Technological Forecasting & Social Change xxx (xxxx) xxxx

Contents lists available at ScienceDirect

Technological Forecasting & Social Change

journal homepage: www.elsevier.com/locate/techfore

Digitalization of the economy and entrepreneurship intention

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ARTICLE INFO

Keywords:
Entrepreneurship
Entrepreneurial intention
Digitalization
Kosovo

ABSTRACT

Our paper contributes to the nascent field of technological entrepreneurial intent by proposing a model linking students' entrepreneurial intent to digitalization of the economy, and providing evidence based on a small transition economy: Kosovo. Our sample is composed of 310 students from two universities in Kosovo (University of Pristina and University of Applied Sciences in Ferizaj). These two universities account for around 60% of student enrolment in Kosovo. We use a modified version of the Entrepreneurial Intention Questionnaire (EIQ) scale developed by Liñán and Chen (2009) which considers the extent of digitalization of the economy. The findings reveal that personal attitude and behavioral content are the main determinants of entrepreneurial intention; our structural model shows that they explain 72.7% of the total variance.

1. Introduction

Digital technologies – the Internet, smartphones and other applications and technologies that collect, store, analyze and share information – are playing a transformational role in the world economy, in particular by changing the entrepreneurship process (Anderson, 2014; Brynjolfsson and McAfee, 2014; World Bank, 2016). Digital technologies are providing new opportunities for entrepreneurs to set up businesses and sell their products and services worldwide (Elia et al., 2016). They are also having an impact on entrepreneurial intent defined as *"a personal conviction of an individual to take one or more specific actions in the process of exploiting a new business opportunity"* (Ahmad and Hoffman, 2008, p. 137).

The literature links entrepreneurial intent to subjective norms, attitudes and perceived behavior, and other contextual variables (Krueger and Carsrud, 1993; Raijman, 2001; Kautonen et al., 2013; Ozarralli and Rivenburgh, 2016; Nowiński and Haddoud, 2019). Some studies focus on how the entrepreneurship intention is handled by universities and higher education institutions (Fayolle et al., 2006; European Commission, 2006; Liñán and Chen, 2009; Liñán et al., 2010; Fayolle and Gailly, 2015; Abou-Warda, 2016; Aloulou, 2016; Fichter and Tiemann, 2018) and show the critical role of higher education for entrepreneurship. This stream of work investigates the effects of different education policies on the development of entrepreneurial intent within a targeted population (Noel, 2002; Peterman and Kennedy, 2003) but these findings need to be linked to digitalization of the economy and its potential impacts[1].

Our paper tackles this issue and contributes to the nascent field of technological entrepreneurial intent by proposing a model that links students' entrepreneurial intent to digitalization of the economy, based on evidence from the small transition economy of Kosovo.

The impact of digitalization on entrepreneurship intention can be considered from two perspectives. Firstly, the context of the potential entrepreneurial activity has a major impact on the intention to become an entrepreneur. According to Mansfield (1962), it is assumed that there is a long queue of well-informed potential entrepreneurs who want to enter the market. Entry is considered to be triggered by the expected level of profit. However, market entry can be hindered by exogenous entry barriers such as initial investment amount (Geroski and Schwalbach, 1991) and bureaucratic entry regulations (Djankov *et al.*, 2002; Ben Youssef et al., 2018), and by endogenous entry barriers such as R&D and advertising costs (Sutton, 1991; Arauzo-Carod and Segarra-Blasco, 2005). Several sectors such as tourism, transport, retail and banking used to be considered protected by the entry barriers involved. Nowadays, new firms (start-ups) are entering these sectors based on use of digital technologies (Uber, Amazon, ING

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[1] Activities, jobs, skills, cultures and needs have changed and are being affected by these technologies. Digital technologies have an impact on entrepreneurship intention and have led to the notion of modern entrepreneurship (Tavakoli, 2013).

https://doi.org/10.1016/j.techfore.2020.120043
Received 31 January 2018; Received in revised form 21 March 2020; Accepted 26 March 2020

Direct, among many others). Virtualization is removing excessive sunk costs and barriers to entry and offering new opportunities to a new generation of entrepreneurs. At the same time, the wide spread and use of digital technologies are creating new needs (services and products especially informational goods) and requiring new firms and a new type of entrepreneur. For example, the 3D printing paradigm has changed the print sector and is providing opportunities for entrepreneurs (Rayna and Striukova, 2016). There are similar trends related to artificial intelligence (McAfee and Brynjolfsson, 2017), blockchain (Iansiti and Lakhani, 2017), virtual and augmented reality (Porter and Heppelmann, 2017) and connected objects (Porter and Heppelmann, 2015). Thus, we need to take account of the prominence of digitalization in our societies. According to Nambisan (2017), new digital technologies have transformed the nature of the uncertainty inherent in the entrepreneurial process and its outcomes and how these uncertainties are handled. This raises important questions about *digital entrepreneurship* which lies at the intersection of entrepreneurship and digital technologies. Most new entrepreneurial ventures are linked in some way to the digital world. Digital technologies reduce the costs of doing business, extend markets and ease the problems related to firm establishment. Much of the time-consuming and labor-intensive administrative work involved, including access to market and relationship with consumers is handled by the Internet. As a result of the reduced risk and greater ease and flexibility enabled by digital technologies, more and more people are engaging in entrepreneurial activities.

Secondly, educational support for entrepreneurship is being facilitated by information and communication technologies (ICT) which are allowing students to develop their creativity, critical thinking and other soft-skills required for entrepreneurship (Solomon, 2007; Raposo and Do Paço, 2011; Sousa, 2019). ICT are allowing the education process to shift to being more practical and more based on problem-solving (Ben Youssef and Dahmani, 2008). Moreover, ICT are offering new opportunities for students to set up businesses during their period of education and training period, and in many countries, student-entrepreneur is a legal status.

Our paper proposes a model which explicitly considers digitalization of the economy and focuses on students' entrepreneurial intentions by examining the determinants of entrepreneurialism drawing on the well-known theory of planned behavior (TPB) which states that "*attitudes toward the behavior, subjective norms with respect to the behavior, and perceived control over the behavior are usually found to predict behavioral intentions with a high degree of accuracy*" (Ajzen, 1991, p. 206). The findings reveal that personal attitude and behavioral content are the main determinants of entrepreneurial intention; our structural model shows that they explain 72.7% of the total variance.

The paper is structured as follows. Section 1 discusses the context of Kosovo; section 2 reviews the literature; section 3 formulates the hypotheses and the model; and section 4 describes data collection and measurement issues. Sections 5 and 6 present the structural equation model and discuss the findings and some conclusions.

2. The context of Kosovo

Kosovo is a small country with a population of 1.8 million. Around 70% of the population is aged less than 35 years. It is classified as a lower middle-income country (MIC) and is one of four European countries that have experienced economic growth every year since the start of the 2008 global crisis. However, its current economic context is characterized by "weak external competitiveness, high informality, low labor force participation and high unemployment, particularly among young workers, and a large infrastructure gap" (IMF, 2018) which is hampering its growth potential. Kosovo features huge income disparities and a high persistent trade deficit compared to the EU countries. It still depends largely on inflows of remittances and foreign direct investment (IMF, 2018, p. 1) which is forcing huge numbers of Kosovars to leave their country in the hope of finding greater prosperity elsewhere[2].

In 2016, Kosovo's human development index was 0.739, having increased from 0.678 in 2007 to 0.700 in 2010 and 0.714 in 2012. However, it remains the lowest in the region and in Europe. Kosovo's economy continues to be problematic and the greatest threat to the country's long-term stability. Unemployment stands at 40.7% for men and 56.4% for women UNDP 2016. According to the Kosovo Agency of Statistics, in 2017 just over 62% of households in Kosovo had access to a computer, with 38.7% declaring no computer access of any type (i.e. desktop, laptop, notebook, tablet but excluding smart phones). Wi-Fi is the preferred mode of Internet connection compared to mobile Internet (3G, 4G, LTE, etc.) (Kosovo Agency of Statistics 2018).

Kosovo needs to develop more favorable private sector conditions to equip its youth with the skills required by the business community and public institutions, and to create new jobs (World Bank in Kosovo, 2018). The role of the private sector and especially small and medium sized enterprises (SMEs) in the country's overall economic development is relatively weak and needs to be strengthened. Nevertheless, Kosovo is still in a transitional phase and it is expected that entrepreneurship and creation of new business start-ups will contribute greatly to its economic growth (Ministry of Trade and Industry 2013). Entrepreneurship is a national priority and the target of several national laws and strategies.

The National Strategy for Innovation and Entrepreneurship 2019–2023 describes the current impediments to developing the innovation and entrepreneurial culture, and how to overcome those barriers (Ministry of Innovation and Entrepreneurship, 2019)

The potential for successful transition and catch-up with the other European economies is high with entrepreneurship considered the main driver of change. Kosovo is keen to adopt the latest ICT and provides an interesting context for understanding how ICT can channel transformational change. In addition, Kosovo has several similarities with most of the other Balkan countries which means that our results should have more general validity, and be informative about the processes in the Western Balkan countries (Albania, Montenegro, Macedonia, Serbia, Bosnia Herzegovina, etc.). Finally, many international organizations consider that alongside SMEs which are seen as catalysts of private sector development, Kosovo's young population offers opportunities for more economic development. Understanding the entrepreneurship intention and its determinants in the context of Kosovo would provide information on the potential of this country.

3. Literature review on entrepreneurial intention in higher education

Entrepreneurship is a dynamic process of creation, vision and change. It requires the generation and implementation of new ideas and solutions. Schumpeter (1934) describes entrepreneurship as a process of creative destruction. Firms produce new goods, services and systems which make existing ones obsolete. Entrepreneurship involves the process of creating something that is new, and the time, effort and financial, psychological and social risks related to obtaining financial resources, job satisfaction and independence (Tavakoli, 2013).

Several authors have proposed definitions of entrepreneurship intention. Krueger and Carsrud (1993) define it as individual commitment to starting a new business while Bird and Jellinek (1988) describe it as a level of cognitive awareness which leads to the establishment of a new business. According to Yurtkorua et al. (2014), personal attitude and perceived behavioral control are predictors of entrepreneurial intention with an emphasis on personal attitude. Ozaralli and Rivenburgh (2016) find a positive correlation between entrepreneurial

[2] Around 130,000 persons left Kosovo in the period 2011–2016 (Kosovo Agency of Statistics, 2017).

intention and subjective norms, attitudes and perceived behavior control. Relational support is another important dimension which affects the decision to become an entrepreneur, and is strongly influenced by family. The importance of family is greater than some business aspects (Kumar 2008). Structural support including stakeholder support is also crucial for entrepreneurship. Denanyoh et al. (2015) find a consistent positive relation between entrepreneurial intention and educational, family and structural support.

There is an important literature stream which examines entrepreneurship intention as a higher education topic (Noel, 2002; Peterman and Kennedy, 2003; Fayolle and Gailly, 2015). Academics and policymakers are trying to encourage students' entrepreneurship intentions by modifying the curricula and type of instruction. Universities are embracing teaching and research missions which include academic entrepreneurship (Ozgul and Kunday, 2015; Menga et al., 2018). They are offering entrepreneurship courses, developing centers of excellence, networking spaces and mentoring, in most cases free of charge for their students.

Several studies shed light on the factors that affect university students' entrepreneurial intention (Liñán et al. 2010; European Commission, 2006). There is evidence that education plays a major role in fostering entrepreneurial activity among students (Türker and Sonmez Selçuk, 2009; European Commission, 2013). For instance, if the learning process includes entrepreneurial activities this could foster the entrepreneurship intention. Education can be important for inspiring students and providing the necessary entrepreneurial knowledge and skills. According to entrepreneurship education and training (EET) programs, helping students identify opportunities during their education can change individual attitudes towards entrepreneurship and reduce anxiety about failure (Dehghanpour, 2013). Also, EET programs encourage entrepreneurship as an alternative and good career choice by highlighting the social status of entrepreneurs. By providing the knowledge and skills required to start a business, EET programs highlight the attractiveness of entrepreneurship. Entrepreneurship education in universities can be achieved through four main activities: "(*i) establishing [a] center for innovation and entrepreneurship; (ii) building a strong pipeline of entrepreneurship educators; (iii) integrating the technology entrepreneurship courses/program in university education; and (iv) developing appropriate evaluation methods for this particular kind of education*" (Abou-Warda 2016, p. 10).

There are several studies of developed countries which provide evidence on the applicability of the TPB in the context of higher education. For instance, Lüthje and Franke (2003) study MIT (Massachusetts Institute of Technology) engineering students and find that personal characteristics and contextual factors have similar effects on entrepreneurial intention. Their results provide evidence that the perceived contextual barriers and support factors play a significant role in the entrepreneurial behavior of MIT students. The studies conducted by Liñán et al. (2011) and Rueda et al. (2015) provide evidence of the validity of the TPB for Spanish universities. Fayolle et al. (2006) and Fayolle and Gailly (2015) show that the TPB is valid also for French business and engineering schools. Other studies confirm this finding for the US (Krueger et al., 2000), Norway (Kolvereid, 1996), and the Netherlands (van Gelderen et al., 2008).

In the context of developing and MIC there are several studies that link higher education to entrepreneurship intention. Entrepreneurship education is important for encouraging future entrepreneurial activity in Nigeria (Ogbari et al., 2018). Türker and Sonmez Selçuk (2009) develop a model in which entrepreneurial intention is determined by relational, educational and structural support. Yurtkoru et al. (2014) apply this model to Turkey and find an important impact of support factors on entrepreneurial behavior. Aloulou (2016) provides empirical evidence of the applicability of the TPB in Saudi Arabia and confirms the existence of a gender bias. Salwah et al. (2013) find that the factors that contribute most to students' entrepreneurship intention in Malaysia are locus of control, followed by need for achievement and subjective norms. Esfandiar et al. (2019) in a study of Iranian students found that socio-psychological factors have an important influence on entrepreneurial intent. Dinc and Budic (2016) found a similar positive and significant influence of personal attitude and perceived behavioral control on entrepreneurial intention in the case of Bosnia Herzegovina.

There is a growing strand of literature investigating the specific role of digital technologies on individual entrepreneurial performance in the context of higher education. Dutot and Van Horne (2015) explore the role of digital technologies in entrepreneurship intention based on 10 semi-structured interviews with French and Emirati digital entrepreneurs. Their results show that entrepreneurial intention is influenced by agility, entrepreneurial alertness and entrepreneurial characteristics. A study by Zhang and Li (2018) considers that access to the Internet, fixed phone and mobile phone has significant influence on performance. The effects of technology-supported experiential entrepreneurship education on learners' entrepreneurial intentions and attitudes to risk show that ICT facilitates the relationship between entrepreneurial attitude and risk (Bandera et al., 2018). The factors that affect the entrepreneurial intentions of students and their link to digital technologies are a prominent focus of entrepreneurship research. Sousa et al. (2019) show that there is a need to employ new methods to promote entrepreneurial activity in today's digital era. Our paper contributes to this line of research and tries to bridge both literatures.

The next section formulates our hypotheses and describes the proposed structural model that considers digitalization of the economy in relation to entrepreneurial intention.

4. Hypotheses and structural model

We draw on the TPB to model the entrepreneurial intention of students. Our model is an extension of the model developed by Türker and Sonmez Selçuk (2009) and extended by Yurtkoru et al. (2014). We use this framework to allow comparison with previous findings and to take into account digitalization of the economy and its implications for entrepreneurship. According to the results of the meta-analysis conducted by Armitage and Conner (2001), subjective norm is a weak predictor of entrepreneurial intention. For this reason, several authors (e.g. Yortkoru et al., 2014; Dinc and Budic, 2016) exclude it from their analyses. Similarly, our model does not include subjective norm as a direct predictor of entrepreneurial intention.

In the TPB inspired model considered here, personal attitude has a strong influence on entrepreneurial intention, alongside perceived behavioral control. Based on this our model hypotheses are:

H1: Personal attitudes have an impact on entrepreneurial intention.

H2: Perceived behavioral control has an impact on entrepreneurial intention.

Personal attitudes and perceived behavior control mediate the relationships between contextual factors and entrepreneurial intention. This paper examines how digitalization of the economy affects contextual factors. The literature suggests that entrepreneurial intention can be considered a function of structural support, educational support and relational support (Shen et al., 2017). We extend this by also considering the impacts of digitalization.

Structural support: The environment in which the entrepreneurial activity takes place has an important influence on the intention to become an entrepreneur. Culture, motivation and institutional support can be barriers to or motivations for deciding to become an entrepreneur. These factors are affected by government interventions and policies. The "doing business" environment has an impact on entrepreneurial intention. Many governments are trying to foster entrepreneurship by providing an improved supportive environment for entrepreneurs which involves fewer administrative tasks, allowing one stop shop systems, greater labor flexibility, less bureaucracy and more fiscal incentives. While these aspects have been considered in previous

studies, we argue that the change in the business environment and digitalization of the economy need also to be taken into account (Margo, 2017; Katz, 2017). E-administration, E-commerce, mobility and mobile Internet are redrawing the business frontiers and making entrepreneurship easier in many countries, and there is a trend toward provision of more structural support enabled by digital technologies. In general, structural support is shown to have a positive impact on entrepreneurial intention.

Educational support: Many studies in different socio-economic contexts find that education support is crucial for entrepreneurial intention (Turker and Selcuk 2009). Universities are providing basic and advanced entrepreneurial skills. They are introducing an entrepreneurship culture and offering lectures, courses and training tailored to young entrepreneurs. The role of universities is being scrutinized in the context of provision of entrepreneurship education, research and programs (Lüthje and Franke, 2003). The literature provides in-depth discussion of the entrepreneurial intention in different cultural contexts. For example, Türker and Sonmez Selçuk (2009) argue that university education is an efficient way to obtain the knowledge required to become an entrepreneur. Their findings show that a university education has a positive impact on entrepreneurial intention. Franke and Lüthje (2004) find that students in German speaking universities have a low level of entrepreneurial intention. Moriano et al. (2012) argue that education programs should pay particular attention to positively influencing students' attitudes towards entrepreneurial activity. According to Henderson and Robertson (2000), although education has been criticized for its theoretical emphasis which is divorced from reality, educationalist can influence entrepreneurial intention. Little attention has been paid to the specific role of digital technologies in this process.

We argue that the current intensive use of ICT in higher education is affecting entrepreneurial intention. MOOCs or massive open online courses, – assistance centers, career centers and start-up centers are providing skills and assistance for young entrepreneurs. According to www.class-central.com, there are more than 218 free online entrepreneurship courses and MOOCs[3]. At the same time, students are being motivated by online reports of successful entrepreneurial activity by players in several sectors. Digitalized teaching materials, digital classrooms and easier access to international knowledge are having an impact on entrepreneurship intention and need to be considered in the context of education support.

Relational support: Relational support refers to support for entrepreneurship from family and friends. A family culture and family values and resources can encourage engagement in entrepreneurial activities. Many authors find that the probability to become an entrepreneur increases if there is an entrepreneur in the family (Dunn and Holtz-Eakin, 2000; Arum and Mueller, 2009; Sørensen, 2007; Colombier and Masclet, 2008; Lindquist et al., 2015). Family members and friends can influence the career decisions of young people. Relational support refers to the approval of and resources exchanges among family members. While relational support refers to the real world and the family and friends context, there is growing evidence that today's digital world is contributing to this relational support. Social media offer virtual opportunities to construct social relationships that can influence career choices and the entrepreneurship intention. People build social capital through social media and virtual networks which can provide support for everyday tasks, aspirations and career choices. Entrepreneur chat forums are facilitating access to knowledge about entrepreneurial activities. Crowd funding platforms enable access to financial resources and loans. This shift toward diversified resources is widening relational support and fostering the entrepreneurial intentions of students. Based on this discussion, we propose the following hypotheses:

H3: Support has an impact on personal attitudes.

H3a: Education support has an impact on personal attitudes.

H3b: Structural support has an impact on personal attitudes.

H3c: Relational support/subjective norms have an impact on personal attitudes.

H4: Support has an impact on perceived behavioral control.

H4a: Education support has an impact on perceived behavioral control.

H4b: Structural support has an impact on perceived behavioral control.

H4c: Relational support/subjective norms have an impact on perceived behavioral control.

This study aims to explore the antecedents to entrepreneurial intention based on contextual factors and using the TPB model. Our proposed model is depicted in Fig. 1.

5. Data collection and measures

From 500 questionnaires randomly administered to students in two public higher education institutions, University of Prishtina "Hasan Prishtina" and University of Applied Sciences in Ferizaj, we collected 310 completed questionnaires. The University of Prishtina is the largest public institution in the country and accounts for approximately 60,000 of Kosovo's 130,000 student enrolment (Kosovo Accreditation Agency, 2018). The universities in Prishtina and Ferizaj account for 60% of Kosovo's student population. Data obtained from the questionnaire responses were analyzed using the SPSS statistical program and the proposed relations were tested using regression analyses. Table 1 shows that our sample is composed 53% male and 46% female students. Most were enrolled in Bachelors (78.7%) studies, and only 11.3% of students were employed.

The distinction between different measures of entrepreneurship intention requires consideration of the economic development context. Market conditions, informality and legal aspects differ strongly among countries and must be accounted for when measuring entrepreneurship intention. Since the late 1990s, several papers have been published on entrepreneurial intention in different contexts and especially in relation to universities and the higher education sector. As a result, various TPB based scales have been proposed to measure the entrepreneurial intention of adults and students (Chen et al., 1998; Krueger et al., 2000; Thompson, 2009; Liñán and Chen, 2009; Prodan and Dronovsek, 2010; Huyghe and Knockaert, 2014, among others). Ozgul and Kunday (2015) conducted a comparative study of current entrepreneurial intention scales and concluded that there is no single ideal measure of entrepreneurial intention. None of the proposed measures covers all the activities linked directly or indirectly to entrepreneurship, and some measures need to be adapted to the local context. In the context of Turkey, Türker and Sonmez Selcuk (2009) and Yurtkoru et al. (2014) use a modified version of Liñán and Chen's (2009) six item scale. Given the proximity of Kosovo and Turkey in terms of their economic challenges and entrepreneurship as one way to achieve long-term economic growth, we use this modified version which is based on three items from Liñán and Chen's scale. Contextual factors are measured using the entrepreneurship support model scale developed by Türker and Sonmez Selçuk (2009).

[3] Examples include the University of Maryland, College Park, Developing Innovative Ideas for New Companies: The First Step in Entrepreneurship (Coursera); How to Build a Start-up (Udacity); Innovation for Entrepreneurs: From Idea to Marketplace (Coursera); Stanford University Y Combinator, How to Start a Start-up via Independent; Duke University, Renewable Energy and Green Building Entrepreneurship (Coursera); Copenhagen Business School, Social Entrepreneurship (Coursera); University of New Mexico, Entrepreneurial Strategic Management (Coursera); Social Entrepreneurship 101 (+Acumen); Massachusetts Institute of Technology, Becoming an Entrepreneur (edX); Massachusetts Institute of Technology, Babson College, The Entrepreneurial Mindset (edX); Taylor's University, Entrepreneurship (Open Learning); Harvard University, Entrepreneurship and Healthcare in Emerging Economies (edX); University of Adelaide, Entrepreneurial Opportunities (edX).

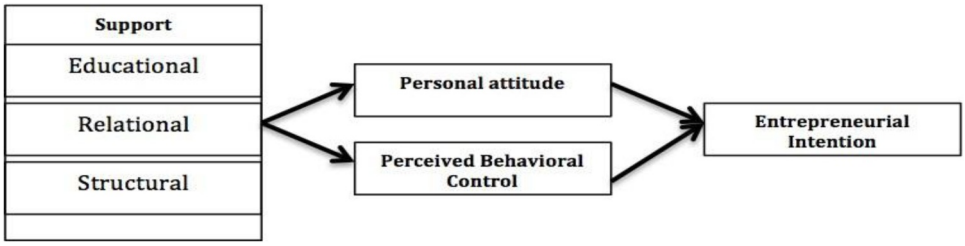

Fig. 1. The structural model.

Table 1
Socio-demographic characteristics of the respondents

Gender		Average age	Level of studies		Employment status	
Female (%)	Male (%)		Bachelor (%)	Master (%)	Working (%)	Not working (%)
53.00	46.00	21.5	78.7	21.00	11.30	88.7

6. Structural equation modeling

To assess our structural equation model, we need to discuss the measurement model loadings and significance, indicator reliability, internal consistency reliability, convergent validity, discriminant validity, target endogenous variable variance and structural model path coefficient sizes and significance (Wong, 2013).

6.1. Measurement model loadings, significance and indicator reliability

To check indicator reliability, we first examine the outer loadings which indicate the contribution of the indicator to a factor. Next, we remove all variables whose contribution to the factor is small. Table 2 indicates that the value of the indicators is greater than 0.4 and statistically significant at the conventional 5% threshold level. Our results show that internal consistency reliability is high for our three reflective latent variables.

6.2. Internal consistency reliability

Measured variables reliability estimates the degree of internal consistency in the estimates of the set of coefficients of the construct of interest to fix error variances. Table 2 shows that the composite reliabilities of the different latent variables range from 0.82 to 0.97 which is evidence of internal consistency reliability among the reflective latent variables.

6.3. Convergent validity

Strong correlation of each item to its assumed theoretical construct is evidence of convergent validity. The items should have a high level of common variance. Average variance extracted (AVE) is generally used to examine convergent validity. Table 2 presents AVE values all of which are greater than 0.5 which is considered an acceptable threshold (Bagozzi and Yi, 1988).

6.4. Discriminant validity

To examine the relationships among the latent variables we focus on discriminant validity which indicates whether or not two constructs are different. Fornell and Larcker (1981) suggest examining the square root of AVE in each latent construct. Table 3 reports the results which show no correlations greater than the square root of AVE which tests discriminant validity.

6.5. Assessment of the structural model

We assess the structural model and present the main results.

6.5.1. Explanation of the target endogenous variable

The coefficient of determination (R^2) is equal to 0.72 for entrepreneurial intention, suggesting that our two latent variables (i.e. personal attitude and behavioral control) explain a significantly large proportion of total entrepreneurial intention variance. Similarly, higher educational and relational support explain 69% of the variance in personal attitude. This is a large coefficient. At the same time, higher education and structural support explain 63.2% of the variance in behavioral control which in our model setting is also a large coefficient.

6.5.2. Structural model path coefficient sizes and significance

We use SmartPLS version 3.2.7. The results of the structural model with 2000 iterations (bootstrap) are presented in Table 4 and Fig. 2. The structural model suggests that personal attitude has the strongest effect (0.48) followed by behavioral control (0.41). Therefore, we can conclude that personal attitude and behavioral control are strong predictors of entrepreneurial intention.

7. Discussion and concluding remarks

This section presents our main findings, discusses the theoretical implications of our results, examines the policy implications and concludes with some limitations of our research.

7.1. Main results

The aim of our study is to contribute to the nascent literature on technological entrepreneurial intent by examining the specific role of digital technologies. The previous literature finds a critical effect of universities and higher education on entrepreneurial intent. However, this body of work does not consider the specific influence of digital technologies on education experience, learning process and learning outcomes, and resulting entrepreneurial intent. We use a modified version of the TPB model focusing on the contextual factors assumed to have an impact on entrepreneurial intention through personal attitude and perceived behavioral control.

We test the applicability of the TPB model in the context of Kosovo using a sample of students from the two main national universities representing 60% of the country's student population. We use a modified TPB model to explain entrepreneurial intention by considering the effect of digitalization of the economy on all the components. Our findings are consistent with previous findings (e.g. Kolvereid, 1996; Tkachev and Kolvereid, 1999; Luthje and Franke, 2003; Fayolle et al.,

Table 2
Measurement properties of reflective constructs

Measurement properties of reflective constructs **Latent Variable**	**Indicators**	**Loadings**	**T-statistics**	**AVE**	**Composite Reliability**	**Discriminant Validity**
Higher education support						
The education in university encourages me to develop creative ideas for being an entrepreneur	EDUSUPP_1	0.75	30.78	0.634	0.923	Yes
My university develops my entrepreneurial skills and abilities.	EDUSUPP_2	0.77	34.32			
My university provides the necessary knowledge about entrepreneurship	EDUSUPP_3	0.67	21.19			
The knowledge acquired from Internet helps me to become an entrepreneur	EDUSUPP_4	0.82	47.67			
ICT usage in university encourages me to develop creative ideas for being an entrepreneur	EDUSUPP_5	0.85	50.23			
Availability of ICT tools at the university (Desktop computer, Laptop, Tablet computer, Printer, USB (memory) stick, Interactive whiteboard, E-book reader (e.g. Amazon Kindle) increases chances for me to become an entrepreneur	EDUSUPP_6	0.85	61.54			
Access to the Internet at the university increases chances for me to become an entrepreneur	EDUSUPP_7	0.84	55.73			
Entrepreneurial intention						
I am determined to create a firm in the future.	ENTINT_1	0.95	148.30	0.904	0.966	Yes
I have thought very seriously of starting a firm.	ENTINT_2	0.95	163.54			
I will make every effort to start and run my own firm.	ENTINT_3	0.95	181.74			
Perceived behavioral control						
I am prepared to start a viable firm.	PCB_1	0.89	82.20	0.752	0.948	Yes
I can control the creation process of a new firm.	PCB_2	0.90	85.64			
I know the necessary practical details to start a firm.	PCB_3	0.90	92.26			
I know how to develop an entrepreneurial project.	PCB_4	0.86	58.03			
If I tried to start a firm, I would have a high probability of succeeding.	PCB_5	0.87	68.98			
It is easy for me to start a firm and keep it working	PCB_6	0.78	28.32			
Personal attitudes						
Being an entrepreneur would entail great satisfactions for me.	PERSATT_1	0.95	181.79	0.863	0.969	Yes
A career as entrepreneur is attractive for me.	PERSATT_2	0.93	104.73			
Among various options, I would rather be an entrepreneur.	PERSATT_3	0.92	104.45			
Being an entrepreneur implies more advantages than disadvantages to me.	PERSATT_4	0.92	104.00			
If I had the opportunity and resources, I would like to establish my own firm	PERSATT_5	0.92	118.59			
Relational support						
If I decide to be an entrepreneur, my close network (from work, school, and neighborhood) will support me.	RELSUPP_1	0.90	84.02	0.752	0.938	Yes
If I decide to be an entrepreneur, my friends will support me.	RELSUPP_2	0.89	87.22			
If I decide to be an entrepreneur, my friends on the Social Networks will support me	RELSUPP_4	0.77	34.68			
If I decide to be an Having internet and ICT access at home would support my career as an entrepreneur	RELSUPP_5	0.85	55.98			
If I decided to be an entrepreneur, my family members will support me.	RELSUPP_3	0.91	147.47			
Structural support						
Kosovo economy provides many opportunities for entrepreneurs.	STRSUPP _1	0.47	6.40	0.550	0.823	Yes
In Kosovo, entrepreneurs are encouraged by a structural system that includes private, public, and non-governmental organizations.	STRSUPP_2	0.68	12.80			
Digitalization of Kosovo Economy encourages me to become an entrepreneur	STRSUPP_3	0.91	118.08			
Digital world provides many opportunities for entrepreneurs	STRSUPP_4	0.83	52.22			

Table 3
Latent variables correlations

	Attitudes	Behav. Cont.	Entrep. Inten.	Higher Educ	Relational	Structural
Attitudes	**0.929**					
Behav. Cont.	0.797	**0.867**				
Entrep. Inten.	0.616	0.631	**0.951**			
HigherEduc	0.773	0.715	0.784	**0.796**		
Relational	0.521	0.703	0.757	0.553	**0.867**	
Structural	0.702	0.706	0.668	0.731	0.711	**0.742**

Note: Diagonal elements (in bold) are the square root of AVE; off-diagonal elements are correlations between constructs.

2006; Liñán and Chen, 2009; Fayolle and Gailly, 2015; Aloulou, 2016) suggesting that personal attitude and perceived behavioral control are predictors of entrepreneurial intention. We find that personal attitude has a stronger effect than perceived behavioral.

In our model, we assume also that personal attitude and perceived behavioral control mediate the relationship between contextual support factors and entrepreneurial intention. We include three support factors, namely relational support, structural support and education support. Higher education support was found to be significant for explaining both personal attitude and perceived behavioral control. However, it has a greater effect on behavioral control (0.53) than on personal attitude (0.26). Relational support has a significant and important impact on personal attitude (0.69). Structural support has a significant effect on behavioral control (0.31). While our results are mostly in line with the previous literature, they contrast with the finding that cultural values are influential.

While previous work shows the critical role of universities and higher education in entrepreneurial intent, it does not consider the specific influence of digital technologies on education experience, learning process and outcomes, and resulting entrepreneurial intent. Our model provides evidence on how the relation between the education, relational and structural support dimensions have been changed by use of digital technologies. Our paper shows a link between digitalized support and entrepreneurial intent.

7.2. Theoretical implications

Our study has several theoretical implications. Its novelty is that it explicitly considers digitalization of the economy in relation to all the contextual factors. While the previous literature stresses the effect of contextual factors on students' entrepreneurial intention it does not consider digital technologies unambiguously.

Table 4
Structural model estimation results

Path	Path coefficients	T-statistics	Total effects
Behavioral control -> Entrepreneurial intention	0.413	10.081	0.413
Personal attitude -> Entrepreneurial intention	0.487	11.474	0.487
Relational Support -> Entrepreneurial intention	0.289	8.590	0.289
Relational Support -> Personal attitude	0.593	11.817	0.593
Structural support -> Behavioral control	0.316	6.732	0.316
Structural support -> Entrepreneurial intention	0.131	5.520	0.131
Support_Edu -> Behavioral control	0.534	13.160	0.534
Support_Edu -> Entrepreneurial intention	0.350	9.204	0.350
Support_Edu -> Personal attitude	0.267	4.998	0.267

We use bootstrapping procedure to generate significance measures i.e. standard errors and t-values. Annex 2 presents the bootstrap test results for the path coefficient of the structural model. All path coefficients are significant at the 0.01 level (p-value lower than 0.01).

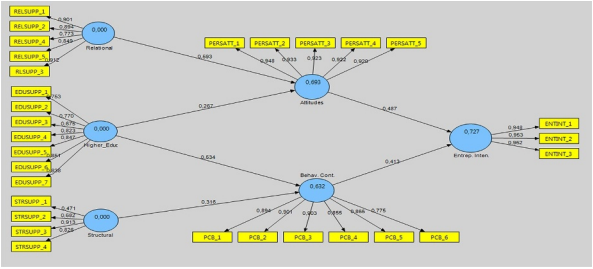

Fig. 2. The results of the structural model with 2000 iterations (bootstrap).

Our proposed model provides a better understanding of the channels through which digitalization of the economy, and more precisely education affect entrepreneurial intent among students. Although universities provide entrepreneurship courses, these may not be sufficient to foster a spirit of entrepreneurship among students. So far, we lack a robust explanation of how education affects entrepreneurial intent; the present paper is an attempt to fill this gap. Not understanding the role of digital technologies and the conditions of their use can lead to unexpected results.

More attention needs to be paid to encouraging graduates to implement their innovative business ideas. Use of digital technologies should be customized to allow a stronger impact on entrepreneurial intention and to deepen relations with the entrepreneurial ecosystem. Learning styles and teaching strategies need to evolve and to move to a more problem-(re)solving style and critical thinking (Pihie and Akmaliah, 2009). Modern entrepreneurs solve problems and propose smart solutions that address local or global needs. Several world countries have introduced the legal status of student-entrepreneur. This allows students to embark on developing a business while also following a university course. Interactions with university staff should help them to resolve everyday entrepreneurial problems. Coaches and mentors could be hired by the universities to fulfill these roles. In addition, interactions via e-learning platforms could increase enrolment of entrepreneurs in university courses to fill any training gaps. This would increase interactions between universities and the private sector.

Our paper contributes to recent work on the development of entrepreneurial competencies in universities (Rasmussen and Borch, 2010; Rasmussen et al., 2014; Gümüsay and Bohné, 2018). Several studies try to explain the paradoxical decline in university spin-offs despite strong support at the academic and policy levels (Guerrero et al., 2015; Wright and Fu, 2016). However, this body of work does not evaluate the role of digital technologies. Universities need to teach e-skills as part of their entrepreneurship training.

7.3. Policy implications

In several countries with high unemployment rates, promotion of entrepreneurship is a serious policy option based on spillovers which generate entrepreneurial activity (Gomez-Grass et al., 2010). One of the missions of the 21st century university is to encourage local, social and economic development through venture creation and entrepreneurship training and development; public policies are putting pressure on universities to teach entrepreneurial skills and to foster entrepreneurial intent. However, how either of these aims can be achieved remains a matter for debate. Higher education policy should focus on the impact of higher education curricula on students' entrepreneurial intentions. Policy could focus on technological change (digitalization) of the economy, and emphasize entrepreneurialism in universities. Policy could direct technological change (digitalization of the economy) towards entrepreneurial activities at universities. Higher education institutions are benefiting from digital technologies which are allowing the development of more instruments to boost the academic entrepreneurial process. They enable the sharing of more data across institutions and are reshaping the interactions among the different stakeholders involved in academic entrepreneurial processes. This is resulting in increased and new opportunities for researchers and students and providing more opportunities for potential student entrepreneurs to pitch their business ideas.

Additionally, universities need to build the skills needed to become a digital entrepreneur (Arvidsson and Troels, 2018). The power of digital technologies to change the academic entrepreneurship process along the horizontal dimension is quite high. New start-ups benefit from digital technologies which are enabling lower cost communication and coordination. Universities are becoming more open and adaptable (Rippa and Secundo, 2019, p. 8). Also, in a globalization context, information technology and platform-based innovation ecosystems are influencing entrepreneurial businesses. This underlines that higher education institutions can play a major role by combining entrepreneurship education with use of new technology (Hsieh and Wu, 2019). A recent study by Sousa et al. (2019) highlights the importance of new technologies such as augmented reality, gamification, simulation and Webinars in all the stages of entrepreneurship from ideation to sustainable new business venture. This requires major changes to how education and training especially entrepreneurship training, are delivered.

Universities need to focus on developing new innovative entrepreneurship courses using a design thinking approach which would be more effective than traditional courses and would provide students with the necessary background and skills to handle the challenges related to the "world of entrepreneurship". Provision of entrepreneurship courses would allow students to gain more knowledge about the possibilities of entrepreneurialism, be more involved in process of learning, acquire more skills and focus on possible future career paths (Lynch et al. (2019).

Given that our results indicate that education support has a significant effect on personal attitude and perceived behavioral control, implementation of entrepreneurship programs in higher education institutions will be essential and beneficial for the development of

students' entrepreneurial skills. More support at university would enable the student to develop entrepreneurial skills and creative ideas, and provide other knowledge needed for entrepreneurship all of which would be enhanced by use of digital technologies. Urbano et al. (2017) suggest that entrepreneurship education has a positive effect on the probability of university students becoming employer entrepreneurs. Entrepreneurial curricula in universities should include project-based learning and the importance of useful results as well as theoretical applications (Etzkowitz et al., 2019).

7.4. Limitations

Our study has some limitations. First, it might be useful to consider ICT support as a distinct construct rather than as a component of our constructs. This would better identify the relative weight of digital technologies in entrepreneurial intention and would extend the present study. Second, future work could focus on a subset of technologies to isolate their individual effects; ICT include technologies with several purposes. Third, there are many constructs that could be used to measure entrepreneurial intention and motivation. Future work could include more items to better capture the different dimension of entrepreneurial intent. Fourth, future research could take into account the differences among sample sub-groups. Our analysis could be extended to examine differences in entrepreneurial intent between students enrolled in engineering schools, or in universities, and those following business and management university courses. Fifth, while TPB remains the most frequent theoretical framework to study entrepreneurial intention (Krueger et al., 2000; Autio et al., 2001; van Galderen and Jansen, 2006; Barba-Sanchez and Atienza-Sahuquillo, 2018), other theories could be used to build more complex models better suited to emerging countries such as Kosovo. The integrated intention model proposed by Krueger, 2009 and its recent extension by Esfandiar et al. (2019) might be more relevant to the context of emerging countries, and might allow consideration of more complexities related to student's decision making in relation to entrepreneurship. Finally, the present analysis could be extended by including a test of students' entrepreneurial intention and the applicability of the TPB to other Balkan countries, in a refined model that includes cross-cultural dimensions. A cross-cultural study of entrepreneurial intention would increase the robustness of our results and examine the impact of cultural differences on entrepreneurial intention. It would extend previous cross-country studies (Liñán et al., 2011; Garcia-Rodriguez et al. 2015).

Our results have some limitations related to the specific context of Kosovo. Kosovo is a small country with a limited internal market since its population is only 1.8 million. Most existing entrepreneurs are satisfying a small market and firm growth is limited. This bounds the desirability of becoming an entrepreneur. In other contexts with larger internal markets the dynamics and entrepreneurial intention might show a different pattern.

Given attractiveness of migration within Europe, young people and educated individuals in Kosovo tend to consider working abroad rather than becoming entrepreneurs in the domestic market. This fact specific to Kosovo means that the priority is migration. Recent trends show an important flow of youth leaving Kosovo for Europe and especially Germany. In the last decade, a huge number of Kosovars left the country in the hope of finding prosperity elsewhere. Around 130,000 left in the period 2011–2016 (Kosovo Agency of Statistics, 2017). The results need to be interpreted in light of this.

Finally, the public sector in Kosovo is associated to high salaries and stability. Most families encourage their children to take a public job rather than choosing among alternatives. The preference among more highly educated individuals for work in the public sector rather than the private sector or entrepreneurship occurs in other contexts around the world. The results need to be understood from this angle.

While some of our results are context sensitive, the findings are generalizable to most emerging and developing countries with similar patterns of equipment and use of digital technologies.

Questionnaire for students on linkage between entrepreneurship intention and ICT

The aim of the questionnaire is to identify a possible linkage between Entrepreneurship Intention and ICT. Results from the questionnaires will be used for academic purposes only. The answers are anonymous and we encourage the respondents to answer sincerely to the questions.

Demographic factors

Directions: Please answer following questions by putting **"X"** or **"✓"** in the option that describes you the best.

1 **Sex:** ☐Female ☐ Male
2 **Age:** _____
3 **Ethnicity:** ☐Albanian ☐ Serbian ☐Turkish ☐Roman ☐Bosnian ☐Other_____
4 **Relationship status:** ☐Single ☐Married ☐Divorced ☐Widowed ☐ Other_____
5 **Level of studies:** ☐Bachelor ☐Master ☐PhD
6 **Study program:**_____
7 **Year of studies:**_____
8 **University/ college name:**_____
9 **Employment:** ☐ Yes ☐ No
9a **If yes, how many hours per week do you work?**

☐10☐ 20 ☐30☐ 40 ☐ 50☐ 60

1 **Income (optional):**_____

Family background

1 **Indicate your family structure:** ☐ Two parents ☐ Single parent
2 **How many brothers and sisters do you have?**

Brothers_____; Sisters_____

1 **Where do your family live?:** ☐Rural area ☐ Urban area
2 **City:** _____
3 **Highest education level of your father:**

☐ No education ☐ Primary ☐Secondary ☐ Bachelor ☐Master ☐PhD

1 **Highest education level of your mother:**

☐ No education☐ Primary☐ Secondary☐ Bachelor☐ Master☐ PhD

1 **Average monthly income of your family:**

☐0-81€ ☐81-170€ ☐171-250€ ☐251-450€ ☐451-600€ ☐601-750€ ☐751-900€ ☐Over 900€

1 **Is any member of the family an entrepreneur? ☐Yes ☐ No**
18a **If yes, who from the family members is an entrepreneur?**

☐Mother ☐Father ☐Brother ☐Sister ☐Other family members

1 **What type of enterprise do they have?**

☐Small enterprise ☐Medium enterprise ☐Large enterprise

1 **Type of business sector of enterprise**

☐Primary sector (producing raw materials…)
☐Secondary sector (carrying out manufacturing)
☐Tertiary sector (providing sales and services)

Educational support

Strongly Agree (5), Agree (4), Undecided (3), Disagree (2) and Strongly Disagree (1)

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
The education in university encourages me to develop creative ideas for being an entrepreneur					
My university develops my entrepreneurial skills and abilities.					
My university provides the necessary knowledge about entrepreneurship					
The knowledge acquired from Internet helps me to become an entrepreneur					
ICT usage in university encourages me to develop creative ideas for being an entrepreneur					
Availability of ICT tools at the university (Desktop computer, Laptop, Tablet computer, Printer, USB (memory) stick, Interactive whiteboard, E-book reader (e.g. Amazon Kindle) increases chances for me to become an entrepreneur					
Access to the Internet at the university increases chances for me to become an entrepreneur					

Relational support

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
If I decide to be an entrepreneur, my close network (from work, school, and neighborhood) will support me.					
If I decide to be an entrepreneur, my friends will support me.					
If I decided to be an entrepreneur, my family members will support me.					
If I decide to be an entrepreneur, my friends on the Social Networks will support me					
Having internet and ICT access at home would support my career as an entrepreneur					

Structural support

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Kosovo economy provides many opportunities for entrepreneurs.					
In Kosovo, entrepreneurs are encouraged by a structural system that includes private, public, and non-governmental organizations.					
Digitalization of Kosovo Economy encourages me to become an entrepreneur					
Digital world provides many opportunities for entrepreneurs					

Personal attitudes

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Being an entrepreneur would entail great satisfactions for me.					
A career as entrepreneur is attractive for me.					
Among various options, I would rather be an entrepreneur.					
Being an entrepreneur implies more advantages than disadvantages to me.					
If I had the opportunity and resources, I would like to establish my own firm					

Perceived behavioral control

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
I am prepared to start a viable firm.					
I can control the creation process of a new firm.					
I know the necessary practical details to start a firm.					
I know how to develop an entrepreneurial project.					
If I tried to start a firm, I would have a high probability of succeeding.					
It is easy for me to start a firm and keep it working					

Entrepreneurial intention

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
I am determined to create a firm in the future.					
I have thought very seriously of starting a firm.					
I will make every effort to start and run my own firm.					

	AVE	**Composite Reliability**	**R Square**	**Cronbachs Alpha**
Behavioral control	0.751546	0.947649	0.6319	0.933268
Entrepreneurial intention	0.904467	0.965989	0.727469	0.947186

Personal attitude	0.863328	0.969306	0.692847	0.960422
Relational Support	0.752218	0.93799		0.916962
Structural support	0.550475	0.822985		0.73897
Support_Edu	0.633525	0.923266		0.902833

	Communality	Redundancy
Behavioral control	0.751546	0.260466
Entrepreneurial intention	0.904467	0.443834
Personal attitude	0.863328	0.534773
Relational Support	0.752218	
Structural support	0.550475	
Support_Edu	0.633525	

	R Square
Behavioral control	0.6319
Entrepreneurial intention	0.727469
Personal attitude	0.692847
Relational Support	
Structural support	
Support_Edu	

	Behavioral control	Entrepreneurial intention	Personal attitude	Relational Support
Behavioral control		0.412986		
Entrepreneurial intention				
Personal attitude		0.4866		
Relational Support		0.288506	0.592901	
Structural support	0.316116	0.130552		
Support_Edu	0.534022	0.350484	0.267038	

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics (|O/STERR|)
EDUSUPP_1 <- Higher_Educ	0.752594	0.751479	0.024452	0.024452	30.778471
EDUSUPP_2 <- Higher_Educ	0.770002	0.769395	0.022436	0.022436	34.31942
EDUSUPP_3 <- Higher_Educ	0.674833	0.672446	0.03185	0.03185	21.187898
EDUSUPP_4 <- Higher_Educ	0.822745	0.822514	0.017259	0.017259	47.670249
EDUSUPP_5 <- Higher_Educ	0.847129	0.846874	0.016863	0.016863	50.234619
EDUSUPP_6 <- Higher_Educ	0.850532	0.850788	0.013821	0.013821	61.538081
EDUSUPP_7 <- Higher_Educ	0.837875	0.83777	0.015034	0.015034	55.730866
ENTINT_1 <- Entrepreneurial Inten.	0.948289	0.948245	0.006395	0.006395	148.29586
ENTINT_2 <- Entrepreneurial Inten.	0.953068	0.953002	0.005828	0.005828	163.54264
ENTINT_3 <- Entrepreneurial Inten.	0.95174	0.951851	0.005237	0.005237	181.744956
PCB_1 <- Behavioural Cont.	0.894257	0.894314	0.010879	0.010879	82.202368
PCB_2 <- Behavioural Cont.	0.901417	0.901297	0.010526	0.010526	85.636469
PCB_3 <- Behavioural Cont.	0.903139	0.902879	0.009789	0.009789	92.26449
PCB_4 <- Behavioural Cont.	0.855415	0.855403	0.014741	0.014741	58.029171
PCB_5 <- Behavioural Cont.	0.865303	0.865368	0.012544	0.012544	68.98111
PCB_6 <- Behavioural Cont.	0.775164	0.774964	0.027376	0.027376	28.315559
PERSATT_1 <- Attitudes	0.947692	0.947739	0.005213	0.005213	181.789324
PERSATT_2 <- Attitudes	0.933328	0.932851	0.008912	0.008912	104.732758
PERSATT_3 <- Attitudes	0.922695	0.922679	0.008834	0.008834	104.448629
PERSATT_4 <- Attitudes	0.921956	0.921893	0.008865	0.008865	103.996348
PERSATT_5 <- Attitudes	0.919809	0.919527	0.007756	0.007756	118.587338
RELSUPP_1 <- Relational	0.900849	0.900795	0.010722	0.010722	84.01854
RELSUPP_2 <- Relational	0.894462	0.894314	0.010256	0.010256	87.216354
RELSUPP_4 <- Relational	0.772984	0.77216	0.022288	0.022288	34.682271
RELSUPP_5 <- Relational	0.849026	0.848962	0.015166	0.015166	55.98362
RLSUPP_3 <- Relational	0.911673	0.911857	0.006182	0.006182	147.472188
STRSUPP _1 <- Structural	0.470958	0.464852	0.073593	0.073593	6.399528
STRSUPP_2 <- Structural	0.681508	0.675751	0.053244	0.053244	12.799725
STRSUPP_3 <- Structural	0.913192	0.912289	0.007734	0.007734	118.078695
STRSUPP_4 <- Structural	0.825667	0.828269	0.015812	0.015812	52.216344

Author statement

The paper "The Digitalization of the Economy and Entrepreneurship Intention" was written with equal contributions of all the authors in all his stages (conceptualization, methodology, analysis, writing, review and editing). Adel BEN YOUSSEF, Sabri BOUBAKER, But DEDAJ, Mjellma CARABREGU-VOKSHI. The authors would like to acknowledge the helpful comments and suggestions from the editor and the three anonymous reviewers. They are also grateful to Professor Fateh Belaid for his detailed comments on a earlier versions of this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.techfore.2020.120043.

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