



China Agricultural Economic Review

Off-farm employment over the past four decades in rural China

Linxiu Zhang, Yongqing Dong, Chengfang Liu, Yunli Bai,

Article information:

To cite this document:

Linxiu Zhang, Yongqing Dong, Chengfang Liu, Yunli Bai, (2018) "Off-farm employment over the past four decades in rural China", China Agricultural Economic Review, Vol. 10 Issue: 2, pp.190-214,

<https://doi.org/10.1108/CAER-11-2017-0212>

Permanent link to this document:

<https://doi.org/10.1108/CAER-11-2017-0212>

Downloaded on: 15 June 2019, At: 01:07 (PT)

References: this document contains references to 78 other documents.

To copy this document: permissions@emeraldinsight.com

The fulltext of this document has been downloaded 419 times since 2018*

Users who downloaded this article also downloaded:

(2018), "Returns to public agricultural and rural investments in China", China Agricultural Economic Review, Vol. 10 Iss 2 pp. 215-223 <<https://doi.org/10.1108/CAER-11-2017-0211>><https://doi.org/10.1108/CAER-11-2017-0211>

(2018), "China's urban-rural relationship: evolution and prospects", China Agricultural Economic Review, Vol. 10 Iss 2 pp. 260-276 <<https://doi.org/10.1108/CAER-02-2018-0038>><https://doi.org/10.1108/CAER-02-2018-0038>

Access to this document was granted through an Emerald subscription provided by emerald-srm:419342 []

For Authors

If you would like to write for this, or any other Emerald publication, then please use our Emerald for Authors service information about how to choose which publication to write for and submission guidelines are available for all. Please visit www.emeraldinsight.com/authors for more information.

About Emerald www.emeraldinsight.com

Emerald is a global publisher linking research and practice to the benefit of society. The company manages a portfolio of more than 290 journals and over 2,350 books and book series volumes, as well as providing an extensive range of online products and additional customer resources and services.

Emerald is both COUNTER 4 and TRANSFER compliant. The organization is a partner of the Committee on Publication Ethics (COPE) and also works with Portico and the LOCKSS initiative for digital archive preservation.

*Related content and download information correct at time of download.

Off-farm employment over the past four decades in rural China

Linxiu Zhang

Center for Chinese Agricultural Policy, Institute of Geographic Sciences and Natural Resources Research of Chinese Academy of Sciences, Beijing, China

Yongqing Dong

Center for Chinese Agricultural Policy, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing, China and University of Chinese Academy of Sciences, Beijing, China

Chengfang Liu

China Center for Agricultural Policy, School of Advanced Agricultural Sciences, Peking University, Beijing, China, and

Yunli Bai

Center for Chinese Agricultural Policy, Institute of Geographic Sciences and Natural Resources Research of Chinese Academy of Sciences, Beijing, China

190

Received 11 November 2017
Revised 5 December 2017
Accepted 6 December 2017

Abstract

Purpose – The purpose of this paper is to evaluate the trend of off-farm employment in rural China over the past four decades since the reform and opening-up.

Design/methodology/approach – Using two sets of panel survey data, the China National Rural Survey conducted in 2000 and 2008, and the China Rural Development Survey conducted in 2005, 2008, 2012 and 2016, this study offers a re-visit of China's off-farm employment to give us the latest information about its evolution and whether rural labor markets have developed in a way that will allow them to facilitate the transformation of China's economy more effectively. The evolution of off-farm employment is further examined through decomposition of types, destinations, industries, and population sub-groups as well as the change in the wage rate.

Findings – The data show the rapid increase in rural labor activities over the whole study period. Most notably, the authors find that a rapid rise in off-farm employment has continued even until after 2008 and into the mid-2010s, which is a time when some feared that macroeconomic conditions might keep rural residents on the farm or drive them back to the farm. In the disaggregation of labor market trends, the authors show that labor markets are acting consistently with an economy that is in transition from being dominated by agriculture to being dominated by other forms of production and with a population that is consistently becoming more urban.

Originality/value – The authors believe that the results will contribute positively to the exploration of answers to the question whether or not rural labor markets have developed in a way that will allow them to facilitate the transformation of China's economy more effectively over the last four decades.

Keywords China, Rural development, Employment, labor use and migration

Paper type Research paper

Alongside China's remarkable growth, perhaps the most conspicuous in human history, the evolution of Chinese off-farm employment by the rural labor force since the start of the reform process in 1978 has been a point of interest among analysts and policy makers. In their study of rural labor markets, de Brauw *et al.* (2002), Wang *et al.* (2011), Li *et al.* (2013), among others, have shown the rapid increase in off-farm employment. Dominated by migration, it extends from the early 1980s all the way to the early 2000s. Moreover, Wang *et al.* (2011) have



JEL Classification — J31, J43, N35, O40

The authors would like to acknowledge the financial support of the National Natural Science Foundation of China (Grant Numbers 71333012 and 71473240).

identified a structural break in the trends of occupational choice before and after the year 2000, which they describe as the rise of migration and the fall of self-employment.

The steady rise in off-farm employment for the rural labor force has become an integral part of the narrative for Chinese development. The key question boils down to whether or not rural labor markets have developed in a way that will allow them to facilitate the transformation of China's economy more effectively. Some researchers believe that significant barriers still exist in China's economy, and that absence of well-functioning rural labor markets has hindered growth (e.g. Meng, 1990, 1996, 2012; Johnson, 1995; Yang and Zhou, 1996; Benjamin and Brandt, 1997; Liu *et al.*, 1998; Mallee, 2000; Belton and Yang, 2006; Au and Henderson, 2006; Cao and Liu, 2015; Fan and Hertel, 2015). In contrast, others believe that rural labor markets are spearheading China's drive towards modernization (Cook, 1999; Lohmar, 1999; Maurer-Fazio, 1999; Rozelle *et al.*, 1999; Knight and Song, 2001; de Brauw *et al.*, 2002; de Brauw and Rozelle, 2008a, b; Li and Démurger, 2010; Che *et al.*, 2015). In any event, "Synchronous Development of New Four Modernizations" was given center stage at the 18th CPC National Congress in 2012, and increasing importance has been attached to off-farm employment in policy considerations. As more detailed data have accumulated, greater attention has been placed on an examination of the evolution of off-farm employment in the rural labor force in the 2000s, including 2008 and afterwards (Li *et al.*, 2013; Zhi *et al.*, 2013; Wang *et al.*, 2016; Yang *et al.*, 2016).

Most studies of China's off-farm employment in the rural labor force have focused on relatively short periods during the first three decades, making use of new household surveys that became available during this period. Of the studies which are closest in spirit to our interest in China's off-farm employment of the rural labor force in the long run, de Brauw *et al.* (2002) stopped in 2000 and Wang *et al.* (2011) stopped in 2008. Li *et al.* (2013) went up to 2011 and disaggregated down to different population groups and types of off-farm employment, specifically gender, age cohorts, and destination, but their study neglected some important perspectives, such as wage-earning vs self-employment, local vs migrant, and sectoral components. It should be mentioned that these three studies used earlier waves from the same data sources that we are going to use in this paper.

The overall goal of this paper is to contribute to the ongoing assessment of China's rural labor markets, paying special attention to whether these markets are developing in a way that is conducive to the nation's modernization. Specifically, we have three objectives. First, we will provide an update on the trends in off-farm labor participation. We will estimate the nation's aggregate off-farm participation rates, focusing on the performance of rural labor over the first four decades since the reform and opening-up. Second, we will decompose the growth in off-farm employment, searching for clues about whether markets appear to be developing in ways that will support China's modernization. Last, we will examine the role that the changing wage rate plays in off-farm employment across different phases.

To meet these objectives, the rest of the paper is organized as follows. In the second section, we introduce the data that are used for the analysis. These are two sets of rural household panel data collected by the authors since 2000 that contain year-by-year employment histories for individuals of more than 3200 rural households across China. Section three presents a series of figures and tables showing the aggregate and disaggregated trends in off-farm employment of rural individuals between 1981 and 2015. Section four explores the driving forces of the off-farm employment patterns, focusing on the role of the changing wage rates. The final section concludes.

Data

We are privileged to have panel data from two rural household surveys, which are almost nationally representative, conducted by the authors themselves for nearly the entire period since the reform and opening-up. They will allow us to analyze the evolution of off-farm employment for rural laborers in China. They are the China National Rural Survey (CNRS)

and the China Rural Development Survey (CRDS). There are two waves of panel data from CNRS: 2000 and 2008. CNRS was collected from a randomly selected sample in six provinces of rural China: Hebei, Liaoning, Shaanxi, Zhejiang, Hubei, and Sichuan. Currently, there are four waves of panel data from CRDS: 2005, 2008, 2012, and 2016. Similarly, CRDS was collected in a randomly selected sample in 5 provinces of rural China: Hebei, Jilin, Shaanxi, Jiangsu and Sichuan. It should be noted that although these two household surveys are both almost nationally representative, we should not expect their estimates of off-farm employment to be exactly the same, as their samples are not exactly the same.

We use these two panel data sets to analyze the evolution and decomposition of off-farm employment in the rural labor force over the past four decades, as well as the changing wage rate, as these data provide rich information about the employment history of each household member. Each data set is described below in greater detail.

CNRS 2000 was initially collected at the end of 2000 from 1199 households in 60 villages. It covers a time period that spans from 1981 to 2000, and has been used in many studies of China's rural labor force (de Brauw *et al.*, 2002; Zhang *et al.*, 2004, 2006; Mohapatra *et al.*, 2007; de Brauw and Rozelle, 2008a, b). CNRS 2008 was conducted in 58 out of the 60 villages surveyed in 2000. Unfortunately, two villages were located in the Wenchuan earthquake zone and were damaged so heavily that, at the time of the second wave of the survey, most of the households had not returned to their normal lives in the village yet. CNRS 2008 covers a time period that spans from 2001 to 2008 and has also been used in several studies of China's rural labor force (Wang *et al.*, 2011; Huang *et al.*, 2011, 2012).

CRDS 2005 was initially collected in 2005 from 800 randomly selected households in 100 villages and covers a time period that spans from 1995 to 2004. CRDS 2008 was conducted in 2008 from the same 100 villages surveyed in 2005 and covers a period that spans from 2005 to 2007. From CRDS 2008 onward, in addition to the 800 households surveyed in CRDS 2005, we added 1200 randomly sampled households, expanding the sample size to 2000 households. CRDS 2012 covers a time period that spans from 2008 to 2011. CRDS 2016 covers a time period that spans from 1998 to 2015. Both CRDS 2012 and CRDS 2016 were conducted on the same 100 villages surveyed in 2005 and 2008. The first three waves of the CDRS data sets have been used in several studies of China's rural labor force as well (Li *et al.*, 2013).

Both CNRS and CDRS surveys share several features that make it possible to combine them together to trace off-farm employment in rural China over the past four decades. First, different waves within the same survey were focused on the same households in the same villages in the same provinces, and the protocols during each of the waves were kept as similar as possible. The data collection efforts involved students and staff from the Center for Chinese Agricultural Policy of the Chinese Academy of Sciences and a group of master and PhD students from a number of other agricultural universities. Households were paid 20 yuan and given a gift in compensation for the time that they spent with the survey team.

Second, the selection of the sample for both surveys was done carefully to make sure that we selected a sample that was representative of large areas of China. After selecting the sample provinces, the next step was to select counties. To reflect accurately varying income distributions within each province, one county was selected randomly from within each income quintile for the province, as measured by the gross value of industrial output (Rozelle, 1996). There is some difference between CNRS and CRDS in terms of selecting sample villages. For CNRS, two villages were selected randomly within each county. For CRDS, two townships were selected randomly within each county first, and then two villages were selected randomly within each township.

After selecting the villages, the last step is to select households. Within each village, the survey teams used village rosters and our own counts to choose a certain number of households randomly, both those with their residency permits, or hukou, in the village, and those without. For the CNRS, a total of 1200 households were surveyed (6 provinces \times 5

counties \times 2 villages \times 20 households) in 2000, and a total of 1160 households were surveyed in 2008 (1200-40 households in the two Wenchuan earthquake damaged villages in Sichuan). For the CRDS, a total of 800 households were surveyed (5 provinces \times 5 counties \times 2 townships \times 2 villages \times 8 households) in 2005, and a total of 2000 households were surveyed in 2008, 2012, and 2016 (5 provinces \times 5 counties \times 2 townships \times 2 villages \times (8 + 12) households).

Third, and most importantly, all waves of both surveys gathered detailed information on a wide number of variables covering many household activities. In particular, there were several blocks of the survey that focused on recording information on off-farm employment, wages, and activities of respondents who did not have off-farm employment. Because we wanted to be able to estimate the change in employment over time, for the CNRS surveys in 2000 and 2008, a twenty-year and nine-year employment history form was completed for each household member and each child of the household head. For the CRDS surveys in 2005, 2008 and 2012, a 10-year, 3-year and 4-year employment history form was completed for each household member and each child of the household head. In the 2016 wave, an 18-year employment history form was completed not only for each household member and each child of the household head, but also for the spouse and each child of the child of the household head as long as they were 16 years old or above. For each year of the employment history module, the questionnaire tracked each individual's participation in the off-farm employment market by recall, the main type of off-farm work performed, the place of residence while working within or outside the village, the county and province of off-farm employment, and whether each individual was self-employed or earned wages.

During each survey, enumerators took great care to get high quality employment histories from the individuals. If a household member or one of the children of the household head was not present, the respondent, who was almost always the household head or spouse of the household head, answered. Extensive pre-testing found that the data are fairly accurate. In addition, we conducted a practical test to see whether or not a respondent bias problem exists in the employment history part of our data. We replicated the analysis after excluding observations of individuals whom we did not interview directly and found that the results did not change.

The data of wages for migrant wage earners were collected by enumerators on the basis of hourly wages. Total earnings were computed by taking all monetary earnings over the course of the year, including earnings from all jobs if the person held more than one job, and dividing by the total number of hours that were reported as being worked during the year. The survey specifically asked respondents whether or not they lived at home while they were working, so they could be categorized as local wage earners or migrants. We define migrants as individuals, who are still considered household members, but live outside of the household for at least one month during the year while working.

Using the employment history data, we classified the labor force into four types of individuals: full-time farmers, full-time off-farm workers, part-time farmers, and those that did not work. Full-time farmers refer to those who worked on the farm but did not have a job off the farm. Full-time off-farm workers refer to those who had some type of off-farm job, either wage-earning or self-employment, but did not work on the farm. Part-time farmers refer to those who had some type of off-farm job and worked on the farm either periodically or during the busy season. If an individual "did not work," it means that the individual did not work either on- or off-farm but was searching for a job. A measure of the size of the household labor force was created by aggregating all individuals in the households between 16 and 65 years old when they indicated that they were working as a farmer, an off-farm worker, or a part-time farmer or were searching for employment. If a person over 16 years indicated that they had retired, could not work for health-related reasons or were enrolled in school full time, they were not included in the labor force total. Descriptive statistics for selected variables in various waves are presented in Table I.

Trends

We first use the national-level data from the National Bureau of Statistics to estimate the participation in off-farm employment of the rural labor force. Our national-level off-farm employment data are drawn from multiple China Statistical Yearbooks and the Migrant Worker Monitoring Surveys, which span from 1978 to 2015. Statistics show an overall upward trend in the first four decades since the reform and opening-up, from 9.3 percent in 1978 to 74.9 percent in 2015, an average increase of 1.8 percentage points a year (Figure 1).

However, there are differences across different periods of the reform. Specifically, in the early years of the reform and opening-up (1978-1983), few in the rural labor force acquired off-farm employment. The share of the rural labor force employed off-farm was quite low, ranging between 9.1 and 9.4 percent. Off-farm employment opportunities were thought of as a measure of the village leader's ability to increase the welfare of the village. These opportunities took on different forms, including jobs in village or township factories, contracts to perform mining, fishing, forestry, and other activities (Su, 1989; Rozelle, 1991). Nonetheless, the share began to increase in 1984. By 1996, the share reached 35.4 percent, an average increase of 2 percentage points per year over this 13-year period (1983-1996). The share stagnated at around 35 percent during the next four years (1997-2000). Then it began to increase at a faster pace, from 33.9 percent in 2000 to 74.9 percent in 2015, an average increase of 2.7 percentage points in this 15-year period.

When examining the growth rate in the number of rural laborers employed off-farm, we see off-farm employment has risen and fallen with economic growth (Figure 2). China's economy has gone through four cycles so far, with peaks in 1985, 1988, 1994, and 2007 (NBS, 2016a). After increasing in the 1980s with a peak in 1984, the off-farm employment growth rate fell during the recession in the late 1980s, followed by slight ups and downs throughout

Table I.
Descriptive statistics
for selected variables

Variable	Mean (SD)			
	CNRS 2000	CRDS 2008	CRDS 2012	CRDS 2016
Age (labor force) (one year prior to the year of survey)	35.76 (12.25)	39.3 (14.34)	41 (13)	42.0 (14.27)
Gender (1 = male)	0.49 (0.50)	0.51 (0.50)	0.51 (0.50)	0.51 (0.50)
Year of education	6.0 (3.66)	8.1 (2.81)	7.6 (3.7)	8.9 (3.33)
Skill training (1 = yes)	0.19 (0.389)	—	—	0.34 (0.472)
Household labor force	3.8 (1.94)	2.9 (1.38)	2.8 (1.4)	2.4 (1.25)
Household size	4.13 (1.49)	4.90 (1.74)	4.2 (1.7)	5.15 (1.90)

Source: Authors' surveys

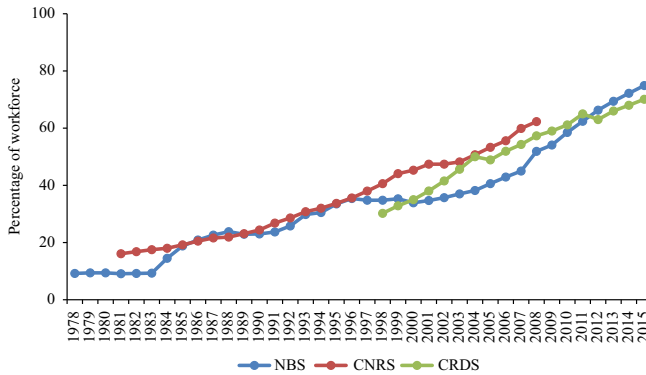
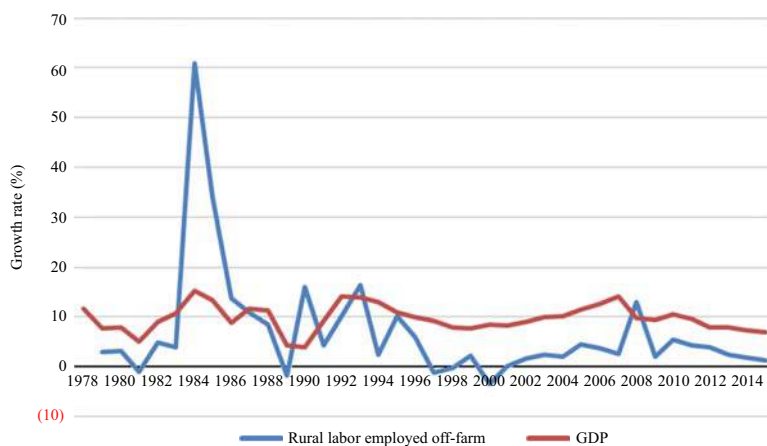


Figure 1.
Percentage of rural
labor force engaged in
off-farm employment

Source: Authors' survey NBS (2016a)



Source: NBS (2016a)

Figure 2.
Growth rates of GDP
and rural labor force
employed off-farm

the 1990s. According to Chen (1985), the record growth of off-farm employment in 1984 was because of the rapid development in the township and village enterprises. The growth rate climbed again following 2000 before reaching a peak in 2008.

In response to faltering growth after the global financial crisis in 2008, China launched a stimulus package that triggered massive waves of investments by the central and local governments. There has been evidence based on individual level data that although the financial crisis had impacts on the off-farm employment of China's rural labor force (Huang *et al.*, 2011), nearly one year after the start of the financial crisis, China was far along on the road to recovery from the financial crisis in terms of rural employment (Huang *et al.*, 2011; Zhi *et al.*, 2013; NBS, 2009). However, starting from 2010, the growth rate of the rural labor force employed off-farm has been slowly decreasing (NBS, 2016b). This might have something to do with government policy that encourages migrants to return to their hometowns to set up their own businesses.

Consistent with the overall upward trends shown above using the national data, household-level data from both the CNRS and CRDS show the off-farm labor force expanded steadily in the first four decades of the reform from 1981 to 2015 (Figure 1). From approximately 16 percent in 1981, our CNRS surveys estimate that by 2008, 62 percent of the rural labor force had found some employment off-farm. In other words, in the first 27-year period since the reform, the off-farm employment increased by an average of 1.7 percentage points per year. By assuming that neighboring provinces similar to those surveyed have identical rates of off-farm labor participation, we estimate that off-farm rural employment in China rose from about 50 million in 1981 to more than 260 million farmers in 2008, a growth in off-farm employment of about 210 million. These figures are also consistent with data from other sources (Giles, 2006; Glauben *et al.*, 2008; NBS, 2009; Wang *et al.*, 2011; Li *et al.*, 2013)[1]. Such a large increase in labor flow would be one indicator that China's labor market is functioning well.

Our data from both CNRS and CRDS show that by 2004, about 50 percent of the rural labor force had found some employment off-farm. In other words, 2004 can be thought of as a watershed year because, according to our CRDS data, it is the first year that half of the rural labor force were engaged in some kind of off-farm work, by earning wages, self-employment, or both. This means the transformation of the rural labor force from one dominated by individuals working on farm to one where half of the individuals are engaged in non-farm jobs is well underway.

If there were any concerns at the end of the third decade about off-farm labor employment in the fourth decade, data from our 2012 and 2016 CRDS surveys should allay

those fears. The upward trend in the share of individuals in the rural labor force with off-farm employment continues to rise. From 57 percent in 2008, 70 percent of the rural labor force worked off-farm in 2015. If this is representative of the entire country, this means that about 280 million members of the rural labor force were fully or partially employed off-farm in 2015, which is consistent with the government's statistics of 277 million (NBS, 2016b)[2].

The evolution of off-farm employment of the rural labor force over the past four decades manifests the government policies on migration during this period. The government policies on migration have gone through four stages over the past four decades. After the "tight control" policy of migration during the early years of reform and opening-up (1979-1983), the government began to adopt the "migration allowed" policy in the period of 1984-1988, followed by the "controlling aimless and disorderly migration" policy between 1989 and 1991. The "regulating migration" policy was implemented between 1992 and 2000. Since 2000, the government switched to the "fair migration" policy which was characterized by the removal of barriers to migration and the implementation of comprehensive reforms towards building up a rural-urban integrated labor market (Song *et al.*, 2002). Although provinces followed the guidelines stated in the migration policies issued by the central government in general, there were variations across provinces. For example, provincial documents that encourage members of the rural labor force to seek opportunities to work off-farm or to migrate have been issued in Jilin, Shaanxi, Sichuan, and Hubei provinces since the mid-1990s. However, such provincial policies have not been issued in Jiangsu, Zhejiang, Hebei, or Liaoning provinces.

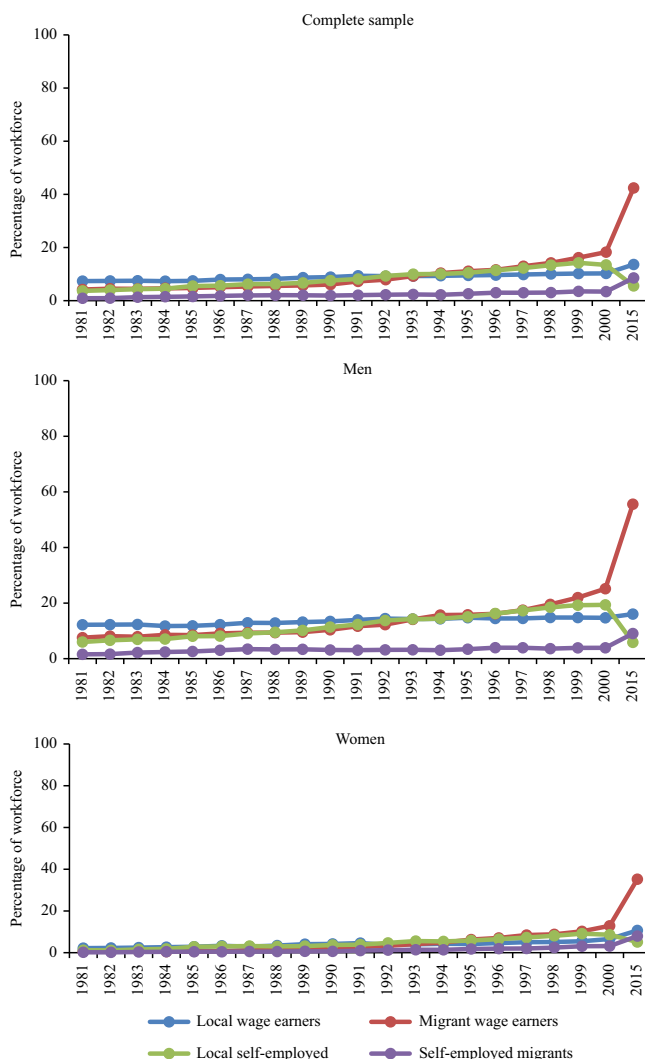
Overall, then, both national and household-level data suggest a clear upward trend in the off-farm employment of the rural labor force in the first four decades since the reform and opening-up. An individual in 2015 in the rural economy was more than four times as likely to work off the farm as an individual in 1981. To unpack the patterns of off-farm employment in the rural labor force, we proceed to disaggregate the trend, first by types of off-farm employment and then by population groups.

Disaggregating the evolution of off-farm employment

Wage-earning vs self-employed

While the rate of growth in off-farm employment, in general, has remained steady in the first four decades, disaggregating the employment figures into wage-earning and self-employed demonstrates that the composition of rural off-farm employment changes sharply before and after 2008. In the same way that Zhang *et al.* (2006) showed that the rise in wage-earning migration was paralleled by the rise in self-employment, our data also show this. Between 1981 and 2008, wage-earning migrants rose from 4.2 percent of the rural labor force to 24.2 percent, an increase of 20 percentage points over 27 years (Figure 3). During this same period, self-employment rose from 4.6 to 21.5 percent, an increase of 16.9 percentage points. The nearly parallel increase in off-farm employment in both of these employment categories shows how both wage-earning migration and self-employment played an important role in the transformation of rural labor markets before 2008. The importance of self-employment might be quite surprising to many observers, given the large increase in the demand for wage-earning labor in the manufacturing facilities that opened in the coastal areas and around cities. However, as discussed in Zhang *et al.* (2006), the lack of the development of the service sector and other sectors, such as housing construction which required many self-employed or custom contractors, also gave many opportunities for rural individuals to start their own self-employed micro- or nano-firms.

Quite differently from the general off-farm trends described above, which continued largely at the same pace before and after 2008, there are noticeable differences in the trends for individual components of off-farm employment after 2008. Specifically in the case of wage-earning migration, which rose at 0.63 percentage points per year between 1981 and 2008, the pace accelerated to 2.6 percentage points per year between 2008 and 2015, up to



Source: Authors' survey

Figure 3. Percentage of rural labor force engaged in different types of off-farm employment

42.4 percent in 2015. On the contrary, in the case of self-employment, after rising at 0.63 percentage points per year between 1981 and 2008, it began to decrease by 1.1 percentage points per year between 2009 and 2015, down to 14.1 percent in 2015. In short, the structural break identified by Wang *et al.* (2011) continued into the fourth decade; that is, the rise of wage-earning migration and fall of self-employment.

Migrant vs local

By disaggregating China's labor trends, our data demonstrate that labor markets are providing more than just off-farm income to rural residents. Trends by employment type clearly show that the target destination of workers over the first 30 years has shifted from

rural to urban areas. Our CNRS data show that in 1981, most rural individuals, nearly 84 percent, spent their time farming (Figure 3). Individuals who worked off the farm, of whom about 7 percent were local self-employed and 4 percent were local wage earners, were almost three times as likely to live at home and work within or close to the village than to work outside of the village and live away from home. Less than 5 percent were migrants, and even less than 1 percent were self-employed migrants. By 2000, almost as many off-farm workers were living away from home as in the village, at 21.7 vs 23.7 percent. By 2015, according to our CRDS data, an off-farm worker was more than twice as likely to live away from home as to live in a village, at 72.7 vs 27.3 percent. Thus, overall, migrant off-farm laborers have comprised both the largest and fastest growing component of the rural labor force in the first four decades.

The nature of self-employed firms

While a complete account of all self-employed firms is beyond the scope of this paper, in general, the firms in 2008 were similar in nature to the firms described in Zhang *et al.* (2006), who used data in CNRS 2000. According to data in the CNRS 2008, firms were still small, at an average of 4 employees per firm; labor intensive, with only an average 83,990 yuan per firm in total assets; and family run using family labor. Notably, only 14.3 percent of the firms hired non-family labor, and the firms which did only hired 1.2 non-family individuals per firm on average. But, while small in scale, there is evidence that self-employed firms have become more specialized. Table II shows that while the number of enterprises has fallen from 473 to 313, the nature of participation by family members has changed. There are fewer firms in which the husband or wife is operating the firm on their own. The share of what we call husband-only firms fell from 53.3 to 37.4 percent. The share of wife-only firms fell from 10.1 to 6.1 percent. In contrast, firms with both the husband and wife rose from 25.4 to 40.6 percent, and those run by children rose from 6.3 to 13.4 percent.

According to data in CRDS 2016, the share of households with self-employed firms has reached 30 percent, almost as high as in the year 2000. However, a closer look reveals that the nature of participation by family members has further changed. There are fewer firms which the husband is operating, either on his own or with his wife. However, there are more firms which the wife and children are operating, either with each other or on their own. The share of what we call husband-only firms fell from 37.4 percent in 2008 to 27.0 percent in 2016. During the same period, the share of husband-and-wife firms also fell, from 40.6 to 34.2 percent. In contrast, the share of wife-only firms rose from 6.1 to 13.2 percent, and those firms run by children from 13.4 to 25.5 percent.

By destination of off-farm employment

Migrants also ventured further from home over the first three decades, a trend that continued to 2007 (Table III). Our CNRS 2000 data show that in 1981, over 70 percent of

	2000 (CNRS 2000)		2008 (CNRS 2008)		2015 (CRDS 2016)	
	Obs.	Per.	Obs.	Per.	Obs.	Per.
Husband	252	53.3	117	37.4	164	27.0
Wife	50	10.1	19	6.1	80	13.2
Husband + wife	120	25.4	127	40.6	208	34.2
Children only	30	6.3	42	13.4	156	25.7
Other	23	4.9	8	2.6	–	–
No of enterprises	473	100	313	100	608	100
Percentage of households		32.4		22.5		25.7

Table II.
Composition of family members in self-employed enterprises

Source: Authors' survey

	Own county	Off-farm job located within Province, but outside of county	Another province
<i>All migrants</i>			
1981 (CNRS 2000)	49	25	26
1990 (CNRS 2000)	42	29	29
1995 (CRDS 2012)	36	29	35
2000 (CNRS 2000)	30	30	40
2007 (CRDS 2012)	30	24	46
2011 (CRDS 2012)	57	21	22
2015 (CRDS 2016)	33	38	29
<i>Migrants under 30 years old</i>			
1981 (CNRS 2000)	39	28	33
1990 (CNRS 2000)	37	32	31
1995 (CRDS 2012)	36	32	32
2000 (CNRS 2000)	26	29	45
2007 (CRDS 2012)	21	25	54
2011 (CRDS 2012)	28	31	31
2015 (CRDS 2016)	25	42	33
<i>Migrants over 30 years old</i>			
1981 (CNRS 2000)	72	17	11
1990 (CNRS 2000)	42	31	27
1995 (CRDS 2012)	40	32	28
2000 (CNRS 2000)	38	33	29
2007 (CRDS 2012)	35	35	30
2011 (CRDS 2012)	69	14	17
2015 (CRDS 2016)	33	38	29

Source: Authors' survey

Table III.
Comparison of
location of migrant
employment in
percentage of
migrants working in
specific locations by
age in various years

migrants worked within their own province; just under 30 percent went out of the province in search of work. By 2007, our CRDS 2008 data show that 46 percent of migrants left the province for work. If we use 30 years old as the age cut-off, the change was similar across age groups, although their starting levels were different. Among workers under 30 years old, in 1981, 33 percent were leaving their provinces, whereas 54 percent did so in 2007, an average increase of 0.8 percentage point per year. Meanwhile, among workers above 30 years old, in 1981, 11 percent were leaving their provinces, whereas 30 percent did so in 2007, an average increase of 0.7 percentage point per year.

Between 2007 and 2015, however, the trends changed. Our data from CRDS 2012 and 2016 show that the share of migrants who worked in another province decreased by 2011 before beginning to increase again by 2015, although not reaching the record of 2007. In 2011, over half, or 57 percent, of the migrants took jobs within their own county, and only 22 percent went out of the province. Interestingly, after 2011, the trends changed again. In 2015, 71 percent of migrants worked within their own province, while only 29 percent went out of the province. However, the change was especially striking among workers under 30 years old. In 2011, only 31 percent of workers aged under 30 were leaving their provinces, an average decrease of 5.8 percentage points per year between 2007 and 2011. Then, the share of young workers who were leaving their provinces in 2015 increased slightly to 33 percent. In contrast, the trend is much less pronounced among workers over 30 years old. In 2011, only 17 percent of older workers were leaving their provinces, an average decrease of 3.3 percentage points per year between 2007 and 2011. By 2015, this number increased to 29 percent, almost as high as that the 30 percent for 2007.

By age cohort

The labor movement contours created from the off-farm employment histories of different age cohorts amplify these trends and demonstrate one of the most striking characteristics of China's changing employment patterns in the first four decades; the shift towards off-farm employment is dominated by younger workers (Table IV and Figure 4). For those under 30 years old, workers in all age cohort categories participated at similar rates in 1981, ranging from 16 to 19 percent. Almost one quarter, or 24 percent, of those aged 36-40 participated in off-farm labor in 1981. In contrast, slightly more than 10 percent of those above 40 years old participated in off-farm labor.

In 1990, participation rates of all age cohorts under 50 were in a wider range, from 21-34 percent. In contrast, only 12 percent of those aged 51-65 had any off-farm employment. There was clear progression when moving from the oldest to the youngest cohorts among workers over 20. However, by 2000, the rise in the off-farm participation rates of younger workers accelerated relative to older ones, and a distinct ranking appeared as one moved from the oldest to the youngest cohort. In 2000, young workers in the 16-20-year-old cohort participated at rates more than three times those of 16-20-year-olds in 1990, at 76 percent compared to 24 percent. Those in the 21-40-year-old cohorts and in the 51-65-year-old cohorts almost doubled the off-farm participation rates of their 1990 cohorts. In contrast, those in the 41-50-year-old cohort, while still increasing their participation rates by 17 percentage points, worked off-farm at half the rate of those in the 16-20-year-old cohort, at only 38 percent compared to 76 percent.

Between 2000 and 2004, the rise in the participation rates of off-farm workers had continued in almost all age cohorts except the youngest, 16-20-year-old, and the eldest, 51-65-year-old, cohorts. The rise is more obvious in the 21-35-year-old cohorts, an average increase of 4.5 percentage points a year during this four-year period. In contrast, the rise for those in the 41-50-year-old cohort is only 0.75 percentage points a year during the same period. Those in the youngest and the eldest cohorts even decreased by 0.5 and 2.8 percentage points a year in the same period, respectively.

The rate of increase of off-farm participation continued for all age cohorts after 2004 and into the mid-2010s. According to our data from CRDS, almost all of those in the youngest cohort who were not in school or not sick were employed and working off-farm. Indeed, in 2015, only 8 percent of 16-20-year-olds that were in the labor force did not have an off-farm job. The rate was increasingly higher for the older cohorts; 91 percent of the 21-25-year-old cohort had an off-farm job; 88 percent of those in the 26-30-year-old cohort had an off-farm job; and 66 percent of those in the 40-50-year-old cohort had an off-farm job. Even for the older workers, namely, those in the 51-65-year-old cohort, the rate of off-farm participation was almost 40 percent in 2015, increasing dramatically from the rate in 2004.

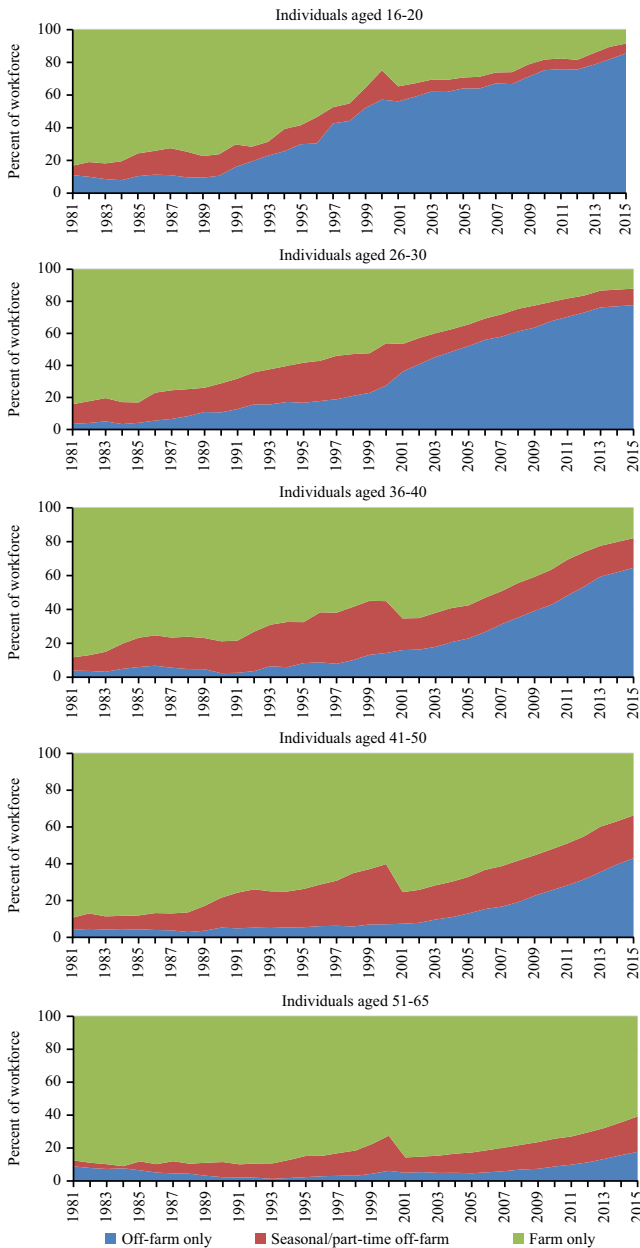
Part time vs full time

Trends by engagement in on- and off-farm employment show clearly that over the first four decades off-farm employment has shifted from part time to full time. Our CNRS 2000 data show

Age categories	Percentage with off-farm work in						
	1981	1990	2000	2004	2007	2011	2015
16-20	17	24	76	74	81	88	92
21-25	19	34	67	82	84	90	91
26-30	16	29	53	73	82	88	88
31-35	24	27	48	68	74	84	87
36-40	12	21	43	53	69	74	82
41-50	11	21	38	41	50	61	66
51-65	13	12	28	17	20	27	39

Source: Authors' surveys

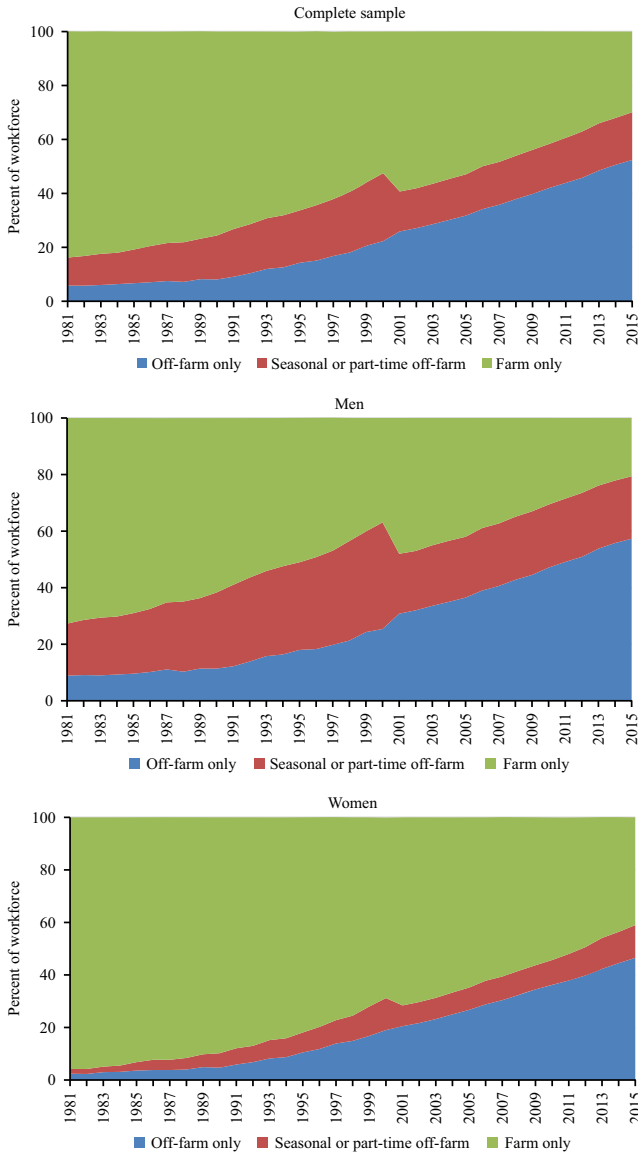
Table IV.
Comparison of labor participation rates in percentage of individuals that participate in the off-farm labor force by age categories, various years



Source: Authors' survey

Figure 4.
Percentage of rural labor force engaged in off-farm and on-farm employment by age cohorts

that in 1981, less than 6 percent of rural laborers worked off-farm full time and about 10 percent worked off-farm part time or did farm work only during busy seasons (Figure 5). By 2015, our CRDS 2016 data show the picture looks strikingly different. More than half of rural laborers worked off-farm full time at 52 percent, whereas 18 percent worked off-farm part time. Although



Source: Authors' survey

Figure 5. Percentage of rural labor force engaged in off-farm and on-farm employment by gender

both types of off-farm employment have been increasing over the 34-year study period, full-time off-farm employment increased at a pace almost 7 times that of part-time off-farm employment at 1.4 vs 0.2 percentage points per year. In other words, there is a clear trend toward specialization in off-farm employment of the rural labor force in the first four decades.

The work behavior of younger laborers also illustrates their increasing specialization in the off-farm sector (Li *et al.*, 2010). For example, our CNRS 2000 data show that in 1981, only 11 percent of those in the youngest 16-20-year-old cohort worked off-farm full time, whereas

6 percent worked on the farm either part time or at least some time during the busy season. By 2015, according to data from CDRS 2016, 86 percent of young people in this cohort worked off-farm full time, whereas the share of those working off-farm on a part-time basis remained the same as 34-years ago at 6 percent. In contrast, in 1981, of those in the 41-50-year-old cohort, more than 95 percent of them were still working in agriculture, either on a part-time or seasonal basis. By 2015, when almost 95 percent of those in the youngest cohort worked off-farm either on a full-time or part-time basis, 47 percent of the 41-50-year-old cohort still worked on farm. Our data illustrate a growing tendency for young workers to live away from home and become increasingly less engaged in on-farm work. Clearly, this generation is very unlike those of the past. In fact, according to interviews with their parents, few among this cohort have any significant experience with farm work at all, except occasionally as children helping out during the harvest or other busy times.

By gender

Emerging labor markets have already begun to positively affect the off-farm participation rates of women (de Brauw *et al.*, 2002; Li *et al.*, 2013). Although women have participated at rates far below those of men throughout the first two decades of the study period, participation rates have risen rapidly since the early 1980s (Figure 5, middle and bottom panels). In the 1980s, and consistent with the findings from the national community survey-based study reported in Rozelle *et al.* (1999), the participation rates of men, at more than 27 percent in 1981, far exceeded those of women at only 4 percent. Moreover, despite low initial levels of involvement in the off-farm sector, participation rates for women grew more slowly than those of men during the 1980s. However, in the 1990s, the participation rate of women in the off-farm sector rose faster than that of men. The rising participation rates of women have been driven by the entry of women into all job categories, although the most striking absolute gains have come from migration. Throughout the entire decade of the 1980s, less than 1 percent of women left their homes to work for a wage. However, since 1990, the rate of growth has been higher than any category of job types for either men or women. By 2015, more than 35 percent of the female labor force was working as wage-earning migrants (Figure 3, bottom panel). One interpretation of this rise in the participation of women is that, as labor markets have become more competitive, the scope for managers to exercise their discriminatory preferences has declined, therefore opening up new employment opportunities for those who had previously not been able to participate. Alternatively, the rise in women's work could have occurred as the types of industries that have a preference for the skills of women rose.

Age cohort analysis shows that the participation by women in the youngest cohorts demonstrates the most striking gender effects of the growth of China's rural labor markets, especially before 2011 (Figure 6). In the 16-20- and 21-25-year-old cohorts, the rates of participation are fairly similar; both are very high and increased rapidly from previous levels, especially in 2007. By the time women reach the 26-30-year-old cohort, however, the rates of participation, while still high at approximately 70 percent, begin to slow. Even with this slow down, when taken as a group, i.e. when looking at the participation of those in the 16-30-year-old cohort, more than seven out of ten women are working off-farm. The rates of participation, as might be expected, fall in the female cohorts above 25-30 years as women begin to have children.

The rates of female participation continued to grow between 2007 and 2011. In the 16-20-year-old cohort, the rate of participation of women reached 86 percent, very close to the rate of complete sample at 88 percent. From 2007 to 2011, the average participation rate of women in the 16-30-year-old cohorts rose more than 10 percentage points, from approximately 70 percent in 2007 to more than 80 percent in 2011. The average participation rates of the complete sample in the same cohort rose less than 7 percentage points. Similarly, the rates of increase of off-farm participation by women in the 30-40-year-old cohorts are much higher than the rates of increase of off-farm participation by complete sample in these cohorts.

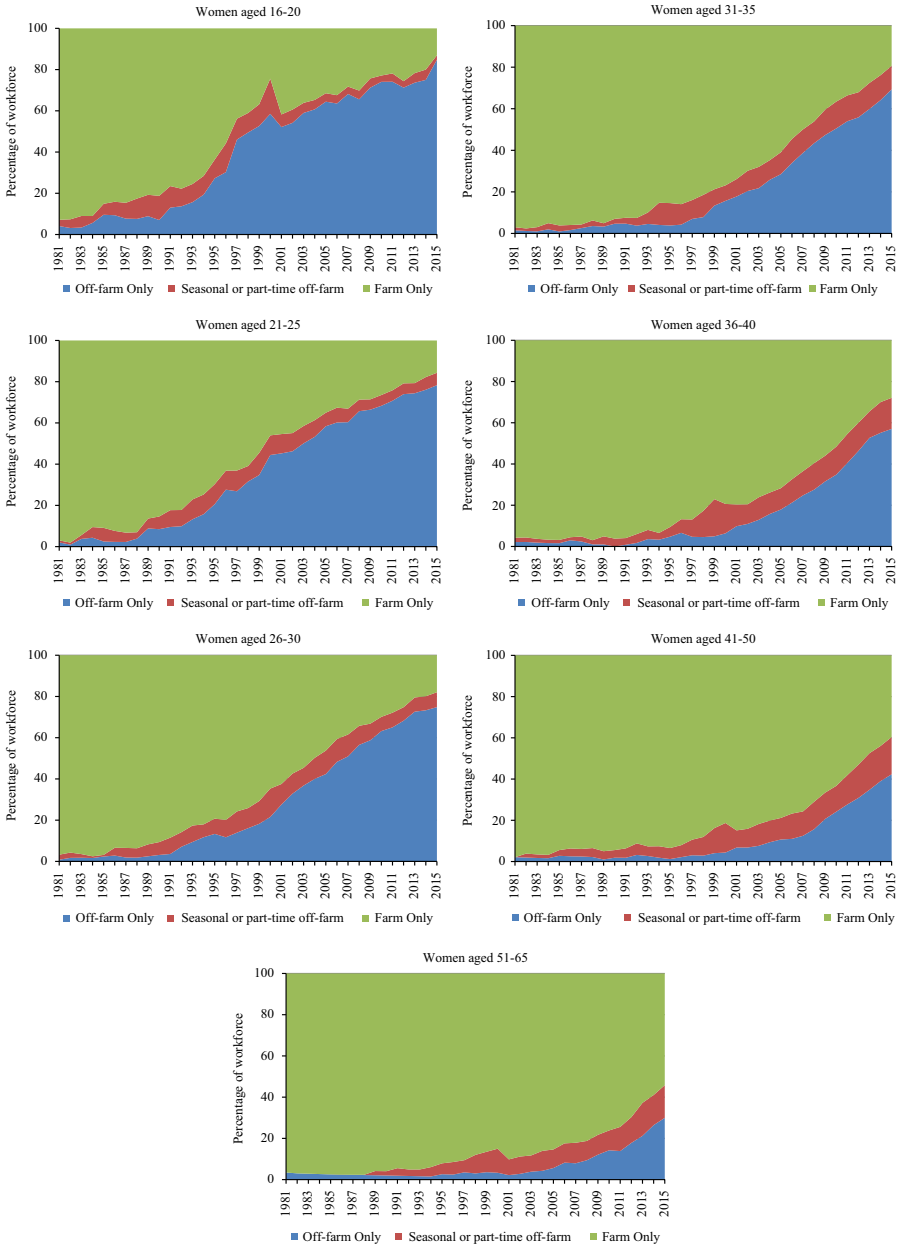


Figure 6. Percentage of rural women labor force engaged in off-farm and on-farm employment by age cohort

Source: Authors' survey

The rates of female participation increased further between 2011 and 2015, but the growth rate was lower than before. In the 16-20-year-old cohort, the rate of participation of women reached 87 percent, very close to the rate of complete sample at 91.5 percent. From 2011 to 2015, the average participation rate of women in the 16-30-year-old cohorts

rose about 9 percentage points, from approximately 78 percent in 2011 to more than 87 percent in 2015. The average participation rates of complete sample in the same cohort also about 9 percentage points. Similarly, the rates of increase of off-farm participation by women in the 30-40-year-old cohorts are higher than the rates of increase of off-farm participation by complete sample in these cohorts.

By economic status of source provinces

The trends that are emerging across China's provinces are also striking and vividly illustrate the changing nature of labor markets and the nation's emerging development path (Figure 7). For example, off-farm participation rates in the richest province in the CNRS our sample, Zhejiang (Figure 7, top panel), are both historically higher and have grown faster than those in other provinces (Figure 7, middle and bottom panels). In 1981, total off-farm

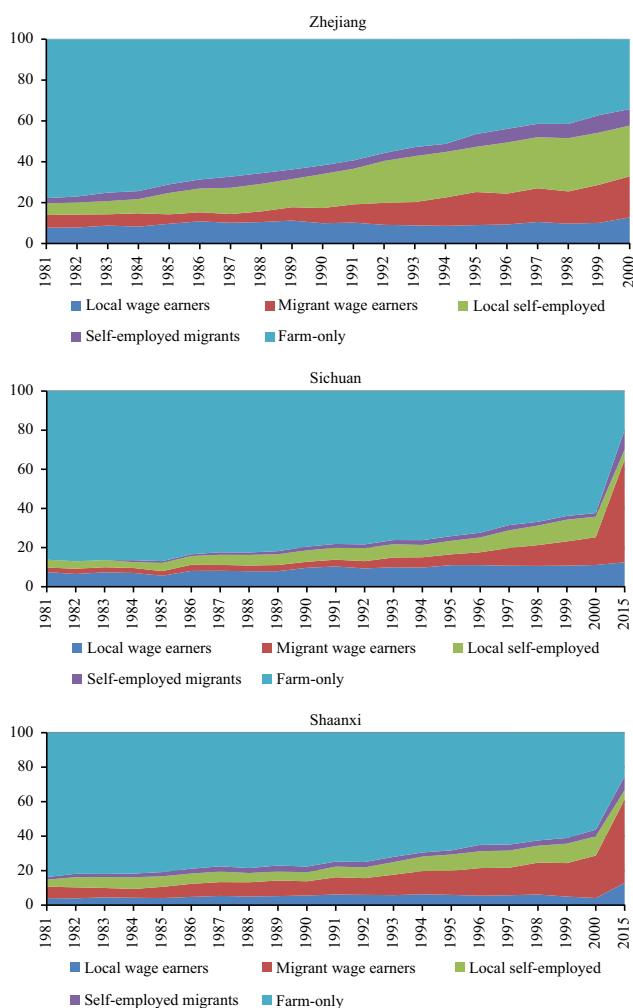


Figure 7. Percentage of rural labor force engaged in off-farm and on-farm employment, by province

Source: Authors' survey

labor participation in Zhejiang was 22 percent, a level well above the national average. By 1990, this number has neared 40 percent, an average increase of 2 percentage points a year in this nine-year period. By 2000, the off-farm participation rates of rural residents across all of Zhejiang, including its poorest southern and western counties, had grown to nearly 65 percent, at a pace slightly faster than the previous period of 2.5 percent and well above that of poorer provinces. In poorer provinces, such as Sichuan and Shaanxi, the two provinces covered by both the CNRS and CRDS surveys, off-farm participation started at a much lower rate in 1981 and grew slowly until 1990. In 1981, the total off-farm labor participation was about 15 percent in these two provinces. After 1990, as migration emerged as the most dominant type of labor activity, labor participation rates in these provinces accelerated and continued into 2015. By 2015, the share of rural labor force employed off-farm has reached 81 percent in Sichuan and 75 percent in Shaanxi.

By sector

Trends by engagement in different sectors of off-farm employment show that over the recent two decades off-farm employment has shifted from primary and secondary industries to tertiary industry. Our CRDS data show that in 1998, 4 percent of off-farm workers gained employment in the primary industry, whereas almost half, or 49 percent, did so in the secondary industry, and the remaining 47 percent did so in the tertiary industry (Table V). By 2015, the share of off-farm workers employed in the primary sector has decreased to less than 3 percent, whereas the share in the secondary industry is down to 38 percent. In contrast, the share employed in the tertiary industry increased to 59 percent.

Year	Primary industry	Secondary industry	Of which 1: manufacturing	Of which 2: construction	Tertiary industry	Of which 1: services, hotels or restaurant
<i>All off-farm workers</i>						
1998	4	49.2	24.5	17	46.8	16.6
2000	3.8	48.5	24.2	16.6	47.7	17.8
2005	3.5	46.9	24.6	14.8	49.7	20.5
2008	3	45.7	24	14.2	51.3	21.2
2010	2.8	43.4	22.2	14.1	53.8	21.5
2012	2.8	42.2	21.1	14.3	55	21.4
2015	2.9	38.1	19.5	13.2	58.9	22.3
<i>Men</i>						
1998	3.8	51.8	19.6	23.3	44.4	16.1
2000	3.8	50.9	18.9	23.2	45.5	17.7
2005	3.5	49.9	19.6	21.4	46.5	20
2008	3.1	49.4	19.4	20.9	47.4	20
2010	2.9	47.9	18.5	20.7	49.2	20.4
2012	2.7	46.7	17.5	20.8	50.5	20.8
2015	2.8	42.6	16.6	19.5	54.5	22.2
<i>Women</i>						
1998	4.3	44	35	3.8	51.9	17.6
2000	4	43.8	35	3.4	52.3	18
2005	3.5	41.2	33.4	2.9	55.3	21.5
2008	2.8	39.1	32.1	2.5	57.9	23.1
2010	2.7	35.6	28.7	2.7	61.6	23.3
2012	2.8	34.3	27.3	3.1	63	22.5
2015	3	30.6	24.1	2.9	66.2	22.5

Table V.
Composition of
off-farm employment
by industry

Source: Authors' survey

Decomposition analysis shows that female off-farm workers demonstrated a more obvious industrial composition than their male counterparts. During the same study period, the share of women off-farm workers engaged in the primary industry has decreased from 4.3 to 3 percent, and the share in the secondary industry decreased from 44 to 31 percent. In contrast, the share of women off-farm workers engaged in the tertiary industry has increased from 52 to 69 percent. Similarly, the share of men off-farm workers engaged in the primary industry has decreased from 3.8 to 2.8 percent, and the share in the secondary industry decreased from 52 to 43 percent. However, the share of men off-farm workers engaged in the tertiary industry has increased from 44 to 55 percent.

Summary of the empirical findings on rural labor markets

According to our household survey data, the rapid increase in off-farm employment that China experienced during the 1980s and 1990s continued and may have even accelerated among certain subgroups during the 2000s and 2010s. The same pattern of the evolution of China's labor market also appears across space. Our analysis shows that the rate of off-farm participation has reached a high level. Interestingly, while there are still tens of millions of rural off-farm workers that live and work outside their own province, by 2011 most of the off-farm workers, especially those over 30 years old, were finding jobs in either their own county or province. However, the picture looks different after 2011. We believe the most important contribution of this section of the paper is revealed by analyzing the labor force participation rates by age cohort. According to our analysis, in 2015, they were: 92 percent of 16-20-year-olds who were not in school; 91 percent of 20-25-year-olds; and 88 percent of 26-30-year-olds. Increasingly, most people in these cohorts are working full-time off-farm.

Our data also reveal that the role of women in the labor force is also changing dramatically. The rise in the participation rates is faster than that of men, although starting from a lower base. In some of the lower-aged cohorts, there is little difference between the participation rates of men and women. One interpretation of this rise in the participation of women is that, as labor markets have become more competitive, the scope for managers to exercise their discriminatory preferences has declined, therefore opening up new employment opportunities for those who had previously not been able to participate. Alternatively, a rise in women's work could have occurred as the types of industries that have a preference for the skills of women have expanded. It is also possible that employers are searching for all types of workers, be they male or female, and since a smaller share of females were employed in the late 1990s and early 2000s, they have been the ones drafted into the labor force most often in recent years. To the extent that working off-farm increases income and status, women have benefited.

Determinants of off-farm employment: the role of change in the wage rate

Consistent with previous literature (Zhao, 1997; Chen and Hamori, 2009; Li *et al.*, 2010; Knight *et al.*, 2011), results from papers based on data from previous waves of the household surveys that we used in this paper show that the size of the household's labor force, gender, and age are important predictors of off-farm participation. Their results also show the importance of human capital, including education, training, and experience, in determining an individual's participation in any off-farm activity (Zhang *et al.*, 2002, 2006; Li *et al.*, 2010).

The role of changing wage rate

In an almost naive way, statistical trends from the literature and aggregated trends from our own data show that there is a clear correlation between occupational choice, namely, self-employed vs wage-earning migration, and the unskilled wage rate. When the unskilled wage was low and stagnant in the 1980s and 1990s, the economic growth in China during

these two decades in general triggered almost equal amounts of expansion of rural labor force participation in the self-employment and wage-earning migration subsectors. After 2000, however, when the unskilled wage rate began to rise, many more individuals in the rural labor force were seen to become engaged in the wage-earning migration subsector than the non-farm, self-employed subsector.

Disaggregated data down to the individual level support this interpretation (Table VI). As seen in the previous subsection, in 2000, the unskilled hourly wage was 3.0 yuan; by 2008 the hourly wage had risen to 5.4 yuan. Moreover, the rise in the unskilled wage rate continued after 2008 to 8.1 yuan in 2011 and further to 10.7 in 2015. Hence, in our sample the real hourly unskilled wage rate rose by 8.8 percent per year between 2000 and 2015. In contrast, the self-employed, while earning more per hour in 2000 at 7.2 yuan per hour and 2008 at 7.4 yuan per hour, saw earnings rise at a much lower rate. Between 2000 and 2008, the growth rate of hourly earnings of the non-farm self-employed was only 0.35 percent per year, or less than one half of 1 percent per year.

From these trends it is clear that it is most likely not only the rising wage rate that may be inducing the shift in trends in self-employment from rising to flat and the shift in trends in wage-earning migration from rising to rising more steeply. Table VI demonstrates that it appears to be the relative changes in the rate of growth of self-employed hourly earnings and the hourly earnings of wage-earning migrants. If we focus on the period of 2000-2008, when wages for both wage-earning migration and self-employment are available, wages between 2000 and 2008 grew at an annual rate that was more than 25 times higher (8.8 vs 0.35 percent).

The role of risk may also be an important determinant of occupational choice over time. In 2000, according to the CNRS 2000, although the hourly earnings of the self-employed were more than twice that of wage-earning migrants, at 7.2 yuan vs 3.0 yuan or 140 percent higher, the standard deviation of the earnings, a measure of risk, was much higher for the self-employed than for wage-earning migrants, at 44.3 vs 2.5. As described in Zhang *et al.* (2006), there were a lot of self-employed, more than 10 percent, who actually lost money in running their enterprises, although on average the self-employed still gained. There were no wage earners that incurred negative incomes.

In 2008, the same high return (earnings or wage)/high risk (standard deviation of earnings or wage) still characterized rural labor markets, but ratios had changed. By 2008, the hourly earnings of the self-employed were only 37 percent higher than those of wage-earning migrants, compared to the 140 percent difference in 2000. Interestingly, although the standard deviation of the earnings of the self-employed were still higher than that of wage-earning migrants, the ratio fell, both because the standard deviation of the earnings of the self-employed fell and the standard deviation of the wage-earning migrants rose. Such a finding is in some sense suggestive of healthy change in self-employment. As the sector has evolved and contracted, there has been a compression of earnings. Markets may have eliminated the very large hourly earnings that some individuals earned in 2008. At the same time, firms that earned higher profits have stayed in business and there has been an elimination of some, but not all, of the loss-making firms.

Table VI.
Actual hourly earnings comparison between wage earners and self-employers (yuan per hour)

	2000	2004	2007	2008	2011	2015	Annual growth rate 2000-2015, %
Self-employer	7.2 (44.3)	—	—	7.4 (21.4)	16.4 (99.3)	17.1 (108.7)	5.9
Wage earner	3.0 (2.5)	3.6 (5.1)	5.3 (21.0)	5.4 (7.3)	8.1 (8.5)	10.7 (11.1)	8.8

Source: Authors' survey

Conclusions

The contribution of off-farm employment to farmers' income and welfare has been well-documented in the literature (Parish *et al.*, 1995; Rozelle, 1996; Li, 1999; Du *et al.*, 2005; OECD, 2005; Wang and Cai, 2006; Cai and Wang, 2009; World Bank, 2007; Zhu and Luo, 2008; Zhu and Luo, 2010; Jia *et al.*, 2017). Remittances sent home by migrants not only help rural households to build up their assets, but also provide funds for them to invest in self-employed businesses. Migration plays an important role in facilitating the growth and poverty reduction of source communities (Rozelle *et al.*, 1999; Giles, 2006; Huang *et al.*, 2011). Moreover, previous studies show that rural labor migration accounted for approximately 1620 percent of the GDP increase in the first two decades after China's reform and opening-up in 1978 (World Bank, 1997; Cai and Wang, 1999; Jia *et al.*, 2017).

Over the past four decades, the relationship between the urban workforce and the off-farm rural labor force has been improving, from almost complete segregation to ever-increasing interactions in the direction of integration. However, significant segregation remains between the two labor forces (Knight and Song, 1999, 2005; Lee and Meng, 2010). In part due to the segregation, the substitution between migrant and urban workers is quite limited, and their wage determinations are different (Knight and Li, 2005; Knight and Yueh, 2009). This may help to explain why only a few studies have examined the interactions between these two labor markets. Of the existing literature on this topic, Knight *et al.* (2011) show that, although the rural and urban laborers are not strongly substitutable, the demand for laborers in the urban economy would upgrade the profession of the urban laborers. This would make room for low-skilled job openings, which the pool of migrant workers from rural areas could fill in. Lu *et al.* (2015) show that off-farm employment of rural laborers acts as a buffer or pool for the urban labor market in macroeconomic cycles. What impacts will these interactions would have on China's economy, society, especially on the labor force *per se* remains a topic for future research.

This paper presents and analyzes the evolution of off-farm employment of the rural labor force in China since the start of the reform and opening-up to the present. Using panel data from two household-level surveys conducted by the authors themselves, we are able to construct a comprehensive panel of off-farm employment by individual rural laborers in China, including its decomposition into a series of components from 1981 to 2015. Our paper provides evidence of the rapid increase in rural labor activities over the whole period. Most notably, we find that a rapid rise in off-farm employment has continued even until after 2008 and into the mid-2010s, which is a time when some feared that macroeconomic conditions might keep rural residents on the farm or drive them back to the farm. In our disaggregation of labor market trends, we show that labor markets are acting consistently with an economy that is in transition from being dominated by agriculture to being dominated by other forms of production and with a population that is consistently becoming more urban.

Our analysis illustrates that labor markets have allowed migration to become the dominant form of off-farm activity, have become increasingly dominated by young workers, have expanded most rapidly in economies or areas that are relatively well-off, and have drawn on portions of the population that had been excluded previously from participation, such as women. Rural workers also show signs of specialization, especially when we examine their working behavior by age group and location of their village. We also find that the share of the rural labor force that is self-employed is falling and this is at least in part due to the narrowing earnings-wage gap that has occurred as the wage rate rose during 2000s. Migration has surpassed self-employment as the number one subsector for employment of the rural population during the past several years. As long as the wage continues to rise, this trend will likely continue.

We also show that young workers are much less likely to work on the farm than older workers today. Perhaps more telling, young workers in 2015 participated in farming far less

frequently than workers in 2000, 1990, and 1981 in the same age cohorts. Our findings show that many of the trends consistent with the emergence of labor markets that can transform China's economy are becoming stronger. Over time and across space, younger and more educated workers are working off the farm. Barriers to entry are falling for women. If China continues to change as it has over the past almost 40 years and as it has in its better-off regions, we expect rural residents to continue their shifts from rural to urban markets and from agriculture to industry. Indeed, all of these are consistent with optimistic future development in China, at least in the case of its labor markets.

Although rural labor has flowed relatively freely from agriculture to industry and from rural areas to urban areas, the process of shifting lives, homes, and families has been difficult. A core aspect of the challenge migrants face is found in China's *hukou* household registration system (Naughton, 2007), which classifies China's citizens as either rural or urban residents. Without an urban *hukou*, migrants and their families have limited access to urban public services, including housing, healthcare, social security, and above all, education. As a result, life in the cities can be immensely challenging for millions of migrant families. The status of left-behind/migrant children and elderly, specifically their well-being in terms of parenting, physical health, nutrition, and education, has drawn attention from many researchers from different fields (Chen and Feng, 2013; Lai *et al.*, 2014; Zhao *et al.*, 2014; Ye and Lu, 2011; Zhou *et al.*, 2015). These are issues that we cannot afford to neglect in future policies.

Where to educate their children? What is the impact of parental migration on the education of their children? These are salient questions faced by millions of parents from rural areas. Answers to these questions may have far-reaching policy implications. However, insight from the literature is mixed. Some studies find that parental migration has a negative impact on the school performance of children (Zhao *et al.*, 2014). In contrast, Zhou *et al.* (2015) find that left-behind children performed as well as or better than children living with both parents. However, both groups of children performed poorly on most of these indicators. Lai *et al.* (2014) demonstrate that given access to better educational resources in public schools in the urban city, migrant students may be able to significantly improve their performance. Either way, we recommend that special programs designed to improve health, nutrition, and education among left-behind children be expanded to cover all children in rural China.

Notes

1. 52 percent, the number of migrant workers (nongmingong shuliang) reported by the Migrant Worker Monitoring Survey 2009 (225.42 Million) divided by the number of employed rural labor force (nongcun jiuye renyuanshu) published by China Labor Statistics 2013 (434.61 Million).
2. Clearly, the shares of off-farm employment of the rural labor force from the CNRS and the CRDS are not exactly the same for the same year, but the patterns revealed by the two panel data sets are quite similar to each other. As has been alluded to in the data section, one of the main reasons might be the fact that the sample provinces are not exactly the same.

References

- Au, C.C. and Henderson, J.V. (2006), "How migration restrictions limit agglomeration and productivity in China", *Journal of Development Economics*, Vol. 80 No. 2, pp. 350-388.
- Belton, F. and Yang, D. (2006), "Problems of China's rural labor markets and rural-urban migration", *Chinese Economy*, Vol. 39 No. 3, pp. 6-25.
- Benjamin, D. and Brandt, L. (1997), "Land, factor markets, and inequality in rural China: historical evidence", *Explorations in Economic History*, Vol. 34 No. 4, pp. 460-494.
- Cai, F. and Wang, D. (1999), "The sustainability of China's economic growth and the contributions of labor", *Economic Research Journal*, No. 10, pp. 62-68 (in Chinese edition).

- Cai, F. and Wang, M. (2009), "Why labor migration has not reduced the income gap between urban and rural areas", *Economics Perspective*, No. 8, pp. 4-10 (in Chinese edition).
- Cao, Y. and Liu, Z. (2015), "Poverty and health: children of rural-to-urban migrant workers in Beijing", *China Social Indicators Research*, Vol. 123 No. 2, pp. 459-477.
- Che, Y., Zhang, Y. and Yu, L. (2015), "The development of farm labor market in rural China", *China Agricultural Economic Review*, Vol. 7 No. 2, pp. 280-302.
- Chen, G. and Hamori, S. (2009), "Solution to the dilemma of the migrant labor shortage and the rural labor surplus in china", *China & World Economy*, Vol. 17 No. 4, pp. 53-71.
- Chen, X. (1985), "The evolution of the China's economy and the development of the township village enterprises", *Economic Research Journal*, No. 10, pp. 31-37 (in Chinese edition).
- Chen, Y. and Feng, S. (2013), "Access to public schools and the education of migrant children in China", *China Economic Review*, Vol. 26 No. 1, pp. 75-88.
- Cook, S. (1999), "Surplus labour and productivity in a Chinese agriculture: evidence from household survey data", *Journal of Development Studies*, Vol. 35 No. 3, pp. 16-44.
- De Brauw, A. and Rozelle, S. (2008a), "Reconciling the returns to education in off-farm wage employment in rural China", *Review of Development Economics*, Vol. 12 No. 1, pp. 57-71.
- De Brauw, A. and Rozelle, S. (2008b), "Migration and household investment in rural China", *China Economic Review*, Vol. 19 No. 2, pp. 320-335.
- De Brauw, A., Huang, J., Rozelle, S., Zhang, L. and Zhang, Y. (2002), "The evolution of China's rural labor markets during the reforms", *Journal of Comparative Economics*, Vol. 30 No. 2, pp. 329-353.
- Du, Y., Park, A. and Wang, S. (2005), "Migration and rural poverty in China", *Journal of Comparative Economics*, Vol. 33 No. 4, pp. 688-709.
- Fan, Z. and Hertel, T.W. (2015), "Labor market distortions, rural-urban inequality, and the opening of People's Republic of China's economy", *Economic Modelling*, Vol. 23 No. 1, pp. 76-109.
- Giles, J. (2006), "Is life more risky in the open household risk-coping and the opening of China's labor markets", *Journal of Development Economics*, Vol. 81 No. 1, pp. 25-60.
- Glauben, T., Herzfeld, T. and Wang, X.B. (2008), "Labor market participation of Chinese agricultural households: empirical evidence from Zhejiang province", *Food Policy*, Vol. 33 No. 4, pp. 329-340.
- Huang, J., Gao, L. and Rozelle, S. (2012), "The effect of off-farm employment on the decisions of households to rent out and rent in cultivated land in china", *China Agricultural Economic Review*, Vol. 4 No. 1, pp. 5-17.
- Huang, Z., Huang, J., Zhi, H., Rozelle, S. and Giles, J. (2011), "The impact of the global financial crisis on off-farm employment and earnings in rural China", *World Development*, Vol. 39 No. 5, pp. 797-807.
- Jia, P., Du, Y. and Wang, M. (2017), "Rural labor migration and poverty reduction in China", *China & World Economy*, Vol. 25 No. 6, pp. 45-64.
- Johnson, D.G. (1995), "Is agriculture a threat to China's growth?", Working Paper No. 95:04. Chicago: Office of Agricultural Economics Research, University of Chicago, Chicago, IL.
- Knight, J. and Li, S. (2005), "Wages, profitability and labour market segmentation in China", *China Economic Review*, Vol. 16 No. 3, pp. 2005-2028.
- Knight, J. and Song, L. (1999), *The Rural-urban Divide. Economic Disparities and Interactions in China*, Oxford University Press, Oxford.
- Knight, J. and Song, L. (2001), "New urban labor market study", paper presented at CERDI Conference on Emergence of Markets in China, Claremont-Ferrandp.
- Knight, J. and Song, L. (2005), *Towards a Labour Market in China*, Oxford University Press, Oxford.
- Knight, J. and Yueh, L. (2009), "Segmentation or competition in China's urban labour market", *Cambridge Journal of Economics*, Vol. 33 No. 1, pp. 79-94.
- Knight, J., Deng, Q. and Li, S. (2011), "The puzzle of migrant labour shortage and rural labour surplus in China", *China Economic Review*, Vol. 22 No. 4, pp. 585-600.

- Lai, F., Liu, C., Luo, R., Zhang, L., Ma, X., Bai, Y., Sharbono, B. and Rozelle, S. (2014), "The education of China's migrant children: the missing link in China's education system", *International Journal of Educational Development*, Vol. 37 No. 37, pp. 68-77.
- Lee, L. and Meng, X. (2010), "Why don't more Chinese migrate from the countryside? Institutional constraints and the migration decision", in Meng, X., Manning, C., Li, S. and Effendi, T. (Eds), *The Great Migration: Rural-Urban Migration in China and Indonesia*, Edward Elgar Publishing Ltd, MA, pp. 23-46.
- Li, S. (1999), "The labor migration, income growth and distribution in rural China", *Social Sciences in China*, No. 2, pp. 16-33 (in Chinese edition).
- Li, S. and Démurger, S. (2010), "The economic situation of rural migrant workers in China", *China Perspectives*, Vol. 4 No. 84, pp. 4-15.
- Li, Q., Huang, J., Luo, R. and Liu, C. (2013), "China's labor transition and the future of China's rural wages and employment", *China & World Economy*, Vol. 21 No. 3, pp. 4-24.
- Li, X., Liu, C., Luo, R., Zhang, L. and Rozelle, S. (2010), "The challenges facing young workers during rural labor transition", *China Agricultural Economic Review*, Vol. 2 No. 2, pp. 185-199.
- Liu, S., Carter, M. and Yao, Y. (1998), "Dimensions and diversity of property rights in rural China: dilemmas on the road to further reform", *World Development*, Vol. 26 No. 10, pp. 1789-1806.
- Lohmar, B. (1999), "Land tenure insecurity and labor allocation in rural China", paper prepared for presentation at the 1999 Annual Meeting of the American Agricultural Economics Association in Nashville, TN, August 9-12.
- Lu, F., Liu, X., Jiang, Z. and Zhang, J. (2015), "The labor market and China's macro-economic cycles: with a discussion of Okun's law in China", *Social Sciences in China*, No. 12, pp. 69-89+206 (in Chinese edition).
- Mallee, H. (2000), "Agricultural labour and rural population mobility: some observations", in Loraine, A. and Zhao, Y. (Eds), *Rural Labor Flows in China*, University of California Press, Berkeley, CA, pp. 34-66.
- Maurer-Fazio, M. (1999), "Earning and education in China's transition to a market economy—survey evidence from 1989 and 1992", *China Economic Review*, Vol. 10 No. 1, pp. 7-40.
- Meng, X. (1990), "The rural labor market", in William, A. and Lin, Q. (Eds), *China's Rural Industry: Structure, Development, and Reform*, Oxford University Press, New York, NY, pp. 299-322.
- Meng, X. (1996), "Regional wage gap, information flow, and rural-urban migration", paper presented at the 1996 Conference on Rural–Urban Labor Migration, Beijing, pp. 25-27.
- Meng, X. (2012), "Labor market outcomes and reforms in China", *Journal of Economic Perspectives*, Vol. 26 No. 4, pp. 75-101.
- Mohapatra, S., Rozelle, S. and Goodhue, R. (2007), "The rise of self-employment in rural China: development or distress?", *World Development*, Vol. 35 No. 1, pp. 163-181.
- NBS (2009), *China Statistical Yearbook*, China Statistics Press, Beijing (in Chinese edition).
- NBS (2016a), *China Statistical Yearbook*, China Statistics Press, Beijing (in Chinese edition).
- NBS (2016b), "Survey report on migrant workers' in 2016", Beijing, available at: www.stats.gov.cn/tjsj/zxfb/201704/t20170428_1489334.html (accessed July 20, 2017).
- Naughton, B. (2007), "The Chinese economy: Transitions and growth", MIT Press, Cambridge, MA.
- OECD (Organization for Economic Co-operation and Development) (2005), *Migration, Remittances and Development*, OECD Publishing, Paris.
- Parish, W.L., Zhe, X. and Li, F. (1995), "Nonfarm work and marketization of the Chinese countryside", *The China Quarterly*, Vol. 143 No. 143, pp. 697-730.
- Rozelle, S. (1991), *The Economic Behavior of Village Leaders in China's Reform Economy*, Cornell University, Ithaca, NY.
- Rozelle, S. (1996), "Stagnation without equity: patterns of growth and inequality in China's rural economy", *The China Journal*, Vol. 35 No. 35, pp. 63-92.

- Rozelle, S., Taylor, J.E. and de Brauw, A. (1999), "Migration, remittances, and agricultural productivity in China", *American Economic Review*, Vol. 89 No. 2, pp. 287-291.
- Rozelle, S., Li, G., Shen, M., Hughart, A. and Giles, J. (1999), "Leaving china's farms: survey results of new paths and remaining hurdles to rural migration", *The China Quarterly*, Vol. 158 No. 158, pp. 367-393.
- Song, H., Huang, H. and Liu, G. (2002), "An analysis of the policy of the flow of rural labor forces", *Management World*, No. 5, pp. 55-65 (in Chinese edition).
- Su, S. (1989), "On China's labor market", unpublished manuscript, Department of Sociology, Cornell University, Ithaca, NY.
- Wang, D. and Cai, F. (2006), "Migration and poverty alleviation in China", *China Labor Economics*, Vol. 3 No. 3, pp. 46-70 (in Chinese edition).
- Wang, X., Huang, J., Zhang, L. and Rozelle, S. (2011), "The rise of migration and the fall of self employment in rural China's labor market", *China Economic Review*, Vol. 22 No. 4, pp. 573-584.
- Wang, X., Han, L., Huang, J., Zhang, L. and Rozelle, S. (2016), "Gender and off-farm employment: evidence from rural China", *China & World Economy*, Vol. 24 No. 3, pp. 18-36.
- World Bank (1997), *China 2020: Development Challenges in the New Century*, World Bank, Washington, DC.
- World Bank (2007), *World Development Report 2008: Agriculture for Development*, World Bank, Washington, DC.
- Yang, D. and Zhou, H. (1996), "Rural-urban disparity and sectoral labor allocation in China", Research Papers in Asian Pacific Studies. Duke University, Durham, NC.
- Yang, J., Wang, H., Jin, S., Chen, K.Z., Riedinger, J. and Chao, P. (2016), "Migration, local off-farm employment, and agricultural production efficiency: evidence from China", *Journal of Productivity Analysis*, Vol. 45 No. 3, pp. 247-259.
- Ye, J. and Lu, P. (2011), "Differentiated childhoods: impacts of rural labor migration on left-behind children in China", *The Journal of Peasant Studies*, Vol. 38 No. 2, pp. 355-377.
- Zhang, L., de Brauw, A. and Rozelle, S. (2004), "China's rural labor market development and its gender implications", *China Economic Review*, Vol. 15 No. 2, pp. 230-247.
- Zhang, L., Huang, J. and Rozelle, S. (2002), "Employment, emerging labor markets, and the role of education in rural China", *China Economic Review*, Vol. 13 No. 2, pp. 313-328.
- Zhang, J., Zhang, L., Rozelle, S. and Boucher, S. (2006), "Self-employment with Chinese characteristics: the forgotten engine of rural China's growth", *Contemporary Economic Policy*, Vol. 24 No. 3, pp. 446-458.
- Zhao, Q., Yu, X., Wang, X. and Glauben, T. (2014), "The impact of parental migration on children's school performance in rural China", *China Economic Review*, Vol. 31 No. 4, pp. 43-54.
- Zhao, Y. (1997), "Rural labor's migration and the role of education: evidence from Sichuan province", *Economic Research Journal*, No. 2, pp. 37-42+73 (in Chinese edition).
- Zhi, H., Huang, Z., Huang, J., Rozelle, S. and Mason, A.D. (2013), "Impact of the global financial crisis in rural China: gender, off-farm employment, and wages", *Feminist Economics*, Vol. 19 No. 3, pp. 238-266.
- Zhou, C., Sylvia, S., Zhang, L., Luo, R., Yi, H., Liu, C. and Rozelle, S. (2015), "China's left-behind children: impact of parental migration on health, nutrition, and educational outcomes", *Health Affairs*, Vol. 34 No. 11, pp. 1964-1971.
- Zhu, N. and Luo, X. (2008), *The Impact of Remittances on Rural Poverty and Inequality in China*, World Bank Publications, Washington, DC, available at: <http://documents.worldbank.org/curated/en/325741468217165097/pdf/wps4637.pdf> (accessed November 21, 2017).
- Zhu, N. and Luo, X. (2010), "The impact of migration on rural poverty and inequality: a case study in China", *Agricultural Economics*, Vol. 41 No. 2, pp. 191-204.

Further reading

- Belton, F. and Wang, X. (2005), "Returns to schooling in China under planning and reform", *Journal of Comparative Economics*, Vol. 33 No. 2, pp. 265-277.
- Chen, X., Huang, Q., Rozelle, S., Shi, Y. and Zhang, L. (2009), "Effect of migration on children's educational performance in rural China", *Comparative Economic Studies*, Vol. 51 No. 3, pp. 323-343.
- Kong, T., Meng, X. and Zhang, D. (2010), "The global financial crisis and rural-urban migration", in Ross, G., Song, L. and Wing, T. (Eds), *China: The Next Twenty Years of Reform and Development*, Brookings Institution Press, Washington, DC, pp. 241-268.
- Riskin, C., Zhao, R. and Li, S. (2001), *China's Retreat from Equality: Income Distribution and Economic Transition*, M.E. Sharpe, New York, NY.
- Zhang, Y. and Huang, Z. (2008), "A literature review of China's rural labor migration", *China Rural Survey*, No. 1, pp. 69-79, (In Chinese Edition).
- Zhang, Z. and Song, H. (2002), "Highlights from the international symposium on rural labor migration in China", *China Rural Survey*, No. 1, pp. 75-79, (In Chinese Edition).

About the authors

Dr Linxiu Zhang is a Professor and Director at the Center for Chinese Agricultural Policy, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences. Her research is focused on rural poverty, rural labor market development, community governance, public investments, and the economics of rural education and health care.

Mr Yongqing Dong is a PhD Candidate at the University of Chinese Academy of Sciences; Center for Chinese Agricultural Policy, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences. His research interests are development Economics, labor economics and health economics.

Dr Chengfang Liu is an Associate Professor with Tenure at the China Center for Agricultural Policy, School of Advanced Agricultural Sciences, Peking University. She obtained her PhD Degree in Agricultural and Resource Economics from the University of California (Davis). Her research is mainly focused on public goods and services provision, rural development, and rigorous impact assessments in areas of education, health and nutrition policies in rural China. Chengfang Liu is the corresponding author and can be contacted at: cflu.ccap@pku.edu.cn

Dr Yunli Bai is an assistant professor at the Center for Chinese Agricultural Policy, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences. Her research interests include rural public investment, rural poverty and rural development.