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Human capabilities and firm performance in women-owned micro and small-medium enterprises: The mediating role of substantive and dynamic capabilities

Capacidades humanas y rendimiento empresarial en microempresas y pequeñas y medianas empresas propiedad de mujeres: El papel mediador de las capacidades sustantivas y dinámicas

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Abstract
Dynamic capabilities are widely recognized as a catalyst for firm performance yet there is a dearth of research on how dynamic capabilities work with human and substantive capabilities to contribute to firm performance particularly in women-owned micro and small firms. This study investigates the influence of human capabilities on firm performance, mediated by both substantive and dynamic capabilities. Drawing on Zahra et al., (2006) conceptual model of substantive and dynamic capabilities, we test the relationship between human capabilities of women business owners and substantive and dynamic capabilities as they act on firm performance. We find that human capabilities directly and indirectly influence firm financial performance, mediated by substantive and dynamic capabilities. Substantive capabilities do not directly influence firm performance but have a role indirectly through dynamic capabilities. The results illuminate the interplay between capabilities as key drivers of financial performance and contribute novel insights into human and substantive and dynamic capabilities for policymakers when developing policy to support micro and small firm performance.

Keywords: firm performance; human capabilities; substantive capabilities; dynamic capabilities; Irish MSMEs
JEL Classification: H32; L25; L26; M10

Resumen
Las capacidades dinámicas son ampliamente reconocidas como un catalizador del rendimiento empresarial, pero hay muy pocos estudios sobre cómo estas capacidades dinámicas interactúan con las capacidades humanas y sustantivas para contribuir al rendimiento empresarial, especialmente en las microempresas y pequeñas empresas propiedad de mujeres. Este estudio investiga la influencia de las capacidades humanas en el rendimiento empresarial, mediada por las capacidades sustantivas y dinámicas. Basándonos en el modelo conceptual de capacidades sustantivas y dinámicas de Zahra et al. (2006), analizamos la relación entre las capacidades humanas de las mujeres empresarias y las capacidades sustantivas y dinámicas en su influencia sobre el rendimiento empresarial. Hemos descubierto que las capacidades humanas influyen directa e indirectamente en el rendimiento financiero de las empresas, mediadas por las capacidades sustantivas y dinámicas. Las capacidades sustantivas no influyen directamente en el rendimiento de las empresas, pero desempeñan un papel indirecto a través de las capacidades dinámicas. Los resultados ponen de manifiesto la interacción entre las capacidades como factores clave del rendimiento financiero y aportan nuevos conocimientos sobre las capacidades humanas, sustantivas y dinámicas a los responsables políticos a la hora de desarrollar políticas de apoyo al rendimiento de las microempresas y las pequeñas empresas.

Palabras clave: rendimiento empresarial; capacidades humanas; capacidades sustantivas; capacidades dinámicas; PYMEs irlandesas
Clasificación JEL: H32; L25; L26; M10

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1. Introduction

The extensive study of firm performance, particularly in the form of growing revenues has exemplified the conspicuous roles of both the business owner and the organisation as key determinants of performance (Helfat et al., 2007; Zhou & de Wit, 2009). Central to understanding firm performance is the concept of dynamic capabilities, which refer to a firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments (Teece, 2014). Teece (2007) describes the foundational constructs of dynamic capabilities as sensing opportunities and threats, seizing opportunities and transforming the firm, all of which collectively underpins a firm's capacity to achieve and sustain competitive advantage and, by extension, improve performance. These capabilities are viewed as critical in enabling firms to adapt and thrive in dynamic business environments. Employing Teece's foundational theoretical work, Zahra et al. (2006) placed emphasis on the role of human, substantive and dynamic capabilities, highlighting how each influences firm performance.

However, despite the substantial interest and considerable empirical research, a dearth of well-founded knowledge still exists surrounding the human and substantive and dynamic capabilities that influence firm performance and the business owners' influential role in this process (Teece, 2014). There is a lack of consensus amongst researchers on the fundamental human and substantive and dynamic capabilities that lead to firm performance in micro, small and medium-sized firms (herein referred to as MSMEs) (Fadahunsi, 2012; Gibb & Davies, 1990; Hart et al., 2021; Storey, 1994), which may be attributable to the slow and non-systematic (Kuratko et al., 2015) rate of theoretical development in the field. This, in turn, has resulted in the absence of a comprehensive theory of small firm performance and the theory of small firm growth and performance continues *"in a rather unsatisfactory state"*(Hart et al., 2021, p. 9). Coupled with this, is the reported dearth of evidence specifically addressing firm performance in women-owned firms, largely attributed to the slower progression of theory development in the field in general (Biru et al., 2021; Chen et al., 2020). Thus, the pivotal role of women business owners leveraging human, substantive and dynamic capabilities to drive firm performance (Fernandes et al., 2017) remains underexplored (Abasolo & Lamug, 2021). Consequently, the critical question of how these capabilities interact to influence firm performance remains unanswered- an issue this study seeks to address within the context of women-owned firms in Ireland.

The contribution of this study is embedded in two important areas of research contemporarily debated in research and policy - namely small firm performance and dynamic capabilities. This study is underpinned by the dynamic capabilities approach which is well-recognised for investigating internal factors driving firm performance (Bueno Campos et al., 2019; Ferreira et al., 2011; He et al., 2016). This study draws upon the conceptually important work of Zahra et al. (2006), recognising the potentially significant work's contribution to understanding dynamic capabilities and firm performance. Specifically, this study examines the relationship between financial firm performance and human capabilities of women business owners (i.e. education, managerial experience, previous sector experience) (Storey, 1994) and substantive and dynamic capabilities.

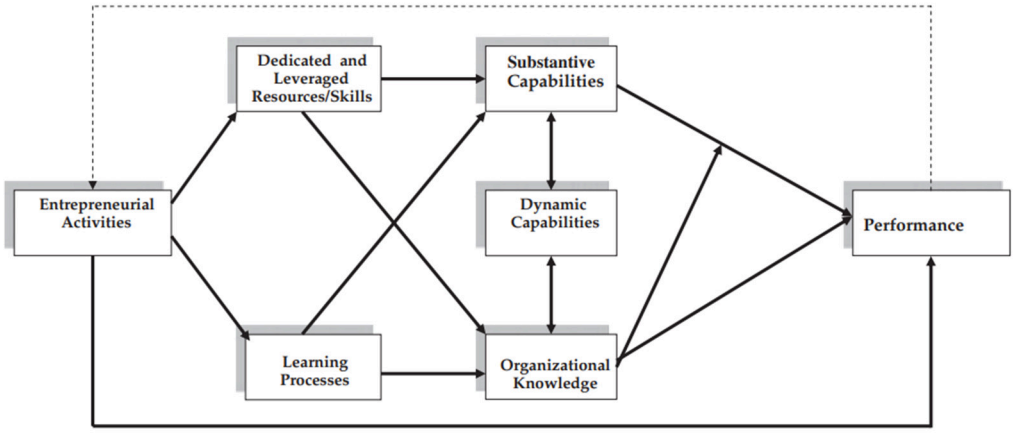
This paper commences by introducing the theoretical framework discussing the dynamic capabilities perspective relevant to micro and small enterprises. Specific human and substantive and dynamic capabilities under investigation are identified, followed by a description of the research approach. The findings and discussion demonstrate that for Irish women-owned micro and small businesses, the multifaceted and pivotal role of women's human capabilities and the mediating role of substantive and dynamic capabilities. The study concludes by considering contributions to theory, policy and practice.

2. Theory and research hypotheses

Research has posited that business owners and the firm are inextricably linked, and it may be *solely* the owner that determines firm performance due to their agency over the firms' resources and capabilities (Foss et al., 2019; Penrose, 1995; Polanyi, 1962; Zhang et al., 2023), which shapes and drives firm performance in unique ways. Moreover, the dynamic capabilities literature (Arthurs & Busenitz, 2006; Weerawardena et al., 2007; Winter, 2003), and explicitly Zahra et al. (2006) and Newbert et al. (2008) identify dynamic capabilities as driven by the business owner's entrepreneurial activities. Therefore, it is important to investigate how, and which, human, substantive and dynamic capabilities of women business owners, (Fernandes et al., 2017) are significant to achieve specific financial firm performance. Whilst dynamic capabilities are perceived as a linear process (Arthurs & Busenitz, 2006), it is important to note that their interaction may be reciprocally active, having a moderating complex effect (Ahlin et al., 2014).

In progressing our understanding of the types of capabilities driving firm performance, Zahra et al. (2006) developed a conceptual model for understanding the dynamic drivers of firm performance by categorising capabilities, and their direction in impacting performance. Adopting this model, this study focuses on the relationship between women business owner's human and substantive and dynamic capabilities. We adopt and align with Zahra et al. (2006), model of capability formation and performance (see Figure 1) which recognises the categorisation of organisational capabilities as "substantive" and "dynamic" capabilities.

Figure 1. A stylised model of capability formation and performance



Source: adapted from (Zahra et al., 2006, p 926)

Zahra et al. (2006) propose that the creation and subsequent use of capabilities correspond to the business owner, their entrepreneurial activities, and the perception of opportunities to productively change existing routines or resource configurations (Penrose, 1995) leading to improved performance. Thus, the owner is the starting point in this study. As illustrated in Figure 1, Zahra et al. (2006) depicts bi-directional arrows to and from dynamic capabilities, indicating that dynamic capabilities are affected by, and transform substantive capabilities and the firm's knowledge base (i.e. in this case women business owners). The substantive capabilities and the firm's knowledge base directly and interactively affect the firm's performance- ultimately improved performance. The key contribution of this study is to understand how women business owners' human capabilities relate to the organisation's capabilities (i.e. substantive and dynamic), and the impact this relationship has on firm performance.

2.1 Human capabilities (education, managerial experience, previous sector experience)

Prior studies in management domains recognise educational qualifications, managerial experience, previous work experience, and firm/sector specific experience as key dynamic capabilities (Barney & Wright, 1998; Colbert, 2004; Jafari-Sadeghi et al., 2021; Wright et al., 1994), having a positive effect on firm performance. Wright et al. (1994) argue that the more qualified human capabilities are, the rarer they are. The literature on dynamic capabilities argues that highly educated individuals show greater ability to sense changes and monitor environmental variables (Feldman & Pentland, 2003; Nijssen & Paauwe, 2012; Teece, 2012; Wei & Lau, 2010; Wright et al., 2001).

Subjective managerial knowledge and perception is also shaped by managerial experiences within a specific industry. Industry-specific experience involves interactions with buyers, suppliers, distributors, and other stakeholders, which produces knowledge about opportunities, threats, competitive conditions, and governmental regulations unique to each industry (Kor, 2003; Spender, 1989). Developments in technology alongside competitive and regulatory conditions in an industry, follow a path-dependent pattern (Arthur, 1994). Therefore, historical, and industry-based experience and knowledge can be useful for perception and evaluation of new business opportunities. Industry experience can also embed goodwill with certain customers, suppliers, and industry stakeholders.

Research in both the dynamic capabilities approach and management domain point to 'human' capabilities and knowledge resources as being a significant factor explaining capabilities effectiveness (Arend & Bromiley, 2009; Colbert, 2004; Kok & Ligthart, 2014).

In summary, human capabilities (i.e. education, managerial experience and previous sector experience) play a central role in the determination of firm performance due to the close relationship between the owner and the firm (Davidsson, 1991; Mitchelmore & Rowley, 2013; Storey, 1994). Human capabilities are intangible and embedded for the most part and can be truly unique in their capability to drive firm performance. Hence, the first hypothesis is:

H1: *Human capabilities have a positive effect on firm financial performance*.

2.2 Substantive and dynamic capabilities

Gilbert et al. (2006) proposes that the firm, and how it operates, is an extension of the owner, so we now

examine the influence of substantive and dynamic capabilities on firm performance. Substantive and dynamic capabilities involve the coordination of multiple organisational activities all of which are aimed at a specific objective e.g. firm performance, change or sustainable advantage (Helfat & Peteraf, 2003; Newey & Zahra, 2009). They are composed of the orchestration of substantive and dynamic capabilities by which firms achieve new resource configurations (Collis, 1994; Eisenhardt & Martin, 2000; Teece, 2014; Zollo & Winter, 2002). In this context, knowledge, and knowledge assets are key resources of the firm. Drawing on Teece (2012, 2014), 'substantive' capabilities, are routine activities involving for example, expansion of distribution channels, advertising and promotion, continuous improvement of information communication technology (ICT), seeking additional financing and professional advice, expanding current facilities, streamlining costs, engaging in web-based activities, franchising the business, and becoming part of a joint venture.

Specifically, a substantive capability enables a firm to perform an activity on an on-going basis over time, using the same techniques on the same scale to support existing products and services for the same customer population (Helfat & Winter, 2011), such as administrative functions, and governance matters necessary to maintain the running of the firm. Substantive capabilities are important to sustain and improve firm performance but are more routine and automatic when compared to dynamic capabilities. Substantive capabilities enable the firm to execute its main operating activities and as such, should impact firm performance (Newey & Zahra, 2009). This study proposes that firm performance is influenced by human capabilities acting through substantive capabilities of the organisation.

H2: *Human capabilities have a positive effect on firm financial performance, and that relationship is mediated by a change in substantive capabilities*.

Dynamic capabilities by comparison are higher-order capabilities given their *dynamic* ability to change or reconfigure existing substantive capabilities (Helfat, 1997). Thus, the qualifier "dynamic" distinguishes one type of ability (i.e. the substantive ability for continuous improvement) from another ability to reform the way the firm develops something new. A review of the literature provides the following examples of dynamic capabilities e.g. research and development capability (Easterby-Smith et al., 2009; Teece, 2014; Teece et al., 1997) innovation capability (Easterby-Smith et al., 2009), product development capability (Easterby-Smith et al., 2009; Teece, 2014; Teece et al., 1997) , and marketing capability (Bruni & Verona, 2009; Easterby-Smith et al., 2009). Dynamic capabilities must be well-targeted, deployed, and managed to achieve strategic goals which drive firm performance. While there is little consensus in the literature regarding a comprehensive definition of what dynamic capabilities entail (Ambrosini & Bowman, 2009; Woldesenbet et al., 2012), for this study we identify dynamic capabilities as those involving newness or novelty: adding a new product or service, selling to a new market, engaging in novel research and development activities, operating in an international market, and being first to market with new products. Therefore, another hypothesis offered here is that firm performance is influenced by human capabilities acting through the dynamic capabilities of the organisation.

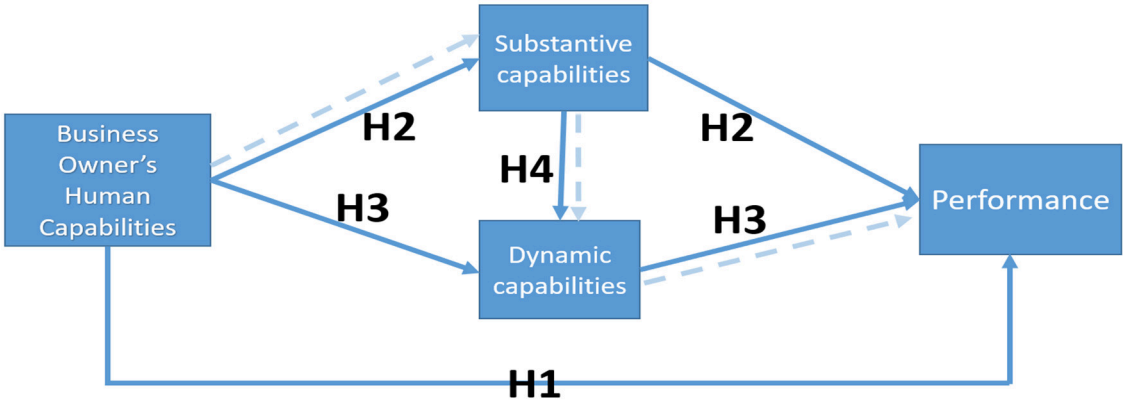
H3: *Human capabilities have a positive effect on firm financial performance, and that relationship is mediated by a change in dynamic capabilities*.

While the dynamic nature of capabilities is crucial to firm performance, they may be influenced by many internal variables (e.g., Schilke, 2014; Wilhelm et al., 2015). The complex process of interaction (Kogut & Zander, 1992), embedded in everyday operating routines and sometimes disruptive innovations determine the success derived from capabilities. This influence of substantive capabilities on dynamic capabilities, is suggested by Zahra et al. (2006), as shown in Figure 1. However, the differentiation between the two categories of capabilities has led to significant debate in the literature. Some authors identify dynamic or higher-order capabilities as only those that provide a source of competitive advantage, discounting the value of substantive capabilities, without evidence. Ambrosini and Bowman (2009) and Helfat and Winter (2011), argue conceptually that the relationship between dynamic and substantive capabilities is indeterminate because change is always occurring. We argue that both substantive and dynamic capabilities are instrumental in value creation, thus placing value on both, and that the relationship between substantive and dynamic capabilities is yet unexplored. Consequently, we examine the impact of human capabilities acting through substantive and then dynamic capabilities on firm performance.

H4: *Human capabilities have a positive effect on firm financial performance, and that relationship is mediated by firstly a change in substantive capabilities and then a change in dynamic capabilities*.

The review to date has highlighted specific human capabilities (education, previous experience, managerial experience) and substantive and dynamic capabilities with a view to investigating how these impact on firm financial performance. Imperatively, we acknowledge that human capabilities influence substantive and dynamic capabilities, so the overall aim is to examine the effect of women business owners' capabilities on substantive and dynamic capabilities as a driver of firm performance, formally represented in the following research hypotheses, illustrated in Figure 2.

Figure 2. A theoretical expression of how human and substantive and dynamic capabilities influence performance



Source: adapted from Zahra et al. (2006, p 926)

By testing these hypotheses, we aim to highlight the primary importance of the human capabilities in relation to firm performance, and additionally the mediating role of substantive and dynamic capabilities. The discussion now turns to the research approach, measures, and sample description.

3. Research methodology

3.1 Data collection and sample description

To conduct this research, a database of women-owned firms operating in Ireland was developed, ensuring that a comprehensive and representative sample of the population of established women owner-managers, as identified by the GEM report (2010) was obtained. Firms in operation for over 3 years were the unit of analysis, to distinguish between start-up and established businesses.

Data was collected through a self-report survey previously approved by the author's HEI research ethics committee and distributed to 1,200 women-owned MSMEs operating in Ireland from 2007 to 2009 following Ireland's so-called "Celtic Tiger" period (1991-2007). This sample time-period captures the impact of the exogenous shock of the global financial crises (GFC) (Morgan et al., 2020) and illuminates the growth of women-owned MSMEs at a time when the GFC depressed overall economic growth, precipitating a prolonged recession. According to Devece et al. (2016) in tough economic periods, opportunity recognition and innovation are stronger determinants of start-up and growth success than in periods of economic prosperity. During the recessionary period in Ireland at that time, the rate of women-owned established firms was higher than the OECD (4.2%) and EU-15 (4.1%) averages at 5.2%, providing testament to the ability of Irish women to innovate, disrupt and drive growth, further supporting the rationale for capturing this time-period.

Overall, 216 surveys were returned and after missing data items were eliminated, there were 176 useable responses (a response rate of 14.6 percent). The reliability and internal consistency of the survey instrument was confirmed by a Cronbach's alpha of 0.738.

3.2 Data analysis techniques

The methodological choice for this study is structural equation modelling, that is multiple regression with parallel and serial mediation. This choice permits the identification of the direct and indirect relationships between independent and dependent variables as shown in Figure 2. This causal mediation analysis examines whether the women's human capabilities causally affect the MSME's financial performance, through the intermediaries of substantive and dynamic capabilities. This approach addresses the limitation of 'black box' causal mechanisms as it can detect mediators on the causal pathway (Imai et al., 2010). By incorporating direct and indirect effects, this method allows for interactions and non-linearities in the casual relationship, permitting testing of the theoretical explanations as outlined in the hypotheses above (VanderWeele, 2016; VanderWeele & Vansteelandt, 2014). Parallel mediation is employed here to determine whether substantive and dynamic capabilities separately mediate the relationship between the business owners' capabilities and firm performance (Hayes, 2018). Serial multiple mediation is then employed to determine whether there is an effect on firm performance through both substantive capabilities and dynamic capabilities (Hayes, 2018).

Table 1 describes the respondents' personal profiles, which when scored and combined provide a proxy for human capabilities, and the profile of their firms across all industry sectors. Human capabilities in the form of education, previous employment sector and managerial experience were gathered via the survey.

Table 1. Sample profile of women business owners and their firms (n=176)

Women Business Owner Profiles		Women-owned Firm Profiles	
Age	**%**	**Industry Sector**	**%**
18-34	25.6%	Professional Services	37.5%
35-44	43.8%	Manufacturing	15.3%
45-54	25.0%	ICT	13.6%
55+	5.7%	Health	11.4%
Education	**%**	Education & Training	9.1%
Second Level	12.5%	Retail	7.4%
Third Level	54.0%	Food & Drink	5.7%
Postgraduate Level	33.5%	**Firm Age**	**%**
Work Experience	**%**	3-5 years	59.1%
Same Sector Experience	61.4%	6-10 years	22.2%
Managerial Position	63.1%	Over 10 years	18.2%
		Firm Size	**%**
		0-10 (Micro)	84.1%
		11-50 (Small)	13.6%
		51 + (Medium)	2.3%

A high percentage (87.5%) of women business owners have attained third level education, with 54% achieving degree level, and a further 33.5% having completed postgraduate levels of education. The majority (61.4%) possess employment experience in the industry in which they started their current firms, while 63.1% also gained managerial experience in previous employment. The majority of firms are micro firms (84.1%), in existence for 3-5 years.

The survey data is organised into a dependent variable of firm financial performance and independent variables of human and substantive and dynamic capabilities. Turnover figures are adopted as a measure of firm financial performance. The dependent variable of turnover is calculated as the percentage change in turnover[1] over 3 years (2007 to 2009) and the percentage change in employee numbers[2] over 3 years (2007 to 2009) respectively (see Table 2 for more details). Turnover is a frequently used performance measure (Gilbert et al., 2006; Roomi et al., 2009) as it reflects the inflationary pressures of the time under study, more easily obtained relative to profits and is familiar to business owners (Neiswander & Fulton, 1989; Roomi et al., 2009; Senderovitz et al., 2016). Furthermore, it reflects both short and long-term changes in the firm, indicating trends in financial performance with respect to aggregate sales and market (Roomi et al., 2009; Senderovitz et al., 2016).

Details of the MSME's routine activities were gathered, scored and linearly transformed to proxy for substantive activities. The same process was applied to the MSME's innovative activities which were a proxy for dynamic activities, as specified in Table 2. The nature of the ownership structure (teams based) was included as a control variable where team-based small firms were denoted by 1 and non-team based small firms were denoted by a zero. The characteristics of the MSME sector, firm size and age were included as control variables, as suggested by Storey (1994, 2011) who advocates that certain firm features are investigated for their influence on firm performance (see Table 2 for an explanation of these control variables).

Table 2. Sample variable explanations

Variable Type	Variable Name	Source	Variable Explanation	Variable Calculation
Dependent Y1 = Firm Performance	**Financial Growth**	Gilbert et al. (2006) Roomi et al. (2009)	Growth rate in Turnover	Percentage change in turnover (revenue) from 2007 to 2009
Independent	**Human Capability**	Wright et al. (1994) Barney and Wright (1998) Colbert (2004) Jafari-Sadeghi et al. (2021)	Standardised z score of the female entrepreneur's capabilities. The standardised variable has a mean of zero and standard deviation of 1	Sum of 3 binary variables (1,0), where 1 is awarded for indicating the presence of each of these human capabilities, and 0 otherwise including third-level education, same sector, and previous managerial experience.
Meditator 1	**Substantive Capability**	Teece (2012, 2014)	Standardised z score of the enterprise's organisational resources used for operational activities, across ten operational activities. The standardised variable has a mean of zero and standard deviation of 1	Sum of firm size (3 categories from smallest to largest MSME) and binary variables (1,0), where 1 is awarded for indicating the presence of each of these substantive business activities, and 0 otherwise: expanding distribution channels; advertising and promotion; continuous improving ICT in

Table 2. Sample variable explanations

Variable Type	Variable Name	Source	Variable Explanation	Variable Calculation
				the business, seeking additional financing, seeking professional advice, expanding current facilities, streamlining costs, engaging in web-based activities, franchising the business, and becoming part of a joint venture.
Meditator 2	**Dynamic Capability**	Ambrosini and Bowman (2009) Helfat and Winter (2011)	Standardised z score of the enterprise's organisational resources used to proactively grow the business. The standardised variable has a mean of zero and standard deviation of 1	Sum of 5 binary variables (1,0), where 1 is awarded for indicating the presence of each of these dynamic business activities, and 0 otherwise including: adding a new product or service, selling to a new market, engaging in research and development activities, operating in an international market, and being first to market with new products/proactive
Control Variables	**Team Capability**	Gilbert et al. (2006) Schjoedt and Kraus (2009) Brinckmann et al. (2011)	Nature of ownership of the female entrepreneur's business	Dummy variable per firm which is equal to 1 when the enterprise is team owned/managed or equal to zero when owned/managed solely by the entrepreneur
Control Variable	**Sector**	Storey (1994, 2011)	The categorisation of the sector as manufacturing or service	This is a dummy variable per firm which is equal to 1 when the enterprise is in the service sector and zero when the enterprise in manufacturing
Control Variable	**Firm Age**	Storey (1994, 2011)	Standardised z score of age of enterprise	5 categories regarding firm age: less than 2 years of age, 2-5 years old, 6-10 years old, 10 to 15 years old, over 15 years old. Mean is zero and standard deviation is 1

The Templeton (2011) two-step transformation process involves transforming the variable into a percentile rank and then applying an inverse normal transformation

The statistical description of the sample is shown in Table 3. Human, substantive and dynamic capabilities independent variables are standardised ensuring these variables are on the same scale, for accurate statistical comparisons. While the meditation analysis process developed by Hayes (2018) does not require normal distribution (as bootstrapping methods do not make assumptions about the distribution), it is essentially a regression-based method. A variable inflation factor (VIF) test produced collinearity statistics of between 1.069 and 1.513 across all the independent variables, confirming that multicollinearity is not present.

Table 3. Sample statistical description (N =176)

Variable	Mean	Median	Std. Deviation	Min	Max	Skewness	Kurtosis
Financial Growth	12.95	11.53	24.87	-63.69	81.52	.366	.61
Human Capability	.00	-.15	1.00	-2.67	1.101	-.49	-.50
Substantive Capability	-.08	-.024	1.00	-1.90	2.80	.14	-.54
Dynamic Capability	.03	-.26	1.00	-1.53	1.65	.18	-1.08
Team Capability	.34	.00	.47	0	1	.70	-1.52
Sector	.85	1.00	.36	0	1	-1.94	1.78
Firm Age	.00	-.73	1.00	-.73	1.95	1.00	-.54

Refer to Table 2 for an explanation of the variables

The causality of the proposed relationships and the mediating effects of independent variables are tested using causal mediation analysis (Hayes, 2018). The Koenker test (Lyon & Tsai, 1996) for heteroscedasticity for the dependent variable of turnover producing a test statistic of 11.704 with a p =0.069, implying that heteroscedasticity is not present. Therefore, a correction for heteroscedasticity is unnecessary in the causal mediation analysis (Hayes & Cai, 2007). The models for the causal parallel (H1, H2 and H3) and serial (H1, and H4) mediation analyses, as shown in Figure 2, are presented below.

Parallel Mediation Model

$$Y = FinancialPerformance_i = \alpha_y + c^1 HumanCapabilities_i + b_1 M_1 + b_2 M_2 + b_3 Controls_i + \varepsilon_y$$
$$M_1 = SubstantiveCapabilties_i = \alpha_{m1} + \alpha_1 HumanCapabilities_i + \alpha_2 Controls_i + \varepsilon_{m1}$$
$$M_2 = DynamicCapabilities_i = \alpha_{m1} + \alpha_1 HumanCapabilities_i + \alpha_2 Controls_i + \varepsilon_{m2} \quad (1)$$

Serial Mediation Model

$$Y = FinancialPerformance_i = \alpha_y + c^1 HumanCapabilities_i + b_1 M_1 + b_2 M_2 + b_3 Controls_i + \varepsilon_y$$

$$M_1 = SubstantiveCapabilties_i = \alpha_{m1} + \alpha_1 HumanCapabilities_i + \alpha_2 Controls_i + \varepsilon_{m1}$$
$$M_2 = DynamicCapabilities_i = \alpha_{m1} + \alpha_2 HumanCapabilities_i + d_{21} M_1 + {}_i\alpha_3 Controls_i + \varepsilon_{m2} \quad (2)$$

The next section describes the empirical tests applying statistical models to determine the impact on firm performance of human capabilities while simultaneously exploring the mediating role of substantive and dynamic capabilities on firm performance.

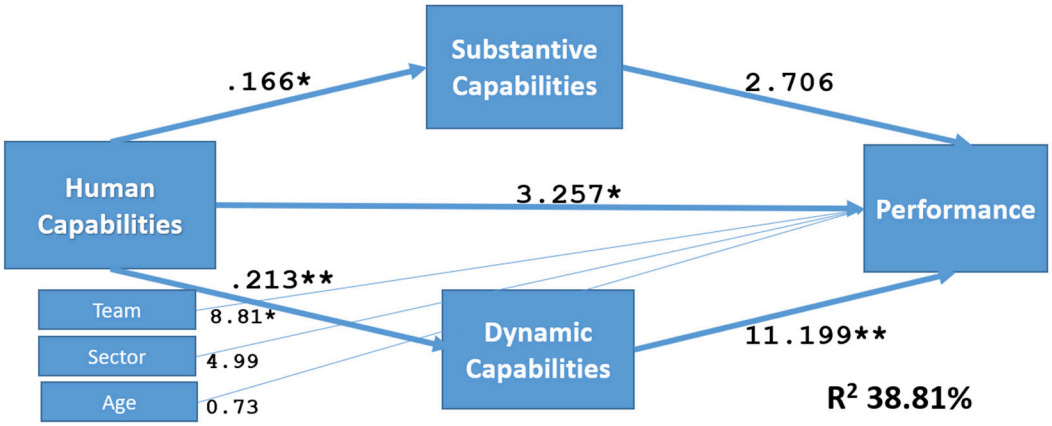
4. Results

In addressing whether women business owners human capabilities (i.e. education, previous experience, and managerial experience) have a direct and positive effect on firm financial performance, the parallel causal mediation analysis shown in Figure 3 demonstrates a significant direct positive effect (3.257) [t(169) = 2.0653, p= 0.04], therefore we accept H1: Human capabilities have a positive effect on performance as represented by financial growth, indicating that the combined human capabilities of women business owners have a significant impact on turnover.

4.1 Results of the parallel mediation of substantive and dynamic capabilities

As shown in Figure 3, human capabilities demonstrate a significant direct positive effect on substantive capabilities (.166) [t (171) = 2.1853, p= 0.03] and dynamic capabilities (.213) [t (171) = 2.8886, p= 0.01]. The mediating effect of substantive capabilities on financial performance is not significant (coefficient 2.706), therefore H2 is rejected for financial performance.

Figure 3. Results of pathway results for parallel mediation, testing hypotheses 1, 2 and 3 for financial growth



(**) Significance at the 0.01 level (2-tailed)
(*) Significance at the 0.05 level (2-tailed)
Refer to Table 2 for an explanation of the variables

In Figure 3, the variable dynamic capabilities significantly mediate the effect of human capabilities on financial performance (11.199) [t (169) = 6.0849, p= 0.000]. Therefore, we accept H3 for financial performance.

The total effect (direct and indirect) of human capabilities on firm financial performance is 6.10 [t = 3.3907, p= 0.001], with an indirect effect of human capabilities on firm financial performance through dynamic capabilities of 2.3901 [significant with 95% confidence intervals ranging from 0.6998 to 4.4974 and the bootstrap standard error of 0.9667]. In sum, human capabilities of women business owners have a direct and significant impact on turnover and an indirect and significant impact on turnover through dynamic capabilities.

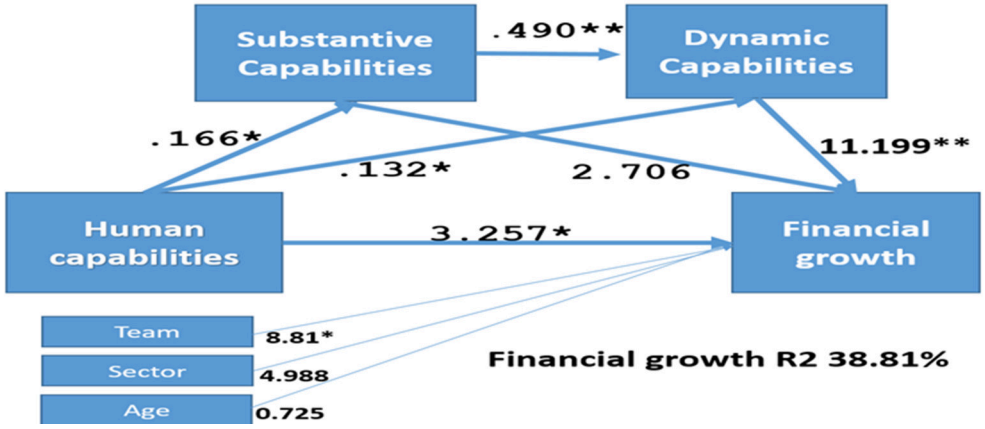
4.2 Results of the serial mediation of substantive and dynamic capabilities

The analysis now moves to test the influence of substantive and dynamic capabilities on firm performance, investigating the serial mediation of both “substantive” and “dynamic” capabilities in Figure 4. Serial mediation captures the influence of substantive capabilities on dynamic capabilities, a pathway missing from the previous parallel mediation analysis. Similar to Figure 3, we can accept H1 for financial performance

(human capabilities have a direct and positive effect on performance). Also, human capabilities demonstrate a significant direct positive effect on substantive capabilities (.166) [t (171) = 2.1853, p= 0.03] and dynamic capabilities (.132) [t (170) = 2.036, p= 0.04]. The interesting effect here is the significant and sizable mediating influence of substantive capabilities on dynamic capabilities (.490) [t (170) = 7.589, p= 0.00]. The indirect influence of human capabilities acting through dynamic capabilities (11.199) [t (169) = 6.085, p=0.00] on firm performance is sizeable and significant. This can be interpreted as confirming human capabilities influencing firm performance both directly and also indirectly through a directional pathway from substantive capabilities through dynamic capabilities.

Based on this evidence for financial performance, we accept H4, that human capabilities have a positive effect on performance, and that relationship is mediated by firstly a change in substantive capabilities and then a change in dynamic capabilities. In summary, human capabilities have a direct and significant impact on turnover and an indirect and significant impact on turnover firstly through substantive capabilities, and then through dynamic capabilities. This finding demonstrates the value of substantive capabilities is indirect as they act on, and through dynamic capabilities and therefore cannot be fully discounted, echoing the views of Ambrosini and Bowman (2009) and Helfat and Winter (2011).

Figure 4. Results of pathways for serial mediation, testing hypotheses 1 and 4 for financial growth



(**) Significance at the 0.01 level (2-tailed)
(*) Significance at the 0.05 level (2-tailed)
Refer to Table 2 for an explanation of the variables

4.3 Robustness testing

The results for financial performance were robustly tested using a different measure of performance as the standardised dependent variable and the base line turnover as an additional standardised independent variable. Instead of the average annual growth rate of turnover, the new dependent variable is the absolute difference between turnover in 2007 and turnover in 2009 per firm. The new additional independent variable is the absolute turnover in 2007. The results confirm the main findings that human capabilities directly and positively influence financial performance (H1) and that substantive capabilities do not have an indirect effect on financial performance (reject H2).

For dynamic capabilities, there is a positive and indirect effect on financial performance (confirming H3) but the direct effect of human capabilities on performance disappears in this analysis, contrary to the main findings. For serial mediation, the key finding of dynamic capabilities influencing the relationship between human capabilities and firm performance is stable, confirming H4. Again, the statistical significance of the direct effect of human capabilities on performance disappears in this analysis. On balance, the robustness tests confirm the main findings and underline the importance of dynamic capabilities as a mediator of association between human capabilities and financial performance.

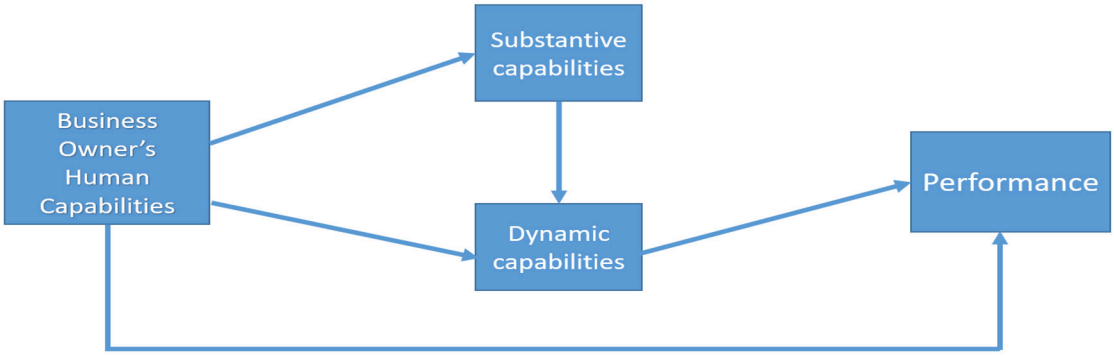
5. Discussion and conclusions

The purpose of this research is to investigate the influence of human capabilities on substantive and dynamic capabilities as a driver for financial performance, through the dynamic capabilities' lens. The empirical analysis confirms that human capabilities of women business owners' have a significant positive impact on turnover (financial performance), endorsing their critical importance as a driver of firm performance in accordance with Zahra et al. (2006) who state that entrepreneurial activities influence performance (see Figure 1). However, while the study finds an indirect route to firm performance through dynamic capabilities,

it does not find a similar route to performance through substantive capabilities, contrary to Zahra et al. (2006) (see Figures 1 and 5).

This study also explores the interplay between substantive and dynamic capabilities as theoretically modelled by Zahra et al. (2006). When the impact of human capabilities on financial performance is intervened by substantive and dynamic capabilities, it confirms that human capabilities cause a change in substantive capabilities which in turn causes a very large change in dynamic capabilities, to ultimately drive financial performance. This positive effect clarifies the one-way direction and the strength of the interactive role of substantive and dynamic capabilities on firm performance, contrary to Zahra et al's (2006) bi-directional theorised relationship and thereby provides evidence of the nuanced relationship between substantive and dynamic capabilities. This finding contributes to demystifying the tautological nature of dynamic capabilities in the literature (Helfat et al., 2007; Teece, 2012, 2014). Finally, the indirect path from human capabilities to substantive capabilities to dynamic capabilities to firm performance is explicitly confirmed in this study. This finding was not conceptualised by Zahra et al. (2006) but it is important as it clarifies how business owners affect firm performance (see Figures 1 and 5).

Figure 5. Confirmed human and substantive and dynamic capabilities pathways for financial performance



Adapted from Zahra et al. (2006, p 926) and modified by authors

Human capabilities, as indicated by educational attainment, prior managerial experience, and sector-specific experience, have a direct positive impact on financial performance. Human capabilities have a larger indirect effect on growth through the mediation of substantive capabilities and dynamic capabilities. In other words, new product development, new markets and innovation are critical to driving financial firm performance. Substantive capabilities are critical for sustaining the firm, but dynamic capabilities are critical for business development and women business owners are key in driving these performance pathways. This substantive capability finding suggests that while they are important, they influence firm performance only through dynamic capabilities, empirically confirming Newey and Zahra (2009), and Helfat and Winter (2011).

This paper further highlights the nature of the relationship between the substantive capabilities and dynamic capabilities as they mediate firm performance. The direction and strength of this pathway of influence illuminating the interplay between substantive and dynamic capabilities. This also answers the call to investigate how, and which human and substantive and dynamic capabilities and/or combination of capabilities drive firm performance (Fernandes et al., 2017; Teece, 2014).

5.1. Conclusions and implications

In conclusion, this evidence confirms the central role that women business owners play in determining firm performance (Davidsson, 1991; Mitchelmore & Rowley, 2013; Storey, 1994), through the dynamic capabilities' lens. The intervention of substantive capabilities with dynamic capabilities suggests that substantive capabilities alone are insufficient for growing MSMEs but when acting in tandem with dynamic capabilities they become necessary and sufficient for financial performance. This represents a key contribution of this study.

The study has implications for theory, policy and practice. In terms of theory, there has been much discussion in the literature surrounding the tautological nature of the dynamic capabilities approach (Helfat et al., 2007; Teece, 2012, 2014). This research expands current insights about dynamic capabilities in the field of MSME firm performance, by developing the concept in the context of women-owned MSMEs in Ireland and highlighting how specific pathways to firm performance are achieved. Moreover, the research demonstrates that to really understand how capabilities influence firm performance, the mediating intricacies and effects of human and interrelated substantive and dynamic capabilities must be acknowledged and explored. In

categorising the capabilities which drive firm performance, this study identifies various capability pathways to MSME performance contributing to the extant literatures.

Research (Blackburn & Kovalainen, 2009; Fadahunsi, 2012) suggests that policymakers, in developing support mechanisms for MSMEs, do not consider the complexities associated with growing MSMEs and the internal capabilities that influence firm performance, especially in the context of women-owned firms (Roomi et al., 2009). This brings to the fore the question of whether current supports are adequate, relevant, and appropriate (de Bruin et al., 2006, 2007; Fleck, 2008). The outcomes of this study imply thatgovernment policy needs to ensure that women-owned MSMEs are provided with specific training and education, critical to achieving sustained firm performance and growth.

Regarding contributions to practise, the research findings identify various human and organisational capabilities affecting firm performance. MSME owners can explore the mediating effects of their human and substantive and dynamic capabilities and reconfigure or leverage these within their firms to ensure better firm performance. The findings of this research are also important for nascent business owners to recognise or further develop the identified capabilities that impact on performance from the outset of business start-up, with a view to developing growth-orientated firms, more particularly for women-owned firms.

5.2 Study limitations and future research

While the study outlines key relationships and drivers of firm performance, there are limitations. The study employs turnover as a metric of firm performance, enabling an examination of financial performance. Alternative measures, such as profit could also be utilised. Whilst this study focused on established firms across many sectors, specific sectoral comparisons could provide useful information on the types of opportunities that exist for individual sectors and comparisons across sectors. The quantitative nature of this study has centred on the presence of capabilities and their statistical interactions. A qualitative approach would capture the process of opportunity identification, search and learning routines that drive capability development and firm performance over time, and from a longitudinal perspective.

Future research could also address some of the key limitations of the dynamic capabilities approach and explore the speed and strength of performance by examining various resources and capabilities, and their combinative capability, along with the business owners' role in developing their MSMEs. While we acknowledge that there are genders other than women, this research provides a nascent ground for future research on firm performance and dynamic capability theory, policy and practice developments, given the lacuna of research in this area.

Data Availability Statement

The research data for this study are not available for sharing due to privacy and ethical restrictions.

Footnotes

[1] The effect of inflation was removed from the turnover data by deflating it in the base year rates to present the real value of financial data for the period of the study using the Consumer Price Index (CPI), which was differentiated separately between goods and services

[2] Employment growth was calculated by taking employment figures for 2009 minus those for 2007, then computing the change in employment performance for the period of the study. The employee growth measure is transformed via its square root to reduce skewness

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