

Article

Fuzzy-Set Qualitative Comparative Analysis of Factors That Influence Skilled Talents Scarcity in Agricultural Industry: Case Study of 14 Cities in Hunan Province

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Abstract: As skilled talent is the core element in optimizing the industrial structure, clarifying the factors that influence the lack of skilled talent in the agricultural industry is essential. The lack of skilled talent in the agricultural industry is a complex problem. The author based this study on the push–pull theory and used the fuzzy-set qualitative comparative analysis (FSQCA) research method to explore the “joint effect” of the factors that affect the lack of skilled talents in the agricultural industry in 14 cities of Hunan Province. This paper found that indicators such as the rural industry status, rural medical level, agricultural and forestry financial investment, urbanization construction, regional economic development level, and local government officials were all presented under sufficient conditions. These influencing factors have a “combined effect” on the agricultural industry’s lack of skilled talent. The rural industry status indicator was the core condition, appearing in all the configurations. This article’s main marginal contribution is that it defined three conditional configurations for the lack of “present” agricultural skilled talents, and dependent configurations are consistent. Among the three conditional configurations, the “rural industry + economic construction and financial investment” configuration is the most powerful way to retain skilled agricultural talents. In addition, the causal relationship between the lack of “present” agricultural industry skilled talents and the lack of “absent” agricultural industry skilled talents are asymmetric. The primary task is to develop rural industries to solve the problem of the shortage of skilled talent in the agricultural industry. Additionally, then implement the ‘industry+’ combination policy. So the government must create related policies in the following areas: the supply of essential public services in rural areas, the economic construction of prefectures, the development of county urbanization, and the financial investment in agriculture, forestry, and water conservancy.

Keywords: rural revitalization; lack of agricultural industry skilled talent; influencing factors; configuration analysis; China



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1. Introduction

The substantial discrepancy between the people’s growing need for a better life and the unbalanced and insufficient development is hampering the high-quality development of China’s economy and society. Promoting rural revitalization to solve the current central social contradiction is of fundamental and strategic importance. Yuan, Y.C and Kang, L.X. [1] believe that industrial development is the “bull’s nose” in rural revitalization, as well as the critical point, the difficult point, and the way to achieve it. The development of the agricultural industry is the primary consideration in the regeneration of rural areas, and it is related to people’s lives and national economic development. However, the development of the agricultural industry in China has been neglected to a certain extent due to the low income and high risk, and the number of people engaged in the agricultural sector is

becoming smaller and smaller. As a central agricultural province in China, Hunan Province has achieved good results in the development of modern agriculture, and it has now entered the stage of the rapid development of agricultural modernization [2]. However, the number of people employed in Hunan's primary sector decreased from 21,209,800 in 2000 to 8.36 million in 2020 [3]. The decline in the agricultural industry is closely linked to the population's rural–urban migration. The rural–urban population reached 385 million in 2021 [4], with Hunan Province, the province with the largest net migration of people, at the forefront of the country.

A country's population is its foundation and the key to regional development. Human capital and industrial development are closely related and contribute to economic growth [5]. Some scholars point out that the quantity and quality of workers can describe human capital management. As the development pattern of China's agricultural industry continues to change, the quantity and quality of the workers in the agricultural industry urgently need to be improved because the transformation and development of agricultural modernization require a reasonable allocation of human capital [6]. In human capital, workers with superior abilities and qualities or specific professional expertise or skills are referred to as skilled talents. The Hunan agricultural industry has few skilled talents, and they have poor-quality skills. Skilled talents in the agricultural industry mainly refer to the professional and technical personnel engaged in agricultural production, manufacturing, and sales. In 2021, the Hunan Provincial Department of Agriculture and Rural Affairs reported that 32.4% of the county and township skilled agricultural workers were over 50, and only 6.4% were under 35. Only 12.1% had a bachelor's degree or above, and 48.4% had technical secondary school education and below. Regarding the types of skilled talents, the workers utilized more traditional farming skilled talents, and e-commerce, management, professional artisans, and other skilled personnel were scarce [7].

The technological innovation of modern agriculture faces problems due to the need for skilled agricultural industry talents. What causes the lack of skilled talents in the agricultural industry? Are the causes “interdependent and co-operative” [8], and do they have a “joint effect”? The researcher explored these questions in this study. The author primarily used the FSQCA research method to analyze the influencing factors on the lack of skilled talents in the agricultural industry in 14 cities of Hunan province, and they identified three conditional configurations. The lack of skilled talent in the agricultural sector in each conditional arrangement is affected by the combined effect of the factors. Among them, the present situation of the rural industry appears in all the conditional configurations in the way of “existence”. In addition, the results of the three conditional configurations are equivalent, and the most potent conditional configuration is the “rural industry + economic construction and financial investment” mode.

This article includes six sections. Section 1 contains the introduction. Section 2 consists of the literature review and theoretical framework. In this section, the author expounds upon and summarizes the six reasons for the migration of the agricultural population: personal factors; the policy regime; essential public services; the rural industry status; the regional economic development level; and small- and medium-sized urbanization construction. At the same time, with the help of the “push–pull” theory, the researcher identified the push factors (such as the current situation of the rural industry, the level of the township medical care, and the financial investments in agriculture and forestry) and pulled factors (such as the urbanization construction, regional economic development, and local government leadership) of the relocation. The author presents the research methods and descriptions of the data sources, variables, and variable calibrations in Section 3. Section 4 mainly presents the results, the necessary analysis of whether there is a single-cause condition, an adequacy analysis of whether there is a combined effect of the cause conditions, a description of the relevant results of the configurations of the three cause conditions after the adequacy analysis, and the robustness test results. Section 5 focuses on the correlation analysis of the three conditional configurations with the existing theoretical

literature and supporting cases and highlights this study's limitations and future directions. The author presents the conclusion in Section 6.

2. Literature Review and Theoretical Framework

2.1. Literature Review

Skilled talents are the core element in the economic structure's high-quality development and the industrial structure's optimization [9]. Human capital investment can promote agricultural economic growth and improve production efficiency [10]. Currently, the distribution of skilled agricultural talents in the industrial chain in China is highly unbalanced, and there is a substantial shortage of composite agricultural skilled talents in preproduction and postproduction, such as planning and management, agricultural technology, and comprehensive services [11,12]. As stated above, Hunan Province is in the same situation due to its shortage of agriculture skilled talents, and more qualified labor is needed. There are many reasons for the lack of skilled agricultural talent, including endogenous shortages and the external loss of rural skilled talent [13]. This study primarily focused on the superficial loss of rural skilled talents and the agricultural population mobility. The paper summarizes the current state of the literature on the six causes of agricultural population mobility as follows.

The first cause is personal factors. Individuals' migration decisions impact agricultural population mobility, resulting from their pursuit of higher comparative cost benefits and utility [14]. Income and wage differences are the main factors that drive population migration [15]. However, Harris, J.R. and Todaro, M.P. argue that the reason for rural-to-urban migration depends on the difference in the income expected by individuals, not just the wage gap [16]. Population migration not only impacts the narrowing of the personal income gap, but it can also balance the domestic labor market. Hiring adult rural workers in the off-season in India has partially prevented their seasonal migration to the cities and narrowed the urban–rural income gap [17].

The second cause is the policy regime. In the 1950s and 1960s, development economists believed that the migration of rural populations to urban areas was a core measure in the economic development process of low-income countries [18]. Other scholars argue that rural-to-urban migration is a balanced flow of rural surplus labor into modern urban industrial sectors and leads to urban capital accumulation and economic growth [19,20]. In China, the bias of the policies, institutions, and resources towards cities and the prioritization of industrial development strategies influence agricultural population mobility [11]. This administrative power has changed the distribution of human capital [21].

The third cause is essential public services. Urban public services influence population mobility [22]: when the local public expenditure of a city increases, the number of people that migrate from that city also increases, and the local government spending on infrastructure, culture, education, health, and social security have a more substantial impact [23,24]. This situation exists not only in China but also in foreign countries. Nepalese emigrants focus on infrastructure and services, usually on locations with electricity and good roads [25]. Selod, H and Shilpi, F. [18] have also proven that migrants are attracted to urban amenities, educational opportunities, and social environments.

The fourth cause is the rural industry status. In a discussion on the decrease in the rural population in England in the 1950s, Bracey, H. [26] pointed out that rural mobility is not only the flow from region to region but is also closely linked to the changing meaning of the countryside. In earlier times, China's rural areas were backward, industries were scarce, and farmers' incomes were low [27]. Migration to the city meant that the farmers could increase their nonagricultural incomes, and thus they left their homes. Now, scholars argue that rural industries should be developed to retain rural skilled talents and that the rural industry must develop modern agriculture, promote agricultural modernization through the structural reform of the agricultural supply side, pay attention to the integrated development of the primary, secondary, and tertiary industries, and increase the incomes

of farmers [28,29] so that their lives can continuously improve, local rural skilled talents will not be lost, and the two-way flow of urban and rural skilled talents will be possible.

The fifth cause is regional economic development. Salvati, L. [30] confirmed that population mobility in Greece is also related to regional economic performance. Population mobility's spatial movement and intensity reflect the complex social and economic transformation. Generally, the economic development area is rich in industry and reasonably structured. The area is the first choice for migrating populations and can absorb more floating populations [31]. Indeed, the power of the population flow is related to the strength of economic development, mainly reflected in employment [32,33]. Economically backward cities usually provide fewer employment opportunities than economically developed areas. Given this, financially backward regions have a net outflow of their populations.

The sixth cause is small- and medium-sized urbanization construction. In the coming decades, rural-to-urban migration will occur in increasingly urbanized low- and middle-income countries [34]. In 2021, China's urbanization level reached 64.72%. According to the data, China's urbanization has entered the middle and late stages, forming a "basic pattern system for the coordinated development of large, medium and small cities and small and medium-sized cities" [35]. However, China has a vast territory, and there is an imbalance between the regional levels of urbanization development. Compared with the successful cases of the small- and medium-sized towns established by the rural industrialization model in southern Jiangsu, China's rural areas still have a long way to go in promoting the development of small- and medium-sized towns with the help of industrial development, and the agricultural population mobility in poor rural areas persists. However, China has faced problems in the process of urbanization. In May 2022, the state issued a grand development plan for county urbanization and directly benchmarked the rural revitalization and development blueprint [36].

In summary, the lack of skilled talents in the agricultural sector is a complex process affected by personal factors, policies and systems, essential public services, rural industrial development, regional economic development, and urbanization. Although the academic community has undertaken in-depth analyses of the reasons for the lack of skilled talents in the agricultural industry, the grounds are rarely used in the data or cases, and there are many subjective attributions. Moreover, in the empirical studies, the researchers focus on analyzing a single factor's "net effect" and do not clarify the "joint effect" or interaction between the causes. In addition, the "net effect" can only be used to analyze the interaction of three variables, which does not fully explain the causal complexity problem [37]. To explore the combined effect of the antecedent variables and the interaction between multiple antecedent variables, researchers commonly use the fuzzy-set qualitative comparative analysis (FSQCA) method [38]. In this study, the author makes two marginal contributions: this article used FSQCA to carry out the configuration analysis of the influencing factors on the lack of skilled talents in the agricultural industry, and it found that there is a combined effect and an alternative relationship between the causes; (2) the study proposes three ways to solve the problem of the lack of skilled agricultural talents in Hunan Province, proposing suggestions on how to prioritize the development of rural industrial policies, and suggesting other combined policy measures.

2.2. Theoretical Framework

The scarcity of skilled agricultural talent is affected by population migration, and that can use the "push-pull" theory can explain the reasons. The theory holds that the driving forces of population migration are the push force of emigration and the pull force of immigration. Therefore, the push-pull theory is suitable for analyzing the problem of the lack of skilled agricultural talent. Bogue, D.J. [39] proposed this theory, the main point of which is as follows.

Population migration is affected by the interaction of the two push and pull forces. "Push" refers to the positive factors that are conducive to population migration, while "pull" refers to the negative aspects that are not conducive to population migration. The

“thrust” of migration mainly relates to factors such as the depletion of natural resources, low-income levels, and poor public services. The “pull” of migration comes from the social network of acquaintances, warm family relationships, etc. Usually, the “thrust” of the emigration place is greater than the “tension” and dominates. The “pull” of the immigration place is mainly due to better employment opportunities, higher wages and incomes, and better public services. The “thrust” of the place of immigration is due to the strange production and living environment, fierce work competition, and deteriorating ecological environment. Generally speaking, the “tension” is greater than the “thrust” in the place of immigration [39]. This paper mainly describes the “push” and “pull” of the out-migration place (as shown in Figure 1). The lack of rural industries and financial investment in agriculture and forestry are the main factors affecting farmers’ incomes, and essential public services (such as education and medical care) are related to the physical quality, intellectual development, and intergenerational transmission of the migrants. These factors are the main “push” behind the outflow of the agricultural population. In 2018, China launched rural revitalization, with many resources tilted toward agriculture and rural development, which government officials initially paid more attention to. Then, in 2022, the national urbanization construction shifted from the metropolis to the county. In addition, the state economy in the central and western development competition has improved. These comparative advantages are the “pull” that attracts skilled talents. Based on the “push–pull” theory of Bogue, D.J. [39], in this paper, authors used the FSQCA research method to explore the “joint effect” caused by six factors (the rural industry status; rural medical level; financial investment in agriculture and forestry; urbanization construction; regional economic level; local government leadership) on the brain drain in the agricultural industry, and to explore the “complementary, alternative and inhibitory” relationships among the influencing factors, to find an effective way to solve the shortage of skilled agricultural talents.

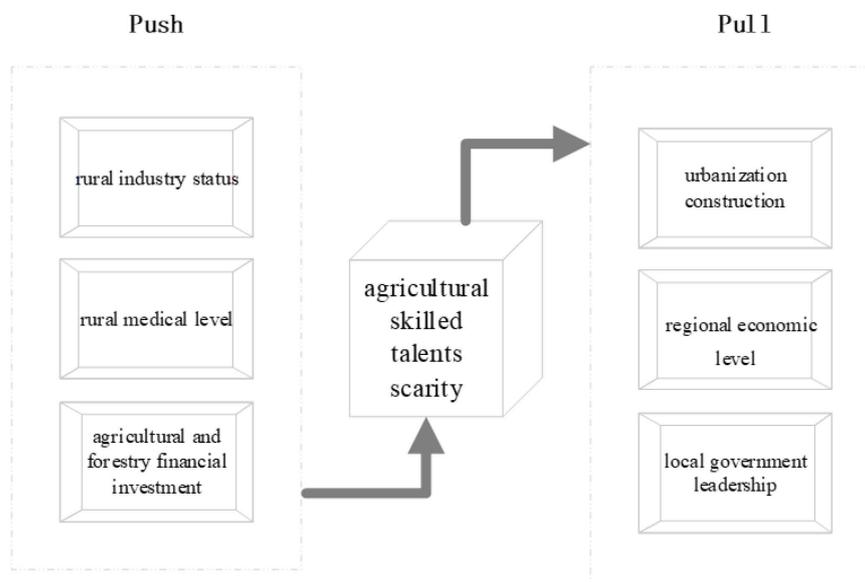


Figure 1. Lack of skilled talents in agriculture industry ‘push–pull’ figure.

3. Research Methodology

3.1. Method Description

A causal relationship exists in the development of things. Researchers usually use quantitative research methods, such as regression, to evaluate the causal impact of a single factor on a single element, which belongs to net effect research. Although researchers can use factor or cluster analysis to evaluate the interaction term, it has certain limitations [40]. For example, it is impossible to effectively identify defects, such as the interdependence

and causal symmetry between conditions [41]. In reality, the results are affected by a combination of multiple factors. For example, the lack of rural industrial skills is impacted by urbanization, the development of local township enterprises, rural infrastructure construction, national financial investment in agriculture, forestry, and water conservancy, government policies, the regional economic development level, and other aspects. A research method needs to analyze the effects of the complex configurations and multiple interactions that considers factors such as complementarity and contingency [42]. Researchers apply the set theory research method to the configuration analysis of various influencing factors. In this method, they mainly use Boolean algebra to determine which combinations of variables will lead to the results in the problem. Boolean algebra is the operation of logical and logical or logical non-of variables here. The set theory uses the set–subset relationship to establish a connection between the conditions. The link between the states is based on the cooperation of the set and subset to determine the requirements and sufficient needs [40,42]. The qualitative comparative analysis (QCA) research method is divided into clear multivalued fuzzy sets. Fuzzy-set qualitative comparative research (FSQCA) provides more accurate data processing. Therefore, the author chose FSQCA in this study to analyze the lack of skilled talents in the agricultural industry in 14 cities of Hunan province.

3.2. Data Sources

The national industrial development from the east to the central and western regions indicates the gradual gradient transfer, and the central region has become a critical national development area. As one of the six provinces in central China, Hunan has jurisdiction over Changsha, Zhuzhou, Xiangtan, Hengyang, Shaoyang, Yueyang, Changde, Zhangjiajie, Yiyang, Chenzhou, Yongzhou, Huaihua, Loudi, Xiangxi Tujia, and Miao Autonomous Prefecture. The landform is mainly mountainous and hilly. The terrain is flat, and the climate is subtropical monsoon, the soil is fertile, the water source is sufficient [43], and the location is advantageous for agricultural development. At present, the agricultural development of Hunan Province ranks second in the central region. However, the number of employees in the primary industry in Hunan Province is declining, and the employees are also unevenly distributed among the municipalities (as shown in Figure 2) [3]. Identifying the impact configurations that affect the lack of skilled talents in the agricultural sector is necessary to speed up regional development. Researchers took 14 cities in Hunan Province as the research sample.

This paper took the data from the Hunan Provincial Statistical Yearbook of 2021 [3], the China County Statistical Yearbook [44], the statistical bulletin on the development of healthcare in Hunan Province [45], and the database of the local party and government leaders of the China Economic Network [46] and so on. The author estimated the number of beds in the townships and towns, which were lacking in some prefectures and cities, according to the 3.92 beds per thousand rural population in township hospitals published in the Statistical Bulletin of the Development of Health Services in Hunan Province in 2020. Compared with the actual data of the total number of beds in the townships and towns in the province, researchers found that the estimation results of the total number of beds in the townships and villages were 98.6%, and the error was controlled within 5%. Compared with the current data results on the township beds, the mean error was also maintained at about 10%.

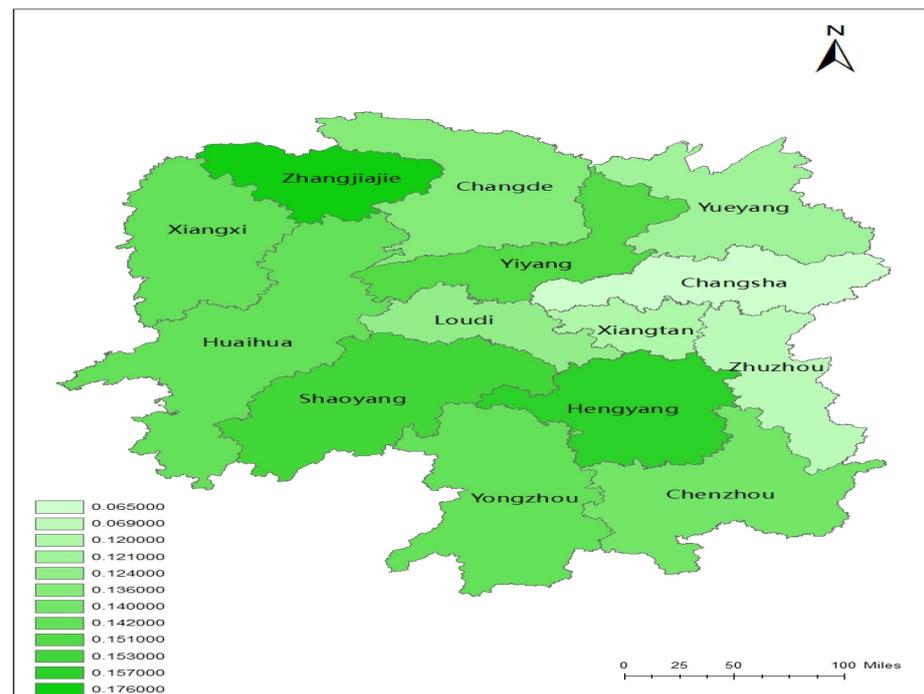


Figure 2. Regional distribution map of the proportion of primary industry in 14 cities of Hunan Province (2020).

3.3. Description of Variables

3.3.1. Outcome Variable

This study focused the result variable on the lack of skilled talents in the agricultural industry. Currently, the state supports the development of agriculture and rural areas through policy, capital, and the workforce. However, the quantity and quality of skilled agricultural workers are still lacking. During the Northern Song dynasty, Chinese scholar Hu Yuan stated that the world's rule lies in skilled talents, which means that skilled talents play an essential role in national governance and social development. The primary task and essence of promoting the implementation of the rural revitalization strategy must be to innovate the rural skill management system and mechanism [47]. Only when skilled talents accumulate in rural areas can technological innovation in the agricultural industry be achieved through “human capital agglomeration and its knowledge creation, demonstration, competition, and other ways” [48]. Qualitative change is the result of quantitative change. Therefore, for the result variable of this paper, the author chose the proportion of the number of employees in the primary industry to reflect the current situation of the lack of skilled agricultural workers in terms of quantity and used the ratio of the number of employees in the primary sector to the number of household registrations in the whole city to measure it. They marked the symbol as Agri.

3.3.2. Causal Variables

This article used QCA to focus on small- and medium-sized-sample studies. The number of case analysis samples is usually between 12 and 60. The antecedent conditional variable index refers to 2^k , and K usually represents the number of indicators (Ref. [38], p. 24). In small- and medium-sized samples, the number of antecedent conditions should be between four and seven. Too many conditional variables will lead to the total number of dependent combinations far exceeding the number of samples, which cannot reflect the actual situation. For this study, researchers selected the following causal variables for the measurement based on the existing research and data availability.

Rural industry status. Industrial prosperity lies in the coordinated use of resource elements so that people, land, and money can effectively flow into the countryside [49].

However, the current foundation of agriculture and rural areas is weak, and the policy system is imperfect. The willingness to retain skilled talents is not apparent. These phenomena stem from the poor development of rural agriculture and industrial enterprises; “people, land, money” cannot find an adequate inflow to undertake the carriers. In the early days, the rapid development of township enterprises formed the stage characteristic of a “small duality” in the “big duality” of urban and rural areas. That is, there was a dual state in the coexistence of the traditional agricultural economy and township industrial economy in the townships and towns [50], in which the agricultural and industrial industries were developed, the rural market economy was activated, and many rural laborers were retained. Therefore, in this study, the author chose the number of township industrial enterprises to measure the prosperity of the rural industries, and they marked the symbol as Indu.No.

Prefecture urbanization construction. The prefecture urbanization construction reflects the extent of the population concentration in the central cities and the outflow of the rural labor factors, and especially the massive flow of young and strong laborers and skilled people to the cities. This unreasonable human resource structure creates a dilemma for rural revitalization and agricultural modernization [51]. Hou, X.N. and Mu, H.Z. [52] found a coupled and coordinated relationship between human capital investment and accumulation and urbanization development: abundant human capital stocks and investments can effectively promote urbanization and make human-capital-based urbanization more robust and solid. For this reason, the discussion of the lack of skilled talents in the agricultural industry cannot bypass urbanization construction. In this study, researchers referred to Shi, H.B.’s [51] practice of using the urbanization rate percentage as a statistical indicator of the ratio of the urban population of the land and city to the total population of the land and city. They marked the symbol as the Town.

Regional economic level. The level of regional economic development mainly refers to the scale, speed, and goal of regional economic growth. It plays a crucial role in the measurement of the regional economic development state and development potential, as well as in retaining skilled industrial talents. Scholars generally measure the level of regional economic development from two aspects: scale and speed. Researchers generally use the per capita GDP index in the scale index and the GDP annual growth rate to represent the speed of economic development. In this study, the author primarily used the GDP per capita scale index for the measurement. Liu, Z. et al. [53] have also confirmed this index. Authors marked the symbol as GDP and expressed it as the city’s GDP/number of household registrations in the town.

Rural medical level. Public services are an essential means to attract and retain skilled workers. The coastal areas have strong public services to attract the inflow of skilled talents and labor to the central and western regions [54]. General services include infrastructure, education, healthcare, social security, and other aspects. “When the scale of the labor force is insufficient relative to the capacity of the employment market, the supply of public services such as basic education and health care should be strengthened to meet the needs of people’s livelihood” [55]. The scale of the rural labor force is insufficient; thus, the author chose essential public services for the measurement in this study, as per Hu, B. et al. [55] Due to the inaccessibility of rural township education data, this paper only used the number of township beds to represent the level of township healthcare. They marked the symbol as Beds.

Financial inputs for agriculture, forestry, and water conservation. The overall incomes of farmers are low due to the agricultural industry’s high risks and everyday interests, less accumulation by the farmers and their poor investment abilities, and insufficient inclusive rural financial support [56]. Thus, strengthening the financial investment in agriculture, forestry, and water conservancy can increase the farmers’ incomes and achieve financial nurturing. It could help farmers share the results of the reform, such as rural production expenditures, agriculture, forestry, water conservancy meteorology, rural infrastructure construction, rural relief fees, etc., which would positively affect their net incomes. The rural production expenditure and the agriculture, forestry, and water

conservancy meteorological expenditure have the most substantial effect on the growth of farmers’ net incomes over the long term [57]. Therefore, this paper chooses the rural production expenditure and agricultural, forestry, and water conservancy meteorological expenditure as indicators, which the author marked with the symbol *Budget*, and which they primarily used to measure the impact of the state support for agriculture on the farmers’ incomes.

Regional administrative leadership. The characteristics of leaders often influence the formulation and implementation of government policies. The features of leaders include their interests and preferences, specifically regarding their education, age, and tenure. Tan, J. et al. reported that the education and term of the mayor were positively correlated with the speed of the PPP landing; in contrast, the mayor’s age was negatively correlated with the speed of the PPP landing [58]. In this paper, researchers selected the administrative leadership responsible for agricultural and rural development and the secretary of the municipal party committee as indicators. They chose the age as the assessment index and marked it with the symbol *Age*. Once the official age exceeds 55 years, the innovation willingness is low, and the promotion opportunity is small [59]. Conservative work attitudes affect agricultural and rural work reform and innovation.

This study statistically describes the result and causal condition variables in Tables 1 and 2. According to the statistics, the mean value of the result variables is 0.1312, the standard deviation is 0.0299, the minimum value is 0.0650, and the maximum value is 0.1760. According to the result variable data, the proportion of employees in the primary industry is generally low. They are identifying the comprehensive influencing factors that affect the intense employment balance in the agricultural sector. The analysis of the standard deviation of the antecedent conditions, the regional economic development, the status of the township industrial enterprises, and the township healthcare level are generally extensive, indicating the imbalance in these three aspects.

Table 1. Variable names and symbol identification.

Variable Type	Measurement Index	Symbol Identification
Outcome variable	The proportion of employed persons in primary industry	<i>Agri</i>
	Number of township industrial enterprises	<i>Indu. No</i>
	Urbanization rate	<i>Town</i>
	Per capita GDP	<i>Gdp</i>
Causal condition variables	Number of beds in township hospitals	<i>Beds</i>
	The financial proportion of agriculture, forestry, and water conservancy	<i>Budget</i>
	Age of prefecture party secretary	<i>Age</i>

Table 2. Statistical descriptions of variables.

Variable	Mean	Std. Dev.	Minimum	Maximum
<i>Agri</i>	0.1312	0.0299	0.0650	0.1760
<i>Indu. No</i>	2809.4290	1047.8690	1227	5180
<i>Town</i>	56.6811	9.8842	46.9360	82.5960
<i>Gdp</i>	25,288.2900	18,787.2200	6382	76,885
<i>Beds</i>	7564.1430	3077.3060	2547	12,306
<i>Budget</i>	0.14010	0.0355	0.0640	0.2010
<i>Age</i>	55.6429	3.0144	51	62

3.4. Measurement Calibration

Researchers used the FSQCA3.0 software for the analysis in this study. Based on Fiss, P.C. [37] and Garcia-Castro, R. and Francoeur, C. [42], The author used the values of the result variable and causal conditional variables at the 25th, 50th, and 75th quantiles as the fuzzy calibration parameters, and they completed the fuzzy calibration by the direct method. The calibration results are shown in Table 3.

Table 3. Types of calibration variables for outcome and antecedent condition variables.

Variable Type	Variable Name	Completely Subordinate	Intersection Point	Completely Not Affiliated
Outcome variable	<i>Agri</i>	0.149	0.141	0.122
	<i>Indu. No</i>	3315.250	2976.000	1953.000
	<i>Town</i>	60.036	53.210	50.499
Causal condition variables	<i>Beds</i>	9275.000	7575.500	5517.000
	<i>Gdp</i>	34,376.584	18,596.814	12,120.247
	<i>Budget</i>	0.163	0.146	0.125
	<i>Age</i>	57.750	56.000	53.250

Sources: The data results are from FSQCA3.0.

4. Results

4.1. Necessity Analysis of Individual Conditions

Necessary condition analysis should be the first step in FSQCA research because it determines whether the result set is a subset of a particular condition set. The measure of necessary condition analysis is consistency. A consistency level of more than 0.9 is required for the results [38,60]. This paper presents the essential requirements for the present or absent skilled talents in the agricultural industry in Table 4. According to the table, the consistency level is not higher than 0.9. Therefore, there is no necessary condition for the lack of skilled talents in the agricultural industry in the six causal states, which also indicates that the interpretation of the results by a single causal condition is insufficient, as the lack of skilled talents in the agricultural industry is affected by multiple causal conditions. Next, the paper performed a configuration analysis, which offers a more convincing explanation for the results. Because “the cause condition configuration of the same result is diverse and equivalent, there is no unique best cause condition configuration” [8]. This study focused on identifying the cause condition configuration with the most robust case interpretation.

Table 4. Analysis of necessary conditions for lack of skilled talents in the agricultural industry.

Variable	Lack of Skilled Talents in the Agricultural Industry (Present)		Lack of Skilled Talents in Agricultural Industry (Absent)	
	Consistency	Coverage	Consistency	Coverage
<i>INDU.NO.</i>	0.5624	0.5397	0.5088	0.5397
<i>Indu. no</i>	0.5203	0.4894	0.5660	0.5884
<i>TOWN</i>	0.2932	0.2893	0.7129	0.7774
<i>town</i>	0.7744	0.7094	0.3483	0.3526
<i>BEDS</i>	0.6842	0.6623	0.4136	0.4425
<i>beds</i>	0.4241	0.3955	0.6844	0.7055
<i>GDP</i>	0.3368	0.3275	0.6857	0.7368
<i>gdp</i>	0.7293	0.6774	0.3742	0.3841
<i>BUDGET</i>	0.6902	0.6652	0.3633	0.3870
<i>budget</i>	0.3639	0.3408	0.6857	0.7099
<i>AGE</i>	0.5159	0.4978	0.5253	0.5602
<i>age</i>	0.5442	0.5091	0.5291	0.5471

Note: capital letters indicate present conditions, and lowercase letters indicate absent conditions. The data results are from FSQCA3.0.

4.2. Adequacy Analysis of Configurations

In inadequacy analysis, researchers use the truth table algorithm to determine the adequacy of the relevant configurations and results, and the measure is consistent [61]. From the set theory point of view, researchers use it to explore whether the set of configurations represented by multiple conditions is a subset of the result set [41]. Ragin, C.C. [62] argued that when the consistency between a particular configuration and the impact is greater than or equal to 0.75, the configuration can be regarded as a sufficient configuration of the result. According to the gap presented by the consistency score in the truth table [63], in this paper, the authors set the consistency threshold to 0.80. In addition to the consistency threshold, the number of cases covered by a specific configuration was a screening criterion

for a particular configuration to enter the Boolean minimization process. The sample size determines the frequency threshold. Usually, the larger the sample size, the larger the frequency threshold. For small- and medium-sized samples (about 10–100 cases), the frequency threshold is usually not less than 1, while for large models, the value can be appropriately increased [60]. This study used a small sample in this case, so the researchers chose a frequency threshold of 1. In addition, they selected a PRI threshold of 0.7.

Adequacy analysis formed the core part of the research, and it is mainly used to conduct research by “constructing a truth table, perfecting truth table and analyzing truth table” [64]. Researchers performed the analysis in this study using FSQCA 3.0 software, which usually outputs “complex solutions, parsimonious solutions, and intermediate solutions”, which Zhang, M. and Du, Y.Z [64] have explained. A complex solution is a solution that does not include any logical remainder. The intermediate solution consists of the logical remainder that conforms to the theoretical direction expectation and empirical evidence. The parsimonious solution incorporates all the logical remainders without evaluating their reasonableness. In this paper, researchers mainly report intermediate solutions and parsimonious solutions for two reasons: (1) “the determination of the core condition and the marginal condition is determined by the intermediate key and the reduced solution, the partial solution appearing in both the parsimonious solution and the intermediate solution belongs to the core condition, and the partial solution appearing only in the intermediate solution belongs to the marginal state” [37]; (2) research analysis should combine theoretical and empirical evidence. The author presents the configuration analysis results of the lack of skilled talents in the agricultural industry formed by the six conditions in Table 5. The presentation of the results is based on Ragin, C.C. and Fiss, P.C. [65]. The condition exists with a solid circle, it is absent with a fork circle, it may exist or may be lacking with a blank, the big circle is the core condition, and the small circle is the edge condition. The coverage reflects the configuration’s empirical relevance or importance [38]. Generally, the researcher used the overall coverage results as a reference.

Table 5. Configurations for presenting agricultural skill scarcity.

Variable	Solution		
	1	2	3
Town	⊗	●	⊗
Gdp	⊗	⊗	●
Indu. No	●	●	●
Beds	●	●	⊗
Budget	●	⊗	●
Age		●	⊗
Consistency	0.9665	0.9011	1
Raw coverage	0.3038	0.1233	0.1053
Unique coverage	0.1624	0.0571	0.0195
Overall solution consistency	0.9405		
Overall solution coverage	0.3805		

Note: ● = core causal condition (present); ⊗ = core causal condition (absent); ● = contributing causal condition (present); ⊗ = contributing causal condition (absent); “blank” indicates that the state is present or absent. The data results are from FSQCA3.0.

Each column represents one of the possible conditional configurations in Table 5. Preliminarily, it is more significant than 0.8 that the consistency of all the dependent configurations, which indicates that all the cases satisfy the consistency condition (i.e., all three categories of conditional groupings have sufficient conditions for the “presence” of a lack of skilled agricultural talents, with three core causal conditions for Solution 1, two core causal conditions for Solution 2, and two core conditions for Solution 3, as well as differences in the contributing causal conditions for each grouping). In addition, the overall consistency was 0.9405, and the comprehensive coverage was 0.3805, which means that the empirical analysis is valid and has a high degree of explanatory power for the necessity.

Configurations for Agricultural Skill Scarcity (Present)

Configuration 1: $town * gdp * INDU.NO * BEDS * BUDGET$. Three core causal conditions exist in this configuration: the rural industry status (present), regional economic development (absent), and urbanization (absent), which is because the three antecedent conditions simultaneously appear in the intermediate and parsimonious solutions. Among them, the rural medical level and financial investment in agriculture, forestry, and water conservancy contribute to causal conditions, and the local government leadership can be present or absent. The consistency of the configuration is 0.9665, and the unique coverage is 0.1624, which included two cases: Shaoyang and Yongzhou (as shown in Figure 3).

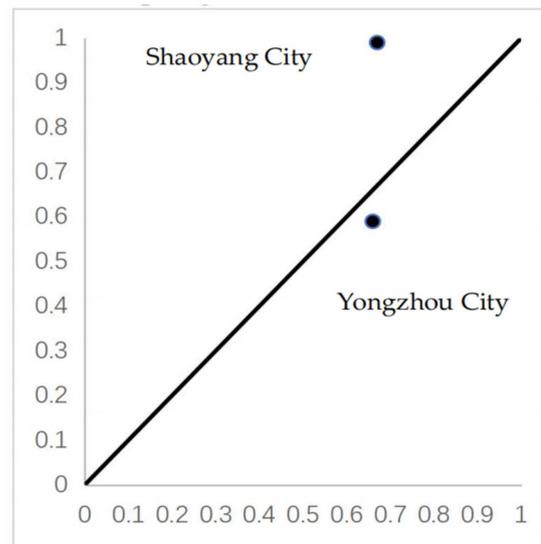


Figure 3. Scatter diagram of cases involved in Configuration 1.

Configuration 2: $TOWN * gdp * INDU.NO * BEDS * budget * AGE$. The core causal conditions of this configuration include the rural industry status (present) and regional economic development (absent). The configuration plays a supporting role in the urbanization (present), rural medical level (present), agriculture, forestry and water conservancy financial investment (absent), and local government leadership (present) due to the contributing causal conditions. The consistency of the configuration is 0.9011, and the unique coverage is 0.0571. The case coverage was the city of Chenzhou (as shown in Figure 4).

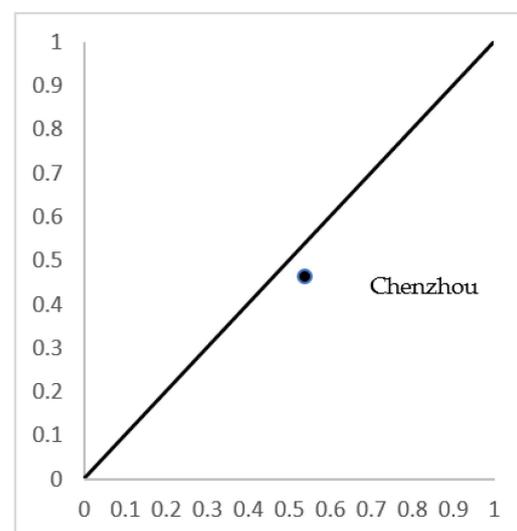


Figure 4. Scatter diagram of cases involved in Configuration 2.

Configuration 3: *town * GDP * INDU.NO * beds * BUDGET * age*. The core causal conditions are the rural industry status (present) and urbanization (absent) in this configuration, both of which appear in the intermediate and parsimonious solutions. The contributing causal conditions include the rural medical level (absent), regional economic development (present), financial investment in agriculture, forestry, and water resources (present), and local government leadership (absent). The consistency of this configuration is 1, which is the highest consistency of all the configurations, and the unique coverage is 0.0195. The case coverage was the city of Yiyang (as shown in Figure 5).

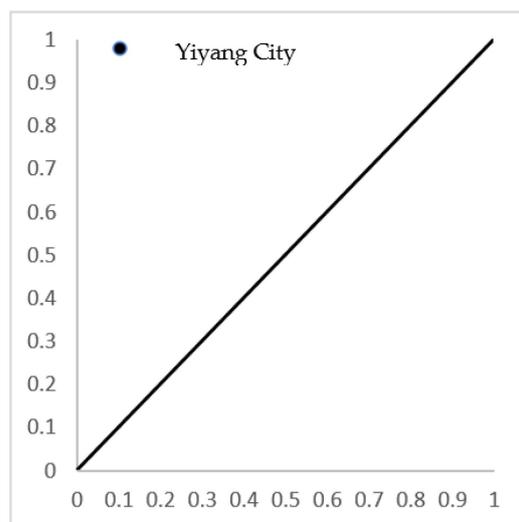


Figure 5. Scatter diagram of cases involved in Configuration 3.

Researchers found that the rural industry status (*Indu.No*) was a core causal condition that appeared in all the configurations in a “present” way by combining the above three configurations, which indicates that this influencing factor is relevant to the lack of skilled talents in the agricultural industry. The regional economic development level (*GDP*) and urbanization construction (*Town*) are also core causal conditions, both of which appear in the relevant solution in an “absent” way, which indicates that low-level development, such as the regional economic development level (*GDP*) and urbanization construction (*Town*), also lead to a lack of skilled talents in the agricultural industry. The rural medical status (*Beds*) financial investment in agriculture, forestry, and water conservancy (*Budget*), and local government leadership (*Age*) are the contributing causal conditions that appear in the intermediate solution, and they can be present or absent. The rural medical level (*Beds*) exists in Configurations 1 and 2, and the contributing causal conditions and financial investment in agriculture, forestry, and water conservancy (*Budget*) are present in Configurations 1 and 3. The local government leadership (*Age*) is in another state, and it can be “present” or “absent.”

4.3. Robustness Tests

In this study, the author used two methods to conduct the robustness tests: one approach improved the consistency level [64], and the other method was to analyze the configurations of the outcome variable “absent” [66]. First, researchers found that the set relationship state of the different designs remained unchanged when they adjusted the consistency level from 0.8 to 0.85. Second, the running results were still robust in the negative set analysis of the outcome variables (Table 6). In all, according to the two robustness tests, the results of this study are feasible.

Table 6. Configurations for the absence of agricultural skill scarcity.

Variable	Solution	
	1	2
Town	●	●
Gdp	●	●
Indu. No		●
Beds	⊗	•
Budget	⊗	•
Age	●	⊗
Consistency	0.9421	0.8730
Raw coverage	0.3321	0.1497
Unique coverage	0.3225	0.1401
Overall solution consistency	0.4722	
Overall solution coverage	0.9180	

Note: ● = core causal condition (present); ⊗ = core causal condition (absent); • = contributing causal condition (present); ⊗ = contributing causal condition (absent); “blank” indicates that the condition is present or absent. The data results are from FSQCA3.0.

5. Discussion

The significant advantage of the QCA method is that researchers can accurately locate the cases covered by the configuration, prompting them to return to the case itself and deepen their understanding of the configuration [67]. Rihoux B. and Ragin C.C. [68] also proposed that configuration analysis should be a dialogue between thought and evidence and that the case-oriented perspective is the strength of QCA. Identifying the impact of the lack of skilled talents in the agricultural industry only represents part of the research work; it is also essential to perform a theoretical elaboration and case explanation related to the configuration. Based on the core causal conditions of the above three configurations and their causal logic, researchers formed the three solutions or paths by configuring the combined influencing factors of the lack of skilled talents in the agricultural industry. This research constructed it as a model of “1 + N” because the core causal condition of the rural industry status (present) appears in the three configurations, which indicates that it plays an irreplaceable role in solving the problem of the lack of skilled talents in the agricultural industry. Researchers determined the N by the contributing causal conditions that were present. Finally, this study configured three models: (1) the “industry + basic public service” model (Path 1); (2) the “industry + public service and urbanization driven by leadership” model (Path 2); (3) the “industry + economic construction and financial investment” model (Path 3).

Compared with the “industry + basic public service” mode, the “industry + economic construction and financial investment” mode lacks the support of essential public services, such as township medical care. Still, the regional economic development precondition exists in this configuration and plays an auxiliary role. Compared with the “industry + public service and urbanization driven by leadership” model, except for the antecedent conditions of the rural industry development, the other five antecedent conditions are opposite in Configurations 2 and 3. “Advocates of the QCA approach argue that there are three possible interactions between the antecedents that make up a configuration: complementary, reciprocal, and suppressive” [69]. Earlier, Peng, J. [70] provided two ways to verify reciprocity: (1) by considering that two elements are reciprocal when they cannot coexist in any of the configurations that lead to an outcome; (2) by comparing two or more structures and considering two factors to be reciprocal if they lead to a common result when combined with the same element or same group of elements. The regional economic development level and current state of the rural industry status alternate in Configurations 1 and 2.

5.1. Theoretical Implications

Solution 1 ($town * GDP * INDU.NO * BEDS * BUDGET$) represents the “industry + basic public service” mode. In this model, the rural industry’s development deepens the agricul-

tural sector's development, and this idea coincides with the central government's ideas. Moreover, industrial development and essential public services are closely related to and accelerate each other. Agricultural skilled talents can be retained if they are pushed forward together, an opinion supported by the scholars Zhu, G.L., et al. [71], they propose that industrial development can provide financial sources for local public services and determine their quality. More public services in urban areas are essential to stimulating the rural–urban migration of the agricultural population. Because public education and public health services are the key factors of human capital and the basis of individuals' feasible abilities [72], rural industry and essential public services can affect the brain drain in the agricultural sector. Therefore, the “industry + basic public services” configuration encourages the region to highlight the construction of essential public services to attract skilled agricultural talents with limited resources based on developing rural industries and highlighting the direction for regional development.

Solution 2 ($TOWN * gdp * INDU.NO * BEDS * budget * AGE$) represents the “industry + public service and urbanization driven by leadership” model. Wang, Z.Y. and Li, R. [54] support this model. They believe that urbanization is a favorable driving factor for economic development. The “scale effect” of population and labor agglomeration and the “structural effect” of the introduction of human capital brought about by urbanization play competitive roles in local governments on the one hand, and on the other hand, produce a compensatory supply of local public services [54]. In addition, the promotion of local government officials is also related to the economic development indicators, and urbanization construction is also closely related to economic development. Urbanization has a positive pulling effect on the modernization of the agricultural industry [73], and it can also attract excellent agricultural industry skilled talents. Therefore, the mode of urbanization and public service construction led by government officials can better disseminate resources to rural industries, encourage skilled workers to return, and focus on resolving the problem of the lack of skilled talents in the agricultural sector.

Solution 3 ($town * GDP * INDU.NO * beds * BUDGET * age$) represents the “industry + economic construction and financial investment” mode. The industry is the foundation of economic development, and the economic level has always been a substantial “pull” indicator of population migration through providing more employment opportunities and better public services. Since the reform and opening up in China, the rural labor force in the central region has been flowing to the developed coastal areas, such as Guangdong Province, which shows that the regions with strong economic development have a strong absorptive capacity and more skilled talents. In addition, financial investment plays a more important role in regional development. A project system is a means of governance related to financial investment. Since the tax reform, the top–down project system has mainly promoted the supply of rural public goods [74]. The project system is indispensable in disputes that arise when the government develops a regional economy and the central, provincial, and municipal governments obtain more resources, such as financial input. It provides an excellent chance to expand the popularity of the cities. Therefore, strengthening the economy of the towns, focusing on developing rural industries, and attracting government financial investment through the project system are important ways to attract skilled workers back to the rural areas.

5.2. Practical Implications

5.2.1. Case Analysis

China has entered the middle and late stages of urbanization. The structure of the agricultural population movement and movement regions has substantially changed as the mortality and fertility rates have fallen to deficient levels. The form of the population migration and movement, as well as the scale and intensity of the population migration and action, affect the coordinated development of China's population and regions, as well as the process of population urbanization, with cross-provincial-movement retracing after rapid growth. The mobile population concentrates in the east, then gradually disperses

towards the central and western regions [75,76]. As one of the representative provinces in the central region, Hunan Province is the undertaking center for the gradient transfer of industries and the return flow of the agricultural population, which present both an opportunity and a challenge.

The representative cases of the “industry + basic public services” model are the cities of Shaoyang and Yongzhou. Shaoyang is in central Hunan, and Yongzhou is in southern Hunan. According to the 2020 statistical yearbook, the four indicators (urban resident population, rural population, number of employees in the primary industry, and number of township beds (sheets)) are among the province’s top five. The financial expenditure on agriculture, forestry, and water conservancy in Shaoyang is the third highest in the region, and Yongzhou ranked sixth. These data prove that the primary sector in Shaoyang and Yongzhou has a larger share in the region’s development. The agricultural output efficiency is lower than in the secondary and tertiary industries. Suppose the government does not increase the financial input and subsidies to the agricultural sector and improve the income level of the farmers through transfer payments. In that case, the primary industry in Shaoyang will not achieve the added value of RMB 39.98 billion in 2020, with an increase of 4.1%. In addition, the gross regional product and urbanization construction of Shaoyang and Yongzhou is not well-ranked in the province, with both ranked at the bottom of the region. These data also confirm the expression of Configuration 1.

In recent years, the state has continuously invested in rural revitalization resources. The government and other media have been calling for the promotion of rural industrial development and are performing well with “industry+” policies. By developing the plantation industry and taking the road of “cultural tourism integration and ‘sports + tourism”, Xiangjia Village in Longhui County, Shaoyang, has gradually become a “model village for poverty alleviation”, a “model village for the beautiful countryside”, and a “model village for tourism poverty alleviation” in Hunan Province, realizing the employment of the agricultural population in the vicinity, and retaining a large number of the young and robust rural labor force. Yongzhou’s rural development is not far behind, and the number of villages selected as “Provincial Beautiful Villages” and “Provincial Characteristic Villages” in 2021 was among the highest in Hunan Province. In short, the “industry + basic public services” model can effectively solve the problem of the lack of skilled talents in the agricultural industry when the region’s economic development is relatively backward and urbanization is poor.

The representative case of Configuration 2 is the city of Chenzhou. The urbanization level in Chenzhou increased from 53.80% in 2017 to 59.04% in 2021, and it ranks among the top five in the province. Urbanization construction has positively impacted the farmers’ incomes, and the impacts of the different urbanization rates on their incomes vary [77,78]. Although Chenzhou does not rank high in Hunan Province in terms of the economic development level, it was in the middle of the provinces in 2020 regarding the disposable incomes of the rural farmers due to urbanization. Li, H.B. et al. [79] confirmed that Chenzhou has a good industrial base, a high county urbanization level, and a high rate of population return. Of course, the urbanization of Chenzhou cannot be built without the local government’s full support, especially in the context of the rural revitalization strategy. The mission to improve the quality and efficiency of economic development has prompted local government officials to pay more attention to the reform and innovation of agriculture and rural areas, especially when the work of agricultural and rural development consists of government projects that further promote the return of skilled agricultural workers and the concentration of agricultural skills.

The representative case of Configuration 3 is the city of Yiyang, the development of which has benefited from the planning of the “3 + 5” city cluster, the Dongting Lake Economic Circle, and the Yangtze River Centralstream City Cluster in Hunan Province, as well as from the substantial attention from its regional government. During the “Eleventh Five-Year Plan” period, Yiyang started the project construction of a modern forestry demonstration city, which has led to an increase in the financial investment in agriculture, forestry,

and water conservancy, the resulting externalities of which will also have positive effects on the development of the agricultural industry. In addition, the construction of high-tech industrial clusters, such as new energy, new materials, advanced manufacturing, and electronic information, can provide rural residents jobs and retain skilled talents for industrial development. In addition, based on the goal of the “3 + 5” city cluster, the development of the “Chang-Zhu-Tan” city cluster can provide opportunities for the development of Yiyang under the radiation effect and can also offer economic development benchmarking points in the competition and cooperation to continuously improve the city’s hardware and software construction and encourage the return of skilled industrial workers.

5.2.2. Practical Implications Related to the Case

The above case analysis has some practical implications that are the key to developing the rural industry when dealing with the lack of skilled talents in the agricultural sector. Therefore, this paper suggests that the main task is to develop, expand, and strengthen the rural industry according to the following suggestions.

First, it is necessary to expand and strengthen the rural industry by integrating the primary, secondary, and tertiary industries. Taking the reform of the agricultural supply side as the primary method, it should broaden the agricultural “production, life and ecology” function by integrating elements such as science and technology, logistics, and finance into modern agriculture and then open up the industrial supply chain, production chain, processing chain, sales chain, circulation chain, and other links, and allow them to play a leading role in the industrial integration through the good example set by the leading enterprises. In addition, it is critical to pay attention to the application of scientific information technology in the agricultural industry, and then increase the rural technology investment and improve the efficiency of the agricultural output.

Second, it is crucial to develop new industries according to the local conditions. The transformation and upgrading of modern sectors should not only be based on the traditional industrial base but also on the natural resource endowment of the region and the actual economic construction to develop localized specific industries to meet the market demand.

Third, it is essential to require the construction of a four-level coordinated industrial development mechanism at the county, township, village, and group levels. The homogenization problem of rural industrial development is obvious, and resources are seriously being wasted. If the government can build a “county economy with the county town as the center, the township as the link, and the countryside as the hinterland” [80], coordinate the allocation of resources across the county, reasonably plan the layout of the county’s people-rich industries, and improve the construction of the county’s commercial system, then they can help the agricultural and rural modernization construction, thus forming a rural industrial development system that is linked at four levels: the county, township, village, and group.

Fourth, it is important to balance the relationship between the government and the market. Xi Jinping proposed socialist market economy reform. The core issue deals with the relationship between the government and the market. The decisive role of the market in allocating resources has led the government to consider further how it should set the stage and create a thriving market in developing rural industries.

Fifth, it is dispensable to make full use of the “industry+” combinations policy. Based on the development of rural industries, the first step is to strengthen the supply of essential public services in agriculture and rural areas and increase financial support. The next step is to seize the development chance of county urbanization to synergize the prefecture economy’s high-quality development and create more employment for people, especially the farmers. To avoid the homogenization of the county towns, the construction of the reform and innovation of the principal local officials is necessary. Age is a crucial factor that affects the innovation work of the leading cadres; thus, the echelon should consist of young cadres to keep up with the pace of development in these times.

5.3. Research Limitations and Improvement Space

We admit that this study has some limitations, which can be improved in the future. One is the sample data. In this study, the author mainly used cross-sectional data from Hunan Province in 2020. The researchers did not use the panel data that reflects the time effect, which indicates that FSQCA has particular research and development space in the future use of time-series panel data. The second limitation is theoretical elaboration. The academic dialogue of this study mainly focuses on the dominant theories related to the research. Because the configurations are composed of multiple reasons and conditions, authors may not have fully explained the prevalent theories related to the study under the conditions of diversity and complexity. It is necessary to introduce other theories to supplement this. In addition, the unrelated case explanations in the conditional configurations of this paper do not provide theoretical explanations. In the future, the development direction of the QCA will be on processing extensive sample data, increasing the time effect processing, and integrating it with mainstream statistical methods to further improve the research explanation.

6. Conclusions

From the empirical evidence of the FSQCA, this paper obtained three conditional configurations that affect the lack of skilled talents in the agricultural industry in 14 cities in Hunan Province. The study results are as follows:

First, the combined effect of the causal conditions affects the lack of skilled agricultural talent. There are six causal conditions: the rural industry status; rural medical level; agricultural and forestry financial input; urbanization construction; regional economic level; and regional administrative leadership. None of the six causal conditions were necessary. All the causal conditions were sufficient to have a combined effect on the presence or absence of the lack of skilled agricultural industry talents. The resulting state was “presence” or “absence”. In this paper, researchers mainly analyzed the combination of the causal conditions that led to “presence” results.

Second, there are three configurations for the lack of “existence” results in terms of agricultural industry skilled talents. According to Configuration 1, in the absence of core conditions, such as the level of regional economic development and urbanization, the development of rural industries, if supported by essential public services, such as township medical care and financial investment in agriculture, forestry, and water conservancy, can maintain the number of skilled agricultural talent in the region at a high level. Configuration 2 is the absence of core conditions for regional economic development. If the core conditions for the development of rural industries, combined with the full support of the leadership of the state government and the gradual improvement in the level of the township healthcare, supplemented by urbanization, when agriculture, forestry and water conservancy financial investment edge conditions do not exist, then the lack of skilled talents in the agricultural industry will also be alleviated. In Configuration 3, the absence of the core conditions of urbanization, as the core conditions of the existence of rural industrial development and the existence of regional economic development, agriculture, forestry, and water conservancy financial investment edge conditions, coupled with the absence of the township health level, state government leadership, and other antecedent conditions, together affect the lack of skilled talents in the agricultural industry.

Third, the rural industry status is the most critical factor affecting the lack of skilled agricultural industry talent because it appears in all the configurations in the “present” state. The core causal conditions also include the urbanization construction and regional economic level; however, they appear “absent” in the contributing causal conditions.

Fourth, Configuration 3 substantially influences the lack of skilled agricultural industry talent. The rural industry status appears as the core causal condition in this configuration. The regional economic level and the financial investment in agriculture, forestry, and water conservancy both appear as contributing causal conditions, which indicates that developing the rural industry, strengthening the regional economic development, and increasing the

financial investment in agriculture, forestry and water conservancy are effective ways of retaining skilled agricultural talents.

Finally, the factors that cause the lack of skilled agricultural industry talents are complex. The causes of the agricultural industry skill deficiency (present) and the agricultural industry skill deficiency (absent) are asymmetrical. The two result states include multiple conditional configurations; however, the outcomes are equivalent.

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