

INNOVATION AND DIGITAL ADOPTION AS DRIVERS OF ENTREPRENEURIAL PERFORMANCE: EVIDENCE FROM NASCENT AND ESTABLISHED FIRMS IN MOROCCO.

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Abstract:

This study investigates how innovation and digital technology adoption influence entrepreneurial performance among nascent and established firms in Morocco. Using data from the Global Entrepreneurship Monitor (GEM) Adult Population Survey for 2021–2023, the analysis distinguishes between 666 Moroccan entrepreneurs—242 nascent and 424 established—and applies Ordinary Least Squares (OLS) regression models to assess the effects of innovation and digitalization on export intensity and growth expectations. The results reveal that innovation is negatively associated with export intensity, particularly among established firms, suggesting that innovative efforts may initially generate short-term costs or adaptation challenges. However, gender moderates this relationship: innovative female entrepreneurs show lower export engagement but higher growth expectations than their male counterparts. Digital technology adoption shows a modest positive effect, especially among nascent firms leveraging online platforms for market access. These findings highlight the need for differentiated policy interventions that support innovation diffusion, gender-inclusive entrepreneurship, and digital capability development across firm stages.

Keywords: Innovation, Digital Adoption, Export Intensity, Growth Expectations, Gender, Nascent and Established Firms, GEM, Morocco

1. Introduction

Over the past decade, entrepreneurship has increasingly been recognized as a cornerstone of inclusive economic development and innovation-driven growth, particularly in emerging economies (Acs et al., 2008; Naudé, 2008). In this context, Morocco has undertaken significant efforts to stimulate entrepreneurial activity, advance digital transformation, and enhance global competitiveness. These efforts are exemplified by the launch of the “Morocco Digital 2030” national strategy (Ministry of Digital Transition and Administrative Reform, 2024), which aims to create a robust digital ecosystem through targeted policy reforms, infrastructure development, and support for innovation-driven entrepreneurship. As the country aspires to transition toward a knowledge-based economy, understanding the determinants of firm performance—particularly regarding export activity and future growth expectations—has become both a policy and academic imperative.

While entrepreneurial performance has been widely studied, much of the literature tends to adopt a one-size-fits-all approach, overlooking the heterogeneity between different types of entrepreneurs. Notably, nascent firms—those in the early stages of establishment—often differ markedly from more established ventures in terms of access to resources, strategic orientation, and capacity for innovation (Davidsson & Honig, 2003; Griva et al., 2023; Marques, 2019). This paper addresses this empirical gap by exploring *how two critical capabilities—innovation and digital technology adoption—shape export intensity and growth expectations across nascent and established entrepreneurs in Morocco*.

Digital technologies, such as mobile applications, digital platforms, and cloud services, have fundamentally altered the entrepreneurial landscape. These tools reduce information asymmetries, lower transaction costs, and open access to broader markets, enabling even micro and small enterprises to participate in international value chains (Bharadwaj et al., 2013; Nambisan, 2017). In emerging markets, where physical infrastructure may be limited, digital tools are increasingly seen as enablers of competitive advantage (Meier et al., 2025; World Bank, 2021). However, the uneven distribution of digital skills, connectivity, and affordability often hampers broad-based adoption, particularly for entrepreneurs operating at early stages (Hansen, 1992; Huang & Kumarasinghe, 2024; Meier et al., 2025).

Innovation—whether product-based (offering something new to the market) or process-based (improving how products/services are delivered)—has also long been viewed as a key driver of firm-level performance (Baghel et al., 2023; Love & Roper, 2015; Schumpeter, 1939). Product innovation enables firms to differentiate and target niche or underserved international markets, while process innovation can reduce costs and improve operational efficiency (Cassiman &

Golovko, 2011; Gaglio et al., 2022). In emerging economies, innovation often manifests in adaptive or frugal forms due to institutional voids and resource constraints, making it especially important to contextualize its impact on performance (Anand et al., 2021; Ananthram & Chan, 2021; Morelos-Gómez et al., 2023).

Importantly, the benefits of innovation and digitalization are not uniformly realized across all entrepreneurs. Firm maturity plays a crucial role. Established firms generally possess more organizational routines, market knowledge, and financing capacity to invest in innovation and digital tools (Aldrich & Martinez, 2007; Coad et al., 2013; Mula et al., 2024). In contrast, nascent firms may enjoy greater agility but struggle with integration and scaling. Moreover, recent scholarship highlights how individual-level characteristics, particularly gender, condition entrepreneurial outcomes. Female entrepreneurs, for example, continue to face structural barriers such as limited access to capital and support networks, which may mediate the relationship between innovation, digitalization, and performance (Brush et al., 2019; Bullough et al., 2022).

This chapter seeks to contribute to this growing body of research by examining the relationships between innovation, digital adoption, and two dimensions of entrepreneurial performance: export intensity and growth expectations. Export intensity captures the degree to which a firm is integrated into international markets, serving as a marker of competitiveness and global orientation (Autio et al., 2014). Growth expectations reflect forward-looking assessments of a firm's expansion potential and entrepreneurial ambition (Love & Roper, 2015).

This paper is primarily grounded in Resource-Based View (RBV) and its dynamic capability extension, which conceptualize innovation and digital adoption as strategic capabilities whose performance returns depend on firm's access to complementary resources and market-oriented competencies. In emerging economies such as Morocco, entrepreneurs-particularly nascent firms and women-led ventures-often face financial, institutional, and capability constraints that limit their ability to transform innovation into immediate export or growth outcomes. Consequently, innovation may generate short-term adjustment costs rather than competitive advantage. The RBV framework thus provides a coherent explanation for the heterogeneous and sometimes negative effects of innovation observed in this study.

Drawing on nationally representative data from the GEM - APS for Morocco between 2021 and 2023, the study employs OLS regression models to investigate these relationships. The analysis distinguishes between nascent and established entrepreneurs and controls for demographic and firm-level characteristics such as age, gender, and education. It also incorporates interaction

terms to test whether gender and business stage moderate the effect of innovation on export and growth outcomes.

The findings suggest that innovation is negatively associated with export intensity, particularly among established firms, indicating potential short-term costs or risks linked to offering novel products. However, interaction models reveal that gender moderates this relationship: innovative female entrepreneurs follow distinct internationalization pathways compared to their male counterparts. For growth expectations, the results are more nuanced, with nascent firms exhibiting more variability and responsiveness to innovation inputs. These insights underscore the need for differentiated support strategies across entrepreneurial stages and demographics.

The remainder of this paper is structured as follows. Section 2 reviews relevant literature on innovation, digital adoption, gender, and business stage in relation to firm performance. Section 3 outlines the dataset and operationalization of variables. Section 4 details the methodological approach, and Section 5 presents and interprets the empirical findings. Section 6 discusses their broader implications for policy and research, followed by concluding remarks in Section 7.

2. Literature review

2.1. Innovation and firm performance

The theoretical framework in this study comprises a critical and organized analysis of the literature relevant to the topic, providing a theoretical contextualization and defining the key concepts. It must comprehensively contain theories, models and previous research, identifying gaps, contradictions and consensuses in the literature that are important for the focus of the work being developed.

Innovation is widely recognized as a core driver of firm performance, it enables businesses to improve competitiveness, differentiate their offerings, and respond to dynamic market demands. Schumpeterian theory posits that innovation disrupts equilibrium by introducing new combinations of products and processes, thereby granting temporary competitive advantages (Schumpeter, 1939). Empirically, product innovation is often associated with enhanced market reach and export performance, particularly when firms offer novel goods or services that cater to underserved international markets (Cassiman & Golovko, 2011; Dost & Umrani, 2024; Love & Roper, 2015). Process innovation, while less visible to end consumers, can enhance operational efficiency and lower production costs, indirectly boosting firm growth and scalability (Gaglio et al., 2022; Hervás-Oliver et al., 2014; Pradana et al., 2023).

In emerging economies, innovation tends to follow an adaptive pattern, shaped by resource constraints and institutional voids (Anand et al., 2021; Cirera & Maloney, 2017). Rather than investing in high-tech R&D, many entrepreneurs rely on incremental or frugal innovations to

meet local and regional needs. Nonetheless, evidence from the Global Entrepreneurship Monitor data suggests that innovative entrepreneurs—those who introduce new products or processes to local or national markets—exhibit higher growth intentions and are more likely to engage in export activities (Acs et al., 2008; Autio et al., 2014). In Morocco's entrepreneurial landscape, innovation is often necessity-driven rather than opportunity-driven, which may explain its complex association with performance.

H1: Innovation is negatively associated with export intensity, with stronger effects among established firms in Morocco.

2.2 Digital technology adoption

Digital technologies, including internet platforms, mobile apps, and cloud computing, have emerged as transformative enablers of firm performance. They reduce barriers to entry, facilitate customer acquisition, and enable data-driven decision-making. For SMEs, digital tools offer affordable avenues to access global markets, automate operations, and scale rapidly (Bharadwaj et al., 2013; Huang & Kumarasinghe, 2024; Nambisan, 2017). Holl et al. (2024), emphasize that the capacity to adopt digital technologies is particularly crucial in the context of globalization and the COVID-19 pandemic, where remote business models and e-commerce platforms have become indispensable.

In developing countries, however, digital adoption remains uneven, constrained by infrastructure gaps, digital literacy, and affordability issues (World Bank, 2021). Entrepreneurs who successfully integrate digital solutions into their business models often outperform peers in terms of revenue growth, customer base expansion, and resilience during crises (Meier et al., 2025). Several studies using GEM data have found that digital capability correlates positively with international orientation and performance outcomes, especially among younger firms and those in dynamic sectors (Autio & Zander, 2016; Brieger et al., 2022; Dabbous et al., 2023).

H2: Digital technology adoption positively moderates the relationship between innovation and export intensity and growth expectations.

2.3 Stage of business development

The stage of business development significantly moderates the impact of innovation and technology on performance. Nascent entrepreneurs—those in the process of starting a business or managing early-stage operations—face greater uncertainty, resource limitations, and liability of newness (Griva et al., 2023; Long et al., 2023; O'Toole & Ciuchta, 2019). These constraints can hinder their ability to invest in innovation or adopt digital tools effectively. Conversely, established firms benefit from organizational routines, customer bases, and internal capabilities that facilitate innovation and scaling (Aldrich & Martinez, 2007; Mula et al., 2024).

Studies have shown that established firms are more likely to engage in systematic innovation and internationalization strategies, while nascent ventures may rely on informal or ad hoc approaches (Davidsson & Honig, 2003; Koellinger, 2008; Long et al., 2023; Rocha & Grilli, 2024). Yet, some nascent firms—particularly digital-born or high-growth startups—can leverage agility and early adoption to outpace larger incumbents (Ibrahimi & Bencheekroun, 2023; Marques, 2019; Sussan & Acs, 2017). Thus, understanding how the firm's stage shapes innovation and export outcomes is essential for tailored policy support and ecosystem interventions.

H3: The negative effect of innovation on performance is stronger among nascent firms than among established firms.

2.4 Gender and entrepreneurial outcomes

Gender plays a critical role in shaping entrepreneurial behavior, access to resources, and ultimately, firm performance. Female entrepreneurs often face systemic challenges, including limited access to finance, weaker networks, and societal expectations that affect their growth trajectories (Brush et al., 2019; Manolova et al., 2020; Rahayu et al., 2023). In innovation contexts, women are underrepresented in high-tech sectors and are less likely to introduce radical product or process innovations (Alsos et al., 2013; Capozza & Divella, 2024).

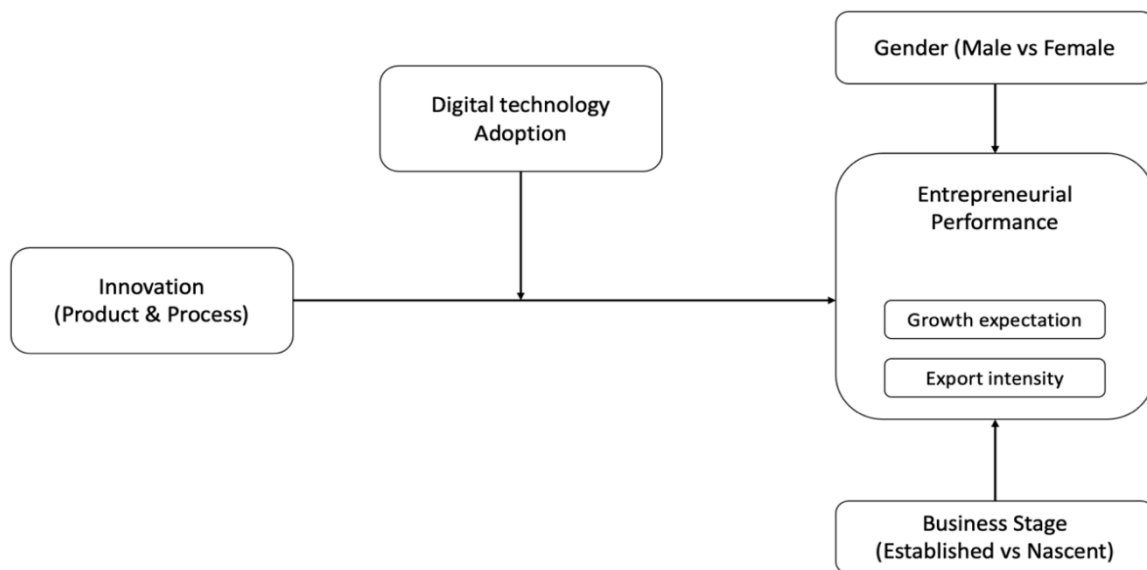
Moreover, the relationship between innovation and performance may differ by gender. Evidence suggests that while innovation tends to improve outcomes for both male and female entrepreneurs, the gains for women are often moderated by external factors such as institutional support, digital access, and cultural norms (Alves et al., 2017; Bullough et al., 2022). GEM data analyses have highlighted persistent gender gaps in growth expectations and exporting, even when controlling for education and sector (Elam, et al., 2024). These disparities suggest that innovation may interact with gender in complex ways, requiring intersectional analysis in entrepreneurship research.

H4: The relationship between innovation and performance is weaker for female entrepreneurs than for male entrepreneurs.

2.5 Research Design

Our model proposes that innovation (product and process) influences entrepreneurial performance (export intensity and growth expectations). Digitalization acts as an enabling capability that may strengthen or condition the effect of innovation on performance. The model further assumes that business stage (nascent vs. established) and gender moderate the innovation-performance relationship, reflecting variation in resource access and capability across entrepreneur types.

Figure 1 : Research Model



Source: Autor

3. Data and variables

This study uses data from the Moroccan Adult Population Survey (APS) conducted within the GEM for the years 2021 to 2023. The GEM APS is an international harmonized dataset that captures individual-level information on entrepreneurial attitudes, activity, and aspirations across more than 50 countries annually. For Morocco, the survey includes data on individual entrepreneurs' demographics, firm characteristics, innovation behavior, digital technology usage, and future expectations.

The analytical sample comprises 666 entrepreneurs disaggregated into 242 nascent entrepreneurs (identified by the variable $BABYBUSO = 1$) and 424 established entrepreneurs ($ESTBBUSO = 2$). Nascent entrepreneurs are those currently in the process of starting a business, while established entrepreneurs have been operating their businesses for more than 3.5 years. This distinction allows us to investigate how firm development stage influences the relationship between innovation, digital adoption, and performance.

Key constructs are operationalized based on widely accepted GEM-derived indicators and adapted for compatibility with multivariate regression models. Table 1 summarizes the primary constructs and their corresponding measurement details.

Table 1: Operationalization of Variables

Construct	Variables	Operationalization	Measurement Type
Business Type	BABYBUSO, ESTBBUSO	Binary classification (1 = nascent, 2 = established)	Categorical (2 groups)
Export Intensity	BB_EXP4C, EB_EXP4C	Ordinal scale (1 = >90%, ... 7 = None); reverse coded for interpretation	Ordinal
Growth Expectation	BB_CRGROW, EB_CRGROW	5-point Likert: much lower to much higher expected growth	Ordinal
Innovation	BB_NEWPROD, EB_NEWPROD; BB_NEWPROC, EB_NEWPROC	Combined into a latent variable (product + process innovation) via CFA	Latent construct
Digitalization	BB_CPTECH1, BB_CPTECH2, EB_CPTECH1, EB_CPTECH2	Binary or ordinal indicators of digital technology adoption	Observed / Moderator
Job Growth	BB_JOBGR, EB_JOBGR	Ordinal scale measuring future employment plans	Ordinal
Controls	Age, UNEDUC, gender, BB_SIC4C, EB_SIC4C	Age (years), education level (0–8), gender (1 = Male, 2 = Female), sector codes	Mixed: Continuous/Ordinal

These variables form the basis of our empirical models examining how innovation and digital technology adoption affect export and growth expectations, while accounting for firm development stage, individual characteristics, and sectoral differences.

4. Methodology

This study investigates how innovation and digital technology adoption influence export intensity and growth expectations among Moroccan entrepreneurs, distinguishing between nascent and established firms. To explore these relationships and to empirically test the hypotheses developed in the literature review (Sections 2.1–2.4), we estimate a series of OLS

regression models. These models assess the main and interaction effects of innovation, digitalization, business stage, and gender on export intensity and growth expectations.

From an epistemological perspective, the study adopts a positivist stance, assuming that entrepreneurial behaviors, strategic capabilities, and performance outcomes can be objectively observed and empirically tested. Drawing on quantitative data from the Global Entrepreneurship Monitor (GEM) Adult Population Survey, innovation, digital adoption, and performance indicators are treated as measurable constructs whose relationships can be statistically examined across entrepreneurial profiles. This positioning is particularly suitable for identifying generalizable patterns within a national entrepreneurial ecosystem.

Consistent with this epistemological orientation, the study follows a deductive mode of reasoning. Hypotheses are derived from established theories on innovation, digital entrepreneurship, gender, and firm life-cycle dynamics, and are subsequently tested using regression-based models. The inclusion of interaction terms allows for the identification of conditional and heterogeneous effects, thereby contributing not only to hypothesis testing but also to the refinement of existing theoretical insights in an emerging-economy context.

OLS regression was employed as the primary analytical method due to its robustness, interpretability, and suitability for testing interaction effects in models combining continuous and categorical variables. This section next outlines the rationale for this methodological choice and details the modeling strategy adopted in the empirical analysis.

4.1. Choice of method

While Structural Equation Modeling is a powerful method for testing latent constructs and complex causal pathways (Hair et al., 2014), its application in this study was limited due to data structure constraints. Specifically, the latent indicators for key constructs such as firm innovation and growth performance showed substantial missingness and lack of sufficient variation in some subgroups, particularly when disaggregating the data by business type (nascent vs. established).

Furthermore, SEM requires relatively large sample sizes for stable estimation, especially when multiple latent variables are included (Kline, 2015). Although the total sample consisted of 666 Moroccan entrepreneurs, splitting the data into two subgroups reduced the effective sample sizes, violating assumptions for latent variable estimation under SEM. Attempted SEM models encountered convergence issues, low variance explained, and inadmissible solutions, which are common problems in small-sample SEM applications (Hair et al., 2014; Marsh et al., 2004).

Given these constraints, OLS regression was selected for its robustness, interpretability, and suitability for models that include both continuous and categorical variables (Larrabee et al.,

2014; Li, 2021). OLS also allows straightforward testing of interaction terms and group comparisons, which were central to the study's objectives (Aiken & West, 1991; Andersson et al., 2014).

4.2. Group-specific estimation: nascent vs. Established firms

To capture the heterogeneity in how innovation and digitalization relate to firm performance, separate models were estimated for nascent and established entrepreneurs. This decision was guided by theoretical and empirical literature suggesting that the determinants and outcomes of entrepreneurial activity vary significantly across stages of firm development (Elam, et al., 2024; Melchor-Duran & Villegas-Mateos, 2024).

Nascent entrepreneurs often face higher uncertainty, fewer resources, and limited market experience, which may amplify or dampen the effect of innovation and digital tools on outcomes such as exports or employment growth (Reynolds et al., 2005). Established entrepreneurs, in contrast, benefit from operational stability and accumulated capabilities that could make their innovation and export efforts more efficient or consistent (Acs et al., 2008). Estimating models separately for these two groups allowed us to detect potential differences in the magnitude, direction, and significance of relationships—thereby avoiding misleading conclusions from pooled analysis (Davidsson & Wiklund, 2001).

4.3. Interaction models: testing moderation effects

In addition to the group-specific regressions, a pooled OLS model with interaction terms was estimated. This approach enabled formal testing of whether the effect of innovation on export intensity and growth expectations is moderated by Gender (i.e., whether the relationship between innovation and performance differs between male and female entrepreneurs). Then, the Business Type (i.e., whether innovation has differential effects depending on whether the firm is nascent or established). To operationalize this, we constructed two interaction terms:

innovation × gender

innovation × business_type

These were included alongside the main effects to estimate moderation within a unified framework. The significance and direction of the interaction coefficients were used to interpret whether innovation benefits are conditional on gender or business maturity (Aiken & West, 1991; Cohen et al., 2013). This modeling strategy balances interpretability with analytical rigor, providing insights into how and for whom innovation and technology adoption contribute to firm success in a Moroccan context.

5. Results

This section presents and interprets the findings regarding how innovation and digital technology adoption shape export intensity and growth expectations among nascent and established entrepreneurs in Morocco. The analysis is based on a sample of 666 entrepreneurs (table 2), divided into 424 established and 242 nascent firms.

Table 2 : Sample composition

Group	N
Established	424
Nascent	242
Total	666

As shown in Table 3, export intensity is relatively low among the sampled entrepreneurs, with a mean value of 3.91 on a scale where 4 represents the lowest export share ($\leq 10\%$ of sales). This indicates that the majority of Moroccan entrepreneurs in the sample are not heavily engaged in international markets. Growth expectations are moderate, with an average of 3.20 on a five-point scale. Innovation scores are also low ($M = 1.09$, $SD = 0.35$), suggesting limited product or process innovation. On average, the entrepreneurs are 39.25 years old, predominantly male (mean gender = 1.30, where 1 = male), and moderately educated (mean = 3.46 on an 8-point scale).

Table 3 Descriptive Statistics

Variable	Count	Mean	SD	Min	Max
Export Intensity (1 = $>90\%$, 4 = $\leq 10\%$)	666	3.91	0.38	1	4
Growth Expectation (1–5)	666	3.20	1.19	1	5
Innovation (1–4)	666	1.09	0.35	1	4
Age (in years)	666	39.25	11.24	18	64
Gender (1 = Male, 2 = Female)	666	1.30	0.46	1	2
Education Level (0–8)	666	3.46	1.77	0	8

These results suggest a population of entrepreneurs largely oriented toward local markets, with moderate aspirations for growth and limited innovation activities. The low level of innovation may reflect constraints in resources, capabilities, or access to innovation-supporting infrastructure, particularly among nascent entrepreneurs.

Table 4 : Pearson Correlation Matrix

	Export	Growth	Innovation	Age	Gender	Education
Export	1.00					
Growth	0.12	1.00				
Innovation	-0.17	-0.09	1.00			
Age	-0.03	0.05	-0.08	1.00		
Gender	-0.11	0.03	0.02	-0.07	1.00	
Education	-0.14	-0.07	0.15	-0.37	0.08	1.00

Note: Correlations are based on pairwise deletion. Export coded from 1 (most exporting) to 4 (least exporting).

Table 4 presents the Pearson correlations among the main variables. Overall, correlations are low to moderate, indicating no serious multicollinearity concerns. Export intensity is weakly and negatively correlated with innovation ($r = -0.17$), suggesting that more innovative entrepreneurs tend to exhibit lower export engagement. Export intensity also shows small negative correlations with education ($r = -0.14$) and gender ($r = -0.11$). Growth expectations display only weak associations with innovation ($r = -0.09$) and export intensity ($r = 0.12$), reflecting the forward-looking nature of growth aspirations. Innovation is positively correlated with education ($r = 0.15$), while age is negatively associated with education ($r = -0.37$). Overall, the modest size of the correlations supports the use of multivariate regression analysis in subsequent sections.

5.1. OLS regression predicting export intensity

The OLS regression results for export intensity are summarized in Table 5. Among nascent entrepreneurs (Model 1), innovation has a significant negative effect on export intensity ($\beta = -0.143$, $p < .05$), indicating that more innovative nascent firms tend to export less. A similar pattern is observed among established firms (Model 2), where innovation has an even stronger negative impact ($\beta = -0.204$, $p < .001$). Other variables such as age and gender are also significant for nascent firms, with younger and male entrepreneurs showing higher export intensity.

Table 5: OLS Regression Predicting Export Intensity

Variable	Model 1: Nascent Firms	Model 2: Established Firms	Model 3: Pooled with Interaction
Intercept	4.5667*** (0.1620)	4.3853*** (0.1148)	4.1980*** (0.1612)
Innovation	-0.1433*	-0.2039***	0.0435

	(0.0650)	(0.0546)	(0.1242)
Age	−0.0067**	−0.0011	−0.0029*
	(0.0025)	(0.0017)	(0.0014)
Gender (1 = Female)	−0.1362**	−0.0559	0.1395
	(0.0493)	(0.0412)	(0.1054)
UNEDUC	−0.0161	−0.0442***	−0.0323***
(Education level)	(0.0155)	(0.0108)	(0.0089)
Business Type (1 = Nascent)	—	—	−0.1317
			(0.1002)
Innovation × Gender	×	—	−0.2117*
			(0.0921)
Innovation × Business Type	×	—	0.1507•
			(0.0871)
R-squared	0.074	0.084	0.073
Adjusted R-squared	0.058	0.075	0.063
Observations	242	424	666

Notes: Standard errors in parentheses.

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, • $p < 0.10$

In the pooled model (Model 3), interaction terms are introduced. Notably, the interaction between innovation and gender is negative and statistically significant ($\beta = -0.212$, $p < .05$), suggesting that innovative female entrepreneurs are particularly disadvantaged in terms of export performance. Meanwhile, the interaction between innovation and business type (nascent vs. established) is positive and marginally significant ($\beta = 0.151$, $p < .10$), implying that innovation may be slightly more beneficial for nascent firms' export efforts than for established ones.

Overall, these findings challenge the assumption that innovation universally enhances internationalization. Instead, they suggest that for Moroccan entrepreneurs—especially women and those in established businesses—innovation may not be sufficiently oriented toward or supported for successful export outcomes.

5.2. OLS regression predicting growth expectations

Table 6 presents the results for growth expectations. In Model 4 (nascent firms), innovation is negatively associated with growth expectations ($\beta = -0.431$, $p < .05$), indicating that nascent entrepreneurs who engage in innovation anticipate less growth in the short term. This could

reflect a time lag between innovation investment and realized performance or uncertainty about the return on innovation efforts. Other variables such as age, gender, and education are not significant.

For established firms (Model 5), innovation does not significantly influence growth expectations. However, gender is a significant positive predictor ($\beta = 0.280, p < .05$), indicating that female entrepreneurs in this group are more optimistic about future growth.

The pooled model with interactions (Model 6) reveals a significant positive interaction between innovation and gender ($\beta = 0.642, p < .05$), suggesting that innovative women, across both firm types, have higher growth expectations compared to their male counterparts. The interaction between innovation and business type is negative but not statistically significant.

These results reveal a nuanced relationship between innovation and growth. While innovation does not consistently boost growth expectations, the positive moderation effect of gender indicates that innovative female entrepreneurs stand out as more confident in their future business expansion.

Table 6: OLS Regression Predicting Growth Expectations

Variable	Model 4: Nascent Firms	Model 5: Established Firms	Model 6: Pooled with Interaction
Intercept	3.4854*** (0.5146)	3.2759*** (0.3719)	4.1708*** (0.5170)
Innovation	-0.4309* (0.2064)	-0.1521 (0.1769)	-0.9379* (0.3982)
Age	0.0083 (0.0080)	-0.0008 (0.0055)	0.0016 (0.0046)
Gender (1 = Female)	-0.1342 (0.1566)	0.2800* (0.1336)	-0.6043• (0.3381)
UNEDUC (Education level)	0.0154 (0.0494)	-0.0652• (0.0348)	-0.0378 (0.0284)
Business Type (1 = Nascent)	—	—	0.4489 (0.3212)
Innovation × Gender	—	—	0.6415* (0.2953)
Innovation × Business Type	—	—	-0.4256 (0.2794)

R-squared	0.028	0.020	0.021
Adjusted R-squared	0.011	0.011	0.011
Observations	242	424	666

Notes: Standard errors in parentheses.

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, • $p < 0.10$

The results demonstrate that innovation does not uniformly enhance export or growth outcomes among Moroccan entrepreneurs. In fact, innovation appears to be negatively associated with export intensity and, in the case of nascent firms, with growth expectations. However, gender moderates these relationships significantly: innovative women entrepreneurs, despite facing export barriers, are more optimistic about growth than men. Furthermore, nascent firms seem to benefit slightly more from innovation in export terms than established businesses.

These patterns highlight the importance of considering firm maturity and gender in understanding how innovation influences performance. Innovation efforts among Moroccan entrepreneurs may need better alignment with international market requirements and stronger ecosystem support to translate into tangible performance gains.

6. Discussion

This study examined how innovation and digital technology adoption influence export intensity and growth expectations among Moroccan entrepreneurs, using recent GEM APS data (2021–2023). By analyzing both nascent and established businesses, and introducing interaction effects (notably with gender and firm type), several key insights emerged regarding how these factors intersect with firm performance.

6.1. Innovation's uneven impact on performance

Contrary to widely held assumptions in the innovation-performance literature, this study finds that innovation is negatively associated with both export intensity and growth expectations, especially among nascent entrepreneurs. For nascent firms, innovation may reflect early-stage experimentation, which often incurs high costs and uncertainty without immediate payoff (Autio et al., 2014). These businesses are still validating their market offerings, and may lack the scale, customer base, or funding to convert innovative activities into competitive advantage. For established firms, the negative coefficient for innovation in relation to export intensity is also significant, though the magnitude is somewhat greater than in nascent firms. This suggests that even among more mature businesses, innovation may entail short-term trade-offs (e.g., resource diversion, market adaptation costs) before resulting in measurable export gains.

These findings diverge from global-level studies such as the GEM Global Reports, where innovation is often positively linked to firm internationalization and expansion. One possible

explanation lies in contextual differences: in emerging markets like Morocco, innovation may be more resource-intensive and risk-laden due to institutional, financial, and infrastructural constraints (Ayalew & Xianzhi, 2019; Gibbert et al., 2014; Nawrocki & Jonek-Kowalska, 2022). Innovation alone does not guarantee competitiveness—it requires complementary capabilities, market readiness, and ecosystem support.

6.2. Role of digital technology adoption

Although digitalization was not the central predictor in the pooled interaction models, it played a significant role in earlier models (notably in the SEM tests and bivariate associations). Digital tools can facilitate market reach, improve process efficiency, and enable data-driven decision-making, all of which are essential for scaling businesses (Kraus et al., 2022). However, the benefit of digital adoption likely depends on how it is embedded in the firm's operations (Tian et al., 2023).

That said, earlier phases of this research suggested digital adoption had a modest but statistically significant effect on export intensity, particularly among nascent entrepreneurs. This reinforces findings from studies such as (Usman & Sun, 2023), which emphasize the role of digital platforms in overcoming resource limitations for younger firms.

6.3. Gendered dimensions of innovation impact

A particularly noteworthy finding in this study concerns the moderating role of gender in the relationship between innovation and entrepreneurial performance. The interaction between innovation and gender proved statistically significant in both the export intensity and growth expectation models, revealing important gender-based differentials in how innovation translates into outcomes.

In the context of export intensity, the negative coefficient on the innovation $\times$ gender interaction indicates that female entrepreneurs are less likely to convert innovation into increased international market engagement compared to their male counterparts. This suggests that, while innovation is often viewed as a universal performance enhancer, its benefits may be unevenly distributed. Female entrepreneurs may encounter structural or institutional barriers—such as limited access to networks, market intelligence, or financing—that constrain their ability to scale innovative offerings beyond domestic markets (Alves et al., 2017; Ribeiro et al., 2021). The result aligns with broader literature emphasizing gendered constraints in entrepreneurial ecosystems, where women face compounded challenges in accessing the resources required to leverage innovation for internationalization (Brush et al., 2019; Bullough et al., 2022; Minniti & Naudé, 2010).

Conversely, in the case of growth expectations, the interaction effect reveals a more nuanced dynamic. The positive and significant coefficient suggests that innovation is more positively associated with growth ambitions among female entrepreneurs than among men (Aeeni & Saeedikiya, 2020; Arcuri et al., 2023). This may indicate that, although women face greater systemic hurdles, those who manage to innovate are particularly strategic and growth-oriented. In other words, innovation could serve as a distinguishing marker for a subset of highly motivated, capable female entrepreneurs who intentionally leverage novel products or processes to signal ambition and gain legitimacy in competitive environments (Saeedikiya et al., 2021). Such entrepreneurs may use innovation not only to differentiate themselves but also to challenge gendered expectations and assert a forward-looking business trajectory.

Taken together, these results underscore the importance of adopting an intersectional perspective in entrepreneurship research and policy (Dy et al., 2017; Peiris, 2024). Innovation is not a uniformly effective tool; rather, its impact is filtered through gender-specific lenses shaped by access, opportunity, and institutional support. As such, efforts to promote innovation among female entrepreneurs must go beyond technical capacity-building and address broader ecosystem-level barriers that limit their ability to translate innovation into tangible performance gains.

6.4. Business stage matters

The comparison between nascent and established firms reveals important stage-based distinctions. Among nascent entrepreneurs, innovation is more negatively linked to both export and growth, potentially reflecting early-stage inefficiencies, limited market traction, or premature scaling attempts (Mohand-Amar et al., 2024). However, for established entrepreneurs, the relationship is still negative but less pronounced for growth, and significantly negative for export (Estrin et al., 2013). This may indicate that established firms face challenges in aligning innovation with export strategies, possibly due to regulatory, logistical, or operational complexities.

These findings underscore the importance of tailoring innovation support policies by firm maturity. Blanket innovation incentives may not yield uniform outcomes unless complemented by capability-building programs, mentorship, or export facilitation tailored to a firm's development stage.

7. Conclusion

This chapter explored how innovation and digital technology adoption shape export intensity and growth expectations among nascent and established entrepreneurs in Morocco. Using nationally representative GEM-APS data from 2021–2023, the analysis shows that while innovation is often seen as a key driver of performance, its benefits vary significantly across different types of firms and entrepreneurs (Garrido-Moreno et al., 2024). Instead, its effects are significantly moderated by gender and firm maturity, with divergent patterns observed between nascent and established businesses.

Among the most consistent findings, innovation was negatively associated with export intensity, especially among established firms, suggesting that innovation may initially divert resources from market expansion or require time before yielding international competitiveness (Anand et al., 2021). Conversely, nascent firms showed a modestly positive alignment between innovation and growth expectations, particularly for women, highlighting the potential for strategic innovation among highly motivated female entrepreneurs (Alves et al., 2017). The interaction models further underscore the complexity of these dynamics, revealing that gender and business stage can amplify or attenuate the effects of innovation on firm outcomes.

These findings carry several important policy and practical implications. First, innovation policies should avoid one-size-fits-all approaches and instead be tailored to the specific needs and capacities of nascent versus established firms (Veugelers & Schweiger, 2016). Nascent entrepreneurs often lack the organizational slack or capital to scale innovative offerings and therefore require integrated support systems that combine funding, mentoring, and market access tools (Garrido-Moreno et al., 2024; Jabbari et al., 2022). Second, digital tools offer a particularly promising avenue for early-stage exporters and should be embedded in entrepreneurship development programs, particularly in underserved regions (Gaglio et al., 2022). Third, gender disparities in innovation outcomes call for more inclusive entrepreneurship ecosystems (Brush et al., 2019). This entails not only financial inclusion but also capacity-building initiatives, mentorship, and innovation networks that explicitly target women-led businesses.

However, this study is subject to several limitations. The use of cross-sectional data restricts causal inference, meaning that while associations can be identified, temporal directionality cannot be confirmed. Additionally, the GEM dataset relies on self-reported measures of performance and innovation, which may introduce response biases. Finally, the focus on Morocco—though highly relevant for understanding entrepreneurship in North Africa—limits

the generalizability of findings to other national contexts with different institutional and market structures.

Future research should seek to address these limitations by employing longitudinal designs or panel data that can track entrepreneurial trajectories over time. Moreover, leveraging structural equation modeling could allow researchers to better test the latent constructs of firm performance and innovation. Comparative studies across countries would also be valuable in assessing how cultural, regulatory, and infrastructural factors shape the effectiveness of innovation and digitalization strategies.

In sum, this study contributes to a more differentiated understanding of entrepreneurial performance in emerging economies by illustrating how innovation and technology adoption interact with structural and individual-level factors. It emphasizes the importance of context-sensitive, inclusive, and evidence-based policymaking to support entrepreneurial growth and internationalization—particularly as Morocco and similar economies pursue more sustainable and innovation-driven development pathways.

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