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The Anti-Poverty Relocation Program and rural household income: evidence from China

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ABSTRACT

Using panel data (2015, 2017, 2019, and 2021) from M County, western China, this paper examines the impacts of China's Anti-Poverty Relocation Program (APRP) on rural households' income structure and labour allocation decisions through a Propensity Score Matching Difference-in-Differences (PSM-DID) approach. Consistent with the Harris-Todaro migration model, our results indicate that APRP significantly increases overall income and wage income by encouraging labour shifts from agricultural to non-agricultural sectors, while agricultural income correspondingly declines. Additionally, heterogeneity analyses reveal that income benefits vary substantially with household health status, education level, and type of industry support. These findings underscore APRP's effectiveness and provide targeted insights for policymakers aiming to replicate similar anti-poverty strategies in other developing regions.

KEYWORDS

Relocation; anti-poverty; income; rural household

JEL CLASSIFICATION

I38; J61; O15; R20

I. Introduction

As one of the first developing countries to achieve the UN Millennium Development Goals on poverty reduction, China launched the Targeted Poverty Alleviation (TPA) strategy in 2013 to lift nearly 100 million rural poor out of poverty by 2020. A core component of TPA is the Anti-Poverty Relocation Program (APRP), which voluntarily relocates eligible poor households from remote areas to locations with improved job access and living conditions, offering housing subsidies (about 26,000 RMB per capita) and employment support. From 2013 to 2020, APRP relocated 10 million individuals, 81% of whom were in western China.

This approach aligns with international practices. Globally, relocation programmes aim to improve welfare by addressing two key rural poverty constraints: low agricultural productivity and poor market access (Aggarwal 2018; Gollin, Lagakos, and Waugh 2014; Lagakos et al. 2020; Provenzano 2024). APRP facilitates labour reallocation to non-agricultural sectors and enhances access to economic opportunities (Zhang, Xie, and Zheng 2023).

To explain the mechanisms behind APRP, this study applies the Harris-Todaro migration model, which argues that migration decisions depend on expected rather than actual income differences. When the expected income from non-agricultural employment, adjusted for job availability, exceeds agricultural returns, rural labourers are more likely to relocate. APRP improves market access, increases non-agricultural job opportunities, and lowers migration costs through housing subsidies, training, and infrastructure, thus raising expected incomes and encouraging labour shifts out of agriculture.

Nevertheless, relocation can also disrupt livelihoods, weaken social networks, and expose households to new risks (Cernea 1997). These potential risks are recognized and further discussed in the policy implication section.

Addressing three research gaps, this study: (1) uses household registration data from M County, a key APRP site in western China; (2) investigates effects on income structure rather than total income alone; (3) integrates migration theory to explain the underlying economic mechanisms.

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The findings offer insights for poverty reduction strategies in other developing countries.

II. Data and empirical strategy

Data source

The data[1] used in this paper originate from four waves of poverty alleviation household information (2015, 2017, 2019, and 2021) in County M, western China. To address the self-selection bias in household participation in relocation, we employ nearest-neighbour matching with $n = 1$, yielding a matched sample of 38,629 households, including 30,811 relocated and 7818 non-relocated households. The matching results are shown in Appendix Table A2. The results indicate that most covariates achieved good balance post-matching, substantially reducing self-selection bias and demonstrating high matching quality. In addition, following Zhang, Xie, and Zheng (2023), this paper compares the 2015 data of County M (prior to the implementation of the relocation policy) with that of other poverty-stricken areas nationwide to assess the external validity of the study. The results, presented in Appendix Table A3, show that County M is highly comparable to national poor areas in terms of economic structure, demographic composition, and basic public services, indicating strong external validity of the findings.

Empirical model

$$Y_{it} = \alpha + \beta did_{it} + \gamma Z_{it} + \mu_i + \nu_t + \varepsilon_{it} \quad (1)$$

Subscript i denotes the household and t the time period. The dependent variable Y_{it} includes total income, wage income, agricultural income, and transfer income. The core explanatory variable did_{it} equals 1 if the household relocated after the policy was introduced and 0 otherwise. Following Zhang, Xie, and Zheng (2023), the policy is considered to have started in 2016. Z_{it} is a vector of time-varying control variables, μ_i and v_t represent household and year fixed effects, and ε_{it} is the error term. The coefficient β measures the impact of the relocation policy on household income and is the main parameter of interest.

III. Empirical results

Main results

Consistent with the Harris-Todaro migration model, APRP significantly reallocated rural labour towards non-agricultural sectors, thereby reshaping household income structures. Table 1 reports that the policy increased annual income by 11.7% and wage income by 24.2%, while Table 2 shows a 6.2% rise in transfer income and a 17.7% decline in agricultural income. These results indicate a 'redistribution effect', where improved non-agricultural opportunities attracted labour away from traditional farming. Moreover, the policy

Table 1. Baseline regression results I.

Variable	(1) Annual Income	(2) Annual Income	(3) Annual Income	(4) Wage Income	(5) Wage Income	(6) Wage Income
did	0.120***	0.118***	0.117***	0.245***	0.241***	0.242***
(std. err.)	(0.006)	(0.006)	(0.006)	(0.022)	(0.021)	(0.021)
Household Head Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Household Characteristics		Yes	Yes		Yes	Yes
Living & Production Conditions			Yes			Yes
Constant	9.695***	9.681***	9.676***	8.890***	8.888***	8.886***
(std. err.)	(0.023)	(0.023)	(0.022)	(0.059)	(0.060)	(0.060)
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Individual Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	38629	38629	38629	38482	38482	38482
R-squared	0.697	0.695	0.697	0.225	0.217	0.220

***, **, * indicate significance at 1%, 5%, and 10% confidence intervals, respectively. Numbers in brackets are standard errors. The notes are the same for the following tables.

[1]The descriptive statistics of each variable are reported in Appendix Table A1.

Table 2. Baseline regression results II.

Variable	(1) Agricultural Income	(2) Agricultural Income	(3) Agricultural Income	(4) Transfer Income	(5) Transfer Income	(6) Transfer Income
did	−0.174***	−0.176***	−0.177***	0.061***	0.061***	0.062***
(std. err.)	(0.016)	(0.015)	(0.016)	(0.017)	(0.018)	(0.017)
Head Of The Household Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Household Characteristics		Yes	Yes		Yes	Yes
Living & Production Conditions			Yes			Yes
Constant	9.060***	9.084***	9.072***	6.979***	7.071***	7.075***
(std. err.)	(0.049)	(0.050)	(0.049)	(0.065)	(0.064)	(0.055)
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Individual Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	38532	38532	38532	38482	38482	38482
R-squared	0.217	0.219	0.223	0.478	0.480	0.512

effect remains robust after sequentially controlling for household head characteristics, family attributes, and production and living conditions. Across specifications, the estimated coefficients fluctuate by less than 2%, and their significance levels remain unchanged, confirming the stability of the results.

To capture the dynamic effects of the relocation policy, this paper extends the baseline PSM-DID model by interacting the treatment group with post-policy years (2017, 2019, and 2021). As shown in Appendix Table A4, the policy impact on household income is both lagged and cumulative. In 2017, only transfer income increased significantly, reflecting initial reliance on subsidies. By 2019, annual and wage income rose, while agricultural income declined, indicating a shift towards non-agricultural employment. In 2021, non-agricultural income further increased, transfer income effects diminished, and agricultural income continued to fall, suggesting households had adapted and undergone a structural transformation in income sources.

Robustness tests

Replacing the dependent variable

Following Zhang, Xie, and Zheng (2023), this study conducts a robustness check by replacing the dependent variable with per capita indicators. Results in Appendix Table A5 remain significant and consistent with the baseline, confirming robustness.

Matching method replacement

In the baseline regression, K-nearest neighbour matching ($n = 1$) is used as the PSM method. To test robustness, caliper matching ($r = 0.01$) and kernel matching are applied to re-estimate policy effects on various income types. As shown in Appendix Table A6, the DID estimates remain consistent in sign, significance, and magnitude across methods, confirming the robustness of the results.

Placebo test

To further verify the robustness and causal validity of the empirical results, a placebo test is conducted. The treatment status (i.e. relocation) is randomly reassigned 500 times while preserving the original sample structure to generate a distribution of pseudo DID estimates. As shown in Figure 1, most simulated estimates cluster around zero, whereas the actual estimate lies in the distribution tails. This clearly indicates that the observed effect is not driven by random factors, thereby reinforcing the credibility of the findings.

Heterogeneity analysis

Health status

Appendix Table A7 presents heterogeneity by health status. Relocation yields larger income gains for less healthy households, who benefit more from improved environments and job access. For severely ill households, income gains mainly stem from increased transfer payments, as they are less able to engage in wage employment.

Education level

Appendix Table A8 shows that relocation has the strongest positive effect on income and wages for less-educated households. This likely reflects improved job access through post-relocation training and support, which helps overcome barriers to formal employment.

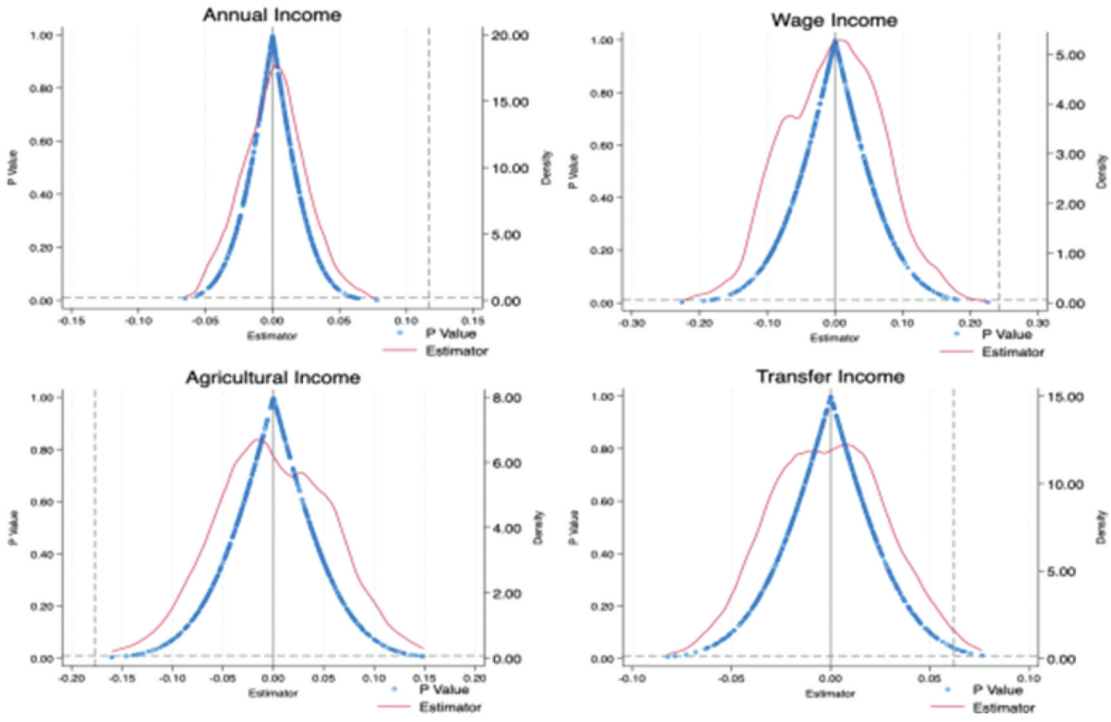


Figure 1. Placebo test results.

Industry support

Grouped regression results (Appendix Table A9) reveal significant heterogeneity in the APRP's income effects across different types of industry support. The policy households participating in animal husbandry experience significant income gains under the policy, crop farming, or rural tourism – sectors aligned with County M's comparative advantages. Households without industry support also benefit, likely due to greater access to non-agricultural jobs near urban or industrial areas. In contrast, the income effect is insignificant for those supported by manufacturing, possibly reflecting mismatches in resources or market conditions. These findings underscore the importance of aligning industry support with regional strengths and ensuring flexible employment opportunities for relocated households.

Mechanism test

Non-agricultural employment mechanism test

Analysis of the effect of the APRP on rural household employment structure (Appendix Table A10) shows that the APRP significantly increases the likelihood of non-agricultural employment (coefficient = 0.350, significant at the 1% level), highlighting its strong role in promoting labour transition to non-agricultural sectors. When 'non-agricultural employment' is incorporated into the regression model (Appendix Table A11), the APRP's effect on annual income declines from 0.117 to 0.049, and its negative effects on agricultural income reduce to −0.061, respectively. Furthermore, 'non-agricultural employment' has a significant positive effect on annual income (coefficient = 0.229, significant at the 1% level), indicating that non-agricultural employment serves as a partial mediating pathway through which the APRP improves income.

In summary, the APRP significantly enhances household income, particularly wage income, by promoting non-agricultural employment while reducing reliance on traditional agriculture. These findings provide strong empirical evidence of the effectiveness of relocation policies.

Regulatory effect analysis

The results of testing the moderating effect of distance to the village main road (Appendix Table A12) show that the interaction terms

between relocation and distance to the village main road are significantly negative in columns (1), (2), and (4), indicating that distance negatively moderates the effects of relocation on annual, wage and transfer income. This suggests that in promoting household income through the APRP, market accessibility serves as a positive moderating factor.

IV. Conclusions

This study finds that China's Anti-Poverty Relocation Program (APRP) significantly improves rural household income by promoting a shift from agricultural to non-agricultural employment, especially through increased wage earnings. Vulnerable groups, such as those with lower education and poorer health, benefit more, and the income effects vary by type of industry support, highlighting the need to align support policies with local comparative advantages. However, the programme may also introduce social and economic risks, including weakened social networks, livelihood disruptions, and tensions between relocated and host communities over access to resources and cultural integration. To enhance long-term effectiveness, we recommend providing integrated employment services, targeted healthcare and education, community integration mechanisms, and strengthening local governance to promote inclusive participation and resource coordination. The study has several limitations: it relies on income-based measures, lacks multidimensional welfare indicators, omits infrastructure and labour market context in resettlement areas, and does not empirically assess reverse migration. Future research should adopt broader welfare metrics, incorporate contextual data, and explore the drivers and consequences of reverse migration to better understand the long-term sustainability of large-scale relocation-based poverty alleviation policies.

Author contributions

CRediT: **Fengxia Hao:** Conceptualization; **Nihan Yu:** Formal analysis, Writing – original draft, Writing – review & editing; **Yong Li:** Conceptualization.

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Data availability statement

The authors do not have permission to share data.

References

Aggarwal, S. 2018. "Do Rural Roads Create Pathways Out of Poverty? Evidence from India." *Journal of Development Economics* 133:375–395. https://doi.org/10.1016/j.jdeveco.2018.01.004.

Cernea, M. 1997. "The Risks and Reconstruction Model for Resettling Displaced Populations." *World Development* 25 (10): 1569–1587. https://doi.org/10.1016/S0305-750X(97)00054-5.

Gollin, D., D. Lagakos, and M. E. Waugh. 2014. "The Agricultural Productivity Gap." *The Quarterly Journal of Economics* 129 (2): 939–993. https://doi.org/10.1093/qje/qjt056.

Lagakos, D., S. Marshall, A. M. Mobarak, C. Vernot, and M. E. Waugh. 2020. "Migration Costs and Observational Returns to Migration in the Developing World." *Journal of Monetary Economics* 113:138–154. https://doi.org/10.1016/j.jmoneco.2020.03.013.

Provenzano, S. 2024. "Accountability Failure in Isolated Areas: The Cost of Remoteness from the Capital City." *Journal of Development Economics* 167:Article 103214. https://doi.org/10.1016/j.jdeveco.2023.103214.

Zhang, L., L. Y. Xie, and X. Y. Zheng. 2023. "Across a Few Prohibitive Miles: The Impact of the Anti-Poverty Relocation Program in China." *Journal of Development Economics* 160:Article 102945. https://doi.org/10.1016/j.jdeveco.2022.102945.