



Article

# Funding Access and Innovation in Small Businesses

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**Abstract:** The study examined the extent to which lack of access to external funding constitutes a barrier to innovation for small businesses operating in traditional industries. The findings indicate that, these businesses do not view lack of access to funding as a barrier to innovation for any of the four types of innovation: product, process, marketing, or organizational. However, for most of the innovations they promoted, the levels of innovation were relatively low, and which naturally entails relatively low risk to businesses. The findings also indicate that, there is a relationship between product and marketing levels of innovation and lack of access to external funding. The study's contribution lies in its focus on small businesses operating in traditional industries—businesses which though, essential to economic growth, have garnered less separate attention in the innovation sphere. The study points to a vicious circle in which these businesses do not promote innovation at high levels that would advance their own competitive advantage and require external funding. Because this funding is not within their reach, they continue promoting low-level innovation, and so on and so forth. The study may practically contribute by assisting policymakers as they draw plans dedicated to supporting innovation in small businesses.

**Keywords:** access to funding; innovation; small businesses; traditional industry

## 1. Introduction

The growing interest in small businesses stems from the perception that these companies constitute one of the main engines of economic growth, and as the main source of new jobs (Henrekson and Johansson 2010; OECD 2009). However, numerous studies have indicated that small businesses have difficulties with access to funding at various stages of their lifecycle, especially in terms of obtaining funding to promote innovation (Bar-El et al. 2017; OECD 2013).

The aim of the present study is to determine whether, and to what extent, lack of access to external funding sources constitutes a barrier to innovation promotion in small businesses operating in traditional industries.

While the funding access problems faced by small businesses have been addressed by numerous studies, these studies have not discussed the unique situation of small businesses operating in traditional industries. Moreover, many earlier studies on small businesses funding have focused on businesses in technological fields and at early stages of the business lifecycle (Bianchi et al. 2010; Colombo et al. 2014; Hossain 2015; Lee et al. 2010; Van de Vrande et al. 2009; Vanhaverbeke and Cloudt 2006; West et al. 2006).

In addition, most studies view small and medium-sized enterprises (SME) as one cohesive group, despite considerable differences in their size and characteristics (Jeong et al. 2018), and many of these studies focused on product and process innovation rather than exploring other types of innovation as

well (De Toni and Nassimbeni 2003; Oke et al. 2007; Mosey 2005). Unlike previous studies, the current one focuses specifically and separately on small businesses that, despite their unique characteristics, have received relatively less attention in the literature with regard to innovation, while distinguishing between the four types of innovation (product, process, marketing and organization), and between different levels of innovation: incremental and radical innovation, which lie at the two extremes of the level of the innovation spectrum. The study also seeks to determine whether lack of access to funding causes these businesses to focus on promoting innovation at a relatively low level—incremental innovation that does not require much funding, and thereby gives these businesses a means of minimizing the risks embodied in innovation.

In promoting incremental innovation, both investment and risk levels are relatively low, meaning that standard funding entities such as commercial banks, which are familiar with the business and its owner from their ongoing business activity, are likely to participate in financing, though in a limited way, and backed up by collateral in the form of existing assets and owner guarantees. In light of the relatively low investment and risk levels involved in promoting incremental innovation, the business' need to obtain additional funding from entities devoted to promoting innovation is likely to be lower. By contrast, in radical innovation, where investment and risk levels are higher, greater business and financial exposure are required of the business and its owner, which also deters funding sources.

The decision to study this group of businesses from among all small businesses stemmed from the fact that this is a distinct group, consisting of businesses that operate in traditional industrial fields and invest relatively small sums in research and development (“R&D”) activity. At the same time, the centrality of these businesses to the economy underscores the need to understand the way in which they promote innovation, while coping with a lack of access to external funding sources.

The study is structured as follows. First, we present a short literature review, including the characteristics of small businesses and definitions of the concept of innovation, then provide background and insights regarding lack of access to funding sources for innovation in small businesses. The next section presents the research methodology we employed including the research question and hypotheses, and an explanation of the data collection, and method. This is followed by the findings section and conclusions. We conclude with the theoretical contribution made by the research and its practical implementation and a recommendation for future research.

## 2. Theoretical Background

### 2.1. Small Businesses

Small businesses are defined as businesses that employ up to 50 employees (European Commission 2003; Prime Minister's Office 2014). They are often characterized by limited regional activity, relatively small market share, operate in niche and highly specific markets and typically have a single or small group of owners, managed by the primary owner (Carland et al. 2007; Schollhammer and Kuriloff 1997; Matejun 2017). In the manufacturing sector particularly, many small businesses act as specialist suppliers of parts, components and subassemblies, and as subcontractors to large companies (Yew Wong and Aspinwall 2004). Nonetheless, the most important distinguishing characteristic of small businesses is their unique management style. Here, management is personal, since the managers know each individual employee, are involved in every aspect of managing the business, and often do not include others in decision-making processes (Carson 1990; Miller 1983; Schollhammer and Kuriloff 1997; Yew Wong and Aspinwall 2004). The manager typically performs multiple roles in the company and serves as a centralized junction for information transfer and decision-making (Cardoni et al. 2019; Yew Wong and Aspinwall 2004).

Small businesses are perceived as an important growth driver in the economy, responsible for creating a significant proportion of new jobs (Henrekson and Johansson 2010; OECD 2009), inspiring the development of new ideas, and encouraging the efficient use of resources (Baas and Schrooten 2006). In the ever-changing economic environment, small businesses have advantages for innovation,

expressed in their flexibility, dynamism, rapid response, adaptability to market changes, informal communication coupled with less bureaucracy, rapid decision making, and greater entrepreneurial spirit (Bommer and Jalajas 2004; Tzadik 2007; Vossen 1998).

## 2.2. Innovation

There is still no broad consensus on the meaning and exact definition of innovation (Baregheh et al. 2009) and on its practical measures (Dziallas and Blind 2019; Kleinknecht et al. 2002; Smith 2005). Schumpeter (1934) was among the first to define the role of innovation, in identifying innovation as the critical dimension of economic change. Thompson's (1965) definition simply states: "Innovation is the generation, acceptance and implementation of new ideas, processes, products or services." A similar definition was proposed by West and Anderson (1996), and quoted by Wong et al. (2009): "Innovation can be defined as the effective application of processes and products new to the organization and designed to benefit it and its stakeholders." Damanpour (1996) provides a detailed definition of innovation: "Innovation is conceived as a means of changing an organization, either as a response to changes in the external environment or as a pre-emptive action to influence the environment." Plessis (2007) notes: "Innovation as the creation of new knowledge and ideas to facilitate new business outcomes, aimed at improving internal business processes and structures and to create market driven products and services."

According to the OECD, innovation is the implementation of a new or significantly improved product or process, new marketing method, or new organizational method in business practices, workplace organization, or external relations (OECD 2005). This study adopts the definition of innovation offered by Israel's Central Bureau of Statistics, based on the OECD definition, which embraces technological innovation in product and processes and non-technological innovation in marketing and organization (Central Bureau of Statistic 2012).

## 2.3. Lack of Access to Funding Sources for Innovation

Many studies show that small businesses face a variety of barriers to promoting innovation (Asheim et al. 2003; Caputo et al. 2002; Harel and Kaufmann 2020; Hossain 2015; Lee et al. 2010; Marom and Lussier 2018; Van de Vrande et al. 2009), which is essential for their development and growth (Chesbrough 2003). According to Caputo et al. (2002), the innovation process requires sources of funding and involves risk that large businesses are generally better at coping with, in view of their access to financial resources and their ability to diversify risks through several parallel projects. The main barriers to innovation for small businesses are funding the high cost of innovation activity, fear of change and lack of information regarding external sources of assistance (Caputo et al. 2002; Harel et al. 2019b).

Berger and Udell (1998), Beck and Demirguc-Kunt (2006), and Ayyagari et al. (2006) argue that small businesses suffer from financial constraints that hamper their ability to grow, that they have less access to formal external sources of funding compared to larger companies, and that they rely on informal sources such as family and friends.

These studies present the clearest illustration of the difficulties facing small firms when attempting to obtain funding from financial institutions, particularly for firms operating in traditional industries that are based on knowledge and innovation that have yet to develop equity-based funding mechanisms, such as venture capital funds ("VC") (Harel and Kaufmann 2016).

Harel and Kaufmann (2020), draw attention to the existence of market failure in funding innovation for small businesses operating in traditional industries. According to their research, this market failure includes structural factors that stem from the combination of the unique characteristics of these businesses (small, innovative, lacking tangible assets to serve as collateral, active in diverse sectors, and in small markets characterized by relatively low growth) and the operational business models of existing sources of financing (such as commercial banks, business incubators, venture capital and private equity funds), which do not allow them to provide suitable funding solutions compatible

with these businesses, due to their operation in traditional industries that are not the focus of those financing entities. As mentioned, small businesses are perceived as an important growth driver in the economy, and have many advantages in innovation, but at the same time, these financing challenges can impede companies' ability to reach their full growth potential, and thus may be detrimental, not just to the growth of individual firms, but to the economy as a whole. Therefore, it is important to understand the dynamics of innovation and funding difficulties in small businesses in order to adapt and facilitate government programs to promote innovation for this sector and contribute to the growth of the entire economy.

### 3. Research Methodology

#### 3.1. Research Question and Hypotheses

The research question is: To what extent does lack of access to external funding sources, constitute a barrier to promoting innovation in small businesses operating in traditional industries?

This question will be examined using the following hypotheses:

**Hypothesis 1 (H1).** *The lower a business's level of product innovation, the less lack of access to external funding sources constitutes a barrier to innovation promotion.*

**Hypothesis 2 (H2).** *The lower a business's level of process innovation, the less lack of access to external funding sources constitutes a barrier to innovation promotion.*

**Hypothesis 3 (H3).** *The lower a business's level of marketing innovation, the less lack of access to external funding sources constitutes a barrier to innovation promotion.*

**Hypothesis 4 (H4).** *The lower a business's level of organizational innovation, the less lack of access to external funding sources constitutes a barrier to innovation promotion.*

#### 3.2. Research Variables

**Dependent variable.** The extent to which lack of external funding sources constitutes a barrier to promoting innovation in the business.

**Independent variables.** The level of innovation in the four types of innovation in the business: product, process, marketing and organizational innovation (Central Bureau of Statistic 2012; Oke et al. 2007).

**Control variables.** Many studies have noted the relationship between various business characteristics and access to external funding and innovation promotion. The business characteristics chosen as control variables in the present study are: size and age (Marques and Ferreira 2009; Vega-Jurado et al. 2008), level of human capital, R&D activity (Caloghirou et al. 2004), growth and export sales (Autio et al. 2000; Chetty and Campbell-Hunt 2004; Rialp et al. 2005; Zahra et al. 2000), sales from subcontracted work (Kumar and Subrahmanya 2010), and sales by business' customer type (B2B or B2C).

Previous studies also showed that various managerial processes and tools employed by businesses to promote innovation have an impact on their level of innovation. Therefore, it was decided to add the following control variables: Business activity aimed at acquiring external knowledge (Caloghirou et al. 2004; Harel et al. 2019b); external collaborations for innovation purposes (Harel et al. 2019b; Kaufmann and Schwartz 2008; Kaufmann and Schwartz 2009; Öberg and Alexander 2018; Stanko et al. 2017); managerial processes for utilizing knowledge (Ahluwalia et al. 2017; Caloghirou et al. 2004; Harel et al. 2020a; Shrafat 2018); and an organizational culture that encourages innovation (Harel et al. 2020b; Skarzynski and Gibson 2013; Terziowski 2010).

### 3.3. Sample

The sample included small businesses in the industry sectors in Israel that employ between 10 and 50 employees. The sample included 202 small businesses, with a geographical distribution from Hadera in the north to Beer-Sheva in the south, based on data from the Association of Craft and Industry in Israel that include all small businesses in these sectors, which by law, are incorporated into this organization.

### 3.4. Data Collection

Data collection was conducted using a structured questionnaire divided into four parts: lack of funding sources as a barrier to innovation, level of innovation, characteristics of the business, and processes and tools for promoting innovation in the business.

### 3.5. Lack of Funding Sources as a Barrier to Innovation

The managers were asked to rate, on a Likert scale (1–5), the extent to which a lack of external funding sources constituted a barrier to promoting innovation in their businesses. The options were: not at all, to a limited extent, to a moderate extent, to a great extent, to a very great extent.

### 3.6. The Level of Innovation

For each of the four types of innovation in the business: product, process, marketing and organizational, the level of innovation was measured according to four degrees of innovation. First-degree innovation indicates a significant improvement of an existing product, process, or method. Second-degree innovation indicates products, processes, or methods that are new to the business, but exist in the local market. Third-degree innovation indicates products, processes, or methods that are new both to the business and to the local market. Fourth-degree innovation indicates products, processes, or methods that are new to both the business and the global market (Oke et al. 2007).

The business managers were asked to indicate the number of innovations implemented in the business in the last three years for each type of innovation, as well as the degree of each innovation on a scale of grades from 1 to 4 (improvements on existing products, processes, or methods; new to the business but existing in the local market; new to both the business and the local market; or new to both the business and the global market). The level of each type of innovation was calculated based on a weighted index of the number of innovations and the degree of innovation (Bobko et al. 2007; Miron-Spektor et al. 2011).

### 3.7. Process and Tools for Promoting Business Innovation

#### 3.7.1. Business Activity Aimed at Acquiring External Knowledge

The knowledge-acquisition activity index, based on a validated index used by Caloghirou et al. (2004), consists of six items: searching patent databases; searching the Internet for professional information; entering competitors' sites; conducting engineering analysis of competing products; participating in exhibitions and professional conferences; and collecting data from the professional press. Each manager was asked to estimate the extent of the business's activity over the past three years in each of the items on a Likert scale (1–5).

#### 3.7.2. External Collaboration for Innovation

The external collaboration index is based on Marques and Ferreira (2009) and Zeng et al. (2010), and includes the number of collaborations to promote innovation with each of the following seven entities: suppliers, customers, other businesses, consultants, academic institutions, public institutions and government authorities, and professional associations. For each item, the manager was asked to



indicate the number of collaborations that were carried out for promoting innovation over the past three years. For each manager, a total of the number of collaborations was calculated.

### 3.7.3. Managerial Processes for Knowledge Utilization (“Sharing Knowledge Processes”)

These processes include five managerial practices: holding weekly meetings for sharing and transferring information, transferring information to employees, reporting on external information after participating in professional conferences, meeting with customers, and so on, maintaining processes for implementing and applying innovations in the business, and taking responsibility for promoting innovation topics as part of the job description of an employee other than the manager. Selection of these processes to the index was based on independent preliminary pilot research and focus groups made with several relevant small businesses. The managers were asked to assess the extent to which each of the five sharing knowledge processes is being implemented on a Likert scale (1–5).

### 3.7.4. Organizational Culture that Encourages Innovation (“Cultural Processes”)

The cultural processes include ten managerial practices. The first six are based on a validated index from a study by Terziovski (2010), while the other four are based on research by Skarzynski and Gibson (2013). The practices are: encouraging employees to engage in informal meetings, monitor their own performance, and share knowledge, focus on teamwork, continuously experiment with new ways of doing things, including a component of creativity in employee remuneration (Terziovski 2010), discussing innovation in meetings with employees, encouraging employees to propose new ideas, implementing employees’ new ideas, and incorporating the consideration of creativity and innovation capabilities into the hiring process of new employees (Skarzynski and Gibson 2013). The managers were asked to assess the extent to which each of the ten cultural processes exists in the business on a Likert scale (1–5).

## 4. Findings

The findings are presented in two parts. The first part includes descriptive statistics that present the characteristics of the businesses; the processes and tools for promoting innovation; the distribution of businesses according to the extent to which lack of external funding sources constitutes a barrier to innovation; and the percentage of businesses that displayed at least one innovation at any degree of innovation and for each type of innovation.

The second part is the main analysis, and presents the correlations between all of the research variables, and the extent to which lack of external funding sources constitutes a barrier to innovation; and the regression analysis that examines the contribution of the level of each type of innovation to the extent to which lack of external funding sources constitutes a barrier to innovation.

### 4.1. Descriptive Statistic

#### 4.1.1. Business Characteristics

More than half of the businesses in the sample have between 10 and 19 employees, while one quarter have between 20 and 29 employees, and another quarter have between 30 and 50 employees. The average number of employees in the businesses is  $M = 22.7$  ( $SD = 13.1$ ), and the businesses’ average age is  $M = 28.3$  ( $SD = 14.2$ ).

Forty percent of the businesses showed no change in their sales over the past three years; in 25%, the average annual change was less than 5%, while in 8% of the businesses, the change was greater than 15%. Seventy percent of the businesses do not export, while for 10% of the businesses, exports account for over 50% of sales.

Forty percent of the businesses work as subcontractors, while for 85% of the businesses, most of their sales are to other businesses (B2B).

Fewer than 20% of the businesses have a continuous R&D activity, while 10% of the businesses engage in ad hoc R&D activity, for specific purposes only.

Furthermore, one third of the businesses have no employees with an engineering or scientific background, and in only 15% of the businesses, more than 20% of their employees have such backgrounds.

#### 4.1.2. Processes and Tools for Promoting Business Innovation

Half of the businesses collaborated with external entities in order to promote innovation. Ninety-five percent of the businesses had an activity aimed at obtaining knowledge from the external environment; however, over 80% of the businesses did this to a limited extent.

In ninety-five percent of the businesses, some kind of sharing knowledge processes took place, and in 15% of the businesses, the processes took place to a great extent. In all businesses, there was a cultural process of some kind, and in 20% of the businesses, these processes took place to a great extent.

#### 4.1.3. The Extent to Which Lack of External Funding Sources Constitutes a Barrier to Innovation

Table 1 presents the distribution of the businesses in the sample according to the extent to which a lack of external funding sources constitutes a barrier to promoting innovation.

**Table 1.** Distribution of businesses according to the extent to which lack of external funding sources constitutes a barrier to promoting innovation in the business.

Lack of External Funding Sources as a Barrier to Innovation	Percentage of Businesses in the Sample (%)
Not at all	52.5
To a limited extent	11.9
To a moderate extent	7.9
To a great extent	20.8
To a very great extent	6.9

The table shows that, for over 70% of the businesses, a lack of external funding sources does not in any way constitute a barrier to promoting innovation in the business, or constitutes a barrier to a relatively limited extent. However, in 30% of the businesses, lack of access to funding still does make innovation promotion more difficult.

#### 4.1.4. The Business' Level of Innovation

Table 2 presents the percentage of businesses that displayed at least one innovation at any degree of innovation, for each type of innovation.

**Table 2.** The percentage of businesses that implemented at least one innovation by type and degree of innovation.

Innovation	Product Innovation (%)	Process Innovation (%)	Marketing Innovation (%)	Organizational Innovation (%)
At least one innovation at any degree of innovation	58.0	60.0	55.0	65.0
<b>Innovation Degree</b>				
Improvement	23.3	20.3	17.3	25.2
New to the Business	42.6	45.0	44.6	46.5
New to Local Market	7.9	0.5	0.5	0.0
New to Global Market	3.0	0.0	0.0	0.0

The table shows that, for each of the four types of innovation, approximately 60% of the businesses in the sample presented an innovation of some kind, however, most of these innovations were at

a relatively low level (an improvement to a product, process, or a method; or an innovation that is new to the business but not to the market). Only 11% of the businesses presented at least one high-level innovation (new to the local or global market), mainly in product innovations.

#### 4.2. Main Analysis

##### 4.2.1. Correlations between the Research Variables and Lack of Access to External Funding Sources

The correlations between business level of innovation and lack of access to external funding sources are presented in Table 3.

**Table 3.** Pearson correlation coefficients between level of innovation for each of the four types of innovation in the business, and lack of access to external funding sources.

	Product Innovation	Process Innovation	Marketing Innovation	Organizational Innovation	M	SD
Lack of external funding sources as a barrier to innovation	0.16 *	−0.06	0.17 *	0.11	2.2	1.4

\*  $p < 0.05$ .

The table shows that significant positive correlations were found between product and marketing innovation and lack of access to external funding sources, but no significant correlations were found with process and organizational innovation.

The correlations between all the other research variables and lack of access to external funding sources are shown in Table 4.

**Table 4.** The correlations between research variables and lack of access to external funding sources.

Variables	Lack of External Funding Sources as a Barrier to Promoting Innovation
<b>Business Characteristics</b>	
Size of business	−0.10
Age of business	−0.14 *
Human capital level	0.20 **
R&D activity	0.17 *
Sales growth rate	0.09
Export sales	0.14 *
Subcontracting	0.01
Sales by type of customer (B2B or B2C)	0.15 *
<b>Processes and Tools for Promoting Innovation</b>	
Activity aimed at obtaining external knowledge	0.28 **
External collaborations	0.20 **
Sharing knowledge processes	0.18 **
Cultural processes	0.33 **

\*  $p < 0.05$ ; \*\*  $p < 0.01$ .

The table shows that the examination of the relationships between business characteristics and lack of access to external funding sources yielded positive and significant correlations with human capital level ( $r = 0.20, p < 0.01$ ), R&D activity ( $r = 0.17, p < 0.05$ ), export sales ( $r = 0.14, p < 0.05$ ) and sales by type of customer—B2B or B2C ( $r = 0.15, p < 0.05$ ). A negative and significant correlation was also found between age of business and lack of access to external funding sources ( $r = -0.14, p < 0.05$ ).

It should be noted that no significant correlations were found with size of business, sales growth rate, or with subcontracting sales.

The table also shows that, in terms of the relationship between the processes and tools for promoting innovation and lack of access to external funding sources, positive, high, and significant correlations were found with cultural processes ( $r = 0.33, p < 0.01$ ), and with business activity aimed at acquiring external knowledge ( $r = 0.28, p < 0.01$ ). Positive and significant correlations were



also found with external collaborations ( $r = 0.28, p < 0.01$ ) and with sharing knowledge processes ( $r = 0.18, p < 0.01$ ).

#### 4.2.2. Regression Analyses

The contribution of level of innovation to the extent to which lack of external funding sources constitutes a barrier to innovation was examined using hierarchical regression analyses, which enabled us to choose the identity of the variables and the sequence of their entry into the regression in stages (Cohen and Cohen 1983; Jansen et al. 2005; Petrocelli 2003; Radmacher and Martin 2001; Rosenzweig et al. 2003; Tsai 2001; Whitener 2001; Zaheer and Venkatraman 1995).

The variables that were significantly correlated in a Pearson’s correlation test with the lack of access to external funding sources were introduced into the regression in four steps. In the first step, the level of product and marketing innovation were introduced; in the second step, the business characteristics were introduced; in the third step, the activity aimed at obtaining external knowledge and external collaborations for innovation purposes were introduced, and in the fourth step, sharing knowledge processes and cultural processes were introduced to the regression.

The regression coefficients are presented in Table 5.

**Table 5.** The regression coefficients.

Variable	$\beta$
<b>Step 1</b>	
Product Innovation	0.16 *
Marketing Innovation	0.14 *
<b>Step 2</b>	
Business age	−0.10
Export sales	0.10
Sales by type of customer (B2B or B2C)	0.15 *
Human capital level	0.15
R&D activity	0.07
<b>Step 3</b>	
Activity aimed at obtaining external knowledge	0.18 *
External collaboration for innovation purposes	0.07
<b>Step 4</b>	
Sharing knowledge processes	−0.12
Cultural processes	0.26 *
$R^2$	0.16

\*  $p < 0.05$ .

In the first step, in which the business innovation levels were introduced into the regression, product and marketing innovation levels were found to have a significant contribution, such that the lower the level of product innovation, and the lower the level of marketing innovation, the less the lack of external funding sources constitutes a barrier to innovation.

In the second step, in which business characteristics were introduced into the regression, sales by type of customer were found to have a significant contribution: the higher the sales were oriented toward other businesses (B2B) and less to the end customers (B2C), the less the lack of external funding sources constitutes a barrier to innovation.

In the third and fourth steps, managerial processes and tools for promoting innovation were introduced into the regression. The business activity aimed at acquiring external knowledge, as well as the cultural processes, make a significant contribution. The lower the extent to which the business

engages in efforts to obtain external knowledge, and the lower the extent to which cultural processes are taking place, the less the lack of external funding sources constitutes a barrier to innovation.

In conclusion, the final model in the study after performing the Pearson's correlation tests and the regression analysis is as follows: the extent to which lack of access to external funding sources constitutes a barrier to promoting innovation in small businesses operating in traditional industries is dependent upon product and marketing level of innovation, on the type of customer (B2B), on the business activity aimed at acquiring external knowledge, and on business cultural processes.

## 5. Discussion

The present study empirically examined the extent to which the lack of access to external funding sources constitutes a barrier to innovation for small businesses operating in traditional industries.

The study findings indicated that for each of the four types of innovation, approximately 60% of the businesses presented innovations of some kind; however, most of these innovations were at relatively low-level (incremental innovation), an improvement to a product, process or a method, or innovations that were new only to the business itself. The study examined the relationship between level of innovation in the four types of innovation, and a lack of access to external funding sources. The findings were obtained from statistical analyses in two stages. In the first stage, correlations between the research variables were examined, in order to determine whether there are relationships between them, and in the second stage, the relative contribution of each of the research variables to the lack of access to external funding sources as a barrier to innovation was examined, via a regression analysis.

In the examination of the relationship between the levels of innovation and the lack of access to external funding sources as a barrier to innovation, positive and significant relationships were found with product innovation and marketing innovation, but surprisingly not with process and organizational innovation.

These findings confirm research Hypotheses H1 and H3, regarding the levels of product and marketing innovation, such that the lower the level of product innovation, and the lower the level of marketing innovation, the less the lack of external funding sources constitutes a barrier to innovation. The findings did not confirm research Hypotheses H2 and H4, regarding the levels of process and organizational innovation.

It may be concluded from the research findings that most small businesses in traditional industries promote incremental innovation, and this seems to be why over 70% of these businesses maintain that lack of external funding sources does not constitute a barrier to promoting their innovation. However, the findings indicate that, within the range of the relatively low levels of innovation, there is a relationship between the level of product and marketing innovation and lack of access to external funding sources. The higher the product or marketing level of innovation, the more likely it is that lack of access to external funding sources will hamper innovation promotion.

A lack of access to external funding sources may cause these businesses to focus on incremental innovation that does not require large-scale funding, thereby constituting, for them, a means of minimizing the risk of innovation. Given the relatively low levels of investment and risk involved in promoting incremental innovation, the business' need for additional funding from entities dedicated to promoting innovation is likely to be lower. Indeed, [Harel and Kaufmann \(2020\)](#), draw attention to the existence of market failure in funding innovation for small businesses operating in traditional sectors.

A possible explanation for the lack of a relationship between process innovation and lack of access to external funding sources lies in the fact that over 40% of small businesses in traditional industries work as subcontractors for other businesses. These businesses are required to adapt production processes to meet their customers' changing requirements, including adapting manufacturing processes to new technical specifications, improving quality and so on. Much of the information and assistance these businesses require for process innovation is delivered by their customers as part of the day-to-day business ([Peng et al. 2013](#)). This may explain why a lack of access to external funding sources does not constitute a barrier to promoting process innovation for these businesses.

A possible explanation for the lack of a relationship between organizational innovation and lack of access to external funding sources may lie in the fact that organizational innovations, such as changes in responsibility and authority, or the adoption of a new management program, require virtually no external resources, and are likely to be introduced into these businesses by the sole decision of the business manager, with no need for anyone else's involvement. Thus, a lack of access to external funding sources for innovation does not necessarily prevent innovation promotion in these organizational spheres.

It is interesting to note that the findings point to several additional factors that significantly affect the extent, to which a lack of external funding sources constitutes a barrier to innovation. The findings indicate that the more a business' sales target other businesses (B2B) rather than end consumers (B2C), the less its activity is aimed at acquiring external knowledge; and the lower the extent to which cultural processes are taking place, the less the lack of external funding sources constitutes a barrier to innovation.

The positive relationship between the business activity to acquire external knowledge and level of product innovation ( $r = 0.53, p < 0.01$ ) or marketing innovation ( $r = 0.26, p < 0.01$ ), and the positive relationship between cultural processes and level of product innovation ( $r = 0.48, p < 0.01$ ) or marketing innovation ( $r = 0.29, p < 0.01$ ) may explain their contribution to the extent to which lack of access to external funding sources does not constitute a barrier to innovation.

Activity aimed at acquiring external knowledge and cultural processes, such as encouraging employees' initiatives to examine new ways of doing things, contribute mainly to product and marketing innovation, as those innovations are based on knowledge, personal experience, skills, insights and motivation of employees at all levels of the business. The combination of obtaining external knowledge and implementation of cultural processes in the business assists in translating external and internal knowledge into explicit and available knowledge for wide use in the business, thereby contributing to its innovation.

It should be noted that these interesting findings did not emerge in earlier studies.

## 6. Conclusions and Implications

The study findings indicate that, in contrast to previous studies, small businesses operating in traditional industries do not regard lack of access to external funding sources as a barrier to innovation. Many of these businesses do present innovation, but at relatively low levels (incremental innovation), and from this, it can be understood why they claim that lack of external funding does not constitute a barrier to innovation. These businesses seem to view incremental innovation as an integral part of an ongoing process of investment in managing the business, and in many cases, they even do not define the investment as innovative (Harel et al. 2019a).

Nevertheless, as was presented in our final regression model, the findings indicate that, within the range of the relatively low levels of innovation, there is a relationship between product and marketing levels of innovation and lack of access to external funding sources. The higher the product or marketing level innovation, the greater the extent to which lack of access to external funding hampers innovation promotion.

Lack of access to external funding sources for innovation may cause small businesses operating in traditional industries to focus on promoting innovation at relatively low levels (incremental) that do not require extensive funding, and thus constitute, for them, a means of minimizing the risks associated with innovation. Given the relatively low investment and risk levels involved in incremental innovation, the business' need to obtain additional funding from entities dedicated to promoting innovation may be lower. This conclusion actually points to the existence of a kind of vicious circle, in which small businesses operating in traditional industries—businesses that are major drivers of economic growth—do not promote the kind of high-level innovation that would advance their own growth. Most of these businesses promote innovation at relatively low levels that do not require

external funding sources, and because these sources are not within their reach, the businesses will continue to promote low-level innovation, and so on and so forth.

The present study's theoretical contribution lies in its focus on small businesses operating in traditional industries, which, though they constitute major economic growth engines, have nevertheless received less separate attention in the innovation literature. The study also distinguishes between the different types of innovation (product, process, marketing, and organization) and between the different levels of innovation as well (incremental and radical).

This study could potentially be of practical assistance to policymakers developing programs to support innovation in small businesses operating in traditional industries. Such programs, by fostering the growth of these businesses, would also promote more rapid economic growth.

## 7. Limitation of the Study and Future Research

The study findings are based on data provided by the business managers during the interviews. Future research could expand the circle of research participants in each business, so as to cross-reference the answers.

Additionally, a future study should include small businesses in other industries, such as commercial, service, and financial companies, as well as small businesses in the periphery. This would make it possible to determine whether differences exist between the various sectors, and whether geography has an impact.

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