The role of entrepreneurial alertness, digital platform capability, organizational agility and business model innovation on young innovative companies' performance

Abstract

Studies on entrepreneurship trajectories of young innovative companies (YICs) are rare and discussion of the specific dynamics taking place within them has remained lacking. This research aims to explore these dynamics by focusing on the relationships between a set of factors and ultimately YIC's performance. Specifically, first we examined the effects of entrepreneurial alertness (EA) on three factors, namely digital platform capability (DPC), organizational agility (OA) and business model innovation (BMI); second, we focused on the effects of DPC on OA and then on those of OA on BMI; lastly, we explored the effects of DPC and BMI on YICs' performance, in terms of market performance (MP), product innovation (PROD) and process innovation (PROC). We adopted the PLS-SEM approach to test our hypotheses and the results support them, in fact all with significant and positive effects. Our findings highlighted a set of capabilities and factors helping YICs to deal with uncertain and changing environments and to achieve a higher level of competitiveness and performance. YICs should develop crucial capabilities and create/nurture a culture focused on innovation and digital transformation. Main stakeholders (e.g. policymakers/governments) should at the same time stimulate cultural changes and introduce specific incentives and programmes to support YICs.

Keywords: young innovative companies; digital platforms; agility; business model

1. Introduction

Young Innovative Companies (YICs), represent new companies with high-growth potential and have attracted the attention of many scholars and practitioners for their potential impacts on markets and benefits in terms of socio-economic developments of the contexts in which they develop (Matricano 2020a).

Over the years, scholars explored YICs by focusing on several aspects such as regulations, policies, financing, resources and networks or ecosystems (Colombelli et al. 2020). Despite the growing interest for this type of ventures, however, scholars know very little about YICs entrepreneurial trajectories, namely the specific dynamics taking place inside them. Entrepreneurial trajectories represent an emerging topic of research concerning the evolutionary paths of YICs (Matricano 2020b). In this vein, Matricano (2020b) highlighted that the YICs' growth paths depend on business models (BMs) and identified opportunities, and opened to reflection on dynamics linking predictors (antecedents) (R&D-investments, skilled-employees, patents) and outcomes (post-entry performance) (capital-turnover, employment-rate, new-product/processes) (Matricano 2020a). These dynamics have been neglected in current literature, but they may be crucial for the survival and growth of YICs, hence further in-depth investigations are required to improve our knowledge.

The aim of this paper is to enhance understanding on the entrepreneurial trajectories of these ventures and to fill an existing gap in literature related to the scarce attention and research on the impact of YICs internal dynamics on companies' performance. Despite growing research in this field, these dynamics have not been sufficiently investigated and it is necessary to provide empirical evidence in this regard. In fact, as underlined by Matricano (2020b), dynamics taking place inside YICs still remains unknown, in particular the relationships between antecedents/predictors and – ultimately – performance/outcome of the companies. In this vein, first, we explored the role of entrepreneurial alertness (EA), a specific entrepreneurial characteristic (Tang et al. 2012), in influencing three main factors, namely digital platform capability (DPC), organizational agility (OA) and business model innovation (BMI). Being YICs new ventures that depend on the actions of their entrepreneurs/founders, EA represents a crucial factor that influences and explains their actions, such as strategic decisions and the identification of opportunities (Tang et al., 2012; Troise and Tani, 2021). As underlined by current literature, DPC, OA and BMI are central factors to examine the dynamics of new and small companies being able to determine their competitive advantages and influence their performances (Bhatti et al., 2021; Ahmed et al. 2022). Then, we specifically focused on the effects of DPC – a relevant capability related to digital platforms (Cenamor et al. 2019; Ahmed et al. 2022) – on OA – a key capacity and feature of companies (Lu and Ramamurthy 2011) and, in turn, on those of OA on BMI, a vital source of value creation for companies consisting of several changes in the BMs (Amit and Zott 2012). Finally, we explored the effects of DPC and BMI on companies' performance, in terms of market performance (MP), product innovation (PROD) and process innovation (PROC). In this way, we explored if the factors are related by specific dynamics and to reveal the relationships existing between them.

Our study follows and aims to respond to recent calls for more research in the field of entrepreneurial trajectories (Matricano 2020b) and to contribute to the current debate on the dynamics of YICs. The contributions of this study are manifold, both from a theoretical and managerial point of view. Our theoretical arguments and the related model are empirically validated, in fact, we found fully support for our hypotheses; the relationships between the factors have been assessed and they explain how they are related to each other. At the same time, our findings offer a framework to many stakeholders,

especially entrepreneurs and governments/policymakers, of the underlying dynamics of YICs and their ultimate performance.

Appendix 1 reports a list of abbreviations.

2. Literature and research hypotheses

Entrepreneurial alertness

EA is an emerging and developing area in the entrepreneurship domain (Tang et al. 2012). Scholars defined it as the ability of entrepreneurs to identify and exploit new opportunities (often overlooked by others) (Obschonka et al. 2017). As argued by Tang et al. (2012: 77) "…entrepreneurs tend to be more alert to possibilities for new entrepreneurial ventures. […] Despite its potential, alertness remains understudied due to an ambiguous understanding of the term and particularly because of major measurement issues". These scholars proposed and validated a specific alertness scale by incorporating three main dimensions: scanning-and-search (SS), association-and-connection (AC), evaluation-and-judgment (EJ).

Entrepreneurs improve their knowledge and their level of alertness through SS (Tang et al. 2012). They, in fact, are more alert to new information and the surrounding environment, thus increasing the identification and exploitation of new opportunities. AC allows entrepreneurs to innovate and move out of the routine by processing new information making unique connections among them (Gaglio and Katz 2001). EJ has a key role in allowing evaluations and judgment of new information and new changes, thus favouring entrepreneurs' identification of the better opportunities (McMullen and Shepherd 2006).

According to Tang et al. (2012), EA positively influences the companies' innovations because alert entrepreneurs tend to better perceive new trends and developments, as well as to exploit external resources and opportunities (Gaglio and Katz 2001). EA enables entrepreneurs to be more open to new opportunities, to make changes to their traditional models and to proactively use new technologies – particularly digital platforms – to increase both opportunities and innovations for their companies (McMullen and Shepherd 2006; Obschonka et al. 2017; Troise and Tani 2021). As evidenced by Roundy et al. (2018), entrepreneurially alert decision-makers reveal greater willingness to make quick and agile strategic change decisions, as well as gain first mover benefits.
The literature confirms that alert entrepreneurs have a higher propensity to innovate, proactively undertake specific actions and exploit opportunities. Compared to non-alert entrepreneurs, they are more likely to do so. Based on the above, we argue that EA leads entrepreneurs to be more open to effectively use the latest digital technologies, to respond to rapid market changes and to innovate their existing BMs.

Thus, we expect EA to play a central role in influencing the entrepreneurial trajectories of YICs and in triggering specific and subsequent dynamics within these companies. Specifically, we suggest that EA can enhance DPC, OA and BMI. Hence, we propose:

Hp1a: EA has a positive influence on DPC of YICs.

Hp1b: EA has a positive influence on OA of YICs.

Hp1c: EA has a positive influence on BMI of YICs.

Digital platform capability

Digital technologies, such as digital platforms, represent strategic tools for companies allowing them to gain sustainable competitive advantages (Sakas et al. 2014). Over the years, digital platforms have acquired increasing importance for companies by improving and facilitating connectivity, coordination, and collaboration within the organization and outside it, particularly with other actors like partners (Cenamor et al. 2019). For companies, it is crucial to effectively use digital platforms and to integrate resources, strategic knowledge, and technologies (ICT-based) with other resources and exploiting the potential of digital technology (Mikalef and Pateli 2017). In general, companies embracing digital transformation disclose improvements in their processes and in their ability to deal with volatility and uncertainty (Troise et al. 2022).

In the last few years, a number of scholars have focused on the importance of digital platforms and the related companies' DPC to foster their OA allowing them to survive, obtain a competitive advantage and improve their performance (Ahmed et al. 2022). DPC has been defined as "the organization's ability to use the latest advanced digital tools and technologies as competitive instruments" (Ahmed et al. 2022: 6). By leveraging DPC to implement digital platforms in an effective way, it is possible for new ventures to pursue OA; this is possible by achieving both platform integration and reconfiguration. The first one improves internal communication and coordination of activities, goals and resources or capabilities, while the second one enhances the external communication, i.e. those with external partners, and the related acquisition and/or organization of information (Cenamor et al. 2019). In this field, Ahmed et al. (2022) have provided empirical evidence that DPC has a positive impact on OA and plays a key role for companies responding to changing environments.

Previous studies highlighted that DPC positively influences innovation, competitive advantage and, in general, the performance of companies (Mikalef and Pateli 2017; Cenamor et al. 2019). In this vein, Cenamor et al. (2019: 196) suggested that "entrepreneurial SMEs can enhance their performance through digital platform capability". Some scholars underlined that DPCs are vital for ventures to face dynamic and rapidly changing environments, as well as to implement specific strategies aimed at increasing the performance of the companies and their agility (e.g. by redesigning key capabilities/skills) (Cenamor et al. 2019; Ahmed et al. 2022). Previous studies have suggested that the higher the levels of DPC developed by ventures, the better their levels of competitiveness thanks to an effective ability to exploit digital platforms (Cenamor et al. 2019). For example, Ahmed et al. (2022) showed that DPC improved ventures' agility and helped them to sustain in the market.

Based on the above and on existing literature, we argue that YICs nurturing DPC might increase both their OA and their performance, particularly the market ones (MP) and the innovation ones (PROD and PROC). Hence, the following hypotheses are proposed:

Hp2: DPC has a positive influence on OA of YICs.

Hp3: DPC has a positive influence on YICs' performance in terms of MP (a), PROD (b), PROC (c)

Organizational agility

Over the years, OA has become a vital imperative for business survival (Lu and Ramamurthy 2011), it refers to "a firm's ability to respond to the challenges posed by the changing and uncertain environment and to renew its business" (Troise et al. 2022: 2). OA represents a specific capacity of organizations to react promptly to market changes and to take advantage of identified opportunities,

thus gaining valuable competitive advantages (Lu and Ramamurthy 2011). Several scholars underlined the benefits of agile organizations, particularly their readiness to deal with the volatility and uncertainty of the contexts (including environment/market), size new opportunities, process information for anticipating external changes, enable companies to better manage their resources (e.g. knowledge), explore rapidly and proactively novelties, and provide responses to changing scenarios, for example in terms of redesign of business-operations/cost-structure and responsiveness to demands of customers (by improving their loyalty/satisfaction) or to the moves of the competitors (Lu and Ramamurthy 2011; Liao et al. 2019; Bhatti et al. 2021; Ahmed et al. 2022; Troise et al. 2022).

Several studies showed that OA favoured the success of new BMs and products by facilitating the adaptation to new technologies (Brand et al. 2021). Companies, in particular YICs, need to innovate their BMs to increase their organizational efficacy and competitiveness (particularly their competitive advantages) (Liao et al. 2019); however, as argued by Liao et al. (2019), several companies are still reluctant to innovate their BMs. Other companies, instead face some difficulties in favouring BMI development, among them Chesbrough (2010) identified two main barriers, namely resource constraints and organizational inertia. The latter is a major cause of organizations' resistance to changes. OA may be an important factor to foster BMI and recent studies in this field provided evidence that it has a positive effect on BMI and is a significant and relevant antecedent (Liao et al. 2019; Bhatti et al. 2021).

In the specific field of digital start-ups, the study of Ghezzi and Cavallo (2018) revealed the importance of agility, and in particular agile methods, to enhance BMI. The lack of OA might represent a limit for companies, particularly YICs, to navigate changing scenarios and adapt their activities accordingly (Cegarra-Navarro et al. 2016). Thus, based on the above, we propose that:

Hp4: OA has a positive influence on BMI of YICs

Business model innovation

BMI represents a source of sustained value creation (Chesbrough 2010), and it refers to companies' changes in their BMs, such as extending them or creating new ones, and adding new activities or introducing novelties in them (Amit and Zott 2012). Among the studies in this field, the research of Casadesus-Masanell and Zhu (2013) described BMI as the search for new ways for value creation and capture, and seize new opportunities emerged. Over the years, scholars have focused on distinct aspects of BMI, such as its role as a process or an outcome (Gambardella and McGahan 2010), and the related single components or the underlying architecture (Amit and Zott 2012). BMI is also considered by several studies as a set of factors changing within the BMs (Osterwalder and Pigneur 2010; Bhatti et al. 2021). In this field, one of the main frameworks leveraged by scholars is the Canvas model proposed by Osterwalder and Pigneur (2010), which describes the ways companies innovate their BM.

BMI may represent a significant driver to improve the performance of companies; however, as argued by Bhatti et al. (2021: 392), "a few studies have tried to investigate the impact of BMs through empirical analyses". These scholars (Bhatti et al. 2021) showed that BMI has a positive impact on companies' performance. The positive effect of BMI is related to several aspects, such as the changes in partnerships, procedures, or expenses. At the same time, BMI can offer new combination of information or products, as well as attract new key stakeholders (suppliers, consumers, strategic partners). In line with the prior studies in this field, we propose that BMI positively influences the performance of the companies. Hence, the following hypotheses are proposed:

Hp5: BMI has a positive influence on YICs' performance in terms of MP (a), PROD (b), PROC (c)

3. Methodology

3.1 Research context and data collection

In line with prior studies (Matricano, 2020a, 2022), we explored YICs in Italy, a vibrant context to study for its developments and regulations on innovative startups. "Innovative start-ups are a worldwide phenomenon, but they are not properly defined in all countries" (Matricano, 2022: 5), hence, the Italian context seems an interesting case to further investigate this phenomenon and for providing new evidence. Furthermore, YICs in Italy are listed in a specific Business Register (https://startup.registroimprese.it/), thus favouring their identification and the related info. To be listed in this register (Law 221/2012), these ventures have to be new or established business for no more than five years and are officially required to possess at least one out of three parameters: investments in R&D activities, highly skilled employees, holding a patent.

Data collection consisted of two steps. The first was to conduct a pilot-study to ten YICs – startups in contact with the authors – before the main survey. This step was useful to get feedback and ensure the validity/reliability of our measures. At the same time, it allows us to assess the completeness and correctness of our survey (respondents' familiarity with the topics; questions' clarity). Then, we conducted the main survey; specifically, we distributed an online questionnaire to YICs established before the 2020 and listed in the specific Business Register. This choice was due to the need to consider companies that had some performances to disclose (therefore not companies that were born recently). The survey followed some steps to increase its efficacy: first, it contained an introductory page to explain the academic scope of the research; second, items from different types of constructs were intermixed in the questionnaires.

Data collection lasted about two and a half months (September 2021-November 2021) resulted into 320 responses; however, 85 of them were incomplete answers, thus we excluded them from the study. To ensure the quality of the responses, we checked the presence of biases related to insufficient effort responses and of longstrings, and there were no points of concerns. We had a final sample of 235 YICs with complete questionnaires. These companies are mainly belonging to service industry, located in north Italy and 3.5 years.

3.2 Measures

Table 1 shows the measures used in this study. We used well-established constructs, and they were measured on a seven-point Likert scale, ranging from one ("strongly disagree"), to seven ("strongly agree"). From Tang et al. (2012), we measured EA using the three well-known dimensions consisting of 13 items: SS (6 items), AC (3 items) and EJ (4 items). DPC was measured adopting seven items proposed by Ahmed et al. (2022) - adapted from Cenamor et al. (2019) – and considering both platform integration and platform reconfiguration. To measure OA, we resorted to the six items' constructs used in several studies in the field (Cegarra-Navarro et al. 2016; Bhatti et al. 2021). In line with the previous research of Liao et al. (2019), adapted from with the study of Zott and Amit (2010) - we used a seven-item scale to measure BMI.

Finally, we leveraged three different measures of performance, namely MP, PROD and PROC. The first (MP) is based on extant studies (Wamba et al. 2017; Bhatti et al. 2021) and consists of four items. The last two variables (PROD, PROC), represent innovative performance measures, respectively of

product and process. They are used in several studies and were taken from Prajogo and Ahmed (2006) consisting of five and four items, respectively.

4. Data analysis and results

4.1. Data analysis

This study uses the Partial-Least Squares approach to Structural Equation Modeling (PLS-SEM) to test the hypotheses. The PLS-SEM technique represents a suitable approach for exploratory research, particularly with small samples, to provide accurate results and to test the model without sample restrictions (Hair et al. 2016).

We adopted the full-collinearity approach to test our model and to check for common method bias (CMB). The model discloses a low risk of CMB, in fact, the higher VIF is below the conventional threshold of 3.3 (in our case, the higher value is 2.366 both for DPC and EA on OA), hence there are no points of concerns.

In line with prior studies, and because this approach does not provide for a global fit measure to assess the validity of the model, we use the widely recognized two-step process (Hair et al. 2016; Ravand and Baghaei 2016): first, to assess the quality of the outer (measurement) model and, second, the inner (structural) model predictive power.

4.2. Measurement model

We examined our measurement model following the four criteria defined by Hair et al. (2016): indicator reliability, construct reliability, convergent validity and discriminant validity. We checked the first criteria, namely indicator reliability, by examining the values of the item-loadings on their latent. As shown in table 1, there are not items with outer loading lower than the threshold of 0.6[1]. The second criteria, namely construct reliability, was checked by analysing three indicators for each construct: Cronbach Alpha, Dillon-Goldstein's rho and Composite reliability. All the constructs can be considered reliable as the values of the three indicators are higher than 0.7 (Hair et al. 2016). For the third criteria, we assessed the convergent validity by examining the average variance extracted (AVE) of each block. The latter (AVE), is always higher than 0.50, hence the constructs pass the convergent validity test (Hair et al. 2016). As shown in table 2, we assessed the last criteria, namely discriminant validity, by adopting the cross-loading approach by Ravand and Baghaei (2016), that is to check that each item loading on its latent was higher than the one on the other constructs.

Table 1. Reliability and validity of the measures.

Latent	Item		Load Factor	Cronbach's Alpha	rho_A	Composite Reliability	AVE	R^2
SS	SS2	I always keep an eye out for new business ideas when looking for information	0.826	0.84	0.845	0.887	0.612	-
	SS3	I read news, magazines, or trade publications regularly to acquire new information	0.864					

[1] One item, namely SS1, has been deleted because of its factor loading lower than 0.6, hence we re-run the test (Hair et al. 2016). The second run passed the four tests as reported in tables 1 and 2.

	SS4	I browse the internet every day	0.719					
	SS5	I am an avid information seeker	0.76					
	SS6	I am always actively looking for new information	0.734					
AC	AC1	I see links between seemingly unrelated pieces of information	0.808	0.836	0.838	0.902	0.755	-
	AC2	I am good at “connecting dots”	0.904					
	AC3	I often see connections between previously unconnected domains of information	0.891					
EJ	EJ1	I have a gut feeling for potential opportunities	0.847	0.889	0.891	0.923	0.75	-
	EJ2	I can distinguish between profitable opportunities and not-so-profitable opportunities	0.856					
	EJ3	I have a knack for telling high-value opportunities apart from low-value opportunities	0.854					
	EJ4	When facing multiple opportunities, I am able to select the good ones	0.906					
DPC	DPC1	Our platform easily accesses data from our partners’ IT systems	0.83	0.935	0.936	0.947	0.719	0.577
	DPC2	Our platform has the capability to exchange real-time information with our partners	0.866					
	DPC3	Our platform easily aggregates relevant information from our partners’ databases (e.g., operating information, business customer performance, cost information etc.)	0.814					
	DPC4	Our platform is easily adapted to include new partners	0.8					
	DPC5	Our platform can be easily extended to accommodate new IT applications or functions	0.869					
	DPC6	Our platform employs standards that are accepted by most current and potential partners	0.867					
	DPC7	Our platform consists of modular software components, most of which can be reused in other business applications	0.885					
OA	OA1	We have the ability to respond rapidly to customers’ needs	0.779	0.836	0.84	0.88	0.551	0.471
	OA2	We have the ability to adapt our production/service provision rapidly to demand fluctuations	0.704					
	OA3	We have the ability to cope rapidly with problems from suppliers	0.824					
	OA4	We rapidly implement decisions to face market changes	0.688					
	OA5	We continuously search for forms to reinvent or redesign our organization	0.719					
	OA6	We see market changes as opportunities for rapid capitalization	0.845					
BMI	BMI1	Our business model offers new combinations of products, services and information	0.747	0.931	0.932	0.944	0.709	0.398
	BMI2	Our business model attracts a lot of new customers	0.826					
	BMI3	Our business model attracts a lot of new suppliers and partners	0.863					
	BMI4	Our business model bonds participants together in novel ways	0.827					
	BMI5	Our business model links participants to transactions in novel ways	0.886					

	BMI6	We frequently introduce new ideas and innovations into our business model	0.89					
	BMI7	Overall our business model is novel	0.731					
MP	MP1	We have entered new markets more quickly than our competitors	0.794	0.878	0.887	0.916	0.731	0.21
	MP2	We have introduced new products or services to the market faster than our competitors	0.884					
	MP3	Our success rate of new products or services has been higher than that of our competitors	0.888					
	MP4	Our market share has exceeded that of our competitors	0.852					
PROD	PROD1	The level of newness (novelty) of our firm's new products	0.843	0.866	0.872	0.903	0.65	0.402
	PROD2	The use of latest technological innovations in our new products	0.813					
	PROD3	The speed of our new product development	0.799					
	PROD4	The number of new products our firm has introduced to the market	0.788					
	PROD5	The number of our new products that is first-to-market (early market entrants)	0.786					
PROC	PROC1	The technological competitiveness of our company	0.844	0.924	0.929	0.946	0.816	0.324
	PROC2	The speed with which we adopt the latest technological innovations in our processes	0.925					
	PROC3	The updatedness or novelty of the technology used in our processes	0.924					
	PROC4	The rate of change in our processes, techniques and technology	0.917					

Table 2. Discriminant validity

	SS	AC	EJ	DPC	OA	BMI	MP	PROD	PROC
SS2	**0.8260**	0.4720	0.4410	0.4510	0.4760	0.4540	0.2570	0.4460	0.4600
SS3	**0.8640**	0.4150	0.4210	0.4550	0.5620	0.5000	0.3420	0.5520	0.5860
SS4	**0.7190**	0.3730	0.3340	0.3870	0.4140	0.3660	0.2250	0.3370	0.4320
SS5	**0.7600**	0.4040	0.4360	0.4310	0.6110	0.4130	0.3250	0.6380	0.5990
SS6	**0.7340**	0.4080	0.4030	0.4430	0.5310	0.5450	0.3770	0.5110	0.6020
AC1	0.5280	**0.8080**	0.5950	0.4890	0.4940	0.4550	0.3670	0.4410	0.4380
AC2	0.4130	**0.9040**	0.6960	0.5500	0.3830	0.3840	0.3290	0.3170	0.3520
AC3	0.4440	**0.8910**	0.7160	0.5950	0.3910	0.4290	0.3610	0.3730	0.4070
EJ1	0.4930	0.7250	**0.8470**	0.6530	0.4470	0.3870	0.2760	0.3780	0.4020
EJ2	0.4210	0.6220	**0.8560**	0.6200	0.4360	0.3430	0.3220	0.3780	0.3830
EJ3	0.3890	0.6550	**0.8540**	0.6210	0.4560	0.3700	0.2830	0.3440	0.3620
EJ4	0.4980	0.6680	**0.9060**	0.7410	0.5430	0.4230	0.3130	0.4250	0.4320
DPC1	0.5360	0.5180	0.6550	**0.8300**	0.5400	0.4310	0.2590	0.4100	0.4310
DPC2	0.5040	0.5540	0.6610	**0.8660**	0.5300	0.4730	0.2770	0.4030	0.4550
DPC3	0.4390	0.4330	0.5770	**0.8140**	0.5140	0.3970	0.2320	0.3220	0.3350
DPC4	0.4090	0.4840	0.6280	**0.8000**	0.4940	0.3570	0.3050	0.3810	0.4000

DPC5	0.4780	0.5930	0.6480	**0.8690**	0.5150	0.4770	0.3660	0.3830	0.4070
DPC6	0.4250	0.5610	0.6660	**0.8670**	0.4820	0.3800	0.3490	0.3290	0.3610
DPC7	0.4930	0.5730	0.6840	**0.8850**	0.5190	0.4200	0.3420	0.3570	0.3870
OA1	0.4620	0.3660	0.4100	0.4380	**0.7310**	0.4380	0.5020	0.5080	0.4800
OA2	0.4260	0.3330	0.3600	0.3980	**0.7790**	0.4030	0.4300	0.5290	0.4930
OA3	0.4050	0.3710	0.4250	0.4490	**0.7040**	0.3840	0.3410	0.4490	0.4320
OA4	0.5670	0.4130	0.4550	0.5030	**0.8240**	0.4850	0.3730	0.6230	0.6100
OA5	0.5300	0.3690	0.4160	0.4560	**0.6880**	0.3690	0.2730	0.4030	0.4950
OA6	0.5530	0.3010	0.3490	0.4450	**0.7190**	0.4030	0.3850	0.4590	0.4950
BMI1	0.4920	0.4490	0.3570	0.4280	0.4430	**0.8450**	0.3830	0.4310	0.4720
BMI2	0.4720	0.4300	0.3800	0.4400	0.4470	**0.7470**	0.3980	0.4500	0.4330
BMI3	0.4890	0.3930	0.4030	0.3980	0.5300	**0.8260**	0.4000	0.4490	0.5240
BMI4	0.4430	0.4500	0.3930	0.4260	0.4310	**0.8630**	0.3970	0.3920	0.4590
BMI5	0.4820	0.3580	0.3500	0.3800	0.4660	**0.8270**	0.3100	0.4260	0.5040
BMI6	0.5250	0.3930	0.3620	0.4310	0.4880	**0.8860**	0.3070	0.5010	0.5760
BMI7	0.5290	0.3930	0.3530	0.4190	0.4840	**0.8900**	0.3180	0.4880	0.5720
MP1	0.3650	0.3870	0.3180	0.3380	0.4540	0.4570	**0.7940**	0.4400	0.4390
MP2	0.3270	0.3540	0.3070	0.3000	0.4480	0.3180	**0.8840**	0.4200	0.4800
MP3	0.2940	0.3030	0.2570	0.2850	0.4090	0.3170	**0.8880**	0.3840	0.4420
MP4	0.3310	0.3210	0.2780	0.2880	0.4400	0.3220	**0.8520**	0.4550	0.4960
PROD1	0.5950	0.3860	0.3460	0.3680	0.5620	0.4500	0.3880	**0.8430**	0.6790
PROD2	0.5760	0.3830	0.3700	0.3850	0.5510	0.4820	0.4000	**0.8130**	0.7020
PROD3	0.5130	0.3830	0.4180	0.3840	0.5960	0.4620	0.4100	**0.7990**	0.6670
PROD4	0.4160	0.3350	0.3290	0.3420	0.4950	0.3560	0.4510	**0.7880**	0.6000
PROD5	0.4420	0.2350	0.3000	0.2610	0.4850	0.3790	0.3780	**0.7860**	0.6310
PROC1	0.5750	0.3730	0.3600	0.3460	0.5390	0.5040	0.4670	0.7560	**0.8440**
PROC2	0.6200	0.4230	0.4200	0.4530	0.6550	0.5500	0.5280	0.7510	**0.9250**
PROC3	0.6340	0.4230	0.4200	0.4340	0.6030	0.5360	0.4450	0.7340	**0.9240**
PROC4	0.6430	0.4370	0.4450	0.4540	0.6460	0.5840	0.5230	0.7160	**0.9170**

4.3 Structural model analysis and hypothesis

Following Hair et al. (2016), we test our hypotheses and assess the Structural Model's quality by verifying the structural path coefficients and t-values with 5,000 bootstrap resamples, as well as the predicting power of the endogenous constructs with the R^2 (Hair et al. 2016). Table 3 shows data, while figure 1 provides the results of the model evaluation. The values of R^2 confirm the related predicting power of the constructs, particularly, these values range from 0.21 to 0.577 highlighting a medium predictive power.

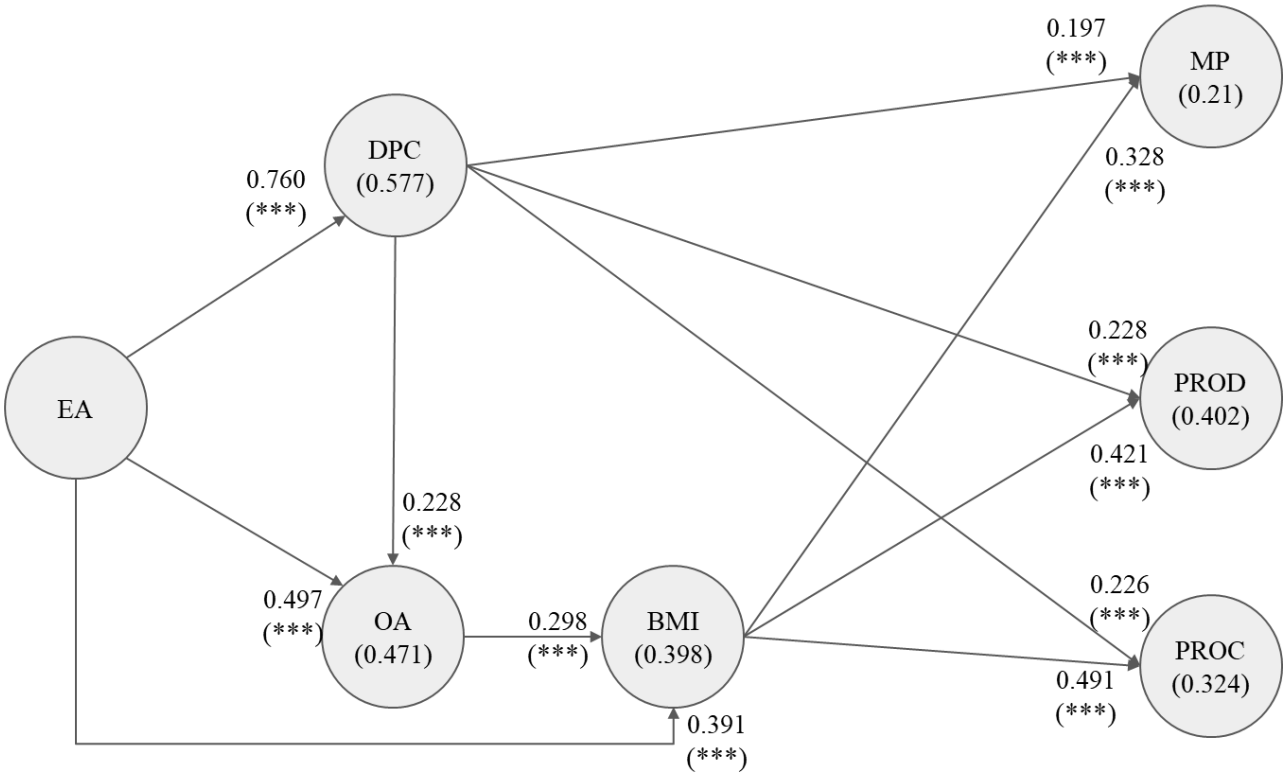
Our hypotheses are supported, in fact, the empirical findings support the hypothesized effects. EA is predictive of DPC (0.760***), OA (0.497***) and BMI (0.391***). DPC is significantly related to OA (0.228***), and the latter, in turn, is significantly related to BMI (0.298***). Finally, both DPC and BMI have positive and significant impacts on the three measures of performance: DPC has a positive effect on MP (0.197***), PROD (0.228***) and PROC (0.226***); at the same time, BMI positively influences MP (0.328***), PROD (0.421***) and PROC (0.491***).

Table 3. Hypothesis testing

Hp	From		To	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Supported
1a	EA	->	DPC	0.760	0.761	0.027	28.453	0.000	Yes***
1b	EA	->	OA	0.497	0.500	0.075	6.584	0.000	Yes***
1c	EA	->	BMI	0.391	0.387	0.077	5.103	0.000	Yes***
2	DPC	->	OA	0.228	0.227	0.085	2.673	0.004	Yes***
3a	DPC	->	MP	0.197	0.196	0.063	3.110	0.001	Yes***
3b	DPC	->	PROD	0.228	0.229	0.065	3.503	0.000	Yes***
3c	DPC	->	PROC	0.226	0.226	0.059	3.822	0.000	Yes***
4	OA	->	BMI	0.298	0.304	0.073	4.062	0.000	Yes***
5a	BMI	->	MP	0.328	0.332	0.067	4.884	0.000	Yes***
5b	BMI	->	PROD	0.421	0.422	0.065	6.452	0.000	Yes***
5c	BMI	->	PROC	0.491	0.492	0.060	8.170	0.000	Yes***

Note: ***p-value < 0.01

Figure 1. Results of the model evaluation



5. Discussion

The emerging research stream focused on entrepreneurship trajectories is gaining growing relevance in the entrepreneurship literature and increasing attention has been paid by scholars and practitioners to the dynamics inside YICs. In this sense, scholars underline the need to shed some lights on these dynamics and provide new insights (Matricano 2020a). This study attempts to improve our knowledge and to contribute to the ongoing debate on this topic by offering some empirical evidence.

The findings of the research reveal that EA plays a key role in influencing the entrepreneurial trajectories of YICs, in fact, it has a positive and significant impact on DPC, OA, and BMI thus confirming H1a, H1b and H1c respectively. These results add to the literature and highlight the importance of an entrepreneurial characteristic like EA, being it crucial for YICs to improve their capabilities and innovations. Furthermore, EA allows entrepreneurs to increase their proactiveness, openness and willingness to make changes and identify or exploit new opportunities (Tang et al. 2012; Troise and Tani 2021).

In line with the proposed hypotheses 2 and 3, a positive influence and relative strategic importance of DPC was found for YICs to increase their OA and – at the same time – to influence their performance. The fully support of the hypothesis 2 confirms the findings of some previous studies (Cenamor et al. 2019; Ahmed et al. 2022). In addition, we provide a novel insight related to the direct effect of DPC on three different measures of performance, namely MP (Hp3a), PROD (Hp3b) and PROC (Hp3c), thus extending current literature.

We found support also for the last two hypotheses, i.e. Hp4 and Hp5. As for the first, the results confirm the positive impact of OA on BMI, suggesting that agility – driven by the above cited DPC – is vital for companies to improve their innovativeness and make strategic changes respect to the existing models. Hence, our research confirms that OA fosters BMI and represents an antecedent of BMI (Liao et al. 2019; Bhatti et al. 2021). Finally, the results of our latest hypothesis confirmed that BMI is a strong driver for enhancing business performance (Bhatti et al. 2021) and, in fact, it positively influences MP (Hp5a), PROD (Hp5b) and PROC (Hp5c). Our study includes also measures of innovation performance, thus adding to other recent studies focused on market/financial performance (Bhatti et al. 2021).

Compared to previous literature, our empirical research adds new insights into the specific field of entrepreneurial trajectories of YICs by exploring new dynamics linking predictors to outcomes. In doing so, our model sheds light on the specific relationships that exist between the identified factors and finally on their importance in improving the performance of the YICs. These dynamics are therefore particularly relevant as they explain the effects between the various factors, i.e. how they are related to each other and, ultimately, their impacts on the final outcomes.

6. Conclusions

This study is one of the few to explore the dynamics taking place inside YICs (Matricano 2020b); it focuses on this specific type of companies, known to be less investigated, and for which further studies are required (Matricano 2020a). Our study examined from an empirical perspective these dynamics and provided evidence on both antecedents and outcomes, as well as the related relationships.

The study has several implications for practice. First, the main stakeholders – entrepreneurs, governments, policymakers, agencies, authorities/regulators, incubators – should be aware of the

importance of entrepreneurial characteristics (EA) and the underlying dynamics of YICs (relationships existing between DPC, OA, BMI). Given the growing interest in YICs' performance and the pressing need to increase our understanding of the main drivers (Matricano 2022), these stakeholders should pay particular attention to the role of DPC and BMI. In fact, our study suggests that both are determinants for YICs to achieve superior performance in terms of market and innovation. Moreover, increased efforts should be done by YICs to increase their OA as it positively influences BMI.

Higher level of these capabilities (DPC) is requested to achieve higher level of competitiveness and significant effects on the desired outcomes (Ahmed et al. 2022). Being DPC crucial for YICs to achieve high performance, greater incentives should be made available by governments, policymakers, public agencies to gain and develop this capability, and also greater efforts should be made by YICs in promoting and embracing the "platform approach" as platforms may alleviate the hurdle faced by small and young companies, namely the implementation of digital technologies (Ahmed et al., 2022).

Furthermore, YICs need to improve their OA to deal with volatility, uncertainty, complexity, and ambiguity (VUCA) environments and changing contexts (Troise et al. 2022), and to have positive effects on BMI, particularly on its successful adoption (Bhatti et al. 2021). In this scenario, YICs – and their entrepreneurs, CEOs, managers – should create, nurture and assimilate a new culture focused on innovation and digital transformation, as well as develop crucial capabilities (Troise et al. 2022). This will help companies effectively understand changes in the environment and take action accordingly (e.g. in reference to BM) (Bhatti et al. 2021). Policymakers, governments, and other ecosystem's actors could stimulate this cultural change and introduce specific incentives and/or programmes in this sense, aimed at supporting the development and growth of YICs. Apart from programmes on digital transformation (spreading recently), also specific programs focused on BMI could represent a novel opportunity for these stakeholders to encourage changes in BMs by YICs, given that the successful adoption of BMI – as highlighted by this study and other previous ones (Bhatti et al. 2021), can lead to superior performance. Hopefully, these dynamics examined in this study may be helpful to comprehend the trajectories of YICs and their performance.

This study provides implications for further research. The study contributes to an emerging research stream focused on the dynamics taking place inside YICs, i.e. the relationships between predictors/antecedents and outcomes/performance, that influences the entrepreneurial trajectories of these companies. We assess the links between EA, DPC, OA, BMI and provide an explanation on how these factors affect the performance of YICs, an under-researched type of companies. In this sense, we enhance the theorization of these factors in the context of YICs. Our proposed theoretical model, being empirically tested, represents a theoretical contribution of this research. Notably, this study is a first step toward an understanding of entrepreneurship trajectories and specifically the internal dynamics of YICs, hence it could be a potential framework to further develop and test with other constructs (performance measures/antecedents); this represents an interesting opportunity for future research in this topical research stream. Although our constructs are reliable and derived from extant literature, other measures (scales) can be used for similar purposes and to capture other aspects related to the internal dynamics discussed above.

Other potential outcomes to consider in subsequent research are financial performance of YICs, while the DPC explored potentially represents a first step in explaining the importance of new digital capabilities for YICs, thus opening up for future research on other capabilities to be investigated and other technologies to consider; this highlights the importance for YICs to fully embrace digital

transformation in the current scenario. Another opportunity in this sense derives from a limitation of the study, i.e. the research context; Italy is an intriguing context to explore given its characteristics, however it will be possible to replicate the survey in other vibrant contexts in terms of YICs to further validate the model and confirm or not our findings in different countries. For these purposes, and to increase the results' generalizability, a potential follow-up study could be based on the exploration of YICs in the whole European context as the classification of these companies is fairly standardized and meets shared criteria[2].

Appendix 1. List of abbreviations

YICs	Young Innovative Companies (YICs)
EA	Entrepreneurial alertness
SS	Scanning and search
AC	Association and connection
EJ	Evaluation and judgment
DPC	Digital platform capability
OA	Organizational agility
BMs	Business models
BMI	Business model innovation
MP	market performance
PROD	Product innovation
PROC	Process innovation

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[2] Such as in terms of age, core business (innovative) and scale (intention to growth) (e.g. the classifications and start up monitor reports provided by the EU commission).

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