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Abstract: Rural areas in China struggle with a scarcity of young farmers and the rapid aging of farming labor. Attracting and retaining university graduates in rural areas is key to achieving the goals of The Rural Revitalization Strategy of the government, which ultimately seeks to guarantee sustainable agriculture and food security in China. This study examines whether the school-to-work process in China is beneficially aligned to these goals. Survey data were collected from graduates in June 2016, and logistic models were generated to identify the probabilities of, and explore the influences on, school-to-rural outcomes. The findings reveal that most graduates who relocate to rural areas are more likely directed there from urban areas. Graduates with rural backgrounds are more likely to become rural successors than graduates with urban backgrounds. The phenomenon of children taking up the occupation of a parent is observed among those with agricultural degrees and rural backgrounds, which will facilitate the school-to-work process and improve agricultural production. In order to achieve a mix of family farms, large-scale farmlands, and educated farmers to improve food security and sustainable agriculture, the following key considerations for agricultural policy in China are proposed: provide adequate incentives, remove obstacles, and streamline the process of school-to-farming.

Keywords: family farming; farm succession; school-to-work process; sustainable agriculture

1. Introduction

Rapid economic growth and an expanding population have significantly increased the demand for food in China [1]. However, the country is currently experiencing a scarcity of young farmers and the rapid aging of the existing farming labor—challenges common to many countries undergoing rapid industrial development [2]. China's food supply system remains insecure, with hollowed-out villages and fragmented families in rural settlements serving as symbols of the irreversible decline of the peasant economy.

In the late 1970s, China began to implement the Household Contract Responsibility System (HCRS) for agriculture. Addressing the reality of more people than land and based on the principle of fairness, village committees implemented the strategy of allocating accessible fertile and barren farmland equitably among farming households. This led to the emergence of small and fragmented farmlands managed by individual households, a situation that continues to this day. Consequently, it has become difficult to apply advanced technology to such small-scale and fragmented contracted farmlands in order to increase agricultural productivity. Additionally, the total agricultural income from such small farms may be insufficient to support family life, with little scope to supplement this income. As a result, younger rural laborers are compelled to leave farming due to the fragmented farmland, lower income, and high barriers to accessing farmland. Industries with higher salaries are attracting more young people, with various consequences. Firstly, the rural farming labor force is rapidly declining, which is harming agricultural productivity [3].



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Copyright: © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/). Secondly, the remaining rural farming labor force is aging quickly [3]. Thirdly, the inefficient use of fragmented agricultural land is apparent [4], and the number of farms engaged in grain production in China has declined over recent years [5]. The overall food supply system in China is insecure and over-burdened. The mechanism underlying this food insecurity is illustrated in Figure 1.



Figure 1. The mechanism underlying food insecurity in China.

Food security largely depends on food supply systems and the rural grain production potential [6]. Whether China can avoid further deterioration in agricultural production will depend on whether it can successfully encourage relatively young people to oversee farms and retain more young farmers to engage in grain production. Attracting graduates to farming can not only change the age demographic trend of the rural population, but also improve agricultural practices. However, there are many obstacles to attracting university graduates to engage in agricultural production as professional farmers. Seeking to address the food security dilemma in China, this article empirically investigates the employment law for university graduates in China and explores the possibility of guiding graduates toward equitable employment and becoming the successors of various industries in rural areas.

2. Literature Review

2.1. School-to-Work Transitions in Terms of Rural Human Capital Accumulation

The school-to-work transition, which is the process of graduates leaving university and entering labor markets, has significant consequences in terms of both individual employment outcomes and the economic vitality of local labor markets. For individual young people, the school-to-work transition comprises a critical period of human capital development, and significantly influences individual career trajectories and long-term earning capacities [7]. Whether students can make a rapid and successful transition into a significant job is crucial for their long-term labor market attachment and, consequently, their societal integration. There is widespread agreement on the centrality of smooth schoolto-work transitions for future employment prospects, and more generally, a successful transition to adulthood [8].

The school-to-work transition, beginning when educational paths diverge and ending when a young person secures full-time employment, has been conceptualized to range from ages 15 to 25 and may involve several intermediate statuses between education and work. Studies focus on different periods in the school-to-work process—some examine school-to-work transitions from six months after graduation up to three years later [9]. Most studies examining school-to-work transitions focus on educational attainment levels and discrete life events [7,8].

Due to rural population fragmentation and decline, the countryside has become a blind spot for public services, leading to young laborers seeking better education and employment opportunities to migrate from the countryside to cities. Therefore, rural development [10] and ensure food security. College graduates are skilled laborers important for the development of the rural and agricultural sectors; therefore, increasingly, scholars are beginning to pay attention to the rural employment of college students [10]. Although factors such as gender and class continue to play an important role in structuring school-to-work transitions, many authors have argued that youth transitions have become more complex. University career, parental background, networks, and economic opportunities within the local area may all lead to graduates experiencing differences in outcomes within the rural labor market [8]. The extent to which youth transitions represent a radical departure from, or are in fundamental continuity with, past cohorts' experiences is a subject of long-lasting debate.

The basic conditions relating to people's livelihoods in rural areas, such as the education system, medical and health services, and welfare levels, will affect a region's ability to attract educated youths. Therefore, some developed countries are being proactive in improving the quality of education and the level of infrastructure in rural areas, and in providing creative policy support for rural cultural heritage, asset protection, and access to land, and so on, for young people [11].

2.2. Rural and Agricultural Development in Terms of an Educated, Young Labor Force

Highly educated and skilled people are widely regarded as an essential element for economic success; however, growing isolation and lack of access to quality services in rural areas will push an increasing number of people (especially young and educated professionals) to leave and seek work in major cities. Stemming the outflow of highly educated people, together with fostering the return migration of youths seeking education elsewhere, is therefore critical for successful rural development [12].

Nevertheless, over recent decades, in developed countries, the number of young farmers has been declining and older farmers have not been passing on their farms to the next generation at a sufficient replacement rate [13]. The unwillingness of young people in some regions to take up farming has exacerbated the aging trend characteristic of agriculture in general and accelerated the abandonment of land in remote regions [14]. Older farm managers who are in good health are often not willing to relinquish management control at an earlier age; this refusal to hand over can stifle farm development through a failure to adopt more innovative approaches to farming [15]. Scholars contend that older workers are, on average, less productive than younger workers and that labor force aging has a modestly negative direct impact on productivity growth [16].

The family farm is considered superior as it is stable, robust, and has special value for the agricultural system [15]. Family farms enjoy lower transaction costs than farms with hired labor and are better equipped to supervise and control their labor. Family farming also allows for the accumulation and transmission of site-specific knowledge in agricultural activity [17], as farm knowledge and local experience can be gradually transferred [18]. Additionally, self-employment in farming is more secure than wage labor in areas with extensive unemployment [18]; even when crop specialization and labor productivity can be increased, the family farm workforce will not be replaced.

Larger farms have production and economic advantages over smaller competitors [19]. Succession, or the transfer of farms across generations, is smoother in larger farms, and it is more common for young labor in smaller farms to choose to leave farming [20]. Aging agriculture is exacerbating the trend of increasing farm sizes and reducing farming numbers in general, thereby increasing the demand for professional young farmers with formal education. The average farm size has increased in some upper-middle-income countries and in nearly all high-income countries [14].

In addition to succession, many proponents have emphasized the need to attract young entrants to family farms because new entrants are more interested in the environmental and social aspects of their holdings [21,22]. The literature on sustainable family farms also

addresses a broad range of topics related to younger farmers, including the benefits of laborers with degrees. It has been found that formal education, in particular university education, plays a positive role in increasing the sustainability of agriculture [15,23].

Food security lies in quantity, which means the volume of food should be sufficient to meet needs; quality, which means the food is healthy for consumption; and future supply, which means a guarantee of sufficient food to meet future demand. The cornerstone of food security is sustainable agriculture [15]. We can postulate the future for a sustainable agriculture scenario, based on the literature as follows. Firstly, a substantial proportion of farms will be operated as family farms due to the advantages inherent in family farming [24]. Secondly, "sustainable agriculture and food security" will heavily rely on younger farmers with degrees [25]. Thirdly, the importance of the scale of individual farms will become obvious, with larger farms able to attract professional young laborers with degrees who are able to use advanced technologies and to ensure sufficient income for their families. Fourthly, farms will mainly produce grain and will be able to satisfy the demand.

2.3. China's Rural and Agricultural Development Practice in Terms of a Young Labor Force

The continual drift of young people from rural areas to urban regions forced China's government to take a more proactive role in helping rural communities attract and retain their young and educated people. The first document issued by the central authority during each calendar year since 2003 has had a rural focus. Plans for Integrated Urban–Rural Development were proposed in the reports to the 17th and 18th National Congress of the Communist Party of China, providing an important boost to agricultural development and farmers' income. In 2017, China initiated the Rural Revitalization Strategy (RRS), which emphasizes building a team of rural development professionals well-versed in industry as well as the agriculture and rural service sectors, all of which are closely linked to food security and sustainable agriculture.

An increasing number of university graduates have recently moved to rural areas to find employment due to the University (College) Student Village Official (USVO) project, which is a national strategic measure to address the lack of talent in rural settings, with the goal of attracting college students to rural employment by providing attractive conditions. They are encouraged to start their own businesses in rural areas, which can lead to them staying in and serving the rural area for longer [26]. Almost all graduates who are selected by the USVO project choose to work in village administrative units in rural areas because of the stable income provided by administrative positions or the advantage of accessing large-scale farmland.

In addition to continuously increasing the adoption of new technologies, the Chinese government has made major efforts to stabilize land usage rights. With the introduction of HCRS in the early 1980s, land contracts were granted for an initial term of 15 years. While the ownership of land remained collective, control and income rights were allotted to individuals based on the contract between the collective and the farm household, and farm households were allowed to regain responsibility for production input and output decisions. As land contracts approached expiry in the 1990s, the contractual period was extended by another 30 years. Recently, the government has announced further extensions of the contract period for an additional 30 years due from the late 2020s. Furthermore, in early 2013, China's government developed new institutional arrangements to increase farm size and for the transfer of land to more productive producers [27,28], with the objective of improving agricultural efficiency, productivity, and farmer income.

Productivity growth can come from increased farm sizes, human capital, and input use. A combination of the farmland and farmer—meaning large-scale family farms with educated young farmers—is the key to sustainable agriculture and productivity growth. Despite this, the role of the supply of laborers with degrees in achieving scaled and sustainable agriculture has been overlooked. In particular, few studies have examined the effects of the school-to-work process in China on agriculture and rural settlement.

3. Research Objectives and Methodology

China's RRS will ultimately ensure food security—the key is to attract and retain educated youth labor based on their pursuit of maximum utility. Due to delays in young graduates taking over farms, it is challenging to precisely determine whether they will eventually work as farmers in the future. Therefore, we must clarify the logic underlying the aims of the RRS before we can understand how to attract youths to work as professional farmers. This logic is described in Figure 2. In order to attract and retain educated youths in rural areas (labeled by pathway (1)), they should be provided with certain preconditions, including pleasant living environments, effective governance, and social etiquette and civility, which are three aims of China's RRS. Educated youths also have to be attracted and retained to effectively execute these great preconditions (labeled by pathway 4). The occupations in rural areas can be divided into three types: those tied to rural life, to agricultural services, and farming. Thus, operating thriving businesses requires combining agricultural services, rural life, and farming occupations, which also require the entry of educated youths (labeled by pathway 2), (3) and (5)) to guarantee smooth farming processes. Employing educated youths in larger-scale farmlands improves productivity and yields higher income, thereby ensuring food security. The three systems, which can be achieved by pathway (2), (3) and (5), are equally important, attracting educated youths, service agriculture and farming directly.



Figure 2. The logical diagram of China's Rural Revitalization Strategy.

However, we develop our research questions based on three considerations. Firstly, agricultural sustainability and food security will benefit from more graduates moving into rural areas as an outcome of the school-to-work process, regardless of whether they work in agricultural production directly, in an agricultural services field, or in another occupation tied to rural life. Secondly, the choice of graduates from rural areas to enter the same occupation as their parents will benefit agricultural production due to the inheritance and accumulation of agricultural knowledge or service skills. Thirdly, due to access costs and institutional constraints, we cannot guarantee that an educated farmer will use hired workers in a large-scale farm, as a graduate who may become a farmer in the future may initially operate in the manner of a family farm. Therefore, our study of the school-to-work process seeks to answer the following questions: Are graduates choosing to work in rural areas? Are graduates from rural areas engaging in the same work as their parents? What are the characteristics of graduates who make these choices?

To answer these questions, we test three aspects of the school-to-work process. Firstly, to understand the overall influences on the intentions of graduates, we examine whether graduates choose to work in rural areas by measuring how many of them move away from or into rural and urban areas upon graduation. Secondly, we examine the decision of graduates to move or return to rural areas in terms of who is more likely to do so. For this, we use a logistic model to isolate the contributions to graduates' decisions to return based on family background, educational background, and study performance. Thirdly,

The logistic models are expressed as follows:

$$\operatorname{Prob}\left(Y_{i}^{j}=1\right) = \frac{e^{\beta' X_{i}}}{1+e^{\beta' X_{i}}} \tag{1}$$

where Y^1 and Y^2 denote two independent models and *j* is coded as either 1 or 2. When *j* is 1, the model is used to estimate the influence on the probability of moving to rural areas for a graduate, and the dependent variable Y^1 takes a value of 1 when the graduate takes up a vocational position in a rural area; otherwise, Y^1 is 0. When *j* is 2, the model likewise estimates the influence on whether a graduate will take a similar job as one of his or her parents, and the dependent variable Y^2 takes a value of 1 when the graduate has a similar job to his or her father or mother, regardless of whether he or she works in the same place; otherwise, Y^2 is 0. *X* is a vector representing characteristics of the graduate and region, and β is the corresponding vector of parameters.

Equation (1) can be transformed into the following:

$$L_{i}^{j} = \ln(\frac{P_{i}^{j}}{1 - P_{i}^{j}}) = \beta' X_{i}$$
⁽²⁾

Generally, Equation (2) is termed the linear expression of the parameters. A linear equation facilitates the explanation of estimated parameters. A sample expression of β_1 is provided in Equation (3):

$$\frac{\partial z}{\partial x_1} = \beta_1 \tag{3}$$

where $z = \ln \frac{P_i^i}{1-P_i^i}$. By taking the antilogarithm of the estimated coefficient (β_1), we obtain the odds ratio, or the change in the ratio of the probability of a particular event (Y = 1) to the probability of a reference event (Y = 0) for a unit increase in an independent variable (x_1), while holding other variables constant. This study estimates using Equation (2), and then explains parameters using Equation (3).

Considering similar life paths, the resources inherent in social and socio-economic factors may influence individuals' decisions differently [29]. Therefore, we focus on such factors, including family background, educational background, and study performance.

All statistical analyses were performed using SAS (Statistical Analysis System) version 9.2 software. Multicollinearity is a common issue, especially in cross-sectional data, and no satisfactory solutions for this issue are currently available. Principal component analysis and the elimination of variables with low tolerances are commonly used methods [30]. This study eliminates variables with tolerances that are lower than 0.64 based on the multicollinearity diagnosis.

4. Data

In China, students graduate from higher education at the end of June, and their final semester (from January to June) is an important period for graduates to find a job using a variety of means. They must supply feedback regarding their decision for the future by submitting their documents for further study or employment contracts to the student offices of their university or college, which will send graduate records to the relevant human resource sector based on those documents or contracts. For those without documents or contracts, the student office at the university or college sends the materials to the graduate's hometown. Almost all students receive confirmation regarding their destination by the end of June.

Graduates without documents or contracts face serious difficulties because they cannot collect any income or government subsidies until they find a job. Due to the limitations of the Household Registration System in China, these graduates cannot enjoy many of the rights available to local residents until they find a job in a place where their records are then kept. Consequently, in our data collection, we assumed they were more likely to work in their hometown initially, and thus, we treated their workplace as being located where their materials were sent.

To identify the key factors that affect the likelihood of a graduate moving to a rural area, questionnaires were designed by research fellows to gather information relevant to each student's family background, educational background, personal details, and study performance, along with vocational information. Family background included the number of family members, educational level of the main labor force participants, family income, father's years of education, and location of the family residence. Educational background included the ranking of his or her university, degree, and major. Personal details and study performance comprised age and scores, among others. Vocational information included the location of work, salary, and employment category based on their employment contract, among others. We improved the questionnaire based on the research goals and feedback from a small-scale pilot survey among graduates.

We invited those who were likely to contribute to this research and were studying in different universities or colleges throughout China. The final fieldwork team comprised 2 faculty staff and 58 students from 49 universities and colleges in 29 provinces or municipalities of China (excluding Qinghai, Tibet, Taiwan, Hong Kong, and Macao).

After instructing the fieldwork team on how to proceed based on the content of the questionnaires, the formal survey was conducted from 15–20 June 2016. The members of the fieldwork team implemented the survey in their university or college and an adjacent university or college, randomly choosing 2–4 graduates per major in 10 majors per university. The team member completed the questionnaires based on the responses given in face-to-face interviews.

The initial data from all questionnaires were first recorded in a spreadsheet. We collected 1586 valid respondent questionnaires. Some outliers were excluded, along with responses that were missing values for discrete variables. In some cases, where continuous variables had missing values, we used averages. The final sample size was 1479, which meets the criteria for a large sample. Definitions and statistical descriptions of the variables considered are reported in Table 1.

Table 1. Definitions and statistical descriptions of related variables.

| Variable | Definition | Moon | ۶D |
|----------|---|-------|------|
| variable | Demition | Wiean | 50 |
| | Dependent variables | | |
| Worp | 1 if working in rural area, otherwise 0; | 0.32 | 0.47 |
| Jobf | 1 if taking a similar vocation as one parent, otherwise 0; | 0.10 | 0.30 |
| | Independent variables: Family background variables | | |
| Fpop | The number of family members | 3.91 | 0.97 |
| Flab | The number of labor force in the family | 2.03 | 0.70 |
| Floc | 1 if family is located in urban areas, otherwise 0; | 0.53 | 0.50 |
| Edfa | The mean value of father's and mother's years of education | 10.09 | 4.16 |
| Finc | Annual income for family (10 thousand RMB) | 8.34 | 9.01 |
| Fhea | 1 if father is head of family, otherwise 0; | 0.78 | 0.42 |
| | Independent variables: Educational background variables | | |
| Maag | Dummy variable, 1 if major belongs to agriculture, otherwise 0; | 0.079 | 0.27 |
| Masc | Dummy variable, 1 if major belongs to science, otherwise 0; | 0.53 | 0.50 |
| Mate | Dummy variable, 1 if major belongs to technology, otherwise 0; | 0.081 | 0.27 |
| Maso | Dummy variable, 1 if major belongs to economic or social; | 0.31 | 0.46 |
| Acvo | Dummy variable, 1 if graduated from junior college, otherwise 0; | 0.13 | 0.34 |
| Acba | Dummy variable, 1 if graduated from university, otherwise 0; | 0.87 | 0.34 |
| | Independent variables: Individual information and study performance variables | | |
| Gend | Gender: male = 1, female = 0 | 0.56 | 0.50 |

| Variable | Definition | Mean | SD |
|----------|--|------|------|
| Phea | 1 if the graduate is at a healthy condition, otherwise 0; | 0.94 | 0.24 |
| Stto | 1 if academic performance is at the top level in class, otherwise 0; | 0.37 | 0.48 |
| Stmi | 1 if academic performance is at the middle level, otherwise 0; | 0.43 | 0.50 |
| Stlo | 1 if academic performance is at the lower level; otherwise 0; | 0.20 | 0.40 |
| Pcum | Consumer spending per month on campus (1000 RMB) | 1.17 | 0.51 |
| Peac | 1 if graduate is a cadre in campus, otherwise 0; | 0.53 | 0.50 |

Table 1. Cont.

5. Results and Discussion

5.1. Summary of the School-to-Work Destination

To understand the relocation intentions of graduates from different areas of origin, we classified the graduates into "from rural" and "from urban" regions based on their hometown, and into "to rural" and "to urban" based on their working area. The number of graduates in each of these classes is reported in Table 2.

| Table 2 | Statistic (| for grad | fuates' s | patial | mobility |
|----------|-------------|----------|-----------|--------|----------|
| 1abic 2. | Statistic | ior grad | audico o | patia | moonity. |

| | | From Rural | | From Urban | | Total | |
|----------------|---|--------------------|------|--------------------|------|--------------------|------|
| | | Absolute Number | % | Absolute Number | % | Absolute Number | % |
| | With work contract | 98 | 14.1 | 93 | 11.9 | 191 | 12.9 |
| To rural areas | Without study document or work contract | 271 | 38.9 | | | 271 | 18.4 |
| | Total rural areas | 369 | 53.0 | 93 | 11.9 | 462 | 31.3 |
| | With work contract | 193 | 27.7 | 164 | 21.1 | 357 | 24.2 |
| т. 1. | With study document | 135 | 19.4 | 263 | 33.8 | 398 | 27.0 |
| To urban areas | Without study document or work contract | | | 259 | 33.2 | 259 | 17.5 |
| | Total urban areas | 328 | 47.1 | 686 | 88.1 | 1014 | 68.7 |
| Total | With study document or work contract | 426 | 61.1 | 520 | 66.8 | 946 | 64.1 |
| | Without study document or work contract | 271 | 38.9 | 259 | 33.2 | 530 | 35.9 |
| | Total areas | 697 | 100 | 779 | 100 | 1476 | 100 |

From Table 2, we can see that 328 graduates from rural areas moved to urban areas, and 369 graduates chose to work in rural areas, of which 271 did not find a job and were compelled to return to rural areas. Thus, only 98 graduates found a job in rural areas. We also found that only 93 graduates from urban areas moved to rural areas. In addition, 68.7% of all graduates remained in urban areas during the school-to-work process, including 27% of the graduates who remained in urban areas to pursue further studies. It is not surprising that graduates from urban areas had a greater probability of pursuing further studies (33.8%) than graduates from rural areas (19.4%), given the long-standing criticism of China's "urban-oriented" education system [31,32]. The overall direction of movement of graduates is clearly from rural to urban.

Nonetheless, we observe that 12.9% (191/1476) of graduates did choose to work in rural areas. In addition, graduates from rural areas were slightly more likely to find a job in a rural area (14.1%) than were graduates from urban areas (11.9%).

Graduates can satisfy the rural demand for skilled laborers because they are more likely to adopt modern technologies [23]. Having educated farmers will benefit the sustainability of agriculture [33]. Graduates, therefore, should be treated as a source of candidates for farming; however, the school-to-rural process in China gives little cause for optimism in this regard. In fact, even though some graduates are compelled to work in rural areas, they tend to choose non-farming positions. There are three factors behind the weak attraction toward farming. Firstly, China is a country of small farm holders [34] and most farms are too small to provide families with sufficient work or income, which makes them

unappealing to young people. Secondly, current land use policies, especially the HCRS, have a negative effect on the accessibility of farmland to graduates over time [35,36]. The HCRS stipulates that farmland belongs to the government and the use of land by farmers is free under the law, wherein different families manage different agricultural land areas based on their population. Many Chinese rural villages have terminated farmland adjustments for 30 years, causing candidates who run a farm to seek employment outside of agriculture after completing their education [37]. Thirdly, the urban-oriented rural culture has been a longstanding barrier for the return of rural youth to the countryside [31]. This culture, whereby rural families are proud of their children who leave the countryside and agriculture to become part of the non-agricultural population, has shaped the environment in rural areas [38].

5.2. The Impact of Relative Factors on the Decision to Return to the Village

We used Equation (2) to estimate the impact of relative factors on the possibility of returning to rural areas. The dependent variable is Worp, with the estimated results presented in Table 3. In model Worp 1, we used the whole dataset. Considering that it is unstable for a graduate without an employment contract to remain in rural areas, we only used respondents with contracts for further estimation in model Worp 2. Since graduates with a rural area background are more likely to return to rural areas, we were also interested in the part of the sample with a rural background. We estimated employment using respondents from rural families and respondents with a contract from rural families separately, and the respective results are presented for model Worp 3 and model Worp 4.

From the estimated results using the family background variables, we can find the variable Floc has a strong statistical significance at the 1% level in model Worp 1 and Worp 2, and the estimated parameters are all negative. The variable Finc has a strong statistical significance in model Worp 3 and Worp 4, and the estimated parameters are all positive, so it can be implied that, among graduates from rural families, those with wealthier families were more likely to return to rural areas, possibly because these families have greater control over economic resources, for example large-scale farmland, in their localities; such graduates can therefore more easily earn higher incomes if they return to their rural areas to work. Decisions of members of farm households as to whether to remain in farming or to leave the sector are influenced by the family's socio-economic conditions [39] and the income difference between agriculture and other sectors [17,40]. The overall farm size is an important consideration in the possibility of succession on farms [35,41]: the larger the farm, the greater the chance of succession as heirs wish to continue their family tradition [42]. It is possible to increase the farm scale for farmers who stay due to some small-sized farm owners exiting farming. It is also possible to halt the process of exiting farming as farm sizes become large enough to provide an adequate family income and, in fact, the number of middle- and larger-sized farms has increased over recent years [34].

The estimated results for the educational background variables reveal that students with a technology major were more likely to find a job in a rural area than students with a science major (the reference category). This may be explained by the rapid growth of the economy in rural areas in China, meaning that the occupational capacity is larger for graduates with a degree in technology. A further finding was that college graduates showed a greater probability of working in rural areas than students with Bachelor's degrees, perhaps because graduates with a vocational education lack competitiveness in the urban sector compared with graduates with Bachelor's degrees.

| | Wor (Whole S | Worp 1 (Whole Sample) | | Worp 2 (Graduates with a Work Contract) | | Worp 3 (Graduates from Rural Areas) | | Worp 4 (Graduates from Rural Areas with a Work Contract) | |
|-----------------------------|-----------------|--------------------------|---------------------|--|----------------|--|-----------|--|--|
| Variable | Estimate | Odds Ratio | Estimate | Odds Ratio | Estimate | Odds Ratio | Estimate | Odds Ratio | |
| Intercept | -0.47 | | -1.25 | | 0.16 | | -0.31 | | |
| * | | | Family I | Background Variables | | | | | |
| Fpop | 0.030 | 1.03 | -0.13 | 0.88 | 0.090 | 1.09 | 0.041 | 1.04 | |
| Flab | 0.092 | 1.10 | 0.20 | 1.22 | -0.12 | 0.89 | -0.095 | 0.91 | |
| Floc | -2.31 *** | 0.10 | -0.72 *** | 0.49 | | | | | |
| Edfa | -0.011 | 0.99 | -0.025 | 0.98 | -0.016 | 0.98 | -0.069 * | 0.93 | |
| Finc | 0.0075 | 1.01 | 0.0085 | 1.01 | 0.034 ** | 1.04 | 0.067 ** | 1.07 | |
| Fhea | 0.096 | 1.10 | -0.11 | 0.90 | -0.12 | 0.88 | -0.30 | 0.74 | |
| | | | Educationa | al Background Variabl | les | | | | |
| Maag | 0.18 | 1.19 | 0.66 * | 1.93 | 0.28 | 1.33 | 0.75 | 2.12 | |
| Maso | 0.32 ** | 1.37 | 0.095 | 1.10 | 0.52 *** | 1.68 | -0.17 | 0.85 | |
| Mate | 0.43 * | 1.54 | 0.79 ** | 2.21 | 0.28 | 1.33 | 1.01 ** | 2.74 | |
| Acvo | 0.92 *** | 2.52 | 0.96 *** | 2.62 | 1.29 *** | 3.62 | 1.15 *** | 3.14 | |
| | | In | dividual Informatio | n and Study Performa | ance Variables | | | | |
| Gend | -0.55 *** | 0.58 | -0.89 *** | 0.41 | -0.56 *** | 0.57 | -0.85 *** | 0.43 | |
| Phea | 0.19 | 1.21 | 0.46 | 1.59 | -0.33 | 0.72 | -0.82 | 0.44 | |
| Stto | -0.79 *** | 0.45 | -0.63 *** | 0.53 | -0.68 *** | 0.51 | -0.11 | 0.89 | |
| Stlo | 0.083 | 1.09 | -0.084 | 0.92 | 0.31 | 1.36 | 0.21 | 1.23 | |
| Pcum | 0.34 *** | 1.40 | 1.02 *** | 2.78 | 0.25 | 1.29 | 1.14 *** | 3.13 | |
| Peac | 0.043 | 1.04 | 0.32 * | 1.38 | 0.096 | 1.10 | 0.33 | 1.40 | |
| Likelihood Ratic | (Pr > ChiSq) | < 0.0001 | | < 0.0001 | | < 0.0001 | | < 0.0001 | |
| lax-rescaled R ² | r | 0.33 | | 0.19 | | 0.14 | | 0.23 | |
| Sampling Size | | 1476 | | 548 | | 697 | | 291 | |

Table 3. Impact of the graduate's background factors on the school-to-village possibility.

*** 0.01; ** 0.05; * 0.10.

From the estimated results for personal details and performance variables, we found that graduates less able to compete in the job market, for example, females and those with poorer study performance [43], were more likely to be directed toward rural areas.

Although part-time farmers are often considered a group that will eventually leave farming [44], the process of part-time farming for USVO project candidates may orient these students toward agriculture because part-time farming indicates that farming is sufficiently attractive to provide an income for a graduate's family. Some of these part-time farmers can become professional farmers because it is easier to accumulate management and production experience in agricultural production when holding an official village position. Policies similar to the USVO project, which can remove the obstacles faced by graduates in accessing farmland, are important to attract young people with degrees to rural areas, and even to work directly in grain production [37].

5.3. The Impact of Relative Factors on the Decision to Follow in the Footsteps of Parents

We used Equation (2) to estimate the probability of graduates following one of their parents' occupations. The dependent variable is Jobf, with the estimated results presented in Table 4. In the model Jobf 1, we estimated the results by only including respondents who held an employment contract. In the model Jobf 2, we focused on who will succeed their parents to work in rural areas by only including respondents who held employment contracts and worked in rural areas. In the model Jobf 3, we only selected respondents who held employment contracts and came from rural areas.

| | Jobf 1 (Graduates with a Work Contract) | | Jo (Graduates with Moving to | bf 2 n a Work Contract Rural Areas) | Jobf 3 (Graduates from Rural Areas with a Work Contract) | |
|---------------|--|--------------------|------------------------------------|---|--|-------------------|
| Variable | Estimate | Odds Ratio | Estimate | Odds Ratio | Estimate | Odds Ratio |
| Intercept | -3.28 *** | | -1.99 | | -1.53 | |
| | | Fami | ly Background Va | riables | | |
| Fpop | 0.18 | 1.20 | 0.082 | 1.09 | 0.28 | 1.32 |
| Flab | -0.46 *** | 0.63 | -0.39 | 0.67 | -0.57 ** | 0.56 |
| Floc | 0.75 *** | 2.12 | 1.74 *** | 5.71 | | |
| Edfa | 0.12 *** | 1.13 | 0.12 ** | 1.13 | 0.10 * | 1.11 |
| Finc | 0.0056 | 1.01 | -0.010 | 0.99 | -0.0057 | 0.99 |
| Fhea | 0.097 | 1.10 | 0.11 | 1.12 | 0.011 | 1.01 |
| | | Educati | ional Background | Variables | | |
| Maag | 0.54 | 1.71 | 0.32 | 1.38 | 2.33 *** | 10.27 |
| Maso | -0.23 | 0.80 | 0.16 | 1.17 | -0.33 | 0.72 |
| Mate | 2.00 *** | 7.42 | 3.47 *** | 31.98 | 2.33 *** | 10.26 |
| Acvo | 0.14 | 1.15 | -0.11 | 0.90 | 0.087 | 1.09 |
| | | Individual Informa | ation and Study Pe | rformance Variables | | |
| Gend | -0.17 | 0.85 | 0.43 | 1.53 | -0.63 | 0.53 |
| Phea | 0.73 | 2.08 | -0.62 | 0.54 | -1.55 ** | 0.21 |
| Stto | -0.28 | 0.76 | 0.12 | 1.13 | -0.28 | 0.75 |
| Stlo | 0.013 | 1.01 | 0.56 | 1.75 | 0.61 | 1.84 |
| Pcum | 0.026 | 1.03 | -0.15 | 0.86 | 0.48 | 1.62 |
| Peac | 0.056 | 1.06 | -0.35 | 0.71 | 0.066 | 1.07 |
| Likelihood R | Likelihood Ratio (Pr > ChiSq) | | | < 0.0001 | | < 0.0001 |
| Max-r | escaled R ² | 0.21 | | 0.41 | | 0.29 |
| Sampling Size | | 548 | | 193 | | 291 |

Table 4. Impact of graduate background factors on the decision to choose a similar job as the parent.

*** 0.01; ** 0.05; * 0.10.

From the parameter results of the family background variables, we found that graduates with an urban background, or whose parents had higher educational levels, were more likely to work in a similar field to their parents. Graduates from families with more labor workers were more likely to choose a different job than that held by their parents. In general, family size is larger in rural China than in urban areas, so this finding indicates that graduates from rural families are more likely to choose a different job than their parents.

The estimated results of the three educational background variables revealed that graduates from rural families with a degree in agriculture were more likely to follow in their parents' footsteps, which is a promising result for sustainable agriculture, and may indicate that they chose their major with the aim to work in the agricultural sector in the future. Graduates with rural backgrounds, especially those with agricultural degrees, have competitive advantages in gaining rural positions over other graduates during the school-to-work process. Their advantages lie in the long-term accumulation of experience in agricultural production, given that most agriculture is similar to that performed traditionally based on family experience.

Among the personal details and study performance variables, none were significant. This includes gender in all three models, countering the cultural notion (Confucian values) in China that parents, especially in traditional rural families, generally have a preference that boys—rather than girls—take over the family business. One of the characteristics of the family farm is that it is transferred within the family, most often from parent to child, which is increasingly viewed as fundamental to the sustainability and development of agriculture [45]. This is frequently both a traditional pattern and to some extent protected by law, but many younger family members only come home to take over the farm "when the father dies", by which time they are already well-invested in another career.

6. Conclusions and Policy Recommendations

Due to the important role of educated youths in the food security system in China (described by the logistic in Figure 2), we focus on the pathways ①, ②, ③ and ⑤ to check whether the current school-to-work process is smooth and if it is ultimately benefitting food security in the RRS. We can conclude from our literature review that graduates are a crucial source of young farmers to shape tomorrow's agriculture. Our research findings also provide insights into the school-to-work process in relation to sustainable agriculture and food security, as outlined below.

Firstly, most graduates who choose rural areas do so because they are pushed there from urban areas. Since there is little pull from rural areas, school-to-work destinations are mainly urban. However, we can remain optimistic that some graduates will still choose to work in rural areas, including farming directly. Larger-scale farms can be considered a factor that can enhance the attractiveness of agriculture for young, educated laborers.

Secondly, graduates from richer rural families are more likely to work in rural areas than graduates with urban backgrounds, but the urban-oriented culture in rural areas means that graduates with rural backgrounds are prone to working in non-farm positions, despite their advantages in gaining agricultural work. Some graduates with urban backgrounds choose to work in positions related to agricultural production as new entrants; however, they need time to accumulate knowledge and experience in agricultural production.

Thirdly, following in their parents' footsteps can smoothen students' school-to-work transition, and the phenomenon of children taking up the occupation of one of their parents is observed among various groups of graduates, including those with agricultural degrees and rural backgrounds; however, the one-child policy presents an obstacle in this regard.

To reduce the adverse impact on sustainable agriculture caused by aging, there are certain key tasks for agricultural policy in China: providing proper incentives, removing obstacles, and streamlining the school-to-farming process. We believe that policy proposals should start with the following considerations:

(1) China needs to address the fundamental problems facing the sector to make agriculture more attractive to young people. For example, the development of viable family farms that are large enough to provide an adequate family income should be promoted. To this end, support is necessary for the restructuring and modernization of farms to improve the viability of the whole farming sector. Taking over a farm from an employer or parents can be a very long process; therefore, government aid should

be targeted at young farmers who take over farms from their parents or engage in start-up activities in agriculture.

- (2) Providing assistance and support to the potential successors of retiring farmers is one of the key tasks for agricultural policy in China, and graduates with degrees in agriculture and a rural background, aligned to the USVO project, should receive more attention as potential candidates to become professional farmers in the future. It is necessary to consider and streamline the school-to-work process among young farmers with respect to other socio-economic challenges in rural areas, including the problem of aging populations. To facilitate farm succession, it is also necessary to provide older farmers with legal protections relating to other social problems, which will improve their willingness to retire from farming.
- (3) Social discrimination based on the "urban-oriented" education system is pushing younger laborers out of rural areas. In response, a "rural-oriented" education system should be encouraged, and rural and traditional cultural values and the rural community's rights of participation should be fully respected and recognized in the course of Chinese social development.

A few limitations have to be noted. The food security system is a huge project; even though we only focus on the school-to-work process, there are a lot of things that need further study, for example, how to improve productivity on limited farmland, how to use farmland efficiently, and so on. The results of this study are largely dependent on the survey data employed, but observational studies are rarely based on perfect data, and a deterministic theory can be invalidated by a single contradictory observation. Further investigation is necessary to validate the accuracy of the results of this research.

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