



## Investigating factors affecting the speed of internationalization with the mediating role of organizational agility in Pharmaceutical SME Companies of Alborz Province

Hossein Norouzi <sup>a\*</sup>, Soheila Khoddami <sup>b</sup>, Haniyhe Bazrpour <sup>c</sup>

<sup>a</sup>Associate professor, Department of Business Administration, Faculty of Management, Kharazmi University, Tehran, Iran.

<sup>b</sup>Associate Professor, Department of Business Administration, Faculty of Management, Kharazmi University, Tehran, Iran.

<sup>c</sup>MSc of B.A, Department of Business Administration, Faculty of Management, Kharazmi University, Tehran, Iran

### Abstract

The purpose of this study was to investigate the effect of business intelligence, foreign market knowledge and entrepreneurial characteristics on the speed of internationalization with the mediating role of organizational agility in SME pharmaceutical companies in Alborz province. Klein approach was used to determine the sample size. A researcher-made questionnaire was used to collect data and its Cronbach's alpha coefficient was 0.950, which indicates the reliability of the research tool. Also, the KMO test was confirmed in the validity of the research instrument construct. Smart PLS software was used to analyze the data and test the research hypotheses. The research findings out of the ten mentioned hypotheses show the confirmation of seven hypotheses and the rejection of three hypotheses. The foreign market knowledge construct did not show any positive and significant relationship with organizational agility structures and the speed of internationalization and its mediating role was not confirmed. However, other structures, namely business intelligence and entrepreneurial characteristics, showed a significant and positive relationship with organizational agility and the speed of internationalization, both directly and indirectly through the mediating role of organizational agility.

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**Keywords:** Business Intelligence, Foreign Market Knowledge, Entrepreneurial Characteristics, Organizational Agility, Internationalization Speed;

### 1. Introduction

With the intensification of international competition, the acceleration of internationalization is becoming an important path for the competitive advantage of international companies (Ferraris et al., 2021). Number of Companies which are eager to engage in international business, with the expectation that a faster international



strategy will help them seize new opportunities, enter global markets and create first-mover advantages, is growing. The title of this research is the influence of business intelligence, foreign market knowledge and entrepreneurial characteristics on the speed of internationalization with the mediating role of organizational agility. This research attempts to investigate the impact of business intelligence on the international activity of small and medium-sized enterprises (SME) in the field of health. Small and medium-sized enterprises (SMEs) in the field of health (pharmaceuticals and medical devices) are businesses that keep their revenue, assets or number of employees below a certain threshold. Small and medium-sized enterprises (SMEs) play an important role in the economy by employing large numbers of people and contributing to the formation of innovation. Small and medium companies or small and medium enterprises are defined differently in the world. The speed of internationalization of the company, one of the main aspects of international strategic decision-making, has become an important issue for the expansion of international markets. Deng and Yang (2015), this is especially important for developing and newly emerging companies, which usually have a strong incentive to catch up with their competitors in advanced markets as quickly as possible. Recently, the internationalization speed literature has increasingly focused on the relationship between a firm's internationalization speed and its international performance (Ferraris et al., 2021).

Current and past studies point out the importance of empirical knowledge in line with the speed of internationalization of small and medium-sized companies. Small and medium-sized enterprises (SMEs) play an important role in the economy by employing large numbers of people and contributing to the formation of innovation. Lecerf & Omrani (2020), the analysis of previous foreign and domestic studies close to the research topic shows that little research has been done in connection with the influence of business intelligence, foreign market knowledge and entrepreneurial characteristics of SMEs on the speed of internationalization, simultaneously and integrated. Each of these researches have examined a part of the factors (variables) in the conceptual model of the research. For example, Cheng et al. (2020), in their research titled *Facilitating the Speed of Internationalization: The Role of Business Intelligence and Organizational Agility*, examines how business intelligence is used in organizational agility to improve the speed of internationalization. Zahoor and Al-Tabbaa (2021), in an article titled "The Speed of Internationalization after SME Entry: The Role of Relational Mechanisms and Foreign Market Knowledge" examine. The results of this study show that the acquisition of foreign market knowledge from domestic networks fully mediates the relationship between relational mechanisms and post-entry internationalization speed. Furthermore, the relationship between foreign market knowledge acquisition and post-entry internationalization speed is moderated by domestic environmental hostility. Hsieh et al. (2019), in an article titled "A Multidimensional Perspective of SME Internationalization Speed: The Impact of Entrepreneurial Characteristics," refer to a multidimensional perspective on SME internationalization speed. It examines the impact of entrepreneurial characteristics, including experience, logic and innovation strategies, on different dimensions of international speed. The general results of this research show that the speed of geographic diversification can only be predicted by the tendency of entrepreneurs to differentiate themselves from competitors. As it can be seen in these three studies (base articles) very close to the research topic. Each of these studies examines part of the factors that affect the speed of internationalization, so there has been a gap of a more comprehensive research that examines all the factors that affect the speed of internationalization of small and medium-sized companies. The goal will be accomplished. In addition, the analysis of previous foreign and domestic studies close to the research topic shows that little research has been done in connection with the influence of business intelligence, foreign market knowledge and entrepreneurial characteristics of SMEs on the speed of internationalization, simultaneously and integrated. The theoretical and practical importance of this research is that it fills the theoretical and practical void of a comprehensive research that identifies and examines all factors affecting the speed of internationalization of small and medium-sized companies. Therefore, recent research on business intelligence and internationalization of a company has focused on data integration and analytical capability, which helps in the development and growth of pharmaceutical SME companies in Alborz province to move from the local and national environment to the global sphere. What can be seen in the discussion related to foreign and domestic empirical studies, most of the studies related to the investigation of the effect and relevance of electronic word-of-mouth advertising on the behavioral reactions of consumers. Therefore, this research has the value of innovation, which for the first time examines the role of social psychological distance of consumers in influencing the quality of electronic word-of-mouth information on user trust from the perspective of customers of an online retail store. Using international studies and business intelligence literature, we proposed a unified theoretical model of several studies that examines the

relationships between business intelligence, organizational agility, foreign market knowledge, entrepreneurial characteristics of EMEs, and firm internationalization speed in pharmaceutical SME companies of Alborz province. We argue that the business intelligence of international companies in the pharmaceutical SME companies of Alborz province increases the speed of internationalization of the company through organizational agility, which is a main mediator that acquires the ability of the company to interpret and use diverse knowledge in its international strategies. In particular, when the developing country's international firms receive valuable knowledge through business intelligence, if they have the organizational ability to manage this new knowledge provided by business intelligence, the speed of internationalization will increase (Lecerf & Omrani, 2019).

In this research, we investigate two important questions: 1) the direct role of business intelligence, foreign market knowledge, entrepreneurial characteristics and organizational agility on the speed of internationalization and 2) the mediating role of organizational agility in the relationship between business intelligence, foreign market knowledge, and entrepreneurial characteristics with the speed of internationalization.

## **2. Theoretical foundations of research**

### **Business Intelligence**

Howard Dresne presented the concept of business intelligence in 1989. He compared business intelligence to an umbrella and defined it as a set of concepts and methods for making decisions based on the obtained information. Salinas La Rosa (2010) considers the main goal of business intelligence to provide effective information in order to achieve the organization's goals and strategies. Based on such decision-making based on effective information, the capability of competitive advantage in the market is improved. In addition, business intelligence facilitates the management of information derived from the grouping of data from different departments such as marketing, sales, human resources, finance and other departments (Niño et al., 2020). The amount of data and information produced daily is constantly increasing and has forced companies to improve their performance and innovation by relying on external knowledge and information (Benner & Tushman, 2015). Along with the rapid development of computer intelligence and the emergence of the "big data" category, the concept of business intelligence has become increasingly important for researchers and activists in various industries (Božič & Dimovski, 2019). Although at the beginning, business intelligence has used to support decision-making activities, but with the increase of its importance, nowadays it is considered for organizational learning, adaptation, improvement of operational efficiency and strengthening of organizational intelligence (Trieu, 2017). Golfarelli et al. (2004) pointed out that in the last decade; we have seen a change in the approach to business management, because they have gained a better understanding of the importance of parameter-oriented management. Business intelligence has now emerged as a main tool for companies in describing analysis systems. According to Andreas Bitterer from Gartner Group, business intelligence has become a strategic action and now chief information officers and business leaders use it as a tool to stimulate business effectiveness and innovation (Bhatiasevi & Naglis, 2020)

### **2-1 Foreign market knowledge**

The importance of foreign market knowledge in international business is very high and it is considered as the most important intangible resource of the company. By starting business in domestic or international markets, the culture of knowledge accumulation can bring significant competitive advantage to companies. The information and knowledge base of companies has been developed through strategic measures of discovery, collection and sharing culture. Knowledge can be obtained from anywhere inside or outside the organization. In most cases, senior organizational managers usually take advantage of valuable knowledge through strategic actions to create economic value such as B2B marketing activities. Accumulation of foreign market knowledge is considered as one of the important success factors and a continuous process for international companies. Due to changes in international policies, technological advancement, competitive advantage, agency effects and customer preference, small and medium companies should keep themselves updated through foreign knowledge so that they can compete in international markets in a stable manner (Mostafiz et al., 2019). Acquiring and using knowledge in internationalization literature has been the focus of many studies. Because internationalization is a subject and a learning process. In addition, knowledge can significantly affect the ability of companies to identify and research internationalization opportunities. Nevertheless, there is no consensus about the role of knowledge in internationalization and it needs to be completed. On the other hand, it is still not clear which knowledge is more

important in the internationalization process: empirical or non-empirical knowledge. Also, if companies learn from failures, it needs to be studied again. Because, they use this knowledge and experience gained in their further internationalization, including re-internationalization and this use of empirical knowledge can be considered as a re-entry into Internationalization considered that it might be fundamentally different from the first time (Vissak et al., 2020). Businesses that want to succeed in the international arena, whether they want to stay focused on one market or those that are engaged in multinational activities should be aware of their target markets. They gain sufficient knowledge and understanding (Abubakari et al., 2021). The nature of knowledge is such that it causes companies to be always on the lookout, with a correct and timely analysis of the trends and changes of foreign markets, react faster, and be able to make decisions that are more correct. (Martin et al., 2021) For this purpose, small and medium-sized companies (SMEs) should increase their knowledge capacity due to the limitations of their resources so that they can compete with other competitors in the international environment and thus be able to increase their competitiveness (Hilmersson et al., 2021). Foreign market knowledge is useful for small firms, but it is costly in terms of the time and effort a firm must devote to acquiring it. According to the relational perspective, relational relationships can help overcome this barrier, as strong relationships are beneficial for sharing market-specific knowledge (Zhohoor & Al-Tabbaa, 2021).

## 2-2. Entrepreneurial characteristics

Entrepreneurial characteristics refer to a series of characteristics and capabilities that SME companies in the international environment should create in their activity and decision-making framework in order to move on the path of internationalization. (Hsieh et al., 2019; Thomas et al., 2020). These entrepreneurial characteristics discussed in the international business environment under the concept of international entrepreneurship. In fact, entrepreneurial orientations in the international environment focus on issues such as the speed of internationalization, especially in the early stages of globalization, and international newcomers (Alayo et al., 2019; Hsieh et al., 2019). Therefore, entrepreneurial characteristics based on an entrepreneur-oriented perspective that SME companies use to accelerate the internationalization of their business (Felzensztein et al., 2015). Entrepreneurial characteristics in this study include the following:

**1) International experience:** In general, it is accepted that the international experience of the founders of companies affects the speed of their internationalization. Companies whose founders have foreign professional experience, or have studied abroad, are likely to internationalize sooner. However, not all graduates who decide to go international have the same international experience. Entrepreneurial start-ups that, since their establishment, obtain a large percentage of their income from the sale of products in international markets, is because in fact they have benefited from people with considerable international experience or entrepreneurs themselves have personal experience by working in multinational companies. At the same time, a significant part of newcomers to the international arena has either no international experience or little experience (De Cock et al., 2021).

**2) Understanding and developing global opportunities:** The beginning of international opportunities starts with ideas in a set of ideas, and finally entrepreneurs turn them into opportunities by acquiring more information and resources. As Chandra et al. (2015) found that over time, international entrepreneurs often inherit a set of opportunities. The classical theory of entrepreneurship shows that opportunities arise because of knowledge differences in time and place. Despite the limitations in the cognitive capacity of international entrepreneurs, they produce beliefs about the possibilities of value creation through the connection between different cross-border flows of knowledge in a new way. International entrepreneurship literature, especially diverse international networks, show that they lead to internationalization to some extent. Because they provide information about the opportunities available in the local markets.

**3) Differentiation:** The differentiation strategy reflects the creation and marketing of a product that is considered relatively unique from the point of view of the industry. Companies can differentiate their offers based on brand image, product design, advanced technology, product features, customer service and other dimensions. The differentiation strategy has led to an increase in the profit margin and has prevented the company from the need to achieve a low cost situation (cost leadership strategy). Differentiation strategy is one of the characteristics of small and medium companies (Knight et al., 2020).

**4) Innovation-oriented:** Innovation-oriented strategy is the patterns and procedures that enable companies' strategy to focus on the drivers and elements of innovation through achieving new opportunities, continuing to produce new products/services, and active competitive positioning at different stages (Datta et al., 2019). Cenamor et al. (2019), define innovation in two dimensions: fundamental innovation (focusing on current internal knowledge, capabilities, and optimal organizational decision-making in order to maximize profitability), and exploratory innovation (focusing on learning new knowledge, discovering new capabilities and Investigating new ways of doing business).

### **2-3. Organizational Agility**

Qin & Nembhard (2010), state that organizational agility should be placed as a necessity in the organizational structure due to the existence of continuous changes, the requirement to respond immediately to market changes and movements, as well as the creation of value based on customer satisfaction. Goldman et al. (1995), about the importance of agility, state that agility consciously and carefully reacts to changes with unpredictable characteristics in the environment and enables organizations to grow and develop in a competitive environment. Shafer et al. (2001), also agree with Goldman et al. (1995), believe that an agile organizational system can operate successfully in very dynamic and complex environments (Darvishmotevali et al., 2020).

Agile organizations can find alternatives to existing processes by using new procedures and resources and redesign organizational structures based on new conditions (Teece et al., 2016). McCarthy et al. (2010), regarding the consequences of agility in the organization, state that organizational agility meets the needs of customers, introduces new products, causes the organization to enter into strategic and planned agreements, or even It may waive those agreements. Agility follows the organizational environment to identify opportunities in such activity environments (Darvishmotevali et al., 2020). Also, agility can improve the organization's ability to supply high-quality products and services, and as a result, it is an important factor for the organization's productivity. On the other hand, producers, organizations and institutions must take steps towards agility in order to compete in the 21st century. Because today's organizations are facing increasing, pressure to find new ways of efficient competition in dynamic global markets. Therefore, to face changes, agility based on initiative, skill, knowledge and quick access to information helps the organization. Organizational agility is an integrated system based on efficiency and effectiveness to use technologies and human resources available in the organization to respond quickly to the changing needs of the market. Also, it increases the capacity of the organization in responding to the needs and demands of customers with appropriate speed and quality (Mohramzadeh and Nouri, 2019). According to the views of Arteta & Giachetti (2004), and Lu & Ramamurthy (2011), organizational agility is through continuous monitoring of the market and capitalizing on changes (market capital agility) or through making changes in internal operations (operational adaptive agility) can be realized (Menon and Suresh, 2021).

### **2-4. The speed of internationalization**

Different governments, both developed and developing, are trying to implement policies that create and encourage the presence of small and medium-sized companies (SMEs) in the global arena (Pickernell et al., 2016). Despite the increasing presence of small and medium-sized companies (SMEs), in international business, they still face limitations compared to large and multinational companies. These limitations in resources, capabilities and knowledge lead to lowering the development speed of their activities (Mayer et al., 2021). According to Welch and Luostarinen (1988), internationalization can be defined as the process of increasing the involvement and participation of companies in international operations, or in the interpretation of Calof and Beamish (1995), the process of adapting the operations of companies to the international environment. Kuiken et al., (2020). Along with the formation of new international business issues, the issue of internationalization of small and medium-sized companies (SMEs) has also been widely noticed by researchers (Costa et al., 2017, and 2020).

## 2-5. Research background

Table 1. there is an overview of the research background in domestic and foreign studies

	RESEARCHER/S	TITLE	FINDINGS
1	Shirmohammadi et al. (2019)	The effect of product innovation and marketing on product internationalization in startups	The research findings showed that product innovation has a positive and significant effect on marketing innovation and innovative performance. In addition, innovation in marketing has a positive and significant effect on innovative performance, production performance has an effect on market performance, and product export has an effect on product internationalization.
2	Zakari and Sarmi (2019)	Determining the configuration of knowledge in the internationalization process of medical equipment knowledge-based companies	The results of content analysis show that technological knowledge and market knowledge are mainly obtained from two methods of direct experience and vicarious or mediated learning. However, the knowledge of internationalization as the third important field of knowledge among these companies has not been formed so that it can play the role of integrating technological knowledge and market knowledge in accordance with the strategy of the company's presence in international markets. However, some companies with high export performance and experience have gained basic knowledge in this field through direct experience and have realized their need to strengthen their knowledge.
3	Tavakli et al. (2019)	Examining the effect of business intelligence characteristics on the competitiveness of companies with the mediating role of entrepreneurship, market orientation and innovation in business	The research findings showed that the variable of business intelligence characteristics (including perceived usefulness, formality of business intelligence, intra-industry analysis, and intra-industry comprehensiveness) directly has a positive and significant effect on competitiveness and entrepreneurship. However, entrepreneurship is more affected by this relationship than the competitiveness of companies. On the other hand, entrepreneurship-oriented has also had an effect on competitiveness and market-oriented and market-oriented was able to influence the two structures of competitiveness and innovation.
4	Hashemi et al. (2018)	Designing a model to evaluate the development of an organizational dashboard with business intelligence logic in organizations; Study case: Iran Khodro Engineering Design and Supply Company	The results show that due to the existence of strategic planning process, evaluation of organizational performance and procedures based on quality management system, as well as the existence of Oracle software, system and software platforms are available in this company. However, due to the lower priority of business intelligence issues in Sapco, the process of developing a dashboard with business intelligence logic is not a high-priority organizational project and needs more work in this area.
5	Ramezani et al. (2018)	Investigation of the internationalization of small and medium industries: dimensions and comprehensive strategies	According to the research findings, the dimensions identified in connection with internationalization are functional-competitive dimension, strategic orientation dimension, entry mode dimension and expansion pattern dimension. Identified combinations compatible with the strategies belonging to the dimensions are thrifty conservatives, corner-finding differentiators, customer-oriented growthists, and technology-reliant attackers. Small and medium-sized companies can choose and use combinations that are compatible with their environmental and organizational conditions.

6	Zahoor and Al-Tabbaa 2021)(	Post-entry internationalization speed of SMEs: the role of relational mechanism and foreign market knowledge	The research findings show that the acquisition of foreign market knowledge from internal networks completely mediates the relationship between relational mechanisms and the speed of internationalization after entry. Furthermore, the relationship between foreign market knowledge acquisition and post-entry internationalization speed moderated by domestic environmental hostility, such that the relationship is strengthened as domestic environmental hostility increases.
7	Cheng et al. (2020)	Facilitating speed of internationalization: the role of business intelligence and organizational agility	The findings showed that cultural distance negatively moderates the relationship between organizational agility and speed of internationalization. Managerial implications of these findings and future research directions on firm internationalization speed discussed.
8	Hsieh et al. (2019)	A multidimensional perspective of SME internationalization speed: The influence of entrepreneurial characteristics	Findings showed that pioneering, speed of deepening, speed of geographic diversification can be considered as three different strategic options, and each dimension is predicted by a different set of entrepreneurial antecedents. In international business experiences, it is related to entrepreneurs' precociousness and their understanding of opportunities abroad, as well as the preference of an innovation strategy characterized by diversified innovation.
9	Božič and Dimovski (2019)	Business intelligence and analytics for value creation: The role of absorptive capacity	The findings of the research showed that four theoretical categories such as absorption capacity, integration capacity, transformation capacity and discovery capacity were classified in the cumulative category of absorption capacity. These four categories obtained from the 16 categories of the first order. Also, three categories of technological capitals, human capitals and relational capitals were classified in the collective category of business intelligence capitals. These three categories were obtained from the first nine categories. In the end, the researchers stated that through the obtained categories, business intelligence and business analysis can be used in order to create value.
10	Jain et al. (2019)	Internationalization speed, resources and performance: Evidence from Indian software industry	The findings of the research showed that the speed of internationalization directly affects the performance of the company. Also, the three variables of using capabilities, learning capabilities, and communication capabilities were able to moderate the relationship between the speed of internationalization and company performance.

## 2-6. Development of research hypotheses and Conceptual model

### Business Intelligence and Organizational agility

The impact of organizational agility on company decision-making relies on the usefulness of business intelligence for two reasons. First, business intelligence provides companies with extensive information and explicit knowledge to improve organizational agility. In particular, the knowledge based on business intelligence is necessary for the international company to deal with unpredictable markets. This is especially important for international companies. Because explicit international knowledge transformed by business intelligence reduces, the difficulty of companies in understanding foreign markets and makes up for the lack of international experience and resources of many companies. Second, proposing practical options based on explicit knowledge is expected to improve the efficiency of resource commitment and facilitate consensus on internationalization expectations among different stakeholders. Useful knowledge resulting from business intelligence is always useful for determining practical options, which are suitable for developing a typical organization to deal with internal contradiction. (Cheng et al., 2020; Jain et al., 2019; Caseiro & Coelho, 2019). According to what was said, the first hypothesis regarding the relationship between business intelligence and organizational agility is formulated as follows:

H1: Business intelligence has a significant effect on organizational agility in pharmaceutical SME companies of Alborz province.

### **2-7. Foreign market knowledge and Organizational agility**

Foreign market knowledge is conceptualized as the level of international market knowledge. Foreign market knowledge helps the company prepare to enter new markets by knowing sales and marketing strategies. Not only does this help the company learn more about its competition, but it can also find opportunities to differentiate its business to meet better the needs of its customers. The company's foreign market guides the company to the information it needs to find the right market for its business, tailor its product or service to that market, and monitors the competition to stay one step ahead (Zahoor and Al-Tabbaa, 2021). By increasing companies' awareness and knowledge of target markets in international destinations, it becomes possible for companies to be able to respond to the demands, changes, developments, procedures and needs of customers with a more appropriate and higher speed. In other words, the coefficient of organizational agility increases (Nemkova et al., 2017; Cheng et al., 2020; Gomez et al., 2020). According to what was said, the second hypothesis regarding the relationship between foreign market knowledge and organizational agility is formulated as follows:

H2: Foreign market knowledge has a significant effect on organizational agility in pharmaceutical SME companies of Alborz province.

### **2-8. Entrepreneurial characteristics and Organizational agility**

An entrepreneur-centered perspective draws attention to the outcomes that arise from the characteristics and action models of key decision makers in SMEs. Among the important dimensions in the entrepreneurial characteristics of the international environment, we can mention international experience, understanding and development of global opportunities, differentiation, and innovation-oriented (Hsieh et al., 2019). In this regard, as the international experience of SME companies increases, their ability to respond to environmental changes increases and they can react to developments in a more agile manner (Hollender et al., 2017). Another important component is the understanding and development of global opportunities. The perception that foreign markets offer favorable opportunities is one of the subjective characteristics of SME entrepreneurs that is influential in the formation of international decisions (Hutchinson et al., 2006). The perception that foreign markets offer favorable opportunities is one of the mental characteristics of SME entrepreneurs that is influential in the formation of international decisions (Hutchinson et al., 2006). Compared to entrepreneurs of small and mid-sized international firms, new international businesses or international entrants are more positive about overcoming barriers to international expansion, perceive international markets as opportunities for themselves, and take less risk (Chetty & Campbell-Hunt, 2004). Moreover, they see internationalization as an opportunity for value creation as well as taking advantage of market inefficiencies (Kalinik and Forza, 2012). Therefore, understanding the open and hidden opportunities in the international environment can increase the agility of companies to respond appropriately and in time to unforeseen developments (Vaillant & Lafuente, 2019). According to what was said, the third hypothesis regarding the relationship between entrepreneurial characteristics and organizational agility is formulated as follows:

H3: Entrepreneurial characteristics have a significant effect on organizational agility in pharmaceutical SME companies of Alborz province.

### **2-9. Business intelligence and Internationalization**

During internationalization, the use of business intelligence is strongly influenced by the selection of information and how it is transformed into decision-making knowledge (Chen and Yeh, 2012). Hence, recent research on business intelligence and a firm's internationalization has focused on data integration and analytical capability (Dubey et al., 2019). In the company's internationalization process, data integration involves filtering, aggregating, and sorting data from various sources, such as host markets, competitors, and local governments, and then systematizing integrated information from the collected data (Popović et al., 2012). Systematic information contributes to companies' deep understanding of the turbulent environment and can inform the most appropriate strategy for learning and conducting the company's international activities, which are the two main elements of international speed. This effect of data integration is particularly important for Chinese companies, which usually

face a lack of information in their international business activities (Gudfinnsson et al., 2015). Business intelligence-based analytical capability can create reliable and immediate communication to improve decision-making efficiency through explicit knowledge sharing as the company's internationalization progresses. This business intelligence function is especially important for Chinese companies, whose decision makers usually lack international management experience (Chen and Yang, 2017), and have few opinions on their own competence (Deng and Yang, 2015). According to what was said, the fourth hypothesis regarding the relationship between business intelligence and internationalization is formulated as follows:

H4: Business intelligence has a significant effect on the speed of internationalization in pharmaceutical SME companies of Alborz province.

## **2-10. Foreign market knowledge and Internationalization**

Prashantham and Young (2011) found that working with domestic partners who have international experience is important in companies' understanding of the internationalization process. In fact, the international experience of internal relations can enable SMEs to identify and efficiently access information related to international operations and market demand, which is their capacity to develop foreign market knowledge. Although the impact of foreign market knowledge on the international success of small firms has been studied, Stoian et al. (2018) stated: "The readiness of a medium-sized firm to participate in international markets can be targeted as a function of its information about foreign markets ». Nevertheless, due to the obligations of being small and foreign, small and medium-sized companies cannot rely on internal resources to gather the necessary knowledge to achieve their international goals in the first stage of entering the foreign market (Stoian et al., 2018). Therefore, SMEs can use their networks and the international experiences of their network partners to create training (Vanninen et al., 2018). In this regard, Prashantam and Young (2011) argued that stronger networks allow new international ventures to absorb the market and technological knowledge needed to accelerate internationalization. According to what was said, the fifth hypothesis regarding the relationship between foreign market knowledge and internationalization is formulated as follows:

H5: Foreign market knowledge has a significant effect on the speed of internationalization in pharmaceutical SME companies of Alborz province.

## **2-11. Entrepreneurial characteristics and Internationalization**

According to the mentioned components (international experience, understanding and development of global opportunities, differentiation, and innovation-oriented) in entrepreneurial characteristics (Hsieh et al., 2019), it can be said that the strategic situation of individual entrepreneurs for internationalization decisions it is too important. According to the mentioned components (international experience, understanding and development of global opportunities, differentiation, and innovation-oriented) in entrepreneurial characteristics (Hsieh et al., 2019), It can be said that the strategic situation of individual entrepreneurs are highly important for internationalization decisions. Entrepreneurs' recognition of the possibility of achieving differentiation from competitors through presence in the foreign market often contributes to the early internationalization decision. In addition, their desire to create a positive image to defend competitive advantages has been suggested as a main and active motivation for the company's internationalization. New international ventures typically exploit their innovative technology in markets to demonstrate their ability to serve core customers. Similarly, Vanninen et al. (2017) found that a global mindset of an entrepreneur who is willing to acquire various sources of opportunities abroad and through observation, reputation and proximity to customers and partners in strategic markets to this important to achieve (Hsieh et al., 2019). Innovation is a key component of a product differentiation strategy that enables companies to rely on their technological expertise to compete in international markets and, in turn, contribute to international sales growth. Therefore, in the study of Ramos et al. (2011), they found that entrepreneurs of high-tech companies who consider product innovation as one of the basic components of competitive strategy internationalize their companies earlier than their main competitors do. It is an indicator of an SME entrepreneur's commitment to innovation. Innovation can take many forms even if we limit the scope of the term to the production of new or improved products and services. Hughes et al. (2010) and Martin et al. (2017) found that bilateral innovation (having both types of innovation capabilities) contributes to the performance of SMEs that internationalize within two years of their

establishment. According to what was said, the sixth hypothesis regarding the relationship between entrepreneurial characteristics and internationalization is formulated as follows:

H6: Entrepreneurial characteristics have a significant effect on the speed of internationalization in pharmaceutical SME companies of Alborz province.

## **2-12. Organizational agility and Internationalization**

Organizational agility is very important for the speed of internationalization of the company for two reasons. On the one hand, the agility of the market capitalist can transfer tacit knowledge to an experiential knowledge to meet a new market need. For example, it can use structural knowledge to create well-defined norms (e.g. trust building) to facilitate monitoring of internationalization and confidently counter threats to host markets (Stahl and Voigt, 2008). On the other hand, operational adjustment agility can enhance the international learning feedback of companies and help them to apply successfully this tacit knowledge to quickly select favorable locations in the target market and quickly gain competitive advantage (Dove, 2002). Due to these two organizational agility capabilities, companies are more prepared to acquire explicit knowledge to implement their international strategies (Cheng et al., 2020; Stoian et al., 2018). According to what was said, the seventh hypothesis regarding the relationship between organizational agility and internationalization is formulated as follows:

H7: Organizational agility has a significant effect on the speed of internationalization in pharmaceutical SME companies of Alborz province.

## **2-13. The mediating effect of organizational agility**

Due to these two organizational agility capabilities, companies are more prepared to acquire explicit knowledge to implement their international strategies. At the same time, some research also suggested that health sector companies with strong organizational agility could acquire experiential knowledge from external sources to enhance their international strategies. In summary, business intelligence is critical for advancing organizational agility and thus achieving higher speed of internationalization for international health sector firms (Cheng et al., 2020). In accordance with what was mentioned in the previous chapters and considering the contribution that organizational agility has in the relationship between business intelligence, foreign market knowledge, entrepreneurial characteristics with the internationalization of companies, the hypotheses The eighth, ninth, and tenth, which oversee the mediating role of organizational agility, are presented as follows:

H8: Business intelligence has an effect on the speed of internationalization in pharmaceutical SME companies of Alborz province through the mediating variable of organizational agility.

H9: Foreign market knowledge has an effect on the speed of internationalization in pharmaceutical SME companies of Alborz province through the mediating variable of organizational agility.

H10: Entrepreneurial characteristics have an effect on the speed of internationalization in pharmaceutical SME companies of Alborz province through the mediating variable of organizational agility.

According to what has been stated in the development of the hypothesis, the conceptual model of the research on the relationships between business intelligence, foreign market knowledge, entrepreneurial characteristics, organizational agility and the speed of internationalization, is as follows:

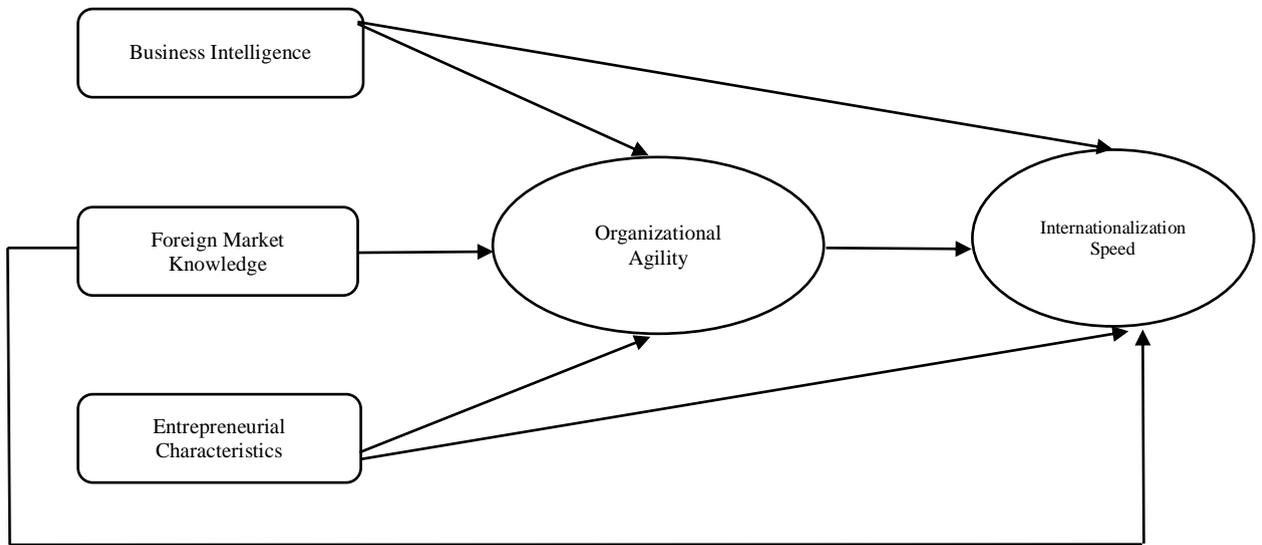


Fig 1. Conceptual Model

**3. Research methodology**

In terms of the type of research, this research is descriptive-correlational (structural equations) and based on the purpose of the research, it is placed in the category of applied studies. From the perspective of methodological philosophy, this study is based on the positivist approach due to the use of a quantitative approach. In other words, quantification in research and it is a quantitative tool for collecting data in order to explain, generalize and forecasting the phenomenon of organizational agility has used commercial intelligence, foreign market knowledge and entrepreneurial characteristics on the speed of internationalization of pharmaceutical SME companies in Alborz province. In relation to the research approach, it may be possible based on the fact that in this study the researcher based on the theoretical and empirical studies in the field of international business studies and the speed of internationalization, designed the model and developed the hypothesis, the research approach considered an analogy that starts from the theory and in the next step the hypotheses are formulated and finally leads to the proof (or rejection) of the hypotheses. The research strategy in this study is survey method. In order to collect data, a researcher-made questionnaire with 29 questions in a 5-point Likert scale according to the table below was used.

Table 2. Sources used in the design of questionnaire questions

Source	No. of questions	Dimension	Variable
Cheng et al (2020)	6	Business Intelligence	
Zahoor and Al-Tabaa (2021)	5	Foreign market knowledge	
Hsieh et al(2019), Su et al(2020)	2	International experience	
Hsieh et al(2019), Ehsan and Mustin (2021)	3	Understanding and developing global opportunities	Entrepreneurial characteristics
Hsieh et al(2019), Knight et al(2020)	3	Differentiation	
Hsieh et al(2019), Eslam and Chadi (2021)	2	Innovation-oriented	
Cheng et al (2020)	4	Organizational agility	
Cheng et al (2020), Song and Lee (2021)	4	Internationalization speed	

The statistical population of this research was made up of managers, assistants, supervisors, senior decision makers, board members, and experts from different departments of SME pharmaceutical companies in Alborz

province. These companies include Rozhan Azma, Ariogen Pharmed, Masoun Daru Company, Actoverco Company, Modava pharma, Goya Bio Innovation Company; Aroco Bioengineering Company. In order to determine the sample size, Klein's approach was used and a sample size of 148 people was covered. In order to measure the reliability of the questionnaire, Cronbach's alpha test was used, and the total coefficient of the questionnaire was calculated as 0.950. Also, to measure the validity of the questionnaire, the KMO test was used, and due to the high KMO coefficients of 0.5 in all factors and the significance of the Bartlett coefficient at the significance level of 0.000, the validity of the research tool was confirmed. In order to validate the non-experimental causal relationships between variables in the form of multivariate analysis, structural equation modeling (SEM) technique was used by partial least square (PLS) method. Data analysis algorithm in PLS includes three parts:

A) Measurement model indicators such as convergent validity (critical level 0.5), combined reliability (level 0.7), diagnostic or divergent validity, factor loadings of indicators (above 0.5 level)

B) structural model indicators such as the coefficient of determination (R<sup>2</sup>) of the endogenous variables (three levels weak 0.19, medium 0.33, strong 0.67); and path coefficients (beta), significance coefficients Z-Value (1.96 significance level 95% confidence), Q<sup>2</sup> coefficient for endogenous variables of the model (three levels weak 0.02, moderate 0.15, strong 0.35)

C) General model test criterion (GOF) (three levels weak 0.01, medium 0.25, strong 0.36)

#### 4. Research findings

In Table (3), the descriptive statistics of qualitative and quantitative research variables are given.

Table3. Descriptive statistics of qualitative and quantitative research variables

Variance	standard deviation	Average	Variable	Percentage	Abundance	Category	Variable	Percentage	Abundance	Category	Variable
				27	40	Less than 30 years	Age	61/5	91	Male	Gender
				42/6	63	Between 31 and 45 years		38/5	57	Female	
.720	.84837	3/66	Business Intelligence	19/6	29	Between 46 and 60 years		24/3	36	Single	Marital status
.714	.84485	3/67	Foreign Market Knowledge	10/8	16	Above 60 years	75/7	112	Married		
.495	.70379	3/81	Entrepreneurial characteristics	22/3	33	Less than 5 years	Years of service	19/6	29	MA	Education
.723	.85016	4/44	Organizational agility	37/8	56	Between 6 and 15 years		31/8	47	MS	
.764	.87389	3/81	Internationalization speed	39/9	59	Above 15 years		48/6	72	Ph. D	

In Table (4), convergent validity coefficients (AVE), composite reliability coefficients (CR) and divergent validity of the constructs of the research conceptual model are given. The convergent validity coefficients of the constructs of the conceptual model of the research, which are indicated by the symbol AVE, should obtain a value above 0.5. Also, the coefficients related to composite reliability (CR) must show a level above 0.7. Before reporting the statistical results of the research conceptual model, it is necessary to mention that, after designing the research conceptual model in Smart PLS software, the researcher should first bring the AVE coefficient of the structures to the critical level of 0.5. For this purpose, according to the model implementation instructions in PLS, indicators (questions) that have the lowest factor load should be removed. Therefore, only one question (Q20) was removed from the entrepreneurial characteristics variable. The importance of this issue is because the AVE statistic is the main statistic for structural equation modeling with the partial least squares approach.

Table 4. Values of AVE, CR and differential validity of the constructs of the research conceptual model

Fit level	Divergent validity	Composite reliability (CR)	Convergent validity (AVE)	Latin equivalent in PLS model	Variable
Acceptable	$\sqrt{(0.578=0.760)}$	0.892	0.578	IB	Business Intelligence
Acceptable	$\sqrt{(0.510=0.714)}$	0.837	0.510	FMK	Foreign Market Knowledge
Acceptable	$\sqrt{(0.500=0.707)}$	0.895	0.500	EC	Entrepreneurial characteristics
Acceptable	$\sqrt{(0.661=0.813)}$	0.886	0.661	OA	Organizational agility
Acceptable	$\sqrt{(0.558=0.747)}$	0.834	0.558	SOI	Internationalization speed

**4-1. Divergent validity with Fornell and Larcker's approach**

Divergent validity refers to the fact that a construct is related to its indicators to what extent compared to other constructs. That is, in the matrix designed by Fornell and Larcker, the values under the validity column of the constructs are higher than the obtained value, indicating that the indices of that construct are more meaningful than the meaning of the corresponding construct. Another structure is related.

Table 5. Divergent validity matrix with Fornell and Larcker's approach

SOI	OA	EC	FMK	IB	Research structures
				$\sqrt{0.578 = 0.760}$	Business Intelligence (IB)
			$\sqrt{0.510 = 0.714}$	0.594	Foreign Market Knowledge (FMK)
		$\sqrt{0.500 = 0.707}$	0.562	0.543	Entrepreneurial (EC) characteristics
	$\sqrt{0.661 = 0.813}$	0.470	0.481	0.544	Organizational agility (OA)
$\sqrt{0.558 = 0.747}$	0.539	0.530	0.549	0.524	Internationalization speed (SOI)

In relation to the AVE coefficient or convergent validity, the highest value is related to organizational agility with a value of 0.661. AVE coefficient of other variables are business intelligence 0.578; speed of internationalization 0.558; foreign market knowledge 0.510; and entrepreneurial characteristics of 0.500. As can be seen, all the constructs of the research conceptual model have passed their critical limit in the AVE statistic, i.e. higher than 0.5. Therefore, the convergent validity of the research conceptual model is confirmed. In relation to the values of CR or composite reliability, the highest value related to the entrepreneurial characteristics variable is 0.895. CR coefficient of other variables are business intelligence 0.892; organizational agility with a value of 0.886, foreign market knowledge 0.837; and the speed of internationalization 0.834. As can be seen, all the CR values of the constructs of the research conceptual model are higher than 0.7. Therefore, the composite reliability of the research conceptual model is confirmed. As the findings showed, the validity of the different constructs of the research conceptual model have been confirmed at the level of the constructs.

In the structural section, coefficients such as path (beta), determination coefficients (R2), Z coefficients and predictive coefficients (Q2) are presented. As can be seen from Figure (2), the relationship between the two constructs of business intelligence and organizational agility among pharmaceutical SME companies in Alborz province shows a value of 0.288. It means that business intelligence has a direct effect of 28.8% on the variable of organizational agility in a positive and increasing state, and as the business intelligence coefficient increases on the part of pharmaceutical SME companies of Alborz province, we can expect more dynamic organizational agility. This amount in the relationship between business intelligence and internationalization speed is equal to 0.315; entrepreneurial characteristics with organizational agility equal to 0.483; Entrepreneurial characteristics with internationalization speed equal to 0.320 and the relationship between organizational agility and internationalization

speed equal to 0.227 have been estimated. As can be seen, the structure of foreign market knowledge has not been able to have a significant impact on organizational agility (-0.064) and the speed of internationalization (-0.008). The coefficient of determination, which is presented only for the endogenous structures of the model, is 0.472 in the agility variable and 0.601 in the internationalization speed variable, respectively, at a medium and close to strong level.

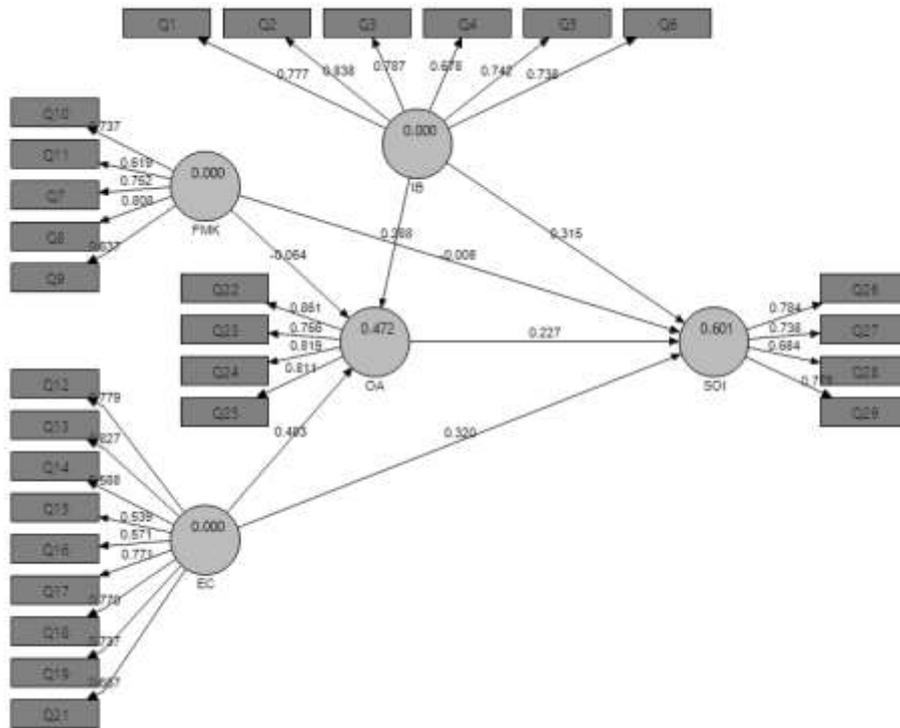


Fig2. The conceptual model of research in the mode of path coefficients and determination

Regarding the significance coefficient Z, based on the relationships determined in the conceptual model of the research and the 10 hypotheses of the research, there are 3 hypotheses in the form of mediators that should be used to calculate the Z coefficient using the Sobel test and to determine the intensity of the effect using the VAF test which is given below. Nevertheless, in the other seven paths, the significant coefficient is rejected except for the relationship between the structure of foreign market knowledge and organizational agility and the speed of internationalization because the Z coefficient is lower than the level of 1.96 with the values of 0.498 and 0.067, respectively. However, the relationships were confirmed in 5 other paths.

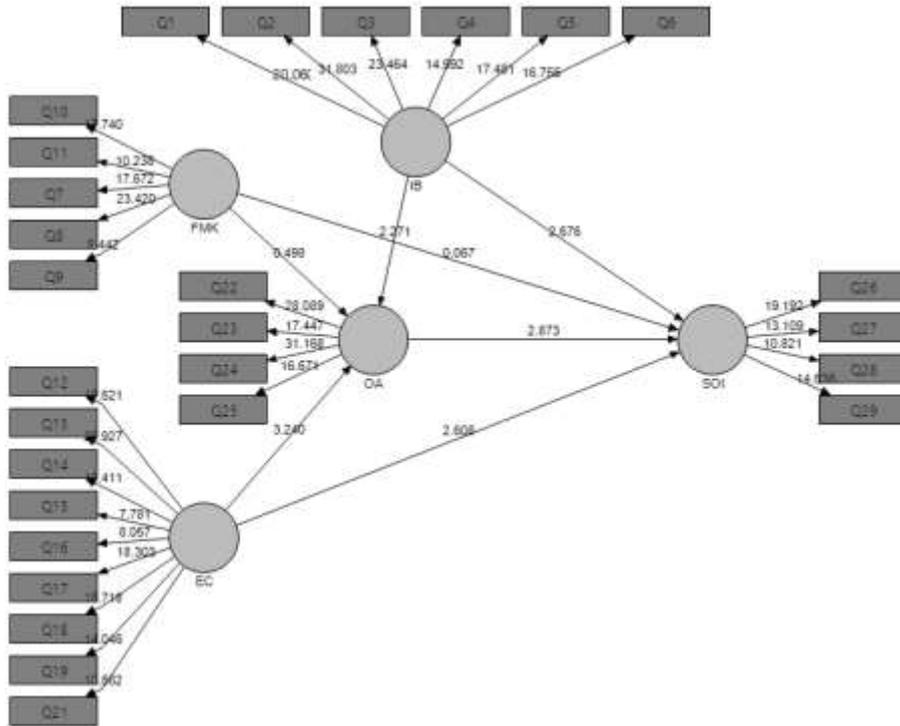


Fig3. The conceptual model of research in the case of significant coefficients

In the Sobel test, to calculate the role of the mediator, the following instruction should be followed.

$$Z - value = \frac{a \times b}{\sqrt{(b^2 \times s_a^2) + (a^2 \times s_b^2) + (s_a^2 \times s_b^2)}}$$

$$VAF = \frac{a \times b}{(a \times b) + c}$$

In table (5), the results of the Sobel test for hypotheses 8, 9 and 10, which investigated the mediating role of organizational agility, are given:

Table 6. The Results of Mediating Role of Organizational Agility Based On Sobel and VAF Test

VAF	Z value in Sobel test	Dependent	Mediator	Independent	Hypothesis
0.172	2.241	The speed of internationalization	Organizational Agility	Business Intelligence	8
0.067	-0.156	The speed of internationalization	Organizational Agility	Foreign market knowledge	9
0.256	3.143	The speed of internationalization	Organizational Agility	Entrepreneurial characteristics	10

#### 4-2. Overall Model Fit

In order to measure the fit of the overall research model, the GOF statistic is used, which is done according to the following formula. The average shared values is equal to 0.560 and the average coefficients of determination is equal to 0.537. According to this:

$$\text{GOF} = \sqrt{(0.560 \times 0.537)} = 0.548$$

According to the coefficient obtained in the GoF statistic = 0.548, the conclusion regarding the conceptual model of the research can be made at a strong level according to the three values of 0.01, 0.25 and 0.36.

#### 4-3. The results of research hypotheses

In order to make a final conclusion regarding the developed hypotheses, it is necessary to act on the basis of two statistics, the path coefficient and the significance coefficient, which are given in table (7), the final conclusion of the research hypotheses.

Table 7. The Results of Research Hypotheses

Hypotheses	VAF	Path coefficient	Significance coefficient	Result
Business intelligence has a significant effect on organizational agility in pharmaceutical SME companies of Alborz province.	—	0.288	2.271	Approved
Foreign market knowledge has a significant effect on organizational agility in pharmaceutical SME companies of Alborz province.	—	-0.064	0.498	Rejected
Entrepreneurial characteristics have a significant effect on organizational agility in pharmaceutical SME companies of Alborz province.	—	0.430	3.240	Approved
Business intelligence has a significant effect on the speed of internationalization in pharmaceutical SME companies of Alborz province.	—	0.315	2.676	Approved
Foreign market knowledge has a significant effect on the speed of internationalization in pharmaceutical SME companies of Alborz province.	—	-0.008	0.067	Rejected
Entrepreneurial characteristics have a significant effect on the speed of internationalization in pharmaceutical SME companies of Alborz province.	—	0.320	2.608	Approved
Organizational agility has a significant effect on the speed of internationalization in pharmaceutical SME companies of Alborz province.	—	0.227	2.873	Approved
Business intelligence has an effect on the speed of internationalization in pharmaceutical SME companies of Alborz province through the mediating variable of organizational agility.	0.172	—	2.241	Approved
Foreign market knowledge has an effect on the speed of internationalization in pharmaceutical SME companies of Alborz province through the mediating variable of organizational agility.	0.067	—	-0.156	Rejected
Entrepreneurial characteristics have an effect on the speed of internationalization in pharmaceutical SME companies of Alborz province through the mediating variable of organizational agility.	0.256	—	3.143	Approved

## 5. Discussion and conclusion

According to the confirmation of hypothesis H1, it can be said that the pharmaceutical SME companies of Alborz province use business intelligence as an important advantage in the operational structure in order to increase their agility level. In fact, due to the knowledge-based nature of the SME companies of Alborz province in drug production and their strong dependence on knowledge and information, in order to be able to communicate with their stakeholders, especially customers, in the industry environment, both domestic and foreign, they benefit from the capacities of business intelligence. In addition to this, i.e. optimal decision-making, pharmaceutical SME companies of Alborz province also pursue organizational learning, adaptability, improving operational efficiency and strengthening organizational intelligence. All these actions are done in order to be able to operate and be recognized as an agile pharmaceutical SME in the industry environment. In fact, they seek to create and improve a sustainable brand image by taking advantage of business intelligence and strengthening organizational agility capacities. Because, business intelligence is a strategic action, and naturally, pharmaceutical SME companies of Alborz province look at it from a long-term point of view, rather than doing something on a temporary basis and not paying attention to its long-term consequences. The findings of this hypothesis are in line with the studies of Cheng et al. (2020), Jain et al. (2019), and Cassiro and Coelho (2019). Despite rejecting the H2 hypothesis, it may be possible to analyze this issue from different angles. Of course, the rejection of this hypothesis does not mean that pharmaceutical SME companies of Alborz province are not looking for foreign market knowledge. But they may have a different mechanism. Anyway, the health and treatment system in Iran is strongly affected by political events and decisions, and maybe even the pharmaceutical SME companies of Alborz province only operate as companies that only produce drugs and the main work government institutions are in charge (of course, it is only raised as a theoretical discussion). Alternatively, even it is possible that the activity structure of the pharmaceutical SME companies of Alborz province is far from what should happen in line with organizational agility to achieve and accelerate the internationalization process. Or perhaps, strategic alignment between organizational units such as marketing with manufacturing and operations may be non-existent or weak. In any case, no relationship was found between foreign market knowledge and organizational agility in the pharmaceutical SME companies of Alborz province, which could be related to various phenomena. The findings of this hypothesis are not in line with the studies of Zahoor and Al-Tabbaa (2021), Nemkova et al. (2017), Cheng et al. (2020), and Gomes et al. (2020). According to the confirmation of hypothesis H3, it can be said that with a high coefficient of 48.3%, entrepreneurial characteristics in the dimensions of international experience, understanding and development of global opportunities, differentiation and innovation-oriented organizational agility in pharmaceutical SME companies of the province Alborz is effective and decisive. This relationship and the high path coefficient show that managers and senior organizational decision-makers of pharmaceutical SME companies in Alborz Province have been able to understand the importance of international entrepreneurship well and in order to be able to compete in the international environment Unpredicted changes and developments show a better and more appropriate reaction, they have tried to guide the entrepreneurial characteristics in the path of operational agility. In fact, pharmaceutical SME companies of Alborz province have become aware of behavioral and attitudinal orientation in this field and have been able to implement this alignment in the framework of their activities and processes. The findings of this hypothesis are in line with the studies of Hsieh et al. (2019), Hollander et al. (2017), Vilent and Lafonte (2019), and Kalinic and Forza (2012). According to the confirmation of the hypothesis H4, it can be said that the pharmaceutical SME companies of Alborz province implement their information and knowledge system in sync with their internationalization in the global environment. Now, to what extent they have been successful in this matter, it is necessary to conduct a longitudinal and economic investigation. But what can be stated in terms of behavior and management is that the use of business intelligence by pharmaceutical SME companies in Alborz province leads to better alignment of organizational resources, improvement of operational capabilities and performance consequences such as speeding up the process between has been internationalized and this issue can certainly be considered a desired result for pharmaceutical SME companies of Alborz province. The findings of this hypothesis with the studies of Yam and Chan (2015), Chen and Yeh (2012), Dubey et al. (2019), Ferraris et al. (2021), Cheng and Yang (2017), and Deng and Yang (2015). It is aligned.

According to the rejection of hypothesis H5, it can be said that, like the second hypothesis that did not show a significant relationship with organizational agility, here too, foreign market knowledge has no significant relationship with the speed of internationalization of pharmaceutical SME companies in Alborz province. Like the

previous relationship, perhaps this lack of relationship can be examined from different angles. Perhaps one of these cases is the scope of activities of pharmaceutical SME companies of Alborz province at the global level. They may have only one destination in the region or interact with the countries of the region in general. Or maybe product diversity is also effective in this field. That is, the number of products they produce, the importance of the product class for foreign markets, economic and political restrictions such as embargo, etc., all of these things can affect the application of foreign market knowledge in the direction of business internationalization. The findings of this hypothesis are not in line with the studies of Zahoor and Al-Tabbaa (2021), Stoian et al. (2018), Prashantam and Young (2011), and Svoboda and Oljenik (2016).

According to the confirmation of hypothesis H6, it can be said that it should be considered that the internationalization of entrepreneurship is a hybrid strategy. The adoption of entrepreneurial characteristics by pharmaceutical SME companies of Alborz province is only in line with the internationalization of business. A company in another industry may consider other characteristics. But what this finding shows is that the application and practice of entrepreneurial characteristics has been successful to the extent that it can put the pharmaceutical SME companies of Alborz province on the path of internationalization and speed it up. The findings of this hypothesis are in line with the studies of Hsieh et al. (2019), Vanninen et al. (2017), Hughes et al. (2010), and Martin et al. (2017).

According to the confirmation of hypothesis H7, it can be said that the relationship between organizational agility and speed of internationalization in pharmaceutical SME companies of Alborz province has been confirmed. Perhaps the reason for this issue is especially during the last two years with the start of the corona virus epidemic, that the pharmaceutical SME companies of Alborz province have come to the conclusion that with all the restrictions they were facing, especially the sanctions issue. In this turbulent environment, with high uncertainty and high risk, economic companies have been able to cover the needs of their target markets. Of course, this hypothesis itself needs a deeper field investigation. In general, it can be concluded that the organizational agility of the pharmaceutical SME companies of Alborz province has shown a positive and significant effect on the speed of their internationalization. The findings of this hypothesis are in line with the studies of Stahl and Voigt (2008), Dow (2002), Cheng et al. (2020), and Stoian et al. (2018). In hypothesis H8, the path coefficient in the relationship between business intelligence and internationalization speed is equal to 0.315. This means that the structure of business intelligence has a direct effect on the structure of internationalization speed by 31.5%. The same amount in relation to organizational agility variable is equal to 0.288. That is, business intelligence has a direct effect on the organizational agility structure by 28.8%. But what should confirm or reject this hypothesis is the significance coefficient Z-value obtained from the Sobel test. This value in this hypothesis for the mediating role of organizational agility is equal to 2.241, which is higher than the 1.96 level; the hypothesis is confirmed at the 95% confidence level. Also, the intensity of the indirect effect of the organizational agility variable in this hypothesis was estimated as 0.172, which shows that nearly one fifth of the total effect of business intelligence on the speed of internationalization is indirectly through the mediating variable of organizational agility to the extent of 4/5 is explained. Therefore, it can be claimed that organizational agility in the space of pharmaceutical SME companies in Alborz province is considered as an effective variable in the relationship between business intelligence and the speed of internationalization, and the managers of SME companies Pharmaceutical companies of Alborz province should pay attention to this relationship in the arrangement of organizational strategies in their functional space. The findings of this hypothesis are consistent with the studies of Cheng et al. (2020), Jain et al. (2019), Casiro and Coelho (2019), Yam and Chan (2015), Chen and Yeh (2012), Dubey et al. (2019), Ferraris et al. (2021), Cheng and Yang (2017), and Deng and Yang (2015), are consistent.

In hypothesis H9, the path coefficient in the relationship between foreign market knowledge and internationalization speed is equal to -0.008. The same amount in relation to organizational agility variable is equal to -0.064. As in the second and fifth hypotheses, the relationship between foreign market knowledge and both the structure of organizational agility and the speed of internationalization was rejected, in this hypothesis; the mediating role of organizational agility is also rejected due to the low significance coefficient Z-0.156. It was not approved from the acceptable level of 1.96. Therefore, it cannot be claimed that organizational agility in the space of pharmaceutical SME companies of Alborz province can be considered as an effective variable in the relationship between foreign market knowledge and the speed of internationalization. The findings of this hypothesis with the

studies of emergence and printing (2021), Nemkova et al. (2017), Cheng et al. (2020), Gomes et al. (2020), Stoian et al. (2018), Prashantam and Yang (2011), and Svoboda and Olejnik (2016), it is not aligned

In hypothesis H10, the path coefficient in the relationship between entrepreneurial characteristics and speed of internationalization is equal to 0.320. This means that the structure of entrepreneurial characteristics has a direct effect on the structure of internationalization speed by 32%. The same amount in relation to organizational agility variable is equal to 0.483. That is, entrepreneurial characteristics have a direct effect on the structure of organizational agility by 48.3%. But what should confirm or reject this hypothesis is the significance coefficient Z-value obtained from the Sobel test. This value in this hypothesis for the mediating role of organizational agility is equal to 3.143, which is higher than the 1.96 level; the hypothesis is confirmed at the 95% confidence level. Also, the intensity of the indirect effect of organizational agility variable in this hypothesis was estimated as 0.256, which shows that nearly one-fifth of the total effect of entrepreneurial characteristics on the speed of internationalization is indirectly through the mediating variable of organizational agility. It is explained as 2.8. Therefore, it can be claimed that organizational agility in the space of pharmaceutical SME companies in Alborz province is considered as an effective variable in the relationship between entrepreneurial characteristics and the speed of internationalization, and company managers Pharmaceutical SMEs of Alborz province should pay attention to this relationship in the arrangement of organizational strategies in their functional space. The findings of this hypothesis with the studies of Hsieh et al. (2019), Hollander et al. (2017), Vilent and Lafonte (2019), Kalinic and Forza (2012), Vanninen et al. (2017), Hughes et al. (2010), and Martin et al. (2017), is aligned.

### **5-1. Practical suggestions for research**

According to the test of research model assumptions, the following practical suggestions are presented:

When it comes to business intelligence, it is actually an organizational capability that by achieving it, organizations can create a significant distinction with their competitors and peers. The reason is that with the institutionalization of business intelligence in the organization, all departments including marketing and sales, human resources, finance, support and other departments are involved in the development process of business intelligence. This all-round conflict provides an opportunity for the organization to increase the achievement rate of organizational goals and to constantly struggle and make necessary revisions regarding new strategies in their business. Considering the confirmation of the effect of business intelligence on organizational agility in pharmaceutical SME companies of Alborz province, it is suggested to create a more coherent and comprehensive structure in relation to gathering information from the industry environment within the organization. To design such a system, they should adopt a bottom-up approach so that all the elements of the organization can work to achieve the organizational goals. For this purpose, first, a specific unit should be built for this problem, and its purpose is that by relying on new technologies such as artificial intelligence and automation processes based on information technology, all the data that enters the company should be to be collected and analyzed there. In the next step, according to the needs of each department, essential and vital information should be presented to them for decision-making and action. In addition, this process requires a feedback section from other information receiving sections to give a more comprehensive understanding and a more realistic view to the members of this unit. The total of these measures increases the organizational agility of pharmaceutical companies.

The nature and definition of an SME company means the establishment of a company by a series of entrepreneurial and innovative people. Therefore, when it comes to entrepreneurial characteristics at the global level, it means those who, in addition to having entrepreneurial ethics and spirit, also have a broader understanding of the characteristics of a business at the international level. In order for the pharmaceutical SME companies of Alborz province to be able to increase their organizational agility level due to their entrepreneurial characteristics, it is suggested that they employ forces that work philosophy in have a global level and be able to adapt themselves to the philosophy of the organization to be present in the international arena. For this purpose, a separate selection system is required in the organizational structure. It means that pharmaceutical SME companies should prepare an attraction system to attract pure and capable talents in the field of global business. Not that only expert are attracted. Perhaps this issue itself also causes limitations in the horizon of the company. With the thought that we have expert people, but unaware that in order to be a leader in the global arena, we need those who, in addition to expertise, need capabilities beyond academic expertise. Capabilities that can be used for the company at the global level. It is not enough to just deal with the experience.

As mentioned in the first hypothesis, it was determined how important business intelligence is for a company aiming to operate in the global arena. What can be inferred from the findings and results of this hypothesis, despite the confirmation of the relationship between business intelligence and speed of internationalization in pharmaceutical SME companies of Alborz province, is that what makes pharmaceutical companies to speed up their internationalization and develop; it is basically the knowledge management system in the organization. Because, business intelligence means collecting information and analyzing data, especially big data from the market environment with the help of artificial intelligence, but the structure of knowledge management is actually the guide of this flow. That is, it even specifies what information to collect, what areas to focus more on, what markets to monitor more, trends and developments to be taken into account, etc. Therefore, the fact that organizations have the advantage of business intelligence increases their ability to react to environmental trends. Besides that, if pharmaceutical companies want to achieve their higher goal, which is to speed up their internationalization process, they should have a knowledge management structure based on advanced technologies in the organization. Design and implement. This structure should include all parts and departments of the organization.

The entrepreneurial approach in the international space is actually a type of external responsibility that companies create for themselves. Considering the confirmation of the effect of entrepreneurial characteristics on the speed of internationalization in pharmaceutical SME companies of Alborz province, it is suggested that they formulate clear and transparent policies in the field of their external responsibility. These policies should be based on the organization's philosophy and presence in the international arena. Crossing internal borders and entering the global arena means creating a series of new values in the organization. Therefore, in order to overcome the challenges and unforeseen phenomena of the international environment, pharmaceutical SME companies should make their best efforts in thinking and operating compatibility between internal processes and procedures with the external environment. Organizational agility should be considered as a necessity in the organizational structure due to the existence of continuous changes, the requirement to respond immediately to changes and market movements, as well as the creation of value based on customer satisfaction. Regarding the importance of agility, it can be said that agility consciously and weightily reacts to changes with unpredictable characteristics in the environment and enables organizations to grow and develop in a competitive environment. As can be seen, in order for pharmaceutical organizations to improve their internationalization speed, they must increase their agility level. For this purpose, it is suggested that they put the development of their human resources on their agenda in the first place. They should note that even at the international level, what makes organizational donation possible is the organization's human resources. Therefore, all employees, whether they are in the laboratory, whether they are in the research and development unit, managers and assistants, all of them should be developed according to their operational level and role-playing, compatible with the changes in the international environment. The next thing is that, first, a system is defined within the organization in which the required competencies are defined, and along with the progress and development of the business, people with unique characteristics and skills and special competencies enter that structure. In fact, creating a platform based on artificial intelligence applications that can be used by both applicants and the organization itself when faced with global opportunities. It means to provide a two-way relationship with accessibility for all employees so that everyone can define themselves there.

Considering the confirmation of the mediating role of organizational agility in the relationship between business intelligence and speed of internationalization in the pharmaceutical SME companies of Alborz province, it is suggested that in order to improve the speed of their reaction in the environment compared to competitors, share-Putting knowledge (collected data and information based on the business intelligence approach) among employees should be seen as a culture and value and adhere to it. It is also suggested that in order to be able to adapt better to the international environment, they should take advantage of the knowledge management approach. This knowledge management approach should emerge in the organizational philosophy and perspective. Considering the confirmation of the mediating role of organizational agility in the relationship between entrepreneurial characteristics and speed of internationalization in pharmaceutical SME companies of Alborz province, it is suggested to understand the openings of the global market well and find the ways they can quickly design and implement entry into those markets. It is also suggested that pharmaceutical companies design and produce products according to the needs of global market customers and prepare a separate unit in the organization to design, manufacture and produce products for supply to global markets in their organizational and operational structure.

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Hossein Norouzi, Associate Professor of Business Management, Faculty of Management at Kharazmi University in Tehran. His research focuses on Marketing, Business Strategies and Consumer Behavior. He is author of more than 100 articles and author and translator of several books about Marketing and International Business. He has teaching courses such as Marketing Management, Consumer Behavior Management, Principles of Commercial Negotiation and International Business Strategies.



Soheila Khoddami works as an Associate professor in the Faculty of Management at Kharazmi University in Tehran, where she has been since 2012. From 2013 to 2015, she served as Vice-Dean for education and from 2015 to 2018 she served as Vice-Dean for research in the Faculty of Management. She received Ph.D. in International Marketing Management from Tarbiat Modares University of Iran in 2012. Her research interests span both brand management and marketing strategy. She has administrative and teaching experiences in many organizations such as banks and etc. She has written several scholarly articles and is author and co-author of several books.



Haniye Bazrpour, MSc, is graduated in Business Administration, majoring in International Business from Kharazmi University of Tehran. She is very interested in research and education. She is concerned with study and research in the field of International Business and Foreign Trade.