Business Failure Experience and Digitalization in Micro and Small Enterprises in Emerging Markets: The Role of Knowledge Exploitation Capabilities.

Abstract

This study offers new insights on the association between business failure experience and digitalization in emerging markets. The study also provides contextual evidence about the extent to which micro and small enterprises can leverage knowledge exploitation capabilities for digitalization in resource-constrained economies where micro and small enterprises are the most ubiquitous form of business entities. Using a survey dataset of 274 firms from Ghana, the study finds a negative association between learning from business failure experience and digitalization. This relationship is attenuated by knowledge exploitation capabilities. This study contributes to the literature on digitalization in emerging markets as well as the knowledge-based theory of the firm. We provide implications for managerial practice noting that managers with prior entrepreneurial failure experience should focus on developing and leveraging knowledge capabilities to achieve a successful digitalization drive.

Keywords: Digitalization, micro and small enterprises, emerging markets, knowledge exploitation capabilities, business failure experience.

Declaration of interest: None

1. Introduction

Business failure refers to "the withdrawal of engagement in a business because it has not exceeded a minimal threshold for economic viability as set by the (founding) entrepreneur." (Ucbasaran et al., 2013, p. 175). Given the increasing complexity of doing business especially in Africa's emerging markets (Adomako et al., 2024) as well as the prevalence of reported business failures (Artinger & Powell, 2016; Amankwah-Amoah et al., 2018; Amankwah-Amoah, 2024,), recent studies have investigated the effect of learning from prior business failure on firm level activities and outcomes such as identification of investment opportunities (Mueller & Shepherd, 2016; Man et al., 2022), subsequent entrepreneurial engagement (Amankwah-Amoah et al., 2018; Costa et al., 2023), collaboration, new venture performance (Boso et al., 2019; Amankwah-Amoah et al., 2021; Amankwah-Amoah et al., 2022), innovation (Ferreira et al., 2020), eco-innovation adoption (Amankwah-Amoah, 2024), etc. Research conducted by this study shows that little is known about the effect of business failure experience on firm level outcomes such as digitalization particularly among MSE (Eller et al., 2020). Digitalization is complex and "describes how IT or digital technologies can be used to alter existing business processes"(Verhoef et al., 2021, p. 891).

Recent studies have examined technology adaption (e.g. Felzensztein & Tretiakov, 2023) and the antecedence of digitalization among small enterprises (e.g. Soluk et al., 2021; Bounfour et al., 2022; Heider et al., 2022), particularly the role of capabilities (e.g. Felzensztein & Bagheri, 2024; Felzensztein et al., 2022) such as knowledge exploitation capabilities (Qandah et al., 2020; Soluk et al., 2021; Bekata & Kero, 2023) digital knowledge sharing capabilities (Anwar, Scheffler, & Clauss, 2022; Osei-Amponsah, 2022; Sakaya, 2022; Satar et al., 2024), etc., in fostering digitalization. However, existing research, has not examined how learning from business failure experience affects digitalization among MSE in emerging markets. The lack of research can be

attributed to that fact that the phenomenon of digitalization and its study is only now gaining traction in many emerging markets including Ghana (Senyo et al., 2021; Ofosu-Ampong et al., 2023; Thorsteinsdóttir & Bandyopadhyay, 2024). The lack of research in the area means that there are no state-of-the-art research driven insights to inform both managerial action and public policy regarding digitalization. This is an important research gap which this study fills this by providing answers to the following questions: *Does learning from business failure impact digitalization in emerging markets? To what extent does knowledge capabilities influence the relationship between learning from business failure and digitalization in emerging markets?*

Addressing this gap is important in the understanding of the evolution of digitalization initiatives, particularly in emerging market contexts (Egbetokun et al., 2016). First, for instance, MSE are the most ubiquitous form of businesses in emerging markets and make a significant contribution to GDP, value creation and job creation aimed at poverty reduction (Acquaah & Agyapong, 2015; Adomako & Ahsan, 2022; Ahmad, 2022; Abbey & Adu-Danso, 2023; Bolosha et al., 2023). Second, businesses in particular MSE are in a race because of the new interest in digitalization in emerging markets (J. Amankwah-Amoah et al., 2021). These firms employ digitalization strategies to respond to the adverse barriers to business growth (Trinugroho et al., 2022). Therefore, there is value in studying how MSE can learn from business failure experience to digitalize business processes as well as make use of their knowledge exploitation capabilities, defined in a nutshell as the ability to identify, internalize exploit and manage new knowledge to improve firm performance (Garcia Martinez et al., 2019; Hock-Doepgen et al., 2021).

Using a survey dataset of 274 MSE from Ghana, this study finds empirical support for the prediction that learning from business failure experience is negatively associated with digitalization in MSE. However, this relationship is positively moderated by knowledge

exploitation capabilities. Surprisingly, contrary to the study's expectation, knowledge exploitation capabilities are negative associated with digitalization.

This study makes two main contributions to the literature. First, this study contributes to the discussion about digitalization in emerging markets. Particularly, this study focuses on MSE, the most ubiquitous form of business organizations and highlights the key antecedence of digitalization. In doing so, this study diverges from recent studies that suggest positive effects of business failure on firm outcomes (Mueller & Shepherd, 2016; Amankwah-Amoah et al., 2022) and show that learning from prior business failure experience inhibits the digitalization of MSE in emerging markets. Second, this research contributes to the knowledge-based theory of the firm by employing empirical data of MSE from emerging economies. The knowledge based theory (Grant, 1996; García-Lillo et al., 2019) demonstrates that knowledge is a significant indicator of organizational outcomes and in particular important for innovation (Anwar, Scheffler, & Clauss, 2022). This study observes that knowledge exploitation capabilities facilitate digitalization in MSE where when firms can demonstrate learning from prior business failure experiences. However, this theory has rarely been discussed in the context digitalization and business failure in emerging markets. Hence, this study advances how knowledge-based theory applies to MSE and business failure experience in emerging markets.

2. Literature review and hypotheses

2.1 Knowledge exploitation capabilities

Knowledge exploitation capabilities include recognizing, internalizing and exploiting internal and external knowledge (Easterby-Smith & Prieto, 2008; Hock-Doepgen et al., 2021). In a rapidly changing business environment, knowledge exploitation capabilities are needed to gain competitive advantages and facilitate innovations and digitalization (Gold et al., 2001; Qandah et

al., 2020). Knowledge exploitation capabilities make it possible for organizations to identify and manage new knowledge that is key for digitalization (Anwar, Scheffler, & Clauss, 2022). Two dimensions of knowledge exploitation capabilities are knowledge infrastructure capabilities and knowledge based dynamic capabilities (Qandah et al., 2020). Knowledge infrastructure capabilities enable knowledge management and manifest in infrastructure that foster the flow of knowledge within and outside firm (Gold et al., 2001; Caputo et al., 2021; Hock-Doepgen et al., 2021). Knowledge based dynamic capabilities are about the ability to acquire, share and recombine new knowledge resources and lead to organisational change such as digitalization (Tortora et al., 2021).

2.2 Digitalization

Digitalization refers to "the sociotechnical process of leveraging digitized products or systems to develop new organizational procedures, business models, or commercial offerings" (Saarikko *et al.*, 2020, p. 4). Therefore, digitalization signifies changing elements of business models and firm value-chain activities to digital platforms via emergent digital technologies such as artificial intelligence (AI), internet of things, cloud computing, etc.(Owoseni, 2023; Sreenivasan & Suresh, 2023). Digital technologies have paved the way for businesses to e take advantage of new market opportunities.

Recent policy changes in emerging markets such as Ghana has led to a sharp increase in the digitalization of many sectors of the economy. This is made possible by the incorporation of digital technologies into the redesign of business models (Senyo et al., 2021). This has further made new digital technology adoption a growing phenomenon, which bespeaks the opportunities for digitalization in emerging markets despite the challenges associated (Joseph Amankwah-Amoah et al., 2021; Nkomo & Kalisz, 2023)

2.3 Business failure experience

Entrepreneurs suffer financial, social, and psychological losses as a result of business failure (Ucbasaran et al., 2013; Bushe, 2019). The loss phase is often followed by a period of making meaning of and learning from the failure, for entrepreneurial re-emergence (Ucbasaran et al., 2013). Therefore, the ability to learn from business failure is a mechanism through which entrepreneurs re-engage in new entrepreneurial acts such as digitalization (Costa et al., 2023).

Existing research yields inconclusive evidence on the possible consequences of business failure. In order to comprehend the consequences of business failure, two key ideas are considered: the contagion viewpoints and competitive (Amankwah-Amoah et al., 2022). According to the contagion viewpoint, business failure can inflict an emotional and psychological weight on unsuccessful entrepreneurs, limiting their capacity to move on (Shepherd, 2003; Bushe, 2019), which can be stigmatizing for entrepreneurs , and undermine their their capacity to participate in risk-taking behavior such as digitalization (Amankwah-Amoah & Wang, 2019; Costa et al., 2023).

Business failure, according to the competitive effect, is a source of good learning and information dissemination to entrepreneurs (Shepherd, 2003; Boso et al., 2019). It is also a source of innovation that helps firms compete (Amankwah-Amoah & Wang, 2019; Amankwah-Amoah et al., 2021). Indeed, learning from prior business failure fosters new knowledge, growth and stimulates the development of problem-solving skills and new networks (Ferreira et al., 2020). This study emphasizes the second consequence, which is the competitive effect, to understand how learning from previous business failures affects entrepreneurial outcomes such as digitalization.

2.4 Hypotheses

Business failure arises when a business is unable to achieve a turnaround following a period of decline, eventually leading to permanent closure of business (Boso et al., 2019). The aftermath of

business failure results in a sense of loss and a period of recuperation for entrepreneurs (Ucbasaran et al., 2013). The lessons learned from such failures can negatively affect subsequent engagement in risky entrepreneurial activities such as digitalization (Amankwah-Amoah et al., 2018). Digitalization is intensive and involves changes in procedures and mechanisms that may impact a company's fundamental organizational structures (Anwar, Scheffler, & Clauss, 2022; Heider et al., 2022). The experience of business failure and the learning from such experiences can significantly reduce the propensity to engage in these risky organizational changes such as digitalization especially in emerging markets where the business environment is highly uncertain (Amankwah-Amoah et al., 2021).

This is because research has shown that the digital identity of entrepreneurs changes after business failure to reflect the psychological distress suffered as a result of the business failure experience (Fisch & Block, 2021). The psychological distress can impact the ability of entrepreneurs to reassure themselves and reengage in complex, risky and uncertain entrepreneurial activities such as digitalization.

Hypothesis 1: Learning from business failure experience is negatively associated with digitalization.

Prior business failure experience presents learning opportunities for subsequent entrepreneurial engagements (Fisch & Block, 2021; Costa et al., 2023). This occurs in the form of experiential learning (Lafuente et al., 2019) through direct involvement in situations which leads an individual to internalize the new knowledge acquired in the process (Amankwah-Amoah et al., 2021). The presence of knowledge exploitation capabilities in a firm can foster the process of learning from failure by helping firms to identify new knowledge and recognize patterns through experiential learning (Lafuente et al., 2019). Apart from identifying, accessing and recombining

new knowledge, knowledge exploitation capabilities also enable knowledge management and learning mechanisms (Soluk et al., 2021). This study argues that knowledge exploitation capabilities can foster learning from business failure and enable the firms to redeploy experiences gained from prior business failure towards successful digitalization initiatives. The learning from the experience of business failure and subsequent entrepreneurial behaviour such as digitalization is an indication of agility (Li et al., 2021). It also shows the capacity to redeploy knowledge capabilities in risky endeavours guided by prior learning from failure in order to capture new markets (Amankwah-Amoah et al., 2018).

Hypothesis 2: The negative effect of learning from business failure on digitalization is mitigated by knowledge exploitation capabilities.

The research model is presented in Figure. 1.

Insert Figure 1 about here

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3. Methodology

3.1 Data collection

Countries at different levels of development have used different criteria to classify MSE based on quantitative and qualitative measures. Earlier studies in Ghana have considered businesses with 1 – 5 employees as micro enterprises, while businesses with employees between 6 and 9 are categorized as very small enterprises and businesses with employees between 10 and 29 employees as small enterprises (Osei et al., 1993). Therefore, this his study approached enterprises with fewer than 30 employees with the survey questionnaire for data collection.

The use of technology amongst individuals and small businesses in Ghana has gained prominence. This made it possible for an online survey to reach firm owners and managers through emails. Consistent with Acquaah and Agyapong (2015), This study obtained the contact

information of 6000 owners and managers of firms from the database of Ghana Startup Network (GSN). All these firms are duly registered with the Registrar General's department, the body charged with the responsibility of registering companies in Ghana (Adomako & Ahsan, 2022)

To give assurance of privacy and data protection to firm owners and managers, the cover letter of the questionnaire indicated that the purpose of the survey was for scientific purposes only. It was further requested that only the owners or managers who are well informed about the details of the business and make important decisions be allowed to respond to the survey. Following Boso et al. (2019) this study also excluded all those responses that have no experience of business failure.

The survey questionnaire was in English language as that is the official language of Ghana. First, the authors contacted the GSN to explain the purpose of the study and the targets of the survey which are the owners and managers of MSE. Subsequent to explaining the target of the survey, a link or URL to the survey using the Qualtrics survey software was sent through emails to the owners and managers of these firms and a further explanation was given about the purpose of the study. The survey was open for two months. A total of 274 completed questionnaires were received after two reminders which represents a 4.56% response rate. This is consistent with studies in small business research as the response rate in online survey is low as compared to a hard copy approach (Eller et al., 2020).

Regarding the distribution of the sample, 48.54% in the services industry and the rest are in wholesale and retail (6.93%), manufacturing 7.66%, primary industries (32.48%) and construction (4.38%).

3.2 Variables

Table I presents an overview of the main variables used in this study. The questionnaire was developed based on validated constructs from prior studies.

Insert Table I about here

3.4 Dependent variable

The dependent variable used in this study is *digitalization*. To measure digitalization, this study relied on Eller et al. (2020) and (Issah et al., 2024) who used a three-item scale to capture the degree of digitalization in small and medium sized enterprises (SMEs). Respondents were asked to subjectively rate their respective firms' level of digitalization from on a five-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree.".

3.5 Independent variable

To measure the independent variable, *learning from failure*, the study used a measure from Boso et al. (2019). This measure is made up of a four-item scale designed to capture learning from business failure. Business managers were asked to indicate the extent to which they have learned from past business failure on a five-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree."

3.6 Moderating variable

The study uses *knowledge exploitation capabilities* as a moderating variable which is measured by three-item scale following Soluk et al. (2021) and Issah et al. (2024). Business owners and managers were asked to rate the knowledge capabilities of their respective firms on a five-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree.".

3.7 Control variables

The study controlled for both demographic and other firm level factors that can influence digitalization in firms. *Financial performance* is measured by a six-item scale adopted from Eller *et al.* (2020). This allows the authors to capture the managers' perception of the financial performance of the respective firms. Respondents were asked to rate the financial performance of

their respective firms on a five-point Likert scale ranging from 1 “strongly disagree” to 5 “strongly agree.”. This subjective measure is used because it is difficult to obtain the financial information of SMEs since they are not required by law to publish it. For this reason, prior research tends to rely on self-reported measure of financial performance (e.g. Anwar, Clauss, & Issah, 2022). The study also controlled for *environmental dynamism* which measures the volatility of the business environment.. Respondents were asked to rate a five-item on a five-point Likert scale ranging from 1 “very stable to very volatile” to 5 “strongly agree.” Furthermore, risk capabilities and marketing capabilities are controlled for using a two-item and three-item scales respectively adopted from (Soluk et al., 2021). Here respondents were asked to rate their respective firms on a five-point Likert scale ranging from 1 “very stable to very volatile” to 5 “strongly agree”. In addition to these, the study controlled for the use of *information technology* tools using a four-item on a five-point Likert scale, ranging from 1 "strongly disagree" to 5 "strongly agree" adopted from Eller et al. (2020). Given that the data was collected during the COVID-19 crisis, the study controlled for the fear of COVID-19, which is said to impact decision making in all spheres of life including business strategic decisions (Issah et al., 2023). With a seven-item scale adopted from Ahorsu et al. (2020), managers were asked to reflect on how the pandemic has affected them. This measure allows the authors to control the effect of COVID-19 on business owners and managers in terms of decision-making.

A natural logarithm of the number of years since a firm started operations and the number of employees are used to control for firm age and firm size respectively(Issah et al., 2023). Furthermore, the study controlled for the education of managers. Industry dummies are also included to control for factors that are associated with digitalization at the industry level (Anwar, Clauss, & Issah, 2022). In a context like Ghana, a firm's location may have a significantly greater

impact on its digitalization drive. The study controlled for this using the north-south divide that has characterized discussions of the persistence of regional economic inequalities between the predominantly rich south and poor northern regions of Ghana (Issah *et al.,* 2024).

4. Results

4.1 Descriptive statistics

In terms of the descriptive statistics as presented in Table II, the mean of digitalization, 4.54 indicates that on average the firms in the sample are quite involved in digitalization. The summary statistics also show that firms in the sample have high knowledge capabilities indicated by a mean of 4.04. The firms in the sample have substantial business failure experience as the *learning from business failure* shows a mean of 4.19. The mean of 3.36 of financial performance shows the average performance of the firms in the sample. Furthermore, the firm size shows that the sample consists of small firms with an average number of employees of 1.55. On average the firm age of the firms in the sample is 1.57 indicating that the sample is made up of relatively younger firms.

Insert Table II about here

Correlations are presented in Table III which indicates that the issue of multicollinearity is not a problem as the variance inflation factor (VIF) test reveals a VIF of 2.05 which is below the acceptable VIF of 10 (Clauss et al., 2022).

Insert Table III about here

4.2 Common method bias

Common method bias (CMB) which may arise in self-reported questionnaires (Malhotra et al., 2006), is a major concern in cross sectional data analysis due to issues of validity and reliability of variables. CMB may lead to misleading inferences if unchecked (MacKenzie & Podsakoff, 2012). “Harman’s One Factor Test” is a common approach of testing for CMB. The rule in CMB is not a concern for a cross sectional data CMB if the first factor accounts for less than 50% of the variance. To test for CMB in this data, the study used an unrotated principal component factor analysis calculated with the STATA software package to undertake Harman’s single factor test on all the survey items. The test shows 10 factors with an eigenvalue greater than 1 which account for 75% of the total variance. 16% of the variance is explained by the first factor. The results suggest that CMB is not an issue in the dataset.

4.3 Regression results

The results are based on multiple linear regression models. The continuous nature of the dependent variable makes this approach the most appropriate (e.g. Issah et al., 2023). Model 1 ($\beta = -0.932$, $p < .05$). Table IV provides empirical support for hypothesis 1 which predicts that learning from failure is negatively associated with digitalization. This result is statistically significant at the 5% level of significance. The study predicted a positive moderation of knowledge capabilities on learning from failure in hypothesis 2. The hypothesis suggests that learning from failure will be positively associated with digitalization if there is an increase in knowledge capabilities. Model 1 ($\beta = 0.222$, $p < .05$) of Table IV provides a statistically significant empirical support for the hypothesis at 5% significance level.

Regarding the control variables, the study finds a statistically significant association between education and information technology and digitalization. However, the fear of COVID-19 and financial performance showed a negative association with digitalization.

Insert Table IV about here

4.4 Robustness tests

The results in Model 1 of Table IV are based on the full sample of this study. Therefore, as a robustness test, results of a subsample analysis consisting of firms in the services sector are presented. This allows the study to capture the level of digitalization in the fastest growing service industry in Ghana (Acquaah and Agyapong, 2015). The results as presented in Model 2 (β = -0.949, $p < .05$) of Table IV shows that learning from failure is negatively associated with digitalization. This study also found that, knowledge capabilities positively moderate the effect of learning from failure on digitalization as captured by Model 2 (β = 0.258, $p < .05$) of Table IV. These results are similar to the results of the full sample thus confirming the robustness of the results.

4.5 Further robustness tests

Regressing outcome measures such as digitalization on managerial capabilities such as knowledge capabilities may bias the results due to self-selection based endogeneity bias (Heckman, 1979; Clougherty et al., 2016). Left unaddressed, endogeneity selection bias can lead to inaccurate inferences (Wu & Shen, 2013). Following Issah et al. (2023), an econometric technique commonly used to address self-selection based endogeneity bias is applied. This involves two steps. First, a control variable known an inverse mills ratio was created. This is done by running an initial probit model that captures digitalization for all the 274 observations in the sample (Heckman, 1979). In the second step, the inverse mills ratio is added as an additional control variable in the model to address the issue of self-selection bias (He & Wong, 2004). The results of this analysis captured by Model 3 of Table IV (β = 0.223, $p < .05$) show that the inverse mills ratio is not statistically

significant, and the results are consistent with the results of Model 1 and Model 2. This indicates that selection based endogeneity is not a major concern for the study (Issah et al., 2023).

5. Discussion and conclusion

5.1 Research implications

The underlying argument of this study is that learning from business failure experience does not foster digitalization among MSE. Pursuant with this, the empirical results show a negative association between learning from business failure and digitalization. This is in consonance with prior studies that have found a negative effect of business failure experience on other performance measures such as successive entrepreneurial engagements (Amankwah-Amoah et al., 2018), entrepreneurial collaboration (Amankwah-Amoah et al., 2022) particularly in emerging markets (Amankwah-Amoah & Wang, 2019). These prior studies coupled with this analysis, reveals that learning from business failure experience is negatively associated with digitalization which is another form of risky entrepreneurial engagement.

Surprisingly, in examining the effect of knowledge exploitation capabilities on digitalization, the study found a negative relationship between knowledge exploitation capabilities and digitalization.. This may be explained by the context and sample of firms in the analysis. For instance, the sample consists of micro and small enterprises most of which tend to adopt digital technologies in their business models.. Perhaps, the knowledge exploitation capabilities of these firms are not properly aligned with their needs such as overemphasis on non-indigenous knowledge systems or capabilities that are not driven by local realities (Malapane et al., 2024). This can in turn hinder digitalization due to knowledge inertia, information overload or the absence of the relevant knowledge capabilities in line with Gong et al. (2022) This study highlights the growing mismatch between the labor force and the needs of the industry or small firms in many

emerging markets particularly in areas such as ICT and other digital technologies (Issah & Calabro, 2024).

The interaction effect demonstrates that learning from business failure, combined with the appropriate amount of knowledge capabilities, can accelerate digitalization in MSE. This is in line with prior studies that recognize employee skills as an important antecedent of digitalization (Eller et al., 2020; Nicolás-Agustín et al., 2021). The findings are also in line with to the study by Boso et al. (2019) which suggests that capabilities such as entrepreneurial alertness and digital knowledge sharing capabilities impact performance positively (Anwar, Scheffler, & Clauss, 2022).

This study makes two important contributions to the digitalization literature and MSE literature. First, the study contributes to the ongoing discussion about digitalization in developing countries. Particularly, this study focuses on MSE, the most ubiquitous form of business organizations in developing countries and highlights the key antecedents of digitalization. By doing so, this study diverges from recent studies that suggest positive effects of business failure experience on firm outcomes (Mueller & Shepherd, 2016; Amankwah-Amoah et al., 2022) and show that learning from business failure inhibits the digitalization of MSE in resource limited countries. Second, this research contributes to the knowledge-based theory of the firm by employing empirical data of MSE from emerging economies. The knowledge-based theory (Grant, 1996; García-Lillo *et al.,* 2019) reveals the importance of knowledge capabilities in fostering organizational outcomes such as innovation and digitalization. This study observes that knowledge exploitation capabilities facilitate digitalization in MSE where when firms can demonstrate learning from prior business failure experiences based on their knowledge capabilities. However, this theory has rarely been discussed in the context digitalization and business failure in emerging

markets. Hence, this study advances how knowledge-based theory applies to MSE and business failure experience in emerging markets.

5.2 Managerial and policy implications

First, owners and managers of MSE should develop their knowledge exploitation capabilities by incorporating indigenous community-based knowledge systems to enhance participatory approaches to technology adoption and development. This will make it easier to recognize and adopt digital technologies that are in tandem with local socio-economic realities as well as addresses local digitalization needs. Second, the policy implication of this study is that policy makers in a resource constrained environment such as Ghana should see prior business failure experience as a resource that can be leveraged for digitalization. Therefore, entrepreneurs with business failure experience should be granted access to government support schemes such as training and financial capital to aid the acquisition of novel technologies and digital systems needed for digitalization.

5.3 Limitations and future research directions

This study is not without limitations. First, the results are based on cross sectional data which does not allow examining the effects of learning from business failure on digitalization beyond a single period. In view of this future research should consider investigating this using longitudinal data in order to track the changes in the digitalization of MSE over time. Second, given the scarcity of research about learning from business failure and MSE, future research may adopt a qualitative approach to enable an in-depth analysis of the digital transformation and the processes involved in MSE. Third, our paper uses knowledge-based view as one of theoretical lenses. However, this theory does not capture the unique socio-cultural environment in which African MSEs operate. In view of this, future research may use theories such as indigenous knowledge systems and ethical digitalization that take into account the unique environments of firms in our sample. Fourth, for

broader applicability of the findings, future research may expand the scope of the study and conduct comparative studies across different African or emerging market contexts. Firth, while the inverse mills ratio has been used to control for reverse causality and endogeneity concerns, future studies may apply the instrumental variable approach to enhance the robustness of the results.

5.4 Conclusion

The aim of this paper was to investigate the association between learning from business failure experience and digitalization in emerging markets. Using a tailored data set of 274 MSE in Ghana, the empirical results show a negative association between learning from business failure and digitalization. This study also found that this association is attenuated when knowledge exploitation capabilities increase. The study provides important practical implications for policy making and managerial action.

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TABLES

Table I: Description of the main variables

	Variables: Response scales range from 1 (strongly disagree) to 5 (strongly agree)	**Properties**
Learning from business failure		**CA = 0.93; VE = 83%**
1	I am particularly making use of previous failure experience in my current venture	
2	I am very sure of making use of previous failure experience in my current venture.	
3	The errors I identified from my previous failure experience lead to new insights and/or ideas within my current venture	
4	I am applying what I learnt from my previous failure experience in my new business.	
Knowledge exploitation capabilities		**CA = 0.84; VE = 76%**
Our company has the capabilities to :		
1	recognize relevant knowledge	
2	internalize new external knowledge	
3	exploit new knowledge for innovations	
Risk capabilities		**CA = 0.61; VE = 72%**
4	has risk-taking capabilities	
5	is willing to take risks.	
Marketing capabilities		**CA = 0.88; VE = 81%**
6	acquire new customers	
7	expand to new markets	
8	increase sales to existing customers	
Financial performance		**CA = 0.91; VE = 70%**
1	Sales growth	
2	Return on sales	
3	Gross profit	
4	Net profit	
5	Return on equity	
6	Return on investment	

Note = CA= Cronbach's Apha; VE = Variance Explained

Table I: Description of the main variables (continuation)

	Variables: Response scale range from 1 (strongly disagree) to 5 (strongly agree)	**Properties**
Digitalization		**CA = 0.77; VE = 69%**
1	Assessment of your own digitalization compared to the industry	
2	Assessment of ICT use	
3	Evaluate how extensive your own ICT use is	
Enviromental dynamism		**CA = 0.86; VE = 66%**
	What is the rate of change (volatility) in your business unit's competitive environment relative to change in other industries? The degree of change	
1	where a change in the processes, products, services, and business models for our customers is needed.	
2	where the knowledge and capabilities of our suppliers change.	
3	where a change in the processes, products, services, and business models of our competitors occur.	
4	where the processes, products, services, and business models of our own company change	
5	where a change in the processes, products, services, and business models for our customers is needed.	
Fear of COVID-19		**CA = 0.86; VE = 70%**
1	I am most afraid of COVID-19	
2	It makes me uncomfortable to think about COVID-19	
3	My hands become clammy when I think about COVID-19	
4	I am afraid of losing my life because of COVID-19	
5	When watching news and stories about COVID-19 on social media, I become nervous or anxious	
6	I cannot sleep because I'm worrying about getting COVID-19	
7	My heart races or palpitates when I think about getting COVID-19	
Information technology		**CA = 0.77; VE = 61%**
1	Social Media and Collaborative Technologies (e.g chat or discussion forums, file or document management or document sharing software etc,)	
2	Mobile Technologies e.g smart phone, iPad, tablets, laptop etc	
3	Data and Analytics	
4	Cloud Computing Services e.g dropbox, googledrive, icloud etc	

Note = CA= Cronbach's Apha; VE = Variance Explained

Table II: Summary statistics

Variables	Obs	Mean	SD	Min	Max
Services (d)	274	0.49	0.50	0.00	1.00
Wholesale and retail (d)	274	0.07	0.25	0.00	1.00
Manufacturing (d)	274	0.08	0.27	0.00	1.00
Primary industries (d)	274	0.32	0.47	0.00	1.00
Construction (d)	274	0.04	0.21	0.00	1.00
Digitalization	274	4.54	1.47	1.00	8.00
Firm age	274	1.57	0.72	1.00	3.00
Firm size	274	1.55	0.84	1.00	3.00
Education	274	2.24	0.67	1.00	4.00
Region (d)	274	0.66	0.47	0.00	1.00
Marketing capabilities	274	4.16	0.70	1.33	5.00
Risk capabilities	274	3.98	0.61	2.00	5.00
Fear of Covid-19	274	2.97	0.87	1.00	5.00
Financial performance	274	3.36	0.72	1.00	5.00
Environmental dynamism	274	2.93	0.70	1.00	5.00
Information technology	274	3.81	0.75	1.00	5.00
Learning from failure	274	4.19	0.96	1.00	5.00
Knowledge capabilities	274	4.04	0.56	1.00	5.00

Note: d = dummy variable

Table III: Correlations

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Services (d)	1.00																	
2	Wholesale and retail (d)	-0.27	1.00																
3	Manufacturing (d)	-0.28	-0.08	1.00															
4	Primary industries (d)	-0.67	-0.19	-0.20	1.00														
5	Construction (d)	-0.21	-0.06	-0.06	-0.15	1.00													
6	Digitalization	0.14	0.12	0.03	-0.22	-0.02	1.00												
7	Firm age	0.01	-0.02	-0.04	-0.02	0.10	-0.10	1.00											
8	Firm size	-0.03	-0.09	0.07	0.01	0.07	-0.05	0.30	1.00										
9	Education	0.05	0.05	0.00	-0.02	-0.13	0.18	0.04	0.06	1.00									
10	Region (d)	0.05	-0.05	-0.03	0.00	-0.03	0.11	-0.10	0.04	-0.01	1.00								
11	Marketing capabilties	0.02	-0.04	-0.09	0.05	-0.01	0.04	0.13	0.26	0.00	0.11	1.00							
12	Risk capabilties	-0.03	-0.07	0.03	0.04	0.04	0.05	0.06	0.06	0.00	0.03	0.45	1.00						
13	Fear of Covid-19	0.00	0.09	0.06	-0.08	0.00	-0.14	0.07	0.04	-0.11	-0.17	-0.17	-0.03	1.00					
14	Financial performance	-0.11	0.00	0.06	0.05	0.09	-0.17	0.14	0.18	0.01	0.03	0.13	0.17	0.04	1.00				
15	Environmental dynamism	0.00	-0.05	0.06	-0.03	0.07	0.00	-0.13	-0.11	-0.01	0.02	-0.10	0.04	0.07	0.05	1.00			
16	Information technology	0.02	0.10	0.03	-0.08	-0.02	0.31	0.01	0.15	0.16	0.08	0.28	0.15	-0.05	0.07	-0.06	1.00		
17	Learning from failure	0.03	-0.11	0.00	0.00	0.07	0.01	0.12	0.12	0.12	-0.04	0.14	0.10	0.00	0.12	0.09	0.26	1.00	
18	Knowledge capabilities	-0.06	0.03	-0.02	0.04	0.05	0.06	0.05	0.13	-0.01	0.11	0.48	0.49	-0.14	0.20	0.02	0.30	0.22	1.00

Note: d = dummy variable

Table IV: Effects of learning from business failure on digitalization

Variables	Model 1	Model 2	Model 3
Inverse mills ratio			-0.717
			(2.673)
Services	-0.028		-0.167
	(0.414)		(0.662)
Wholesale and retail	0.355		0.174
	(0.514)		(0.847)
Manufacturing	-0.029		-0.247
	(0.491)		(0.952)
Primary industries	-0.602		-0.584
	(0.420)		(0.426)
Firm age	-0.126	-0.024	-0.126
	(0.122)	(0.161)	(0.122)
Firm size	-0.066	-0.303**	-0.040
	(0.108)	(0.145)	(0.144)
Education	0.253**	0.411**	0.219
	(0.126)	(0.169)	(0.179)
Location	0.192	0.087	0.073
	(0.177)	(0.240)	(0.477)
Marketing capabilties	-0.036	-0.013	0.033
	(0.149)	(0.179)	(0.298)
Risk capabilities	0.193	-0.180	0.083
	(0.163)	(0.220)	(0.441)
Fear of Covid-19	-0.175*	-0.131	-0.154
	(0.099)	(0.120)	(0.128)
Financial performance	-0.353***	-0.224	-0.340***
	(0.119)	(0.149)	(0.129)
Environmental dynamism	0.025	0.031	0.058
	(0.119)	(0.157)	(0.171)
Information technology	0.590***	0.572***	0.386
	(0.122)	(0.148)	(0.768)
Learning from failure	-0.932**	-0.949**	-0.915**
	(0.441)	(0.473)	(0.446)
Knowledge exploitation capabilities	-0.961**	-0.886*	-0.908*
	(0.482)	(0.508)	(0.522)
Learning from failure* knowledge exploitation capabilities	0.222**	0.258**	0.223**
	(0.110)	(0.119)	(0.110)
_cons	7.100***	7.015***	8.244*
	(1.942)	(1.985)	(4.686)
N	274.000	133.000	274.000
R2	0.23	0.25	0.23

d = dummy variable; standard errors in parentheses

*p < .10. **p < .05. ***p < .01.

Figure 1: Research model

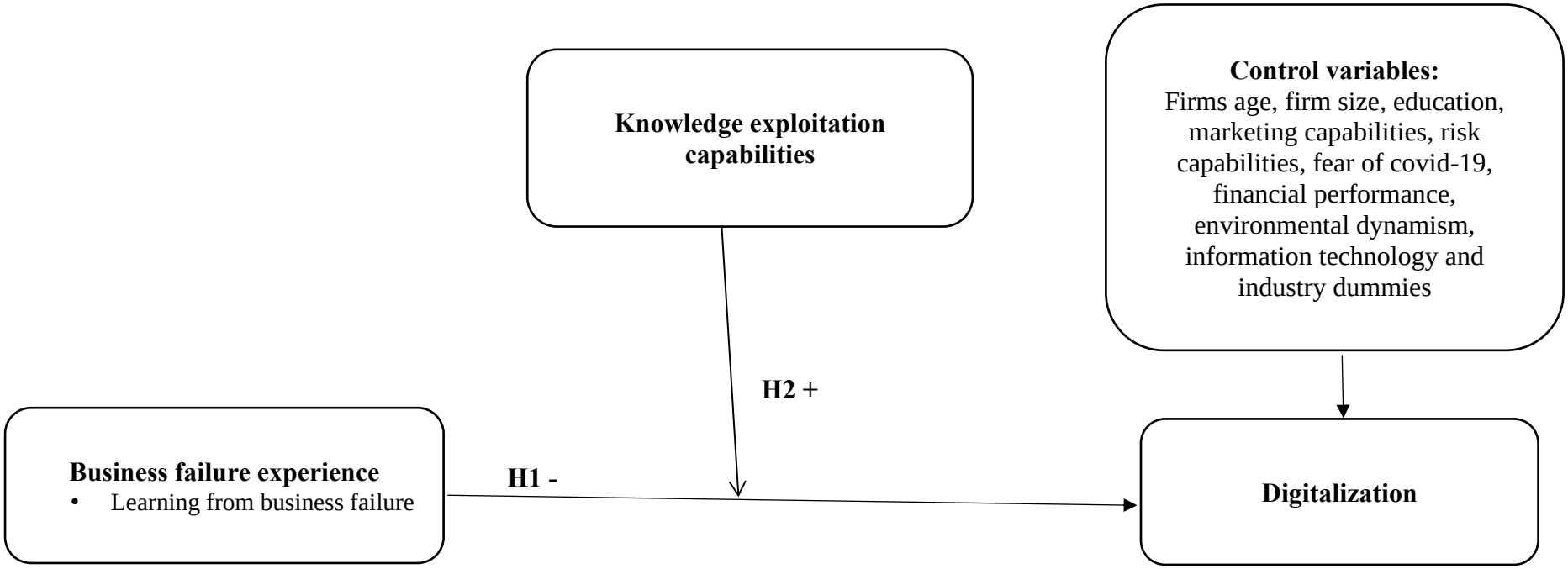

Figure 2: The moderation of knowledge capabilities on the association between learning from business failure and digitalization.