Self-Employment in Rural China: Its Development, Characteristics, and Relation to Income

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ABSTRACT

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The changes in the employment structure in rural China are studied with a focus on off farm self-employment. Data from the China Household Income Project surveys covering the same 14 provinces from 1988 to 2018 are used. We find that the proportion of adults in rural China with self-employment as their primary form of off-farm employment increased from only 2 percent in 1988 to 11 percent in 2013, with no further increases through 2018. In 1988 and 1995, the rate of self-employment was highest in the eastern region, but thereafter, this regional pattern disappeared. The probability of being self-employed in rural China was higher among married males than among unmarried persons. Having had a migration experience increases the probability of being self-employed. We also report that since 1995, self-employed households have a higher average income than other categories of households. Based on estimates of income functions, we conclude that the income premium from being self-employed increased rapidly from 1988 to 1995 to become remarkably large when only a few adults were self-employed. However, as a larger fraction of the rural population has entered self-employment, the payoff from being self-employed has rapidly diminished, although in 2018, it was nevertheless still substantial.

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1 Introduction

After thirty years of economic reforms and rural-urban migration, the structure of employment in rural China has fundamentally changed during the period when the income of households has increased rapidly. From a situation in which a very large proportion of rural households and their members were predominately involved in self-subsistence agriculture, a majority have moved into off-farm activities. Some have become self-employed and an even larger number have become wage earners.

In this paper, we take a fresh look at the developments in the employment situation in rural China with a focus on off farm self-employment (in the following referred to as "self-employment"). The following research questions are asked: How has the rate of self-employment in rural China changed from 1988 to 2018? How do various characteristics relate to the probability of a person being self-employed? We also ask: How high are the incomes of the self-employed households and does it pay to be self-employed? Relating to the last question, we are interested in whether and how the payoff from being self-employed has changed.

In this study, we use household data collected in a similar manner across no less than 14 rural provinces for the years 1988, 1995, 2002, 2013 and 2018. For each of these years, we calculate the proportion of self-employed individuals in the adult population as well as the proportion of wage earners and of farmers. The resulting information provides a picture of the changes that occurred during a period of three decades. We also estimate multivariate models for the years 1995 and 2018 in which the probability of being self-employed, a wage earner alternatively a farmer is related to a number of factors. Furthermore, we investigate the average income among self-employed households and place it in relation to the average income of other categories of households. Finally, we estimate income functions to investigate the size of the payoff from being self-employed and whether this benefit had changed from 1988 and 2018.

To the best of our knowledge, this work makes several contributions to the literature on self-employment in rural China. First, no other study that we are aware of has covered self-employment and wage employment in the entirety of rural China over such a long period. Our latest year of study, 2018, is more recent than the latest year covered in the studies we are aware of. Second, we specify and estimate probability models for adult persons to understand the determinants of three alternative employment states: self-employment, being a wage earner and farming. Our third contribution relates to the knowledge of income among the self-employed. We document how much income self-employed households on average receive relative to other categories of households and also

2

estimate income functions. These estimates allow for an understanding of how the payoff from being self-employed has changed over a period when, as we shall see, self-employment expanded rapidly.

The findings of the study are as follows: The proportion of adults with self-employment as their primary off-farm job in rural China increased from no more than 2 percent in 1988 to as high as 12 percent in 2013. This rapid growth in self-employment took place in the shadow of a rapid expansion of wage employment and the decline of farm employment. However, between 2013 and 2018, no further increase in the proportion of self-employed individuals took place.

We discuss the factors that are behind the (perhaps temporary) halt in the increase in self-employment in rural China. One factor is sociodemographic changes in rural China: the large outmigration of young adults in combination with a rapid drop in the birth rate has led to the aging of the population. Between 2013 and 2018, the share of the rural population in China decreased by 6 percentage points (from 46 percent to 40 percent). Even more rapid was the numerical decrease in the rural population within the entire population, of employed individuals, as it decreased by approximately 12 percent (from 387 million in 2013 to 342 million in 2018). [2] Given that our sample is nationally representative, applying our estimates yields an estimate of the size of the self-employed population in rural China: approximately 42 million people in 2013 and 40 million in 2018. Another factor behind the halt in the expansion of the rate of self-employment in rural China is most likely the relatively recent public policy measures that have made farming less unattractive.

We find an inverted U-shaped relationship between age and the probability of being self-employed. We also find that the probability of being self-employed in rural China is higher among married males than among unmarried persons. In 1988, there was clear spatial variation in the proportion of self-employed individuals, with the highest rates among people living in the eastern region of China, which was the first area to open to the other countries. However, this spatial pattern has disappeared, as during the following years, self-employment expanded rapidly into central and western China. We report that in 2018, having migration experience increased the probability of being self-employed. We also report that a higher level of education as measured by years of

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[2] As defined by the National Bureau of Statistics, Rural Statistical Year book of China, 2019 people employed in rural China refers to those who are older than 16 (with no upper age limit), who often participate in production and business and who obtain payment. This definition is slightly different from the one used in this paper, mainly in terms of age range.

schooling increases the probability that a person is a wage earner and decreases the probability that he or she is a farmer, but level of education is not related to the probability of being self-employed.

In this paper, we report that since 1988 self-employed households have a higher average income than other categories of households. The income premium for being self-employed was remarkably large in 1988 when rather few rural Chinese individuals had taken the step into self-employment. However, as a larger fraction of the rural population has entered self-employment, the payoff from being self-employed has rapidly diminished, although in 2018, it was nevertheless still substantial.

2 China's self-employed population in the literature

At least three different strands of literature are relevant to our research questions. One is related to the broader framework of rural development, often taking the well-known Lewis model as the point of departure (Lewis 1954; see also Gollin 2014). In this model, the economy consists of two sectors, the 'modern' (capitalist) and the 'traditional' (subsistence) sectors. The modern sector includes industries using capital and technology that can be advanced. Workers have different levels of qualifications, and their wages are influenced by demand and supply. The traditional sector employs farmers, handicraft workers, petty traders and domestic servants who live near the subsistence level, as the supply of unqualified workers is "unlimited".

Such a description is a good representation of the economic situation in many developing countries. Visitors can observe the existence of firms using modern techniques and employing workers with varying qualifications, some of whom are well-paid, side by side with traditional economic activities, where those employed live on meager incomes. It should be no doubt that central elements of the Lewis model apply to the Chinese context, as has been observed for many years Agriculture had the character of self-subsistence, and there was limited economic activity during slack seasons.

Economic development in the Lewis framework takes place as employment in the modern sector increases at the expense of employment in the traditional sector. While increased labor demand in a growing modern sector can lead to increased real earnings, this is not the case in the traditional sector as long as the unlimited supply of workers places downward pressure on the wage. It is thus possible for such an economy to compete in the international market for goods by selling products manufactured largely by less qualified workers at low costs. In

addition to the presence of this mechanism, China's economic development during those years also most likely benefited from the country's favorable demographic composition (see Cai and Wang 2005).

China's economic transformation started in the rural regions in the late 1970s, as the household contracted responsibility system replaced the communes. The centrally planned economy gradually gave way to market allocation. The private economy began to exist legally, and rural residents started to run their own businesses. As a consequence, agricultural productivity increased. (Taylor 1988) Restrictions on rural-urban migration were eased, and starting in 1984, it became possible for people with a rural *hukou* (resident status) to work in cities. Due to the very large earnings differential between rural and urban areas, thousands of rural residents rushed to urban areas, looking for jobs. As it was rather difficult to convert their *hukou* status, most migrants returned to their rural hometowns during the harvest season.

However, once the supply of less qualified workers has dried up, the downward pressure on wages disappears, and thereby, the drivers of economic growth are gone. To sustain economic growth after what many economists refer to as "the Lewis turning point", other mechanisms are required: technological development, investments in education, etc. From this perspective, it is understandable that several authors have addressed the question of whether China has passed the Lewis turning point (see Athukorala and Wei 2017).

One contribution to this literature is Zhang et al. (2011), who analyzed a survey from Gansu Province and data from a village-level survey conducted in Jiangsu, Hebei, Shaanxi, Jilin, and Sichuan Provinces in 2005 and 2008. The results showed a clear trend of increases in the rural real wage rate since 2003. On the other hand, Golley and Meng (2011) presented evidence derived from different data sources on urban workers, migrant workers and rural workers from 2000 to 2009. Their findings showed that during that time, rural China was not running out of surplus labor. According to Knight et al. (2011), who used CHIP data for 2002 and 2007, China's particular institutional framework explains why, on the one hand, it is possible to observe rising real wages among migrants while on the other hand, there is still a pool of surplus labor in rural China.

On the basis of the reasoning above, we expect to find that during the years we study (1988 to 2018), rural China saw a rapid reduction in the proportion of workers employed in agriculture and instead saw increases in wage employment and self-employment. We also expect to find that a household's movement out of agriculture led to a higher income. However, the categories used in the Lewis model as described above do not fully match the categories we use. While it is true that most people who have traditionally been involved in agriculture in China

have been active in self-subsistence production, in recent years, China has also experienced productivity growth in agriculture, which has become more commercialized. This means that the term "traditional sector" is not fully appropriate for describing the entire Chinese agricultural sector during all years here studied.[3]

The second strand of literature addresses the characteristics of Chinese rural self-employed individuals.[4] The modern history of self-employment can be traced to the development of township and village enterprises (TVEs) in rural China. TVEs developed rapidly from 1.52 million units in 1978 to 20.03 million units in 1998, providing jobs to over 100 million surplus rural laborers (National Bureau of Statistics 1999). Research from this period indicates that village cadres often held the right to allocate resources in their villages and were more likely than others to start a business (Zhou 1995). However, due to their characteristics and the reform of property rights, TVEs have become less important since 2000. The Chinese government has introduced measures to encourage entrepreneurship, and an increasing number of rural residents have turned to trade activities or to growing vegetables, fruit and grains for sale (Wang 2002; Guo 2006).

A relatively early paper on the characteristics of self-employment during its initial period is Mohapatra et al. (2007), who analyzed panel data on 610 households from six provinces for the period 1981 to 2000. The results showed that there had been a rapid increase in self-employment during the period studied and that self-employment in rural China at that time was a sign of development, not distress. The authors also found that the pattern of transition into self-employment was higher in the richer, more advanced region of Zhejiang than in the other regions studied. This finding suggests that the importance of self-employment would continue to increase after the period studied. However, using the same panel but for the period 2000 to 2008, Wang et al. (2011) stressed that by 2000, those who left agriculture were migrating out for work, not shifting to self-employment. Parallel to this, Zhang et al. (2017) show that political advantage was no longer a factor that increased the probability of being self-employed but was still a factor that increased the probability of being a wage-earner.

[3] Several studies have dealt with the importance of technological and institutional changes in Chinese agriculture. One example is Huang and Rozelle (1996), who used provincial data from 13 rice growing provinces from 1975 to 1990. Wang et al. (2017), in a study based on data from 1999 to 2008 covering slightly less than 1 200 provincial households show that specialization has taken place on farms.

[4] There are also studies on the urban self-employed, see, for example, Yueh (2009) and Li and Goetz (2019).

A characteristic of rural-to-urban migration in China is that its importance differs across locations and is often temporary. Upon returning, some migrants move into self-employment. That such a link exists has been shown by Démurger and Xu (2011), who analyzed a rural household survey conducted in 2008 in a county in Anhui Province, known for being the origin of a disproportionately large number of migrants. The authors found that returning migrants were more likely to be self-employed than non-migrants and that remitted savings and the frequency of job changes during migration increased the likelihood of returning migrants becoming self-employed.

A study similar to ours is Xiao and Wu (2020), who used the 2010 wave of the China Family Panel Study to study the determinants of self-employment among rural inhabitants aged 16 to 60 years. Among 11 842 individuals in the labor force, 9 percent were classified as self-employed. The authors estimated a probit model in which self-employment status was contrasted with other persons in the labor force. They found among other results, that health status as well as level of education increased the probability of being self-employed. Furthermore, among men, being married increased the probability of being self-employed.

A third strain of literature that relates to our study deals with elites in rural China and is mainly found in the field of sociology. It deals with income among self-employed individuals and among cadres. It is inspired by Nee (1989), who defined the following categories of households: "self-employed", "cadre", "self-employed and cadre" and "nonelite". Using data on approximately 600 households collected in two counties in Xiamen, which is in eastern China, an income function analysis was performed. The results indicated a positive payoff from being self-employed as well as from being a self-employed and cadre household. A further analysis of income changes using the same data resulted in similar conclusions (Nee 1991). Later, similar analyses of rural China using larger datasets obtained from many provinces also provided similar results (see Nee 1996; Parish and Michelson 1996).

Further studies in this vein include Walder (2002), who analyzed 3 000 households living in 100 villages all over China in 1995. This study found, for example, that the payoff from being an entrepreneur declined with the importance of wage employment in the local economy. The same data were further analyzed by Walder and Zhao (2006) by redefining the household categories studied. Working in the same tradition, Gustafsson and Ding (2012) used data from the 1995 and 2002 China Household Income Project (CHIP). Those authors also studied the route to becoming a self-employed household and a cadre household, finding that formal education was more important for the latter than the former. This investigation also found that the probability of being an entrepreneurial household was strongly negatively linked to the age of the household head and positively linked to the income level of the

county. The present study also uses the 1995 and 2002 data from CHIP. However, it is also based on CHIP data for 1988, 2013 and 2018. Furthermore, here, we define self-employment at the individual level and use other definitions of household categories.

3 Data and definitions

This study is based on microdata from the rural samples of CHIP referring to each of the years 1988, 1995, 2002, 2013 and 2018. This means that we study people who lived at least six months during the studied year in rural China. From this follows that people who have migrated but for a period of less than six months are included (but not those who have migrated for more than six months during the measurement year). The five samples were drawn as subsamples from the larger samples administered by the National Bureau of Statistics to collect official statistics on rural China. This information includes various components of total disposable income. The data also include answers to questions designed by the research group and posed to household members shortly after the end of the measurement year. Microdata from CHIP are available to researchers and have been used for studies reported in a large number of scientific publications. For a fuller description of CHIP and other household income surveys for China, see, for example, Gustafsson et al. (2014).

The rural provinces sampled in CHIP have to some extent varied across the different waves. To reach a high level of comparability across years, we selected data from the 14 provinces that were sampled in all five years we investigated. This means that our data refer to rural households in the following five provincial-level units located in eastern China: Beijing, Liaoning, Jiangsu, Shandong and Guangdong. We also included the following five provincial-level units located in the middle of China: Shanxi, Anhui, Henan, Hubei, and Henan. Finally, we included the following four provincial-level units located in the western region of China: Chongqing (which was included in Sichuan in 1995), Sichuan, Yunnan, and Gansu.

We conduct the statistical analysis on the individual level as well as on the household level. For the individual-level analysis, we required that during the measurement year, the person was 16 to 65 years old, had a rural *hukou*, claimed to have been working during that year and was not engaged in full-time education during the same year.[5] With those restrictions, the number of observations was 15 399 in 1988, 14 186 in 1995, 11 213 in 2002,

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[5] We excluded observations that could not be identified following our definition. They include: 1) observations reporting unemployment but who answered the questions about their off-farm jobs; 2) observations reporting being

17 812 in 2013 and 15 933 in 2018. It should be understood that when deriving descriptive statistics and for the analysis, we used the sample weights developed by Yue and Sicular (2016) for 2013 and updated by the authors of this paper for 2018.We followed their steps to develop weights for also 1988, 1995 and 2002.

To study adult employment, we classified persons aged 16 to 65 into one of three categories depending on how they answered the questions related to their economic activities during the preceding year, as further documented in the appendix. Our focus is on the self-employed, a category that includes the relatively small number of persons who indicated that they were owners of a business. They may be the owner of a firm with or without workers, owners of a retail shop selling goods, contractors working in construction who hire several people, owners of a lorry who deliver goods, etc. The second category consists of people who stated that their primary off-farm job (the highest-paid job among all the off-farm jobs they engaged in) during the preceding year was work for wages. The residual category, best corresponding to the "traditional sector" in the Lewis model, consists of adults who were mainly involved in farming. It means that we follow the definition in NBS rural survey manual with the exception of including business owners who hired people, no matter how many people they hired in the category self-employed.

Very few rural households in China have only one adult member; many have two adult members and some have three or more adult members. Adult members in a household can be involved in different kinds of employment. For example, by mixing types of employment across members, households can reduce risk.[6] We consider this, as shown in Table 1, when we conduct our analysis at the household level. As a consequence, in addition to the three categories of all adult members being self-employed, all members working for earnings and all members working as farmers, we define two hybrid categories. One of these hybrid categories contains households that include at least one adult member who is self-employed. The other hybrid category contains households that are a mix of adults who are wage earners and farmers with no self-employed members.

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involved in off-farm jobs but the number of days in which they engaged in off-farm activities were zero or missing; 3) observations reporting involvement in farming but the number of days in which they engaged in farming were zero or missing; and 4) family helpers. Because family helpers were not included in CHIP 1995 and 2002, we did not include this category in 2013 (140 observations) or 2018 (188 observations). In total we excluded 748 observations in 1995, 3 598 observations in 2002, 2 938 observations in 2013, and 3 307 observations in 2018.

[6] For a detailed analysis of how rural households mix employment, see Démurger et al. (2010). This study is based on 322 households who were living in Labangoument township, Beijing municipality, in 2003.

/Table 1 about here/

4 The development of different kinds of employment in rural China

In this section, we report how, from 1988 to 2018, different kinds of employment developed in rural China. We start with reporting results at the individual level in Table 2. The first observation is that the proportion of self-employed adults in rural China rapidly expanded during most, but not all, of the period studied. The proportion of self-employed individuals increased from a rather low 2 percent in 1988 to 3 percent in 1995, then increased slightly to 5 percent in 2002, and thereafter jumped to 11 percent in 2013. However, no further increase had taken place by 2018.

/Table 2 about here/

A second observation from the information reported in Table 2 is that the increase in self-employment took place under the shadow of the much more forceful increase in wage employment. We can see that in 1988, 15 percent of individuals were wage-earners, and that proportion increased to 19 percent in 1995. By 2002, the share had increased to one out of three rural adults. From 2002 to 2013, wage employment in rural China expanded rapidly, and during the latter year, almost two out of three adults were wage earners. However, parallel to the trend among the self-employment, no further increase in the proportion of wage earners had taken place by 2018.

That the period 2002 to 2013 was a period of large changes in the employment composition that was followed by almost no changes is reflected in the level and development of the proportion of farmers in rural China. Table 2 shows that in 1988, as many as 83 percent of all employed individuals in rural China were farmers according to our criteria. The corresponding proportion had decreased to 62 percent by 2002 and thereafter fell dramatically to as low as 27 percent in 2013. However, no further reduction in the share of the population working as farmers had taken place by 2018. This lack of further reduction of the proportion of farmers between 2013 and 2018 calls for an explanation, an issue we turn to below.

In Table 2, we also see a clear regional pattern in the compositional changes to employment. In 1988, the eastern region had taken the lead with the highest proportions of wage earners and of self-employed individuals, and mirroring this, it also had the lowest proportion of farmers. However, by 2002, the other two regions had caught up with the eastern region in regard to the proportion of self-employed individuals. In 2018, the western region continued to have a somewhat lower proportion of wage earners and a higher proportion of farmers than the other two regions.

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/Figure 1 about here/

Fig. 1 supplements this description of the rapid move away from farming into wage earning and (to a lesser extent) self-employment by showing how the household categories defined above changed over the study period. There is one part showing the proportion involved in farming, a second showing the proportion involved in wage earning and a third showing the proportion involved in self-employment. We see that in 1988, as few as 4 percent of all rural households in China had specialized in wage employment and only 0.6 percent in self-employment. However, thereafter, specialization in each of these activities increased rapidly. In 2002, as many as 16 percent of all rural households had adult members who were wage earners, while one-fifth had a mix of wage earners and farmers. Employment mixing also became particularly prevalent among the self-employed. For example, while in 2013, when 7 percent of all rural households had specialized in self-employment, an additional 12 percent had at least one self-employed adult and at least one adult member who was employed in another activity.

We return to the regional perspective, but focus now on the household level. Our data show the pattern of expansion in self-employment in the three regions of China from 1988 to 2018. Again, large differences can be seen in 1988, when 8 percent of the households in the eastern region had at least one self-employed member, while the proportion was rather low in the western region. By 2002, the central region had caught up with the eastern region and thereafter actually surpassed it. In 2018, the self-employment rate among households in the western region had caught up with that in the eastern region, as one in five households had at least one self-employed member. This pattern is consistent with how the economic reform, which was introduced in China in 1980 in the eastern region of the country, gradually extended to the whole country.

5 Modeling the determinants of the employment structure in rural China 1995 and 2018

In this section, we investigate what characterizes adults who are self-employed relative to those who are wage earners or farmers. We analyze the situation in 1995 when employment in farming was very widespread; few adults were wage earners, and very few were self-employed. We also analyze the situation in 2018 when, as we have seen, wage employment had become rather common and self-employment was common, while farm employment had decreased to play a much smaller role than it had previously. Year 1995 is the first in which the number of observations of self-employed is sufficient large to allow for a meaningful statistical analysis, 2018 is our latest year

of observation. To understand the factors associated with the probability of an adult being self-employed, a wage earner or a farmer, we specify multinomial logit models, following Zhang et al.(2006). Applying a model with three outcomes makes it possible to contrast the variables that are related to the probability of being self-employed with those related to being a wage earner; such a model can be considered more informative than an alternative model using only the two employment states of "self-employed" and "not self-employed", which has sometimes been used in the literature.[7]

The model has the following structure:

$$Y_i = \alpha + \beta \textbf{\textit{individual and household characteristic}}_i + \gamma \textbf{\textit{human capital}}_i + \tau \textbf{\textit{spatial variables}}_i + \varepsilon$$

where Y_i=1 for those who are self-employed, =2 for farmers, and =3 for wage earners. Farmers are omitted as the base category.

The explanatory variables include the following:

Individual and household characteristics: age and age squared, gender interacted with marital status (unmarried male is the base category), ethnic minority (equal to one if the individual is an ethnic minorities), membership in the CPC (equal to one if the individual was a CPC member), number of family member older than 65, and number of children younger than 16.[8]

Human capital: years of education, health status (equal to one if the self-reported health status was good or above), migration experience (equal to one if the individual had migrated out for work before the measurement year

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[7] The multinomial logit model is perhaps the most commonly used regression model for nominal outcomes in the social sciences. A concern raised by many researchers, however, is the assumption of the independence of irrelevant alternatives (IIA) that is implicit in the model. In an often cited paper Cheng and Long (2007) investigates a number of statistical texts and concludes: "Our overall conclusion, based on the simulations shown above and of other data structures, is that tests of the IIA assumption that are based on the estimation of a restricted choice set are unsatisfactory for applied work." Nevertheless we performed some tests that can be found in the literature and found that the classification of individuals in three categories appears to be appropriate for 1995 while the corresponding was less the case for year 2018. A probable reason for the latter is that during this year a sizable number of individuals combined wage work or self-employment with farm work, which probably was not the case in 1995. For studies having the aim of portraying the situation in 2018 it thus appears to work with a number of categories larger than three as is done here.

[8] To capture possible intergenerational influences, we also explored the impact of the self-employment status of parents and parents-in-law by estimating an alternative specification for persons living in household with heads who were younger than fifty. We did not find that parental characteristics were associated with the probability of individuals being self-employed.

but had not migrated during the measurement year), and military experience (equal to one if the individual had ever been a solider). The last three variables are only available for 2018.

Spatial variables: the location of the family (hill, plain, or mountain, and those living on the plains are omitted), county-level per capita income, county-level per capita cultivated land (*mu*), distance to the nearest county (equal to one if the distance from the village where the household is located to the nearest county was no more than 5 km, available in 2002, 2013, and 2018), and province (Gansu is the omitted category).

/Table 3 about here/,,

In Table 3, we report the right-hand side variable used in the estimation of the multinomial model for 1995 and 2018.[9] On average, people of working age (16-65) in rural China were seven years older in 2018 than those in 1995. However, farmers were as much as 14 years older in 2018, when they were on average 52 years old. The youngest category during both years under study was the wage earners category. The gender composition among self-employed individuals became more balanced as the proportion of males decreased from 71 percent in 1995 to 66 percent in 2018. The proportion of female farmers increased from 51 percent in 1995 to 62 percent in 2018. Wage earners have the highest levels of education, with farmers having the lowest. In 2018, when 16 percent of the self-employed had previous migration experiences, differences in such experiences were small across the three categories. We also note that while two-thirds of the self-employed individuals were living on the plains in 1995, this proportion had decreased to approximately half by 2018.

/Table 4 about here/

Table 4 presents the results from the baseline specification by reporting marginal effects. Panel A reports the estimates for 1995, and panel B reports those for 2018. As in Xiao and Wu (2020), we report an inverted U-shaped relationship between age and the probability of being self-employed (see Fig 2). Not surprisingly, we find that the probability of being self-employed or a wage-earner decreased with age, and the opposite was the case for the probability of being a farmer, particularly in 2018.

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[9] In the basic specification, all variables used are the same for 1995 and 2018. However, a few variables we think are also important, were available only for 2018, e.g., having engaged in rural-to-urban migration, and can only be used in an alternative specification.

We find that gender matters among married persons but not among unmarried persons. Being a married male increases the probability of being self-employed (particularly forcefully so in 2018) and reduces the probability of being a wage earner. In contrast, being a married female increases the probability of being a farmer and reduces the probability of being a wage earner, and this is true in both years. In 2018, being a married woman increased the probability of being self-employed (however, not as much as it increased the probability of being a farmer). These results suggest that employment decisions are made at the household level and are influenced by prevailing gender norms.

We found that CPC membership is not associated with the likelihood of being self-employed during any of the years studied. However, being a CPC member increased the probability of being a wage-earner and decreased the probability of being a farmer. These associations were stronger in 1995 than in 2018. This is probably because labor markets had become more developed by 2018 and therefore being a CPC member had become less important for receiving a job offer and the role of political power had been weakened (but still existed). (Li and Zhao 1999)

Next, we turn to the associations between the human capital variables and the probabilities of being involved in one of the three employment categories. Not surprisingly, we find that the variable years of education is negatively related to the probability of being employed in agriculture. It is the probability of being wage earner that is positively associated with years of education. There is no association between years of education and the probability of being self-employed.[10]

The survey conducted in 2018 makes it possible to also investigate whether employment types are related to additional variables. We report marginal effects for such variables in Table 5. We find, not surprisingly, that being in good health increases the probability of being a wage earner and reduces the probability of being a farmer. Previous migration experiences particularly increase the probability of being a farmer but also, and to a lesser degree, the probability of being self-employed. In contrast, previous migration experiences decrease the probability of being a wage earner. We also report that the experience of having been a soldier has no relationship with employment.

/Table 5 about here/

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[10]Alternatively we used level of education and found that a higher degree increases the probability of being a wage earner. This is in contrast with what Xiao and Wu (2020) report. This is possibly due to the fact that those authors did not distinguish between farmers and wage-earners.

As could be expected from the descriptive statistics, we report clear indications that spatial variables had played rather different roles in determining the kind of employment that adults were likely to have during the years 1995 and 2018. For 1995, we show a very clear pattern of county income being positively related to being wage earner and to a lesser extent, to being self-employed and negatively related to being a farmer. No similar relationship is found for 2018, where we instead are able to establish a different spatial relationship: A short distance to the county seat increases the probability of being a wage earner and, to an extent, also increases the probability of being self-employed while reducing the probability of being a farmer. Furthermore, people living in hilly areas were less likely to be self-employed than people living on the plains in 1995, but we did not find the same impact of altitude in 2018. Taken together, the results indicate that large-scale spatial differences have more or less vanished over time but that recent small-scale spatial differences matter.

6 Income among self-employed individuals and the payoff from being self-employed

In this section, we focus on total household income per capita among self-employed households and the other household categories as defined in Section 3 above. We study each of the years 1988, 1995, 2002, 2013 and 2018. First, we report descriptive results; afterwards, we report results from estimating income functions. We are interested in how those functions shed light on the income gains for a household if it had changed from specializing in farm work to self-employment or to wage employment. Particularly, we are interested in finding evidence that the payoff from being a wage earner and from being self-employed increased in the early reform process and became rather large in 1995 when it was still only a few adults who had taken up wage employment or self-employment but that this payoff decreased when, as we have seen, wage employment and self-employment later expanded.

/Table 6 about here/

We follow the definitions used in CHIP when defining total household income per capita. This means that we add the value of farm products consumed by household members and the net from sales in the market to earnings from self-employment and the wages received by the household. Furthermore, we add capital income from the interest on bank accounts, dividends from stocks and bonds, etc., as well as the imputed rent of owner-occupied housing. We also add net transfers from the public sector and from other households.

In Table 6, we see rather large differences in total household income per capita across the five categories of households. In 1988, households specializing in wage employment had the highest total household income per capita.

However, since 1995, households specializing in self-employment have had the highest total average income, followed by those specializing in wage employment. After these two categories come households with mixed employment. The lowest average income per capita is observed, not surprisingly, for households specializing in farming., In 1995had the few households specializing in self-employment received, on average, incomes that were as much as 4.3 times as large as those received by households specializing in farming.

The last column of Table 6 shows that across all households, average income increased by no less than 7 percent per annum. Particularly rapid was the income growth between 2002 and 2013, . As seen over the entire period of 1988 to 2018, there were no large differences in income growth for the five categories we report in Table 6. However, during the different subperiods, more differences are visible. Between 1988 and 1995, the average total income among the self-employed increased very rapidly, while the average income among specialized farmers actually experienced a small decrease. In contrast, since 2002, average income has increased more rapidly among specialized farmers than among households in the other four categories.

There are probably several reasons for the rapid increase in incomes among farm households during the later years covered in this study. One is the change in the demographic composition of this category. As we have seen above, farmers observed in 2018 were as much as 14 years older than their counterparts observed in 1995. This means that a larger proportion of farm households had no dependent children in 2018 than in 1995. An indication of this is that the average household size among farm households decreased from 3.8 persons in 1995 to 3.0 persons in 2018. A second reason for the favorable income growth among farmer-only households is changes in public policy. These changes include the abolishment of the agriculture tax as well as the introduction of subsidies for farming and pensions.[11]

In the next and final step, we specify and estimate income functions. We are interested in the payoff to households from specializing in self-employment, wage employment or self-employment mixed with other activities.

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[11] For more information on this, see, for example, Li (2018). In our data we can observe the relative share of transfer income in total income per capita. In 2018, net transfers made up no less than 12 percent of total household income per capita among farmers, while among members of the other four categories; the relative share was less than plus or minus one percent.

For this purpose, we specify a regression model in which there are four dummies indicating each of the four household types with households specializing in farming as the omitted category. In this specification, we include a large number of other variables that in previous studies have been shown to be related to the level of household income. Those variables include two dummy variables indicating the altitude where the household lives (plains are the omitted category), the per capita area of cultivated farmland the household has access to and this variable squared. Furthermore, we include the average number of years of education among household members aged 16 to 65 and the same variable squared. We also include the percentage of working-age members who belong to the CPC, household size and household size squared, and the percentage of household members aged 16 to 65. Furthermore, we also include a dummy indicating whether the household head belongs to one of China's ethnic minorities and the average income per capita in the county. Finally, we also include 13 dummies to indicate the provinces (Gansu is the omitted category).

/Table 7 about here/

We estimate the same specification using data for each of the years 1988, 1995, 2002, 2013 and 2018. The coefficient estimates we are interested in are shown in Table 7. The association between average income per capita in the county and household income increased from 1988 to become stronger in 1995 and 2002 According to estimates could a farmer household with given characteristics expect to increase it's household income by approximately two thirds if moving into self-employment. [12] However, thereafter became the relationship considerably weaker. This indicates first a divergence followed by a convergence in income across China's counties. Turing to the focus of this paper, we see that the positive relationship between status as a self-employed household and income per capita increased after 1988 and become rather strong in 1995, indicating that during this period, there was a rather high payoff from moving into self-employment. However, the coefficient for household specialization in self-employment had become lower in 2002 and was lower still in 2013, after which it did not change much.

The coefficient for the category self-employed in combination with another employment activity and the coefficient for households specializing in wage earning both developed similarly to the coefficient for households specializing in self-employment: after increasing from 1988 to becoming large in 1995 thereafter it decreased until

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[12] For interpretation of regression coefficients when the dependent variable is in logarithmic form, see for example Thornton och Innes (1989).

2013 and thereafter the change was small. In each year, those coefficients were smaller than the coefficient for a household specializing in self-employment. We also observe that the payoff from combining farm employment with wage employment was substantial in 1995 but thereafter fell rapidly and actually was not statistically significantly different from zero at the five percent level in 2018.

7 Summary and conclusions

In this paper, we used data collected from 14 provincial-level units in rural China. The first cross-section of data comes from 1988, the last from 2018, a period of 30 years. During the first year, as many as 790 million persons were living in rural China. However, by 2018, the number had reduced to 564 million due to out migration and, to a smaller degree, to changes in the classification of areas (National Bureau of Statistics 2019). We described the development in employment at the individual as well as household level. Furthermore, we estimated models relating the employment categories wage earner, self-employed and farmer to a number of various factors. We studied disparities in the average total income among self-employed households, wage earner households, farmer households and households receiving income from a combination of activities. In addition, we estimated income functions to determine the magnitude of the payoff from being a household specializing in self-employment, from being a household specializing in wage earning, or from combining various economic activities. Those changes took place at the same time as a number of other socioeconomic changes in rural China. They include a very large migration from rural to urban areas. Some of the migrants returned to rural China and became involved in various economic activities. Partly due to the out-migration, but also due to falling birth rates China's rural population aged rapidly. In addition the rural labour market developed and regional income differences appear to have converged.

To answer our first research question, we investigated how self-employment in rural China has developed over time. We found that the proportion of self-employed adult individuals increased from as few as 2 percent in 1988 to 5 percent in 2002 and thereafter jumped to 11 percent in 2013, after which no further expansion took place. Many self-employed adults live in households in which other adult members are employed in either farming or in wage employment. This means that in 2018, no less than 21 percent of rural households had at least one self-employed adult member. The expansion of self-employment has taken place in the shadow of increased wage employment and the rapid decline of employment in farming. Although the pattern of change during the more than two decades studied indicated continuous increases, we also found an absence of change between 2013 and 2018.

We have argued that this absence of change can be attributed to at least two factors: the rapid aging of the rural population and the fact that farm households have benefited from changes in public policy.

Turning to the research questions on the characteristics of the self-employed, we reported that during the earliest years studied, there was clear spatial variation in the prevalence of self-employment. The highest proportion of self-employed individuals was found in the eastern region of China, which was the first area to be opened to other countries. However, thereafter, these large scale spatial differences faded as self-employment spread to all counties in rural China. We reported that the probability of being self-employed in rural China is higher for married men than for others. However, the gender imbalance in the self-employed population was not as large in 2018 as in 1995. These results suggest that employment decisions are made at the household level and influenced by prevailing gender norms, norms that seem to be changing. We also showed that in 2018, having migration experience increases the probability of being involved in self-employment but increases the probability of farming even more. While a higher level of education increases the probability of being a wage earner and reduces the probability of being a farmer, we did not find a relationship between level of education and the probability of being self-employed in rural China.

This research also investigated the income of self-employed households. We reported that between 1988 and 1995, the income gap between households specializing in self-employment and particularly those specializing in farming increased to more than four times . During the following period, when an increasing number of adults had moved into self-employment, the corresponding income disparity narrowed. We estimated functions in which a large number of variables were related to total per capita household income and found that although the payoff from moving into self-employment increased from 1988 to 1995, it narrowed afterwards. However, in 2018, households with certain characteristics were still predicted to receive a higher income when specializing in self-employment than if earning an income in other ways.

While we hope that this study has contributed to the understanding of the development of self-employment and wage employment in rural China from 1988 to 2018, we would also like to draw attention to issues to be addressed in future research. First, it should be remembered that we have analyzed repeated cross section data. High quality panel data allows for more detailed analyses resulting in better insight into how and why some households becomes self-employed and the consequences thereof. Second, other outcome variables than household income can be studied. One such example is household wealth. Some preliminary computations from the data used here indicate

that in 1995, for example, there were no large differences in average household wealth across the employment categories here studied. However, such differences were much more pronounced in 2018. Still an issue for future research is to fuller examine the consequences of China's pro-rural public policy adopted during the new millennium. These policy changes involve measures such as the abolishment of agricultural taxes, the establishment of subsidies for agricultural production, and the rolling out of old age pensions in rural areas. All those reforms should have increased household income among farm households and thereby also made the alternative of farm employment more attractive than it would have in a situation in which no such reforms had been introduced.[13] There is thus a risk that as side effects, the reforms have preserved the employment structure in rural China and delayed an otherwise preferable change in that employment structure. This example illustrates the trade-offs that policy-makers have to address.

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[13] For details on policy-changes see for example Naughton (2018 p 272 - 277). The same author (p 302) also writes that "the combination of tax remission, subsidies, and price supports could easily be responsible for a 20% - 30% increase in average agriculture incomes".

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Tables

Table 1 Definition of households by employment category

Household Category	Individual category		
	Self-employed individual	Farmer	Wage-earner
Self-employed only households	>=1	0	0
Famer only households	0	>=1	0
Wage earner only households	0	0	>=1
Hybrid households with self-employed	>=1	>=1	0
	>=1	0	>=1
	>=1	>=1	>=1
Hybrid households without self-employed	0	>=1	>=1

Note: The CHIP surveys were conducted on the household level. We have access to information on all members of the household.

Table 2. Individual employment categories in rural China by region; 1988, 1995, 2002, 2013 and 2018. Numbers and percentages

	Self-employed individuals	% of all individuals	Farmers	% of all individuals	Wage earners	% of all individuals	Number of observations	Total %
1988								
Total	273	1.82	13,361	83.39	1,765	14.79	15,399	100
East	139	2.61	3,876	73.24	931	24.15	4,946	100
Central	111	1.66	5,877	88.27	595	10.08	6,583	100
West	23	0.58	3,608	94.02	239	5.4	3,870	100
1995								
Total	342	3.11	11,636	78.06	2,208	18.83	14,186	100
East	172	4.87	3,572	63.89	1,252	31.24	4,996	100
Central	129	2.45	4,711	85.41	663	12.14	5,503	100
West	41	0.91	3,353	92.56	293	6.53	3,687	100
2002								
Total	582	5.29	7,218	62.31	3,413	32.4	11,213	100
East	240	6.34	2,473	54.13	1,461	39.53	4,174	100
Central	251	5.48	2,823	63.59	1,338	30.93	4,412	100
West	91	2.95	1,922	75.84	614	21.21	2,627	100
2013								
Total	1,959	10.93	4,865	26.78	10,988	62.29	17,812	100
East	704	11.24	1,166	19.34	4,190	69.43	6,060	100
Central	815	11.49	1,694	25.21	4,385	63.3	6,894	100
West	440	9.42	2,005	42.54	2,413	48.04	4,858	100
2018								
Total	1,889	11.64	4,083	25.48	9,961	62.88	15,933	100
East	573	11.1	1,079	23.17	3,278	65.72	4,930	100
Central	792	12.77	1,242	20.29	4,143	66.93	6,177	100
West	524	10.7	1,762	37.52	2,540	51.78	4,826	100

Notes: 1) Two-level (rural/urban $\times$ region) weights used.
2) Computations based on 14 provinces sampled in 1988, 1995, 2002, 2013, and 2018.
 3) If the sum of percentages does not equal 100, it is due to rounding.
Source: CHIP, rural survey 1988, 1995, 2002, 2013 and 2018.

Table 3. Characteristics of individuals by category of employment

	Variables	Self-employed individual	Farmer	Wage-earner	Total
1995					
	Age, years	36.11	36.95	33.25	36.24
Individual and household characteristics	Male, percent	71.43	49.13	68.15	53.35
	Ethnic minority, percent	1.25	10.55	3.66	8.98
	CPC member, percent	6.45	4.54	18.50	7.18
	Family size	4.34	4.64	4.38	4.58
	Percent of households having no land	7.17	0.02	10.79	2.24
Human capital	Years of education	7.66	5.87	8.38	6.39
Spatial variables	County-level per capita income (*yuan*, in 2018 prices)	5,849	3,106	5,325	3,609
	Terrain, percent				
	Plains	69.59	44.52	57.84	47.78
	Hills	17.37	29.43	23.93	28.03
	Mountains	13.04	26.05	18.23	24.19
	Number of observations	334	11271	2084	13689
2018					
	Age	44.02	51.6	40.25	43.59
Individual and household characteristics	Male, percent	65.20	38.5	66.6	59.30
	Ethnic minority	8.07	13.00	6.81	8.52
	CPC member, percent	6.92	4.97	7.98	7.09
	Family size	4.33	4.01	4.29	4.23
	Percent of households having no land	10.3	0.87	10.8	8.19
Human capital	Years of education	8.40	6.73	9.16	8.45
	Self-reported health, percent	95.47	89.94	97.26	95.18
	Migrated before 2018, percent	16.23	14.12	10.90	12.33
	Ever been a soldier, percent	3.55	2.44	3.33	3.13
Spatial variables	County-level per capita income (*yuan*, in 2018 prices)	11.44	6.05	11.04	9.81
	No more than 5 km to the nearest county seat, percent	16.23	14.12	10.90	12.33
	Terrain, percent				
	Plains	47.53	37.21	46.54	44.26
	Hills	27.60	26.92	28.92	28.26
	Mountains	24.87	35.87	24.54	27.48
	Number of observations	1850	4069	9853	15772

Notes: 1) Computations based on 14 provinces sampled in 1995 and 2018.
2) Sample weights are used.
3) If the sum of percentages does not equal 100, it is due to rounding.
Source: CHIP, rural survey, 1995 and 2018.

Table 4. Marginal effects on being self-employed, a farmer or a wage earner based on the multinomial logit model:

basic specification

Panel A: 1995

	Self-employed Coefficient (z-value)	Farmers Coefficient (z-value)	Wage earners Coefficient (z-value)
Age	-0.0005	0.0029***	-0.0024***
	(-1.7170)	(5.2467)	(-4.2481)
Married male	0.0205*	0.0130	-0.0335*
	(2.2019)	(0.8932)	(-2.2849)
Married female	-0.0078	0.1605***	-0.1527***
	(-0.7700)	(10.0608)	(-9.2263)
Unmarried female	-0.0086	0.0103	-0.00170
	(-0.9839)	(0.9204)	(-0.1571)
Being an ethnic minority	-0.0252	0.0398	-0.0146
	(-1.4721)	(1.8789)	(-0.7049)
CPC membership	-0.0209*	-0.1048***	0.1257***
	(-2.0278)	(-7.3739)	(9.2275)
Years of education	0.0001	-0.0200***	0.0199***
	(0.0561)	(-12.8055)	(12.2388)
Number of family member older than 65	-0.0159**	-0.00250	0.0184*
	(-2.6901)	(-0.3188)	(2.3801)
Number of family member younger than 16	0.0044	0.0153**	-0.0197***
	(1.4403)	(3.0945)	(-3.6165)
County-level per capita income (10000 yuan, in 2018 prices)	0.0608***	-0.2910***	0.2302***
	(4.9795)	(-12.0744)	(9.6321)
County-level per capita cultivated land (mu)	0.0000	-0.0000**	0
	(1.2998)	(-2.6265)	(1.7294)
Hills	-0.0153**	0.00390	0.0114
	(-2.8186)	(0.4261)	(1.2202)
Mountains	-0.0171*	0.00700	0.0101
	(-2.4885)	(0.4541)	(0.7399)
Beijing	0.0460***	-0.3266***	0.2806***
	(3.5109)	(-8.9418)	(8.0192)
Shanxi	0.0270*	-0.1378***	0.1109***
	(1.9734)	(-5.7517)	(4.4965)
Liaoning	0.0069	-0.0669*	0.0599*
	(0.4979)	(-2.5717)	(2.2975)
Jiangsu	0.0087	-0.1581***	0.1495***
	(0.6590)	(-6.7541)	(6.3064)
Anhui	-0.0205	-0.0781**	0.0987***
	(-1.3262)	(-3.2494)	(3.9883)
Shandong	-0.0160	-0.0479*	0.0640**
	(-1.2872)	(-2.1463)	(2.8090)
Henan	0.0065	-0.0804***	0.0739***
	(0.5784)	(-3.6540)	(3.2938)
Hubei	0.0320**	-0.0202	-0.0118

	(2.7764)	(-0.7875)	(-0.4430)
Hunan	0.0175	-0.0984***	0.0809***
	(1.4033)	(-4.2172)	(3.3841)
Guangdong	0.0101	-0.1172***	0.1072***
	(0.7907)	(-5.0561)	(4.6021)
Sichuan	0.0119	-0.0801***	0.0682**
	(0.9992)	(-3.6366)	(3.0462)
Yunnan	-0.0389	0.0791*	-0.0402
	(-1.2288)	(2.2050)	(-1.1238)
Pseudo R-squared		0.3041	
Number of observations		13689	

Panel B: 2018

	Self-employed Coefficient (z-value)	Farmers Coefficient (z-value)	Wage earners Coefficient (z-value)
Age	-0.0013***	0.0131***	-0.0118***
	(-5.0042)	(33.9041)	(-28.1232)
Married male	0.0962***	-0.0505**	-0.0457**
	(6.7023)	(-3.2252)	(-2.6070)
Married female	0.0599***	0.1339***	-0.1938***
	(4.1981)	(8.7339)	(-11.2514)
Unmarried female	-0.0167	0.0103	0.00640
	(-0.7091)	(0.4310)	(0.2494)
Being an ethnic minority	-0.0050	0.0484***	-0.0434**
	(-0.3915)	(3.6911)	(-2.5964)
CPC membership	-0.0070	-0.0387*	0.0456**
	(-0.6087)	(-2.5627)	(2.7304)
Years of education	-0.0004	-0.0105***	0.0109***
	(-0.3024)	(-5.3222)	(4.9640)
Number of family member older than 65	0.0065	-0.00940	0.00290
	(1.1535)	(-1.3400)	(0.3681)
Number of family member younger than 16	0.0054	0.0139***	-0.0193***
	(1.3677)	(3.3931)	(-3.9278)
County-level per capita income (10000 yuan, in 2018 prices)	-0.0027	-0.00870	0.0114
	(-0.4096)	(-0.9854)	(1.2003)
County-level per capita cultivated land (mu)	-0.0002	0.0019***	-0.0016***
	(-0.6699)	(6.7918)	(-5.1550)
Hills	-0.0100	-0.000500	0.0105
	(-1.0815)	(-0.0440)	(0.8246)
Mountains	-0.0112	0.0438***	-0.0326*
	(-1.1092)	(3.9701)	(-2.4873)
Beijing	0.0117	-0.2588***	0.2472***
	(0.3769)	(-6.5547)	(5.8287)
Shanxi	0.0089	-0.1589***	0.1500***
	(0.3906)	(-7.9030)	(5.9879)
Liaoning	0.0352	-0.0511**	0.0160
	(1.7165)	(-2.6887)	(0.6553)
Jiangsu	0.0452*	-0.1844***	0.1392***

	(2.2229)	(-8.5087)	(5.5684)
Anhui	0.0739***	-0.2318***	0.1579***
	(4.0699)	(-12.5615)	(7.0380)
Shandong	0.0349	-0.1063***	0.0714**
	(1.8275)	(-5.8930)	(3.2164)
Henan	0.0188	-0.1353***	0.1165***
	(1.0278)	(-8.3649)	(5.6968)
Hubei	0.0408*	-0.1458***	0.1050***
	(2.3639)	(-9.7455)	(5.5156)
Hunan	0.0713***	-0.2000***	0.1288***
	(4.1810)	(-11.8981)	(6.1906)
Guangdong	0.0267	-0.2333***	0.2065***
	(1.4127)	(-12.1156)	(9.3071)
Sichuan	0.0449**	-0.1069***	0.0621**
	(2.6347)	(-7.1967)	(3.2516)
Yunnan	0.0538**	-0.0562***	0.00240
	(3.0361)	(-3.6580)	(0.1157)
Pseudo R-squared	0.2000	0.2000	0.2000
Number of observations		15778	

Note: 1) The marginal effect of age contains the effect of age squared.

2) Unmarried males, locations on the plains, and Gansu Province are omitted.

3) Computations based on 14 provinces sampled in 1995 and 2018.

4) z-statistics are reported in parentheses (* $p<0.05$, ** $p<0.01$, *** $p<0.001$); standard errors are clustered at the household level.

5) Sample weights used. Source: CHIP, rural survey 1995 and 2018.

Table 5. Marginal effects on being self-employed, a farmer or a wage earner in 2018 based on the multinomial logit

model: alternative specification, selected coefficients

	Self-employed Coefficient (z-value)	Farmers Coefficient (z-value)	Wage earners Coefficient (z-value)
Self-reported health	-0.0176	-0.0847***	0.1023***
	(-1.2806)	(-5.8264)	(5.5385)
Ever been a soldier	0.0138	-0.00400	-0.00980
	(0.8076)	(-0.1937)	(-0.4385)
Migrated for work before but not during 2018	0.0222**	0.0511***	-0.0733***
	(2.7933)	(5.3379)	(-6.3315)
No more than 5 km to the nearest county seat	0.0299**	-0.0964***	0.0665***
	(2.6763)	(-6.4464)	(4.2118)
Pseudo R-squared		0.2086	
Number of observations		15426	

Note: This specification contains all explanatory variables listed in Table 3 Panel B, plus the variables listed above.
2) Estimates are based on 14 provinces sampled in 1995 and 2018.
3) z-statistics are reported in parentheses (* $p<0.05$, ** $p<0.01$, *** $p<0.001$); standard errors are clustered at the household level.
4) Sample weights used.
Source: CHIP, rural survey 2018.

Table 6. Income per capita among different categories of households in rural China; 1988, 1995, 2002, 2013 and 2018

	Self-employed only households	Wage-earner only households	Farmer only households	Hybrid households with self-employed	Hybrid households without self-employed	Total
1988						
Mean	4976	5464	2737	3835	3839	3147
Number of observations	52	314	9537	558	2571	13032
1995						
Mean	10661	8061	2499	6166	4704	3726
Number of observations	78	475	9044	681	3855	14133
2002						
Mean	8185	7351	4210	7008	4716	5110
Number of observations	203	1135	4281	876	4714	11209
2013						
Mean	18931	16278	11460	15038	9745	13693
Number of observations	827	6623	1713	2349	5714	17226
2018						
Mean	24436	19129	18584	18505	13509	17500
Number of observations	757	6073	1336	2383	5105	15654
Annual growth rate, percent						
1988 to 1995	11.50	5.71	-1.29	7.02	2.95	2.44
1995 to 2002	-3.71	-1.31	7.74	1.85	0.04	4.62
2002 to 2013	7.92	7.49	9.53	7.19	6.82	9.37
2013 to 2018	5.24	3.28	10.15	4.24	6.75	5.03
1988 to 2018	7.16	5.60	8.68	7.08	5.62	7.75

Notes: 1) Adjusted by the Rural Consumer Price Index.
2) Computations based on 14 provinces sampled in 1988, 1995, 2002, 2013, and 2018.
3) Household income contains all income earned by household members, including agricultural income, earnings, (other) business income, income from migration, net transfers, and other income, following the income definition used by the CHIP group.
4) Sample weights used.
Source: CHIP, rural survey 1988, 1995, 2002, 2013 and 2018.

Table 7. Estimated income functions; 1988, 1995, 2002, 2013 and 2018, selected coefficients

Dependent variable: log household income per capita	1988 Coefficient (Standard errors)	1995 Coefficient (Standard errors)	2002 Coefficient (Standard errors)	2013 Coefficient (Standard errors)	2018 Coefficient (Standard errors)
Dummy for self-employed only households	0.365***	0.581***	0.392***	0.241***	0.282***
	(0.0951)	(0.121)	(0.0447)	(0.0278)	(0.0399)
Dummy for hybrid households with self-employed	0.223***	0.456***	0.323***	0.184***	0.226***
	(0.0251)	(0.0254)	(0.0244)	(0.0199)	(0.0257)
Dummy for wage-earner only households	0.238***	0.471***	0.212***	0.114***	0.107***
	(0.0441)	(0.0411)	(0.0201)	(0.0170)	(0.0236)
Dummy for hybrid households with farmer and wage earner	0.178***	0.301***	0.105***	0.0378**	-0.00189
	(0.0145)	(0.0145)	(0.0107)	(0.0167)	(0.0235)
Logarithm of county income per capita	0.614***	0.779***	0.842***	0.780***	0.829***
	(0.0196)	(0.0161)	(0.0208)	(0.0136)	(0.0201)
Constant	2.499***	1.282***	1.426***	2.199***	1.327***
	(0.214)	(0.190)	(0.215)	(0.167)	(0.233)
Observations	13,032	14,133	11,213	17,226	15,654
Adjusted R-squared	0.354	0.507	0.326	0.503	0.382

Notes:

1) Individuals are the unit of analysis.
2) Farmer-only households are the base group. Other explanatory variables include a dummy for mountains, a dummy for hills, per capita operational farmland (Mu), per capita operational farmland squared, average education level of working-age adults (16-65), average education level of working-age adults squared, percentage of working-age members that belong to the Communist Party, average age of working-age adults (16-65), average age of working-age adults squared, family size, family size squared, percentage of household members of working age (16-65), a dummy for households with at least one ethnic minority member, logarithm of county income per capita, and 13 dummies for provinces. Dummies for plains and Gansu Province are omitted.
3) Estimates are based on 14 provinces sampled in1988, 1995, 2002, 2013, and 2018.
4) Sample weights applied (except of 1988, for which no weights have been developed).
Source: Authors' estimates based on CHIP, rural survey 1988, 1995, 2002, 2013 and 2018.

Appendix

Details about the classification of individuals as self-employed, wage earners or farmers

In the CHIP questionnaires, there are questions for all adult members about their primary off-farm jobs (defined as the job providing the highest payment). We used the individuals' answers to the questions about the role she/he plays in her/his highest-paid off-farm job and the type of organizations she/he worked for (public sector, private company, individual enterprise, etc.).

The questions regarding the primary job in 1995 and 2002 were slightly different from those in 2013 and 2018. In 1995 and 2002, the jobs were divide d into labor force engaged in agricultural production, ordinary workers, skilled workers, high-level professional workers, principals of state-owned enterprises or owners of private companies, cadres/civil servants, general managers of enterprises, temporary workers or short-term contract workers, nonagricultural self-employed owners, and others.

For 1995 and 2002, we classified ordinary workers, skilled workers, technical workers, principals of state-owned enterprises, civil servants, cadres, and temporary workers or short-term contract workers as wage earners. In 2013 and 2018, two questions were asked, one about the role played in the job (employer, employee, self-employed, or family helper) and the other asked about the occupation code. We classified private business owners and nonagricultural self-employed individuals as self-employed, and the remaining individuals, including family helpers without payment, as others in 2013 and 2018.

Regarding farmers, there were questions on the questionnaire in all 5 rounds directly asking about farming . For example, in 1988 and 1995, farmers were listed as one type of work. In 2002, 2013 and 2018, there were questions about the number of days allocated to cultivation or to breeding animals. Furthermore, in 2013 and 2018, there was one question directly asking the respondent, "Did you engage in farming activities for your household in 2018 (not including being employed for earnings in these activities)?".

Table A1. Proportion of households by employment category in rural China; 1988, 1995, 2002, 2013 and 2018

	Self-employed only households	Wage-earner only households	Farmer only households	Hybrid households with self-employed	Hybrid households without self-employed	Number of observations
1988						
Total	0.63	3.74	72.55	4.31	18.78	4,921
East	0.69	6.62	59.39	7.12	26.17	1,586
Central	0.94	3.09	76.93	3.61	15.42	2,133
West	0	1.08	82.11	1.83	14.98	1,202
1995						
Total	1.14	5.93	62.86	5.3	24.77	5,443
East	2.29	12.67	46.15	7.31	31.57	1,896
Central	0.4	1.53	70.61	4.76	22.69	2,220
West	0.13	0.26	82.81	2.16	14.64	1,327
2002						
Total	3.17	17.72	34.18	7.94	36.99	3,963
East	3.61	24.74	28.57	8.93	34.16	1,483
Central	3.68	13.76	28.96	8.7	44.9	1,570
West	1.05	8.8	58.56	3.96	27.64	910
2013						
Total	7.23	42.42	11.96	11.98	26.41	7,038
East	7.92	54.39	9.53	11.73	16.44	2,419
Central	7.93	43.04	8.76	12.8	27.47	2,794
West	5.71	28.64	18.08	11.38	36.19	1,825
2018						
Total	7.29	42.04	10.84	13.86	25.97	6,020
East	6.84	48.93	10.95	13.19	20.09	1,872
Central	8.09	46.04	7.77	15.1	22.99	2,393
West	6.73	25.24	15.46	12.93	39.64	1,755

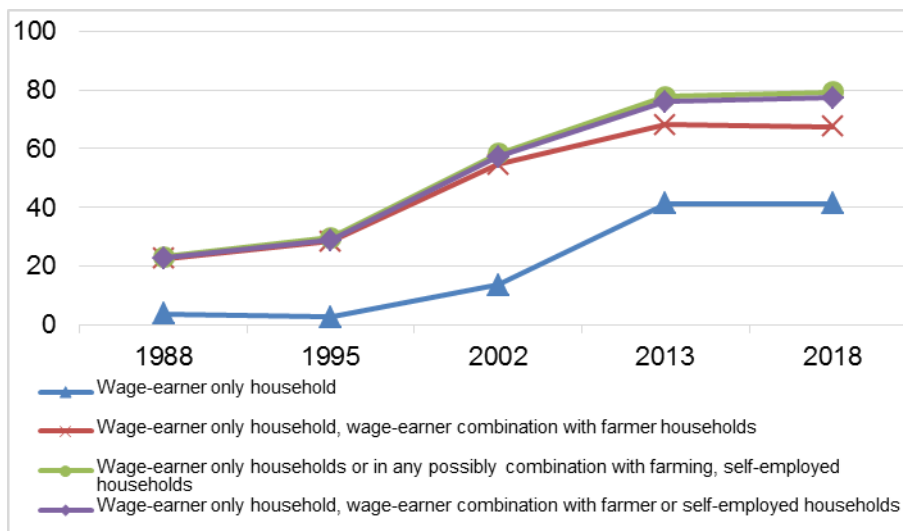Note: 1) Computations based on the 14 provinces sampled in 1988, 1995, 2012, 2013 and 2018.
 2) Sample weights used (with the exception of 1988, for which no weights has been developed didn't published the number of households at province level)

Figure 1 The development of the employment structure by household employment characteristics; 1988, 1995, 2002, 2013 and 2018. Percent
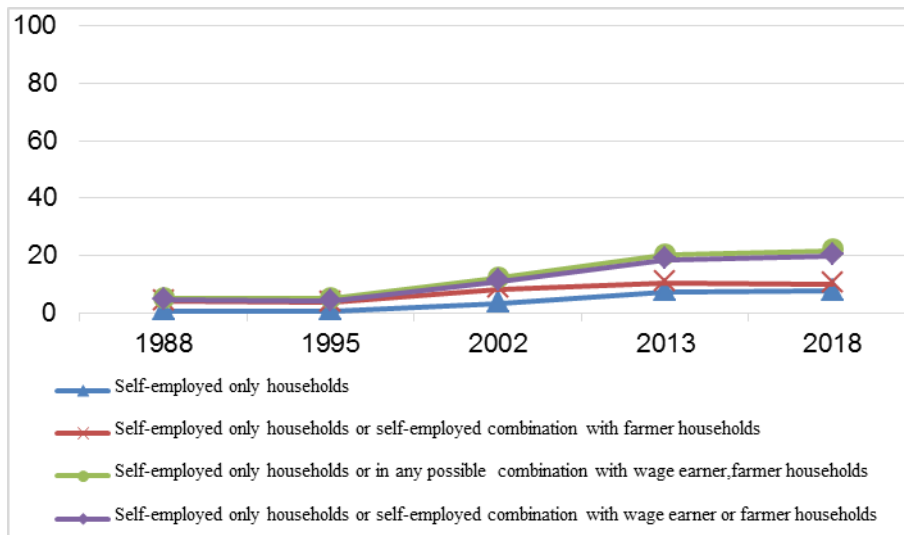
Farmer
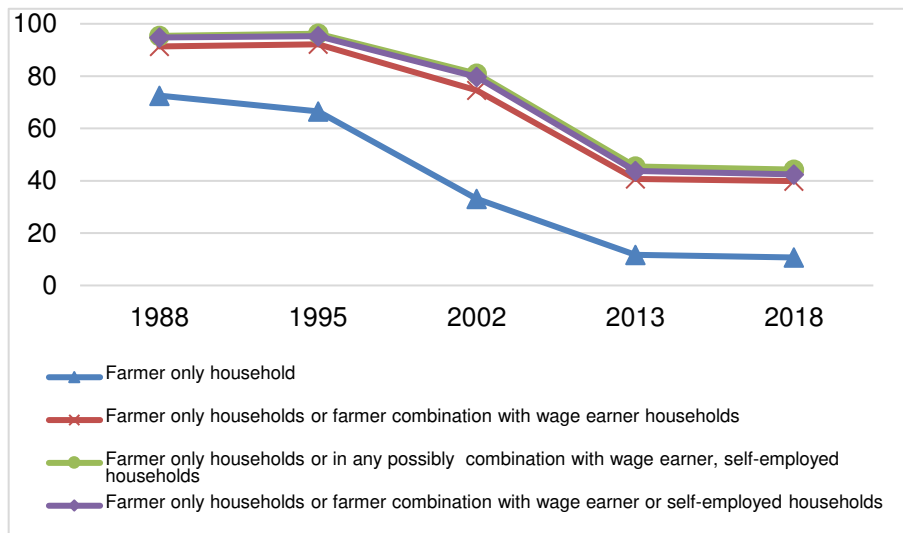
Wage-earner

Self-employed

Notes:

1) Computations based on the 14 provinces sampled in 1988,1995, 2002, 2013, and 2018.

2) Sample weights applied.

Source: Authors' estimates based on CHIP, rural survey 1988, 1995, 2002, 2013 and 2018