, wealth, earnings, and measure of job satisfaction are controlled for, then the differences in retirement expectations between the SE and the WS become even larger. The presence of compulsory retirement among the WS does not account for the different timing of retirement either.

I have suggested some indirect evidence as to H5 to H7 that highlights the importance of the matching between the minimum work efforts required by jobs and the desirable amount of work effort workers would choose to provide. The results given in this paper suggest that the distributions of work efforts and wages are more widely dispersed for the SE than for the WS. This is consistent with the hypothesis that, since self-employment provides a wider range of required minimum work efforts than do wage and salary jobs, the SE are more likely to be employed in a job well matched to their preference or capacity than are the WS. The retirement expectations of the SE are more weakly influenced by job characteristics related to work requirements than those of the WS, suggesting that the SE are better able to match the requirements of their jobs with their physical capacity and tastes for work.

Finally, it is revealed that the difference between the SE and the WS in the probability of changing work efforts at an older age while remaining in the same job (hypothesis [6] given above) is perhaps an important explanation for the observed disparity in retirement expectations between the SE and the WS. The difference between the SE and the WS in the probability of diminishing the hours of work is explained entirely by the disparity in within-job flexibility by employment status. On the other hand, the difference between the SE and the WS in the chances of switching jobs (hypothesis [7]) turns out to be a trivial factor.

As admitted above, the results provided in this study are subject to various types of bias such as those arising from self selection in occupational choice and measurement errors. If individuals having stronger preferences for work were selected for self-employment jobs, for example, the difference in the retirement expectations between the SE and the WS reported in this paper should be overstated. I expect that some of these problems can be mitigated by analyzing panel data when the second wave of the KLoSA is completed. For instance, we will be able to identify

job switchers and investigate their retirement decisions to diminish self-selection bias. We will also be able to reduce measurement errors by examining actual retirement behaviors rather than retirement expectations.

The results provided in this paper offer the following implications. First, that type of employment is an important determinant of the timing of retirement if the differences in personal and job characteristics are considered. This implies that shifts in the employment structure, such as changes in the fraction of self-employment, should be a major cause of long-term change in the economic activity of older individuals. In addition, as noted above, the peculiar features of the employment structure in Korea, such as the high proportion of self-employment, should be an important element accounting for the relatively high labor-force participation rate of older people in Korea.

Second, if it is the greater job flexibility, rather than relative poverty, that make the SE remain in the labor market longer than the WS, as suggested by this study, then self-employment could indeed be an important option for boosting the employment of the elderly population. Regarding this issue, recent studies on the nature of selection into self-employment jobs and the quality of self-employment in Korea offer somewhat mixed results. It appears that self-employment in Korea are highly heterogeneous, including highly talented individuals who voluntarily enter self-employment with expectations of high returns on one side, and marginal workers with low ability who are pushed out of formal wage and salary jobs on the other extreme (Keum and Cho 2000). The questions are which type is relatively more important, and how does the composition of the SE change over time.

Though these questions have not been fully answered, a number of recent studies tend to support the optimistic view of self-employment that, in recent years, an increasing proportion of the SE select their job voluntarily, and that their quality relative to that of WS is improving over time. To provide some evidence, Ryoo and Choi (2000) show that the labor flows into and from the self-employment sector, which is indicative of the fragile labor-market status of the SE, are largely confined to a relatively small group of marginal workers. They also found that the expected duration of self-employment has increased since 1990,

suggesting that the employment stability of the self-employed has improved over time. Ryoo (2005) offers evidence suggesting that the self-employment sector has become more attractive in recent years. This study also found that the negative selectivity of self-employed workers has decreased or disappeared, indicating that the relative quality of the SE has improved over time.[16] The reasons for becoming self-employed, as reported in KLoSA, tell that three of four self-employed workers choose their job voluntarily.[17] It is particularly remarkable that 41 percent of the SE chose their job because it gave them more flexibility.

Lastly, the reasons for the differences in retirement behaviors between the SE and the WS provide useful implications for labor-market reform to encourage the employment of the elderly. The results of the present study suggest that eliminating mandatory retirement and practices of age discrimination may not be enough to increase the employment of older workers in wage and salary jobs. It will be helpful to enhance job flexibility so that employees can adjust their work efforts by accepting lower wages as their preferences, health, and productivity change with aging. Although this paper has not provided decisive evidence, the presence of heterogeneous jobs that offer a wide range of job characteristics, such as the amount of required work effort, wages, and flexibility of work schedule, may help too.

As Hurd (1996) noted, it would certainly not be easy to find policy measures to get rid of these labor-market rigidities. In principle, however, it would be desirable, at least for boosting the employment of older persons, to loosen such labor-market regulations as those aiming at standardizing wages, hours, and other work conditions across various jobs and within a particular job. It would also be helpful to drop the

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[16] There is additional evidence suggesting that the quality of the SE has improved over time. Since 1982, the educational attainments of the SE have increased more rapidly than those of WS. Though the majority of the SE is employed in service and sales, the occupational composition of the SE has been greatly improved. For example, the percentage of the SE who are either professionals or semi-professionals increased from 4.1 percent in 1982 to 16.3% in 2004 (Keum and Yoon 2005).

[17] The percentage distribution of each reply is as follows: (1) Because I can earn more money (28.9 percent); (2) Because it is the work I wanted to do (4.9 percent); (3) Because it gives me more flexibility (41.3 percent); (4) Because of tax benefits (0.1 percent); (5) Because I could not get a wage job I wanted (10.1 percent); (6) Because it was difficult to get a wage job (13.1 percent); and (7) Other reasons (1.6 percent).

regulations that make it difficult for employers and employees to flexibly adjust work efforts and wages. For example, the requirements of providing fringe benefits and social insurance to employees make it difficult to diminish the hours of work by increasing the fixed costs of employment (Hurd 1996).

Appendix Table

First-Stage OLS Regression for Estimating the Index of Job Satisfaction

	Dependent Variable: JOBSAT (Mean = 0.597)		
	Mean	Coefficient	P-value
INTERCEPT	0.597	0.1520	<0.0001
PHYSICAL	0.643	0.0357	0.0364
BURDEN	0.516	-0.0356	0.0341
BENDING	0.595	0.0021	0.9005
EYE SIGHT	0.546	-0.0175	0.1988
CONCENTRATION	0.652	0.0221	0.1346
HUMAN	0.485	0.0196	0.1317
COMPUTER	0.222	0.0215	0.2070
HARDER	0.284	0.0187	0.1830
EARNSAT	0.407	0.1426	<0.0001
JOBSTABLE	0.572	0.0728	<0.0001
ENVISAT	0.557	0.1771	<0.0001
WORKSAT	0.619	0.4244	<0.0001
STRESS	0.579	-0.0549	<0.0001
LOW EDUREQ	0.245	-0.0311	0.1253
HIGH EDUREQ	0.017	-0.0113	0.8187
LOW SKILLREQ	0.215	-0.0284	0.1828
HIGH SKILLREQ	0.015	-0.0318	0.5394
N	3531		
R-Square	0.528		
F-value (P-value)	230.85 (<0.0001)		

Note: The dependent variable is 1 if the respondent is satisfied with his or her job, and 0 otherwise. See text for the definition of the variables used in the regression.

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