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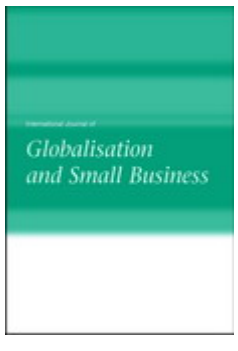

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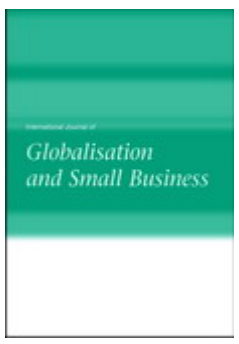

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Title: Improving the business performance of women's micro and small enterprises: evidence from Indonesia

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Abstract: This study aims to investigate the determining factors to improve women's micro small enterprises (MSEs) business performance in Indonesia. An explanatory sequential design from mixed research methods was applied to analyse the quantitative data of questionnaires and qualitative data from field observation and focus group discussion to help explain or contextualise the quantitative findings. By applying partial least squares-structural equation modelling (PLS-SEM), we found that only access to finance, social networks, and product innovation have direct and significant effects on the business performance of women's MSEs. Furthermore, family support and the adoption of digitalisation have direct effects on product innovation. These two variables also indirectly affected women's MSEs business performance if mediated by product innovation. This study relied on the model constructed and was based on a cross-sectional design where all variables were subjective self-report variables obtained from a single source. Thus, caveats apply.

Keywords: business performance; family support; access to finance; digital adoption; product innovation; women's MSEs; Indonesia.

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Improving the business performance of women's micro and small enterprises: evidence from Indonesia

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1 Introduction

Micro, small, and medium enterprises (MSMEs) play a significant role in the economies of many developing countries (World Bank, 2016). In Indonesia, in particular, the Central Bureau of Statistics (2024) reported that the number of MSMEs in 2023 exceeded 65 million establishments. These MSMEs are spread across various sectors, including culinary, fashion, handicrafts, and digital technology. This sector contributed approximately 60.5% of the national gross domestic product (GDP) and employed 97% of the total workforce. Of the total number of MSMEs, about 70.3% were micro small enterprises (MSEs), which are predominantly operated by women (Central Bureau of Statistics, 2022a). These women's MSEs create not only jobs (Weldeslassie et al., 2019)

but also support economic growth (Fiseha and Oyelana, 2015) and contribute to poverty alleviation (Nursini, 2020).

Previous studies in the literature confirmed that women engaged in MSEs not only in Indonesia but also in many developing countries face many problems (World Bank, 2016; Tundui and Tundui, 2021). These problems include limited financial access and market, raw materials, tight competition, and access to fuel/energy (Panda, 2018; Prijadi et al., 2020; Atmadja et al., 2018). Also, there are problems related to the lack of product innovation, the adoption of digitalisation, social networking, insufficient family support, entrepreneurial skills, market orientation, managerial ability, product strategy, process and service improvement, resource capability, innovation culture, and organisational climate (Basu and Chaudhuri, 2023; Goldooz and Zakery, 2024; Kafetzopoulos, 2022; Matekenya and Moyo, 2022; Dabić et al., 2019). These problems make the business performance of women's micro and small businesses poor (Safitri et al., 2019; Tambunan, 2021).

However, the findings of the above studies differ between one study and another. Harini et al. (2023), for example, found that the problem of product innovation does not affect micro-small business performance. Neneh and Welsh (2022) and Kar and Ahmed (2022) confirmed that family support has a positive effect on micro-small business performance, while Tundui and Tundui (2021) and Dyer et al. (2012) indicated that business performance encounters obstacles with family support. In terms of digitalisation adoption and business performance, Jones et al. (2014), Azam (2015), and Yasa et al. (2020) showed positive effects, in contrast with the work by Sanchez-Riofrio et al. (2022) in Latin America, where digitalisation adoption has failed to enhance MSEs' business performance. Basu and Chaudhuri (2023) from their study in India also confirmed that the effect of digitisation has not yet been reflected in the sales growth of SMEs.

As the previous empirical findings showed different results concerning factors influencing the business performance of women's MSEs, this study aims to fill the research gap specifically to examine:

1 the direct effects of family support, financial access, social networks, the adoption of digitalisation, and product innovation on the business performance of women's MSEs

2 the direct effects of family support, access to finance, social networks, and the adoption of digitalisation on product innovation of women's MSEs

3 the effects of family support, financial access, social networks, the adoption of digitalisation on the business performance of women's MSEs mediated by product innovation.

The urgency and the uniqueness of examining the business performance of women's MSEs is because the MSEs sector in Indonesia is dominated by women. This indicates that not only can men do this MSEs business activity, but also MSEs business activity can be a safety valve for women to get family income and to avoid difficulties in getting formal employment (Hamdani et al., 2023). Also, compared to businesses owned by men, women-owned MSEs are imposed by women`s dual responsibility for the business on the one hand, and family and household on the other. Women's MSEs lack ownership of

property, minimal prior business experience, limitations in mobility, and huge dependence on husbands and family. Additionally, women's MSEs face constraints related to regulation, access, and use of finance that are more severe than for men (World Bank, 2016). Thus, improving those shortcomings needs a specific approach that cannot be the same for women's and men's MSEs.

Of the regencies in Indonesia, the Belitung Regency of the Bangka-Belitung province was justified as the survey location. This is because MSEs in this regency were engaged by women (CBS, 2022a). The Small-Medium Enterprises, Trade, and Labour Cooperative Service office in Belitung Regency (2023) recorded that the proportion of women's MSEs in this regency was about 63.6%. Also, women's MSEs in Belitung Regency have already used digital technology to market their products. The type of business characteristics of women's MSEs in this location are not only limited to food, beverage, apparel, pharmaceutical, and handicraft, but also leather goods and footwear business activities. These business characteristics relatively differ compared with other regencies in Indonesia (CBS, 2022).

Therefore, this study can contribute to widening the knowledge of factors influencing the business performance of women's MSEs. Also, it can sharpen policy efforts and well-designed support programs to improve the business performance of women's MSEs at least in the Belitung regency. However, before we detail and discuss the results of the study, we first highlight the theory underlying this research, the definition of variables, their relationship, the hypotheses, and the research model proposed in this study in Section 2. Section 3 describes the data and methods of data analysis. Section 4 shows and discusses the results of the study. Finally, Section 5 draws conclusions, implications, and limitations of the study.

2 Literature review

2.1 Underlying theory

The theory underlying this research is the theory of resource-based view (RBV). The rationale for applying the RBV in this study is as follows. First, this theory highlights the importance of firm resources (physical capital resources, human capital resources, and organisational capital resources) to be able to compete against competitors. Second, this theory emphasises strategic choices, optimising human resources, managing, identifying, developing, and using key resources to maximise firm value (Barney, 1991; Barney et al., 2001; Dasuki, 2021). Companies that can select specific capabilities and unique resources not owned by competitors can achieve long-term, sustained competitive advantages (SCA) and subsequently create business opportunities (Wernerfelt, 1984).

Third, the application of this theory is not limited to large companies, but can also be applied to small and medium-sized companies to achieve SCA by improving their capabilities (Rangone, 1999). Fourth, the RBV suggests that firms differ in their resource endowments and that this resource heterogeneity matters, resulting in differential performance (Barney, 1991; Tokarczyk et al., 2007). Finally, the application of RBV theory in examining business performance has been widely used in previous research on

several factors including family support (Hatak et al., 2016; Martinez-Alonso et al., 2022), social network (Muafi, 2020), social network and innovation (Suardhika et al., 2018), innovation (Hillebrand et al., 2020), adoption of digitalisation (Bhatta et al., 2023; Lee and Falahat, 2019; Lestari et al., 2020; Ardito et al., 2021; Vrontis et al., 2022), financial access (Pergelova and Angulo-Ruiz, 2014), financial access and innovation (Thai and Mai, 2023).

Based on the above rationale, this study builds on the RBV view perspective in that five variables, consisting of family support, financial access, social networks, the adoption of digitalisation, and product innovation, were hypothesised to directly affect the business performance of women's MSEs. Also, we hypothesised the direct effects of family support, financial access, social networks, and the adoption of digitalisation on product innovation. Finally, product innovation is assumed to mediate the effects of family support, financial access, social networks, and the adoption of digitalisation on women's MSEs business performance. The following briefly defines the variables under study, their relationship, and their hypothesis.

2.2 Definition of variables, their relationship, and hypothesis

2.2.1 Business performance

Business performance is an inevitable result obtained in management, economics, and marketing that characterises the organisation's competitiveness, efficiency, effectiveness, and structural and procedural components (Taouab and Issor, 2019). Meanwhile, Kotane and Kuzmina-Merlino (2017) and Wahyuni and Sara (2020) define business performance as the result of the company's business activities. In this study, we define business performance as the result of the company's business activities, which, in this case, is focused on the business operations of women's MSEs.

2.2.2 Family support and business performance

Family support is defined as the perception of individuals having family emotional, intellectual, and economic support related to starting a new business (Osorio et al., 2017). Neneh and Welsh (2022) explain that family support is a support system from the family consisting of emotional support, instrumental support for business, and instrumental support at home.

Several studies of the effect of family support on business performance revealed positive and significant results (Martinez-Alonso, 2022; Neneh, 2017; Tundui and Tundui, 2021; Neneh and Welsh, 2022). However, Welsh et al. (2018) found that family support had a positive but did not have a significant effect on women's business performance, with 117 respondents in Egypt. Hamdani et al. (2023) explain that family support is the main source for female entrepreneurs to start a business because it plays an important role in increasing self-efficacy and business success. The importance of family support is in line with the RBV theory. This is because family support can produce firm-specific capabilities and resources that lead to superior performance and help family firms thrive. However, as the previous studies showed different results on the effect of

family support on business performance, we considered it relevant to test the following hypothesis.

H1 Family support has a positive effect on the business performance of women's MSEs.

2.2.3 Access to finance and business performance

Chowdhury and Alam (2017) define access to finance as the extent to which entrepreneurs have access to formal lenders willing to offer affordable and appropriate financing. Aminu and Shariff (2015) define access to finance as the absence of financial and non-financial barriers to accessing financial resources and services, as measured by the extent to which financial resources and services are available to users at a reasonable cost of capital.

There have already been many studies that have tested the influence of financial access on business performance in Indonesia (Priyadi et al., 2020; Safitri et al., 2019; Tambunan, 2021), in Ethiopia (Meressa, 2020), in India (Jha and Alam, 2022), in South Africa (Matekenya and Moyo, 2022), and in Vietnam (Thai and Mai, 2023). Most of these studies found that access to finance is still a barrier for MSEs to improve their business performance. While the RBV theory suggests that access to finance is needed to support competitive advantage and higher business performance of any firm, including MSEs. This financial access can be a resource for firms to invest in unique assets, develop innovative technologies, and cultivate strong stakeholder relationships, all of which are foundational to achieving sustainable long-term success and improved performance. To further justify the importance of the effect of access to finance on business performance, we test the following hypothesis.

H2 Access to finance has a positive effect on the business performance of women's MSEs.

2.2.4 Social network and business performance

Fink et al. (2020) define a social network as something that allows access to resources provided through social network membership, and the perceived value of social networking technology leads to satisfaction with its use and increases the intention to recommend social networks to business partners. Meanwhile, Pratono (2018) defines a social network as a network that refers to a form of internet-based application that allows individuals to build personal profiles to develop social relationships with whom to interact. The ability to build relationships with clients is one form of female entrepreneurial competence to reach success in business activity (Ramadani et al., 2013). While Anggadwita et al. (2017) suggest to maintain the business, including the possibility of expanding the business, female entrepreneurs must find and build extensive relationships.

Previous studies on the effect of social networks on business performance showed positive and significant results. Pratono (2018), for instance, in his research on 380 Indonesian SMEs, found that social networks had a positive but not significant effect. A similar finding was also estimated by Franco et al. (2016) in their research on 86 SMEs in Portugal. Meanwhile, other studies conducted by Xie and Lv (2016), Prijadi et al. (2020),

Fatima and Bilal (2020), Nu'man et al. (2020), and Ismail (2022) reported that social networks have a positive and significant influence on women's business performance in several countries, including Indonesia. While there are different findings concerning the significant influence of social networks on business performance, RBV theory highlights that a network is an important organisational capability that leads toward including market opportunities, competitive advantage, and the firm's success. As there are different empirical findings on this issue, and the digital technology usage by MSEs is rapidly growing, the following hypothesis is proposed.

H3 Social network has a positive effect on the business performance of women's MSEs.

2.2.5 Adoption of digitalisation and business performance

Digitalisation is defined as the use of digital technology to transform business models and provide new revenue and value-generating opportunities (Bloomberg, 2018). While Sklyar et al. (2019) define digitalisation as the extent to which companies can combine physical and digital materiality for goal value creation. The adoption of digitalisation is a form of using technology by applying the internet, information and communication technology skills, and investment in technology. Thus, the adoption of digitalisation provides opportunities to obtain a lot of information and ease of establishing relationships to improve business performance.

Several studies of the adoption of digitalisation on business performance confirmed that the adoption of digitalisation has a positive effect on business performance (Faroque et al., 2017; Curraj, 2018; Falentina et al., 2021; Azam, 2015). Azam (2015), for example, based on 282 SMEs in Bangladesh, found that the adoption of digitalisation has a positive and significant effect on business performance. Similarly, Curraj (2018) in his research in Albania obtained the same results in that the adoption of digitalisation has a positive and significant effect on business performance. This finding was also supported by Falentina et al. (2021), who found that the adoption of digitalisation has a positive and significant effect on business performance.

These findings were in contrast to studies conducted by Sanchez-Riofrio et al. (2022), who found that the impact of the adoption of digitalisation on business performance in Latin America, has a negative and insignificant effect on business performance. Basu and Chaudhuri (2023) also found that the effect of digitisation has not yet been reflected in the sales growth of SMEs in India. These suggest that the positive and significant effect of the adoption of digitalisation on business performance depends on other factors, including the benefits, risks, ease of use, and usefulness of digitisation usage (Akturan and Tezcan, 2012; Gao and Bai, 2014; Hu et al., 2022; Ming and Jais, 2022).

While the previous empirical finding revealed different results, the RBV theory suggests that the adoption of digitalisation is a valuable resource that can contribute to a firm's competitive edge. This factor provides unique ways to create value, deliver products/services, and respond to market changes more quickly. Also, it enables firms to build new capabilities, such as enhanced data analytics, improved supply chain visibility,

and faster innovation. These further lead to higher profits, a stronger market position, and improved business performance. Therefore, the following hypothesis is worth testing.

H4 The adoption of digitalisation has a positive effect on the business performance of women's MSEs.

2.2.6 Product innovation and business performance

The OECD (2005) defines product innovation as the introduction of new goods or services that are new or significantly improved in terms of characteristics or uses as intended. Whereas Parida et al. (2012) define innovation as the inclusion of spin-offs from new ventures based on previous product or technology development and external involvement in product development and technology licensing to other organisations.

Previous research on the effect of product innovation on business performance obtained positive and significant results. The positive and significant influence of innovation on MSEs business performance was found by Anggadwita and Dhewanto (2016) in Indonesia, Suardhika et al. (2015) and Wahyuni and Sara (2020) in Bali-Indonesia, Karabulut (2015) in Turkey, Agyapong et al. (2018) in Ghana, Restrepo-Morales et al. (2019) in Colombia, Matekenya and Moyo (2022) in South Africa, Tran et al. (2023) in Vietnam, Bhatta et al. (2023) in China and Suder et al. (2024) in Poland. Anggadwita and Dhewanto (2016), for instance, highlighted that creativity and innovation are important parts of entrepreneurs. They investigated the types of SMEs in Indonesia, mostly in the form of imitation, innovation, and repetition. They found that creativity and innovation are the keys to success for entrepreneurs. This suggests that product innovation that is attractive to the community has an impact on performance, profit, and business growth. Conversely, the insignificant effect of innovation on business performance was found in Italy (Cucculelli, 2013), in Portugal (Franco et al., 2016), and in Ghana (Issau et al., 2021).

The insignificant effect of product innovation on business performance does not mean that it contradicts the RBV theory. The reason is that the RBV theory suggests that product innovation enables a company to differentiate itself, enter new markets, and adapt to changing demands. All these lead any firm to have a sustainable competitive advantage, better strategic positioning, superior business performance over time, gain an advantage in the market, and allow them to explore new markets by reinforcing the value of its resources. Therefore, the following hypothesis is justified and still relevant to be tested.

H5 Product innovation has a positive effect on the business performance of women's MSEs.

2.2.7 Family support and product innovation

The study on the effect of family support on product innovation has been conducted by Comin et al. (2022). The results of this study confirmed that family support encourages innovation, and family involvement affects the tendency to innovate in products, services, or new business models. This suggests that intellectual and

economic support in the family has the potential to encourage product innovation, and vice versa. The findings are in line with the RBV theory, since this theory considers that family involvement promotes knowledge sharing (e.g., trust, cohesion, transfer of ideas and expertise across generations) within the family, encourages a risk-taking culture (e.g., financial support), and reinforces a long-term commitment. These factors enhance a firm's capability to achieve product innovation, thereby sustaining competitive advantage. Therefore, we proposed this hypothesis.

H6 Family support has a positive effect on the product innovation of women's MSEs.

2.2.8 Access to finance and product innovation

The effect of access to finance on product innovation has been addressed in the literature. Jabeen et al. (2019) in their study in the Emirate Arab and Fombang and Adjasi (2018) in several developing countries, such as Cameroon, Kenya, Morocco, Nigeria, and South Africa, found that access to finance for companies that have good access to loans has better product innovation initiatives. Similarly, research by Girma et al. (2008) on innovation activities in China showed that access to finance (loans) provides better innovation results. These findings support the RBV theory in that access to finance provides firms to have the ability to invest in Research and Development (R&D), technology acquisition, and skilled human resources. These will help improve firms' business performance. However, as previous empirical studies indicate, financial resources and services available to MSEs in many developing countries (including in Indonesia) are not common, or they have a cost of capital, making them a rare advantage. The following hypothesis was relevant to be tested.

H7 Access to finance has a positive effect on product innovation of women's MSEs.

2.2.9 Social network and product innovation

Social networks relate to customers, suppliers, distributors, competitors, investors, communities, or other organisations. The RBV justifies the relationship between social networks and product innovation. The relationship can be in the forms of knowledge flow, collaboration and co-creation, risk sharing, and market responsiveness. Concerning knowledge flow, for instance, networks act as a channel for exchanging ideas, technologies, and practices, giving firms access to insights they can transform into new products. Also, close ties with customers provide early feedback, helping firms align product innovation with market needs.

Previous studies have confirmed the importance of social networks in influencing product innovation. Jabeen et al. (2019), for instance, showed that social networks have positive effects on innovation. Also, Faroque et al. (2017) specifically showed that networking personally and between companies plays a positive role in product innovation. This indicates that social relationships with customers, distributors, and other organisations expand the MSEs to innovate their products. As there are advancements in social media used as an instrument for social networks, we consider it relevant to propose the following hypothesis.

H8 Social networks have a positive effect on the product innovation of women's MSEs.

2.2.10 Adoption of digitalisation and product innovation

The effect of digitalisation on product innovation has been investigated by Chen and Kim (2023) and Blichfeldt and Faullant (2021). Blichfeldt and Faullant (2021), by using the sample of 747 manufacturing companies in Europe, and by applying multiple regression analysis, indicated that the adoption of digitalisation has a positive and significant effect on product innovation and service innovation. This finding was supported by Shen et al. (2021) from their work on manufacturing companies in China. Rajala and Hautala-Kankaanpää (2023) also supported this result that the adoption of digitalisation has a positive and significant effect on product innovation. This relationship highlights the importance of digital adoption in inspiring product innovation.

The RBV theory supports the findings above. This theory indicates that the relationship of these two factors can be in the forms of knowledge integration, agility and flexibility, collaboration, customisation, and path dependency. In terms of knowledge integration, for example, digitalisation enhances data-driven decision making, enabling businesses to identify unmet needs and design innovative products. Also, digital adoption supports mass customisation, making product innovation more aligned with customers' preferences. However, as women's MSEs faced problems, including the adoption of digitalisation, we, therefore, hypothesise as follows.

H9 Adoption of digitalisation has a positive effect on the product innovation of women's MSEs.

2.2.11 Relationship of family support, access to finance, social networks, and the adoption of digitalisation on the women's MSEs business performance: the mediating role of product innovation

Little is known about previous studies that advanced in reputable journals specifically analysing the effects of family support, access to finance, social networks, and the adoption of digitalisation on women's MSEs business performance mediated by product innovation. The available study that developed an unexplored intervening mechanism related to innovation was the study by Martinez-Alonso et al. (2022). However, the estimated mediating variable influencing the relationship between family involvement in management and firm performance was technology innovation (TI) efficiency, but not product innovation. In this study, TI efficiency is defined as a firm's capability to maximise innovation outputs given a certain quantity of innovation inputs (Cruz-Cázares et al., 2013). They applied random-effects regression analysis to a longitudinal sample of 1118 Spanish private firms from 2010 to 2016 to test the suggested relationships. The result supported the indirect effect of TI efficiency on the relationship between family involvement in management and firm performance. They suggest that TI efficiency leads to richer firm performance in family firms with active family involvement in management.

Other prior studies, however, estimated innovation as the moderating variable in the relationship between efficiency and business performance. Matekenya and Moyo (2022), by applying a two-stage empirical analysis using a sample of Spanish manufacturing

firms for the period 1992–2005, supported the arguments that the best measurement of outcomes of technological innovations is through the efficiency with which they are developed. While Diéguez-Soto et al. (2018) empirically explored the moderating role of family management on the relationship between input mix and the occurrence of process innovation. The results show that family management increases the conversion rate of innovation inputs into process innovation outcomes. The study also finds evidence for the existence of a non-linear relationship between innovation input mix and process innovation, indicating that there is both a minimum level and a maximum level in the efficient use of resources in process innovation. The findings indicate that family-managed firms are more efficient in their use of innovation input resources from a certain reference point.

The findings related to the significance of the indirect effect of product innovation in mediating the relationship between family support and business performance align with the RBV theory. The reason behind this is that family support enables businesses to gain the confidence and stability needed to take risks and invest in product innovation. In other words, family support enhances the internal resource base that boosts the firm's product innovation. This innovation further acts as the conversion mechanism that translates family support into a competitive advantage and improved performance.

The RBV theory also highlights the importance of product innovation in mediating the indirect effect of access to finance on business performance. This is because product innovation acts as the mechanism that transforms financial resources into sustainable performance outcomes. Firms with access to finance can scale up production of innovative products and develop new product designs and features. These conditions have the potential to drive higher profitability, growth, and market share. Similarly, the product innovation can mediate the effects of social networks on business performance. This occurs as social networks gain knowledge, market information, funding opportunities, and partnerships. These resources can be transformed into new products, features, or services, which then translate into improved business performance. In the same way, the product innovation can mediate the effect of the adoption of digitalisation on the business performance. This happens because the adoption of digitalisation gives firms better access to information, efficiency, connectivity, and new processes. These resources can act as an enabler of innovation capacity, which then potentially drives firms' business performance. Based on the background rationale of the RBV theory above, we thus postulate the following four hypotheses.

H10 Product innovation positively mediates the effect of family support on the business performance of women's MSEs.

H11 Product innovation positively mediates the effect of access to finance on the business performance of women's MSEs.

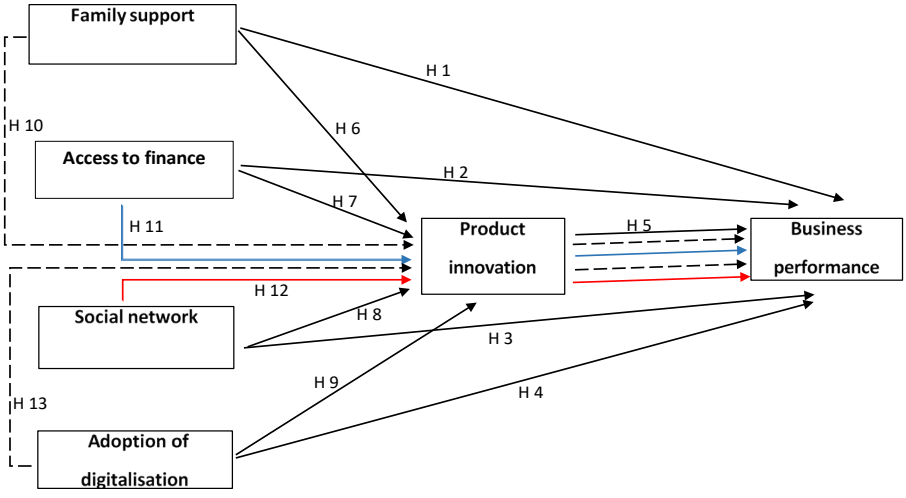
H12 Product innovation positively mediates the effect of social networks on the business performance of women's MSEs.

H13 Product innovation positively mediates the effect of the adoption of digitalisation on the business performance of women's MSEs.

2.3 Research framework

Based on several studies that have been advanced in the literature, the research framework or model of this study and the hypothesis of this study are shown in Figure 1. The rationale of the research model is justified based on the RBV theory and confirmed by the empirical studies advanced in the literature as addressed previously. Thus, the proposed research model addressed three research issues. First, the issue related to the direct effects of family support, financial access, social networks, the adoption of digitalisation, and product innovation on women's MSEs business performance. Second, the issue addresses the direct effect of family support, financial access, social networks, and the adoption of digitalisation on product innovation. Third, the issue associated with the indirect effects of family support, financial access, social networks, and the adoption of digitalisation on MSEs' business performance mediated by product innovation.

Figure 1 Proposed research model (see online version for colours)



3 Data and methods

The study began by identifying the research problems of women's MSEs business performance in Indonesia, as advanced in the literature, and followed by seeking and reviewing relevant previous studies to determine the underlying theory and methods of analysis to justify the proposed three research questions. After completing this stage, we examined the data availability and determined the relevant research location to carry out the study. We were informed by an official of the Central Board of Statistics in Jakarta and the local government office of Small-Medium Enterprises Trade and Labour in the province of Bangka Belitung that the Belitung Regency was the appropriate research locus where women's MSEs in this location already used digital technology to market their products. Further, we discussed the research method and instruments to collect the data.

A mixed research method was employed, in that we collected data from both qualitative and quantitative sources at the same time. By applying an explanatory sequential design, we first analysed the quantitative data collected, followed by qualitative data to help explain or contextualise the quantitative findings. The qualitative data were obtained from field observation and a focus group discussion (FGD) with 10 women's MSE business owners. The quantitative data were collected from the questionnaire instrument. In determining the number of sample observations of women's MSE respondents, we discussed with the official of the local government office of Small-Medium Enterprises Trade and Labour in the Belitung Regency. From the discussion, we agreed to distribute the questionnaire to 150 women's MSEs respondents. Our justification for having 150 sample respondents was based on Wolf et al. (2013), who argue that a range of sample size requirements (i.e., from 30 to 460 cases) reveals meaningful patterns of association between parameters and sample size. Solihin (2021) suggested that the PLS-SEM model with a small sample size range (35–50) can still be estimated and can achieve quite high statistical power, while large sample sizes (>250) can improve precision and consistency.

To select respondents as the sample, we employed the non-probability sampling method with a purposive technique. The reason for using this sampling method was that the number of the population in the Belitung Regency of women's MSEs who used digitalisation, as recorded by the local government office of Small-Medium Enterprises Trade and Labour, was not available. The criteria of women's MSEs sampled are that they have family support, access to finance, adopt digital technology, have social networks, and product innovation. Another criterion was that the business activity they operated should be more than one and a half years old. By applying these criteria, the type of business activity of women's MSEs who met the criteria was those who engaged in the food, beverage, apparel, pharmaceutical, handicraft, leather goods, and footwear business activities.

Note that the non-probability sampling method that we used to sample the respondents has drawbacks. The drawback of this method was that respondents were sampled based on convenience or ease of access. This means there's a high chance they may not be representative of the greater population. Also, this method was unable to calculate the margin of error, which refers to how much one can expect survey results to reflect the views of the total population. In addition, sample sizes may be unclear because there is no way to measure the boundaries of the relevant population in the study, and there is the potential for strategic sampling bias. Because sample selection is deliberate, there is a big risk that a researcher's personal views and opinions could easily influence the sample (Sugiyono, 2020). To address the drawbacks of the non-probability sampling method, we visited the survey location and organised a FGD with 10 women's MSEs. While the caveats still apply, field observations and FGD may reduce the strategic bias of the respondents to respond questions given in the questionnaires.

Concerning the questions asked in the questionnaire, we organised the questions based on the indicators of each variable. References to variable indicators used for questionnaire materials were taken from several previous studies. Eight indicators of the business performance variable were adopted from Azam (2015), Lu and Zhang (2016), and Agyapong et al. (2018). Eight indicators of family support were adopted from Neneh and Welsh (2022). Seven indicators of financial access were taken from Prijadi et al. (2020). Six indicators of social networks were adopted from Pratono (2018) and Ismail (2022). Five indicators of product innovation variables were adopted from

Karabulut (2015) and Issau et al. (2021). Fourteen indicators of digitalisation adoption were taken from Azam (2015). Thus, the total indicators 48, and statements of six variables were questioned in the questionnaire. To measure the indicators of each variable, a Likert scale with a score ranging from 1 to 6, from one (strongly disagree) to six (strongly agree) was employed. The choice of the 1 to 6 Likert scale diverged from more common scales aimed at hindering ambiguous answers given by the respondents (Sugiyono, 2020).

However, before undertaking the main survey, we carried out a pilot survey. The objective of this pilot survey was to seek the views of respondents on whether or not the indicator statement of each variable given in the questionnaire was important. Also, they were asked whether or not the material questions in the questionnaire were easy to understand and clear. In addition, they were asked to give inputs, suggestions, or modifications to improve the pilot questionnaire for the main survey. A total of 30 women MSE respondents were conveniently selected in the Belitung Regency. The result of the pilot survey questionnaire was used to finalise the main survey questionnaire.

After finalising the main survey questionnaire, we then distributed the main questionnaire to women's MSEs with the help of the officials of the local government office of Small-Medium Enterprises Trade and Labour in the Belitung Regency. Of the 150 respondents previously determined, only 135 women's MSEs respondents completed the questionnaires and met the requirement criteria, so the response rate was 90.0%. Data collection was carried out in the field from 1st July 2023 to 31 August 2023. Note that the completion of data was done by the officials of the local government office of Small-Medium Enterprises Trade and Labour in the Belitung Regency, as we had limited resources to stay for that long period.

The questionnaire data were then analysed by applying the partial least squares-structural equation modelling (PLS-SEM). These data were processed using the Smart PLS version 4.0 software tool (Hair et al., 2010). The PLS-SEM was preferred over other statistical tools for this study's analytical needs. This is because PLS-SEM effectively tests theoretical frameworks predictively and handles complex structural models with multiple constructs and relationships. SEM estimates complex cause-and-effect relationships with latent and observed variables, making it useful for analysing theoretical frameworks. PLS-SEM effectively balances explanation and prediction, aligning with current research needs and making it a suitable choice for drawing significant empirical conclusions (Asra et al., 2022; Hair et al., 2022).

The stages in applying the PLS-SEM were as follows. First, before assessing the structural model by measuring R2, the path coefficient, and effect size f2 criteria, we examined the measurement model by assessing validity and reliability. Convergent validity was measured through indicators with outer loadings > 0.5, and for average variance extracted (AVE) above 0.5, so that a variable is declared convergently valid (Vinzi et al., 2010; Sekaran and Bougie, 2016; Hair and Alamer, 2022).

In addition, we also assessed discriminant validity by applying the Heterotrait-Monotrait Ratio (HTMT) approach, comparing with the threshold of either 0.85 or 0.9 (Henseler et al., 2015; Garson, 2016). Further, we test reliability to show the extent to which the measurement is without bias (error-free). Also, this test aims to ensure that measurements are consistent over time and across various items in the instrument (Sekaran and Bougie, 2016). The variable is declared very good and reliable if the value reaches 0.8-0.9. In the second step, we tested the inner model. In this testing phase, we assessed the significance of the impact of exogenous variables on endogenous variables.

Additional analyses included the variance inflation factor (VIF) to address collinearity issues, hypothesis testing, and variance accounted for testing mediating variables. The analysis was conducted using Smart PLS 4.0, with one-tailed testing of the hypothesis at a significance level of 0.05. The coefficient of determination (R^2) and path coefficients were also estimated in the analysis of the inner model (Hair et al., 2021).

4 Results and discussion

4.1 Results

4.1.1 Validity and reliability tests

The results of validity testing can be seen in Table 1. As shown in Table 1, the values of the outer loading for all indicators of the six variables examined were greater than 0.5. The values of the outer loading for all indicators of the adoption of digitalisation, for instance, are between 0.821 and 0.907. For indicators of access to finance, the values of the outer loading range from 0.621 to 0.891. Similarly, for all indicators of family support, product innovation, social networks, and MSEs performance variables, no indicators of these four variables have values of the outer loading less than 0.649. This suggests that all indicators in each variable of family support, financial access, social network, digitalisation adoption, product innovation, and MSEs performance are valid.

Table 1 Results of outer loadings value

Indicators	*Adoption of digitalisation*	*Access to finance*	*Family support*	*Product innovation*	*MSEs performance*	*Social network*
Information technology is useful for business	0.876					
Communication technology makes interaction easier	0.907					
Ease of use of information technology	0.821					
Ease of use of communication technology	0.860					
Get information technology that is easy to use	0.822					
Get communication technology that is easy to use	0.840					
Communication technology is useful for business	0.872					
Completion of tasks faster with information technology	0.889					

Table 1 Results of outer loadings value (continued)

Indicators	*Adoption of digitalisation*	*Access to finance*	*Family support*	*Product innovation*	*MSEs performance*	*Social network*
Faster task completion with communication technology	0.904					
Information technology increases productivity	0.873					
Communication technology increases productivity	0.884					
Increasing organisational development with information technology	0.884					
Increasing organisational development with communication technology	0.873					
Information technology makes interaction easier	0.903					
Ease of financing business development		0.781				
Ease of access to banking services		0.821				
Easy access to non-bank financing services		0.744				
Stable financing from banking institutions		0.882				
Sustainable financing of banking institutions		0.891				
Stable financing from a non-bank institutions		0.803				
Sustainable financing of non-bank institutions		0.824				
Access to financing supports business		0.621				
Willingness to understand related to business			0.784			
Empathy towards business problems that occur			0.753			
Interest in business			0.728			
Emotional support			0.869			
Willingness to provide feedback on business ideas			0.833			
Willingness to help in business activities			0.836			

Table 1 Results of outer loadings value (continued)

Indicators	*Adoption of digitalisation*	*Access to finance*	*Family support*	*Product innovation*	*MSEs performance*	*Social network*
Willingness to help with routine household tasks			0.660			
Willingness to do part of the housework			0.649			
Has one innovative product				0.806		
Emphasis on new product development				0.803		
Try new ideas				0.864		
Produce new products to remain competitive				0.849		
Improvement of existing products for customers needs				0.883		
Expansion of sales area					0.801	
Increased interaction with customers					0.865	
Consistency in meeting customer needs					0.835	
Offering product diversity to customers					0.796	
Growth in business sales results					0.871	
Increased business profits					0.872	
The goal of increasing income					0.848	
Satisfaction with performance					0.786	
The network facilitates information about the input supplies						0.757
The network provides market price information						0.755
Strong ties with distributors						0.817
Networking with distributors helps promotion						0.756
Relationships with corporate partners via social media						0.853
Maintain relationships with partners						0.845

Source: Data processing results from Smart PLS 4.0

Further, the findings of the AVE within the outer model are shown in Table 2. As can be seen in this table, the adoption of digitalisation has the highest AVE value at 0.761, followed by product innovation (0.708), business performance (0.697), access to finance (0.640), and social networks (0.637). Family support has an AVE value of 0.589. As the AVE value for each construct exceeds 0.5. These results indicate that all indicators of each variable under analysis are valid.

Table 2 Results of the average variance extracted (AVE) value

Variable	*AVE value*
Adoption of digitalisation	0.761
Access to finance	0.640
Family support	0.589
Product innovation	0.708
MSEs performance	0.697
Social network	0.637

Source: Data processing results from Smart PLS 4.0

The results of the Heterotrait-Monotrait (HTMT) ratio are shown in Table 3. As can be seen in Table 3, the HTMT value for each variable under study is less than 0.9. The discriminant validity of access to finance against the adoption of digitalisation is 0.401, family support against the adoption of digitalisation is 0.608, social networks against the adoption of digitalisation is 0.700, product innovation against the adoption of digitalisation is 0.769, and the discriminant validity of business performance against the adoption of digitalisation is 0.673. This means that each indicator is valid as a good measure for its construct. This demonstrates the discriminant validity of each construct within the scope of this study. In other words, there is a significant level of difference between the constructs being studied.

Table 3 Results of Heterotrait-Monotrait ratio (HTMT) value

	Adoption of digitalisation	*Access to finance*	*Family support*	*Product innovation*	*Women's MSEs business performance*	*Social networks*
Adoption of digitalisation						
Access to finance	0.401					
Family support	0.608	0.343				
Product innovation	0.769	0.360	0.676			
Women's MSEs business performance	0.673	0.590	0.576	0.711		
Social networks	0.700	0.540	0.536	0.606	0.726	

Source: Data processing results from Smart PLS 4.0

Moreover, the results of reliability testing are shown in Table 4. It can be seen in this table that all variables in this study are reliable. This is indicated by the value of composite reliability and Cronbach's alpha value of all variables that are greater than 0.70 (Sekaran and Bougie, 2016; Hair et al., 2021). So, they can be continued for the next test, namely, R^2, f^2, and path coefficient estimations.

Table 4 Results of composite reliability and Cronbach's alpha value

Variables	*Cronbach's Alpha*	*Composite reliability* (*rho_a*)	*Composite reliability* (*rho_c*)
Adoption of digitalisation	0.976	0.977	0.978
Access to finance	0.918	0.934	0.934
Family support	0.899	0.908	0.919
Product innovation	0.897	0.901	0.924
MSEs performance	0.938	0.940	0.948
Social networks	0.887	0.894	0.913

Source: Data processing results from Smart PLS 4.0

The estimated results of the R2-adjusted values for business performance and product innovation are shown in Table 5. As can be seen in Table 5, the adjusted R^2 value of women's MSEs business performance is 0.617. This suggests 61.7% of the variation in business performance can be explained by the adoption of digitalisation, family support, financial access, social networks, and product innovation. While the R^2 adjusted value of product innovation is 0.576. This indicates 57.6% of the variation in product innovation can be explained by the adoption of digitalisation, family support, financial access, and social networks. The rest of 42.4% of the variation in product innovation is explained by other variables outside the model.

Table 5 Results of the coefficient of determination

Variable	*Adjusted R-Square value*
Product innovation	0.576
Women's MSEs business performance	0.617

Source: Data Processing Results from Smart PLS 4.0

Further, the estimated results of effect size (f^2) can be seen in Table 6. As known that the effect size indicates the practical significance of the research results. A large effect size means that the research findings have practical significance, whereas a small effect size indicates limited practical application (Sullivan and Feinn, 2012). As can be seen in Table 6, there are four relationships between variables that have no effect size. The relationship between the adoption of digitalisation and women's MSEs business performance, for instance, has an effect size of 0.015. This indicates that there is no meaningful relationship between the two variables. This is also the case for the effect size of the relationship between access to finance and product innovation, the relationship between family support and women's MSEs business performance, and the relationship between social network and product innovation. However, the relationship between access to finance and women's MSEs business performance, family support, and product

innovation, product innovation and women's MSEs business performance, and social network and women's MSEs business performance has a small effect size. Only the relationship between the adoption of digitalisation and product innovation shows a medium effect size of 0.300.

Table 6 Results of effect size (f2) value (see online version for colours)

	f-square	*Results*
Adoption of digitalisation → Product innovation	0.300	Medium effect size
Adoption of digitalisation → Women's MSEs business performance	0.015	No effect size
Access to finance → Product innovation	0.001	No effect size
Access to finance → Women's MSEs business performance	0.126	Small effect size
Family support → Product innovation	0.119	Small effect size
Family support → Women's MSEs business performance	0.008	No effect size
Product innovation → Women's MSEs business performance	0.090	Small effect size
Social network → Product innovation	0.006	No effect size
Social network → Women's MSEs business performance	0.091	Small effect size

Source: Data processing results from Smart PLS 4.0

4.1.2 Results of hypotheses testing

The results of the path coefficient analysis and hypothesis testing are exhibited in Table 7. In terms of the path coefficients, product innovation has a stronger effect on women's MSEs business performance than the effects of social networks and access to finance on the business performance of women's MSEs. These are shown from the magnitude of the path coefficient of the relationship between product innovation and business performance at 0.284 compared to the path coefficient magnitudes of the relationship between social network and women's MSEs business performance (0.269), and the relationship between access to finance and women's MSEs business performance (0.253). While the adoption of digitalisation has a stronger effect on product innovation (0.510) than family support (0.277).

Concerning hypothesis testing, the results show seven hypotheses (H2, H3, H5, H6, H9, H10, and H13) were found to be positively significant as the p-values were less than 5%. The direct and significant variables that influence the business performance of women's MSEs are access to finance (p-value 0.000), product innovation (0.001), and social networks (p-value 0.007). The direct and significant variables affecting product innovation are the adoption of digitalisation (p-value 0.000) and family support (p-value 0.001). Also, product innovation can mediate the influence of the adoption of digitalisation and family support on the business performance of women-owned MSEs. The significant p-values of the effects of the adoption of digitalisation and family support on the business performance of women's MSEs mediated by product innovation are 0.007 and 0.037. These suggest that product innovation has an indirect effect on the

relationship between the adoption of digitalisation and women's MSEs business performance. Also, it has an indirect effect on the relationship between family support and women's MSEs business performance.

Conversely, the rest of the 6 hypotheses (H1, H4, H7, H8, H11, and H12) were found to be insignificant as the p-values are greater than 0.05. The effect of family support on women's MSEs business performance (H1), for example, has a p-value of 0.480. The effect of the adoption of digitalisation on the business performance of women's MSEs has a p-value of 0.240. Similarly, the influences of access to finance and social networks on product innovation have p-values of 0.405 and 0.691, respectively. The other two variables of access to finance and social network mediated by product innovation have no significant influence on women's MSEs business performance. This indicates that product innovation has no indirect effects on the relationship between access to finance and women's MSEs business performance, as well as the relationship between social networks and women's MSEs business performance (Table 7).

Table 7 Path coefficients and hypothesis testing

	Hypothesis	*Path coefficients*	*t-statistics*	*p-values*	*Conclusions*
H1	Family support → Women's MSEs business performance	0.070	0.706	0.480	Insignificant
H2	Access to finance → Women's MSEs business performance	0.253	4.314	0.000	Significant
H3	Social networks → Women's MSEs business performance	0.269	2.719	0.007	Significant
H4	Adoption of digitalisation → Women's MSEs business performance	0.125	1.174	0.240	Insignificant
H5	Product innovation → Women's MSEs business performance	0.284	3.402	0.001	Significant
H6	Family support → Product innovation	0.277	3.179	0.001	Significant
H7	Access to finance → Product innovation	0.024	0.398	0.691	Insignificant
H8	Social network → Product innovation	0.071	0.832	0.405	Insignificant
H9	Adoption of digitalisation → Product innovation	0.510	4.790	0.000	Significant
H10	Family support → Product innovation → Women's MSEs business performance	0.079	2.089	0.037	Significant
H11	Access to finance → Product innovation → Women's MSEs business performance	0.007	0.375	0.707	Insignificant
H12	Social network → Product innovation → Women's MSEs business Performance	0.020	0.799	0.424	Insignificant
H13	Adoption of digitalisation → Product innovation→ Women's MSEs business performance	0.145	2.706	0.007	Significant

Source: Data processing results from Smart PLS 4.0

4.2 Discussion

4.2.1 Factors affecting the business performance

As exhibited in Table 7, factors or variables that directly and significantly affect the business performance of women's MSEs are access to finance, social networks, and product innovation. The significant influence of these three variables on business performance was supported by the results of the FGD with women's MSEs in the Belitung regency. The FGD confirms that the direct effect of financial access on women's MSEs business performance is because the local government in this regency has given financial assistance programs to support the business performance of women's MSEs. These programs include business development programs from Bank Indonesia and/or institutional programs, such as Angkasa Pura and PT Timah.

The importance of financial access to support women's MSEs business performance is also supported by previous studies, including those conducted by Prijadi et al. (2020), Reçica et al. (2019), Matekenya and Moyo (2022), Trandayen-Ragoobur and Kasseeah (2017), and Thai and Mai (2023). Thai and Mai (2023) even found that access to finance not only significantly affects women's MSEs business performance but also affects significantly business innovation and competitive advantage. However, if there is an obstacle to financial access for women's MSEs, this obstacle hinders the performance of these small firms (Trandayen-Ragoobur and Kasseeah, 2017). Thus, easy access to obtaining sources of funding is one of the requirements for improving the business performance of women's MSEs in the Belitung regency.

The social network also has a significant influence on the business performance of women's MSEs in the survey location. This finding is in line with several previous studies (e.g., Xie and Lv, 2016; Reçica et al., 2019; Prijadi et al., 2020; Ismail, 2022). This confirms that social networks are very instrumental for women's MSEs in Belitung Regency. The explanation for this finding is also confirmed by the group discussion with 10 women's MSEs business owners. They pointed out the significant effect of social networks related to the wide use of social media such as WhatsApp, TikTok, Instagram, and Facebook by women's MSEs. These social media were applied by women's MSEs to obtain information related to business activities and input sources, services to consumer users, and to promote their business activities. That is why social networks are viewed by women's MSEs as significant to optimise their business performance.

Product innovation also shows a positive and significant effect on the women's MSEs business performance. The direct and significant influences of the relationship between these two variables were also found in the previous studies conducted by Karabulut (2015), Agyapong et al. (2018), Restrepo-Morales et al. (2019), Suardhika et al. (2015), Wahyuni and Sara (2020), Matekenya and Moyo (2022), Tran et al. (2023), Bhatta et al. (2023), and Suder et al. (2022), as discussed previously in Section 2. The FGD with 10 women's MSEs business owners revealed reasons why they innovate their products, because they avoid producing the same product sold by other MSEs. In other words, women MSEs in this location viewed product innovation as an important method to manage tight competition with other similar products produced by other MSEs. By innovating their products, women's MSEs expect that they can improve their business performance. However, this finding is different from the case studies of women's

MSEs in Italy, Ghana, and Portugal, where the effect of innovation on women's MSEs business performance was found to be insignificant (Cucculelli, 2013; Issau et al., 2021; Franco et al., 2016).

However, family support and the adoption of digitalisation were found to be insignificant in influencing the women's MSEs business performance in the Belitung regency. The explanation of the insignificant effect of family support on business performance may be because family support was applied only for starting a new business, emotional support, or providing a feeling of physical and psychological comfort in dealing with stress. In other words, family support was not used to manage the operation of women's MSEs business performance. This finding is in line with the empirical studies by Welsh et al. (2018), Tandrayen-Ragoobur and Kasseeah (2017), and Dryer et al. (2012). However, it differs from the results of studies conducted by Neneh (2017), Tundui and Tundui (2021), and Neneh and Welsh (2022) as they estimated that the effect of family support on women's MSEs business performance is positive and significant.

Similarly, the adoption of digitalisation has no significant effect on the business performance of women's MSEs in the survey location. This result supports previous studies by Faroque et al. (2017), Curraj (2018), Falentina et al. (2021), Vrontis et al. (2022), but not in line with the study by Azam (2015), who found that the adoption of digitalisation has a positive and significant effect on business performance. Based on the FGD, the insignificant effect of the adoption of digitalisation on women's MSEs business performance in the Belitung Regency is partly because they still have limited experience in using information and communication technology in their business activities, and/or it is because of tight business competition.

4.2.2 Factors affecting product innovation

As addressed previously in the results section, factors that significantly affect product innovation are family support and the adoption of digitalisation. Whilst access to finance and social networks are insignificant in influencing product innovation. The finding related to the significant effect of family support on the product innovation of women engaged in MSEs aligns with the conclusions drawn by Comin et al. (2022) and Hillebrand et al. (2020). This highlights that greater family support encourages the family members to be more innovative. Also, it may be because there are individuals in the family who have an intellectual background to support product innovation in their women's MSEs business operation.

Further, the direct effect of the adoption of digitalisation on product innovation indicates that the adoption of the internet, and information and communication technology, defined as the adoption of digitalisation (Sklyar et al., 2019) assists women's MSEs to innovate their products sold to the markets. Also, it is because of the facts of the bulk of women in MSEs have adopted digitalisation in the form of a smartphone, so they are well informed about any product innovation related to their business activities. The previous studies that supported this finding include Blichfeldt and Faullant (2021), Shen et al. (2021), and Sanzo-Perez et al. (2015).

However, access to finance has an insignificant effect on the product innovation of women's MSEs. The reason for this, as explained from the FGD, is partly because funding required for product innovation is difficult to obtain by women. Apart from the lack of financial literacy to take advantage of the available finance programs provided by the government, women's MSEs need to fulfil detailed financial requirements to have

financial access from formal financial institutions. This finding does not support previous studies conducted by Fombang and Adjasi (2018), Pergelova and Angulo-Ruiz (2014), and Girma et al. (2008), who found that access to finance, in the form of access to finance, trade credit, access to domestic bank funding encourages innovation in several countries such as Kenya, Morocco, Nigeria, Cameroon, and China.

Similarly, social networks have an insignificant influence on product innovation. This finding differs from previous studies by Ortiz-Ospina (2019), Faroque et al. (2017), Muafi (2020), and Jabeen et al. (2019), who estimated that social networks have a positive and significant impact on innovation through interaction in professional relationships, close relationships through social networks, which can generate development ideas in the form of innovation. This suggests that social networks have not yet shown a tangible impact on the product innovation of women's MSEs in the survey location. This is partly because social networks among women's MSEs in the survey location are primarily used for building relationships rather than for input providers and customer relationships.

4.2.3 Effects of family support, access to finance, social networks, and the adoption of digitalisation on the business performance mediated by product innovation

The results of the study confirm that family support mediated by product innovation significantly influences women's MSEs business performance. This suggests that family support plays a significant role in improving the women's MSEs business performance if and only if it is mediated by product innovation. Without a product innovation mediator, family support cannot improve directly women's MSEs business performance. This suggests that family support is needed as a support system for starting a new business (Osorio et al., 2017), emotional support, intellectual, and instrumental support for business (Neneh and Welsh, 2022), and/or well-managed business operation of the women MSEs (Maharajh et al., 2024) to improve business performance if it is mediated by product innovation.

The same implication is also for the adoption of digitalisation, as this variable affects indirectly women's MSEs business performance if it is mediated by the product innovation. In other words, the adoption of digitalisation affects the women's MSEs business performance if and only if it is mediated by product innovation. Therefore, based on the model constructed, product innovation as the mediator of both family support and the adoption of digitalisation affects indirectly women's MSEs business performance in the survey location.

The implications are different, however, in relation to financial access and social networks, as these two variables are insignificantly affecting the women's MSEs business performance mediated by product innovation. However, these two variables have a direct effect on women's MSEs business performance. Judging from the model constructed, this suggests both financial access and social networks cannot be underestimated to affect the women's MSEs business performance in the Belitung regency.

To sum up: the results and discussion of this study suggest that determining what factors influence women's MSEs business performance constitutes an essential issue in both management and policy efforts, as well as well-designed support programs to improve the business performance of women's MSEs. This is mainly because problems faced by women's MSEs need a specific approach that cannot be the same for women's

and men's MSEs. The RBV theory applied in this study confirmed that resources are crucial in improving women's MSEs business performance. However, for a business to achieve and maintain competitive advantages, it needs resources that are valuable, rare, inimitable, and non-substitutable-VRIN (Barney, 1991). In the case of this study, firm resources, specifically financial access, social networks, and product innovation, are crucial resources to improve women's MSEs business performance in the Belitung regency. Product innovation of the women's MSEs in this regency can be realised if the women's MSEs have resources related to family support and adoption of digitalisation. The product innovation plays a mediating role in affecting the effects of family support and the adoption of digitalisation on women's MSEs business performance.

5 Conclusions, implications, and limitations

This study aimed to investigate three research questions. First, what were the effects of family support, access to finance, social networks, the adoption of digitalisation, and product innovation on women's business performance? Second, what were the effects of family support, access to finance, social networks, and the adoption of digitalisation on product innovation? Third, what were the effects of family support, access to finance, social networks, and the adoption of digitalisation on women's business performance mediated by product innovation?

The results of this study are as follows. First, access to finance, social networks, and product innovation have linear effects on the business performance of women's MSEs, but not family support and the adoption of digitalisation. Second, family support and the adoption of digitalisation significantly affect product innovation, but not access to finance and social networks. Third, family support and the adoption of digitalisation significantly affect the women's MSEs business performance if the product innovation mediates it, but not access to finance and social networks. The FGD with 10 women's MSE business owners supports these findings. These findings also support the theory of the Resources-Based View (RBV) applied in this study in that resources, specifically finance, social networks, and product innovation, play roles in improving the business performance of women's MSEs.

The policy implications of the study for the government, women's MSEs business owners, practitioners, and other stakeholders, to improve women's MSEs business performance, are as follows. First, there is a need for continuous access to finance, social networks, and product innovation, as they directly affect women's MSEs business performance. Second, family support and the adoption of digitalisation are important to create product innovation for women's MSEs business performance. Third, family support and the adoption of digitalisation need product innovation mediators to improve the business performance of women's MSEs. Without product innovation, family support, and the adoption of digitalisation have no effect on improving the business performance of women's MSEs. However, to optimise those policies into concrete programs in improving business performance and creating product innovation of women's MSEs, each indicator to measure significant variables mentioned above needs to be addressed by the government and other stakeholders.

However, caveats were applied as this study has limitations not only because of the limited number of samples and sampling method, but also because it relied on the model constructed, and it was based on a cross-sectional design where all variables were subjective self-report variables obtained from a single source. Therefore, it would be necessary in future research to reinvestigate variables that are still inconclusive affecting the business performance and product innovation of MSEs and/or to examine different constructs of the women's MSEs business performance. Also, the cross-sectional design method from a single source needs to be complemented by in-depth interviews and more representative of the number of samples to further justify and sharpen the study's findings.

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Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data is available upon request.

Institutional review board statement

The Ethical Committee of the Faculty of Economics and Business, Universitas Tarumanagara, Indonesia has approved this study (Ref. No. 072-D/127/FE-UNTAR/I/2025).

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