Fiscal Livelihood Spending's Effects on Multidimensional Poverty Reduction in China

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Abstract: *This paper investigates how fiscal spending on livelihood improves multidimensional household poverty in China. Based on the panel data of the "China Health and Nutrition Survey" (CHNS) for 2004-2015, we measured the chronic multidimensional poverty index for Chinese households. We have created a multitiered model for empirical analysis. Our findings suggest that multidimensional poverty in China is predominantly capacity poverty. Fiscal spending on livelihoods significantly reduces multidimensional poverty for Chinese households, especially rural households. Investments on livelihoods are more poverty-reducing than transfer spending on livelihoods. As an innovation, this paper offers a dynamic analysis of the effects of livelihood spending on multidimensional household poverty controlling for heterogeneity between individual households and across regions. Our conclusion suggests that the government should improve policy arrangements to increase social opportunities and support sustainable development capacities for the poor, while enhancing protective social security systems.*

Keywords: *fiscal spending on livelihoods, chronic multidimensional poverty, multitiered model, poverty-reducing effects*

JEL Classification Codes: H51, H52, H55, I32

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1. Introduction

As a common concern for most countries, poverty reduction has topped China's policy agenda over the past decades. General Secretary Xi Jinping noted that the basic goals of socialism are to eradicate poverty and improve people's livelihoods for common prosperity. The Report to the 19th CPC National Congress called for "resolutely scoring a victory in battling poverty" and achieving moderate prosperity by 2020. As the causes of poverty become increasingly complex amid China's socio-economic transitions, multidimensional poverty has become the main form of poverty in China. In this context, the sole criterion of income no longer reflects the full picture of poverty.

Compared with income poverty, multidimensional poverty more precisely captures the nature of poverty. For the first time, Sen (1976) argued that poverty should be reflected in the deprivation of capabilities instead of inadequate income. According to Sen, five types of capabilities contribute to a person's ability to live freely, i.e., political and economic freedoms, social opportunities, guarantees

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of transparent governance, and protective security. Existing studies have identified the lack of social opportunities and protective security as the underlying causes of poverty. Social opportunities refer to people's ability to access health and education services and participate in social activities. Protective security pertains to social protection for the vulnerable people who otherwise might fall into abject deprivation.

The Chinese government at various levels have recognized the importance of poverty's non-income dimensions. As the new principles for poverty reduction, the "two no worries"—no worries about food and clothing, and "three guarantees" —guarantees of housing, healthcare, and education, reflect the goals of multidimensional poverty reduction. They correspond to the "social opportunities" and "protective security" as two of the five capabilities. In the future, China's targeted poverty reduction strategy should focus on multidimensional poverty and improve the poor's capabilities.

Fiscal spending has played a pivotal role in lifting hundreds of millions of people in China out of poverty. Through its indirect and direct effects, fiscal spending can reduce poverty by: (i) stimulating overall economic growth, e.g. productive spending on infrastructure construction; and (ii) offering public services such as education, healthcare, and social protection to individuals.

Since 2002, the Chinese government has refocused its fiscal functions from economic growth to people's livelihoods. The result is a spike in government spending on education, healthcare, and social security. Compared with other fiscal spending items, spending on people's livelihoods may improve the poor's capabilities with respect to social opportunities and protective security, thus effectively reducing poverty. Spending on education and health services helps raise living standards for low-income households. Protective security refers to social protection for poor households in the form of social security spending and other transfer payments to prevent abject deprivation for the poor. In this sense, the poverty-reducing effects of livelihood-related fiscal spending are of great theoretical and policy significance.

Poverty eradication and shared prosperity are aspirations for countries of all political systems. International studies have demonstrated that fiscal spending can reduce poverty by raising productivity and spurring growth in economic and agricultural sectors (Imai *et al*., 2015). Recent years have seen international research progress on fiscal spending's livelihood effects that help reduce poverty. Most studies believe that fiscal decentralization is conducive to increasing livelihood spending, human capital, and living standards in poor regions, contributing to poverty reduction (Faguet, 2010; Imai *et al*., 2017).

However, some studies argued that the poverty-reducing effects of fiscal decentralization, which boosted local livelihood spending, cannot be overestimated since the rich prioritize accessing public services (Amakom and Ogujiuba, 2010; Edeme and Imide, 2014). China's considerable contributions to the global poverty reduction agenda and the United Nations Millennium Development Goals (MDGs) have drawn extensive attention to China's poverty reduction policy. Unlike international literature, Chinese academics have focused their research on the direct poverty-reducing effects of fiscal spending based on absolute income poverty as the poverty line. There remains a paucity of research on the effects of fiscal spending on multidimensional poverty in China. While earlier studies investigated the poverty-reducing effects in terms of the amount of fiscal spending (Zou and Feng, 2015), subsequent studies have focused on how the structure of fiscal spending would contribute to poverty reduction in China. These studies found significant differences in the poverty-reducing effects of fiscal spending of different types. An increasing body of literature demonstrates that productive fiscal spending mitigated regional imbalances and poverty by spurring economic growth (Lin, 2005; Zhan and Wang, 2017; Zhou and Zhang, 2019), but the effects of China's poverty reduction policy diminished possibly due to weakening fiscal spending on social programs (Yang and Zhang, 2016; Liu, 2017; Zuo *et al*., 2018; Yang and Liu, 2019).

Hence, Chinese academics have investigated the poverty-reducing effects of livelihood spending in China. Studies suggest that the redistribution effect of livelihood spending is conducive to reducing urban-

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rural household income gaps and mitigating poverty (Li *et al.*, 2016; Lu and Du, 2019). Nevertheless, some academics contended that livelihood spending's poverty-reducing effects would change as fiscal policy priority shifts from economic growth to public welfare (Zhang and Gong, 2015; Wang and Xie, 2018).

Above all, existing studies have shed light on livelihood spending's poverty-reducing effects. However, China's changing national conditions require continued research on livelihood spending's effects in reducing poverty in the long run. All previous studies have examined poverty from the single dimension of income. However, according to the capability approach, poverty is the deprivation of people's capability to access basic material conditions for subsistence. This approach requires a reassessment of China's fiscal policy on multidimensional poverty. In addition, existing studies on poverty are static cross-section studies. Given the dynamic nature of poverty, poverty research should incorporate the temporal dimension to reflect the dynamic relationship between livelihood spending and multidimensional poverty. Lastly, unlike existing studies based on cross-section or panel data, this paper employs a multitiered model to control for the heterogeneous response of households and communities to livelihood spending and examines the multidimensional poverty effects of livelihood spending at the provincial level. With panel data from the China Health and Nutrition Survey (CHNS), this paper measures the chronic multidimensional poverty incidence, the share of poverty deprivation, poverty duration, and the integrated poverty index of Chinese households during 2004-2015. Moreover, a multitiered model is employed to test the dynamic effects of livelihood spending on Chinese households' multidimensional poverty over an extended period of time. Our findings contribute significantly to the theoretical research on poverty and offer important policy advice.

2. Chronic Multidimensional Poverty Indicators for Chinese Households

2.1 Data Source

This paper utilized panel data from the China Health and Nutrition Survey (CHNS). CHNS multi-stage and multitiered random samples are individuals and households from Liaoning, Heilongjiang, Jiangsu, Shandong, Henan, Hubei, Hunan, and Guizhou provinces and Guangxi Zhuang Autonomous Region. By tracking households in a long period, this survey ensures extensive sample representativeness. We identified and retained households included in the survey for all the five years and deleted those with missing or abnormal indicators. After the treatment, we have ended up with 1,106 valid household samples or 5,029 persons on average for each year.

2.2 Measurement of Chronic Multidimensional Poverty

(i) Indicator assignments. $Y^t_{N\times D}$ is the matrix with $N\times D$ dimensions in period t, which denotes N households for D indicators in period T. Element $y^t_{ij}\in Y^t_{N\times D}$ in the matrix is the value of household i with respect to indicator j in period t. Where, $i=1,2,...,N, j=1,2,...,D, t=1,2,...,T$. Row vector $Y^t_{i\cdot}=(y^t_{i1},y^t_{i2},...,y^t_{iD})$ is a set of values for all indicators of household i in period t, and column vector $Y^t_{j}=(y^t_{1j},y^t_{2j},...,y^t_{Nj})^T$ means the distribution of values of households with respect to indicator j in period t.

(ii) Identification of multidimensional poverty: According to the "double boundary method" (Alkire *et al*., 2017), we first specify the deprivation critical value $z_j=(z_1,z_2,...,z_D)^T$ of indicator j. It is assumed that g^t_{ij} is the identification function of a single indicator. For any matrix $Y^t_{N\times D}$, when $y^t_{ij}<z_j$, $g^t_{ij}=1$, i.e. household i is poor with respect to indicator j in period t; otherwise, $g^t_{ij}=0$. Then, we specify the weight $w_j=(w_1,w_2,...,w_D)$ of indicator j, which satisfies $\sum_{j=1}^{D}w_j=1$. The share of deprivation of household i with respect to all indicators in period t is calculated, i.e., $c^t_i=\sum_{j=1}^{D}w_jg^t_{ij}$. Lastly, we specify the critical value of multidimensional poverty k, i.e., when $c^t_i\geq k$, household i is deemed as a multidimensionally poor

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household in period t, $c_i^t = \sum_{j=1}^{D} w_j g_{ij}^t$; otherwise $c_i^t = 0$.

Referencing the MPI index[1] developed by the Oxford University, this paper creates China's multidimensional poverty indicators (see Table 1) according to China's national conditions. Based on the availability of CHNS survey data, we have selected nine indicators on the four dimensions of education, health, living standards, and income. These indicators have equal weights following the method of the Human Development Report.

(iii) Identification of chronic multidimensional poverty. Following the duration analysis method (Foster, 2007), we specify the critical value of duration to be $\tau(0 < \tau \leq 1)$. When household i is poor with respect to at least a certain percentage τ of all T periods, household i will be deemed as a chronically and multidimensionally poor household.

Firstly, we denote a matrix of $N \times T$ dimensions by $Q(k)$, defined as the multidimensional poverty identification matrix for N households in period T. We define element $q_i^t \in Q_{N \times T}$ in the matrix as an indicator of whether household i is multidimensionally poor in period t. When $q_i^t(k) = 1$, household i is multidimensionally poor in period t; otherwise $q_i^t(k) = 0$. Column vector $Q_{\cdot t}(k)$ in the matrix denotes the multidimensional poverty status of various households in period t. Row vector $Q_{i\cdot}(k)$ is the

Table 1: Multidimensional Poverty Indicators

Dimension	Indicator	Explanation	Critical value	Weight
Education	Length of education	Average length of education of family members aged above 16 years	9 years	1/8
	Education of school-age children	Percentage of dropout children aged between six and 16 (including six years)	100%	1/8
Health	Medical insurance	Percentage of family members with health insurance coverage	100%	1/8
	Healthiness	Body mass index (BMI) of adults aged at or above 18 years	18.5kg/m^2	1/8
Living standards	Cooking fuel	Other=1; Charcoal=2; Charcoal, firewood, etc.=3; Coal=4; Kerosene=5; Liquefied natural gas=6; Electricity=7; Natural gas=8	4	1/16
	Sanitary facilities	No=1; Other=2; Open pit=3; Open cement pit=4; Outdoor non-flushing toilet=5; Outdoor flushing toilet=6; Indoor toilet (non-flushing)=7; Indoor flushing=8	7	1/16
	Access to clean drinking water	Other=1; Stream, spring, river, lake=2; Ice snow melt water=3; Open well water (≤5m)=4; Groundwater (>5m)=5; Municipal water=6	5	1/16
	Durable household goods	Camera, color TV, telephone, electric fan, fridge, air-conditioner, video recorder, pressure cooker, microwave oven, washing machine, electric cooker, VCD/DVD, electric bike, motorcycle, computer, automobile, or any other durable consumer goods	Qualitative indicator: Yes=1; No=0	1/16
Income	Per capita income	Per capita income is total household income divided by the number of family members. The official poverty line of 2,300 yuan established in 2011 is followed.	2300	1/4

[1] With respect to the creation of multidimensional poverty indicators, this paper has referenced the Multidimensional Poverty Index (MPI) published by the Oxford Poverty & Human Development Initiative (OPHI). The MPI started to be used in the Human Development Report of 2010 and later became an international multidimensional poverty index.

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multidimensional poverty status of household i in various periods. $\sum_{t=1}^{T} q_i^t(k)$ is the number of periods when household i experienced poverty under the critical value k of multidimensional poverty, and $0 \le \sum_{t=1}^{T} q_i^t(k) \le T$.

Secondly, $p_i(\tau)$ is the chronic multidimensional poverty identification matrix for household i. When $\sum_{t=1}^{T} q_i^t(k) \ge \tau$, $p_i(\tau) = 1$, and household i is identified as chronically and multidimensionally poor; otherwise $p_i(\tau) = 0$, i.e., household i is free from chronic multidimensional poverty.

Lastly, we define the abridged indicator identification function $g_{ij}^t(k,\tau)$ in period t and the abridged indicator deprivation share vector $c_i^t(k,\tau)$, i.e., when household i is free from chronic multidimensional poverty, various indicators for household i with respect to $g_{ij}^t(k,\tau)$ are all zero; otherwise, they remain constant. The same is true for $c_i^t(k,\tau)$. $\sum_{t=1}^{T} q_i^t(k,\tau)$ denotes the number of periods when household i experienced chronic multidimensional poverty abridged by critical values k and τ. $p_i(k,\tau)$ is the identification matrix for chronic multidimensional poverty abridged by critical values k and τ.

In a nutshell, there are three critical values for identifying households in chronic multidimensional poverty: critical value for indicators z_j is used to assess whether a household is poor with respect to an indicator; critical value for multidimensional poverty k is used to assess whether a household is multidimensionally poor after weighting all poverty indicators; critical value for duration τ is used to assess whether a household is in chronic multidimensional poverty.

(iv) Aggregation of chronic multidimensional poverty. By the above approach, we create the chronic multidimensional poverty index expressed as:

$$M_0^C = \frac{1}{NT} \sum_{i=1}^{N} \sum_{j=1}^{D} \sum_{t=1}^{T} w_j g_{ij}^t(k,\tau) = H^C \times A^C \times D^C \tag{1}$$

In equation (1), poverty incidence H^C denotes the share of chronically and multidimensionally poor households (q^C) in total households (N), which can be expressed as the following equation:

$$H^C = \frac{\sum_{i=1}^{N} p_i(k,\tau)}{N} = \frac{q^C}{N} \tag{2}$$

Share of poverty deprivation A^C denotes the average weighted share of deprivation for households in chronic poverty, which can be expressed as:

$$A^C = \frac{\sum_{i=1}^{N} \sum_{t=1}^{T} c_i^t(k,\tau)}{\sum_{i=1}^{N} \sum_{t=1}^{T} q_i^t(k,\tau)} \tag{3}$$

Poverty duration D^C is the average duration of poverty for chronically and multidimensionally poor households, which can be expressed as:

$$D^C = \frac{\sum_{i=1}^{N} \sum_{t=1}^{T} q_i^t(k,\tau)}{q^C \times T} \tag{4}$$

(v) Decomposition of indicators. Through calculation, we may obtain the incidence of poverty due to restricted capabilities CH_j, which means the percentage of households identified as chronically and multidimensionally poverty and poor with respect to indicator j. This poverty incidence can be expressed as:

$$CH_j = \frac{1}{NT} \sum_{i=1}^{N} \sum_{t=1}^{T} p_t(k,\tau) g_{ij}^t(k,\tau) \tag{5}$$

In addition, we may also obtain the contribution rate ϕ_j^t of indicator j to M_0^C, which can be expressed as:

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$$\phi_j^t = \frac{\sum_{i=1}^{N}\sum_{t=1}^{T} w_j g_{ij}^t(k,\tau)}{\sum_{i=1}^{N}\sum_{j=1}^{D}\sum_{t=1}^{T} w_j g_{ij}^t(k,\tau)} \quad (6)$$

2.3 Results of Poverty Measurement

The five curves in Figure 1 depict the trend of change for multidimensionally poor households with the critical value for duration τ at different k values. Horizontally, when τ value is constant, the chronic multidimensional poverty incidence decreases with the increase of k value, and the downward trend is more significant when $k>50\%$. This implies that higher k value corresponds to a smaller percentage of households identified as in chronic poverty. Currently, the indicator weight share for Chinese households falls in the range between 10% and 40%. With the increase of k value, the chronic multidimensional poverty incidence with a higher τ value will decrease more rapidly. An extreme scenario is that when $\tau=1$, i.e., households are multidimensionally poor in all periods, the indicator weight share is in the range between 10% and 30% for over 95% of all poor households ($\tau=1$). This implies that households that are multidimensionally poor in all periods are deeply deprived with respect to certain indicators and find it hard to escape poverty. Such households are extremely vulnerable to chronic multidimensional poverty.

Vertically, when k value is constant, the chronic multidimensional poverty incidence curve continuously moves from upper right to lower left with the increase of τ value since higher τ value means fewer households in chronic multidimensional poverty. With given k value, changes in the chronic multidimensional poverty incidence and the integrated poverty index can be compared under different τ values. For instance, when k is 30%, τ increases from 3/5 to 4/5, and the chronic multidimensional poverty incidence H and the integrated poverty index M_0 decrease by 28.5% and 8.45% with the increase of τ value, respectively. These correlations are consistent with the characteristics of the multidimensional poverty theory, which is highly sensitive to k and τ values.

In addition, this paper measured China's poverty incidence by various indicators and their contributions to poverty over the period 2004-2015 (see Table 2). Results of cross-section calculations suggest that due to the decrease of poverty incidence H from 61.93% to 19.35%, China's integrated poverty index M_0 fell from 28.19% in 2004 to 7.6% in 2015. In this period, however, China's poverty

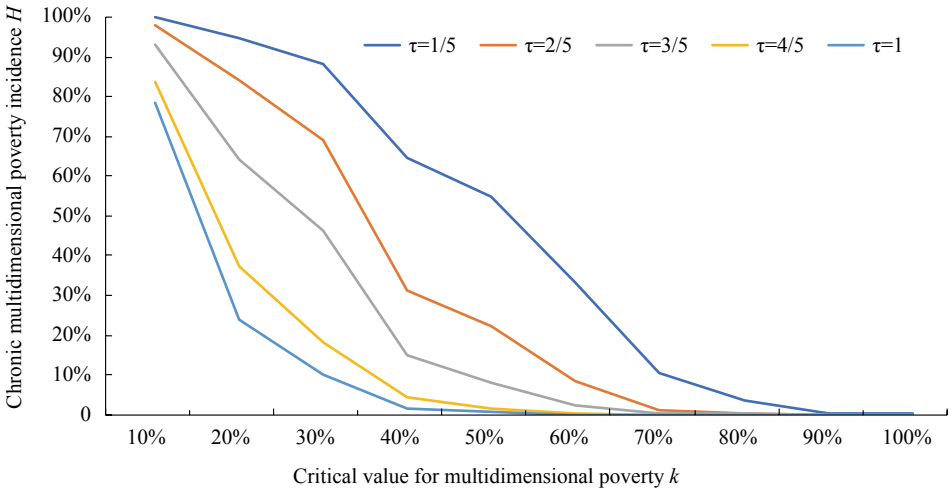

Figure 1: Change in Chronic Multidimensional Poverty Incidence at Different k and τ Values

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deprivation share A nudged down from 45.51% to 39.28%. Results of vertical calculation suggest that when τ=1/5, 74.77% of households are poor. The duration of their poverty accounts for 47.38% of all years in question, and poverty indicators accounts for 43.48% of the nine indicators. That is to say, 74.77% of sample households were poor in at least one of the five years in question, and their poverty lasted for about 2.4 years involving 3.9 poverty indicators.

Such indicators as the length of education, medical insurance coverage, coking fuel and sanitary facilities contributed more than others to poverty reduction. Among them, medical insurance contributed the most to the reduction of poverty incidence in 2004, but with the implementation of medical insurance reform, fell to 5.42% in 2015. This indicator's contribution to poverty reduction for corresponding years decreased accordingly. However, other health indicators such as the healthiness of family members

Table 2: Calculation Results of Multidimensional Poverty Indicators (k=0.3) (%)

	Cross-section calculation results					Vertical calculation results				
Primary statistics	2004	2006	2009	2011	2015	τ=1/5	τ=2/5	τ=3/5	τ=4/5	τ=1
Poverty incidence (H/H^C)	61.93	47.38	24.14	24.32	19.35	74.77	53.53	30.20	14.01	4.61
Poverty duration ($/D^C$)	-	-	-	-	-	47.38	58.24	72.34	86.58	100.00
Poverty deprivation share (A/A^C)	45.51	45.41	41.78	39.54	39.28	43.48	43.88	44.81	45.74	45.93
Integrated poverty index (M_0/M_0^C)	28.19	21.51	10.09	9.62	7.60	15.40	13.68	9.79	5.55	2.12
Incidence of poverty due to deprivation of capabilities (H_j/CH_j)	Cross-section calculation results					Vertical calculation results				
Length of education	61.97	59.71	40.43	29.44	22.57	59.98	46.35	27.65	13.29	4.52
Education of school-age children	1.18	1.54	0.72	1.45	1.72	1.23	1.12	0.83	0.45	0.14
Health insurance	85.17	57.50	16.55	10.13	5.42	27.90	21.14	12.51	6.09	1.88
Healthiness	14.38	15.01	12.48	16.09	15.01	13.22	11.23	8.63	5.80	2.71
Cooking fuel	33.09	28.84	20.25	20.71	16.09	21.05	16.47	10.20	4.65	1.74
Sanitary facilities	56.55	53.11	37.05	32.89	12.22	50.05	38.92	23.24	11.54	4.14
Clean potable water	12.84	13.47	10.40	8.68	5.48	10.69	8.61	5.41	3.13	1.54
Durable consumer goods	6.42	4.61	1.81	1.27	1.45	3.09	2.97	2.26	1.56	0.87
Per capita income	23.06	21.52	12.84	12.66	11.84	16.13	14.10	10.29	5.66	1.77
Contribution to poverty(ϕ_j)	Contribution to M_0					Contribution to M_0^C				
Length of education	25.87	28.83	41.28	42.29	43.44	25.22	24.93	25.45	25.64	25.47
Education of school-age children	0.42	0.64	0.42	0.88	1.19	0.45	0.49	0.68	0.61	0.62
Health insurance	30.61	23.78	9.70	6.17	3.77	29.81	29.49	29.35	28.48	29.19
Healthiness	5.17	6.21	7.31	9.80	10.42	5.52	5.55	4.58	4.48	4.97
Cooking fuel	5.95	5.96	5.94	6.31	5.59	5.85	5.57	5.12	4.17	3.11
Sanitary facilities	11.96	13.05	16.72	16.11	14.66	12.35	12.25	12.04	12.31	12.42
Clean potable water	2.31	2.79	3.05	2.64	3.99	2.60	2.64	2.88	3.56	4.97
Durable consumer goods	1.15	0.95	0.53	0.39	0.50	1.32	1.40	1.76	2.03	3.11
Per capita income	16.57	17.80	15.05	15.42	16.45	16.89	17.68	18.14	18.72	16.15

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contributed a bit more to chronic multidimensional poverty. These health indicators still exerted an important influence on chronic multidimensional poverty during the entire period in question. This implies that China's poverty reduction work should focus on improving the healthiness of the poor.

Length of education was the second largest contributor to poverty incidence in 2004, but its contribution continuously decreased. By 2015, 22.57% of households had a per capita length of education shorter than nine years. In addition, this indicator's contribution to poverty for corresponding years increased. In 2015, per capita length of education contributed over 40% of multidimensional poverty for poor households. With rising living standards, the level of education has become a key contributor to poverty reduction.

3. Livelihood Spending's Effects on the Multidimensional Household Poverty

3.1 Selections of Variables and Models

CHNS survey data samples are from different levels or entities with an apparent nested structure, i.e. low-level entities or individuals are nested in a higher level of entities or groups, and samples within the same group have similarities and are suitable for a multitiered model analysis (Goldstein, 1991).

This paper employs a three-tiered random intercept model for analysis. A multitiered Logit model is selected with chronic multidimensional poverty status (poor=1, not poor=0) as a dependent variable to investigate the effects of livelihood spending on chronic multidimensional poverty incidence. Then, variables at the household, community, and provincial levels are selected to create a multitiered model.

Households represent the first tier of data structure with control variables including age of household head, working years of household head, number of workers, and share of female members. Communities represent the second tier of data structure with control variables including administrative jurisdictions (city, suburb, time, village), the percentage of the agricultural working population, the average length of education, and per capita income. Provinces represent the third tier of data structure with independent variables including per capita livelihood spending, per capita educational spending with a 10-year lag[2], per capita medical spending, and per capita spending on social security, all of which are in current-year constant prices and taken logarithms (see Table 3).

Before an empirical analysis, we perform an ICC test with a null model to calculate the correlation coefficient between community and province.[3] With the multitiered linear model as an example, results suggest that 14.45% of total variation in the poverty deprivation share is attributable to community differences, and that 9.52% is attributable to provincial differences. The multitiered model, therefore, should be employed.

Tier 1 is inter-household model, which can be expressed as:

$$Y_{ijk} = \beta_{0jk} + \beta_{1jk} X_{1ijk} + r_{ijk} \tag{7}$$

Tier 2 is inter-community model, which can be expressed as:

$$\beta_{0jk} = \gamma_{00k} + \gamma_{01k} W_{1jk} + \mu_{0jk} \tag{8}$$

[2] Unlike current fiscal spending on education that makes education more affordable for poor households, this paper is more concerned with the lasting poverty-reducing effects of human capital arising from educational spending. Referencing Li *et al*. (2018) lag phase of educational spending variable, this paper selects per capita fiscal spending on education with a 10-year lag considering that our samples received an average of 9.2 years in education and entered the workforce in the 10th year, and that the lag term may mitigate the model's endogeneity problem.

[3] Take communities for instance, the correlation coefficient $\rho = o_c^2 / (o_c^2 + o_p^2 + \sigma_0^2)$, where o_c^2 and o_p^2 denote the inter-group variance for communities and provinces under the null model, respectively, and σ_0^2 is the intra-group variance of the null model. Correlation coefficient is the ratio of inter-group variance to total variance under the null model and the value range is between 0 and 1. The closer it is to 1, the greater the impact of group on the dependent variable, which necessitates the use of the multitiered model.

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Table 3: Descriptive Statistics of Variables

Category	Variable	Definition	Mean	Standard deviation	Min.	Max.
Household variables	Age of household head	Age of household head	57.353	11.141	16.8	93
	Age of household head squared	Age of household head squared	3413.441	1325.067	282.24	8649
	Working years of household head	Working years of household head	34.530	13.185	1.8	66
	Number of working family members	Number of family members aged between 16 and 65 years	3.691	1.621	0	10
	Percentage of female family members	Percentage of female family members	0.514	0.162	0	1
Community variables	City	City=1, not city=0	0.078	0.268	0	1
	Suburb	Suburb=1, not suburb=0	0.172	0.377	0	1
	Town	Town=1, not town=0	0.100	0.301	0	1
	Village	Village=1, not village=1	0.650	0.477	0	1
	Percentage of agricultural work on population	Percentage of working population in the community	0.302	0.273	0	0.941
	Average length of education	Average length of education of population in the community	6.559	1.964	1.343	13.286
	Per capita income	Logarithm of per capita income in the community	9.565	0.666	6.800	11.325
Provincial variables	Per capita livelihood spending	Sum between current-phase per capita fiscal spending on education, healthcare and social security	7.167	0.806	5.809	8.368
	Per capita educational spending	Per capita local fiscal educational spending with a 10-year lag	6.380	0.786	5.048	7.692
	Per capita medical spending	Health spending before 2007 and medical spending afterwards (change in statistical scope)	5.332	1.051	3.383	6.930
	Per capita social security spending	Comfort fund payments, social reliefs, pension payments from administrative institutions, and social protection allowances before 2007; social protection and employment spending afterwards.	6.137	0.802	4.547	7.728

$$\beta_{1jk}=\gamma_{10k}+\gamma_{11k}W_{1jk}+\mu_{1jk} \tag{9}$$

Tier 3 is inter-provincial model, which can be expressed as:

$$\gamma_{pqk}=\pi_{pqk}+\sum_{s=1}^{S_{pq}}\pi_{pqs}Z_{sk}+e_{pqj} \tag{10}$$

Where, subscript i is households at the first tier; subscript j is communities at the second tier; subscript k is provinces at the third tier. For instance, Y_{ijk} is the poverty deprivation share of surveyed household i in community j of province k. X_{1ijk} is household variables of poverty incidence; W_{1jk} is community variables of poverty incidence; Z_{sk} is provincial variables of poverty incidence. β_{0jk} is average

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poverty incidence in community j of province k; γ_{00k} is average poverty incidence in province k; π_{pqk} is regression coefficient in the equation at tier 2 and indicates the average poverty incidence in all provinces. π_{pqk} is regression coefficient of tier-2 equation, and indicates average poverty incidence for the province. β_{1jk} is regression coefficient related to X_{1ijk}; γ_{00k} and γ_{01k} are slope terms and indicate the influence of community variables W_{1jk} on dependent household variables in the same community j, r, μ and e are tier 1, tier 2 and tier 3 error terms, respectively.

3.2 Empirical Results and Analysis

(i) Livelihood spending's multidimensional poverty effects. Judging by the regression results of Table 4, livelihood spending has significantly influenced household chronic multidimensional poverty, poverty deprivation share, and poverty duration. Livelihood spending's poverty-reducing effects are more significant for rural households than for urban households as rural households benefited from higher marginal utility per unit of livelihood spending than their urban counterparts. In recent years, the Chinese government has steadily increased spending on rural education, healthcare, and social protection. As a result, urban-rural gaps in basic public services have narrowed. In the sample period, China included compulsory education into the public fiscal security system and made it free of charge in the countryside. In 2011, China raised the fiscal allowance for the new rural cooperative medical insurance to 200 yuan per person per year and the new rural cooperative medical insurance participation rate to above 90%. In 2012, China achieved full coverage of new rural and urban household pension insurance systems, shifting fiscal spending in favor of the countryside.

With respect to household control variables, the age of household head is in a U-shaped relationship with multidimensional poverty, i.e., poverty reduction effect will diminish with age; a higher percentage of female family members is not conducive to reducing poverty; the work experience of household head and the number of working family members are conducive to poverty reduction. With respect to community control variables, the percentage of the agricultural working population, the average length of education, and the community's per capita income help reduce multidimensional poverty.

(ii) Chronic multidimensional poverty effects of livelihood spending. Table 5 provides the estimated results of chronic multidimensional poverty with respect to the itemized level of spending. As can be seen from the table, per capita educational spending is significantly negatively correlated with long-term household multidimensional poverty, poverty deprivation share, and poverty duration. Education spending's poverty-reducing effects are more significant for rural households than for urban households. Among the three items of livelihood spending, the coefficient of educational spending is smaller than that of medical spending. A possible reason is that education is a primary poverty-inducing factor in China. Educational spending helps reduce human capital gaps with long-term effects in reducing multidimensional poverty. According to CHNS data, the countryside mainly consists of households with junior middle school and primary school education in the sample period. Their average length of education is only 7.4 years, 4.4 years below the cities average level. Hence the more robust demand for better education in the countryside. In recent years, China has steadily increased educational spending for the countryside and support to poor households, particularly improving educational conditions for rural schools, made compulsory education free of charge for poor rural students, and offered allowances to boarding students. These steps help children from low-income families receive more education.

Per capita medical spending is significantly negatively correlated with household chronic multidimensional poverty, poverty deprivation share, and poverty duration. Medical spending's poverty-reducing effects are more significant for rural households than for urban households. Among the three items of livelihood spending, the coefficient of medical spending is the largest. Deaton (2013) identified health as the top factor for poverty reduction and a key determinant of development gaps between rich and developing countries. This paper's empirical results have reached the same conclusions. During the

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Table 4: Regression Results of Livelihood Spending's Poverty-Reducing Effects

	Chronic multidimensional poverty			Poverty deprivation share			Poverty duration		
Variable	Total samples	Urban	Rural	Total samples	Urban	Rural	Total samples	Urban	Rural
Per capita livelihood spending	-0.787***	-0.554**	-0.850***	-0.056***	-0.033***	-0.067***	-0.087***	-0.028*	-0.108***
	(0.091)	(0.266)	(0.098)	(0.006)	(0.011)	(0.007)	(0.010)	(0.022)	(0.011)
Age of household head	-0.036**	-0.016	-0.042	-0.002	-0.001	-0.003	-0.002	-0.003	-0.004
	(0.020)	(0.096)	(0.036)	(0.002)	(0.004)	(0.002)	(0.003)	(0.007)	(0.004)
Age of household head squared	0.001**	0.002	0.001**	0.003*	0.002	0.005**	0.005*	0.004	0.007**
	(0.001)	(0.007)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.005)	(0.003)
Work experience of household head	-0.036	-0.016	-0.042	-0.005**	-0.006***	-0.006**	-0.002	-0.003	-0.004
	(0.030)	(0.096)	(0.036)	(0.002)	(0.002)	(0.002)	(0.003)	(0.007)	(0.004)
Number of working family members	-0.051*	-0.247***	-0.036	-0.001	-0.008**	-0.001	-0.007**	-0.024***	-0.006*
	(0.035)	(0.092)	(0.029)	(0.002)	(0.004)	(0.002)	(0.003)	(0.007)	(0.003)
Percentage of female family members	0.017	0.476	0.090	0.001	0.022	0.002	0.018	0.061	0.011
	(0.237)	(0.635)	(0.258)	(0.016)	(0.026)	(0.019)	(0.025)	(0.047)	(0.029)
Percentage of community agricultural working population	-0.116***	-0.148	-0.190***	-0.057***	-0.115	-0.081***	-0.020	-0.400*	-0.053**
	(0.046)	(1.918)	(0.068)	(0.016)	(0.107)	(0.016)	(0.026)	(0.227)	(0.027)
Average length of education in the community	-0.136***	-0.204*	-0.129***	-0.004	-0.006	-0.009**	-0.008	-0.015	-0.012*
	(0.042)	(0.105)	(0.047)	(0.003)	(0.004)	(0.003)	(0.005)	(0.012)	(0.006)
Per capita income in the community	-0.803***	-0.648	-0.787***	-0.083***	-0.021	-0.082***	-0.074***	-0.049	-0.064***
	(0.116)	(0.459)	(0.120)	(0.008)	(0.019)	(0.008)	(0.013)	(0.037)	(0.013)
Intercept term	14.950***	10.410**	15.360***	1.470***	0.574***	1.606***	1.991***	0.918***	2.145***
	(1.139)	(4.293)	(1.203)	(0.0755)	(0.170)	(0.0851)	(0.124)	(0.319)	(0.138)
Random effects and statistics									
Random parameter at tier 2	0.741	0.632	0.695	0.047	0.033	0.047	0.155	0.165	0.140
Random parameter at tier 3	0.465	0.521	0.562	0.030	0.011	0.040	0.096	0.010	0.129
LR statistic	196.96	16.33	189.73	193.98	12.05	189.42	1015.48	134.37	905.94
Sample size	5155	930	4225	5155	930	4255	5155	930	4225

Notes: Chronic multidimensional poverty is measured by the criteria k=0.3 and τ=3/5; numbers in parenthesis are standard deviations; the estimated coefficient of multitiered Logit regression is the odds ratio; *, ** and *** respectively denote significance at 10%, 5% and 1% levels; this table does not include the results of administrative jurisdictions (city, suburb, town, village).

sample period, China's medical spending rose from 85.464 billion yuan in 2004 to 1,195.318 billion yuan in 2015,[4] which is a 14-fold increase in a matter of 12 years. Adequate healthcare funding has prevented the recurrence of poverty due to health reasons and made access to healthcare more affordable and accessible. With a new round of healthcare reform initiated in 2009, the central government has established higher rural healthcare requirements. The goal is to equalize access to basic health services for urban and rural residents by improving the healthcare system, rural cooperative medical insurance,

[4] Data are from *China Statistical Yearbook* of various years.

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Table 5: Poverty-Reducing Effects of Livelihood Spending

	Chronic multidimensional poverty status			Poverty deprivation share			Poverty duration		
Variable	Total samples	Urban	Rural	Total samples	Urban	Rural	Total samples	Urban	Rural
Per capita educational spending	-0.251***	-0.220*	-0.302***	-0.155***	-0.082*	-0.163***	-0.043***	-0.029*	-0.049***
	(0.105)	(0.151)	(0.124)	(0.021)	(0.051)	(0.024)	(0.012)	(0.021)	(0.014)
Per capita medical spending	-0.645***	-0.607**	-0.799***	-0.194***	-0.142**	-0.218***	-0.086***	-0.061*	-0.095**
	(0.228)	(0.316)	(0.246)	(0.015)	(0.023)	(0.017)	(0.024)	(0.045)	(0.027)
Per capita social security spending	-0.215	-0.117**	-0.157	-0.084***	-0.044**	-0.086	-0.029	-0.024*	-0.037
	(0.299)	(0.058)	(0.345)	(0.021)	(0.020)	(0.075)	(0.035)	(0.018)	(0.040)
Intercept term	10.100***	9.876**	9.931***	1.133***	0.571***	1.202***	1.623***	0.991***	1.717***
	(1.366)	(4.563)	(1.463)	(0.098)	(0.191)	(0.112)	(0.149)	(0.348)	(0.168)
Attribute variables of community, household and household head	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Random effects and statistics									
Random parameter at tier 2	0.721	0.630	0.669	0.046	0.032	0.045	0.155	0.162	0.139
Random parameter at tier 3	0.490	0.450	0.618	0.049	0.004	0.060	0.101	0.023	0.133
LR statistic	183.18	9.52	171.21	224.56	8.81	205.78	991.90	116.30	841.32
Sample size	5155	930	4225	5155	930	4225	5155	930	4225

Notes: the same as in Table 4.

and rural public health environment. With the reforms in place, medical spending has achieved significant poverty-reducing effects for poor households in China, predominantly rural poor households.

Per capita social security spending has a significant negative correlation with the chronic multidimensional poverty, poverty deprivation share, and poverty duration of urban households. However, the poverty-reducing effects of per capita social security spending are insignificant for rural households. The regression coefficient of social security spending is the smallest. The poverty-reducing effects vary significantly across different items of livelihood spending. In the present stage, investment spending plays a more prominent role in reducing household poverty in China than does transfer spending. Four decades of poverty reduction efforts have lifted most poor populations with self-development capabilities out of poverty, leaving remaining poor households deprived of capabilities. Due to various limitations and inadequacies of the rural social security system, China's per capita social security benefits are small. In 2014, China's urban per capita social security spending (8,236.1 yuan) was 25 times higher than rural per capita social security spending (328.50 yuan) (Yang and Shen, 2016). Under the current fiscal system, social security spending has limited effects on multidimensional household poverty in China.

(iii) Heterogeneity test of livelihood spending's effects on chronic multidimensional poverty. To test fiscal spending's heterogeneous effects on households with different age structures and educational levels, this paper conducted a Logit grouped regression [5]by the average age and the household heads'

[5] This paper divides household heads into two age groups, i.e., 16-60 and above 60 years, and two groups by education, i.e. primary school or below and junior middle school and above.

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Table 6: Heterogeneity Test of Livelihood Spending's Multidimensional Poverty Effects for Different Types of Households

Variable	Below 60	60 and above	Primary school and below	Junior middle school and above
Per capita educational spending	-0.282***	-0.182*	-0.231**	-0.397***
	(0.116)	(0.135)	(0.136)	(0.148)
Per capita medical spending	-0.555***	-0.648***	-0.482***	-0.605***
	(0.235)	(0.309)	(0.203)	(0.245)
Per capita social security spending	0.135	-0.204**	-0.208	-0.192
	(0.352)	(0.097)	(0.466)	(0.349)
Intercept term	11.330***	7.964***	12.250***	7.722***
	(1.882)	(2.369)	(2.037)	(1.849)
Attribute variables of community, household and household head	Controlled	Controlled	Controlled	Controlled
Random effects and statistics				
Random variables at tier 2	0.717	0.750	0.870	0.443
Random variables at tier 3	0.478	0.412	0.560	0.505
LR statistic	68.39	83.37	106.51	50.38
Sample size	2590	2561	2205	2809

Notes: the same as in Table 4.

education level. Results in Table 6 suggested that per capita fiscal spending on education is more poverty-reducing for households headed by those aged below 60 years than for households headed by those aged above 60 years. The opposite is true for the effects of per capita fiscal spending on healthcare. The poverty-reducing effects of per capita fiscal spending on education and healthcare are greater for households with junior middle school education and above than for households with primary education and below. Irrespective of the household head's age or length of education, the coefficients of per capita social security spending are almost all negative. However, except for households headed by those aged 60 years and above, other types of households did not pass the significance test, which indicates that social security spending's poverty-reducing effects diminished in the grouped regression.

(iv) Dynamic test of livelihood spending's effects on chronic multidimensional poverty. In this section, we have tested livelihood spending's poverty-reducing effects for different types of households.[6] Results in Table 7 suggested that per capita fiscal spending on education and healthcare has significant poverty-reducing effects for households in different types of multidimensional poverty. The effects are greater for chronically poor households than for temporarily poor households and more significant for households that have escaped poverty than for households that have returned to poverty. Per capita social security spending is significantly poverty-reducing for households in temporary poverty or returning to poverty. However, the poverty-reducing effects are insignificant for chronically poor households and households that have escaped poverty. The deprivation of capabilities primarily causes poverty in China.

[6] Referencing existing literature, this paper defines households that stayed in poverty between one and three periods as temporarily poor households and those that stayed in poverty for no less than three periods as chronically poor households; households that were not poor in at least one of the first four periods and poor in the last period as households that returned to poverty. Households that were poor in at least one of the first four periods and not poor in the last period are defined as households that have exited poverty.

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Table 7: Dynamic Test of Livelihood Spending's Effects on Households in Different Types of Multidimensional Poverty

Variable	Temporary poverty	Chronic poverty	Returned to poverty	Exited poverty
Per capita educational spending	-0.113***	-0.443*	-0.330***	-0.660***
	(0.049)	(0.278)	(0.135)	(0.265)
Per capita medical spending	-0.657***	-0.736***	-0.409***	-0.841**
	(0.269)	(0.274)	(0.166)	(0.360)
Per capita social security spending	-0.178**	-0.261	-0.163*	-0.298
	(0.106)	(0.542)	(0.113)	(0.298)

Note: Chronic multidimensional poverty is measured by k=0.3; others are the same as in Table 4.

Table 8: Robustness regression results of livelihood spending's poverty-reducing effects

	Chronic multidimensional poverty		Poverty deprivation share		Poverty duration	
Variable	Absolute poverty	Relative poverty	Absolute poverty	Relative poverty	Absolute poverty	Relative poverty
Per capita educational spending	-0.259**	-0.610*	-0.120***	-0.147***	-0.054*	-0.088**
	(0.114)	(0.452)	(0.023)	(0.032)	(0.031)	(0.049)
Per capita medical spending	-0.375***	-0.735**	-0.169***	-0.194***	-0.074*	-0.093*
	(0.137)	(0.406)	(0.015)	(0.020)	(0.020)	(0.031)
Per capita social security spending	-0.230**	-0.217	-0.084***	-0.069***	-0.062**	-0.023*
	(0.129)	(0.364)	(0.015)	(0.022)	(0.021)	(0.014)
Intercept term	5.731***	10.650***	0.323***	0.854***	0.513***	1.312***
	(1.735)	(1.882)	(0.071)	(0.101)	(0.103)	(0.158)
Attribute variables of community, household and household head	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Random effects and statistics						
Random variables at tier 2	0.569	0.480	0.012	0.023	0.079	0.131
Random variables at tier 3	0.530	0.513	0.016	0.013	0.033	0.070
LR statistic	26.57	61.15	76.69	22.24	507.85	635.03
Sample size	5155	5155	5155	5155	5155	5155

Notes: chronic multidimensional poverty is measured by ; others are the same as in Table 4.

Hence, investment spending is more effective in reducing poverty. For chronically poor households and households that have escaped poverty, the poverty-reducing effects of transfer spending are insignificant. Compared with the policy option to improve social protection, the Chinese government should focus more on education and healthcare to improve human capital and reduce poverty.

(v) Robustness test of livelihood spending's effects on chronic multidimensional poverty.[7] To ensure

[7] Referencing existing literature, this paper defines multidimensionally poor households with as households in absolute poverty and those with as households in relative poverty.

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the robustness of the regression result, this paper conducted a robustness test on livelihood spending's of poverty-reducing effects by changing poverty criteria. Table 8 provides the estimated results of livelihood spending's poverty-reducing effects for households in different levels of poverty. The impact of educational and medical spending are more significant for households in relative poverty than those in absolute poverty, but the opposite is true for social security spending. Similarly, the impact of educational and medical spending are more significant for households in relative poverty than most households in absolute poverty with respect to the poverty deprivation share and poverty duration. However, the opposite is true for social security spending. This implies that investment spending may help households in relative poverty exit poverty by raising human capital. However, households in absolute poverty that find it hard to work their way out of poverty depend more on government transfer payments.

4.Conclusions and Policy Implications

With the China Health and Nutrition Survey (CHNS) panel data for 2004-2015, this paper tests livelihood spending's effects on chronic multidimensional poverty in China. Empirical results revealed livelihood spending's significant effect in reducing multidimensional household poverty, which is more significant for rural households than for urban households. Investment spending on education and healthcare is more poverty-reducing than transfer spending for social protection. As China enters a decisive stage for building a moderately prosperous society in all respects, it can eradicate absolute poverty on the income dimension if it manages to concentrate resources quickly. However, in the long run, the government must ramp up livelihood spending to ensure equal access to basic public services for poor groups in underdeveloped regions and enhance the poor's capabilities. Hence, this paper puts forth the following policy advice:

4.1 Improving the multidimensional poverty identification mechanism and offering integrated reliefs to the poor

(i) China should reform its poverty identification criteria to reflect multidimensional poverty as the basis for poverty reduction. In 2018, the CPC Central Committee and the State Council put forth a multidimensional approach for poverty reduction, focusing on people's right to development. Competent authorities should collect and trace both the income and non-income information of poor households to ensure improvements in their living standards and welfare.

(ii) Poverty reduction programs should address the deprivations of poor households on specific dimensions. In the present stage, non-income dimensions have become critical factors – that sometimes outweigh the income dimension - lifting poor households in China out of poverty. This paper, has identified education, healthcare, and sanitary conditions as key contributors to multidimensional poverty and priorities for targeted poverty reduction. These non-income dimensions warrant great attention from policymakers.

(iii) Livelihood spending should be coordinated with poverty reduction. Over the past four decades, China has lifted hundreds of millions of people out of poverty. Nevertheless, income alone cannot reflect a full picture of poverty. What matters more is to address the deprivation of capabilities among the poor by ensuring access to education, healthcare, and social protection. Vulnerable groups should be assisted to become more risk resilient.

4.2 Leveraging Livelihood Spending's Poverty-Reducing Effects

(i) Livelihood spending should be increased in the countryside, where it plays a more prominent role in reducing poverty. During the sample period, rural fiscal spending on education increased substantially. In 2015, the average rural educational spending increased by 8.46 times over 2004 for each primary school student and 10.57 times for each junior middle school student. However, in absolute terms, rural

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educational spending remains below the national average. In 2015, the ratio between the average rural educational spending per primary school student and the national average value was 0.97:1. For junior middle school students, this ratio was 0.94:1.[8]

According to the Ministry of Finance, rural healthcare spending - including spending on the new rural cooperative medical insurance scheme, rural medical relief, and township health centers - represented 34% of national total healthcare spending in 2011. This figure dropped to 28% in 2015.[9] There is no detailed urban-rural itemized data of social security spending. However, according to data released by the Ministry of Finance, total fiscal spending on subsistence allowance and social relief were more or less the same between urban and rural areas in 2011. Nevertheless, it started to shift in favor of the countryside afterward. By 2014, the Chinese government spent 1.39 times more on subsistence allowance and social relief in the countryside than in cities. After livelihood spending became a priority in 2002, the government started to increase budgetary spending on rural affairs. Yet cities still received a lion's share of investment spending. Hence, the government should equalize public services for urban and rural residents and increase rural livelihood spending as a share of transfer payments.

(ii) Livelihood spending should help the poor develop capabilities to exit poverty since the deprivation of capabilities is the main form of multidimensional poverty in China. Instead of relying on government allowances, we should help the poor learn to make a living and better themselves. In this regard, priority should be given to healthcare for the poor. With direct poverty-reducing effects and capability improvements for the poor, spending on education and healthcare represents a vital factor in China's sustainable poverty reduction strategy. Fiscal spending should prioritize education and healthcare for the poor to grasp skills for escaping poverty not only for themselves but also for their offspring.

China should leverage healthcare spending's poverty-reducing effects, focusing on basic healthcare services. China's medical reform of 2009 was followed by a sharp increase in national healthcare spending, up from 85.46 billion yuan in 2004 to 1,195.318 billion yuan in 2015. Healthcare spending as a share of total government spending increased from 2.57% to 6.81% in the same period. In the future, we should improve essential healthcare services as a policy priority to reduce multidimensional poverty in China. We should move forward healthcare programs under the 13th Five-Year Plan, invest more in health protection, local health services, disease prevention and control, and women and children's health, enhance urban and rural community health services, enhance health management for common and chronic diseases, and ease medical costs for critical illnesses. Less developed regions should receive more transfer payments to increase health service accessibility and affordability. Only in good health will the poor be able to develop human capital to exit poverty.

Education will improve human capital for the poor and prevent poverty's intergenerational transmission. China should reform the fiscal system for education to reinforce the government's role in education, share fiscal responsibilities between central and local governments, and increase pro-poor educational investment. The government should promote equal access to education across the country, especially for poor regions and vulnerable groups. The rural educational investment must increase steadily to integrate urban and rural educational development.

Pro-poor educational programs should be carried out for children from poor families. China has enacted special policies on education for poor urban and rural households. In 2014, the State Council enacted the *National Plan on Children's Development in Poor Regions (2014-2020)* for rural children from birth to the end of compulsory education in 680 counties of contiguous poor regions. The goal is to increase children's overall development level in poor regions to reach the national average level. Children's right to development must be guaranteed to sever the intergenerational transmission of poverty.

[8] Data are from *China Educational Spending Yearbook*.
[9] Data are from the Ministry of Finance (See Wind database for details).

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In 2015, the State Council enacted the *Plan for Supporting Rural Teachers (2015-2020)* to improve rural teachers and bring poor children fair access to education.

(iii) Increasing social security spending as a share of livelihood spending. Despite the least overall poverty-reducing effects of the three livelihood spending items, social security spending helps households in absolute poverty the most. We should create an integrated social security protection system for urban and rural areas and ramp up spending on rural social protection. China's urban-rural divide and fragmented social security systems breed injustice and social instability. Steps should be taken to integrate social security systems across the country. We should ease and eliminate urban-rural and regional differences in the basic social security system for all society members to benefit from the results of development.

Social security spending should be coordinated with poverty reduction programs. Social protection aims to offer direct assistance to the poor, break through the vicious cycle of poverty, and establish a long-term mechanism to prevent poverty. The social insurance system may incorporate poor populations troubled with old age, disease, work injury, or unemployment. The government may cover minimum pension contributions for poor populations who otherwise cannot afford pension insurance. Public communication should be carried out to increase the poor's awareness to participate in pension insurance. The rural subsistence system should be improved and coordinated with poverty reduction priorities. Social relief and allowances should be offered to poor groups, rural left-behind children, disabled persons, and other groups with special difficulties to undergird the last defense line in the social protection system.

References:

[1] Alkire, S., M. Apablaza, S. Chakravarty, and G. Yalonetzky. 2017. "Measuring Chronic Multidimensional Poverty." *Journal of Policy Modeling*, 37(6):983-1006.

[2] Amakom, U., and K. K. Ogujiuba. 2010. "Distributional Impact of Public Expenditure on Education and Healthcare in Nigeria: A Gender Based Welfare Dominance Analysis." *International Journal of Business and Management*, 5(12): 116-127.

[3] Deaton A. 2013. *The Great Escape: Health, Wealth, and the Origins of Inequality*. Princeton University Press.

[4] Edeme, R. K., and I. O. Imide. 2014. "Measuring the Welfare Impact of Public Expenditure on Primary Healthcare Services in Rural Nigeria." *Journal of Economics and Sustainable Development*, 5(21):71-78.

[5] Faguet, J. 2010. "Does Decentralization Increase Government Responsiveness to Local Needs? — Evidence from Bolivia." *Journal of Public Economics*, 88(3-4):867-893.

[6] Foster, J. E. 2007. "A Class of Chronic Poverty Measures." *CPRC Working Paper,* No.07-W01.

[7] Goldstein, H. 1991. "Nonlinear Multilevel Models, with an Application to Discrete Response Data." *Biometrika*, 78(1): 45-51.

[8] Imai, K. S., M. Hasan, and E. Porreca. 2015. "Do Agricultural Extension Programmes Reduce Poverty and Vulnerability? Farm Size, Agricultural Productivity and Poverty in Uganda." *RIEB Discussion Paper,* No.2015-06.

[9] Imai, K. S., R. Gaiha, and F. Bresciani. 2017. "The Labour Productivity Gap between Agricultural and Non-agricultural Sectors and Poverty in Asia." *RIEB Discussion Paper,* No.2017-04.

[10] Li, Shengji, Kangyin Lv, and Fengling Jin. 2016. "Spatial Econometrics Analysis of Spatial Spillover of Poverty Reduction of Fiscal Expenditure on Education." *Taxation and Economy,* 6:48-52.

[11] Li, Xiangyun, Jianshun Zhang, and Shan Chen. 2018. "Does Public Education Expenditure Reduce Income Distribution Inequality? Empirical Study Based on Provincial Panel Data." *Journal of Yunnan University of Finance and Economics*, 34(08):3-13.

[12] Lin, Boqiang. 2005. "Government Expenditure and Poverty Reduction in China." *Economic Research Journal,* 1:27-37.

[13] Liu, Yiwei. 2017. "The Impact of Social Security Expenditure on Residents' Poverty and Its Mechanism." *Journal of Central University of Finance & Economics,* 7:7-18.

[14] Lu, Hongyou, and Yixuan Du. 2019. "Measurement of China's Fiscal Redistribution and Poverty Reduction Effects." *Economic Research Journal*, 54(02):4-20.

[15] Sen, A. K. 1976. "Poverty: An Ordinal Approach to Measurement." *Econometrica*, 44(2): 219-231.

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[16] Wang, Xiaofang, and Xianjun Xie. 2018. "Does Fiscal Decentralization Help to Reduce Rural Poverty?—Based on the Perspective of Productive and Unproductive Financial Expenditure." *Finance & Economics,* 3:55-66.

[17] Yang, Fengshou, and Mo Shen. 2016. "Research on the Relationship between Social Security Level and Urban-Rural Income Gap." *Macroeconomic Research,* 5:61-72.

[18] Yang, Junhua, and Can Liu. 2019. "Determinants and Anti-poverty Strategies for Farmers to Get Rid of Poverty under the Background of Precise Poverty Alleviation." *The Journal of Quantitative & Technical Economics*, 36(07):3-21.

[19] Yang, Yiyong, and Qiang Zhang. 2016. "Research on the Anti-poverty Effect of China's Social Security System-Based on the National Inter-provincial Panel Data." *Economic Trends*, 6.

[20] Zhan, Xinyu, and Suli Wang. 2017. "Research on the Quality Effects of Economic Growth in the Fiscal Expenditure Structure: From the Perspective of Five Developmental Concepts." *Contemporary Finance & Economics*, 4:25-37.

[21] Zhang, Zhaoxia, and Min Gong. 2015. "Income Inequality, Economic Growth and Fiscal Expenditure Bias." *On Economic Problems*, 7:41-47.

[22] Zhou, Bo, and Kaili Zhang. 2019. "Research on Output and Inflation Effects of Fiscal Policy Different in Different Cyclical States." *Journal of Central University of Finance & Economics*, 7:3-17.

[23] Zou, Wenjie, and Linjie Feng. 2015. "Spatial Heterogeneity and Threshold Characteristics of the Poverty Reduction Effect of Financial Support for Agriculture." *Collected Essays on Finance and Economics*, 9:18-26.

[24] Zuo, Ting, Mengyuan Zhao, and Jing Jin. 2018. "Approaches, Mechanism and Innovation: Policy Review on Social Security System for Poverty Alleviation." *Journal of Huazhong Agricultural University (Social Sciences Edition)*, 1:1-12+156.

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