Determinants of financial inclusion among women-owned enterprises: a case study of the informal sector

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Abstract

Purpose – The purpose of this paper is to analyse the determinants of financial inclusion among women-owned informal enterprises in India.

Design/methodology/approach – The study is based on a primary survey of 321 informal enterprises. The data has been collected through a structured questionnaire. A chi-square test has been used to examine the significant association between the characteristics of informal enterprises and their owners and financial inclusion. A logistic regression model has been developed to analyse the determinants of financial inclusion among women-owned informal enterprises.

Findings – A significant and negative association has been found between business duration and entrepreneurs' experiences with financial inclusion. In addition, the chi-square test shows a significant association between resource capability, use of ICT by enterprises and financial inclusion. Further, logistics regression shows that duration of business, entrepreneurial experience, resource capability in terms of machinery and equipment use, and ICT are significant determinants of financial inclusion among women-owned informal enterprises.

Practical implications – There are several practical implications for national policymakers and other stakeholders, such as banks and international bodies working on financial inclusion. It is suggested that while designing the policy for financial inclusion among woman-owned informal enterprises, it should ensure that experience and older woman entrepreneurs are included in financial inclusion schemes.

Originality/value – There has been very few research on financial inclusion in woman-owned businesses. However, no research has been conducted on the financial inclusion of women-owned informal businesses. This study fills a gap by investigating the factors that influence financial inclusion in women-owned informal businesses.

Keywords Financial inclusion, Access to finance, Informal enterprises, Woman entrepreneurs, India

Paper type Research paper

Introduction

Financial inclusion refers to the process of ensuring access to suitable financial instruments and services at a reasonable price to disadvantageous and low incomes group

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(Abdu & Adem, 2021; Vo, Nguyen, & Van, 2021; Iqbal & Sami, 2017; Deka, 2015). It is crucial for poverty reduction, social transformation, woman empowerment and inclusive economic prosperity (Pandey, Kiran, & Sharma, 2022; Hewa Wellalage, Hunjra, Manita, & Locke, 2021; Ouechtati, 2020; Hendriks, 2019). Financial inclusion promotes sustainable and equitable economic growth, gender equality and women's economic empowerment (Pal, Gupta, & Joshi, 2022; Cicchiello, Kazemikhasragh, Monferrá, & Girón, 2021; Cabeza-García, Del Brio, & Oscanoa-Victorio, 2019; Samargandi, Al Mamun, Sohag, & Alandejani, 2019). According to empirical research, financial inclusion and income inequality are inversely related, therefore expanding financial inclusion will likely result in lower inequality (Kling, Pesqué-Cela, Tian, & Luo, 2022). Because financial inclusion follows the philosophy of public good which are non-rival and non-excludable for all users (Shabir & Ali, 2022). Equal financial access creates a "virtuous spiral of social, economic and political empowerment" for women (Rastogi & Ragabiruntha, 2018). The Reserve Bank of India and the Indian government have recently placed more emphasis on the idea of financial inclusion as Individuals' access to the formal financial system is more likely to enhance collective savings, with an increase in savings, the capacity to raise investable capital grows, which has a beneficial impact on long-term economic growth (Ghosh & Vinod, 2017; Aghion, Boustan, Hoxby, & Vandenbussche, 2009).

The credit risk assessment systems exhibit unjust discrimination against women, resulting in their disproportionate exclusion from financial services. This exclusion can be attributed to various factors, including inadequate banking infrastructure, limited access to credit information, insufficient financial literacy and lower levels of educational attainment (Morsy, 2020; Ghosh & Chaudhury, 2019). Klapper and Lusardi (2020), Rai, Dua, and Yadav (2019), and Grohmann (2016) shows that there exists a gender-based financial disparity in many countries, potentially attributed to the comparatively lower levels of financial awareness among women. Making women financially aware is also a difficult undertaking because of the lack of freedom women have in developing nations due to societal and cultural constraints (Baluja, 2016). There is also a significant disparity in access to finance between men and women (Demirguç-Kunt & Klapper, 2013; Allen, Demirguc-Kunt, Klapper, & Peria, 2012). Global Findex (2014) found that globally, women are 17% less likely than men to have a formal loan and 20% less likely to have a bank account. Furthermore, the amount of loans given to women for similar activities is smaller than that given to men (Günther, 2017; Demirguç-Kunt & Klapper, 2013; Duflo, 2012). It may be due to the fact that women have less control over the resources accepted as collateral. Women typically lack social capital and financial knowledge, and they are also negatively affected by ingrained gender biases and strict lending guidelines, making it challenging for them to get funding from formal financial institutions (Orser, Riding, & Manley, 2006; Kuada, 2009). When compared to men, women face distinct social structures and social settings that all have an impact on the growth of their human and social capital, which is a major factor in the slower growth of firms owned by women (Brush, Carter, Gatewood, Greene, & Hart, 2006). Moreover, women entrepreneurs suffer from often rejection of business loans (FAO, 2011).

Women's economic participation, especially in the form of self-employment, enhances their economic power and ability to contribute to economic growth (Minniti, Arenius, & Langowitz, 2005; Sarri & Trihopoulou, 2005). Numerous factors affect a woman's decision to pursue a career in business. Strong peer support from family members and the chance for innovation and inspiration lead to entrepreneurial intention, which is essential for starting a firm (Nassif, Andreassi, & Tonelli, 2016; Baum, Frese, & Baron, 2014). Limited access to financial resources has been highlighted as one of the most significant impediments women entrepreneurs face when starting their companies (Sena, Scott, & Roper, 2012). Lack of transaction history and lack of collateralized assets are the primary obstacles women entrepreneurs face when attempting to obtain financing through formal banking channels (Wasiuzzaman, Nurdin, Abdullah, & Vinayan, 2020). When seeking financing, women entrepreneurs from rural, underdeveloped areas with harsh weather frequently prefer informal lending, which includes borrowing from family members, friends, angel investors or moneylenders (Lyons & Kass-Hanna, 2021; Findex, 2019). Within South Asia, significant disparities exist in the availability of capital for women-owned businesses. For instance, in India, where nearly 97% of women-owned firms are microenterprises and almost 90% are in the informal sector, with 52% of them being in only four states: Kerala, Karnataka, Tamil Nadu and West Bengal, 92% are either self-funded or by friends, family and other informal sources (see Arora, 2020).

Women business owners face obstacles such as large interest rates relative to male entrepreneurs, a high reliance on informal financing, and limited financial awareness when getting finance (Muravyev, Talavera, & Schäfer, 2009; Lusardi & Tufano, 2009; Richardson, Howarth, & Finnegan, 2004). Specifically, women business owners are less likely to receive finance from official financial institutions (Coleman & Robb, 2012). To finance their enterprises, they are forced to rely more on unofficial financial resources like private lenders, family members and friends (Treichel & Scott, 2006). The aggregate funding needs of women-owned Micro, Small and Medium Enterprises (MSMEs) in India, both formal and informal, are INR (Indian rupee) 8.68 trillion (Arora, 2020). The inability of women to obtain financial products and services prevents them from seizing market possibilities (Porter, Widjaja, & Nowacka, 2015). The gender gap in India in terms of bank accounts has shrunk from 18% (44% men and 26% women accounts) in a 2011 poll to 6% (83% men and 77% women accounts) in 2017. The government's recent emphasis on financial inclusion, shown by the implementation of the Prime Minister's Jan Dhan Yojana and government-to-person transfers, has emerged as a noteworthy catalyst for progress. The data suggests that a substantial proportion of women's accounts exhibit inactivity, implying a lack of engagement with formal financial institutions. A significant proportion of women in India, specifically 42%, abstained from making any financial transactions, such as deposits or withdrawals, over the entire year.

The notion of the informal sector originated in the 1970s and pertains to a diverse and significant phenomenon involving productive entities and labourers who operate outside the realm of regulated economic activity and safeguarded labour relations. The significance of the informal sector has increased not only due to its proliferation in numerous nations but also because this expansion has given rise to novel expressions that are increasingly acknowledged as means to foster economic development and alleviate poverty. However, it is estimated that more than 60% of men and women employed worldwide earn their living through the informal economy (ILO, 2018). It is challenging to estimate the overall size of the informal sector and the proportion of men and women whose livelihoods depend on it. The Indian economy is highly bifurcated, especially the labour market. India has both a formal economy and a highly regulated labour market, but the country also has a sizable informal sector that is responsible for over 60% of gross domestic product (GDP) and employs more than 90% of the workforce (World Bank, 2008). The International Labor Organization (ILO, 2020) estimates that as many as 400 million people in India's informal economy could be pushed into extreme poverty as a direct result of the spread of COVID-19. Women contribute to two-fifths of the workforce in India, but they have limited access to financing (Singh & Pattanaik, 2018). The current study focuses on women who engage in unregistered microbusinesses and do not pay taxes, both as individuals and on behalf of their enterprises. These businesses are exclusively operated by women. Hence, these entities are referred to as women-owned informal enterprises. They do not have any accounts with the name of enterprises because they are not registered. Consequently, individuals conduct their financial transactions either through their personal bank accounts or by using cash. Typically, financial transactions in informal businesses controlled by women are conducted through cash exchanges. The informal enterprises engage in the sale of dairy products, groceries, fruits and vegetables, as well as clothing businesses, conducted from residential premises.

Academicians have been fascinated by female entrepreneurship because it has the potential to boost economic growth and create jobs (Baumol, 1996). Policymakers see women entrepreneurs as the new engine for economic growth and rising stars for an emerging economy that will bring prosperity to the country (Garg & Agarwal, 2017). Carter, Anderson, and Shaw (2001) concluded that women-owned businesses have lower sales turnover, fewer staff, serve largely local markets and are less ambitious to grow their enterprises and less enthusiastic about the future success of their businesses than men. There was a paucity of accumulated knowledge to appropriately conceptualise and create explanatory theories on the growth process of women-owned firms (Brush *et al.*, 2006). Access to finance is frequently empowering, especially for women, because it allows for greater economic and social inclusion (Park & Mercado, 2015). In addition, a lenient legal environment and easy access to finance will increase entrepreneurial activity in the country (Bogdanovic, 2017). Even after accounting for a number of factors such as age, income, education, work status and rural domicile, gender continues to be highly correlated with both access to and use of financial services (Demirguc-Kunt, Klapper, Singer, & Ansar, 2018). In many developing nations, women entrepreneurs may face even greater impediments to getting formal financial services (Bardasi, Blackden, & Guzman, 2007; Demirgüç-Kunt & Levine, 2009).

A lot of studies has been done on the issue of financial inclusion in general (Bekele, 2023; Abdu & Adem, 2021; Cicchiello *et al.*, 2021; Akudugu, 2013) and among women in particular (Goel & Madan, 2019; Ghosh & Chaudhury, 2019; Holloway, Niazi, & Rouse, 2017). However, there are limited studies on the financial inclusion among SMEs while very few in financial inclusion among women owned enterprises. There is no study on financial inclusion among women owned informal enterprises. Therefore, novelty of this study is lies in filling the research gap by analysing the determinants of financial inclusion among women-owned informal enterprises. Understanding of determinants of financial inclusion among women owned informal enterprises is instrumental in designing product and policy. There is imperative to explore the determinants of financial inclusion among women owned informal enterprises. Considering the importance and severity of the topic, the broad aim of this paper is to analyse the determinants of financial inclusion among women owned informal enterprises. The specific objectives of the study are assessed the association between firms and women entrepreneur's characteristics and financial inclusion in terms of having bank account. Further, paper presented the factors affecting the financial inclusion among women-owned informal enterprises.

This research adds to the existing literature on financial inclusion in informal sector in both a theoretical and practical sense, with a specific focus on women-owned firms. The current study introduces a novel research approach aimed at investigating the elements that contribute to financial inclusion among informal enterprises owned by women. This raises the question of what potential avenues exist for conducting a comprehensive investigation in this particular field. Moreover, this study aims to examine the association between the characteristics of owners and firms, and financial inclusion among woman owned informal enterprises, which may help to design the specific strategy for informal enterprises regarding financial inclusion. In this study, we aim to examine the factors that influence financial inclusion among informal enterprises owned by women. By identifying these drivers, we may develop effective strategies to address the issue of financial inclusion within the informal sector specifically for women-owned enterprises.

This research paper has total 5 sections. Literature review and conceptual research framework is presented in section 2. Section 3 discussed the methodology which includes data source and questionnaire, data analysis techniques and descriptive statistic. Results and discussion on association of informal enterprises and owners characteristics with financial inclusion and determinants of financial inclusion in female owned enterprises is given in section 4. Final section provides the conclusion, implications and limitation of the study.

Review of literature

Financial inclusion among women and its determinants have been studied by various researchers, which is critical for policymakers, particularly in developing countries (Tinta, Ouédraogo, & Al-Hassan, 2022; Mishra, Malik, Chitnis, Paul, & Dash, 2021; Bhatia & Singh, 2019; Ghosh & Vinod, 2017; Demirgüç-Kunt, Klapper, & Singer, 2013). Studies have suggested that financial inclusion has increased over time, but women are still lagging behind as compared to men in availing of financial services, and the degree of discrimination against women varies across countries (Morsy, 2020; Mohammed, Mensah, & Gyeke-Dako, 2017; Demirgüç-Kunt, Klapper, Singer, & Van Oudheusden, 2015). Balasubramanian, Kuppusamy, and Natarajan (2019) indicated that when women are supported by other family members and belong to a higher income quartile group, they are more likely to avail credit from the bank. Ghosh and Vinod (2017) assessed the constraints on financial inclusion among women. They found gender disparity in both access to and use of financial services. Further, they highlight that for female-headed households (FHHs), education and wages are more relevant in explaining access to finance, whereas political and social factors are much more germane in explaining the use of finance. Kaur and Kapuria (2020) explored the determinants of financial inclusion from a gender perspective. The study points out four important findings: (1) FHHs have a lower probability of accessing institutional finance and a higher probability of accessing non-institutional sources of finance; (2) In general, education levels, monthly household consumption expenditure, land size holding, irrigated area and penetration of scheduled commercial banks favourably influence financial inclusion; (3) Third, FHHs belonging to socially disadvantaged castes are less likely to access institutional finance; and (4) a large chunk of FHHs access neither institutional finance nor non-institutional finance.

Further, the impact of financial inclusion on women's empowerment has been discussed and evaluated in many studies, which is important for gender-specific policy design and promotion (Pal *et al.*, 2022; Hendriks, 2019; George & Thomachan, 2018; Swamy, 2014). Bhatia and Singh (2019) assessed women's empowerment through financial inclusion in urban slums and concluded that financial inclusion is a critical indicator for economic development and well-being in society, and the Pradhan Mantri Jan-Dhan Yojana (PMJDY) scheme has been quite successful, especially in the case of women in slums, and has a positive influence on the social, political and economic dimensions of women's empowerment. Financial tools can allow women to make decisions and acquire greater control over resource distribution within households (Karlan *et al.*, 2016). Holloway *et al.* (2017) argued that because low-income women experience poverty more frequently than men do, it is crucial for both women's empowerment and poverty reduction to give them the financial access to manage risk, save money, borrow money and pay their bills. Aslan (2022) constructed a multidimensional financial inclusion index and found that formal employment, national ID and government spending on education and health drive financial inclusion. He also said that education is extremely important for low-income people and that government spending on education and health would improve youth financial inclusion in South Asia, especially for women. Aziz, Sheikh, and Shah (2022) discuss why Asian women are discouraged and more likely to be removed from the formal financial system than men. They show that women are less likely than men to have bank accounts in countries where religious constraints prevent them from working. Pal *et al.* (2022) examine the impact of social and economic dimensions on women's empowerment through financial inclusion in rural India and find that earning status, household financial decision-making and social welfare plan receipt have a substantial impact.

The study conducted by Ndouna and Zogning (2022) examines the impact of varying financial product accessibility on the mitigation of income disparities among male and female individuals employed in the informal sector inside Cameroon. They indicate that in terms of credit accessibility, men exhibit a higher degree of financial inclusion compared to women. According to Amin (2018), women entrepreneurs operating in the informal sector tend to earn lower incomes compared to their male counterparts. Additionally, research conducted by Aterido, Beck, and Iacovone (2013) suggests that women entrepreneurs in this sector face limited access to formal financial services in comparison to males. The accessibility of financial services in under developed countries such as African countries is significantly limited among the women, especially within the informal economy (Andersen & Muriel, 2007). According to Bruhn and Love (2014), women who engage in informal trading have low incomes, and as a result, they are unable to maintain the accounts that financial service providers make available to them. Siwela and Njaya (2021) confirm that mobile technology has transformed the non-banked and under-banked, especially women working in informal sector women. Despite mobile phones' convenience, reliability and accessibility for Zimbabwe's underbanked and unbanked, affordability is a barrier to financial inclusion. According to Demirgüç-Kunt (2018), mobile phones have a significant impact on facilitating financial inclusion. The utilisation of mobile technology has contributed to the enhancement of financial inclusion among women engaged in informal industries within the context of Zimbabwe.

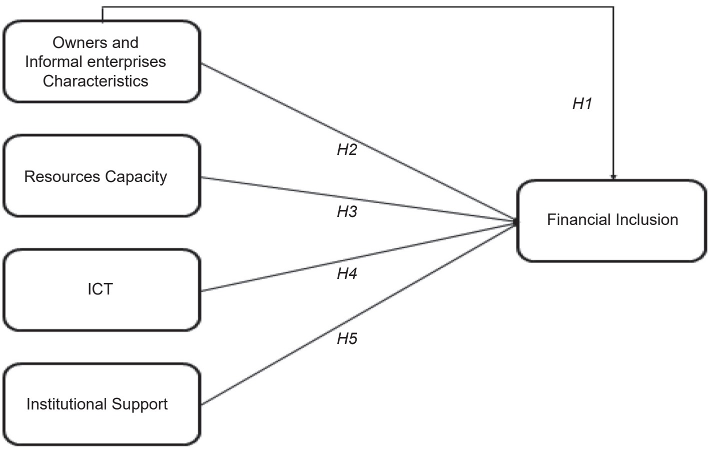
Considering the critical nature of finance for entrepreneurship in general and women's entrepreneurship in particular, many studies have discussed barriers, enablers, and access to finance by women entrepreneurs (Andriamahery & Qamruzzaman, 2022; Shaikh, Tunio, & Qureshi, 2021; Goel & Madan, 2019; Manwari, Ngare, & Kipsang, 2017; Fareed, Gabriel, Lenain, & Reynaud, 2017; Witbooi & Ukpere, 2011). Howell and Nanda (2019) expressed that access to finance is still one of the biggest problems for women entrepreneurs in both developed and developing countries. Kwong, Jones-Evans, and Thompson (2012) studied if being female increased the likelihood that an individual believed trouble acquiring funding was a barrier to establishing a business and found gender variations in perceived financial constraint. Andriamahery and Qamruzzaman (2022) examined the effects of access to finance, technical know-how and financial literacy on women's empowerment through establishing women's entrepreneurial development and suggested that effective policies around financing accessibility, technical knowledge expansion and financial understanding must be promulgated in the economy to sustain women's entrepreneurship and empower women. Fareed *et al.* (2017) examine the association between women's entrepreneurship and financial inclusion across informal and formal work and economic sectors. The positive association between women's entrepreneurship and financial inclusion does not hold for women entrepreneurs in the informal sector or in commerce, and problems pertaining to financial illiteracy exist in the informal sector. Shaikh *et al.* (2021) examined women's entrepreneurship funding sources in developing, emerging and transition economies (DETEs) and found that women entrepreneurs face financing difficulties while starting, maintaining and growing their businesses. Kedir and Kouame (2022) find that increasing mobile money use in Africa promotes financial inclusion and women's entrepreneurship. Oshora (2022) revealed that Ethiopian government policies and laws positively and significantly affect women's economic empowerment through financial inclusion for SMEs. They also found that collateral, start-up capital, illiteracy, high interest rates, bureaucratic procedures and a lack of technical skills hamper Ethiopian women's economic empowerment. Ojo and Zondi (2021) examined the impact of institutional quality and governance on financial inclusion among women entrepreneurs and found no impact, and further efforts must be intensified to achieve equal access to financial services in South Africa. Goel and Madan (2019) find that financial inclusion has a statistically significant impact on women's entrepreneurship, along with family conditions, benchmarking, entrepreneurial motivation and entrepreneurial intention. It helps women start businesses. Using survey data on informal traders, Simatele and Kabange (2022) demonstrate that the presence of various forms of marginalisation significantly influences the ability to access financial resources. Education is identified as a crucial determinant in mitigating the impact of various marginalities within the banking sector. Individuals who identify as female and those who identify as black and possess greater levels of education are more likely to have improved access to more reliable sources of start-up finance.

The literature analysis showed that financial inclusion for women entrepreneurs is crucial for women's empowerment but is yet underdeveloped. Financial inclusion depends on women's entrepreneurs, enterprises and resource utilisation. Financial inclusion promotes women's entrepreneurs and the economy. Poverty traps could hinder women's growth without inclusive financial systems (Tarsem, 2018; Allen *et al.*, 2012). The majority of the research examined women's reasons for starting a business and the following impact of those motivations on growth, as well as the impact of their location, whether urban or rural, on business performance and the impact of the business's size and industry on its growth (Merrett & Gruidl, 2000; Du Rietz & Henrekson, 2000; Buttner & Moore, 1997). Over the course of its 70 years as an independent nation, India has advanced significantly on many fronts. However, a significant portion of the population, particularly women in India, is still not part of the mainstream of progress. Due to the gravity of the problem at hand, a thorough study of the factors that influence financial inclusion among informal businesses run by women is essential due to the prevalence of informal business among women. Consequently, this study addresses the two primary research questions. (1) the relationship between financial inclusion and the characteristics of owners and informal enterprises; and (2) understanding the causative factors of financial inclusion among women-owned informal enterprises. Based on the research question, a conceptual research framework has been developed for the study (Figure 1). On the basis of the above research questions and framework given in Figure 1, the hypothesis to analyse the determinants of financial inclusion among woman-owned enterprises is as follows;

H1. There is significant association between financial inclusion and the characteristics of owners and informal enterprises

H2. The characteristics of owners and informal enterprises affect the financial inclusion among women owned informal enterprises

H3. Resource capacity affects the financial inclusion among women owned informal enterprises.



Source(s): Prepared by author

Figure 1. Conceptual research model

H4. ICT affects the financial inclusion among women owned informal enterprises.

H5. Institutional support affects the financial inclusion among women owned informal enterprises.

Research methodology

Data collection techniques and survey instruments

To understand the determinants of financial inclusion in terms of bank accounts among women-owned informal enterprises, a primary survey from western Uttar Pradesh was conducted. Uttar Pradesh is the most populous state in India and ranks as the sixth-largest administrative unit globally in terms of population. The primary survey was done using a structured questionnaire. The sampling frame for informal enterprises owned by women is unavailable. The data collection process employed a non-probability sampling technique. The study employed snowball and purposive sampling strategies to gather data from informal companies run by women. Snowball sampling helps us reach the same kind of respondents. A comprehensive sample was collected from a total of 321 informal enterprises operated by women. The unit of analysis pertains to informal enterprises that are operated by women. The interview methodology has been employed to get data from the aforementioned women. In order to optimise participation rates, the researchers initially reached out to female business owners to collect data at their preferred time slots. The interview method has commonly been employed to get data from respondents in the majority of circumstances. Furthermore, participants were provided with the opportunity to independently complete the questionnaire and subsequently submit it to our research team.

To collect the primary data needed to measure financial inclusion among women-owned informal enterprises, a structured questionnaire was developed. This structured questionnaire mainly includes questions related to owners' characteristics such as entrepreneur age, entrepreneur experience, business duration, number of household members, education level of entrepreneurs as well as enterprise characteristics in terms of whether businesses have machinery or equipment, vehicles, smart mobile phones, loans through government schemes and keep written business records. Financial inclusion is measured in terms of accounts in the bank. If the woman has an account in the bank and is using this account for her business purposes, this is termed as financial inclusion in female-owned enterprises. Their business is not registered formally, and women are not paying any tax as the business is very small and they are not eligible. They are asked on a binary scale whether they have a bank account or not (yes = 1, no = 0) and it is treated as financial inclusion among women-owned enterprises. The majority of the questions were asked on a nominal and ordinal scale. The description of variables used in the regression model is given in Table 1.

Variables selection and estimation strategy

Simple descriptive statistics, the chi square test and logistic regression have been used to analyse the data. A chi-square test has been applied to analyse the association between owner characteristics, resource capability and ICT with financial inclusion among woman-owned enterprises. Further, a logistic regression model has been developed to explore the determinants of financial inclusion. The reason behind using logistic regression is the dichotomous nature of the dependent variable. The owner of the informal business having a bank account is taken as the dependent variable, which is measured on a dichotomous scale (yes = 1, no = 0), while all independent variables are measured on a different scale. Therefore, logistic regression is a suitable approach to exploring the determinants of financial inclusion in woman-owned informal enterprises. There are four sets of independent variables: owner and enterprise characteristics, resource capacity, ICT and institutional support. All four sets

	Description	N	Miin	Max	Mean	S.D
Dependent variable						
Financial inclusion	Women have account in bank and using this for business purpose (Yes = 1, No = 0)	321	0	1	0.43	0.50
Independent variables						
Owner and informal enterprises characteristics						
Business duration	How long she is doing this business	320	0	50	6.99	8.22
Education level of entrepreneurs	Education level	321	0	1	0.55	0.50
Entrepreneur experience	How many years of experience she has	317	1	50	9.67	8.01
Resources capacity						
Business have machinery or equipment	Business or activity uses any machinery or equipment (Yes = 1, No = 0)	289	0	1	0.29	0.46
Business have vehicles	Business or activity uses vehicles (Yes = 1, No = 0)	296	0	1	0.15	0.35
ICT						
ICT use	Using smart mobile phone for business purpose is concern (Yes = 1, No = 0)	321	0	1	0.69	0.47
Institutional support						
Loan through government scheme	Owner received loan under government scheme (Yes = 1, No = 0)	206	0	1	0.06	0.24

Source(s): Calculated by author based on primary data

Table 1. Descriptive statistics and variables description

of independent variables have a total of seven explanatory variables. Descriptive statistics of dependent and independent variables are given in Table 1. A specific regression model to analyse the determinants of financial inclusion can be written as follows:

$$FI = \beta 0 + \beta 1EE + \beta 2\,ELE + \beta 3\,BD + \beta 4\,BME + \beta 5\,BV + \beta 6\,ICT + \beta 7LGS + \varepsilon$$

Where, FI is financial inclusion which measured through bank accounting holding, EE is entrepreneur experience, ELE is education level of entrepreneurs, BD represent business duration, BME is business have machinery or equipment, BV shows business have vehicles, ICT shows that informal enterprises use smart phone in business and LGS represent loan through government scheme.

The logit model is based on the cumulative logistics probability function and is specified as follows:

$$P = F(Z) = \frac{1}{\left(1 + e^{-(\alpha + \beta_i X_i)}\right)}$$

Results and discussion

Profile of owners and informal enterprises characteristics by financial inclusion

The characteristics of owners and informal enterprises with financial inclusion are presented in Table 2. Analysis shows that 42.7% of women-owned informal enterprises have bank accounts. The chi-square test shows a significant negative association between business duration and financial inclusion ($\chi^2 = 8.01$, P = 0.046), which implies that older informal enterprises do not have bank accounts to run their businesses. It reveals that young women-owned informal enterprises have more banking penetration and have bank accounts for

	Have a bank account to run this business				Chi-square	df	Sig
	Yes		No				
	N	%	*N*	%			
Business duration							
Less than 5 years	95	48.5	101	51.5	8.01**	3	0.046
6–10 years	24	34.8	45	65.2			
11–15 years	8	36.4	14	63.6			
>15 years	9	27.3	24	72.7			
Entrepreneur experience							
Less than 5 years	70	51.9	65	48.1	9.393**	3	0.025
6–10 years	35	39.3	54	60.7			
11–15 years	13	35.1	24	64.9			
Above 15 years	17	30.4	39	69.6			
Education level of entrepreneurs							
No schooling	5	20.8	19	79.2	16.949*	5	0.005
Incomplete primary school	12	32.4	25	67.6			
Primary school	33	39.3	51	60.7			
secondary school certificate	50	42.7	67	57.3			
Complete technical/non-technical diploma	25	59.5	17	40.5			
University bachelors or more	12	70.6	5	29.4			
Smart mobile phone							
Yes	109	49.5	111	50.5	13.475*	1	0.000
No	28	27.7	73	72.3			
Loan through government scheme							
Yes	10	76.9	3	23.1	6.229**	1	0.013
No	80	41.5	113	58.5			
Business have vehicles							
Yes	23	53.5	20	46.5	1.611	1	0.204
No	109	43.1	144	56.9			
Business have machinery or equipment							
Yes	55	65.5	29	34.5	19.397*	1	0.000
No	76	37.1	129	62.9			

Note(s): * Shows 1 percent level of significance, ** Shows 5 percent level of significance and *** Shows 10 percent level of significance
Source(s): Calculated by author based on primary data

Table 2. Profile of owners and informal enterprises characteristics by financial inclusion

informal businesses. Similarly, χ^2 estimates of entrepreneur experience with and without bank accounts revealed a significant negative association ($\chi^2 = 9.393$, P = 0.025), reflecting that new entrepreneurs are relatively more likely to open bank accounts now as compared to experienced entrepreneurs. Because of the established conventional system, it's possible that older individuals do not place a high value on using financial services. Research by Litwin and Sapir (2009) demonstrates that older people often underestimate their financial difficulties. For education level, a significant positive association has been observed ($\chi^2 = 16.949$, P = 0.005) with financial inclusion among woman-owned informal enterprises. It implies that the education level of entrepreneurs plays an important role in opening bank accounts among women entrepreneurs working in informal businesses. Bajos *et al.* (2012) also demonstrate that women with a low level of education face financial difficulties. Lotto (2018) confirms a gender disparity in formal financial inclusion, which may be attributable to the inability of women to provide collateral, their lack of financial literacy and their lack of business experience.

As far as ICT use in terms of using smart mobile phones for business purposes is concerned, analysis revealed a positive association between using ICT and financial inclusion ($\chi^2 = 13.475$, P = 0.000), which may be due to the fact that use of ICT empowers and makes people aware of benefits and procedures. A positive and significant association was observed between financial inclusion and having machinery or equipment in informal enterprises ($\chi^2 = 19.397$, P = 0.000). It implies that resource-capable informal enterprises have bank accounts. Similarly, institutional support in the form of loans through any government scheme has a positive association with financial inclusion ($\chi^2 = 6.229$, P = 0.013). It may be due to the fact that the government now provides direct benefit transfer (DBT) in bank accounts that forces people to open bank accounts. The previous studies suggest that the significance of individual traits and economic conditions in determining financial inclusion is noteworthy. Specifically, higher levels of education and income are connected with an increased likelihood of financial inclusion. Conversely, being a woman, having lower levels of education, being unemployed and experiencing poverty are negatively correlated with financial inclusion (Asuming, Osei-Agyei, & Mohammed, 2019; Yangdol & Sarma, 2019).

Determinants of financial inclusion among woman owner of informal enterprises

The result of the binary logistics regression model is given in Table 3. Column 2 represents the regression coefficient, column 3 reflects the standard error and Wald statistics are given

1	β 2	S.E. 3	Wald 4	df 5	*p*-value 6	Exp(*β*) 7
Owner and informal enterprises characteristics						
Business duration	0.029	0.025	1.304	1	0.253	1.029
Entrepreneur experience	−0.071**	0.033	4.534	1	0.033	0.931
Education level of Entrepreneurs (Above primary = 1, Else = 0)	0.686**	0.347	3.906	1	0.048	1.986
Resources capacity						
Business have machinery or equipment (Yes = 1, No = 0)	1.476*	0.429	11.841	1	0.001	4.377
Business have vehicles (Yes = 1, No = 0)	0.344	0.525	0.431	1	0.512	1.411
ICT						
ICT use (Yes = 1, No = 0)	0.983***	0.384	6.565	1	0.01	2.673
Institutional support						
Loan through government scheme (Yes = 1, No = 0)	0.727	0.778	0.873	1	0.35	2.069
Constant	−1.294*	0.466	7.73	1	0.005	0.274
Log likelihood	−104.71					
Cox & Snell R Square	0.195					
Nagelkerke R Square	0.26					
Correct prediction	68.9					
Omnibus tests of model coefficients						
Chi-square value	39.022					
df	7					
Sig	0.000					

Note(s): * Shows 1 percent level of significance, ** Shows 5 percent level of significance and *** Shows 10 percent level of significance
Source(s): Calculated by author based on primary data

Table 3. Determinants of financial inclusion among woman owner of informal enterprises

in column 4. Column 5 shows the degree of freedom, and the significance level (p-value) is presented in column 6. The odd values, which represent the ratio of probability of having a bank account by woman-owned informal enterprises to not having a bank account, are given in column 7. There are various studies that examine the determinants of financial inclusion among individuals (Bekele, 2023; Abdu & Adem, 2021; Bozkurt, Karakuş, & Yildiz, 2018; Sanderson, Mutandwa, & Le Roux, 2018; Akudugu, 2013). The logistic regression results reveal that out of a total of 7 variables, 4 variables, namely entrepreneur experience, business machinery or equipment, ICT use and education level of entrepreneurs, significantly determine financial inclusion in terms of bank accounts.

The regression coefficient of entrepreneur experience is negative and significant ($\beta = -0.071$, $p = 0.033$), indicating that women who are involved in informal business have less experience and are more likely to have bank accounts. The possible reason for this result may be awareness about the importance of bank accounts among young female entrepreneurs. According to Oseifuah (2010), young entrepreneurs have better financial literacy. In addition, less experienced entrepreneurs require loans from banks to establish their businesses, so they need to open bank accounts to get credit. The logistic regression estimates for machinery or equipment are positive and significant ($\beta = 1.476$, $p = 0.001$), indicating that informal businesses use machinery and equipment to determine the opening of bank accounts for their owners. It may be due to the fact that some big machines are generally not purchased in cash; people buy them on finance, which requires a bank account. Odd value shows that informal businesses having machines and equipment are 4.377 times more likely to have bank accounts as compared to those informal enterprises that do not have any machines and equipment.

The estimated coefficient of ICT (information and communication technology) shows that it has positive and significant implications for financial inclusion in terms of having a bank account for women-owned informal enterprises ($\beta = -0.983$, $p = 2.673$). Previous studies have also observed that ICT can be instrumental in empowering women and creating financial awareness (Mushtaq & Bruneau, 2019; Bansal, 2014; Patil, Dhere, & Pawar, 2009). The odd ratio suggests that women who use ICT are 2.673 times more likely to have a bank account than women who do not use ICT. According to Garcia-Murillo and Velez-Ospina (2017), ICTs (information and communication technologies) have garnered considerable acclaim for their advantageous effects. They found that mobile phones contribute to the expansion of the informal sector, and broadband connectivity might facilitate individuals' transition to the formal sector, enhancing their economic circumstances. The regression analysis supports the fact that the education level of entrepreneurs has a positive and significant impact on having a bank account for women owners of informal enterprises ($\beta = 0.686$, $p = 0.048$). It implies that education attainment has a significant positive impact on financial inclusion. Highly educated people understand the benefits of financial literacy and holding a bank account. The results are in line with the findings of studies by Fungáčová and Weill (2015) and Ghosh and Vinod (2017). Estimates of log likelihood (−104.710) suggest that the regression model is reasonably fit to explore the determinants of financial inclusion by female owners of informal enterprises. The correct prediction of the regression model is 68.9%. The value of the chi-square test is 39.022, which is significant at the 1% level. It shows that all predictor variables have significant power to explain financial inclusion.

Conclusion and policy implications

Financial inclusion is one of the major challenges in India as well as other developing countries. It became very critical in the case of women and informal business. It is imperative to bring a large section of society into the main stream economic system so they can save and connect with an easy, necessary, and affordable financial system. Despite huge effort, informal businesses, particularly women-owned businesses, are not part of the formal banking system. Considering the importance of understanding the determinants of financial inclusion at the individual level, a primary survey has been done to explore the determinants of financial inclusion in terms of bank accounts in India for proper policy formulation.

The finding shows that 47.7% of the women entrepreneurs involved in informal business have bank accounts. It has been found that young woman entrepreneurs working in informal enterprises with less experience are associated with financial inclusion in woman-owned enterprises. Further, a positive association is observed between a woman entrepreneur's education level and having a bank account. In addition, the chi-square test shows that the resource capability of woman-owned enterprises is significantly associated with financial inclusion. The regression analysis reveals that owner and informal enterprise characteristics in terms of the entrepreneur's experience and education and resource capacity with respect to business machinery or equipment have significant effects on financial inclusion among woman-owned enterprises. Moreover, logistic regression shows that the use of information and communication technology is very instrumental in financial inclusion.

The research reveals a number of noteworthy practical implications, any of which may be of assistance to the numerous stakeholders, including the government, the bank and other international organisations working in the field of financial inclusion. The findings contribute to the development of a framework for increasing financial inclusion by measuring the characteristics of owners and firms. It has been suggested that when the strategy for financial inclusion among woman-owned informal businesses is being designed, it should guarantee that women of all age groups should be included in financial inclusion schemes. Policymakers should focus on the diffusion of information and communication technology (ICT) and education among women-owned informal enterprises. Because it contributes to increased financial inclusion, special focus should be placed on developing the resource capabilities of informal businesses that are owned by women.

There are some limitations for the present study in terms of a lack of behavioural variables and a lower sample size. Future research on financial inclusion may be designed based on an already established theoretical model and include some behavioural factors with a larger sample size.

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