

# SOCIAL RESPONSIBILITY OF GREEN MICROFINANCE INSTITUTIONS: A TOOL FOR PROMOTING WOMEN'S ECONOMIC EMPOWERMENT IN CHINA

Jiuzheng PEI<sup>✉</sup>

North China University of Water Resources and Electric Power, Zhengzhou 450046, China

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**Abstract.** Economic freedom has central importance among the nations, however, Chinese economic freedom index declining continuously, leading to the several issues. Particularly, economic freedom is low among the Chinese female population. The world average of economic freedom index in 2022 based on 175 countries is 60 index points, but the Chinese index is 48. To address this issue, this study introduced green microfinance institutions based on Mayoux's Feminist Empowerment Theory. The objective of this study is to examine the role of green microfinance institutions in women economic freedom in China. A survey questionnaire is used to collect data from female clients of microfinance institutions. 315 respondents responded to the survey and data analysis is carried out by using Structural Equation Modeling (SEM). Results of the study identified that, green microfinance institution's services such as credit and insurance can facilitate green micro enterprises. The promotion of green micro enterprises causes to increase women economic security, leading to the economic freedom. Additionally, green microfinance policy is a critical factor to promote the positive relationship between green microfinance institution's services and women economic freedom. Findings of this are helpful for the practitioners to increase women economic freedom in China by providing various services of green microfinance institutions.

**Keywords:** economic freedom, microfinance institutions, credit, insurance, green microfinance policy, green micro enterprises.

**JEL Classification:** Q01, A13, F15, M14.

<sup>✉</sup>Corresponding author. E-mail: [peijiuzheng@ncwu.edu.cn](mailto:peijiuzheng@ncwu.edu.cn)

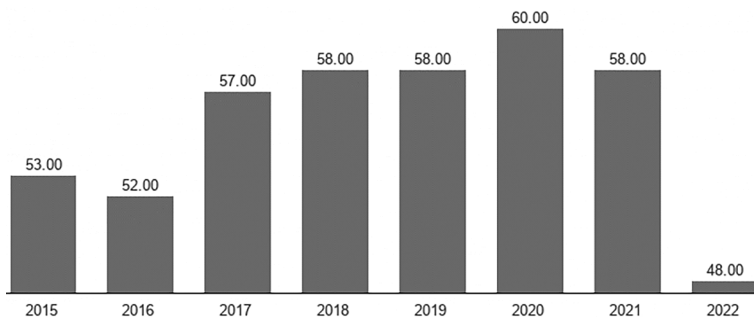
## 1. Introduction

Economic freedom is one of the critical problems among several nations (Karimi et al., 2022). Despite the significant efforts made by the nations to increase the economic freedom index, still it is major problem globally. The measures taken by different nations to overcome this problem has little impact. Although, developed countries has achieved success and achieved a significant level in economic freedom. However, this issue is prevailing among the developing or low income countries. Most of the developing countries are facing the issue of low economic freedom. Especially, this issue is rising among the women, as in various countries, women are facing the issues of gender discrimination which lead to decrease in economic freedom. Low level of economic resources provided to the women causing to decrease the women productivity along with several other issues related to the women well-being. Particularly, this issue is most common in various Asian countries (Alcaráz-Ibañez et al., 2020; Demir, 2020; Huynh, 2022).

Similar with the other Asian countries such as Pakistan, India and Bangladesh, China is also facing the problem of economic freedom. Economic freedom is a necessary antecedent to China's structural economic rebalancing (Abulela & Davenport Jr, 2020; Albert & Gómez-Fernández, 2020; Yap & Sufian, 2018), but it is decreasing in China having negative influence on certain group of people. According to the Heritage Foundation (The Heritage Foundation, 2022), the economic freedom index of China is 48 for the year of 2022. The economic freedom index is low as compared to the global economic freedom index. Similarly, the current economic freedom index of China is lower than last several years. The average value for China during that period was 54 index points with a minimum of 48 index points in 2022 and a maximum of 60 index points in 2020. The Chinese economic freedom index is highlighted in Figure 1. The world average in 2022 based on 175 countries is 60 index points, but the Chinese index is 48.

Due to the low economic freedom in China, the gender gap is also increasing. That is the reason, the economic freedom among women is low. The low economic freedom among women leading to the several other issues such as gender inequality, low economic contribution, low household wellbeing and low community development. Along with the low economic freedom in China, the economic freedom among female population is also low which is not addressed by the previous studies. Although other studies highlighted economic freedom in China (Akadiri et al., 2021; Duan et al., 2022; Westhuizen & Ntshingila, 2020; Yap & Sufian, 2018), however, it is not addressed among the Chinese women. Therefore, it is needed to address the problem of economic freedom among women in China. According to the current study, the problem of economic freedom among women can be addressed with the help of green microfinance institutions. Microfinance institutions provide various services such as credit and insurance to promote micro enterprises. According to Mayoux's Feminist Empowerment Theory, service from microfinance institutions can decrease the gender inequality and increase the women wellbeing by promoting women micro enterprises.

Consequently, the objective of this study is to examine the role of green microfinance institutions in women economic freedom in China. The service of green microfinance institutions such as credit, saving and insurance can promote green micro enterprise which has the potential to promote economic resource of women leading to the economic freedom. In addition, green microfinance policy by the microfinance institutions (Bakota, 2020; Brookes, 2020; Nel & Masilela, 2020; Uddin et al., 2021) also help to enhance economic freedom. This study contributed significantly to the literature by introducing green microfinance institutions



**Figure 1.** Economic Freedom in China (2015–2022) (source: The Heritage Foundation)

as a possible solution to overcome the problem of women economic freedom. Furthermore, this study introduced green microfinance policy as an important factor in relation to economic freedom. The most significant contribution of this study is related to the Mayoux's Feminist Empowerment Theory. This study suggested to focus green microfinance institutions rather than traditional microfinance institutions. Hence, the findings of the study are helpful for the practitioners to increase women economic freedom in China by providing various services of green microfinance institutions.

The paper comprises of five sections. The first section covers the introductory part where as the literature review part discusses the theoretical foundation and hypothesis formulation in the light of prior studies. Literature review section is followed by methodology part where sampling technique, respondents' information, adopted questionnaire and data analysis techniques are discussed. Next section of the study interprets the findings which is followed by discussion that further elaborates the findings compared to previous studies. Lastly, the conclusion is drawn on the basis of implications and future directions that are proposed to generalize the study's findings.

## **2. Literature review**

### **2.1. Theoretical foundation**

Foundation of the study framework given in Figure 2 is grounded on Mayoux's Feminist Empowerment Theory (Mayoux, 2005). This is one of the most prominent theories which link the relationship between micro finance institutions and women empowerment. This study considered women economic freedom in relation to the women economic security which is also explain with the help of this theory. Consistent with the objective of the study, the current theory provided a mechanism which shows the connection between microfinance and women economic conditions. According to this theory, women economic condition can be improved through microfinance institution services (Abubakari, 2021; Akula & Singh, 2022; Brüntrup, 2021; Haaskjold et al., 2022; Sharma et al., 2022). The recommended services of microfinance institutions include the credit and insurance policies. The theory explained that the provision of various services such as credit and insurance to the women can lead to the economic empowerment with the help of economic security (Akula & Singh, 2022; Asad et al., 2020). The credit given to the women can be used in women micro enterprises which further strengthen the financial resources. Similarly, the insurance policies offered may also lead to handle any emergency condition related to the micro enterprises which also has direct effect on the financial health of women. This theory described that both the services have positive role to promote women micro enterprises which further lead to the women economic security. Therefore, women economic freedom is achievable with the help of microfinance institution's services. This theory explained that credit given by micro finance institutions to the women used in business activities leading to the increase in decision making of financial resources which has the potential to improve economic empowerment. The model of this theory is presented in Figure 2 which highlighted that women economic empowerment can be achieve with the help of women economic activities which are based on the investment in various business activities. Therefore, both the services of microfinance institutions have the potential to promote women economic freedom in China.

Based on this theory, the current study proposed a framework which is given in Figure 3. The theoretical framework of the study is based on two independent variables namely; credit and insurance. Credit and insurance are the services of microfinance institutions. According to the theory, micro finance institutions increase the green micro enterprises which further causes to increase women empowerment or women economic security. Therefore, micro enterprises are playing the role of mediating variables, therefore, this study considered micro enterprises as mediating variable in the theoretical framework of the study. Additionally, this study introduced green micro finance policy as moderating variable.

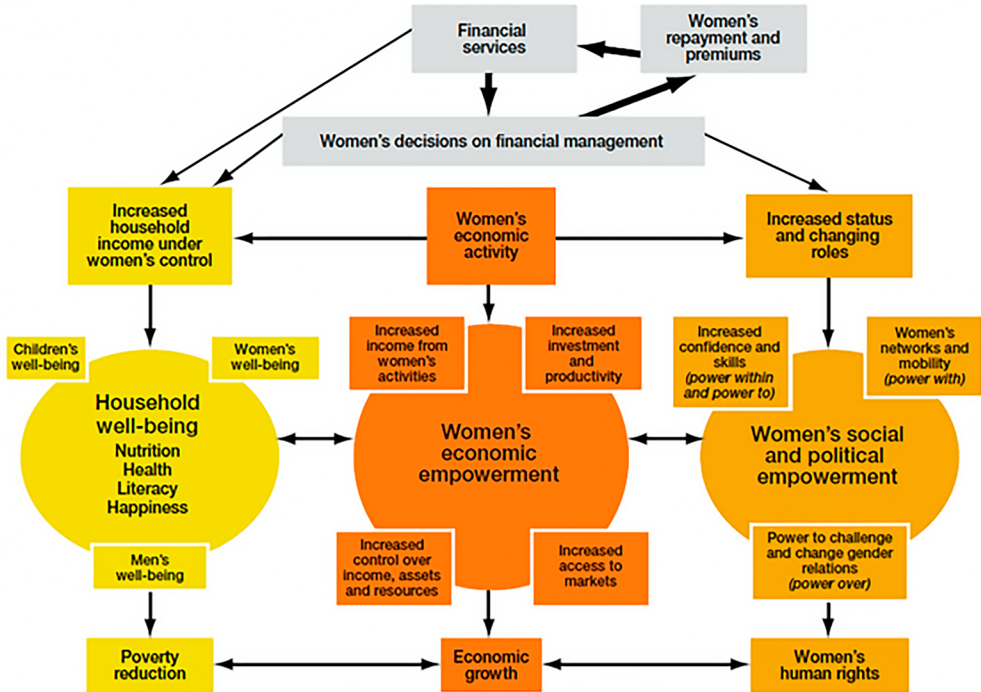


Figure 2. Mayoux's Feminist Empowerment Theory

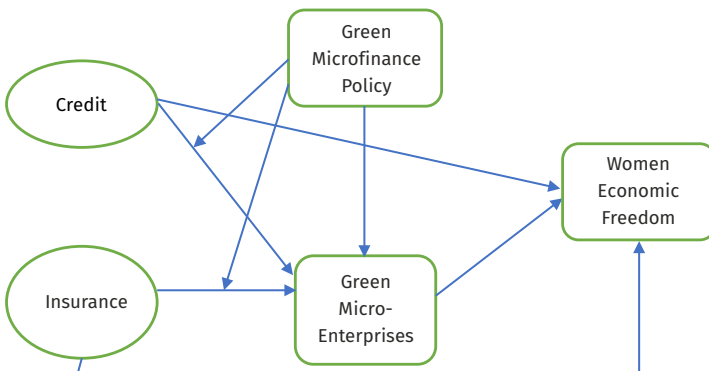


Figure 3. Theoretical framework of the study

## 2.2. Micro finance institutions

The accounting literature particularly related to microfinance is still growing. As per literature, studies are scarce which made comparison between MFI accounts quality and scrutinized whether MFIs are non-profit entities or not (Ali et al., 2023). The microfinance literature also argue that profitable MFIs appear to be more commercialized, hence, they utilize debt along with equity instruments. Besides, micro finance institutions acquire capital to increase target market in order to inject growth in loan portfolio. One benefit of for-profit MFIs is that these institutions have an ability to access domestic in international investors, thus, they have an opportunity to extend their financing mix. Studies are also there which claimed that for-profit MFIs are better when compared to non-profit ones due to better financial reporting quality and degree of transparency (Goodell et al., 2020). Profitable MFIs also manages higher disclosure level to produce satisfactory expectations for shareholders. However, in case of non-profits, there seems to be pressure from donors which is not enough to produce comparable disclosure level as there exists no market in case of non-profits for corporate control. Besides, for non-profit MFIs, the survival depends on government subsidies. Although MFIs are permitted to increase client base to achieve the mission, however, there is also an attached threat that may damage the quality of loan portfolio (Kollujo & Meli, 2022). Based on the discussion, a sharp difference can be seen between for-profit and non-profit MFIs which is also backed by the recent study of Leite et al. (2019). The study demonstrated that both the types have the potential to become sustainable, however, in case of profitable MFIs, they charge high interest rates in comparison with non-profit ones. Studies also articulate that for profit micro finance institutions offers large loans, hence, facilitating different set of population; "richest of the poor".

Scholars also claimed that non-profit MFIs are more motivated entities (Karaivanov, 2018). According to Leite and Civitarese (2019), countries where women empowered ratio is low, non-profit MFIs tend to increase the share of female portfolio. Because of this, these micro-finance institutions possess different incentive strategies. As discussed already, not-for profit MFIs offer different incentive schemes in contrast with for-profit MFIs (Leite et al., 2019; Pignatel & Tchuigoua, 2020). Thereby, we can build an argument they have reasonable justifications for each scheme to manage the earnings. Although it is quite a statement that not-for profit MFIs are not established with this aim their existence is based on profit maximization because of no shareholders. However, they still have motivations to manage their earning due to various intrinsic reasons (Leite et al., 2019).

## 2.3. Green microfinance institutions and women economic freedom

Talking about MFIs, literature concluded MFIs have higher percentage in loan portfolio. This shows that the objective is enhance gender equality along with women empowerment which itself is a goal rather than an instrument to achieve other goals. Thus, it can be debated that such women centric goals should be considered a fundamental goal for micro finance institutions to be achieved. It is also arguable that MFIs might offer more lending to women because women are believed to be a better consumer, hence, make reasonable financial making decisions (Leite & Civitarese, 2019). From economic point of view, in some econo-

mies, women do not have access to traditional finance and credit line because of absence of credit history, thereby, there is a greater need to return the loans in order to gain future credit lines. It is also debatable that credit history lacking and collateral might be a biggest challenge for entrepreneurs belonging from developing economies (Cheston & Kuhn, 2002; Mahmood, 2011).

Further to discussion, micro finance has also been gaining a prominent case in policy development for the poor. Thereby, various firms as per evidences made emphasis on the women role to achieve desired outcome, be it social or financial. However, literature is limited that pinpoints female clients % in micro finance institutions which should influence economic outcome as well. Meanwhile, behavioral research also argues that factors such as overconfidence and time inconsistency can be well observed in men behavior (Belwal et al., 2012). This leads to an argument that incase of women, relative risk is much smaller. Besides, there exists many reasons due to which much emphasis on women could lead to high risks for banking institutions. For suppose, sexism may undermine investment returns for female entrepreneurship. If this hypothesis is true, psychological concerns must be valued in prediction along with the cultural environment that may affect the outcome of MFI's lending to female as well (Leite & Civitarese, 2019).

Green microfinance is a financial service provided by microfinance institutions which attempts to advance the environmental conditions by generating incentives for the poor people. It delivers the poor with micro loan that inspires them to utilize more sustainable environmental-friendly initiatives (Abedin & Khan, 2018; Huybrechs et al., 2019; Sofyan et al., 2019). Economic freedom, or economic liberty, is the ability of people of a society to take economic actions. This study considering the economic freedom in the perspective of women. The level of economic freedom among the women is low as compared to the men. Therefore, this study highlighted the most vulnerable part of society. Women economic freedom is grounded on the economic security which can be examined through the possession of economic resources by the women and its decision-making power. High economic security shows high possession of economic resources and decision-making power to use the economic resources (Klaa, 2020).

Green microfinance institutions provide various services including the credit and insurance (Abu, 2019; Bari et al., 2021; Braičić, 2021; Nyakuwanika et al., 2022). The services of microfinance institutions are based on the small loan to the poor people to promote various green businesses. The financing of micro finance institutions to the people has the ability to promote economic freedom. The credit given to the females allowed them to take various decisions for the investment of credit which causes to increase economic freedom policy. As highlighted by other studies that provision of credit to women for businesses causes to increase empowerment level and economic freedom which is one of the important examples of empowerment. Therefore, economic freedom can be promoted through providing various financing opportunities to the women. Furthermore, economic freedom can also be promoted with the help of insurance activities. The insurance policies provided to the women increases the position of financial resources. Similar to the current study, previous studies mentioned the relationship between credit, insurance and economic freedom (Ahmed et al., 2021; Bru-neckiene et al., 2020; Lee et al., 2021; Liu & Liu, 2020). Therefore, the current study proposed

that credit and insurance have positive role to promote women economic freedom leading to the following hypotheses.

**H1.** *There is a relationship between credit and women economic freedom.*

**H2.** *There is a relationship between insurance and women economic freedom.*

## 2.4. Green microfinance institutions and green micro enterprises

Green micro enterprises are those businesses which have positive impact on environment. These micro enterprises are environmentally friendly business activities conducted at micro level (Aslam et al., 2021; Ballestar et al., 2021; Holt, 2012; Shahidullah & Haque, 2014). Particularly the poor people carry out various micro enterprises which have no effect on the environment. The promotion of the green micro enterprises, the micro finance institutions provide financing opportunities to the poor people. Generally, credit is the life blood of any business, similarly, green micro enterprises also need credit to carry out various business operations. The financing opportunities from microfinance institutions can increase the success rate of green micro enterprises. Previous studies addressed micro finance institutions financing to the micro enterprises, however, green micro enterprises are less focused as compared to the traditional micro enterprise. By highlighting this gap, this study considered the effect of credit opportunities provided by green micro finance institutions for green micro enterprises in China. Similar with the credit, insurance is another service of the green microfinance organizations which is available for the poor women entrepreneurs. Insurance is the important way to protect the business or any asset from risk (Khan et al., 2020). The insurance provided by the microfinance institutions can reduce the risk of failure. The availability of insurance policies helps the poor women for businesses in case of any emergency. As reported by (Kazaure, 2019; Salleh et al., 2021) that insurance is one of the key financial services which has important contributions on micro enterprises. Insurance has the potential to enhance business opportunities of the vulnerable women.

**H3.** *There is a relationship between credit and green micro enterprise.*

**H4.** *There is a relationship between insurance and green micro enterprise.*

## 2.5. Green micro enterprises and women economic freedom

Women economic freedom is influenced by several factors. Economic freedom is majorly based on the success of women for financial resources. The access to the financial resources can increase economic freedom, however, decrease in access to the financial resources can decrease the economic freedom (Abdur Rouf, 2012; Gilman, 2022). In various countries, the economic freedom is at lower level particularly the economic freedom among women is at bottom level (Özsungur, 2019). This study considered economic freedom with the help of economic security. Women economic security (Cheng et al., 2022; Kwiecień & Poprawska, 2022) is one of the important determinant of economic freedom. Any change in the level of economic security among the Chinese women can have influence on economic freedom. However, economic freedom can be promoted through green micro enterprises. The success of green micro enterprises is based on financial resources of the women and it has the ability

to provide access to the financial resources among the poor woman. Increase in financial resources due to the micro enterprises can increase women economic freedom. The low level of Chinese women economic freedom can be managed through income generating activities such as micro enterprises (Ul-Hameed et al., 2018; Zhu et al., 2019). As reported in the literature, business activities have significant influence on economic freedom of the people (Cernikova & Hyblerová, 2021; Chen & Hu, 2021; Mehdipour, 2021; Russell et al., 2020). The promotion of business opportunities among the women can increase the women economic security. This study proposed that micro enterprises have positive role to promote women economic freedom in China. Therefore, this study hypothesized that.

- H5. There is a relationship between green micro enterprises and women economic freedom.*
- H6. Green micro enterprises mediate the relationship between credit and women economic freedom.*
- H7. Green micro enterprises mediate the relationship between insurance and women economic freedom.*

## **2.6. Green microfinance policy**

The organizations have their own policy to protect the environment (Yuan & Zhang, 2020). Businesses always have impact on the environment health; therefore, the policies of businesses can help to reduce the negative effect of business activities on the environment. In addition, the organizations also have social responsibility to protect the environment (Shabbir & Wisdom, 2020). The micro finance organizations also have the environmental policy. The environmental policy of green microfinance institutions can reduce the environmental effect of various businesses. Green microfinance policy provides various services as well as financing opportunities to the businesses to invest in green projects. The investment in green projects leading to the no effect on the environment (Gu & Zhou, 2020; Han et al., 2022). Green micro finance institutions also follow green microfinance policy. Green microfinance policy has impact on green micro enterprises working in China. Because green micro finance promotes green micro enterprises to fulfill their social responsibility related to the environment health. Various policies develop by the green micro finance institutions has positive role to promote green micro enterprises in China. While considering the microfinance green policy, various organizations provide credit which help the green investment activities by the poor people. In this way, green micro finance policy has effect on the relationship between credit and green micro enterprises. Similarly green microfinance policy also has affect on the relationship between green micro enterprises and insurance. However, the fulfillment of green microfinance policy requirement after getting green financing from these institutions could be tough for the poor woman to manage. It is not easy to address all the requirements of green micro finance policy. Therefore, it may have negative influence on the poor woman to expand or developed green micro enterprises.

Microcredit is famous for addressing poverty related issues which are spread all over the world. Microcredit reduces poverty by encouraging communities to engage in micro loans and businesses so that they can earn well. The advanced and new microfinancing programs are expanding all across the world to upsurge economic growth in individuals' lives. How-



ever, one should be aware of the fact that if microfinance institutions are not regulated and microfinance is offered to people who are indulged in to unsustainable businesses and practices then the impact of microcredit approach would be negligible because if fails to promote sustainable business practices. Resultantly, microcredit programs not only discourage sustainability but also affect environment especially rural communities who rely on it. Thus, we can say that microfinance policies should have socially and environmentally responsible feature along with economic component due to which it may moderate the relationship of microcredit and green microenterprises as discussed above.

**H8.** *There is a relationship between green microfinance policy and green micro enterprises.*

**H9.** *Green microfinance policy moderates the relationship between credit and green micro enterprise.*

**H10.** *Green microfinance policy moderates the relationship between insurance and green micro enterprise.*

### 3. Methodology

#### 3.1. Questionnaire development and Pre-Test

To examine the relationship between credit, insurance, green micro enterprise, green microfinance policy and women economic freedom, this study designed a survey questionnaire. Women economic freedom is measured by using women economic security. The measures for women economic security are adapted from Sujatha Gangadhar and Malyadri (2015). Three scale items are adapted related to the economic security. The effect of green microfinance institutions is measured by considering the two important services of green microfinance institutions; credit and insurance. Five scale items are adapted from Bernard et al. (2016) to measure credit. Furthermore, five scale items are adapted from Bernard et al. (2016) while considering the effect of insurance. Similarly, to measure the effect of mediating variable; green micro enterprise, nine scale items are adapted from Bernard et al. (2016). Finally, the moderating effect of green microfinance policy is considered by adapting three scale items from Uddin et al. (2021). All the scale items are provided in Table 1.

Minor changes were made among the scale items and adapted for the current study. To ensure the validity of the instrument, this study used content validity and face validity. For this purpose, the complete questionnaire was sent to three experts. These three experts were selected based on the area of expertise in the concerned study. The questionnaire was sent to them and detailed discussion was carried out on each scale item. These experts suggested minor changes in the scale items. Therefore, after the minor changes related to the sentence structure and addition of green finance, these items were adapted for the current study.

#### 3.2. Data collection

This study considered 764 as the sample size of the study. According to the Krejcie and Morgan (1970), sample size should be 382 if the population is higher than 10,000. In the current study, number of female clients of microfinance institutions are more than 10,000. Therefore, 382 sample size is appropriate, however, for more accuracy, the current study considered

**Table 1.** Scale items

Constructs	Sr. N	Scale Items	Source
Economic Freedom (Economic Security)	01	"I have independent savings which can use for business.	Sujatha Gangadhar and Malyadri (2015)
	02	I am confident to face financial crisis.	
	03	I have different assets like house/land/livestock in my name."	
Credit	01	"The loan interest is reasonable.	Bernard et al. (2016)
	02	The loan obtaining procedure is simple.	
	03	The loan amount is sufficient.	
	04	The loan repayment period is sufficient.	
	05	The loan repayment procedure is easy."	
Insurance	01	"Insurance benefits are effective.	Bernard et al. (2016)
	02	Availability of different policies are satisfactory.	
	03	Obtaining an insurance policy is compulsory.	
	04	Insurance policy premiums are reasonable.	
	05	Insurance claims are promptly paid."	
Green Micro Enterprise	01	"Profits of my enterprise tend to increase after getting green finance.	Bernard et al. (2016)
	02	Turnover of my enterprise tend to increase. Number of	
	03	employees of my enterprise started to increase.	
	04	Number of products of my enterprise tend to increase.	
	05	Number of buyers of my enterprise tend to increase.	
	06	My family income tends to increase.	
	07	My family expenditure tends to increase.	
	08	My family assets tend to increase.	
	09	My family savings tend to increase."	
Green Microfinance Policy	01	"Microfinance institutions has created green strategic planning and disclose it.	Uddin et al. (2021)
	02	Microfinance institutions is following environmental risk management manual or guidelines including green financing."	
	03	Microfinance institutions has formulated a sector-wise strategy to protect the environment through green financing.	

double of the sample size which is 764. Furthermore, area cluster sampling is preferred to collected data from the respondents because the population is spread on wide area and area cluster sampling is suitable in this case. Finally, 764 questionnaires were distributed among the female clients of microfinance institutions in China and 315 were returned.

## 4. Results

This study carried out data analysis by using Partial Least Square-Structural Equation Modeling (PLS-SEM) (Hair Jr et al., 2021). The latest version of Smart PLS 4 is utilized. It is most prominent data analysis tool which is recommended by several previous studies (Afthanorhan, 2013; Basco et al., 2022; Hair Jr et al., 2021). Generally, PLS is robust in terms of "missing values, model misspecification, and violation of the usual statistical assumptions of latent variable modeling" Besides, PLS-SEM is also robust against measurement error. Before data analysis, the current study carried out data screening to fix the errors such as missing value and outlier in the data. After the data screening, the data statistics are given in Table 2.

**Table 2.** Survey data statistics

Name	No.	Type	Missing	Mean	Median	Minimum	Maximum
CR1	1	MET	0	3.243	3	1	7
CR2	2	MET	0	3.243	3	1	7
CR3	3	MET	0	3.515	3	1	7
CR4	4	MET	0	3.481	3	1	7
CR5	5	MET	0	3.527	3	1	7
IN1	6	MET	0	3.49	4	1	7
IN2	7	MET	0	3.494	4	1	7
IN3	8	MET	0	3.665	4	1	7
IN4	9	MET	0	3.695	3	1	7
IN5	10	MET	0	3.657	3	1	7
GME1	11	MET	0	3.548	3	1	7
GME2	12	MET	0	3.573	3	1	7
GME3	13	MET	0	3.594	3	1	7
GME4	14	MET	0	3.481	3	1	7
GME5	15	MET	0	3.523	4	1	7
GME6	16	MET	0	3.46	3	1	7
GME7	17	MET	0	3.644	3	1	7
GME8	18	MET	0	3.029	3	1	7
GME9	19	MET	0	3.142	3	1	7
GMP1	20	MET	0	3.192	3	1	7
GMP2	21	MET	0	3.105	3	1	7
GMP3	22	MET	0	3.079	3	1	7
WEF1	23	MET	0	3.155	3	1	7
WEF2	24	MET	0	3.105	3	1	7
WEF3	25	MET	0	2.983	3	1	7

*Note:* CR – Credit; IN – Insurance; GME – Green Micro Enterprise; GMP – Green Microfinance Policy; WEF – Women Economic Freedom.

Confirmatory factor analysis is carried out by using PLS measurement model which is shown in Figure 4. All the loadings of scale items were observed to check the internal item reliability. According to the literature, factor loadings must be higher than 0.7 to achieve the required level of internal items reliability (Hair et al., 2014; Marcoulides & Saunders, 2006). All the factor loadings are highlighted in Table 3. The PLS measurement model is presented in Figure 4. It can be observed that; credit, insurance, green micro enterprise, green microfinance policy and women economic freedom has factor loading higher than 0.7 for each item. Similarly, this study also addressed the composite reliability (CR) of each construct. The CR must be higher than 0.7 which is minimum threshold level in this study (Murugan et al., 2019; Purwanto, 2021). CR for all the variables is higher than 0.7 which confirmed the reliability of the construct. Additionally, this study also addressed average variance extracted (AVE) which should be higher than 0.5 (Basco et al., 2022; Manley et al., 2021). All the variables given in Table 3 having AVE higher than 0.7. The convergent validity achieved with the achievement of

minimum threshold level of CR and AVE. In addition, the current study achieved discriminant validity through heterotrait-monotrait ratio of correlations (HTMT)<sub>0,9</sub> which is a latest measure of discriminant validity confirmation and recommended by previous studies (Alarcón & Sánchez, 2015). It is evident from Table 4, all the values of HTMT correlations are less than 0.9.

Results of the hypotheses are identified through PLS structural model. While considering PLS structural model, this study observed beta value and t-value. T-value 1.64 is used to

**Table 3.** Factor loadings, composite reliability (CR) and average variance extracted (AVE)

Variables	Items	Loading	Alpha	CR	AVE
Credit	CR1	0.9	0.941	0.955	0.809
	CR2	0.907			
	CR3	0.914			
	CR4	0.895			
	CR5	0.88			
Green Micro-Enterprises	GME1	0.882	0.947	0.956	0.708
	GME2	0.855			
	GME3	0.875			
	GME4	0.869			
	GME5	0.884			
	GME6	0.878			
	GME7	0.863			
	GME8	0.708			
	GME9	0.736			
Green Microfinance Policy	GMP1	0.917	0.903	0.939	0.837
	GMP2	0.913			
	GMP3	0.916			
Insurance	IN1	0.922	0.948	0.96	0.827
	IN2	0.908			
	IN3	0.896			
	IN4	0.903			
	IN5	0.917			
Women Economic Freedom	WEF1	0.938	0.919	0.949	0.861
	WEF2	0.945			
	WEF3	0.9			

**Table 4.** Discriminant validity

	CR	GME	GMP	IN	WEF
Credit					
Green Micro-Enterprises	0.888				
Green Microfinance Policy	0.741	0.809			
Insurance	0.791	0.787	0.881		
Women Economic Freedom	0.652	0.694	0.612	0.697	

examine the significance of the relationship. Beta value is used to examine the direction of the relationship. PLS bootstrapping is used to obtain the results (Maes et al., 2019; Saberifar, 2020). PLS bootstrapping is highlighted in Figure 5 in which the effect of credit is examined on green micro enterprises and women economic freedom. Furthermore, the effect of insurance is examined on green micro enterprises and women economic freedom. Similarly, the effect of green micro enterprises is considered on women economic freedom. Results are reported in Table 5.

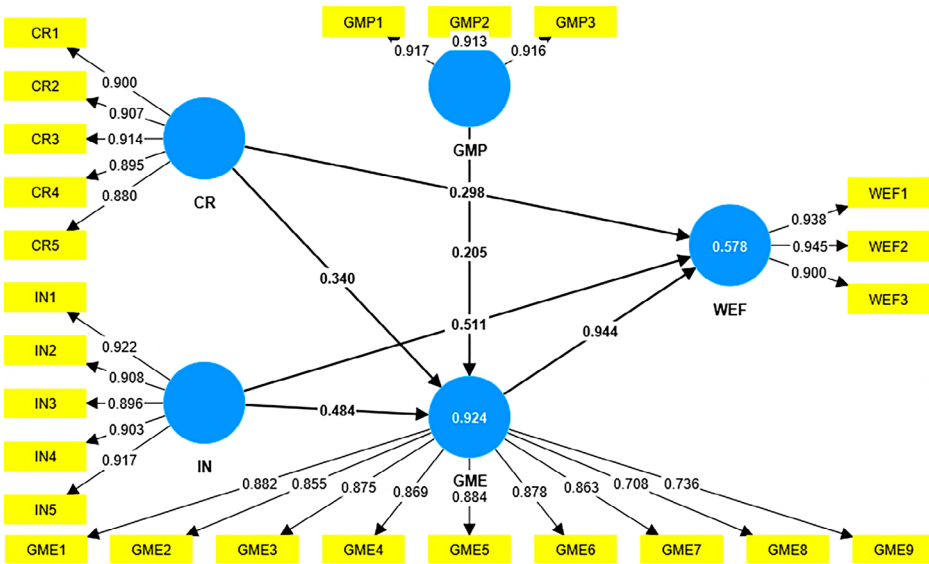


Figure 4. Measurement model

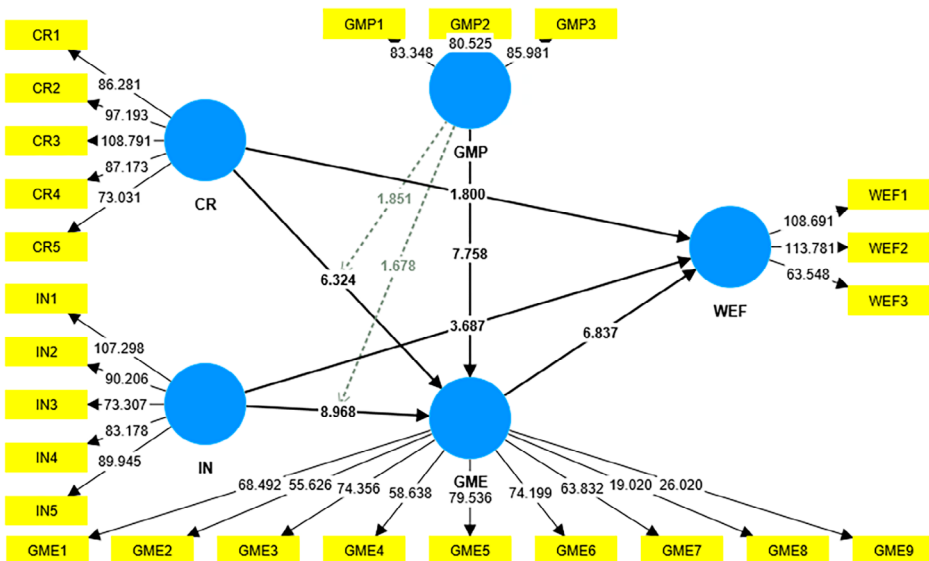


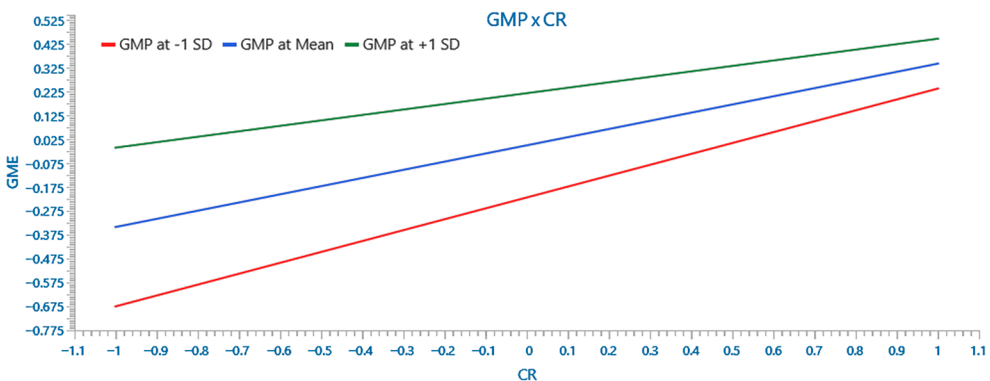
Figure 5. Structural model

**Table 5.** Results (direct effect and moderation)

	Beta	M	SD	T statistics	P values
CR -> GME	0.342	0.344	0.054	6.324	0
CR -> WEF	0.298	0.295	0.166	1.8	0.036
GME -> WEF	0.944	0.947	0.138	6.837	0
GMP -> GME	0.218	0.217	0.028	7.758	0
IN -> GME	0.487	0.485	0.054	8.968	0
IN -> WEF	0.511	0.51	0.139	3.687	0
GMP x CR -> GME	-0.114	-0.111	0.062	1.851	0.032
GMP x IN -> GME	0.104	0.104	0.062	1.678	0.047

Credit has significant relationship with green micro enterprises with t-value 6.324. Furthermore, it also has significant relationship with women economic freedom as the t-value is 1.8 which is higher than 1.64. Results of structural model shows significant effect of insurance on green micro enterprises with t-value 8.968. Similarly, it has significant effect on women economic freedom with t-value 3.687. The relationship between green micro enterprises and women economic freedom is significant as the t-value is 6.837.

Moreover, this study examined the moderation effect of green microfinance policy. The moderation effect of green microfinance policy considered between credit and green micro enterprise. This moderation effect is significant with t-value 1.851. The moderation effect of green microfinance policy between credit and green micro enterprise is given in Figure 6. It shows that moderation effect weakens the relationship between credit and green micro enterprises. Another moderation effect of green microfinance policy is examined between insurance and women economic freedom. This moderation effect is significant with t-value 1.678. Moderation effect of green microfinance policy between insurance and green micro enterprise is given in Figure 7 showing that green microfinance policy strengthens the positive relationship between insurance and green micro enterprise.



**Figure 6.** Moderation effect of green microfinance policy between credit and green micro enterprise

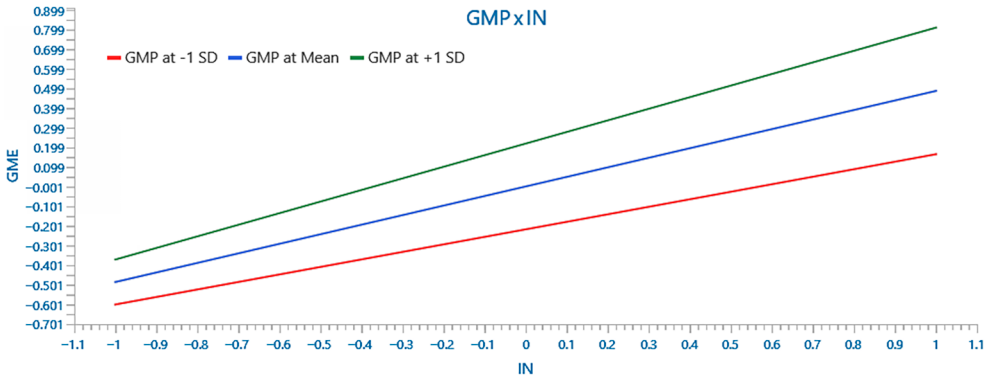


Figure 7. Moderation effect of green microfinance policy between insurance and green micro enterprise

Table 6. Indirect effect

	Beta	M	SD	T statistics	P values
CR -> GME -> WEF	0.323	0.326	0.069	4.713	0
IN -> GME -> WEF	0.46	0.459	0.081	5.646	0

In addition to direct effect, this study addressed the mediation effect of green micro enterprises. First mediation effect of green micro enterprises is considered between credit and women economic freedom. Second mediation effect of green micro enterprises is considered between insurance and women economic freedom. The mediation effect of green micro enterprises between credit and women economic freedom is also significant with t-value 4.713. The mediation effect of green micro enterprises between insurance and women economic freedom is also significant with t-value 5.646. Indirect effect results are given in Table 6.

### 5. Discussion

While considering the direct effect, the effect of credit and insurance is examined in relation to the women economic freedom. Hypothesis 1 and hypotheses 2 indicated the effect of credit and insurance on women economic freedom. Both these hypotheses are supported. Results highlighted that credit has positive effect on women economic freedom. It shows that the delivery of credit by green microfinance institutions to the women economic freedom can increase the level of economic security. These results are consistent with the other studies which also highlighted the positive role of credit to enhance economic security among the women (Akula & Singh, 2022; Duncanson, 2019). Similarly, hypothesis 2 shows that the insurance also has positive effect on economic security. Therefore, the increase in the delivery of insurance services to the women, the economic freedom will increase with the help of economic security. Thus, both the services of green microfinance institutions; credit and insurance have potential to promote women economic freedom in China by promoting economic security.

Hypothesis 3 shows the relationship between credit and green micro enterprise. Results of this hypothesis identified the positive role of credit in green micro enterprise. Increase in credit among women can increase the green micro enterprise success. A study carried out by highlighted the positive role of credit in women micro enterprise development. Similarly, insurance has positive role to enhance green micro enterprises which proved by hypothesis 4. Increase in insurance policies among the women population has positive effect on women micro enterprises. Credit and insurance are both the importance of micro enterprise success among women. Insurance is one of the most important parts of micro enterprise which is providing by the microfinance institutions as reported in the literature (Kazaure, 2019).

Hypothesis 5 shows the positive role of green micro enterprise in women economic freedom. Results of the study reported the positive contribution of green micro enterprise in women economic freedom. The promotion of green micro enterprise among women clients of microfinance institutions can increase the women economic freedom. These results identified that the promotion of women economic security is possible with the help of green micro enterprises success. Similar results are found in literature which identified the positive role of green micro enterprises in women empowerment or women economic security (Alam et al., 2017). The mediation effect of green micro enterprises is addressed in hypothesis 6 and hypothesis 7. It is observed that; green micro enterprises have important role to transfer the positive effect of credit on women economic freedom. Similarly, green micro enterprises have positive role to transfer the positive effect of insurance on women economic freedom.

Additionally, hypothesis 8 identified the positive role of green microfinance policy in green micro enterprises. The microfinance institutions are focusing to promote green initiatives to enhance green micro enterprises through policy making which has key role to enhance green micro enterprises. The moderation effect of green microfinance policy is addressed which identified the valuable results. It is observed that; green microfinance policy has negative influence on the relationship of credit and green micro enterprises through hypothesis 9. This negative effect shows that the green microfinance policy decreases the positive effect of credit on green micro enterprise. This negative effect is due to the various requirements of microfinance institutions towards green projects. The micro enterprises could not fulfil the requirements which lead to the negative effect on green micro enterprises. While considering the environmental issues, microfinance institutions developed the policy to promote green projects, however, these policies have tough requirements to fulfil by the micro enterprises, leading to weaken the relationship between credit and green micro enterprise. However, moderation effect of green microfinance policy between insurance and green micro enterprise is positive. This moderation effect increases the positive effect of insurance on green micro enterprise which is given in hypothesis 9.

## 6. Conclusions and implications

The relationship between green microfinance institutions and women economic freedom is first time examined in this study. To examine this relationship, the current study considered the relationship between credit, insurance, green micro enterprise, green microfinance policy and women economic freedom. The objective of this study was to examine the role of green



microfinance institutions in women economic freedom in China. A survey was carried out through questionnaire among the microfinance institutions of China. 10 hypotheses were proposed to examine the relationship between variables, including the direct effect, indirect effect and moderating effect.

The current study provided important implications for the academicians because this study filled the important literature gap. Women economic freedom is very rare in the literature. Most importantly, the economic freedom of Chinese women is not addressed in the literature. The major contribution of the study is based on the relationship between women economic freedom and green microfinance institutions. Literature have not identified the effect of green microfinance on women economic freedom in China. Therefore, this study addressed the literature gap by considering the effect of green micro finance services such as credit and insurance in relation to the women economic freedom. The findings of the study are very unique in the literature because none of the previous study proved that green micro finance institutions can promote women economic security. Additionally, the study also addressed green micro enterprises as one of the most important elements of economic security. The mediating effect of green micro enterprise is proved by the current study between green micro finance institutions and women economic freedom. The study contributed by addressing the role of microfinance policy in green micro enterprises. The green micro finance policy has the potential to strengthen and the relationship between microfinance institutions and green enterprises which further lead to the women economic freedom. Majorly, this study contributed to the Mayoux's Feminist Empowerment Theory. This study recommended that Mayoux's Feminist Empowerment Theory should be extended by adding green microfinance institutions along with the traditional microfinance institutions.

Findings of the study has important practical insights which can promote women economic freedom in China as well as other countries. As the results of the study proved that green micro finance institutions are important to promote women economic freedom, therefore, practitioners should promote economic freedom among the women with the help of green micro finance institutions. It is recommended to the practitioners to encourage economic security among the women with the help of credit as well as insurance services. The promotion of economic security is possible with the help of credit and insurance services for women to promote green micro enterprises. The economic security among the women must be ensured by the concerned authorities with the help of credit opportunities for the women along with the insurance opportunities. Furthermore, it is recommended to the microfinance institutions to provide flexible green microfinance policy to promote green micro enterprises. The strict guidelines to promote environment policies discourage the women to get loan for green micro enterprises. The microfinance policies should be flexible and easily adoptable by the women owners of green micro enterprises.

## **7. Limitations and future directions**

This study provided valuable insights for the academicians and practitioners; however, this study could not address few of the elements which should be considered by future studies. For instance, this study included only two services of green microfinance institutions such as

credit and insurance. Future studies should include various other services such as micro saving, training and skill development programs. Furthermore, to promote economic freedom, traditional microfinance institutions also have equal role, but this study only addressed green microfinance institutions. Future studies should include traditional microfinance institutions along with green microfinance institutions. Lastly, this study only addressed microfinance banks but not considered non-government organizations (NGOs). NGOs also has significant role to promote women economic freedom which should be considered by future studies.

## Availability of data and material

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

## Competing interests

The author declare that they have no competing interests.

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