Do College Graduates Serving as Village Officials Help Rural China?

BY GUOJUN HE AND SHAODA WANG *

This study estimates the effect of improved leadership quality on rural development by exploring a unique human capital reallocation program in China -- the “College Graduate Village Official” (CGVO) program. We find that introducing educated leaders into village governance has no impact on rural households’ net income or the structure of their income sources. However, college graduates working as village officials do succeed in helping the poor by improving the implementation of pro-poor policies. In villages with CGVOs, more poor households are subsidized and more dilapidated houses are renovated. (JEL: O18; O20; J24)

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I. Introduction

Does leadership quality matter? At the macro level, recent research suggests that quality leadership plays important roles in shaping the growth of nations (Jones and Olken, 2005; Besley et al. 2011). At the micro level, it is found that the quality of village political leaders is a key factor determining the level of public goods provision (Martinez-Bravo, 2014). This paper provides new empirical evidence on the effect of improved quality of village leadership on rural development by exploring a unique human capital reallocation policy in China called “Selecting College Graduates to Work as Village Officials”. Under this program, the Chinese government hires a large number of college graduates each year and assigns them to rural villages where they serve as assistants to the elected village chairperson or/and the appointed village party secretary. These graduates are often referred to as “College Graduate Village Officials (CGVOs)”. The central government hopes that those CGVOs, who are more educated and accountable, can help improve village governance, boost local economy, alleviate poverty, and perhaps reduce grassroots corruption.

The CGVO program fits into a village governance system that is both “democratic” and “autocratic”. In this system, a village has two self-governing bodies: a village committee usually consisting of three to seven members and a village party branch including several Chinese Communist Party (CCP) members in the village. The village chairperson, who is democratically elected since village elections were introduced in the mid-1980s, leads the village committee. The village party secretary, however, is appointed by the county-level government and leads the village party branch.

China’s introduction of village elections has led to increased political accountability and public goods provision (Zhang et al., 2004; Martinez-Bravo et al., 2011; Martinez-Bravo et al, 2014). However, researchers also find that village
chairpersons often come from the largest village clans and the dominant family clans are able to exercise considerable influence over election outcomes and public resource allocation (Xu and Yao, 2014). This fact raises the concern that the poor villagers, especially the poorest of the poor, may be under-represented in this village governance system.

The presence in village governments of CGVOs, who have no ex ante political ties to the local interest groups, provides a unique opportunity for a more pro-poor development. While CGVOs serve as assistants to the village chairpersons or village party secretaries, their performance is evaluated by the upper-level (township and county-level) governments, which decide whether a CGVO’s contract should be renewed or not. This mechanism provides the CGVOs an incentive to represent villagers’ interests, which may or may not be aligned with the village chairpersons’ interests, for the development of the villages.

From the central government’s perspective, an important policy goal of the CGVO program is to improve the implementation and targeting of pro-poor programs. Previous research around the world has shown that relying on local “insiders” to implement pro-poor programs can reduce the monitoring costs and improve the targeting of pro-poor programs (Klugram, 1997; Alderman, 1998; Coudouel et al. 1998; Bird and Rodrigues, 1999; Ravallion, 1998; Alderman, 2000). However, due to lack of political accountability, empowering local administrators also increases the risk of corruption and in reality local administrators often pocket the lion’s share of the gains from the pro-poor programs (Seabright 1996; World Bank, 2004; Olken and Pande, 2011; Ferraz and Finan, 2012). In contrast, CGVOs can serve as accountable local “insiders”. They are trained and educated in urban areas, and the majority of them hope to become civil servants working in upper-level governments after the term, so they are less inclined to commit corruption. Moreover, they live and work in the
villages, and have to deal with village affairs every day, which make them as well informed as local administrators.

The CGVO program is ambitious in scale and is expanding dramatically. By 2020, the Chinese government plans to hire roughly 600,000 CGVOs, so each village in all of China will by then have at least one CGVO. In recent years, however, the program has become controversial. The opponents of this program believe that it is misallocating human capital. Since most CGVOs are not trained to work in rural areas, their knowledge about agricultural production and rural development can be very limited. More importantly, because the costs of running the CGVO program are so tremendous yet no rigorous analysis has been conducted to compare the benefits and costs of the CGVO program, maintaining the project at its current level, or even expanding it to the national level, may lead to significant efficiency loss.

This paper provides the first causal estimates on the economic impacts of the CGVO program. We obtained 12 years’ worth of panel data (2000-2011) for 232 representative Chinese rural villages from the National Fixed-Point Survey (NFS), then matched them to a retrospective survey on CGVOs. We studied whether the CGVO program can help raise the income of the rural households, change their income source, and improve the implementation and targeting of pro-poor services. By employing a generalized difference-indifferences approach, we found that the CGVO program has no impact on per capita net income or the structure of income source, but the CGVOs do succeed in helping the poor households to a certain extent. In villages with CGVOs, more poor households are subsidized and more dilapidated houses are renovated. We argue that CGVOs achieve all this by strengthening the enforcement and targeting of the central government’s two pro-poor policies, namely the “Subsidizing Poor Households” policy and the “Renovating Dilapidated Rural Houses” policy. To support this argument, we further analyzed the CGVO program’s impact on village business revenue, and
village government revenue and spending. The empirical results show that CGVOs are not making the villages richer. However, we found that more households are registered as poor households in villages with CGVOs, suggesting that CGVOs can assist the poor in obtaining subsidies directly from upper-level governments. We conducted in-depth interviews with several CGVOs and found qualitative evidence that CGVOs can help improve the implementation and targeting of pro-poor policies.

The remainder of this paper is organized as follows. Section 2 reviews the development of the CGVO program. Section 3 discusses the benefits of being a CGVO and the duties involved, and the recruiting and assignment processes. Section 4 describes the data and explains the key variables. Section 5 tests for the exogeneity of the CGVO assignments. Section 6 estimates the economic impacts of the CGVO program, and section 7 discusses the underlying channels and mechanisms. Section 8 concludes.

II. Development of the CGVO program

The origin of the CGVO program in China can be traced back to the “Chuying Project” launched in 1995. Thirteen local college graduates, selected from over 200 applicants, were hired as assistants to the village heads in 13 villages in Jiangsu province. Later in 1998 and 1999, several other cities, such as Yancheng city, Anding city, Linggao city and Dongfang city, also launched similar programs. In 2000, Ningbo city in Zhejiang province initiated a larger program called “One Village One College Graduate” and hired more than 500 local college graduates as village officials. The 1995-2000 period is usually considered as the early stage of CGVO development, in the sense that these early programs were mostly implemented by county- or city-level governments usually in an informal and localized way.
In March 2000, Tianhe district in Guangzhou city in Guangdong province also began hiring college graduates to work as village officials. A noteworthy feature of this recruitment was that the positions were open to all the college graduates in China. The recruitment aroused an enthusiastic response: more than 3,000 college students from different provinces went to Guangzhou to apply for available positions. The popularity of the program encouraged more and more cities/counties to launch similar CGVO programs, and the scale of hiring gradually increased. For example, Xingtai City in Henan province hired roughly 1,000 CGVOs in 2004 and aimed to assign at least one CGVO to each of its 5,200 villages in the following years.

After observing the development of local CGVO programs for a few years, the central government decided to promote the program to the national level. In June 2005, the General Office of the Central Party Committee of China and the General Office of the Council of China jointly issued “The Guideline on Encouraging Graduates to Work at the Grassroots Level”, which officially stated that the government would hire a certain number of outstanding college graduates each year to work in rural areas. Six provinces, namely Beijing, Sichuan, Jiangxi, Fujian, Qinghai and Liaoning, immediately followed this policy and started to hire college graduates in 2006. Later, many other provinces also joined in.

Table 1 shows the development of CGVO programs since 1999. The number of CGVOs was around 14,000 in 2001, and only about 2% of villages had CGVOs. By the end of 2011 the number had grown 14 times to reach more than 210,000. The central government plans to hire roughly 400,000 CGVOs by the end of 2015, which will cover roughly 60% of villages in China, and by 2020, there should be at least one CGVO to each village in the country.
III. CGVO Details

A. Benefits and Duties of CGVOs

Due to the enormous socioeconomic differences between rural and urban areas in China, the idea of living in the rural villages is unappealing to many young college graduates, especially those who were born in the cities. To compensate for the (possibly) lower quality of life and to attract better applicants, the central government provides CGVOs with a favorable package of benefits: (1) CGVOs receive salaries directly from upper-level governments during their term of office (typically three years); (2) the governments provide CGVOs with pension, medical insurance, and other kinds of insurance if applicable; (3) if the CGVOs’ performance is satisfactory, their contracts can be renewed with all the benefits attached; (4) related governmental departments will assist them in looking for jobs if they choose to leave the villages after their term; (5) CGVOs are given priority for working and getting promoted in the government system, holding other factors constant; (6) for those who take the National Civil Service Exam after the term, the admission requirements for them are lower, and they have priority for admission if all other conditions are the same; (7) for those who want to attend graduate school after the term, free points will be added to their graduate entrance examination score;¹ and they will be afforded priority for admission if other conditions are the same; (8) for those who want to start their own business after the appointment, the government will provide them with training programs, small loans, information consulting, tax and fees reductions, etc.

Governments in different levels jointly share the costs of this program. The central government provides basic compensation bundles for CGVOs, then provincial and local governments offer more benefits. Rich regions usually offer

¹ They usually receive 10 bonus points, while the full score is usually 350.
better packages. For example, Beijing provides CGVOs with a monthly wage of 2,000 yuan ($317) in the first year, 2,500 yuan ($396) in the second year, and 3,000 yuan ($475) in the third year. After serving as village officials for two years, CGVOs are eligible to obtain a Beijing Registered Residence (Hukou). In Shanghai, a base wage of 2,000 yuan ($317) per month is provided to the CGVOs; by the end of each year, a lump sum compensation of 21,760 yuan ($3448) will be given to those who passed the evaluations. In Chongqing, CGVOs have the same wage and benefits packages as entry-level civil servants. In Jiangsu and Shanxi provinces, their wages match those of other public institutions. In Hubei province, a CGVO receives a compensation of 15,000 yuan ($2377) per year, and a lump sum re-allocation compensation of 2,000 yuan ($317). In less developed places, the wage is lower. Sichuan offers 900 yuan ($143), 1,100 yuan ($174), and 1,500 yuan ($238) per month, respectively, to college graduates (3 years of higher education), university graduates (4 years of higher education) and master’s degree holders. If they are working in the minority areas, an additional 200 yuan ($32) per month will be added. In poor areas, the compensation is low. For example, Guizhou province only provides the CGVOs with a monthly wage 600 yuan ($95). Henan provides the college graduates, university graduates and master’s degree holders with monthly wages of 500 yuan ($79), 600 yuan ($95) and 800 yuan ($127), respectively.

Each year, upper-level governments (township or county-level government) evaluate CGVOs’ performance. The evaluation results not only affect a CGVO’s employment status, but are also linked to his/her future career development. If a CGVO is rated as “disqualified,” the government can terminate the appointment.

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2 We use the exchange rate in 2012 (1:6.31) to convert Chinese yuan to US dollars.
3 The Hukou System (Household Registration System) in China not only distinguishes people in rural areas from people in urban areas, but also distinguishes people from one place to another. The residence registration status is typically associated with a variety of benefits, such as education, housing and medical care. Beijing and other major metropolitan cities impose very strict restrictions on Hukou registration. In the black market, a Beijing Hukou can fetch about 500,000 yuan (source: http://news.qq.com/newspedia/101.htm).
A CGVO may be disqualified for several reasons. For example, if a CGVO is found committing crimes or violating the law, the appointment will be terminated immediately; if a CGVO participates in gambling, fighting, superstitious activities, and acts of indecency, or if a CGVO does not comply with the work-leave system (absent from work for more than 10 consecutive days, or more than 20 accumulated days in a year), the appointment can be terminated, too.4

On the supply side, China's dramatic expansion of higher education makes it increasingly difficult for fresh graduates to find jobs in the cities. For example, in 2008 over 1.5 million college graduates were unemployed (CASS, 2008). Becoming a CGVO is an appealing option. Consequently, competition for the CGVO positions is fierce, especially in areas with better benefits. For example, Beijing planned to hire 3,000 college graduates in 2007, but more than 19,000 students applied. Among these applicants, roughly 1,800 had master’s degrees. Shanxi province wanted to hire 9,030 village officials in 2009; 181,300 applications were received. The admission rate was about 1/20.

A CGVO’s work involves almost every aspect of local governance. As administrative officers, they deal with regular administrative affairs such as documenting and classifying materials, collecting village statistics, and writing reports. As members of the village committees or of the local Communist Party branches, they are involved in the village policy-making process.5 Some CGVOs even deliver training and education to villagers. For example, they teach villagers how to use computers and how to adopt new agricultural technologies. They also help collect and distribute information on products, markets and new policies. In the event of a conflict, CGVOs may also serve as mediators. Financial services

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4 On September 19th 2007, a CGVO in Fengyang county became the first CGVO to be laid off for being absent from work for more than 20 days in a year.

5 Although CGVOs typically serve as assistants to VC or VPS, more and more of them have become direct decision makers in the villages in recent years. By the end of 2012, more than 67,000 CGVOs became members of village committees and communist party branches. Among them, over 4,200 became the chairmen of party branches and over 1,500 were elected as the chairpersons of village committees (CGVO Development Report, 2013).
are typically more accessible to better-educated people, so CGVOs sometimes also help villagers acquire loans from commercial banks. In some cases, they may engage in volunteer work such as helping vulnerable and disabled people with their farming work.

\[ B. \text{Recruiting and Assignment Process} \]

The CGVO recruitment process typically involves several rounds. After the government decides how many college graduates they will hire, all applicants will take a comprehensive examination, which is similar to the Administrative Aptitude Test and Essay Writing Test used in the National Civil Service Exam. Applicants with higher grades will be invited to an interview. The government typically selects twice as many candidates as it will eventually hire. Then, the recruiting team interviews all the candidates and grades their performance based on a variety of characteristics, such as communication skills, political beliefs, and moralities. The recruiting team are also interested in whether the candidates are mentally prepared, whether they are familiar with rural development, and their future career plan. The total score of a candidate is the sum of the written exam score and the interview score, and the interview score usually accounts for 20-40\%. Applicants with higher total scores will be asked to attend medical checks and drug tests. Once they pass those tests, the government will train them and familiarize them with the rural areas before assigning them to the villages.

The assignment of CGVOs is determined by upper-level governments (county level or prefectural level). Several rules are used to match CGVOs to villages. The dominant rule is based on a CGVO’s hometown. Most governments encourage CGVOs to go to villages that are closer to their hometowns so that the CGVOs are more familiar with the local conditions. Given that there are many
dialects in China, matching by “hometown” will significantly reduce the cost of communication and understanding.

Some governments assign CGVOs based on their test scores. Candidates with higher scores are more likely to be assigned to larger and richer villages. However, this is not deterministic. It is also possible that some good candidates are assigned to poor villages to help alleviate poverty. In our survey, 40% of upper-level government officials said the “Hometown Rule” was the most important determinant of CGVO assignment; 33% said CGVOs’ test scores were the most important one. In some places, the government also asks CGVOs about their location preferences. In our survey, 12% reported that CGVOs’ preferences are also important.

IV. Data and Key Variables

A. Data

This study combines the National Fixed-Point Survey (NFS) data with data from a retrospective CGVOs survey to investigate the impacts of the CGVO program. The NFS is a longitudinal survey conducted by the Research Center for Rural Economy (RCRE) in the Ministry of Agriculture in China. It was initiated in 1986, and covered about 24,000 households in 350 villages across 31 provinces in China. The survey used a multi-stage cluster population probability sampling method, and the sampling process included three strata. The first stratus was based on geographic topology dividing a province into three regions: plain, hilly, and mountainous. The second stratus was based on the county characteristics. Counties were divided into three groups by per capita income: low, middle, and high. Representative counties were chosen according to their per capita income. The last stratus was based on village characteristics. Within a county, one representative village was chosen for sampling. Then the households were
randomly sampled in this village. There are about 2600 counties in China; the NFS sample covers 13.5% of them. The number of households surveyed in each village ranged from 50 to more than 100, depending on the size of the village. NFS records a detailed set of household and village data for a relatively long period.

We obtained access to the village-level data for 232 villages in 19 provinces from 2000 to 2011. These provinces are Anhui, Fujian, Gansu, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shandong, Shaanxi, Shanxi, Sichuan, and Zhejiang. The NFS dataset includes detailed information on village income, population, employment, household composition, enterprise information, local government, land, agricultural production, village business, and public facilities.6

In 2012, we conducted a retrospective survey on CGVOs based on the village information in the NFS sample. We first identified to which town and county each village belongs, then we invited relevant government officials at the town or county level to fill out the questionnaires. We asked whether a village has a CGVO, when the first CGVO was appointed, and how many CGVOs there were in each village in the past years. We also collected CGVOs’ personal information when available.

Figure 1 illustrates the share of villages with CGVOs in the sample. The share started to increase dramatically in 2007, one year after the central government’s nationwide promotion. Between 2000 and 2006, only about 1% percent of the villages had CGVOs, but the share rose to 30% in 2010.7 The trends are very

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6 Several previous studies have used part of the NFS data, such as Benjamin et al. (2005), Giles and Yoo (2007), and Shen and Yao (2008). More details of the data are discussed in those papers.

7 The share decreased slightly in 2011 for two reasons. First, some CGVOs who were appointed in 2008 left the villages after the three-year term; second, we found that the number of villages surveyed in 2011 was slightly less than in previous years.
similar to the national statistics reported in Table 1, suggesting the NFS sample is representative.

**B. Key Variables**

We focus on four important welfare measures that might be affected by the CGVO program. Per capita net income of rural households is used to measure the overall welfare in a village. The number of rural households who earn income primarily from agricultural production is used to examine whether CGVOs can accelerate the urbanization process and help the farmers develop more diversified income sources. The number of subsidized poor households and the share of poor houses are used to evaluate whether they can help improve the implementation and targeting of pro-poor policies.

Net income of rural households refers to the total income of rural households from all sources minus all corresponding expenses. It is calculated as the sum of income from wages and salaries, income from household operations, income from properties and income from transfers, minus household operation expenses, depreciation of fixed assets for production, taxes and fees paid, and gifts to non-rural relatives. Per capita net income of rural households in each village is calculated by dividing the total net income of selected households by the total number of permanent residents of selected households. It is usually considered as the most important welfare measure in rural areas in China.

Most rural households earn their living from agricultural production. In the process of urbanization, they will become less agriculture-dependent, and their primary income source will gradually switch from agriculture to non-agriculture. In the NFS data, rural households are classified into different groups based on their income sources. Pure agricultural households are those who earn more than 90% of their total income from agricultural production. Primary agricultural
households are those who earn 50-90% of their total income from agricultural production, and non-agricultural households are those who earn less than 50% of their total income from agricultural production. We examine whether CGVOs helped the rural households develop more diversified income sources. The outcome of interest is the number of households who earn more than 50% of their income primarily from agricultural production.

We are particularly interested in understanding the program’s impacts on improving the implementation and targeting of pro-poor policies. Two national policies are most relevant: the “Subsidizing Poor Households” Policy and the “Renovating Dilapidated Rural Houses” Policy.

“Subsidizing Poor Households” Policy

The Chinese government subsidizes poor households. A household is eligible for the subsidization if its per capita net income falls below the poverty line. A subsidized poor household usually receives around 200-500 yuan ($32-79) per capita annually from the government.

Many poor households are not subsidized because they are not aware of the policy, or not able to complete the applications. Filing an application requires not only getting hold of an application form, but also attaching a proof of low income certified by the village officials, a household registration book, and sometimes a family photo. It is difficult for some poor households, especially the illiterates, to gather all the evidence. CGVOs can help the poor households collect relevant materials and complete the applications. Thus, we examine whether CGVOs increase the number of subsidized poor households in the villages.

“Renovating Dilapidated Rural Houses” Policy

8 The poverty line in China has changed over time. For example, in 1990, the poverty line was 300 yuan ($47.54) per month, and it increased to 530 yuan ($84) per capita in 1995. In 2000, the poverty line was set at 625 yuan ($99), and it further increased to 683 yuan ($108) in 2005. Based on local economic conditions, local governments can also set their own subsidy standards.
Another important policy aiming to help the poor in China is the “Renovating Dilapidated Rural Houses (RDRH)” project. Dilapidated houses refer to houses with damaged main structure, which may collapse at any time. Dilapidated houses have lost their stability and carry capacity, but many people, especially the poor, still live in these houses. Natural disasters, such as earthquakes, floods and typhoons, can easily bring down these houses and cause severe injuries or even death.

In 2008, the central government started to implement the RDRH project, which provides poor households with subsidies to renovate their dilapidated houses. The cost of the program is shared between the central and provincial governments. Typically, the central government provides a fixed amount to all qualified households (5000 yuan ($792) per household in 2009), and the provincial government matches the amount or provides even more.

The dilapidated houses are classified into different levels based on the potential risks of collapsing. Poorer households who live in high-risk houses are given priority for the renovation subsidy. The application for the housing renovation subsidy is very complex and involves lots of screenings and evaluations. First, the applicant needs to fill out a long application form and provide the household registration book, personal ID, and a proof of poverty obtained from the Department of Civil Affairs. Then, the application is screened by neighborhood villagers, village officials, township officials and county officials. Different levels of officials will evaluate whether the house is indeed dilapidated, whether the applicant can afford the renovation, and whether the applicant will spend the money solely on renovating the house rather than on other issues.

In the NFS data, we have information on two types of houses: houses built with reinforced concrete and steel, and houses built with bricks, stones and woods. The latter ones are less stable and more dangerous than the former ones. In the sample, roughly 57% households live in houses built with bricks, stones and woods. The
number of dilapidated houses is not reported in the NFS data, but we know that the dilapidated houses are a subset of the houses built with bricks, stones and woods. So we investigate whether the share of houses built with bricks, stones and woods decreased after the CGVOs were assigned. We call the share of houses built with bricks, stones and woods “the share of poor houses” in the rest of this paper.

In Table 2, we summarize the descriptive statistics of the four main dependent variables and several other variables that will be used in subsequent analysis. The mean per capita net income in the whole sample is 3946 yuan ($625), with a standard deviation of 2718 yuan ($431). Average village population is 1756, and average number of households is 474. Typically there are six officials in a village. The majority of rural households rely on agricultural income. The share of households who primarily earn their living from agriculture production is 74.35%. Roughly 11% of households are subsidized households in the sample. More than half of the households (56.69%) live in poor houses built with bricks, stones and woods. Per capita village government revenue and spending are respectively 504 ($80) and 319 yuan ($51). Weather conditions are important determinants of agriculture production, and we collect weather data (rainfall and temperature) from China’s national weather stations.

V. Exogeneity

In most places, the assignment of CGVOs is determined by upper-level governments. The CGVO assignment should be exogenous at the village level because villages and college graduates are typically not allowed to choose each other. However, due to the complexity of the assignment process, a reasonable concern is that assignment choices may not be orthogonal to unobservable factors that also affect household income and other policy implementations.
There are two potential hypotheses regarding the assignment choices. The first hypothesis is that upper-level governments choose villages based on their characteristics. On the one hand, governments may prioritize richer and/or larger villages, where they expect CGVOs' knowledge would help boost the economic development. On the other hand, it is also possible that governments may favor poorer villages, expecting CGVOs to help alleviate poverty. The second hypothesis is that upper-level governments assign CGVOs in response to local economic shocks. For example, if a village experiences a negative income shock, upper-level governments may send a CGVO to help the village, which increases the village’s probability of getting a CGVO.

In this section, we test the exogeneity of CGVO assignment using a logit model with duration dependence. Specifically, we model the probability that a village receives a CGVO at time t as a function of a set of village-level time-invariant and time-variant covariates, and allow for duration dependence. The CGVO appointment variable is a dummy, which equals 1 if a village has a CGVO in year t, and 0 otherwise.

The time-invariant covariates include two sets of variables. The first set of variables are the four welfare measures discussed in Section 4, which include per capita net income of rural households, number of households who primarily earn their income from agricultural production, number of subsidized poor households and share of poor housing. Since the CGVO program started to expand in 2007 and 2008, we use the levels of the four variables in 2006 to test whether the CGVO assignments are correlated with these pre-determined factors.9

The second set of time-invariant variables are basic village characteristics, including village size (population) in 2006, size of village government (number of village officials) in 2006, share of educated (completed high school education)

9 The conclusions are the same if we use data before 2006.
village officials in 2006, the terrain of the village (plain or hill/mountainous), the pillar industry of the village (agriculture or others (forestry, livestock and fishery)), whether a village is close to a city, and whether a village is the location of the township government.

The time-variant covariates are changes in the four outcomes: changes in per capita net income, changes in the share of households who primarily earn income from agricultural production, changes in the number of subsidized poor households, and changes in the share of poor housing.

Specifically, we estimate the following logit model with duration dependence:  

\[
P(CGVO_{it} = 1|X_{it}) = \frac{e^{X_{it} \beta + f(t)}}{1+e^{X_{it} \beta + f(t)}}
\]

where \(P(CGVO_{it} = 1|X_{it}) = h(t, X_{it})\) is the hazard function (the probability of receiving a CGVO conditional on a set of variables), and \(f(t)\) is a flexible function of time \(t\).

When the dependent variables are all set to zero, the baseline hazard rate can be written as a function of time duration \(t\), \(h_0(t) = \frac{e^{f(t)}}{1+e^{f(t)}}\). \(f(t)\) allows the baseline hazard rate of receiving a CGVO to vary over time \(t\).

There are multiple ways to estimate the duration dependence. We estimate the duration dependence both parametrically and non-parametrically. In the parametric model, we approximate \(f(t)\) by using a 4th order polynomial function of \(t\), while in the non-parametric model, we estimate the duration dependence using locally weighted regressions (lowess smoothing). In effect, the logit model has the following form:

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10 Traditional logit or probit models assume duration independence, i.e. the probability of being treated at any point in time is always the same. This is not a valid assumption here because the probability of getting a CGVO increases over time. Without taking into account duration dependence, the standard errors estimated from a traditional logit/probit model would be wrong (Poirier & Ruud, 1988).
\[
\log \left( \frac{P_{it}}{1-P_{it}} \right) = \beta_0 + \beta_1 \cdot X_{i,2006} + \beta_2 \cdot \Delta X_{i,t} + \beta_3 \cdot Z_i + f(t) + \epsilon_{it}
\]

where \( P_{it} \) is the probability of receiving a CGVO for village \( i \) at time \( t \), \( X_{i,2006} \) are the time-invariant welfare measures in 2006 (one year before the CGVO program), \( \Delta X_{i,t} \) are lagged changes in the welfare measures, and \( Z_i \) are the time-invariant basic village characteristics. Time duration \( f(t) \) is approximated either by a 4th order polynomial function of \( t \), or by the predicted smoothed values of time dependence from the lowess regression.

The term of a typical CGVO appointment is three years. Once assigned, the CGVO variable is 1 for three years. However, the ongoing CGVO appointment is not our focus. We are more interested in the first CGVO assignment. As suggested by Beck, Katz, and Tucker (1998), we drop the second and subsequent years of CGVO appointment from the data, and only investigate how those time-invariant and time-varying variables affect the first CGVO assignment.

The regression results are reported in Table 3. In Column (1), we only include the first set of time-invariant covariates: the four welfare measures in 2006. None of them is statistically significant at the 5% level. In column (2), we also include a set of basic village characteristics. Population and village government size are both statistically significant at the 5% level. The positive associations suggest larger village are more likely to be assigned CGVOs in a given year. Besides, the (log) number of households who primarily earn income from agricultural production becomes statistically significant after we control for basic village characteristics. More agriculture-dependent villages are less likely to receive a CGVO. Other variables such as terrain, pillar industry of the village and closeness to a city are not significant.

In column (3), we further add the changes in the four welfare measures into the regression model. None of them is statistically significant, indicating that economic shocks at the village level do not affect upper-level government's
CGVO assignment decision. Indeed, if we test whether the estimates are jointly zero, we would not be able to reject the hypothesis at the 5% level. When all the covariates are included, as reported in Column (4), only village government size and income in 2006 are statistically significant. Villages with more officials or higher income are less likely to be assigned a CGVO. Again, none of the time-variant variables are statistically significant. Columns (5) and (6) summarize results using duration dependence predicted from lowess regressions. The findings are similar to those from the non-parametric model.

Overall, we find that upper-level governments are more likely to assign CGVOs to larger and more agricultural-independent villages. However, there is no evidence that the economic shocks affect the CGVO assignment. Indeed, whether the assignment decision is driven by the time-varying shocks is critical to subsequent impact analysis. To identify a causal effect, our main econometric model relies on the variations in CGVO assignments across time and space in a difference-in-differences (DID) setting. The results in Table 3 show that the CGVO assignments are not correlated with observed time-varying factors, suggesting that DID is likely to be a valid approach to estimate the impacts of the CGVO program.

VI. The Impacts of the CGVO program

A. Graphical Analysis

Household per capita net income is usually considered as the single most important welfare measure in rural China. Figure 2 shows the trends in per capita net income for villages with and without CGVOs. Before the CGVO program was introduced, the per capita net income for both groups follow essentially the same trends. During the post-treatment period (2008-2011), the income in the treatment
group (villages with CGVOs) appears to be slightly higher than that in the control group in 2009 and 2011. However, the differences are almost negligible.

Figure 3 shows the trends in the share of households who earn income primarily from agricultural production for the treatment and control groups. Both trends are downward sloping, indicating that increasingly farmers' primary source of income is switching from agriculture to non-agriculture. The share of agricultural households in the treatment group is slightly less than that in the control group, suggesting more agriculture-dependent villages are less likely to receive CGVOs.

From Figure 2 and Figure 3, it seems that CGVOs have no effect on rural households’ income and sources of income. The trends for both groups are parallel before the introduction of the CGVO program, further suggesting that the DID approach will be able to capture the effect of CGVOs, if any.

Next, we look at two important national pro-poor policies: the “Subsidizing the Poor Households” policy and the “Renovating Dilapidated Rural Houses” policy. Figure 4 illustrates the trends in the share of subsidized poor households for villages with and without CGVOs. Overall more and more poor households are subsidized, as the share is increasing over time. The trends are parallel before CGVOs are assigned to the villages. Particularly, the shares of subsidized poor households are virtually the same in both groups in 2006, 2007 and 2008. Starting from 2009, more poor households are subsidized in villages with CGVOs than in those without. It seems that the CGVO program has helped more poor households obtain subsidies.

Figure 6 shows trends in the share of households living in poor houses. The trends for both groups, again, are parallel before the introduction of the CGVO program. The share of households living in poor houses started to decrease in both groups after the central government launched the “Renovating the Dilapidated Houses” policy. The decrease in the treatment group is much more dramatic than
that in the control group. The most likely explanation is that CGVOs have helped the villagers find the means to renovate their dilapidated houses.

B. Econometric Model

The main findings are evident in Section 6.1. The graphical analysis suggests that the assignment of CGVOs to villages is unlikely to affect per capita net income and source of income of rural households, but it does benefit the poor villagers. In the presence of CGVOs, more poor households are subsidized, and more dilapidated households are renovated. We quantify these impacts using a generalized DID (fixed-effects) method:

\[ y_{it} = \alpha \ast CGVO_{it} + X'_{it} \ast \beta + \rho_t + \mu_i + \varepsilon_{it} \]

where \( y_{it} \) is a welfare measure for village \( i \) in year \( t \), \( CGVO_{it} \) is a dummy indicator which equals 1 if village \( i \) in year \( t \) has a CGVO, and 0 otherwise. \( X_{it} \) is a set of control variables that vary both across units and time, \( \rho_t \) is a time effect common to all villages in period \( t \), \( \mu_i \) is a time-invariant effect unique to village \( i \), and \( \varepsilon_{it} \) is a village time-varying error distributed independently of \( \mu_i \) and \( \rho_t \).

College students typically graduate from school in June of each year, and assume their duties as CGVOs in the same month or the one after. Using current year's treatment status may fail to capture the full impact of CGVOs, thus we also use one-year lagged values of CGVOs as the independent variable.

In the light of the graphical analysis, we expect that CGVOs have little effect on per capita net income or income structure. However, CGVOs may help more poor households obtain subsidies, and decrease the share of households living in poor houses.

The timing of CGVO assignment was largely decided at the province level, so it is at this level that we cluster the standard errors. As we only have 19 provinces, we address the possibility of small sample bias in the clustered standard errors by
also presenting p-values derived from wild bootstraps, as recommended by Cameron, Gelbach, and Miller (2008).

The underlying assumption for an unbiased estimate of $\alpha$ in the DID model is that the pre-trends of the outcomes for both control and treatment groups are parallel. In Section 5, we showed that the assignment of CGVOs is only correlated with a few time-invariant factors, such as village size and village government size, and is not correlated with any observable time-varying covariates. We control for all the time-invariant factors by including the village fixed effects dummies $\mu_i$. We also control for any shocks common to all villages by including year fixed effects $\rho_t$. The graphical analysis shows that the trends in the outcomes in both groups of villages are similar before the introduction of CGVOs. The parallel trends validate the DID identification (Heckman and Hotz, 1989). Since there is no systematic differences in trends between villages with and without CGVOs before the assignment, villages without CGVOs can serve as a good control group for villages with CGVOs in the treatment period.\footnote{This DID approach may be problematic if there are spillover effects. A CGVO does not necessarily only work in one village. If two neighboring villages have good connections, a CGVO in one village may help the other village as well. When the spillover effects are large, the DID approach cannot estimate the actual impact.}

\textit{C. Regression Results}

Table 4 summarizes the regression results for log per capita net income of rural households and log number of households earning income primarily from agriculture. We use current or lagged CGVO status in the regressions. Control variables are time-varying factors including village population, precipitation and temperature in each year. In columns (1)-(4), we find no effect of CGVOs on log per capita net income. The estimated coefficients of CGVOs are close to zero and statistically insignificant. In columns (5)-(8), CGVO is positively associated with
the number of households who earn income primarily from agricultural production, but the associations are insignificant.

We present the results for poor households in Table 5. We expect that CGVOs increase the number of subsidized poor households, and decrease the share of dilapidated houses, as shown in Figure 3. In columns (1)-(4), we find that CGVOs have a positive impact on the number of subsidized poor households. When all the control variables are included, the estimated coefficient is 0.228 and is statistically significant at the 5% level. The number of subsidized households is on average 22.8% higher in villages with CGVOs than in those without. The results are very robust to the inclusion of time-varying control variables, suggesting that the DID model has properly controlled for the confounders. The magnitude of the estimated coefficient for lagged CGVO is similar to that for current CGVO. It shows that the poor households are able to obtain subsidies in the same year when CGVOs start working in their villages. Columns (5)-(8) summarize the results for the share of poor houses. Both CGVO and lagged CGVO have a significant negative effect on the share of poor houses. The estimated coefficients range from 0.0382 to 0.0541 and are all statistically significant at 1%. Given that the mean value of the share of poor houses is 0.57, the CGVO program decreases the share of poor houses by 6.7–9.5%. Note that the effect is larger in columns (7) and (8). So one year after these college students commenced work in the villages, more poor houses are renovated. This is logical because the application for the renovation subsidy and the process of renovation take much more time than the application for poverty subsidy.
VII. Discussion of the Results

A. Channels of CGVO Effects

Our analysis in the previous section suggests that more poor households are subsidized and more dilapidated houses are renovated in villages with CGVOs. We argue that the effects are primarily driven by better enforcement of central government’s pro-poor policies, namely the “Subsidizing Poor Households” Policy and the “Renovating Dilapidated Rural Houses” Policy. However, other explanations may as well exist. For example, if CGVOs are able to raise money from other channels to increase village government revenue, then poor households may still be subsidized.

We show, however, that this is unlikely in two ways. First, CGVOs are not making the villages or village governments richer. In Section 6, we already showed that CGVOs have no impact on per capita net income or source of income of rural households. Here we explore several other welfare measures relating to income or government revenue. In panel A of Table 6, we examine whether CGVOs affect per capita village business revenue, village government revenue and expenditure. Columns (1)-(2) show that CGVOs have no impact on the growth of village business revenue. In columns (3)-(4), we find that CGVOs are not helping the village governments generate more revenue. Although the association between CGVO and log per capita village government revenue is positive, this relationship is statistically insignificant. Results in columns (5)-(6) further suggest that there is no significant relationship between CGVO and village government spending.\(^\text{12}\) Since rural households and village governments are not becoming richer, and village governments with CGVOs are not spending more,

\(^{12}\) Note that the subsidies received by poor households from upper-level governments are not part of village revenue and expenditure.
the increased number of subsidized poor households and renovated poor houses is unlikely internally supported.

Second, we find that more households are registered as poor households in villages with CGVOs. Registered poor households are those who applied for the government subsidies and have their application materials kept in government agencies. Once registered poor households pass government screenings, they will receive subsidies from the government. If CGVOs indeed help the poor households obtain money directly from upper-level governments, we should observe more registered poor households in villages with CGVOs. In columns (1)-(2) of Panel B, we find the expected results that more poor households get registered in villages with CGVOs. Both current CGVO and lagged CGVO are positively associated with a higher number of registered poor households, and the relationship is statistically significant at the 5% level for the one-year lagged CGVO. On average, the one-year lagged CGVO is associated with a 21.6% increase in the number of registered poor households. In line with the registration story, we also find that the disability rate (calculated as the total number of people with disabilities divided by the village population) increases in villages with CGVOs in columns (3)-(4). The effect is statistically significant at the 10% level for the current CGVO indicator, and is statistically significant at the 5% level for the one-year lagged CGVO indicator. Since people with certain disabilities also receive subsidies from the government, the higher disability rates in the treatment villages suggest that CGVOs have helped register more disabled people.

Note that the number of registered poor households is not necessarily larger than the number of subsidized poor households. In fact, when we interviewed the village officials, we found that some villages subsidized more poor households than the registered number. For instance, richer villages sometimes have their own anti-poverty programs that subsidize the poor households. It is also common for the village government to split the subsidies from the upper-level government, then distribute to all the poor households, no matter whether they have registered or not.
Our findings are also consistent with national-level statistics. Table 7 shows governments’ expenditure dedicated to poverty alleviation from 2003-2010. The spending on anti-poverty programs grew from less than 28 billion yuan ($4.44 billion) to more than 50 billion yuan ($7.92 billion) in 7 years. The growth had accelerated since 2007, which coincided with the rolling introduction of the CGVO program in the country.

\[\text{B. Improvement of Policy Targeting}\]

The pro-poor policies are designed to help the poor. However, due to the lack of self-targeting mechanisms built into these policies, the non-poor have strong incentives to capture the subsidies, too. There is also a concern that CGVOs may just game the system and pocket the money from the central government without providing the subsidies to the most needy households. It is also uncertain whether those subsidized households are indeed the poorest. We provide some suggestive evidence to address these concerns.

All school-aged children in China are required to receive at least nine years of education, which include six years of primary education, and three years of junior secondary education (middle school). The nine-year education plan is funded by the central government and it has become completely free of charge since 2006. However, because of extreme poverty, some kids in rural villages are still not able to attend primary schools. In the NFS data, we have information on the number of children aged 7-13 and the number of enrolled students in each village. The mean enrollment rate (calculated as the number of enrolled students to the number of children aged 7-13) in the NFS data is 97.9%, with a standard deviation of 0.0724. If we run the same set of regressions as before, we find that lagged CGVOs are

\[\text{14 The governments’ expenditure dedicated to poverty alleviation, also known as the “anti-poverty fund,” mainly comes from the fiscal support of the central and local governments. A small proportion of the fund also comes from interest-bearing loans (guaranteed by the governments) provided by domestic and international financial institutions.}\]
positively associated with school enrollment rate (columns (5)-(6) of panel B in Table 6). The estimated coefficient is 0.0166 and is statistically significant at the 5% level. This is important because it suggests that almost all the drop-out students (the last 2%) are now at school in villages with CGVOs. Since the dropout students are mainly from the poorest households, the results suggest that in the process of implementing the central government’s policies, CGVOs are targeting the right population.

Second, we conducted in-depth interviews with seven CGVOs in Henan and Yunnan province from 2013-2014. During the interview, five of the seven CGVOs emphasized their roles in promoting government policies, particularly among those who are illiterate or have low cognitive abilities. We further asked the CGVOs why they contributed the most to policy promotion and implementation rather than other aspects of the rural development, such as promoting agricultural technology adoption and/or helping to start up village enterprises, they explained that there was not much conflict of interest in helping the poor apply for subsidies. Villagers were happy to cooperate with CGVOs when they realized that CGVOs could help them obtain subsistence. Local officials also had no excuse to hinder their work when it came to implementing the central government’s policies. At the same time, because CGVOs had no local political connections, it was safer for them to just follow the central government’s policies and not do anything risky. For other village issues, particularly when it involved financial or political interests for multiple interest groups, it was much more difficult for CGVOs to move things forward because they were usually not the final decision makers in the villages.

Last, our findings are consistent with several qualitative studies investigating rural households’ assessment of CGVO performance in China. For example, Cheng and Liu (2010) discover that different from traditional village officials, the CGVOs make extra efforts to find out about what the villagers need, and they do a
great job in helping the most disadvantaged households by enforcing the governments’ pro-poor policies. In a case study, Fu (2009) finds that with the help of CGVOs the illiterate villagers can understand government policies better, and thus become more willing to cooperate with the local governments. The “2013 CGVO Development Report” also concludes that “CGVOs have made significant contributions in making government's pro-poor programs more accessible to the poor, and increase the villagers’ willingness to participate in them.”

VIII. Conclusion

The CGVO program is a novel policy experiment aiming to help the poor in rural China. Each year, the Chinese government sends thousands of college graduates to rural villages, where they work and live with the rural households, and deal with various issues in the villages as officials. The government hopes that these educated village officials can help improve village governance and benefit rural development.

This study evaluates the economic impacts of the CGVO program in China. By exploring the staggered timing of the introduction of the CGVO policy in different regions, we provide the first causal estimates on how the CGVO program affects the poor. We find that, by strengthening the implementation of two national pro-poor policies, namely the “Subsidizing Poor Households” policy and the “Renovating Dilapidated Rural Houses” policy, CGVOs are able to get more poor households subsidized and more dilapidated houses renovated. In villages with CGVOs, the number of subsidized poor households increases by 22.8%, and the share of poor houses decreases by 6.7–9.5%.

Our explanation is that CGVOs are better informed about the pro-poor policies and can assist the poor households in filing subsidy applications. The empirical results support this argument as both the number of registered poor households
and the disability rate increase in villages with CGVOs. Further investigation on
the school enrollment rate and our CGVO interviews suggest that CGVOs may
improve the targeting of government services.

The costs of running the CGVO program are enormous. For example, in the
single year of 2012 the central government spent at least 3.3 billion yuan (523
million USD) to support its over 230,000 CGVOs. A back of envelope calculation
tells us the annual total cost would exceed 10 billion yuan (1.585 billion USD) if
all the villages in China were assigned CGVOs.\textsuperscript{15} Given the significant costs, a
critical question is whether the CGVOs’ overall performance has met the central
government’s policy goals. In addition to policy promotion and implementation,
CGVOs are also expected to play important roles in other aspects of rural
development, with increasing rural households’ income being the most important
one of all. Our findings, however, suggest that CGVOs have little impact on this
measure. Not only do CGVOs have no impact on per capita income, there is also
no evidence that they can help diversify rural households’ income sources, or
raise the village collective business revenue or the village government revenue.
These results suggest that CGVOs fail to increase rural productivity.

As a further matter, the program’s impacts we found in this study shed little
light on the necessity of higher education for the implementation of national
policies. If the upper-level government just introduces an outside person with
some education (not necessarily with college education) into the village
government, it is still possible that the designated person will be able to make
comparable contributions as a CGVO. In the end, understanding national policies

\textsuperscript{15} We cannot find official statistics on the total spending of the CGVO program. In 2012, the central government of
China spent 20,000 yuan ($3170), 15,000 yuan ($2377) and 8000 yuan ($1268) respectively to support a CGVO working
in the eastern, central and western parts of China. If we assume there are 76,600 CGVOs in each region, then the total cost
will be 20,000*76,600+15,000*76,600+8,000*76,600=3,293,800,000 yuan ($523 million). Note that this calculation does
not include provincial and local government’s spending on the CGVO program.
and helping the poor get subsidies does not seem to be a high-skilled work that requires much expertise.

These findings beg an obvious question: why have CGVOs failed to make full use of their human capital and make larger contributions to village development? Due to data limitations, this study is unable to explore the underlying factors that hinder CGVOs from playing more significant roles. We offer several possible explanations for future research. First, higher education may not be a determining factor in agricultural production and rural development in China, so the CGVO program cannot effectively increase rural productivity. Second, CGVOs and villages may not be properly matched. CGVOs’ backgrounds and personal characteristics may play important roles in determining the outcomes. For example, a CGVO majoring in agricultural economics is likely to be more capable of helping a village than a CGVO studying fine arts. Third, since CGVOs are not the final decision-makers in villages and lack authority, they are not able to secure sufficient resources to execute their plans. Fourth, because of the poor mechanism design, CGVOs may have no incentives to take risky actions, so they only focus on areas that do not threaten entrenched interests but consistent with national policies. Fifth, we use data from a relatively short period of time and only estimated the short-run effects of CGVOs. It is possible the CGVOs will make a larger contribution in the long run.
References


Table 1. Number of CGVOs in China

<table>
<thead>
<tr>
<th>Year</th>
<th>1999</th>
<th>2001</th>
<th>2003</th>
<th>2007</th>
<th>2011</th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>2,200</td>
<td>14,000</td>
<td>21,000</td>
<td>58,000</td>
<td>210,000</td>
<td>&gt;400,000</td>
<td>&gt;600,000</td>
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<tr>
<td>Share</td>
<td>0.32%</td>
<td>2.03%</td>
<td>3.04%</td>
<td>8.41%</td>
<td>30.43%</td>
<td>&gt;58%</td>
<td>&gt;100%</td>
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</table>

Sources: Lv (2008) and CGVO Development Report (2013). The share is calculated using 690,000 villages.

Table 2: Summary Statistics of NFS Villages

<table>
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<tr>
<th>Variable</th>
<th># Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
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</thead>
<tbody>
<tr>
<td>Per Capita Net Income (Yuan)</td>
<td>2661</td>
<td>3945.94</td>
<td>2718.17</td>
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<tr>
<td>Village Population</td>
<td>2773</td>
<td>1755.76</td>
<td>1324.18</td>
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<tr>
<td>Number of Households</td>
<td>2775</td>
<td>474.08</td>
<td>381.20</td>
</tr>
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<td>Number of Village Officials</td>
<td>2809</td>
<td>5.95</td>
<td>3.19</td>
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<tr>
<td>Share of Agricultural Households</td>
<td>2621</td>
<td>74.35%</td>
<td>24.05%</td>
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<tr>
<td>Share of Subsidized Households</td>
<td>2089</td>
<td>10.75%</td>
<td>12.60%</td>
</tr>
<tr>
<td>Share of Poor Houses</td>
<td>2417</td>
<td>56.69%</td>
<td>31.35%</td>
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<tr>
<td>Primary School Enrollment Rate</td>
<td>2369</td>
<td>97.98%</td>
<td>6.76%</td>
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<tr>
<td>Per capita Village Gov. Revenue (Yuan)</td>
<td>1974</td>
<td>503.56</td>
<td>2798.27</td>
</tr>
<tr>
<td>Per capita Village Gov. Expenditure (Yuan)</td>
<td>1584</td>
<td>319.34</td>
<td>1758.92</td>
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Table 3: Probability of CGVO Assignment: Discrete Time Duration Model

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<th>VARIABLE</th>
<th>(1)</th>
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<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
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<tr>
<td>Log Income, 06</td>
<td>-0.222</td>
<td>-0.829</td>
<td>-0.562</td>
<td>-1.337*</td>
<td>-0.541</td>
<td>-1.299*</td>
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<td>(0.380)</td>
<td>(0.475)</td>
<td>(0.619)</td>
<td>(0.591)</td>
<td>(0.654)</td>
<td>(0.602)</td>
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<td>Log # Ag. HHs, 06</td>
<td>-0.186</td>
<td>-0.536*</td>
<td>0.0317</td>
<td>-0.128</td>
<td>0.00576</td>
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<td>(0.296)</td>
<td>(0.244)</td>
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<td>Log # Subsidized HHs, 06</td>
<td>0.0141</td>
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<td>0.0842</td>
<td>-0.303</td>
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<tr>
<td>Share of Poor Houses, 06</td>
<td>-0.190</td>
<td>0.170</td>
<td>-0.805</td>
<td>-1.522</td>
<td>-0.824</td>
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<td>(0.506)</td>
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<td>Δ in Log (Income)</td>
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<td>(1.172)</td>
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<td>Δ in Log (# Ag. HHs)</td>
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<td>(1.060)</td>
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<td>Δ in Log (# Subsidized HHs)</td>
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<td>(0.342)</td>
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<td>Δ in Share of Poor Houses</td>
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<td>(1.371)</td>
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<td>Government Size, 06</td>
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<td>0.342**</td>
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<td>(1=Plain)</td>
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<td>-1.397</td>
<td>-1.325</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1=Agriculture)</td>
<td>(0.660)</td>
<td>(0.846)</td>
<td>(0.799)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Close to a City</td>
<td>-0.0849</td>
<td>-0.158</td>
<td>-0.162</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>(1=Yes)</td>
<td>(0.441)</td>
<td>(0.443)</td>
<td>(0.435)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Town Gov.</td>
<td>0.0107</td>
<td>0.0735</td>
<td>0.0950</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1=Yes)</td>
<td>(0.373)</td>
<td>(0.511)</td>
<td>(0.498)</td>
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</tbody>
</table>

Time Duration: 4th Poly 4th Poly 4th Poly 4th Poly Lowess Lowess

Observations: 1,382 1,382 664 664 664 664

Standard Errors in parentheses are clustered at the village level. ** p<0.01, * p<0.05.
Table 4. CGVO and Income

<table>
<thead>
<tr>
<th></th>
<th>Log Income</th>
<th>Log # of Ag. HHs</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
</tr>
<tr>
<td>CGVO</td>
<td>0.0027</td>
<td>-0.0006</td>
<td></td>
<td></td>
<td>0.0620</td>
<td>0.0688</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0379)</td>
<td>(0.0364)</td>
<td></td>
<td></td>
<td>(0.0482)</td>
<td>(0.0460)</td>
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<td></td>
</tr>
<tr>
<td>L.CGVO</td>
<td>-0.0175</td>
<td>-0.0186</td>
<td></td>
<td></td>
<td>0.0776</td>
<td>0.0840</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0367)</td>
<td>(0.0359)</td>
<td></td>
<td></td>
<td>(0.0507)</td>
<td>(0.0489)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controls</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Village FE</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Year FE</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Obs.</td>
<td>2,661</td>
<td>2,634</td>
<td>2,370</td>
<td>2,354</td>
<td>2,632</td>
<td>2,614</td>
<td>2,332</td>
<td>2,321</td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.906</td>
<td>0.908</td>
<td>0.914</td>
<td>0.916</td>
<td>0.847</td>
<td>0.854</td>
<td>0.863</td>
<td>0.868</td>
</tr>
</tbody>
</table>

Standard Errors in parentheses are clustered at the province level. ** \(p<0.01\), * \(p<0.05\).

Table 5. CGVO and Pro-Poor Policies

<table>
<thead>
<tr>
<th></th>
<th>Log # of Subsidized HHs</th>
<th>Share of Poor Houses</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
</tr>
<tr>
<td>CGVO</td>
<td>0.225*</td>
<td>0.228*</td>
<td></td>
<td></td>
<td>-0.0382**</td>
<td>-0.0399**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.107)</td>
<td>(0.105)</td>
<td></td>
<td></td>
<td>(0.0119)</td>
<td>(0.0124)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.044]</td>
<td>[0.044]</td>
<td></td>
<td></td>
<td>[0.006]</td>
<td>[0.006]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.CGVO</td>
<td>0.227*</td>
<td>0.228*</td>
<td></td>
<td></td>
<td>-0.0541**</td>
<td>-0.0541**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.108)</td>
<td>(0.107)</td>
<td></td>
<td></td>
<td>(0.0153)</td>
<td>(0.0151)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.060]</td>
<td>[0.050]</td>
<td></td>
<td></td>
<td>[0.004]</td>
<td>[0.006]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controls</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Village FE</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Year FE</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Obs.</td>
<td>2,115</td>
<td>2,091</td>
<td>1,813</td>
<td>1,799</td>
<td>2,417</td>
<td>2,404</td>
<td>2,338</td>
<td>2,326</td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.696</td>
<td>0.701</td>
<td>0.707</td>
<td>0.712</td>
<td>0.805</td>
<td>0.808</td>
<td>0.810</td>
<td>0.813</td>
</tr>
</tbody>
</table>

Standard Errors in parentheses are clustered at the province level. P-values derived from wild bootstraps are in brackets. ** \(p<0.01\), * \(p<0.05\).
### Table 6: CGVO and Other Welfare Measures

#### Panel A: CGVO's Impact on Village Government

<table>
<thead>
<tr>
<th></th>
<th>Log per capita Village Business Revenue</th>
<th>Log per capita Gov. Revenue</th>
<th>Log per capita Gov. Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGVO</td>
<td>0.0378</td>
<td>0.241</td>
<td>0.0489</td>
</tr>
<tr>
<td></td>
<td>(0.0827)</td>
<td>(0.146)</td>
<td>(0.184)</td>
</tr>
<tr>
<td>L.CGVO</td>
<td>0.00989</td>
<td>0.147</td>
<td>-0.0968</td>
</tr>
<tr>
<td></td>
<td>(0.0849)</td>
<td>(0.138)</td>
<td>(0.205)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,747</td>
<td>2,439</td>
<td>1,974</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,914</td>
<td>1,584</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,541</td>
<td>1,541</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.739</td>
<td>0.764</td>
<td>0.704</td>
</tr>
</tbody>
</table>

#### Panel B: CGVO's Impact on the Poor

<table>
<thead>
<tr>
<th></th>
<th>Log # Registered Poor HHs</th>
<th>Disability Rate</th>
<th>School Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGVO</td>
<td>0.177</td>
<td>0.000665</td>
<td>0.0136</td>
</tr>
<tr>
<td></td>
<td>(0.0857)</td>
<td>(0.00137)</td>
<td>(0.00683)</td>
</tr>
<tr>
<td>L.CGVO</td>
<td>0.216*</td>
<td>0.00267*</td>
<td>0.0166*</td>
</tr>
<tr>
<td></td>
<td>(0.0936)</td>
<td>(0.00124)</td>
<td>(0.00774)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,169</td>
<td>1,878</td>
<td>1,826</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,771</td>
<td>2,354</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2,279</td>
<td>2,279</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.744</td>
<td>0.747</td>
<td>0.638</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.641</td>
<td>0.329</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.336</td>
<td></td>
</tr>
</tbody>
</table>

All regressions include village fixed effects, year fixed effects and control variables as in Table 5. Standard Errors in parentheses are clustered at the province level. ** p<0.01, * p<0.05.

### Table 7. Expenditure Dedicated to Anti-Poverty Programs (Anti-Poverty Fund)

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spending, billion yuan</td>
<td>27.8</td>
<td>29.2</td>
<td>26.7</td>
<td>27.9</td>
<td>31.7</td>
<td>36.8</td>
<td>45.7</td>
<td>51.5</td>
</tr>
<tr>
<td>Growth</td>
<td>-</td>
<td>5.0%</td>
<td>-8.7%</td>
<td>4.6%</td>
<td>13.6%</td>
<td>16.1%</td>
<td>24.2%</td>
<td>12.8%</td>
</tr>
</tbody>
</table>

Figure 1. Share of Villages with CGVOs
Figure 2: Per Capita Net Income and CGVOs
Figure 3. Share of Households Who Earn Income Primarily from Agricultural Production and CGVOs
Figure 4: Share of Subsidized Poor Households and CGVOs
Figure 5: Share of Poor Houses and CGVOs