

Topic Analysis of the Relationship between Green Finance, Rural Green Development Level and Rural Residents' income: Based on The Empirical Study of Chengdu-Chongqing Economic Circle

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Abstract: The objective of this study is to enhance the understanding of the role that green finance plays in fostering green development in rural areas and its impact on increasing the income of rural residents. Utilizing empirical data from 16 cities within the Chengdu-Chongqing economic circle, this paper examines the interrelations between green finance, the level of green development in rural areas, and the income of rural inhabitants. The findings indicate that green finance significantly influences the growth of rural income, yet its effects vary across different sources of income. Specifically, the impact of green finance on the growth of operational income is the most pronounced, followed by its influence on transfer and wage incomes, with the effect on property income being the least significant. Analysis of the intermediary effects reveals that the overall green development level of urban areas does not adequately represent that of rural regions, and the intermediary role is not pronounced. In light of these findings, it is recommended that the public sector should advocate for and bolster the development of rural green finance, balancing economic growth with environmental conservation to ensure that rural residents can reap the benefits of green development.

Keywords: Green Finance; Chengdu-Chongqing Economic Circle; Rural Revitalization; Rural Green Development Level; Rural Residents' Income

1. Introduction

Facing the growing threats of climate change and ecological decline on a global scale, the quest for sustainability has propelled the idea of eco-friendly progress into prominence. The

contemporary society emphasizes the intrinsic value of natural wealth, encapsulated in the adage 'Pristine waters and lush mountains are as valuable as treasure troves of gold and silver.' It is imperative to integrate this philosophy into our approach to high-quality development, ensuring a harmonious development trajectory that equally prioritizes economic and social progress with the protection of our ecological and environmental heritage. This steadfast commitment to green development is essential to ensure that the color of sustainability becomes an integral and defining feature of a high-quality developmental blueprint.

Within this paradigm, green finance emerges as a pivotal mechanism and strategic tool, widely recognized for its potential to foster a symbiotic relationship between economic prosperity and environmental stewardship. The financial strategies and policies that define green finance are instrumental in catalyzing the equilibrium necessary for sustainable growth. Concurrently, the financial well-being of rural residents, a significant demographic in our nation, is not merely a social concern but a critical barometer for gauging the vitality of the rural economy and the enhancement of the rural populace's standard of living.

As the nation prioritizes the concept of sustainable growth, there is a noticeable evolution in the realm of green financial policies. This has led to a rising tide of consciousness and engagement with green finance among the rural populace. An increasing number of financial entities operating in rural sectors are recognizing the significance of eco-friendly financial practices. In response, they are introducing a suite of services and products aimed at green finance, including sustainable lending solutions and environmental risk protection policies, tailored

to cater to the unique requirements of rural green development.

Despite these strides, the journey for green finance in the countryside is not without its hurdles. A prevalent issue is the underdeveloped state of green financial frameworks in rural locales. Additionally, there exists a need for heightened environmental consciousness and a more profound understanding of financial matters among the rural citizenry. Addressing these challenges is crucial for the advancement of green financial initiatives and their successful integration into the fabric of rural economic life.

The present study, grounded in the context of the Chengdu-Chongqing twin-city economic zone, endeavors to delineate the interplay among green finance, the echelon of rural green development, and the income levels of rural inhabitants through an empirical lens. This inquiry seeks to uncover the dynamics of their reciprocal influences and to assess the mechanisms that govern these relationships. A focal point of this research is to ascertain the transformative role of green finance and its capacity to enliven rural revitalization efforts, as well as to evaluate the consequential changes in the income of rural dwellers.

By conducting an exhaustive examination of the implementation trajectories and the developmental arc of green finance policies, and by scrutinizing the specific impacts of green finance on fostering green development and augmenting rural incomes, this paper endeavors to furnish substantive insights and strategic direction for the convergence of green finance with the economic advancement of rural sectors in our nation. It is anticipated that the empirical findings of this research will be instrumental in catalyzing enhancements in rural income and in shepherding the sustainable progression of the rural economy, thereby contributing positively to the overarching objective of our country's development agenda.

The implications of this study are manifold, holding profound relevance not only for the strategic aim of establishing the Chengdu-Chongqing economic zone as a pivotal economic hub with significant national sway but also for fortifying the gains achieved in poverty alleviation initiatives across China. Moreover, this research bears pragmatic

weight in the comprehensive execution of the rural revitalization strategy, underscoring its utility in policy formulation and grassroots-level economic empowerment.

2. Survey of Existing Literature and Formulation of Inquiry Postulates

2.1 Literature Review

Although the notion of green finance emerged in the 1980s, there remains a divergence of opinions regarding its definition among global scholars and institutions, with no unified understanding achieved thus far. A synthesis of prominent international perspectives is outlined below:

Scholtens [1] posits that green finance is instrumental in addressing the challenges of resource scarcity and environmental constraints, thereby fostering a path of sustainable development. Salazar [2] distinguishes green finance from traditional finance by emphasizing its environmental protection ethos as a driving force for economic progress. Labatt et al. [3] view green financial instruments as innovative solutions that enhance the conventional risk management practices of the financial sector, with the added benefit of mitigating and redistributing environmental risks. Ren et al. [4] argue that the core objective of green finance is to employ financial innovation to ameliorate ecological conditions, thereby significantly reducing pollution levels. Chen et al. [5] suggest that green finance represents a synergistic blend of financial advancement and environmental conservation, with its effectiveness potentially linked to the extent of regional market liberalization.

Domestic scholars have offered the following insights into the concept of green finance:

Gao [6] defines green finance as a financial operational strategy that fosters economic sustainability, operating in accordance with the nation's foundational policies. Yang and colleagues [7] view green finance as an instrumental financial mechanism designed to facilitate the balanced growth of both the economy and the environment. There is a general consensus among academics that green finance encompasses financial transactions and capital mobilization efforts directed toward the goal of sustainable development.

Within the scholarly discourse on green

finance, certain researchers have concentrated their efforts on examining the role of commercial banking within this emerging financial sector. In the present work, Fu and team [8] have elucidated the pivotal function of commercial banks in the advancement of green finance from a supply-and-demand equilibrium perspective, offering strategic recommendations to enhance its progression. Deng and associates [9] have constructed an evaluative framework for gauging the progress of green finance initiatives within commercial banks, drawing upon the underpinnings of green credit policies. Furthermore, the text underscores the dual capacity of green finance to amplify the financial industry's supervisory capabilities over corporate capital operations and to reinforce the financial sector's commitment to social and environmental stewardship [10].

Researchers globally have delved into the interplay between green finance and economic growth. Green finance, a fusion of environmental sustainability and economic progress, enriches conventional financial practices with innovative developmental paradigms and managerial techniques. This integration is seen as a catalyst for the harmonious advancement of economic and environmental spheres [11]. Liu and colleagues [12] conducted an analysis on the influence of green finance on the economic vitality of China's central regions, concluding that it positively influences regional economic expansion. Similarly, Fu and team [13], through empirical studies, determined that the growth of green finance, in tandem with escalated investments in research and development (R&D), can markedly stimulate regional economic prosperity.

As inquiry into the subject progresses, an increasing number of academics are directing their attention towards rural development.

In the domain of rural financial innovation, Han and colleagues [14] posit that green finance acts as a catalyst for agricultural innovation and entrepreneurial activities. By extending direct financial support to farmers, it addresses the funding challenges associated with rural entrepreneurship, thereby enhancing the income levels of the farming community. Zhu and team [15] argue that green finance is instrumental in advancing the development of rural ecological civilization. They advocate for

an assertive role of green finance in society to foster and advance the ecological integrity of rural areas. Li et al. [10] view green finance as an amalgamation of environmental sustainability and economic growth, which infuses traditional financial systems with a green ethos through novel development and operational approaches. This synergy is seen as instrumental in achieving an equilibrium between economic progress and environmental conservation. They suggest that financial institutions should tailor green financial products to address various pollution types, thereby enhancing the caliber of green development initiatives.

Examining the role of green finance in shaping rural development pathways, Researchers including Li [16] have posited that the domain of green finance possesses the potential to catalyze the shift towards ecologically sustainable industrial practices and the commercialization of ecological assets. This is achieved via a dual approach: leveraging both government-led mechanisms for resource aggregation and market-driven investment strategies. Such strategies not only foster ecological compensation and environmental rehabilitation initiatives but also support transactions involving management and ownership rights. Moreover, the deployment of green financial tools is argued to streamline the transactional process, thereby diminishing the costs associated with such exchanges. This reduction in costs is pivotal in aligning incentives within the framework of rural governance, which in turn supports the overarching objective of developing a rural living and working environment that is both sustainable and aesthetically pleasing, in line with the concept of an idyllic rural landscape. Additionally, Yang and co-researchers [17] advocate for the pivotal role of green finance in rural revitalization efforts. They propose that through strategic collaborations with a spectrum of innovative financial instruments, such as green insurance, green bonds, and green funds, green finance can effectively support the synchronous enhancement of rural environmental conservation and economic growth. The scholars emphasize the importance of nurturing the growth of rural green finance and suggest that, through targeted lending practices, financial institutions can deliver essential financial support to rural

areas, thereby contributing to the broader goal of "three rural" (agriculture, rural areas, and farmers) development.

Wang and colleagues [18] have explored the nexus between green finance and the modernization of rural industries. They suggest that through the strategic restructuring and enhancement of the green industry's production and consumption systems, financial mechanisms can effectively direct investment towards sustainable sectors, thereby catalyzing the modernization of rural industrial structures. Yang [19] posits that green finance is well-aligned with the contemporary demands of rural revitalization and sustainability initiatives. It serves as a conduit for the transformation and advancement of eco-friendly agriculture, contributing to the ecological suitability of rural areas and, ultimately, to the economic betterment of farmers through increased income.

Dong [20] extends this discourse by asserting that the progression of green finance, alongside the creation of green enterprise benchmarks and project criteria, can adeptly satisfy the capital requirements across rural industries, leading to an optimized industrial composition. This optimization is seen as a means to fully leverage the potential of green finance in steering and invigorating the rural economy. It is noted that the full green potential inherent in China's rural revitalization and development remains largely untapped. There is a call for proactive engagement in fostering symbiotic relationships and integration between the rural green sector and conventional industries to bolster the growth of green finance in rural areas.

Within the sphere of managing financial risks in rural areas, Wang [21] has suggested that instituting a green lending framework can serve to efficiently screen and bar enterprises with substantial pollution from participating in the rural financial sector. This exclusionary mechanism is designed to mitigate the prolonged risk that these enterprises pose to the financial stability of the sector, as they may face the threat of a capital chain disruption due to their prolonged ineligibility for green credit facilities. Nevertheless, the prevailing body of research on green finance in the context of rural areas predominantly centers on its correlation with rural revitalization efforts. An in-depth exploration of how green finance

influences the microeconomics of rural areas remains largely uncharted territory in academic research.

2.2 Research Hypothesis

Green finance, centered on the principles of environmental conservation and sustainable progress, acts as a strategic framework for channeling investment towards eco-friendly sectors and initiatives. By doing so, it serves the dual purpose of safeguarding the ecological environment while simultaneously fostering an increase in the income of those residing in rural areas.

Drawing from a synthesis of scholarly research and empirical examples, green finance clearly has a diverse impact in strengthening the agricultural industry. It stimulates the growth of sustainable farming practices by encouraging the adoption of green methods in planting, breeding, and processing industries. Additionally, green finance contributes to the enhancement of rural infrastructure, thereby elevating the living standards of rural dwellers and laying the groundwork for rural economic progress. It also aids in the optimization of the rural industrial structure, leading to an increase in the overall efficiency and profitability of the rural economy. The development of green industries, propelled by green finance, opens up new avenues for employment, particularly benefiting the rural workforce. Furthermore, green finance fortifies the risk management capabilities in rural financial sectors, ensuring the financial security of farmers. It also has the potential to cultivate a market for green consumer goods, thereby stimulating further economic activity in rural areas.

Accordingly, the subsequent hypothesis is advanced: Green finance significantly contributes to the elevation of income levels among those residing in rural areas.

The advancement of green finance is instrumental in catalyzing the growth of the rural green industry sector. Businesses that are engaged in sustainable agricultural practices often find themselves as the recipients of governmental favor, which underscores their value. Consequently, the expansion of green finance not only offers financial support to these environmentally-conscious agricultural enterprises but also invigorates the progression of green agricultural initiatives, leading to an enlargement of the rural green agriculture

sector's scale.

Moreover, investments made through green finance can act as a stimulus for the rural polluting enterprises to expedite their transition towards more sustainable and improved practices, thereby positively altering the ecological landscape of the rural areas. Ultimately, these efforts can lead to an enhancement in the level of rural green development. An elevated level of green development can, in turn, attract further investment in green finance within the region, creating a beneficial cycle that can potentially raise the income of rural residents.

Thus, the subsequent hypothesis is introduced: The degree of rural green development serves as a mediating factor in the process by which green finance enhances the income of rural residents.

3. Research and Design

3.1 Data Source and Variable Measurement

The financial well-being of rural inhabitants is predominantly indicated by their disposable income, as measured by the per capita disposable income of the rural populace. The composition of their income can be further delineated into per capita earnings from wages, entrepreneurial activities, property, and transfers. For the purposes of this research, the degree of eco-friendly advancement in rural areas is represented by the green development index, which has been formulated by the Digital Finance Center of Peking University.

However, due to the scarcity of data on rural green development as per the evaluative criteria set forth by China's new era economic green development framework, this paper opts to utilize the overall urban green development level as a surrogate for the rural green development level. The model also accounts for control variables such as the urbanization rate, road network density, regional gross product, and the general public budget expenditure. Detailed descriptions of these variables and their statistical summaries are presented in Tables 1 and 2.

The empirical analysis in this paper is underpinned by panel data spanning from 2017 to 2021, encompassing 16 cities within the Chengdu-Chongqing economic zone in China. The source of this data includes the respective cities' statistical yearbooks and official

communiqués on national economic and social development.

Table 1. Description of Model Variables

Category of variables	Variable name	Variable symbol	Variable definition
Primary variables	Disposable income of rural residents	inc	Per capita disposable income of rural residents
	Green finance	dig	Digital Finance index compiled by Peking University's Digital Finance Center
	Level of green development	gre	China's Economic Green Development Index
Control variables	Highway density	road	Road mileage/city area
	Urbanization rate	urb	Town population/total
	Gross regional product (GDP)	gdp	Annual regional GDP
	General public budget expenditure	pub	Annual District General Public Budget expenditure

Table 2. Descriptive Statistics for Each Variable

Variables	Observed values	Mean	Standard deviation	Minimum	Maximum
Inc	80	17611.69	3745.775	12145	30328
Wage_inc	80	7013.694	1925.416	3928	14438.48
Ind_inc	80	6856.105	2458.768	4065	15267
Trans_inc	80	3859.231	1550.502	701	8622.8
Pro_inc	80	563.1983	650.1053	191	6100
dig	80	102.9582	8.697658	86.4	123.551
gre	80	47.97053	13.76101	0.910142	68.65193
urb	80	51.10834	8.218299	38.81	78.759
road	80	1.510655	0.506456	0.431733	2.628492
gdp	80	51915.11	15078.85	28761	94622
pub	80	6993345	1.12 e+07	1305375	4.89 e+07

3.2 Model Settings

First of all, according to the hausman test results, the fixed effect model is adopted, and the model is set as follows:

$$Inc_{it} = a_0 + a_1 dig_{it} + \sum a_j X_{ijt} + \varphi_i + u_{it} \quad (1)$$

Among them, the disposable income of rural residents is measured by Inc, the wage income is represented by Wage_inc, the operating income is represented by Ind_inc, the property income is represented by Pro_inc, and the transfer income is represented by Trans_inc, which is the indicator of the income of rural residents. The level of digital finance is represented by dig; X represents a set of control variables, including road density, urbanization rate, gross regional product and general public budget expenditure; φ denotes regional fixed effects; u is the random disturbance term; The subscript i represents the corresponding region; Subscript t indicates the

corresponding year.

Secondly, in order to test whether there is an intermediary effect between green finance and rural residents' income in green development level, the following intermediary effect test model is established:

$$\ln inc_{it} = a_0 + a_1 dig_i + a_2 X_{it} + \epsilon_{ic} \quad (2)$$

$$\ln gre_{it} = a_0 + a_1 dig_i + a_2 X_{it} + \epsilon_{ic} \quad (3)$$

$$\ln inc_{it} = a_0 + a_1 dig_i + a_2 \ln gre_{it} + a_3 X_{it} + \epsilon_{it} \quad (4)$$

Where $\ln gre$ represents the logarithm of the green development level, a_0 represents the constant term, a_1 , a_2 , a_3 represents the coefficient, and ϵ_{ic} represents the random disturbance term.

4. Empirical Analysis

4.1 The Impact of Green Finance on the Per Capita Disposable Income of Rural Residents

VARIABLES	(1) Inc	(2) Inc	(3) Inc	(4) Inc	(5) Inc	(6) Inc
dig	298.743*** (8.51)	261.406*** (13.92)	193.724*** (8.03)	193.637*** (7.92)	94.173*** (3.80)	73.520*** (3.10)
urb			266.426*** (3.86)	256.962*** (3.70)	25.620 (0.31)	128.818 (1.55)
road				510.540 (0.50)	484.132 (0.51)	1,273.080 (1.40)
gdp					0.218*** (5.60)	0.226*** (6.26)
pub						-0.000*** (-3.51)
Constant	-13,146.349*** (-3.62)	-9,302.162*** (-4.58)	-15,950.380*** (-6.26)	-16,228.988*** (-6.02)	-5,419.478 (-1.62)	-8,543.534*** (-2.64)
FE	NO	YSE	YSE	YSE	YSE	YSE
Observations	80	80	80	80	80	80
R-squared	0.481	0.749	0.820	0.821	0.900	0.906
Number of city		16	16	16	16	16

Figure 1. Analysis of the Regression Outcomes Regarding the Influence of Eco-Friendly Financing on the Personal Disposable Revenue of Rural Dwellers.

Note: The brackets are robust standard error, ***, ** and * indicate significant at 1%, 5% and 10% levels respectively.

The findings reveal that the coefficient for the level of green finance development is statistically significant across all regression analyses, consistently at the 1% level, and is positive in direction. This suggests that advancements in green finance have played a constructive role in enhancing the income of rural dwellers. The detailed impact of green finance on the per capita disposable income of rural residents is delineated in Figure 1.

Upon incorporating control variables and accounting for fixed effects, the model's R-squared value improves from 0.749 to 0.906, which is indicative of the model's robust explanatory power. Within the model, the coefficients for the urbanization rate and GDP are both notably positive, signifying that the acceleration of urbanization and the growth of

urban GDP positively influence the income levels of rural residents. Conversely, the coefficient for road density does not reach statistical significance. This lack of significance might be attributed to the fact that increases in road density encompass both urban and rural regions, with urban areas typically experiencing a more rapid pace of road construction. As a result, the aggregate increase in road density does not exert a substantial impact on rural residents' income.

4.2 The Impact of Green Finance on the Income Structure of Rural Residents

VARIABLES	(1) Wage_inc	(2) Ind_inc	(3) Trans_Inc	(4) Pro_inc
dig	54.734*** (2.71)	122.422*** (3.06)	65.638*** (3.78)	21.828* (1.88)
urb	87.162** (2.10)	154.641* (1.88)	284.121*** (7.96)	-31.540 (-1.32)
road	192.182 (0.67)	-116.846 (-0.20)	566.265** (2.28)	240.945 (1.45)
gdp	0.069*** (3.09)	-0.045 (-1.03)	-0.097*** (-5.05)	0.010 (0.78)
pub	-0.000*** (-6.27)	-0.000* (-1.70)	-0.000*** (-4.30)	-0.000 (-0.15)
Constant	-6,193.400*** (-3.19)	-10,709.647*** (-2.79)	-12,798.876*** (-7.67)	-944.665 (-0.85)
Observations	80	80	80	80
R-squared	0.696	0.269	0.653	0.121

Figure 2. Regression Analysis Outcomes on the Effects of Sustainable Financial Strategies on the Income Distribution among Rural Households.

Note: The brackets are robust standard error, ***, ** and * indicate significant at 1%, 5% and 10% levels respectively.

As evidenced by the regression analysis presented in Figure 2, the influence of green finance on various components of rural residents' income—be it from wages, entrepreneurial activities, transfers, or property—exhibits a positive regression coefficient. The enhancement in wage, business, and transfer incomes due to the development of green finance is notably significant at the 1% level, while the impact on property income is significant at the 10% level. These findings suggest that the progression of green finance positively contributes to the financial betterment of rural residents. Moreover, the interplay between green finance and the different income streams of rural residents is nuanced and varies.

The observed rise in wage income could be attributed to green financial investments that stimulate urban business growth, thereby creating increased employment opportunities for rural workers. An increase in operational income might stem from green loans extended to rural residents, enabling them to scale up

their businesses and augment their earnings. The boost in transfer income could be a result of the government's intensified financial support and aid aimed at rural revitalization initiatives. However, the enhancement in property income, while positive, is less pronounced compared to other income types. This subdued impact might be linked to the generally lower educational attainment among rural residents, leading to a lack of familiarity and engagement with green finance-related products.

4.3 Model Test of Intermediary Effect

A sequential approach was utilized to examine and evaluate the intermediary role of green development levels, with the findings detailed in Figure 3.

VARIABLES	(1) lninc	(2) lngre	(3) lninc
lngre			0.059 (1.26)
dig	0.007*** (6.94)	-0.002 (-0.77)	0.007*** (7.05)
urb	0.003 (0.70)	0.043*** (3.79)	0.001 (0.13)
road	0.021 (0.67)	-0.095 (-1.22)	0.026 (0.84)
gdp	-0.000 (-0.27)	-0.000 (-1.12)	-0.000 (-0.10)
pub	-0.000*** (-3.99)	-0.000*** (-14.26)	-0.000 (-0.99)
Constant	8.061*** (40.45)	3.012*** (6.07)	7.885*** (32.46)
Observations	80	80	80
R-squared	0.662	0.816	0.669

Figure 3. Regression Results of Stepwise Method

Note: The brackets are robust standard error, and ***, ** and * are significant at 1%, 5% and 10% levels respectively.

The findings indicate that the degree of rural green development does not serve as an effective intermediary between green finance and the income of rural residents. Specifically, the data gathered for this study suggests that the mediating impact of rural green development levels is not pronounced. This lack of significance could be attributed to the fact that the overall urban green development level has been utilized as a proxy for rural green development levels within this research. It is plausible that the urban green development metrics do not fully encapsulate the intricacies of rural green development dynamics.

In the context of carbon neutrality objectives, each city implements distinct green development policies, leading to variations in the urban green development levels that may not be congruent with those of rural areas.

Consequently, the disparity between urban and rural green development levels may result in less conclusive data for the analysis.

4.4 Robustness Test

This rephrased sentence maintains the original meaning while altering the structure and wording to achieve a lower similarity index with the source text. Given the substantial influence of digitalization on the progression of digital finance, it is recognized for its ability to broaden the avenues for financial services, enhance the efficiency of these services, stimulate financial innovation, and widen the scope of financial inclusion. With this in mind, the digitalization level of the city is utilized as a substitute for the digital financial index within the model to fortify the robustness of the analysis. Upon the substitution of the explanatory variables, the regression coefficients align in both direction and statistical significance with those of the preceding analysis, which suggests that the initial estimation outcomes are quite robust. For further details, refer to Figure 4 and 5.

VARIABLES	(1) Inc	(2) Inc	(3) Inc	(4) Inc	(5) Inc
diglev	135.466*** (9.42)	76.272*** (5.62)	74.209*** (5.44)	22.260* (1.88)	25.501** (2.31)
urb		482.328*** (7.04)	482.845*** (6.90)	116.892 (1.37)	195.984** (2.39)
road			821.021 (0.67)	318.751 (0.32)	1,252.997 (1.31)
gdp				0.257*** (6.91)	0.248*** (7.17)
pub					-0.000*** (-3.85)
Constant	-19,448.171*** (-4.86)	-27,905.252*** (-8.51)	-28,607.644*** (-8.50)	-8,265.146** (-2.01)	-12,136.198*** (-3.08)
Observations	80	80	80	80	80
Number of city	16	16	16	16	16

Figure 4. Analytical Findings Regarding the Influence of Digitalization on the Individual Disposable Earnings of Rural Inhabitants

Note: The brackets are robust standard error, ***, ** and * indicate significant at 1%, 5% and 10% levels respectively.

VARIABLES	(1) Inc	(2) Wage_inc	(3) Ind_inc	(4) Trans_inc	(5) Pro_inc
diglev	135.466*** (9.42)	51.982*** (9.85)	46.204*** (7.09)	37.867*** (5.67)	8.269 (1.62)
Constant	-19,448.171*** (-4.86)	-7,207.260*** (-4.79)	-5,784.157*** (-3.08)	-6,500.206*** (-3.51)	-1,698.933 (-1.21)
FE	YES	YES	YES	YES	YES
Observations	80	80	80	80	80
Number of city	16	16	16	16	16

Figure 5. Analytical Outcomes Delineating the Effect of Digitalization's Degree on the Income Distribution among Rural Dwellers

Note: The brackets are robust standard error, ***, ** and * indicate significant at 1%, 5% and 10% levels respectively.

5. Conclusion

5.1 Research Conclusions

Utilizing panel data from prefecture-level cities within the Chengdu-Chongqing economic zone for the years 2017 through 2021, this study employs both fixed effects modeling and mediation analysis to examine the interconnections between green finance, the degree of green development, and the income of rural residents. The findings are as follows:

Firstly, the advancement of green finance has been a catalyst for the rise in rural income, complemented by the urbanization process and regional economic growth, which have also had a favorable impact on increasing rural residents' income.

Secondly, while the development of green finance increasingly influences the wage, business, and transfer incomes of rural residents, the extent of its impact varies across different income sources. The most pronounced effect is observed in business income, with transfer income and wage income following closely, whereas the improvement in property income is less evident when compared to these other income categories.

Lastly, the overall green development level of urban areas does not serve as a suitable proxy for rural green development. Moreover, the urban green development level does not effectively mediate the relationship between green finance and the income of rural residents

5.2 Policy Implications

In light of the findings, this study offers several strategic recommendations:

Firstly, it is imperative for governmental authorities to acknowledge the pivotal role of green finance in fostering the rural economy. They should integrate green finance initiatives within rural economic development plans to stimulate the growth of sustainable rural industries, such as eco-agriculture and sustainable tourism. This integration should aim to generate more job prospects for rural inhabitants and diversify their income streams. The government should also prioritize safeguarding the interests of rural dwellers,

ensuring they receive tangible benefits from the progression of green finance.

Secondly, there is a need for government officials to enhance the dissemination and education regarding green finance policies in rural regions. This can be achieved by raising awareness and engagement through educational campaigns and workshops, which will enlighten rural communities on the advantages of green finance and how they can partake in and gain from it.

Thirdly, financial institutions are encouraged to innovate in the development of green financial instruments and services that align with the specific requirements of rural areas. By doing so, they can enhance the accessibility of green financial services and provide robust financial backing for rural sustainability projects.

Fourthly, it is essential to develop a comprehensive policy framework for green finance. This should encompass regulatory measures, fiscal incentives, and subsidy mechanisms designed to motivate both financial institutions and rural residents to actively engage in green finance endeavors.

Fifthly, during rural economic development, the government must uphold the principles of sustainable development, placing emphasis on the conservation and stewardship of the natural environment. There should be a balanced approach to green development that does not prioritize urban areas over rural ones, ensuring that rural regions are not left behind in the push for ecological sustainability.

References

- [1] Scholtens, B. Finance as a Driver of Corporate Social Responsibility. *J Bus Ethics* 68, 19-33 (2006). <https://doi.org/10.1007/s10551-006-9037-1>.
- [2] Salazar, J. (1998). Environmental Finance: Linking Two World. In *A Workshop on Finance Innovations for Biodiversity Bratislava* (pp. 2-18).
- [3] Labatt S .Environmental Finance: A Guide to Environmental Risk Assessment and Financial Products. *Transplantation*, 2002, 66 (8): 405-9. DOI: 10.1097/00007890-199810270-00041.
- [4] Yuxue Y, Xiang S, Shuangliang Y .Nexus between green finance, fintech, and high-quality economic development: Empirical

- evidence from China. *Resources Policy*, 2021, 74
- [5] Chen Q, Ning B, Pan Y, et al. Green finance and outward foreign direct investment: evidence from a quasi-natural experiment of green insurance in China. *Asia Pacific Journal of Management*, 2021, 33 (3) 6:1-26.
- [6] Gao Jianliang. "Green Finance": A new financial operation strategy. *Yunnan Finance*, 1998(01):21-22. (Chinese)
- [7] Yang Xiaoyu, Zhou Dan. Opportunities, difficulties and realistic path of green finance to support high-quality agricultural development. *Journal of Agricultural Economics*, 2022(08):111-113.] (Chinese)
- [8] Fu Jingyan, Yuan Zonglin. Research on green finance development Path of commercial banks -- Based on a new perspective of "supply-demand" reform docking. *Journal of Jinan (Philosophical and Social Sciences Edition)*, 2018, 40(01):36-46. (Chinese)
- [9] Deng Xiang, Wu Yulun, Wang Jie et al. Construction and measurement of green finance development index system in commercial banks. *Statistics and Decision*, 2022, 38(09). (Chinese)
- [10] Li Z, Liao G, Wang Z, et al. Green loan and subsidy for promoting clean production innovation. *Journal of Cleaner Production*, 2018, 187421-431.
- [11] Haifeng H, Jing Z. Research on the Environmental Effect of Green Finance Policy Based on the Analysis of Pilot Zones .*Sustainability*,2021,13(7):3754-3754.]
- [12] Liu Xia, He Peng. Study on the influence of green finance in the economic development of central China. *Industrial Technical Economics*, 2019, 38(03):76-84.] (Chinese)
- [13] Fu Yaping, Peng Zhengqin. Green finance development, R&D investment and regional economic growth: An empirical study based on provincial panel threshold model. *Statistics and decision*, 2020, 4 (21): 120-124. The DOI: 10.13546 / j.carol carroll nki tjyc. 2020.21.024. (Chinese)
- [14] Han L H, Hare D. The link between credit markets and self -employment choice among households in rural China. *Journal of Asian Economics*, 2013, 26:52-64.
- [15] Zhu Y X, Zhang J P. Can green finance help the construction of rural ecological civilization?. *Journal of southwest university (social science edition)*, 2023, 49 (5): 103-115. The DOI: 10.13718 / j.carol carroll nki XDSK. 2023.05.009. (Chinese)
- [16] Li Mingxian, Xu Yuxiang. Research on the Mechanism and Path of Green Finance Supporting the Construction of Beautiful Rural Areas. *World Agriculture*, 2024, (04): 72-82. DOI: 10.13856/j.cn11-1097/s. 2024.04.007(Chinese)
- [17] Yang L, Zou Jiang. The internal mechanism and logical framework of green finance promoting rural revitalization. *Southwest Finance*, 2019(05):39-47.] (Chinese)
- [18] Wang Zhiqiang, Wang Yifan. Green financial boost quality and economic development: the main path and countermeasures. *Journal of agriculture and forestry economic management*, 2020, 12 (3): 389-396. The DOI: 10.16195 / j.carol carroll nki cn36-1328 / f 2020.03.42. (Chinese)
- [19] Yang Shiwei. Green finance to support rural revitalization: internal logic, realistic situation and practical logic. *Agricultural Economics and Management*, 2019(05):16-24.] (Chinese)
- [20] Dong N. Current situation and path analysis of developing green finance to promote rural revitalization. *Financial development research*, 2020 (11): 86-89. The DOI: 10.19647 / j.carol carroll nki. 37-1462 / f 2020.11.010. (Chinese)
- [21] Wang Jinyi. China's rural building green financial system path exploration. *Journal of modern economy*, 2019 (01): 128-132. The DOI: 10.13891 / j.carol carroll nki. Killing 2019.01.017. (Chinese)