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Effectual flexibility and venture performance: The intervening effects of absorptive capacity

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Background: Increasingly, there is a determined effort to understand the actions, behaviours and decision logics that drive the performance of entrepreneurial ventures (EV). This study provides insight into the interplay between effectual flexibility (EF), absorptive capacity (AC), and venture performance (VP).

Aim: The study aims to understand the relationship that exists between the flexibility principle of effectuation and VP as well as the interfering impact of AC in a moderating and/or mediating role.

Setting: The data used for the study were collected from EV operating in various sectors in South Africa.

Methods: Using data drawn from a sample of 685 EV, a partial least squared structural equation modelling (PLS-SEM) technique was employed to examine the significance of the relationship between the key variables in the study.

Results: The results reveal that EF has a positively significant relationship with VP. While there was no support for moderating effects on this relationship, the findings confirmed that AC has partial and complementary mediating effects on the relationship.

Conclusion: The findings suggest that EF enables EV to adapt in dynamic contexts while cocreating opportunities to achieve performance. The nuanced outcome supports the notion that EF and AC are distinct but complementary capabilities.

Contribution: This study contributes to the broader entrepreneurship landscape as it highlights that EF and AC are synergistic rather than interdependent capabilities. This means that ventures do benefit from both, but one does not rely on the other to function effectively.

Keywords: effectual flexibility; absorptive capacity; venture performance; effectuation; decision-making; effectual logic; lemonade principle.

Introduction

The performance of entrepreneurial ventures (EV) and indeed the actions that sustain such performances continue to preoccupy scholarship (Rusu & Roman 2023; Wood, Bakker & Fisher 2021). Increasingly, scholars, practitioners and policy makers agree on the importance and significance of successful entrepreneurial activity to economic development (Zwane & Osuigwe 2024). Such a consensus has led to the proactive promotion and advancement of entrepreneurial activities in most economies. Consequently, the interest in the circumstances and situations that lend themselves to successful venture performance (VP) has resulted in the understanding of performance as an outcome of a variety of antecedents. Interestingly, an antecedent that has received increasing scholarly attention within such narrative is flexibility (Brozovic 2018).

Flexibility, used interchangeably with agility (Christofi et al. 2021), is mostly associated with EV (Ebben & Johnson 2005) and refers to a capability used to navigate uncertain and resource-constrained contexts. The entrepreneurial space is synonymous with uncertainty (Arend 2024) and hence warrants an investigation into the effects of flexibility on VP. Broadly, flexibility could be described within the confines of organisational agility as the organisational capacity to effectively and efficiently put existing resources to a different use with the aim of greater value maximisation (Zighan & Dwaikat 2023). At an individual level, this notion is understood as the ability of an entrepreneur to think and act fast, quick and decisively to anticipate and take advantage of change and contingencies (Christofi et al. 2021). Consistent with these

understandings of flexibility, the current study approaches the concept from the notion of effectual flexibility (EF).

According to Bai et al. (2025), EF is the ability of the entrepreneur or the venture to adapt to the environment using entrepreneurial actions aligned to available resources for the exploitation of emergent opportunities. This flexibility dimension of the effectuation theory is described metaphorically as 'the lemonade principle' in the foundational work by Sarasvathy (2001). It explains how experienced entrepreneurs navigate an unpredictable future through flexibility by exploiting unexpected contingencies from the environment while avoiding predictiveness and predetermined goals (Read et al. 2017). According to Kump and Schweiger (2022), flexibility describes the adaptive capability of the entrepreneurial venture to align decisions and entrepreneurial actions to available resources in the exploitation of contingent opportunities. The flexibility capability enables the effectual actor to creatively combine the available resources to leverage surprises from the environment (Yi, Oh & Amenuvor 2023). It is conceivable that EV that demonstrate this capability may most likely achieve significant outcomes in uncertain and resource-constrained contexts.

The study conducted by Brinckmann et al. (2019) reports a gap in the literature that calls for future research into how flexibility capability leads to venture success. Instructively, while there is a notable interest in understanding the flexibility capability in extant literature, much remains to be learnt about the nexus between EF and VP in uncertain and resource-constrained contexts. The current study, therefore, is set out to interrogate the interplay between the EF, absorptive capacity (AC) and the performance of EV in uncertain and resource-constrained contexts. Firstly, the study investigates the relationship between EF and VP. Secondly, it explores the intervening outcomes of AC in the possible relationship between EF and VP. Absorptive capacity is introduced given its demonstrated critical role in facilitating the ability of EV in responding quickly in uncertain environments (Marco-Lajara et al. 2023).

The study contributes to the development of the effectuation theory by investigating the relationship between EF, as a dimension of the theory, and the performance of EV as they navigate uncertainty and constraints. It further introduces AC, a more mature management theory, in the understanding of this relationship. By examining the role of the EF capability of EV in their performance, there is an increased understanding of EF as a capability effectively utilised by these ventures not only to navigate uncertainty and constraints but also to achieve greater outcomes.

Literature review

Effectual flexibility

The effectuation theory, describing a common way of thinking and acting used by expert entrepreneurs to navigate uncertainty and risk, was introduced by Sarasvathy (2001) as comprising five fundamental principles. These include bird-in-hand, affordable loss, crazy-quilt, lemonade and pilot-in-the-plane. The study done by Chandler et al. (2011) operationalised these principles into four independent dimensions (experimentation, affordable loss, flexibility and pre-commitment). Interestingly, this operationalisation has gained popularity in effectuation literature, leading to their application in several studies (see Ko et al. 2022; Ryman & Roach 2024).

Effectual flexibility draws impetus from the popular bromide 'when life gives you lemons, make lemonade'. Sarasvathy and Dew (2008) describe EF as the ability to leverage contingencies. It explains how entrepreneurs embrace uncertainty by exploiting unforeseen events as opportunities to exert control and create viable effects. Contingencies are a constant given that entrepreneurial experiences are riddled with unpredictable, uncertain and challenging events. Consequently, while some may seek to avoid such uncertain contexts, entrepreneurs utilise their flexibility capability to proactively exploit them for emergent opportunities (Yu et al. 2022).

The discussion of flexibility in extant literature surfaces views that seem to describe EF within the purviews of dynamic capability, behavioural, business model adaptation and innovativeness perspectives. Rehman and Jajja (2023) provide a view through which flexibility in uncertain contexts, germane to the effectual process, is appreciated as a key characteristic of dynamic capabilities. From a behavioural perspective, the entrepreneurial behaviours that lend themselves to flexibility comprise the response to emergent opportunities and the modification of products or services based on resources at hand (Fisher 2012). Aagaard and Nielsen (2021) aver that the uncertainty synonymous with the business environment warrants that business models are continuously adapted. According to this perspective, EV need to be adaptable enough to keep trying new things with their business ideas and learn from their experiences with customers, the market and their products.

Estrin et al. (2025) introduce innovativeness to the conversation on flexibility by arguing that entrepreneurs make use of the uncertainties in their environments to generate fresh and creative opportunities. Koporcic et al. (2025) further suggest that innovation encompasses not only the generation of new value but also adjustments to business models and mindsets, as well as changes to organisational structures and procedures. According to Mamun, Muhammad and Ismail (2017), a crucial component of entrepreneurial venture owners' entrepreneurial personalities is their innovativeness, which is a reflection of their competence, creativity and capability to identify and seize emergent opportunities.

Therefore, the flexibility dimension accounts for an entrepreneurial venture's capacity to adjust to changing circumstances, make modifications to its current resource base and modify its business structures and procedures in response to new environmental occurrences. Peng,

Lin and Liu (2015) define EF's variability as encompassing multiple elements that include the entrepreneur's capacity to access various resource combinations in an uncertain environment as well as the entrepreneur's openness and ability to seize emerging opportunities. Further, it refers to the ability of the entrepreneur to forgo planning and objectives in order to take advantage of contingent opportunities, as well as the capacity of the entrepreneur to react quicker to environmental uncertainties in order to take advantage of emergent insights. Finally, it consists of the capacity of the entrepreneur to continuously adapt and change business models and decisions in response to changing conditions.

Effectual flexibility, absorptive capacity and venture performance

According to existing research, EV have a significant advantage over established businesses because of their flexibility (Sen et al. 2023). It has been shown that these ventures need this capacity even more as they operate in uncertain and resource-constrained situations where they must utilise the resources at hand to navigate a continuously changing environment. According to Dopfer et al. (2017), flexibility gives firms options when combining resources in unpredictable situations. It also enables EV to adjust their plans and continuously adapt to the uncertain and fluid environment. Flexibility is important for EV because it allows for creative responses to uncertain situations, the pursuit of alternative actions that may lead to success and the efficient use of the venture's limited resources for a successful outcome (Deligianni, Voudouris & Lioukas 2017).

Effectual flexibility and venture performance

The flexibility heuristic, according to Gorondutse, Arshad and Alshuaibi (2021), guarantees that contingencies are used as resources to generate a potential range of outcomes. According to Busch and Barkema (2021), flexibility is still a critical component of the entrepreneurial venture's growth and survival in resource-constrained environments and developing economies. According to Peng et al. (2015), these ventures will probably perform if they can combine their resources more flexibly to keep up with emerging prospects. Diverse findings have been reported from earlier investigations examining the connection between flexibility manifestations and VP. According to some research, there are inverse, insignificant or no connections between performance metrics and flexibility. According to Eyana, Masurel and Paas (2018), there is no correlation between flexibility and assets, sales, profit or employment size.

However, other results show the existence of strong and/or positive connections between performance measures and flexibility. Urban and Heydenrych (2015), for instance, find that business performance is significantly impacted by flexibility. Accordingly, the research conducted in 2016 by Smolka et al. demonstrates that flexibility positively correlates with sales, profitability and market share. According to research done by Blauth, Mauer and Brettel (2014), highly practised creativity is significantly enhanced by flexibility. Cingöz and Akdoğan (2013) report that there is a noteworthy positive correlation between explorative and exploitative innovation performance and strategic flexibility. In an investigation of the correlation between entrepreneurial VP and strategic flexibility, Guo and Cao (2014) offer proof that strategic flexibility has a favourable association with productivity, return on assets, market share, sales growth and profit growth.

The present study is motivated by the arguments from earlier research to propose that, as EV adjust to ongoing changes in their surroundings, they may be able to take advantage of opportunities and combine existing resources to potentially produce favourable results. Given that flexibility and VP may positively interact, the following hypothesis is put forth:

H_1: Effectual flexibility has a positive relationship with venture performance.

Interfering effects of absorptive capacity

Cohen and Levinthal (1990) positioned AC as the ability to recognise the importance of new information, incorporate it internally and apply it to a positive outcome. Absorptive capacity is defined by Zahra and George (2002) as a higher-order dynamic capability that consists of a set of organisational processes by which businesses acquire, assimilate, change and use knowledge. Absorptive capacity is essentially presented in this study as the ability to identify the importance of new and emergent insights, incorporate it internally and apply it to a positive end. The current study makes the case that the relationship between EF and VP is significantly influenced by AC. Therefore, by combining new and existing knowledge, AC makes it easier for EV to adapt to changes in their environment (Apriliyanti & Alon 2017). Arguably, as it allows businesses to adjust and change as well as to take advantage of new opportunities for improved performance, AC can be considered fundamental to the survival of a firm (Briel, Schneider & Lowry 2019).

The present study argues that AC plays a significant role in the interaction between EF and VP. As such, Apriliyanti and Alon (2017) aver that AC facilitates the ability of EV to respond to changes in their environment by integrating existing and new knowledge. Fundamentally, AC could be said to be key to business survival given that it enables businesses to adapt and modify as well as to exploit emergent opportunities for superior performance (Briel et al. 2019). Moreover, AC facilitates an increase in EV' innovativeness, a form of EF, which in turn leads to improved performance (Mamun et al. 2017). These perspectives from literature appear to suggest that in a fluid environment, AC is an important capability as EV apply EF to take advantage of emergent opportunities for the possible creation of viable outcomes.

Instructively, results from studies examining the interfering outcomes of AC on the nexus between different business

concepts and diverse performance indicators reveal varying outcomes. For instance, Chang et al. (2013) found that AC has no mediating effect in a relationship path from variations of flexibility-oriented human resource management to market responsiveness and innovation performance. However, Patel et al. (2015) find that the effects of innovation variability on sales growth are strengthened by realised AC. In a similar vein, Chaudhary (2019) offers proof of the significance of prospective AC as a moderator in the relationship between financial performance and strategic flexibility.

Based on the perspectives and conclusions of previous studies, it is conceivable that AC may make it easier for EV to obtain emerging resources to complement and modify current resources, thus producing better results. This offers a strong foundation to anticipate that AC may interfere in the nexus between EF and VP, either by moderating or mediating it. This projection provides the impetus for this study to hypothesise that:

H_{2a}: Absorptive capacity moderates the relationship between effectual flexibility and venture performance.

H_{2b}: Absorptive capacity mediates the relationship between effectual flexibility and venture performance.

Research design and methodology

Research studies benefit from having philosophical underpinnings and assumptions as they provide clear direction for a study, improve understanding of the research procedures and align the different components (Mbanaso, Abrahams & Okafor 2023). The current study's philosophical disposition is for an epistemological positivist and ontological objectivist approach. According to Shan (2022), the ontological tenet that reality exists independently of the observer forms the basis of epistemological positivism. Given this, a survey method was considered suitable for data collection.

The target population considered for the study was EV of varying sizes and growth stages operating across a variety of sectors in South Africa. Using a random sampling technique, the sampling frame consisted of EV pooled from the database of various entrepreneurial hubs, as well as national entrepreneurship directories in South Africa. The sampling approach allowed the study to achieve an unbiased sample that appropriately represents the population. At the same time, the sample enabled the study to generate insights on the relationships between EF, AC and VP from EV of different sizes and growth stages.

The sample size rationale for the study was based on Gay, Mills and Airasian's (2012) suggestion that 400 is an acceptable sample size for quantitative studies. Given this, self-administered questionnaires, distributed to EV throughout South Africa, were used for the study's data collection. Survey Monkey, an online survey platform, was selected as the means of gathering data from the 01 February 2020 to the 30 March 2020. This allowed the study to account for the geographical dispersion of the target population, the required sample size for analysis and the available technological resources. Respondents were presented with an informed consent form that highlighted the confidentiality and anonymity of their involvement in the survey as well as their choice to withdraw from participating in the study.

A little over 2000 emails with surveys were sent to the sample frame, and over 1000 of the responses were retrieved, representing a response rate of 47%. Due largely to incomplete responses and the application of exclusion and inclusion criteria that consisted of whether the respondent owned or currently owns an entrepreneurial venture, as well as whether the venture operates in at least one of the nine South African provinces, only 685 of the returned surveys were deemed suitable for data analysis.

Consistent with the views of Sreejesh, Mohapatra and Anusree (2014) that data analysis refers to the interpretation of collected data using multiple statistical tools, the current study applied descriptive and inferential statistical tools for data analysis. The Statistical Package for Social Sciences (IBM SPSS Statistics for Windows, [IBM Corp., Armonk, N.Y. US]) version 26.0 was used for the descriptive analysis of the study's data. The SMART-PLS 3.0 software programme (Ringle, Wende & Becker 2015) and its technique of partial least squares structural equation modelling (PLS-SEM) methodology, consisting of bootstrapping and PLS algorithm calculations, were used for the factor analysis of the outer models as well as the measurement of the structural models. The choice of this technique is anchored on its consideration as the appropriate technique for estimating complex models (Hair et al. 2017), as is the case with the three models considered in the current study.

Measures

Dependent variable

Venture performance is the study's dependent variable. Venture performance is presented in this study using a multi-dimensional, subjective scale developed by Zahra, Neubaum and El-Hagrassey (2002). This scale is composed of seven items: return on equity, growth in sales, return on sales, expansion in market share, increase in workforce, return on investment and net profit margin. These elements assess the respondents' overall satisfaction with the performance's growth and profitability characteristics. Respondents were asked to rate their level of satisfaction with the performance of their venture across these factors using a 5-point Likert-type scale, ranging from 1 (not satisfied) to 5 (very satisfied). Scholars have used varying approaches to apply the scale in previous studies. For instance, Arend (2014) makes a partial use of the multi-dimensional scale focusing on the financial and competitive indicators. The construct was validated through reliability and internal consistency checks and had a Cronbach's alpha level of $\alpha = 0.870$. A more recent study done by Celik and Uzunçarşılı (2023) operationalised the scale as two dimensions of financial performance and growth

performance with six items each. The internal consistency and reliability of the two dimensions were established based on Cronbach's alpha values greater than the recommended 0.70.

In the current study, the VP scale was put through two iterations of evaluations to ensure that the final items in the measurement scale achieved the required item loadings of 0.5 and above. This process led to the elimination of one item from the scale, which confirmed initial item reliability for a single measurement scale of six items. The scale and its six items were further evaluated using the value of item loadings (0.694–0.913), *t*-statistics (> 1.96), significance level ($p < 0.01$), composite reliability (CR) (0.933) and average variance extracted (AVE) (0.702). The outcome of the evaluations provided sufficient confirmations for the construct validity and reliability of the measurement scale.

Independent variable

The independent variable in this study is EF, which is a component of the multi-dimensional and formative effectuation measure operationalised in Chandler et al. (2011)'s study. This scale is considered one of the most used measures in effectuation studies (McKelvie et al. 2020). For instance, Smolka et al. (2016) used the measure to evaluate the hypothesis that a balance between effectual and causal logics leads to superior firm performance. In the study, the scale was validated by demonstrating the discriminant validity of the instrument as well as by establishing criterion-related validity. More recently, Boonchoo (2025) used the measure to explore the impact of causation and effectuation decision-making logics on de-internalisation strategies. The instrument was validated in the study using partial least squares structural equation modelling (PLS-SEM) for standard validity and reliability checks.

In the current study, the independent variable, EF, was operationalised as a component of the multi-dimensional and formative effectuation construct, using PLS-SEM techniques. The scale was validated by evaluating the indicator weights (0.296–0.695), the confidence intervals (CIs) (0.181–0.772), *t*-statistics (4.869 and 19.430), statistical significance of the indicator weights ($p < 0.01$), the indicator correlations (0.021–0.430) and the coefficient of determination (R^2 value 0.066) of the construct. While the values confirm the fitness of the effectuation measure for structural model estimations, the low correlations between the dimensions of the effectuation construct validate their distinctness and relevance as independent constructs.

As such, the outcome of the evaluation confirmed EF as an independent construct measured using four items and distinct from other dimensions of effectuation, as applied in the current study. This is consistent with the approach of previous studies (see Deligianni et al. 2017; Peng et al. 2015) that focus on the distinctness and the construct independence of the effectuation dimensions. The current study gauged the respondents' agreement or disagreement with statements such as 'we adapted what we were doing to the resources we had' by asking them to score them. Every statement on the list had a 5-point Likert-type response option, with 1 denoting 'strongly disagree' and 5 denoting 'strongly agree'.

Intervening variable

On the balance of its applicability to EV, the Fernhaber and Patel (2012) scale, modified from Jansen, Van den Bosch and Volberda (2005), is employed to assess the current study's intervening variable, AC. This scale has 23 items and 4 dimensions: 6 items are associated with 'acquisition (AQ)', 3 items with 'assimilation (AS)', 6 items with 'transformation (TF)' and 6 items with 'exploitation (EXP)'. In the current study, AC was measured as a single construct with 5-point Likert-type response options, ranging from 1 (strongly disagree) to 5 (strongly agree), to the provided statements. This scale was validated in a study done by Pütz, Schell and Werner (2023) using the realised versus potential AC logic, and the results of the reliability and validity checks confirmed the scale as fit for the study's purpose. Further, Müller, Buliga and Voigt (2021) using PLS-SEM techniques operationalised the scale as a second-order reflective construct by evaluating construct validity and reliability.

Similarly, the current study applied a PLS-SEM approach to validate AC as a second-order reflective scale. Following the confirmation of the convergent and discriminant validity as well as the CR and item reliability of the first-order constructs, AC as a second-order construct was confirmed following the recommendations of Hair, Howard and Nitzl (2020). Item reliability was confirmed as loadings ranged from 0.678 to 0.922. The AVE and CR of the first-order factors (acquisition [AQ], assimilation [AS], transformation [TF], exploitation [EXP]) ranged from 0.524 to 0.837 and 0.799 to 0.911, respectively. These values confirmed the convergent validity and the internal consistency of the second-level indicators. The value of the squared AVE, using the Fornell and Larcker (1981) criterion for discriminant validity, with values ranging between 0.724 and 0.915, established the discriminant validity of AC as a second-order construct.

To further establish the second-order AC as a valid measurement model, the statistical significance of the second-level indicators was confirmed by establishing the *t*-statistics and the CI ratios with value ranges of 20.511–111.975 and 0.586–0.925, respectively. The final step in the confirmation of AC as a second-order construct consisted of the estimation of the coefficient of determination (R^2) of the validated scale. The result of 0.108 R^2 value confirmed the adequacy of the scale for the estimation of structural models.

Ethical considerations

Ethical approval to conduct this study was obtained from the University of Pretoria's Faculty of Economic and Management Sciences Research Ethics Committee (EMS148/18).

Results

Descriptive findings

The research instrument used in the study had profile questions meant to generate insight into the demographics of the respondents. The results of the study showed that 60% of the respondents have tertiary degrees. Consistent with the findings of a study done by Ndlovu and Makgetla (2017) that demonstrated high levels of formal education among owners of businesses in South Africa, the percentage of respondents with degrees suggests that most of the respondents in this study are well educated. Further, over 70% of respondents have 5 plus years of experience running a business. This result is significant given the relationship being explored in the study as well as McKelvie, DeTienne and Chandler (2013)'s argument that founder experience may play some role in business performance. As such, it was important to establish that the respondents are currently running successful businesses.

Measurement model

As highlighted in the methodology section, the study employed PLS-SEM methodology. A similar statistical technique has been used in previous research (De La Cruz, Jover & Gras 2018; Masroor et al. 2020; Roach, Ryman & Makani 2016) that examined potential correlations between effectuation, its dimensions and various other constructs. Prior to the estimation of the structural models and the testing of the theorised relationships, the suitability of the outer measurement models of the key constructs was verified.

Pearson correlations

Examining the correlations (r) between the major variables of the study, as presented in Table 1, revealed a weak to moderate but significantly positive relationship between EF and AC ($r = 0.306$, $p < 0.01$). The relationship between EF and VP ($r = 0.195$, $p = 0.137$) revealed a positively significant relationship that demonstrates an initial support for H_1. The results in addition demonstrate a substantial positive correlation between AC and VP ($r = 0.269$, $p < 0.01$). An inference from the correlation output provided indication of adequate direct relationships between the key constructs of the current study.

There are no issues with multi-collinearity between the variables given that the correlations between the major constructs are less than the recommended threshold of 0.7 (Knoke, Bohrnstedt & Mee 2002). The results of the correlation analysis showed that there is a strong relationship between EF and VP, which aligns with the current study's theoretical arguments.

TABLE 1: Pearson correlations ($N = 685$).

Variable	1	2	3
1. EF	1	-	-
2. AC	0.306**	1	-
3. VP	0.195**	0.269**	1

EC, effectual flexibility; AV, absorptive capacity; VP, venture performance.
**, $p < 0.01$.

Factor analysis

To examine the distinctiveness of these constructs and whether the indicators loaded successfully in relation to the constructs they were intended to estimate, the measurement model utilised for the study was assessed. Items that met the requirement for loadings greater than 0.5 were kept, while those that did not were deleted, in accordance with the suggestions made by Hulland (1999). The results of the factor analysis showed that the values of the retained item loadings, as shown in Table 2, are higher than the suggested threshold, indicating that the VP, EF and AC measuring scales are sufficient for the structural model estimation.

Internal consistency and construct validity

To establish the internal consistency and the construct validity of the outer model, the study calculated the values of the Fornell-Larcker criterion for discriminant validity, the AVE and the CR. The values of the CR presented in Table 2 are greater than 0.70. These values, therefore, served as evidence of the measurement model's internal consistency. Further, the AVE values shown in the table provide proof for convergent validity of the measurement model, in accordance with the guidelines provided in Fornell and Larcker (1981) that requires the values to be ≥ 0.5. These results showed the extent to which the measuring items of the various constructs are related to each other, as well as the items of the major constructs' internal consistency and convergent validity.

The diagonal values in Table 3 are the outcome of the assessment for discriminant validity using the Fornell-Larcker criterion. These numbers represent the square root of the AVE of the latent variables, which must be greater than other numbers in their respective columns and rows. The AVE of EF, VP and AC has the highest square roots in their respective columns and rows. The outcome of this assessment confirmed that the items of the measurement model are discriminant of each other.

Inferential statistics (structural model)

Three structural models in the study were evaluated using the PLS algorithm as well as the bootstrapping process. Consistent with the PLS-SEM approach, the adequacy of the structural models was determined using indicators such as the construct validity and reliability (already established), significance levels, the coefficient of determination (R^2), predictive relevance (Q^2) and the effect size (F^2).

Hypothesis analysis (direct relationship)

The first model evaluated the direct nexus between EF and VP. The relationship between EF and VP exhibited path coefficients with sufficient values, as Table 4 illustrates. The findings from the evaluation of this structural model regarding the levels of significance of the postulated direct relationship are also included in the table. The outcome of the evaluation confirmed a significant and positive relationship between EF and VP ($\beta = -0.257$, $t = 6.398$, $p = 0.000$).

TABLE 2: Measurement model validity assessment.

Factors	Items	Loadings	|t|^	p	AVE	|t|^	p	CR	|t|^	p
Variables										
EF	Q10.80	0.813	23.939	0.000	0.508	18.662	0.000	0.799	38.846	0.000
	Q10.90	0.565	7.676	0.000	-	-	-	-	-	-
	Q10.10	0.854	34.636	0.000	-	-	-	-	-	-
	Q10.11	0.567	8.497	0.000	-	-	-	-	-	-
VP	Q11.10	0.904	95.586	0.000	0.702	46.192	0.000	0.933	198.391	0.000
	Q11.20	0.913	92.298	0.000	-	-	-	-	-	-
	Q11.30	0.858	65.669	0.000	-	-	-	-	-	-
	Q11.40	0.882	71.435	0.000	-	-	-	-	-	-
	Q11.50	0.753	29.179	0.000	-	-	-	-	-	-
	Q11.60	0.694	20.749	0.000	-	-	-	-	-	-
AC										
AQ	Q12.10	0.786	8.120	0.000	0.665	26.107	0.000	0.799	30.319	0.000
	Q12.50	0.844	10.688	0.000	-	-	-	-	-	-
AS	Q12.80	0.904	68.288	0.000	0.837	55.889	0.000	0.911	102.339	0.000
	Q12.90	0.925	94.056	0.000	-	-	-	-	-	-
TF	Q12.10	0.693	16.635	0.000	0.519	25.510	0.000	0.810	59.404	0.000
	Q12.11	0.776	22.576	0.000	-	-	-	-	-	-
	Q12.12	0.805	30.038	0.000	-	-	-	-	-	-
	Q12.15	0.586	10.100	0.000	-	-	-	-	-	-
EXP	Q12.19	0.825	20.613	0.000	0.708	36.063	0.000	0.829	60.110	0.000
	Q12.21	0.858	25.499	0.000	-	-	-	-	-	-

AVE, average variance extracted; CR, composite reliability; EF, effectual flexibility; AC, absorptive capacity; VP, venture performance; AQ, acquisition; AS, assimilation; TF, transformation; EXP, exploitation.

TABLE 3a: Square root of average variance (extracted) assessment for discriminant validity.

Variables	Fornell-Larcker criterion output for EF and VP scales	
	EF	VP
EF	**0.713**	-
VP	0.062	**0.838**

Note: Bolded values show the values that are greater than every other value in their respective rows and columns.

EF, effectual flexibility; VP, venture performance.

TABLE 3b: Square root of average variance (extracted) assessment for discriminant validity.

Variables	Fornell-Larcker criterion output for AC scale			
	AQ	AS	EXP	TF
AQ	**0.815**	-	-	-
AS	0.377	**0.915**	-	-
EXP	0.388	0.512	**0.842**	-
TF	0.469	0.659	0.619	**0.720**

Note: Bolded values show the values that are greater than every other value in their respective rows and columns.

AC, absorptive capacity; AQ, acquisition; AS, assimilation; TF, transformation; EXP, exploitation.

TABLE 4: Outcome of the test for direct relationship.

Hypothesis	Relationships	SB	SE	|t|^	p	Decision	Q^2	R^2
H_1	EF → VP	0.257	0.040	6.398	0.000	Supported	0.059	0.110

EF, effectual flexibility; VP, venture performance; SB, standard Beta; SE, standard error.

This outcome confirms that H_1 has statistical support. Further, the Q^2 value of 0.059 shows that the predictive relevance of the model is strong, and as such, the model is fit for purpose. The R^2 value of 0.110 explains the contribution of EF to the volume of changes in VP.

Hypothesis analysis (moderation effects)

In the second model, the moderation effects of AC on the relationship between EF and VP, in terms of direction and strength, was estimated following the process recommended by Baron and Kenny (1986). To estimate the moderating effects of AC on the relationships between EF and VP, the present study used the product indicator method recommended for PLS-SEM analysis (see Hair et al. 2017). Using the PLS algorithm and the bootstrapping technique, the moderation effects calculation was performed to produce the path coefficients and to determine whether or not the effect of AC on the hypothesised relationship is significant.

TABLE 5: Output of the test for moderation effects.

Effects	SB	SE	|t|^	p	Decision	F^2	R^2
AC → VP	0.288	0.041	7.011	0.000	Not supported	0.081	-
AC*EF → VP	-0.016	0.034	0.476	0.634	-	0.000	
EF → VP	0.149	0.046	3.208	0.001	-	0.020	

EF, effectual flexibility; VP, venture performance; AC, absorptive capacity; SB, standard Beta; SE, standard error.

Table 5 shows the relationship between EF and VP as well as the moderating effect of AC calculated through the new latent variable of AC*EF. Effectual flexibility (β = –0.149, $p < 0.01$) and AC (β = 0.288, $p < 0.01$) have significantly positive relationships with VP. However, the output showed that AC*EF (β = –0.016, $p = 0.634$) has an insignificant effect on the relationship between EF and VP. The outcome does not provide support for H_{2a}. This result shows that while the relationship between EF and VP is statistically significant, AC does not intervene in the direction and strength of this relationship.

Hypothesis analysis (mediation effects)

Using Baron and Kenny's (1986) three-step procedure for the estimation of mediation effects, the mediation effect of AC was evaluated. To calculate the mediation effect the PLS-SEM was applied and the bias-corrected bootstrapping

TABLE 6: Total and indirect effects.

Effects	Hypotheses	SB	SE	|t|^	p	Bias corrected 95% CI		F^2	R^2
Total effect	AC → VP	0.288	0.041	7.049	0.000	0.221	0.355	0.081	-
	EF → AC	0.374	0.048	7.823	0.000	0.286	0.446	0.152	0.200
	EF → VP	0.259	0.040	6.363	0.000	0.074	0.218	0.021	0.177
Indirect effect	H_{2b}: EF → AC → VP	0.108	0.021	5.224	0.000	0.078	0.146	Supported	Supported

CI, confidence interval; EF, effectual flexibility; VP, venture performance; AC, absorptive capacity; SB, standard Beta; SE, standard error.

technique used to compute the CIs, as well as the weight and *t*-statistics for the indirect, direct and total effects (Carrión, Nitzl & Roldán 2017).

The results of the estimation of the mediation effects in Table 6 showed that EF and VP have a positively significant direct ($\beta = 0.259$, $t = 6.363$, $p < 0.01$) and indirect ($\beta = 0.108$, $t = 5.224$, $p < 0.01$) relationships. This outcome confirmed a complementary and partially mediated relationship by AC between EF and VP. This result provides confirmation that H_{2b} is statistically supported. Further, a review of the values of the bias corrected 95% CI (upper and lower bounds) demonstrated that EF, AC and VP have values of 0.078, 0.146. This shows that the results are statistically meaningful as they do not include the value of zero in the interval. This shows that the results are statistically meaningful as they do not include the value of zero.

Discussion

This study set out to examine the interactions between EF and VP as well as the interfering effects of AC on this relationship in uncertain environments. The findings provided evidence that EF has a significant impact on the performance of EV. This result is consistent with the outcomes of existing studies (see Blauth et al. 2014; Urban & Heydenrych 2015) that found positive and significant relationship between EF and VP. This finding suggests that EF allows EV to adapt to uncertainties, pivot strategies and leverage contingencies to enhance their performance. It further demonstrates that ventures employing EF and hence, a non-predictive decision-making process, are better positioned to navigate dynamic environments to achieve performance.

Contrary to the theorised expectations, AC did not significantly moderate the relationship between EF and VP. This implies that the strength of the relationship between EF and VP does not depend on the venture's ability to acquire, assimilate and exploit emergent insights. This outcome differs from the outcomes of studies conducted by Chaudhary (2019) and Patel et al. (2015), which report significant moderating effects by AC on the studied relationships. The result suggests that EF may operate outside of knowledge absorption given that effectual behaviour eschews extensive market insights but relies on leveraging existing means and co-creating opportunities.

Further, it is conceivable that specific to the sample studied, there are other factors outside of the scope of this study that interact with EF to achieve significant moderating effects. Consistent with the suggestions of Zahra and George (2002), it could be that AC as a moderator is not embedded as a dynamic capability into the routines of the sample studied. Theoretically, the result challenges the assumption that all dynamic capabilities, such as AC, necessarily enhance the effects of effectual processes. It makes for interesting future research to explore the boundary conditions under which AC matters.

Insignificant moderating effect, notwithstanding, the current study finds that AC plays a complementary and partially mediating role between EF and VP. This result is consistent with the findings of previous studies (Aljanabi 2018; Ferreras-Méndez et al. 2015) that report varied significant mediating effects of AC on the explored relationships. The import of the current outcome is that while AC does not strengthen the direct effect of flexibility, it contributes to VP in conjunction with other variables. The result supports the notion that EF and AC are distinct but complementary capabilities. Effectual flexibility drives adaptive decision-making while AC enhances the utilisation of insights. As such, ventures should not only focus on flexible decision-making but also invest in systems for the management of knowledge and the sourcing of emergent external insights.

Theoretical contribution

This study refines the broader effectuation theory by clarifying EF as a direct driver of VP, as well as its centrality in entrepreneurial decision-making. Significantly, it challenges the assumption that all dynamic capabilities, such as AC, enhance effectual behaviour. The study reconceptualises AC as the findings highlight its translation of effectual behaviours into performance rather than the conditioning of their impact. Further, the complementary mediation suggests that EF and AC are synergistic but not interdependent. This means that ventures do benefit from both, but one does not rely on the other to function effectively.

As such, this study significantly contributes to the broader entrepreneurship literature. It provides empirical evidence from South Africa, a context that has been underexplored in the effectuation and AC research. The findings underscore the relevance of EF and AC in resource-constrained environments, where EV must navigate high levels of uncertainty and limited access to formal knowledge systems.

Limitations and future research directions

The study has several limitations. Highlighting these limitations in the study ensures that the findings are more appropriately interpreted and contextualised. The data

were collected from EV in South Africa, which may limit the generalisability of the findings to other contexts or to more established and larger firms. The cross-sectional design of the research lacks the quality of longitudinal studies in establishing temporal dynamics of the relationships investigated. The study relied on self-reporting data, which may be subject to biases such as social desirability or common method variance. Moreover, while the study employed validated scales, the measurement of complex constructs such as EF and AC may not fully capture their multi-dimensional nature. Because of the quantitative and positivist nature of the study, the question of how the relationship between the key variables manifest in the lived experiences of the EV may not have been addressed.

The findings present an opportunity for future research to explore the appropriate contextual factors, such as industry type or the stage of the venture, that influence the interrogated relationships. Further, there is an opportunity to consider alternative intervening variables that could play a role in shaping the relationship between EF and VP. Future studies should employ longitudinal approach to explore how these relationships evolve as ventures scale. Moreover, these relationships should be explored in different cultural and economic contexts to assess the generalisability of the findings. A phenomenological approach could provide deeper insights into how the venture owners perceive and implement EF and AC in practice.

Practical implications

This study has implications for entrepreneurs and policymakers alike. The findings of this study establish the need for entrepreneurs to prioritise EF by embracing adaptive strategies that allow for quick adaptation to changing circumstances and leveraging available resources creatively. EV should cultivate EF as a core competency while developing learning routines and external knowledge networks to enhance their performance.

Policymakers should design support programmes that emphasise both effectual logic and knowledge management, given their independent contributions to VP. Similarly, funding and support for entrepreneurs should consider both adaptive decision-making and knowledge infrastructure, rather than an assumption that one reinforces the other.

Conclusion

The current study set out to interrogate the interplay between EF, AC and VP, testing direct and indirect relationships. This study makes a significant contribution to the understanding of how EF and AC influence VP in small businesses, particularly in the context of South Africa. The findings confirm the significance of EF as a driver of VP. This confirms that ventures employing EF, that ability to adapt to uncertainties, leverage contingencies and co-create opportunities, achieve better performance. This aligns with previous studies (Blauth et al. 2014; Read et al. 2009) and reinforces the idea that non-predictive and flexible decision-making is preferable in dynamic environments.

The study reported a lack of support for the moderating role of AC, which suggests that its influence may be context dependent and, as such, warrants further investigation. Given that AC did not significantly strengthen or weaken the link between EF and VP, it is conceivable that EF operates independently of a venture's knowledge absorptive capabilities. As such, AC is not a boundary condition for effectual behaviours.

Despite the lack of support for moderation, the study highlights the complementary role of AC in mediating the relationship between EF and VP. This means that EF enhances performance partly by improving the absorption and utilisation of knowledge. The findings provide nuanced insights that advance both theoretical understanding and practical applications in entrepreneurship.

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Author's contributions

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Data availability

The data that support the findings of this study are available from the corresponding author, U.U.S.O., upon reasonable request.

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