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Gender and Off-farm Employment: Evidence from Rural China

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Abstract

The goal of the present paper is to examine how the expansion of the economy from 2000 has affected rural off-farm labor market participation. Specifically, we seek to determine whether off-farm labor increased after 2000, what forms of employment are driving trends in off-farm labor and whether gender differences can be observed in off-farm employment trends. Using a nationally representative dataset that consist of two waves of surveys conducted in 2000 and 2008 in six provinces, this paper finds that off-farm labor market participation continued to rise steadily in the early 2000s. However, there is a clear difference in the trends associated with occupational choice before and after 2000. In addition, we find that rural off-farm employment trends are different for men and women. Our analysis also shows that the rise of wage-earning employment corresponds with an increasing unskilled wage for both men and women.

Key words: gender, rural China, self-employment, wages
JEL codes: J31, J43, N35, O40

I. Introduction

During periods of industrialization and urbanization, increasing opportunities to earn off-farm income have reshaped economies (Kuznets, 1941). In many ways,

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the transformation of the labor force from agricultural to non-agricultural activities (Huffman, 1991) and from rural to urban labor markets (Zhao, 1999) defines what it means for an economy to develop. China's rural economy showed signs of this type of transformation between 1980 and 2000. During this two-decade period, many laborers found employment in the off-farm sector. Both government statistics and the published literature underscore this trend (de Brauw *et al*., 2002; Lin *et al*., 2004; Zhang *et al*., 2006; NBSC, 2009). Depending on the sources used, it has been estimated that the share of the rural labor force engaged in off-farm employment ranged from 35 to 40 percent between 1990 and 2000.

Although the share of rural individuals that began to work off farm between 1980 and 2000 indicates that China was on a transformative development trajectory, a closer examination reveals a more nuanced composition of China's off-farm labor force. Rural laborers generally found employment in two distinct types of off-farmwork: work within the wage-earning sector and self-employment (Rozelle *et al*., 1999; Zhang *et al*., 2006). According to de Brauw *et al*. (2002), the share of rural laborers engaged in both forms of employment more than tripled between 1980 and 2000 (from 6.7 to 20.6 percent for wage-earners and from 4.8 to 18 percent for the self-employed). Interestingly, when the wage-earning sector is divided into those who did and those who did not migrate to another location for work, it was found that the growth of the migrant labor force did not account for most of the growth in the overall off-farm employment. Instead, the fastest growing subset of the rural off-farm employment sector between 1980 and 2000 was driven by rural self-employment.

Currently, there is little consensus among development economists as to whether the self-employment sector serves as a true engine of development (Lucas, 1978; Tokman, 1992; Woodruff, 2006; Fairlie and Woodruff, 2010). In other developing economies, economists have demonstrated that self-employment can be a dead-end rather than a strategy for increasing welfare (Woodruff, 2006). Self-employment is often viewed as a refuge for those who have been excluded from the formal, wage-earning segment of the labor market. There are indications that China is no exception. Zhang *et al*. (2006) found that before 2000, rural self-employment relied on simple technologies and low levels of capital utilization. For this reason, it is important to examine the breakdown of the growth in off-farm labor in terms of wage-earning work and self-employment in order to analyze the health of the development of an economy.

In addition, a thorough understanding of the current state of off-farm labor employment requires attention to the gendered dimensions of employment. In theory, an economy that does not discriminate against a worker on the basis of individual characteristics (e.g. gender) can most effectively take advantage of its labor resources,

subsequently promoting faster and more broad-based development. Although the China National Bureau of Statistics reports rapidly rising off-farm employment numbers (NBSC, 2011), it is unclear whether both men and women are benefiting. Specifically, it is unclear whether both men and women are finding work off the farm and how the mix of wage-earning and off-farm self-employment differs between the genders. Although scholars were concerned about China's female employment between 1980 and 2000, there has been surprisingly little written about the subject after 2000.

The goal of the present paper is to use a nationally representative sample of rural and urban migrant households to empirically examine trends in rural off-farm employment. Specifically, we seek to examine: the trends in off-farm market employment after 2000; the trends in wage-earning employment and self-employment during this period; whether there is still an off-farm employment access gap between men and women and, if the gap exists, whether it is driven by changes in the gendered dimension of employment; and what role changes in the wage rate play in determining the size and composition of the rural off-farm labor force. While the information provided in the present paper cannot fully answer whether China is on a transformative development path, we do present a detailed study on the nature of and the driving forces behind rural off-farm employment.

To answer these questions, the rest of this paper is organized as follows. The next section presents the data used for the study. Section III presents the basic trends in the off-farm employment sector in terms of the forms of employment and gender distribution. Section IV seeks to understand the role that changes in wage rates play in driving the observed changes in off-farm employment patterns. The last section concludes with a discussion on policy implications.

To help the reader navigate the discussion, in the rest of this paper we use the following definitions. Off-farm employment refers to any labor activity off the farm. Off-farm employment includes all work regardless of whether the individual works and lives in his/her village or has migrated to a location outside of his/her village. Off-farm employment includes wage-earning employment (when an individual earns a wage in return for his/her allocation of labor) and self-employment (when an individual does not earn a wage, but, instead the earnings are the profits from his/her economic activities). It should be noted that while wage-earning employment can be further broken into local wage-earning employment (i.e. when rural individuals live at home and work in a local enterprise) and migrant wage-earning employment (where the individual migrates to another location in search of employment opportunitites), for purposes of clarity we do not make this distinction.

II. Data

The data for the study includes two waves of the China National Rural Survey (CNRS), which was collected by the Center for Chinese Agricultural Policy using nearly identical protocols in 2000 and 2008. This dataset includes 1199 households from 60 randomly-selected villages in six provinces (Hebei, Liaoning, Shaanxi, Zhejiang, Hubei and Sichuan).[1] These provinces were selected to best represent China's major agricultural regions. This dataset has been used in a number of studies of China's rural labor force (e.g. de Brauw *et al*,. 2002; Zhang *et al*., 2004; Csanádi *et al*., 2015).

To create a sample representative of China's rural areas, the sample selection was carried out as follows. One county was selected randomly from within each income quintile for each province (as measured by the gross value of industrial output) to accurately reflect varying income distributions within each province. Two villages were then selected randomly within each county. Using village rosters and our own counts, 20 households were picked randomly from those with or without their residency permits (hukou) in order to obtain a sample that included both migrant and local off-farm workers. A total of 1160 households were surveyed from 6 provinces: 5 counties were chosen in each of the provinces, 2 villages were chosen in each of the counties and 20 households were chosen in each of the villages (minus 40 households in two earthquake-damaged villages in Sichuan in 2008).

The CNRS includes information on a wide number of variables covering many household activities. In particular, several blocks of the survey focused on off-farm employment as well as wages and activities of respondents who did not engage in off-farm employment. To estimate the change in employment over time, employment history forms were completed for each household member and each child of the household head.[2] The questionnaire tracks individual participation in off-farm employment as well as the main type of off-farm work performed.

Enumerators collected data for wage workers and self-employed workers separately for the purpose of calculating their salaries or earnings. The salaries of wage workers were collected on the basis of hourly wages. Total earnings were computed by taking all monetary earnings over the course of the year divided by the total number of hours worked during the year. The earnings of the self-employed workers were calculated by

[1]The 60 villages were visited in the first round of the CNRS in 2000. Unfortunately, 2 villages in the Sichuan earthquake zone were so heavily damaged that a year after the earthquake, most of the households had not yet returned to the village, and, therefore, the 2008 sample only includes 58 villages.

[2]The surveys conducted in the years 2000 and 2008 include records for employment history in the past 19-year period and 9-year period, respectively.

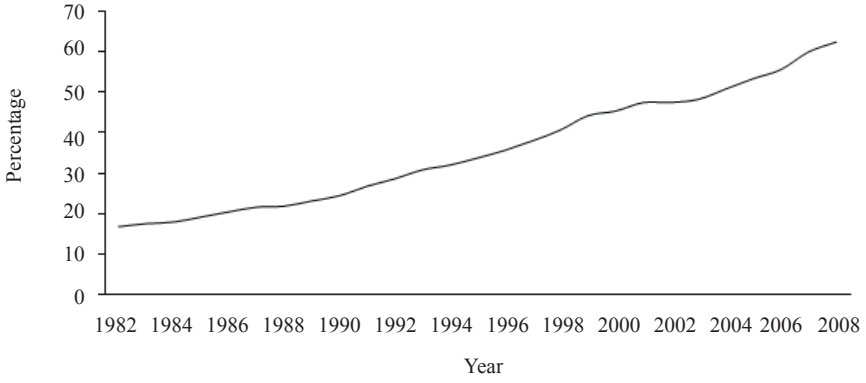
taking the total net income from self-employment activities divided by the number of working hours per year (Zhang *et al*., 2006). We exclude returns to capital by calculating the return to capital as the accumulated interest that the value of the capital would have earned in a bank had it not been invested. The annual interest rate (2.5 percent) for deposits in China's banking system is used for calculating the interest income (NBSC, 2009).

A final section of the survey collected data on each family member's basic characteristics, such as gender, age and educational attainment. Descriptive statistics for wage workers (in terms of both local and migrant employment) and for the self-employed are organized by gender, age and education level and can be found in Appendix Table A1.

III. Employment Trends in China from 1980 to 2000 and after 2000

The labor force in rural China is characterized by the rise of off-farm employment between 1980 and 2000 and continuing after 2000 (Figure 1). According to the 2000 CNRS, in the early 1980s only 15 percent of individuals in the rural labor force were involved in off-farm employment. Between 1980 and 2000, this share rose to approximately 45 percent, and continued to increase to 62 percent by 2008. This suggests that with over 500 million people in the rural labor force, roughly 310 million (62 percent) were employed off the farm in 2008. Consistent with trends shown in national statistics (NBSC, 2009), our data show the transformation of the rural labor force from one dominated by agricultural employment to one that is mostly composed of individuals engaged in off-farm employment.

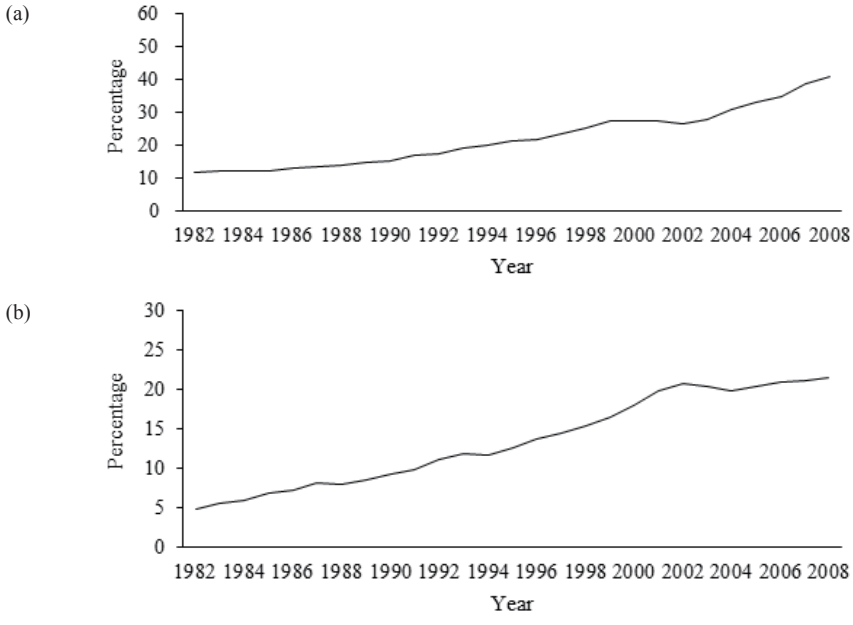
Figure 1. The Percentage of Rural Labor Force in Off-farm Employment, 1982–2008



Disaggregating the employment figures into wage-earning employment and self-employment shows that the composition of rural off-farm employment changes significantly before and after 2000 (Figure 2). Our data show that the rise in wage-earning employment between 1980 and 2000 (Figure 2a) was paralleled by a rise in self-employment (Figure 2b). Specifically, wage earning employment rose by 18 percentage points between 1980 and 2000, while at the same time self-employment rose by 13 percentage points.

After 2000, however, there are noticeable shifts in the trends of both wage-earning and self-employment that move in opposite directions (Figure 2a,b). For wage-earning employment, our data show that the rate of those employed in the wage-earning sector accelerated after 2000. Note that in Figure 2a, the slope of the line is noticeably steeper after 2000. In contrast, the slope of the line for self-employment falls sharply during the 2000s (Figure 2b). In fact, the self-employment line is nearly flat between 2000 and 2008. Zhang *et al*. (2006) conclude that the relative lack of development of China's service sector, as well as other sectors such as housing construction (carried out by self-employed/custom contractors), appears to have given rural individuals ample opportunity to start their own micro-firms between 1980 and 2000. However, self-employment figures stagnated between 2000 and 2008, likely due to wages rapidly

Figure 2. The Percentage of Labor Force in Wage-earning Employment and Self-employment, 1982–2008: (a) Wage-earning Employment and (b) Self-employment



rising and labor shortages occurring in many areas (such as manufacturing and construction; see Du and Park, 2006; Cai *et al*., 2008; Luc *et al*., 2010; Fleisher *et al*., 2011; Wang *et al*., 2011).

1. Gender Differences

In the same way that rates of off-farm employment rose for all rural laborers between 1980 and 2000, our data show that employment rates increased for both genders (Figure 2a). Between 1980 and 2000, the share of men engaged in wage-earning employment rose from 26 to 58 percent, while the share of women employed within this sector increased from 10 to 28 percent. These figures consitute a 32-percentage point and an 18-percentage point increase in male and female wage-earning employment, respectively. However, it is clear from Figure 3a that despite the rise in rates of off-farm employment of women between 1980 and 2000, the gender gap remained wide and mostly unchanged.

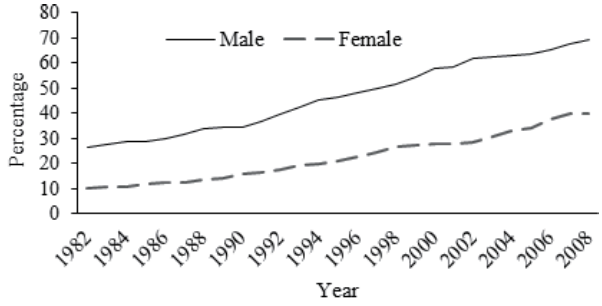
When looking at the gender gap in overall off-farm employment after 2000, it is clear that the trends that existed prior to 2000 continued: in terms of both the shares of male and female employment (Figure 3a). Between 2000 and 2008, the share of both rural men and women engaged in off-farm employment rose 12 percentage points (from 58 to 70 percent for men; and from 28 to 40 percent for women). Due to the fact that the increases in off-farm employment for both men and women are comparable, this means that the gender gap for off-farm employment persisted in the period after the year 2000.

The same trends that emerged between the genders when examining overall off-farm employment hold true when examining only the case of wage-earning employment (Figure 3b). Between 1980 and 2000, the share of both men (from 22 to 46 percent) and women (from 10 to 22 percent) employed in wage work rose steadily. However, the gender gap in wage-earning employment did not decrease over time, although it is smaller than the gender gap in overall off-farm employment. In addition, the trends of wage-earning employment for both genders and the gender gap continue after 2000.

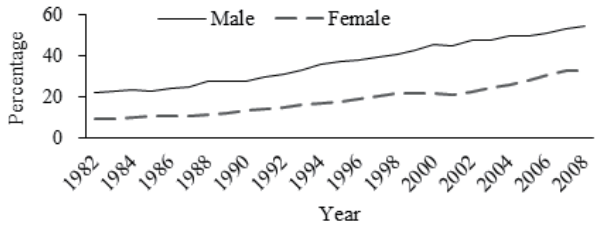
The trends in self-employment for men and women are similar to the overall trends for off-farm work both before and after 2000 (Figure 3c). Between 1980 and 2000, in the case of self-employment, the shares of men and women involved in self-employment rise steadily (from 4 to 12 percent for men; and from 1 to 6 percent for women). Once again, the employment gap between genders did not narrow over time. After 2000, the trend for men's self-employment is similar to the trend for self-employment for the entire sample. Note that the slope of the self-employment trend line falls slightly between 2000 and 2008. However, the trend for women's self-employment is slightly positive, meaning that the rate of self-employment among rural women rises between 2000 and 2008.

Figure 3. The Percentage of Labor force in Off-farm Employment, Wage-earning Employment and Self-employment by Gender, 1982–2008: (a) Off-farm Employment, (b) Wage-earning Employment and (c) Self-employment

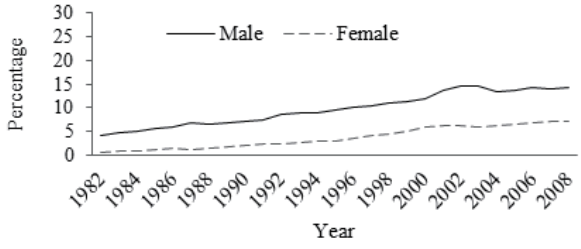
(a)



(b)



(c)



2. Age Cohort Effects and Off-farm Employment

Within this section we employ cohort analysis to decompose the aggregate trends in rural off-farm employment to better illuminate some of the drivers of these changes. Specifically, we examine the trends in off-farm employment for individuals within seven age cohorts (16–20; 21–25; 26–30; 31–35; 36–40; 41–50; and 51–65 years). In any economy, labor force participation by individuals in younger cohorts is a sign of relative health because the accumulated experience of individuals within these age cohorts can be of use (to both individuals and the economy at large) for longer periods of time.

Table 1. The Proportion of Off-farm Employment by Age Cohort and Gender (%), 1990, 2000 and 2008

	1990	2000			2008		
Age cohorts	Total	Total	Male	Female	Total	Male	Female
16–20	24	71	68	73	88	91	84
21–25	34	77	84	68	91	92	84
26–30	29	59	80	35	86	92	70
31–35	27	56	78	30	75	89	58
36–40	21	50	71	29	69	87	53
41–50	21	41	61	21	59	76	44
51–64	12	25	33	12	38	52	21

Source: Authors' own survey.

In the time period between 1990 and 2000, our data show that the entrance into the labor force of individuals in the younger cohorts (ages 16 to 40) explained a large share of the expansion of off-farm employment between 1990 and 2000 (Table 1, columns 1 and 2), which is consistent with de Brauw *et al.* (2002). Between 1990 and 2000, the share of individuals engaged in off-farm employment in each of the younger subcohorts (16–20; 21–25; 26–30; 31–35; and 36–40 years) more than doubled. However, although the share of individuals in older cohorts (41–50 and 51–65 years) involved in off-farm employment increased, this increase was much smaller in magnitude. Hence, even between 1990 and 2000, the emergence of labor markets should be considered healthy from the perspective of age patterns.

In the time period between 2000 and 2008, the fast growth experienced in the overall labor market was shared by virtually all age cohorts (Table 1, columns 2 and 5). According to our data, between 2000 and 2008 the growth of off-farm employment for all age cohorts ranged between 13 and 27 percentage points (column 5 minus column 2, rows 1 to 7). Interestingly, the percent increase in off-farm employment participation was higher for older cohorts. However, this should not be considered as a sign of poor health of the economy, as this is due in no small part to the fact that employment rates were already high for younger cohorts by 2000. Specifically, by 2008, almost all individuals in the younger cohorts (88 percent of 16–20 year olds; 91 percent of 21–25 year olds; and 86 percent of 26–30 year olds) were involved in off-farm employment, which should be taken as a sign of healthy economic development.

3. Gender Differences in Cohort Effects (2000–2008)

The increases in the off-farm employment rate between 2000 and 2008 among the different age cohorts hides sharp gender differences (Table 1, columns 3, 4, 6 and 7). The descriptive statistics reveal that, although there was rapid growth in off-farm employment for men and women of all ages between 2000 and 2008, the increase in off-farm employment is mainly driven by men in somewhat older age cohorts and women

below 35 years of age (with the exception of those in the 16–20 year cohort). From the data, the major differences in participation in off-farm labor among age cohorts of the same gender appear to raise the starting participation rates. For example, the main reason for the slow growth in participation among the age cohorts for younger men and 16–20 year old women is that the initial participation figures for these cohorts started out very high.

Despite the rapid rise in the participation in off-farm labor of women between 2000 and 2008, there are still striking gender differences by the end of the study period. In 2008, the participation rates of men are higher than the participation rates of women in all age cohorts (Table 2, columns 6 and 7). The gap steadily widens as the age cohorts increase in age. For example, the average gap among the 16–20, 21–25 and 26–30-year-old cohorts was only 9 percentage points, but the average gap for the 36–40, 41–50 and 51–65-year-old cohorts was 32 percentage points.

Table 2. Average Earning Difference between Wage Earners and Self-employers by Gender (Yuan/Hour), 2000 and 2008

	2000			2008			2000–2008 growth rate (%)		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Wage earning	3.0 (2.5)	3.2 (2.7)	2.5 (1.7)	5.4 (7.3)	5.9 (8.4)	4.2 (3.6)	7.7	7.9	6.7
Self-employment	7.2 (44.3)	9.1 (52.4)	2.7 (3.9)	7.4 (21.4)	7.9 (23.9)	6.6 (16.3)	0.35	–1.75	11.8

Source: Authors' own survey.

Note: Standard deviations are in parentheses.

4. Summary: Rural Labor Market Trends and Health of the Rural Economy

In summary, it appears as if China's labor markets become more healthy after 2000. Wage-earning employment, the sector that development economists believe is important for creating a strong foundation for economic development, continued to rise between 2000 and 2008. At the same time, self-employment, which is mostly comprised of small, informal economic activities, began to play a markedly less significant role. Specifically, self-employment as a share of overall rural employment remained constant between 2000 and 2008. Therefore, stagnating self employment coupled with the rising share of rural individuals in the wage-earning sector resulted in the relative importance of self-employment falling between 2000 and 2008.

Our evidence on gender also suggests that China's development is relatively healthy, at least from the view point of rural labor trends. While there is still a significant gender gap in 2008, it did not widen after 2000. Moreover, the share of women in the labor force between 2000 and 2008 continued to rise at a similar rate as it did between 1980 and 2000, particularly within the wage-earning sector.

Finally, the increase in employment in the rural labor force throughout our study period has been dominated by participation by individuals in younger cohorts. In fact, by 2008, between 86 and 91 percent of all individuals in the 16–30-year-old cohorts were working off the farm. This is also a sign of economic health, because whatever experience they are gaining by participating in off-farm employment may be useful for many decades.

IV. Wage Rates and the Changes in the Nature of Off-farm Employment

In this section, we explore wage trends, one of the possible determinants of the changing trends in wage-earning and self-employment in rural China's labor market before and after 2000. To do so, we adopt a two-step process. First, we will examine the wage rates over the study period. The data show that the wage rates trends seem to be highly correlated with the observed occupational choices. Second, we will show that individualized wage rate and earnings ability are correlated with the gender of the individual who is engaged in either the wage-earning or self-employment sector.

1. Wage Trends and their Gender Effects

Wages in China were stagnant between 1980 and 2000 (Fleisher and Wang, 2005; Giles *et al*., 2012). The few true panel datasets that exist clearly show that in the 1980s and 1990s the real wage was relatively stable. The rise of the real wage rate between 1988 and 1995 was only 5 percent in total according to the Chinese Household Income Project Series (CHIPS) dataset (Riskin *et al*., 2001). When adjusting the unskilled wage rate by the rural consumer price index, there is virtually no rise in wage rates from the late 1980s to the late 1990s according to data from the 2000 CHNS dataset (Zhang *et al.*, 2003). Individual-level data in Jiangsu Province showed that the real unskilled wage rose less than 1 percent per year between 1988 and 1996 (Rozelle *et al*., 2002). These results mirror official statistics (NBSC, 2000) that show that the wage rate rose negligibly during the 1990s.

Compared to the time period between 1980 and 2000, the real wage rate accelerated between 2000 and 2008 (Cai *et al*., 2008; Cai and Wang, 2010). Between 2000 and 2008, our sample shows that the real hourly unskilled wage rate rose by 7.7 percent per year, whereas the hourly wage (in real terms) for the same individuals in the same jobs performing the same tasks increased from 3.0 yuan in 2000 to 5.4 yuan in 2008 (Table 2, row 1, columns 1, 4 and 7). These findings are in accordance with the rapid evolution of China's economy. In the early 2000s, migrant communities appeared and

expanded in urban areas around the country (Zhang and Song, 2003; Park and Wang, 2010). Shortages of both unskilled and skilled workers existed not only in the booming coastal regions but also in the less-developed inland areas (Fleisher and Wang, 2005; Du and Park, 2006; Cai *et al.*, 2008; Luc *et al*., 2010; Fleisher *et al.*, 2011). Moreover, the service sector across China continued to mature (Pant and Blades, 2007). All of these factors contributed to rising wage rates.

2. Gender Differences in Wage Rates

Between 2000 and 2008, men in the labor market outearned their female counterparts, on average, both in terms of the level of the wage and the growth rate of the wage (row 1, columns 2 and 3, 5 and 6, 8 and 9). The hourly earnings of a rural male engaged in unskilled wage-earning employment increased from 3.2 yuan to 5.9 yuan between 2000 and 2008 (row 1, columns 2 and 5). This is a growth rate of 7.9 percent per year (row 1, column 8). During the same time period, the female unskilled hourly wage rate rose from 2.5 yuan in 2000 to 4.2 yuan in 2008 (row 1, columns 3 and 6). The growth of the female unskilled hourly wage between 2000 and 2008 was 6.7 percent per year (row 1, column 9), which is slightly less than that of the male wage growth rate. Because of the lower starting wage of women compared to men in 2000 (2.5 yuan vs 3.2 yuan) and the difference in the wage growth rates (6.7 percent for women *vs* 7.9 percent for men), the gap in the hourly earnings of male and female unskilled wage earners widen from 0.7 yuan in 2000 to 1.7 yuan in 2008.

3. The Correlation of Occupational Choice and Wages Rates

The conceptual basis for decision-making used in this analysis can be summarized by Woodruff (2006). This model assumes that an individual in the labor market is endowed with some innate entrepreneurial ability and prefers more income and less risk. To choose between wage-earning or self-employment, Woodruff (2006) compares the level of the wage offered by an employer with the earnings that an individual could make from self-employment, while at the same time taking into account the variability of the expected earnings stream.

In real-life decision-making, there is also almost certainly an assessment of the likelihood of becoming unemployed in the wage-earning sector as well as the likelihood of not being able to find clients/customers/contracts in the self-employed sector. Given the rapid growth in China's economy, these risks are probably less important, at least in the short run. If one job ends or if one client contract is finished, there are almost certainly other possibilities. Of course, there are smaller earnings during the periods of

search and job switching/client hunting. However, this, at least in part, is accounted for in our analysis by the variability in the hourly earnings of the wage-earning and self-employed.

Of course, not all individuals are alike, even if they are competing in the same labor market: a fact that is important to allow for because we are looking at individuals choosing to do different activities in the same economy. The marginal return to self-employment varies according to an individual's earning potential and endogenously determined entrepreneurial abilities. Because of this heterogeneity, there is a different minimal level of compensation (holding risk constant) required by different individuals to induce them to switch from being self-employed to being wage-earners (and vice versa). The wage rate of wage-earners will, in turn, determine the ability level of the marginal self-employed individual who is indifferent between self-employment and wage-earning work. Although the quality of individuals in the self-employed sector is not observable, changes in the wage rate may affect the quality of self-employed activities overall. In the final analysis, individuals in the labor market are assumed to be trying to maximize their income subject to reducing their risk. Because of this, there should be expected to be a tradeoff between the hourly wage/earnings and the variability of (or the risk inherent in) the wage/earnings.

Data disaggregated to the individual level from our 2000 and 2008 surveys support the conceptual framework detailed above (Table 2). Without considering gender differences, the growth rate of the hourly unskilled wage rate exceeded the growth rate of self-employed hourly earnings by more than 7 percent per year (Table 2, column 7). In turn, a sharp increase in the number of individuals engaged in wage-earning employment and nearly stagnant growth in self-employment are understandable in light of these trends in wage growth (Figure 2). Interestingly, the widening gap between wage-earning employment and self-employment may have been more distinct if the variance in earnings of the self-employed had not fallen over the same period (this variance fell from a measured standard deviation of 44.3 in 2000 to 21.4 in 2008: Table 2, row 2, columns 1 and 4).

The trends in the hourly earnings can also help explain some of the differences in the trends of male and female involvement in off-farm employment. The rising unskilled hourly wages for both men and women wage earners (Table 2, row 1, columns 8 and 9) help explain the overall increase in wage-earning employment (see Figure 3). In the case of men, the fall in hourly self-employment earnings (from 9.1 yuan in 2000 to 7.9 yuan in 2008: Table 2, row 2, columns 2, 5 and 8) likely explains, in part, the fall in male self-

employment between 2000 and 2008 (Figure 3). However, for women, the growth rate of self-employed hourly earnings increases between 2000 and 2008 (Table 2, row 2, columns 3, 6 and 9), which may explain why self-employment for women also increases over this period.

One of the only puzzles in our data is that the rise in wage-earning employment for women far outpaces the rise in self-employment for women (Figure 3), despite the fact that the relative hourly wage rate for women grew slower than hourly self-employment earnings (6.7 percent vs 11.8 percent per year: Table 2, row 1, column 9; row 2, column 2). One reason for this may be that between 2000 and 2008, the risk associated with self-employment for women (as measured by the standard deviation of the earnings from self-employment) rose sharply (from 3.9 in 2000 to 16.3 in 2008: Table 2, row 2, columns 3 and 6). Ceteris paribus, this increase in risk would dampen enthusiasm for self-employment among women, especially because the risk faced by female wage-earners was so low comparatively (only 3.6 in 2008: row 1, column 6).

However, in Table 2 it is likely that the results are influenced by differences in the characteristics of the individuals (e.g. age and level of education) in the two different occupational sectors. Therefore, in Table 3, we present a similar analysis, but compare the earnings of self-employed individuals with the wage they would have received had they chosen wage-earning employment instead of self-employment.[3] Employing this analysis allows us to examine trends in our outcome measures while controlling for the endogenous factors that affect the employment decisions among individuals in our sample.[4]

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[3]We used a three-step process to create Table 3. First, we used all of the wage earners in our sample in each year (separately; that is, we did not include those who were self-employed) to estimate a wage equation (with the hourly wage as the left-hand side, dependent variable) and the characteristics of the individual wage earners on the right-hand side. The means and standard deviations of the variables used in the analysis for both years (separately) are reported in Appendix Table A1. The coefficients from the estimated wage equations for both years are reported in Appendix Table A2. Second, we used the coefficients from the wage equations from Appendix Table A2 and the characteristics (e.g. age and education) of those involved in self-employment, and predicted the wage that each self-employed individual would have earned (according to the wage equation) had the individual been in the wage-earning labor force. This step produces a predicted wage rate for each self-employed individual on an observation-by-observation basis for each year. In the third and final step, we use the two vectors of observations on the predicted hourly wage rates of the self-employed and compare them to their actual hourly earnings.

[4]To further control for possible selection bias in estimating the parameters of the wage equation, the authors follow the conventional two-stage Heckman selection correction procedure (Heckman, 1979). The approach that we use is also consistent with that of Hamilton (2000).

Table 3. Difference between Predicted Hourly Wage Earnings and Actual Earnings as Self-employer by Gender (Yuan/Hour), 2000 and 2008

	2000			2008		
	Total	Male	Female	Total	Male	Female
Actual hourly earnings	7.2	9.1	2.7	7.4	7.9	6.6
Predicted wage	3.1	3.2	2.7	4.7	5.4	3.3
Difference	4.1	5.9	0	2.7	2.5	3.3

Source: Authors' own survey.

The results in Table 3 are similar to those when we compared self-employed individuals with wage-earners in Table 2. Here, the earnings gap is defined as the difference between the average actual hourly earnings of the self-employed and the average predicted hourly wage of the same individuals if they work in the wage-earning sector. The results indicate that between 2000 and 2008, a gap in earnings exists (2.7 yuan per hour), although it is narrower than the figure provided in Table 2 (4.1 yuan per hour: Table 3, row 3, columns 1 and 4).

Furthermore, the results in Table 3 show that there are different patterns for the predicted wage changes between male and female self-employed workers. There are two distinct features of these patterns that might explain why female self-employment rose relative to that of men. First, the absolute value of the predicted wage for males increased from 3.2 yuan per hour in 2000 to 5.4 yuan per hour in 2008 (row 2, columns 2 and 5). However, the predicted wage for women only rose by 0.6 yuan per hour during the same time period, from 2.7 yuan per hour in 2000 to 3.3 yuan per hour in 2008 (row 2, columns 3 and 6). This means that the likelihood of women who were self-employed in 2000 shifting into the wage-earning sector by 2008 was less than that of men.

The second feature concerns the different patterns in the predicted change in the wage rate between the genders as seen from the differences between the actual hourly earnings from self-employment and the predicted wage rate for wage-earners between 2000 and 2008. The differences between the actual hourly earnings and predicted wage for self-employed men fell from 5.9 yuan per hour in 2000 to 2.5 yuan per hour (Table 3, row 3, columns 2 and 5). During the same period, this difference widened for women, from 0 in 2000 to 3.3 yuan per hour in 2008 (row 3, columns 3 and 6). This decrease in the relative value of self-employment for men and the simultaneous increase in value for women likely explains why there was such sharp movement away from self-employment for men but less so for women.

V. Conclusion

China's economy has continued to maintain a high annual GDP growth rate over the

past two decades. GDP per capita reached US$7575 in 2014 (NBSC, 2015). Although China's unskilled wage rate remained stagnant between 1980 and 2000, since 2000 it has risen at a rate nearly equal to that of GDP. However, self-employment, which was so dominant in the rural labor market in the 1980s and 1990s, began to stagnate after 2000.

According to our analysis, these trends are due in no small part to changing wage rates and returns to self-employment. As the wage rate rose between 2000 and 2008, the gap between wage earnings and self-employment earnings narrowed and the share of the rural labor force that was self-employed began falling. Over the past several years,wage-earning has surpassed self-employment as the top sector for employment among China's rural population.

So what does this suggest about the health of China's economy, particularly in terms of the nation's rural labor markets? In short, our results are consistent with the conceptualization of the occupational choice process detailed in Woodruff (2006). First, it is clear that when wages are rising (and there is fair access to employment opportunities) more people (regardless of gender) will choose to work in the wage-earning sector. As expected, many of those in the self-employed sector chose to shift to the wage-earning sector. These trends all bode well for the health of China's economic development.

Importantly, we also see other signs of healthy economic development. Although a gender gap persists in terms of the share of the rural population involved in any form of off-farm employment, women have entered the labor force in massive numbers and the gender gap has not widened. In addition, a large share of the growth in off-farm employment has occurred among individuals in the younger cohorts. This is important, as it suggests that individuals who enter the off-farm workforce earlier are likely to accumulate more work experience, which can benefit both individuals and the economy at large in the long term.

Although our understanding of rural off-farm employment in China is generally optimisitic, some of our findings point to concerns that women are not being treated fairly in the labor market. The increase in both the share of women in the labor market and women's average wages are slower than the increases for men. Women are increasingly engaging in forms of self-employment, while men are increasingly leaving self-employment for higher-paid wage-earning jobs. Although our study finds that self-employed women are able to earn more on an hourly basis than those employed in wage-earning jobs, self-employment has inherent risks.

Nonetheless, there have been tremendous gains in the opportunities for women, particularly young women, to participate in the off-farm sector. By 2008 more than 80 percent of women in the 16–20-year-old cohort had jobs off the farm, most of which

were in the wage-earning sector. The choice that they make between wage-earning and self-employment seems largely rational. Undoubtedly, while labor markets are not gender-neutral, they are providing never-before-seen opportunities for women to work off the farm and earn a salary.

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Appendices

Appendix Table A1. Descriptive Statistics of Variables Used in Wage Equation, 2008

	Self-employer	Wage earner	*p*-value of mean difference
Actual earning/wage (yuan/hour)	7.4 (21.4)	5.4 (7.3)	0.32
Gender (1 = male; 0 = female)	0.64 (0.48)	0.68 (0.47)	0.09
Age (year)	42.35 (12.07)	36.56 (30.02)	0.00
Education (year)	8.25 (5.21)	8.82 (3.37)	0.01
Training[a] (1 = yes; 0 = otherwise)	0.32 (0.47)	0.25 (0.43)	0.01
Marriage (1 = yes; 0 = no)	0.90 (0.29)	0.67 (0.47)	0.00
Number of observations	479	1398	

Source: Authors' survey. Standard deviations are in parentheses.

Note: [a]The training is defined as the training for the off-farm employment activities, such as construction, transportation and service.

Appendix Table A2. Wage Earning Equations for Wage Earners, 2008

	Coefficient	Z-value
Gender	1.960***	4.28
Age	0.002	0.28
Education	0.349***	5.63
Training	0.734	1.62
Marriage	–0.012	–0.03
Constant	0.808	1.04
Selection equation		
Employment	2.417***	24.91
Gender	0.216***	2.62
Age	0.003	0.90
Education	–0.025***	–2.08
Training	–0.093	–1.12
Marriage	–0.254***	–2.50
Constant	–3.698***	–13.50
Mills ratio	–0.343	–0.46
Wald $chi^2(5)$		57.79
Number of observations		1877

Source: Authors' survey.

Note: ***, ** and * represent significance at 1, 5 and 10 percent, respectively.