



**Behavioral Determinants
of Enterprise Development
and Innovation**

Edited by

**Anna Ujwary-Gil
Natalia R. Potoczek**

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From the Editors

The second issue in 2020 of the quarterly published JEMI explores enterprise development and innovation. The behavioral determinants of the economic ventures indicated by the authors is a continually developing trend of research in economic sciences. Contemporary enterprises are increasingly investing their resources in obtaining information on factors that stimulate employee behavior in order to increase efficiency or develop innovation. Behavioral approach is also used in seeking answers to questions about the development of small and medium enterprises (SMEs) posed by entities responsible for supporting the SME sector. In economic sciences, behavioral approaches result from an interdisciplinary view on the behavior of people participating in economic life. The behaviors of entrepreneurs, managers, other participants in an organization, clients, and entities supporting economic activities are an essential subject of research interest. The presented articles show the research perspectives that contribute to the development of a behavioral stream in economic sciences.

The first article proposes a triangulation of theoretical foundations for behavioral research in economic sciences. Dominika Korzeniowska and Łukasz Sułkowski reviewed the scientific literature and analyzed 37 articles and 21 monographs selected from scientific databases. As a result of their research, the authors concluded that by adopting different research perspectives in behavioral economics, rather than just a cognitive one, it is possible to enrich both theoretical and empirical foundations in scientific research. Discovering human economic behavior can be done using methods and techniques appropriate to research, e.g. in behavioral or evolutionary trends. The authors conduct their analysis in relation to three paradigms: cognitive, behavioral and evolutionary, and then come to the conclusion that these approaches should not be treated as competitive but complementary knowledge of economic behavior. For example, the evolutionary approach in psychology makes it easier to explain the genetics of certain automatic response patterns that have developed during evolution. Its usefulness is expressed in the possibilities of creating an image of the human economic mind or economic society. In turn, the use of behavioral approaches, according to the authors, allows finding ways to eliminate the effects of mental traps appearing in

the processes of making economic decisions and other problem situations. The authors in their research refer to three research trends, but ultimately encourage the search for other theories and concepts in the study of human economic behavior and their impact on business ventures.

The next article presents field studies carried out in West Sumatra. The authors use psychoeconomic factors lying on the side of entrepreneurs to study failures in their business operations. An essential aspect of the research is the identification and analysis of opportunistic behavior and its impact on the success or failure of operations. Hafiz Rahman, Eri Besra, and Nurhayati conducted quantitative research using multiple and partial regression analysis on a sample of 1541 young entrepreneurs from the West Sumatra province in Indonesia, who had experienced failures in their earlier enterprises. It was found that psycho-economic factors, together with the opportunistic behavior of individuals, more or less, caused the entrepreneurial failure. The obtained research results also formed the basis for the claim that opportunistic behavior can be seen as both a source of business success and failure. The authors believe that the research should be of interest to the Indonesian government, as it suggests that the creation of entrepreneurial resilience takes place in a process that also considers the failures of undertaken enterprises. Young entrepreneurs usually draw conclusions from the mistakes they made, which is why it is postulated to support them even in situations of failure, e.g. through entrepreneurship capacity building programs. In addition to economic and business knowledge, it is necessary to build mental resilience, develop maturity, logically consider the choice of alternatives, improve decision-making processes, and deal with social pressure.

The subject of interest of the author of the third article is organizational behaviors that affect high performance. Przemysław Zbierowski presented the results of his research, conducted on a sample of 406 enterprises, using the computer-assisted personal interview (CAPI) technique. Based on the collected research material, the author analyzed the impact of high-performance organizational features on actual organizational performance, and the indirect impact on organizational citizenship and entrepreneurship-oriented behavior. As the author notes, his research contributes to the scientific debate in at least three ways. Firstly, it confirms that the features of high performance have a strong impact on the actual performance of the enterprise, which is not surprising but verifies the hypothesis. Secondly, it indicates entrepreneurial orientation as a partial mediator in this relationship. Finally, he discovers the very strong impact that high-performance features have on the organization's civic behavior. The article also has practical implications. The obtained research results form the basis for developing

organizational citizenship and entrepreneurship orientation through the skillful use of high-performance factors.

Behavioral research trends in economic sciences also include the research presented in the fourth article regarding employee behavior and their development stimulated by managerial coaching. Ghulam Abid, Saira Ahmed, Tehmina Fiaz Qazi, and Komal Sarwar filled the research gap in the field of sustainable employee development in the organization. The research conducted by them is pioneering. The authors relate to the context of work and individual differences in promoting a thriving workplace. The intervention mechanism of self-efficacy and prosocial motivation in the relationship between managerial coaching and thriving at work was explored using a sequential mediation approach. Data were analyzed using Hayes' Process Model 6 based on 1,000 bootstrap resampling with an actual sample of 221 respondents. The obtained results confirm that managerial coaching increases employee self-efficacy. The goal of coaching is to increase the employee's sense of self-efficacy in connection with a particular activity so that he or she can perform his or her tasks effectively and efficiently. Efficiency among employees directly activates positive moods that help engage employees and trigger prosocial behavior. This study contributes to the detection of awareness related to the links between prosocial motivation and employee development and provides an additional, comprehensive analysis of the procedure for obtaining the positive effects of managerial coaching.

Another group of articles relates to the behavioral aspects of developing innovation in enterprises in relation to employees, as well as the implementation of innovation by customers. Determinants of innovation in enterprises have become the subject of the research interests of Izabella Steinerowska-Streb and Grzegorz Głód. The authors presented the results of their research, which was conducted on a sample of 353 Polish family businesses. In the course of the conducted research, it was possible to determine whether family businesses that introduced the creative ideas of their employees were more innovative than others. The company's innovativeness can be expressed in the product, process, marketing, or organizational area. The authors also examined the relationship between the innovation of family businesses and their involvement in activities that stimulate creative thinking, build trust in the workplace, stimulate employee development, and support team integration. The study revealed that family businesses that are aware of the importance of creative employees, and that bring their employees' creative ideas into business practice, are more innovative than other family businesses. In addition, it was found that an increase in company innovation exists when the company supports employee development.

Interesting behavioral aspects are presented in the research on employee resistance to implementing technological innovations. Çiğdem Sıcakyüz and Oya Hacire Yüregir conducted a study of medical personnel at a public hospital in Adana, Turkey, to investigate the reasons for employee resistance to implementing an IT system. The Technology Acceptance Model (TAM) was expanded to include factors such as affective commitment, gender, and age. Based on the data collected from 291 surveys, a regression analysis was conducted, which led to the formulation of conclusions regarding the usefulness of information technology, its ease of use, and affective commitment. It was examined whether demographic factors such as age, gender, position, and tenure are associated with resistance to implemented technological innovations. The results of this study confirm earlier models of technology acceptance. The practical implications of the study relate to the need to increase employee participation in making decisions about the change process. The examined resistance of employees to technological innovations should also be treated as an essential voice in the discussion of problems related to managing change in the organization.

In the article presented by Neema Mori and Rosallia Mlambiti, attention was focused on the acceptance of product innovation by customers. The research was carried out in Tanzania using the example of mobile banking services. To examine the impact of demographic factors on the adoption of innovative mobile banking services, Rogers' Diffusion Innovation Theory (DIT) was applied to 416 clients of a leading bank in Tanzania. Regression results showed a positive and significant relationship between income level and education on the one hand, and the adoption of mobile banking on the other. Practical implications refer to the recommendations to develop promotional practices and awareness campaigns and capture customer demographic profiles to encourage them to use mobile banking. The study showed the importance of using the situational theory to adopt innovative technologies in banking services in Tanzania. The authors indicate that this approach to research issues, broadens the understanding of the importance of demographic factors, especially in relation to the Sub-Saharan African region, and also contributes to a better understanding of mobile banking from the point of view of the bank's customers in Tanzania.

The last article covers a bibliometric analysis of published research results in the field of business innovation, its financing, and policy framework. The analysis was based on the resources of the Web of Science Core Collection using Vosviewer for the period 1990–2019. The researched publications were divided according to the research area, and then the research gaps were identified. In total, 437 articles were found that went through various stages of selection. 32 publications were analyzed in detail, and the study presents

citations received by each of these selected publications and their summaries. Thematically grouped summaries show the areas that the researchers paid more or less attention to. The conducted research allowed the authors to state that the countries involved in a higher level of innovation had a higher level of publication. Few studies on this topic have been developed in emerging economies such as Africa and Asia, excluding China and Taiwan. A similar situation was noted for countries in the Middle East. Most of the research comes from the United States and European countries. The article also refers to aspects such as the time horizon of research, approach, and research methods. The results of the presented research allow readers to get acquainted with the current state of publications on the subject of financing innovation and policy in this field.

The editors express the hope that the articles presented will contribute to the development of knowledge on behavioral aspects of the functioning of enterprises and the development of innovation. The authors' extension of the research perspective with behavioral determinants, strengthens our belief in the legitimacy of supporting this research trend in JEMI. We thank all the researchers and authors for enriching their studies, broadening the perspective of resolving complex management problems, and developing innovation in organizations dispersed in geographical, economic, and cultural terms. We hope all readers will find this second issue of JEMI in 2020 both interesting and informative.

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Going beyond cognitive approach to behavioral stream in economic sciences: Behavioristic and evolutionary perspectives

Dominika Korzeniowska¹ , Łukasz Sułkowski² 

Abstract

The paper is a proposal of the triangulation of a theory basis for the behavioral stream in economic sciences that currently mostly uses a cognitive approach, by adopting a behavioristic and evolutionary perspective into that scope of reflection. A narrative literature review of scientific databases by means of Internet search engines based on the combinations of relevant keywords was used. The final selection included 37 articles and 21 monographs subjected to further analysis. The analysis showed that by adopting other perspectives than just a cognitive one into behavioral economics research can enrich theoretical and empirical foundations, provide new research tools, and enable discoveries on human economic behaviors. Evolutionary concepts also seem to gain in importance nowadays, especially in terms of neuroscientific methods used to investigate how the human brain functions. The combination of all three approaches seems quite promising and worth further development, as it may lead to not only uncovering the mechanisms underlying economic behaviors but also may help people to make better decisions. Thanks to the combination of the three approaches (paradigms) pictured together (which has not previously been present in the literature on the subject), the paper aims to inspire behavioral economic researchers to search for the theoretical basis of their scientific quest going beyond the cognitive canon, to facilitate embedding their studies in a proper paradigm or finding the relevant concept/theory, and also recognizing niche or complementary research areas. Therefore, the article adds to a discussion on the theoretical foundations of the stream and the process of shaping its scientific identity.

Keywords: *behavioral economics, behavioral finance, behavioral accounting, behaviorism, evolutionism*

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INTRODUCTION

Over the last few years, more and more has been written in the literature on the science of interdisciplinarity, its causes, manifestations, forms, and types (Dudziak, 2013). Leaving aside the discussion on the need and significance of – on the one hand, fragmentation, and on the other hand, the integration of scientific knowledge – the development of an interdisciplinary approach entails some essential problems connected with the theoretical background of the newly created streams. The tendency to structure descriptions of reality considering the perspectives of multiple disciplines has also been present in the economic sciences. Casting doubt on their main paradigm of *homo oeconomicus* has led to an increased interest, mostly in the concepts and methodology of psychology and sociology. One manifestation of these divergent searches is the dynamically developing behavioral stream, which consists of behavioral economics, behavioral finance, and behavioral accounting. Additionally, some of the neurosciences emerged as part of this tendency (neuroeconomics, neurofinance, neuroaccounting, neuromarketing), which apply some of the research methods used in biology, medicine and chemistry, such as magnetic resonance, electroencephalography and positron emission tomography (c.f., Artienwicz, 2015).

Scientists operating within the behavioral stream of economic sciences seem to focus mostly on its empirical aspect, meaning extensive research activity with the dissemination of their findings. The literature on the subject has not yet seen any broader discussion on, for example, macro-theories that would provide an epistemological basis, and would, therefore, contribute to the distinctness and identity of these subdisciplines. The existing reflection is mostly founded on certain assumptions drawn from cognitive psychology, which deal with research into cognitive structures and processes, and into the organization and functioning of the human mind (Maruszewski, 1996; Materska & Tyszka, 1997; Nęcka, Orzechowski, & Szymura, 2006). Cognitive psychology, however, treats these structures, processes, and the ways the human mind works as existing elements. Moreover, cognitive psychologists assume that architecture of the brain has “a general purpose” and is devoid of content. In other words, the same information processing mechanisms are used in resolving various problems, no matter what their nature is. These general mechanisms allow for logical thinking, learning, recognizing similarities, creating concepts, and memorizing. But investigation e.g. why they developed in a particular way or how to shape external conditions in order to obtain the desired behavior, still remains open. A cognitive approach seems to be an insufficient basis for finding a comprehensive answer to such doubts. The main research question of the paper then is

RQ: What other paradigms the behavioral stream in economic sciences can draw from, to enhance its epistemic value?

In particular, what theories and concepts within those paradigms may be of assistance in discovering the causes underlying economic behaviors. Literature studies indicate that two paradigms look especially promising in that respect i.e. evolutionary and behavioristic. According to evolutionary psychologists (in contrast to a cognitive approach), the human mind consists of a large number of specialized (not general) mechanisms, each of which is used to solve a different adaptive problem (Winterhalder, 2007). While behaviorism holds the position that the only thing that can be controlled and can be studied is behavior itself, not mental processes. Perhaps then, extending the cognitive perspective with such issues would provide the inspiration to develop new research and to make valuable discoveries. Behaviorism and the evolutionary theory, particularly in their psychological aspects, could become the basis for finding explanations and roots of the existing patterns of human economic behavior.

The aim of this article is, thus, taking the floor in the discourse on the paradigms and theories underlying the behavioral stream in economic sciences by proposing an enlargement of their theory basis, going beyond the prevailing cognitive canon. Two emergent theories for that scope of reflection are, as mentioned above, behaviorism and evolutionism. The article will first describe the areas of interest in the subdisciplines of this stream, considering their currently dominant paradigm. It will then discuss changes in the research perspective relating to the use of behaviorism and evolutionism as a new theoretical and empirical basis.

RESEARCH METHOD

The methodology of the paper is based on a narrative literature review which adopts a less formal approach than systematic reviews (Jahan, Naveed, Zeshan, & Tahir, 2016). The main disadvantage of such a method is its subjectivity resulting from a less explicit methodology to identify, select, and evaluate results. However, the paper's character is introductory, so the approach adopted herein to select the relevant bibliography was rather qualitative. The primary motive was to identify possible paradigms used by behavioral economic researchers and outline their specifics, not to verify e.g. which paradigm was the most frequently used. Nevertheless, a systematic review of the literature could become a valuable continuation of the issues raised in this article, as it would probably reveal other concepts or theories applicable

to behavioral economic research. The review was conducted through Internet search engines. The following databases were explored: Business Source Complete, Academic Search Complete, Science Direct, SpringerLink, Web of Science, and Google Scholar.

The combinations of the following keywords and expressions were used: cognitive psychology, evolutionary psychology, behavioral psychology, behavioral economics, behavioral accounting, behavioral finance, behavioral aspects, behaviorism, behavioristic, evolutionary, evolutionism, neoevolutionism, neo-evolutionism, and neoevolutionary. Additional search criteria were applied: only full text records published in Polish or English as reviewed publications were included. In total, 1884 results were obtained. It turned out that EBSCO also returned many unrelated items (medical, technical, etc.). They were not further analyzed (527 left). The publication time span was limited to the period of the last 40 years to exclude the works that may already be outdated. Then, after removing duplicates, the search base was thus limited to 286 items. Next, the titles and abstracts of the selected publications were examined to verify the relevance of their content. Finally, the analysis was based on 37 articles and 21 monographs published in the years 1979–2019.

NARRATIVE LITERATURE REVIEW

The behavioral stream in economic sciences

It is assumed that the behavioral stream in economic sciences includes behavioral economics, finance, and accounting. All three subdisciplines aim to explain various economic (in general) behaviors. However, most findings and explanations are based on a cognitive approach. The following fragments briefly present the essence of these three subdisciplines, including their definitions as well as areas of their research interests. This should all be treated as the necessary basis for discussion on the possibility of using the behaviorist and evolutionary paradigms in further research, in this respect.

The term ‘behavioral economics’ was coined by K. Boulding in 1958, in which the author indicated the need to study certain human ideas or emotional and cognitive structures that have an impact on economic decisions (Angner & Loewenstein, 2006). The idea of looking for findings that would explain economic phenomena based on the knowledge of a person’s psycho-social functioning thus emerged. Cartwright (2001) describes it as the science of applying the conclusions of laboratory experiments, psychology, and other social sciences to economics. Polish authors, on the other hand, have narrowed down the designata of the object of behavioral economics,

from the perspective of the scale of use of findings provided by the science of human behavior. They conclude that, instead, its attempts to build more realistic models of economic thinking and behavior are thanks to the use of the achievements of psychology, which equipped with proper, descriptive theories of decision-making, helps to explain human weaknesses, limitations or insufficient rationality (Brzeziński, Gorynia, & Hockuba, 2008). Behavioral economics studies concentrate, among others, on entrepreneurship, consumers' behaviors, saving money, insuring oneself, paying taxes, risk-taking, motivation to work, and money perception (Artienwicz, 2018).

Behavioral finance, treated by some researchers as a part of behavioral economics, focuses on the behavior of investors in the financial markets, using psychological aspects (Zielonka, 2003; Tyszka, 2003). Behavioral finance attempts to explain and increase understanding of the reasoning patterns of investors, including the emotional processes involved and the degree to which they influence the decision-making process. Essentially, behavioral finance attempts to explain the what, why, and how of finance and investing, from a human perspective (Ricciardi & Simon, 2000).

The neoclassical theory of finance is based on the assumptions of rationality of the investors' behaviors and market effectiveness, which virtually permeate each other as there is no effective market if investors act irrationally. However, the reality of the stock market has painfully verified these assumptions on several occasions (Hersh, 2002). It turns out that participants of financial markets fall into all kinds of mental traps, with the most common being: overconfidence, illusions of control, over-optimism, confirmation bias, anchoring, the affect heuristic, the status quo effect, and the disposition effect (Zielonka, 2003). Besides cognitive biases, behavioral finance research also focuses on anomalies (deviations from market efficiency), investors' motivational tendencies, behavioral portfolio theory, deferred payments discounting, etc. (Zielonka, 2019).

"Behavioral accounting is an offspring from the union of accounting and behavioral science. It represents the application of the method and outlook of behavioral science to accounting problems" (Report of The Committee, 1974, p. 127). Its fundamental aim is to explain and predict human behavior in all possible aspects of accounting (Belkaoui, 1989). According to a different description of its area of interest, it is a dimension of accounting related to human behavior and its connection with planning, developing, and using an effective accounting system (Siegel & Ramanauskas-Marconi, 1999). A similar approach is proposed by Cieciora (Cieciora, 2015, p. 36): "The subject of its research covers issues concerning the behavior of people involved in an accounting system." Belkaoui clarifies that "behavioral accounting emphasizes the relevance of accounting information to decision-making,

as well as the individual and group behavior caused by the communication of this information”, and that “its purpose is to influence action or behavior directly through the information content of the message conveyed and indirectly through the behavior of accountants” (Belkaoui, 1989, Preface). Thus, he also draws attention to such issues as group behavior, including the behavior of accountants.

Some of the ultimate goals of classical accounting are delivering a real and reliable image of the material and financial situation of a unit and providing economic information allowing the recipients of this information to formulate opinions and judgments and to make further decisions (Micherda, 2007). This very approach might be prone to behavioral distortions, as accounting is practiced by people, for people (Arnold & Sutton, 1997). Thus, the way data provided in the form of all kinds of reports is presented can affect the choices made based on it. In contrast, the ability of the recipients of the accounting information to read and analyze it correctly and to make the right decision based on it might be limited by human intellectual potential (e.g., Sithole, 2016). Behavioral accounting research concerns such issues as managerial control, accounting information processing, accounting information system design, auditing process research, and organizational sociology (Birnberg & Shields, 1989).

In the research subject of these three subdisciplines outlined above, one may conclude that ‘behavioral’ definitely means ‘related to behavior.’ However, this adjective is mostly understood by the cognitive paradigm. The carried-out research aims to explain human behavior from the perspective of the way people perceive economic, financial, and accounting situations, the way they interpret them, what they already know about them, and what their expectations of them are. Cognitive psychology forms both the theoretical and methodological basis for the research conducted within this stream. That is exceptionally well visible in the research design. The research mostly focuses on discovering and describing mechanisms leading to distortion of the rationality of thinking and decision-making processes – heuristics and other similar phenomena – as a result of which people choose shortcuts or give in to their emotions. However, to be able to isolate particular factors that disturb rational thinking, quite artificial research conditions have to be created. Cognitive researchers are “accused of” not paying too much attention to the stimuli employed in their experiments. They choose them rather according to their ease of use and the possibility of effortless manipulation in experimental conditions (Buss, 2001). That is why they prefer some abstract categories instead of real ones. They use it purposefully, as they want to get rid of all the content that the respondents could have had earlier contact with, and that could “contaminate” the final results. Their aim is to grasp

“pure” causal inference. Those “precautions” are, however, only valid if the human mind is a “general-purpose” processor. What if cognitive mechanisms are specialized in processing information about specific problems, not “the general ones”? It seems that explaining why these mechanisms developed and why they developed the way they did, maybe difficult based only on a cognitive paradigm. Perhaps the behaviorist approach is a step towards getting to know more of the root causes of this state.

What if ‘behavioral’ comes from behaviorism?

If we assume that the adjective ‘behavioral’ comes from a trend in psychology and philosophy called behaviorism, then the phrase ‘the behavioral stream in economic sciences’ takes on a completely different meaning. To “decipher” this new meaning, one must first look at the main tenets of behaviorism (c.f., Staddon, 2016).

It is believed that creation of this trend was affected not only by Pavlov’s experiments or Thorndike’s discoveries but also by Darwin’s theory of evolution. Behaviorism assumes that behavior is “mostly controlled by environmental factors such as imitating the behavior of others, reinforcement and conditioning” (Winstanley, 2008, p. 183). “When trying to understand behavior, behaviorism adopts (...) an experimental approach, suggesting that psychology should (...) focus on an objective study into observable behavior, and not thoughts or cognitive processes. Behaviorists believe that ‘facts’ cannot be reached by looking into human thoughts and minds as people may lie or be mistaken” (Winstanley, 2008, p. 27, as cited in Nowak, 2015). The “truth” can be revealed by studying only the things that can be observed, i.e. behavior and environmental stimuli that trigger this behavior. A significant part of this approach is behavior analysis, which seeks universal laws and regularities that describe relationships between environmental independent variables and behavior, which is a dependent variable. There are two types of environmental factors: a) events that have occurred so far in the environment being a consequence of a specific behavior (positive and negative reinforcements) and b) formerly and currently existing environmental conditions that are the background of activity and changes that appear in the environment under its influence (differential and extinction stimuli) (Bąbel & Ostaszewski, 2008).

Reading between the lines of the above descriptions, one can also find the three basic assumptions of behaviorism. First of all, it assumes that human behavior results from the influence of the environment (environmentalism), which is manifested in the existence of rewards and punishments. Second, the patterns governing human behavior can be identified by performing experiments (experimentalism), and third, if one recognizes elements of the

environment affecting behavior, then by changing these elements, one can change human behavior (optimism) (Nowak, 2015). The first two assumptions are particularly in accordance with the assumptions of Darwinian thought. The examples of research based on behavioristic theories/concepts (evoked in subsections' titles) will be presented in the following fragments.

Conditioning

Interestingly, despite the obvious dominance of the cognitive approach in these three subdisciplines, research in this field does include attempts to apply the behaviorist perspective. For example, mechanisms of the effect of money have been studied within behavioral economics based on a conditioning hypothesis. Pursuant to this approach, "money should be interpreted as the generalized conditional reinforcement connected with all kinds of consumer goods (such as food), acting as unconditioned reinforcers" (Zaleśkiewicz, 2011, p. 193). Thus, people need money in order to obtain other things that they find attractive. Money is also a universal good, meaning that it allows for selection from an unlimited range of products, which additionally increases its value (Simmel, 1997, p. 182). Adopting such an approach, one can see – for example, in the development of incentive systems for employees and the rules and regulations of remuneration used to train/condition employees – that efficient performance of certain professional tasks results in the obtaining of specific financial reinforcers.

Another example is a practice called "token economy." According to the theory of operant conditioning, delayed gratification is far less effective than immediate reward. However, most immediate reinforcers cannot be used in a quick and reproducible manner. In order to overcome this, the idea emerged to substitute the primary reward with a secondary reward in the form of a token that can be then exchanged for the real "carrot." This method has proved to be very successful in shaping the behavior of schizophrenics and children with social disorders (Zaleśkiewicz, 2011).

Conditioning, and particularly instrumental conditioning, has also been used by 'behavioral accountants' in their studies into functional fixation (or, in fact, data fixation) (Korzeniowska, 2018). In its original psychological version, functional fixation is a lack of the ability to use a given object (thing) in a non-standard way, contrary to its intended purpose. With regard to accounting, it is more often a data fixation, meaning "the tendency of users of information provided by the accounting system to understand accounting categories (values) in a uniform way, even in cases when methods employed for the calculation of these categories (values) are fully disclosed" (Bloom, Elgers, & Murray, 1984). An example of the conditioning mechanism in accounting is as follows: Sterling

(Sterling, 1970) found that the “production” of reports is accompanied by “impressive ceremony,” engaging both managers and accountants. Thus, the recipients of these reports get the impression that they need to respond to them because they are the results of a very complicated ritual involving many people. Thus, accountants respond to financial data because they are taught (conditioned) to respond to them, not because the data has any significant informational content. Even if it does, there is the question of whether accountants respond appropriately (Belkaoui, 1989). Perhaps they only respond in a previously acquired manner, regardless of the methods employed to obtain the results presented. In this case, it would require them to change their behavior, i.e. to pay additional psychological ‘costs.’ It is worth bearing in mind that accountants, in the course of their professional education, learn the rules, procedures and methods of accounting, and of financial reports drawn up using these rules and procedures. They also learn methods of ratio analysis and cash flow, in the case of which accounting data is used to assess a company’s effectiveness and perspectives. Thus, they are ‘indoctrinated’ during their education concerning ways of determining the correctness and usefulness of information from accounting systems. Then such ‘indoctrination’ is reinforced continuously by each report they receive in their everyday work.

Matching law

The matching law formulated by Herrnstein (1970) may also be of assistance in explaining human economic behaviors. Matching law is an attempt to quantify Thorndike’s law of effect (Thorndike, 1970), which says that the reaction force is directly proportional to the pleasure that comes after it. The more reinforcing power the behavior’s consequence has, the stronger the reaction force will be. Herrnstein claims that if there are two simultaneously available competing reactions, the relative frequency of response to one of them will be equal to the relative frequency of reinforcements obtained from it (Herrnstein, 1970). People invest more of their time and resources in something they like doing. Daniels (1999) (after Bąbel & Ostaszewski, 2008) enumerates several consequences of matching law relating to the employees’ performance at work. For instance, if the job provides weak reinforcements even a small external reinforcement will distract people from their work, if some changes are introduced (new structure, responsibilities, procedures, software, etc.) managers have to remember to also implement proper reinforcements to induce employees to use them, as the old reinforcements are still active and may affect the effectiveness of the new solutions. Interestingly, as evidenced by numerous research, matching law “works” not only with human beings (Baum, 1975) but also with animals like monkeys, rats,

pigeons, hamsters, cows, or hens (e.g., Anderson, Velkey, & Woolverton, 2002). The vast majority of research on matching law studied various characteristics of reinforcements such as their: frequency, probability, deferment, or size. However, in real life, we encounter numerous reinforcements that differ both in terms of quantity and quality. Another question then arises; that is whether people's involvement in certain behavior depends on the availability of reinforcements' substitutes in our environment. Such a question makes another interesting research area where behaviorism (matching law) meets behavioral economic sciences (phenomenon of substitution).

Scholars representing a behaviorist approach noticed the analogy between economics and behavior analysis. Reinforcements are the equivalent of goods in economics, and the prices of these goods represent the number of reactions needed to receive them. If the number of reactions to get a specific reinforcement increases, and there is another reinforcement (substitute) available. The consumption of a substitute reinforcement will increase; the more, the better the substitute of the "original" reinforcement is. There were many studies on animals' behaviors in terms of food choices based on these assumptions, e.g. Green and Freed (2000), but similar patterns can be observed in humans as well. Foxal (1999) analyzed the frequency of purchases of various coffee brands. Taking into consideration the FMCG industry, there are a lot of brands available for a certain type of goods. If we want to buy e.g. mineral water and the prices of different products are similar we should choose the cheapest one (assuming no impact of marketing activities) as all of them will satisfy the same need. However, Foxall concluded that coffee brands were not treated as substitutes. Consumers did not pick one type of coffee, but their preferences were changing. If those products were not the same in terms of quality, the consumers' behavior was not against matching law. Although the results of Foxall's research are not unambiguous, it can become an inspiration for behavioral economists to further studies on the law of effect or other "behavioristic" phenomena.

Nudging

There is another concept inscribed in the behaviorist paradigm that cannot be ignored while considering its influence on economic behaviors. This concept was popularized in 2008 by Thaler and Sunstein although it has its source in much earlier works (Wilk, 1999). It is about libertarian paternalism known under its more attractive name - "nudging." "A nudge is any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives. A mere nudge, the intervention must be easy and cheap to

avoid. Nudges are not mandates. Putting fruit at eye level counts as a nudge. Banning junk food does not” (Thaler & Sunstein, 2008, p. 6). In other words, nudging is about influence made by rulers or creators of decision-making situations on individuals in such a way that they make decisions that are optimal for them. The idea is not, however, to influence the individuals’ decisions through orders, prohibitions, or manipulations. Creators or rulers only have to shape the decision-making situation in such a way as to guide decision-makers to the optimal variants for them and limit irrational actions (resulting e.g. from cognitive biases). Comprehensive elaboration on the nudging phenomenon is far beyond the capacity of this paper, but even from its sole definition cited above it is clear that this is an evident example of a gentle form of behavior shaping.

If the three subdisciplines making up behavioral economic sciences are perceived from the behavioristic perspective, they will deal with an experimental study into human responses to different economic, financial, and accounting stimuli. Thus, it would not matter what kind of distortion occurred when making a decision in a given situation, but what kind of behavior was evoked by, for example, imposing a tax, stock prices going up, or reading a financial report.

What does evolutionism offer the behavioral stream in economic sciences?

The evolutionary metaphor has been broadly used in economics, for example, in the analyses by Joseph Schumpeter, Thorstein Veblen, Kurt Dopfer, and Ulrich Witt. Evolutionary assumptions of selection, changeability, and reproduction have been applied to economic organizations and the economic market, which has led to the use of some biological terms that were related to population, ecology, and balance. Contemporary scholars who use evolutionary analogies in economics are usually aware of cognitive limitations brought about by the transfer of biological terms to such a discourse (Dopfer, 2001; Witt, 2008).

The evolutionary approach is a relatively new one in behavioral economic sciences and is rarely used cognitively. Among several different applications of evolutionism in economic sciences, three approaches can be distinguished. First, it appears as a kind of paradigm or meta-theory describing human nature and social behaviors, on which the entire economy, management, and finances are founded. In the literature on the subject, we can also find authors questioning the usefulness of evolutionism (mostly in its new form, neoevolutionism) in economics, and even in social sciences in general (Poirot, 2007). Second, it is used as a source of variables explaining various economic behaviors. For example, it may be a study of the relationship between

financial behavior and gender or age, in which the concept of “Pleistocene mind” will be used. Third, evolutionism (neoevolutionism) may be a source of research methods that expand the traditional range of methods used in economic sciences so far.

Key research questions are related to the search for a decision-making model in conditions of uncertainty, the analyses of perceptive and cognitive illusions, and interpretation of man’s economic behavior in the categories of evolutionary cognitive models. The methodology of this trend is primarily based on social experiments but uses statistical, demographical and historical analyses as well (Camerer, Loewenstein, & Rabin, 2001). Thanks to the use of brain examination techniques, it is nowadays possible to study, among other things, the neuronal bases of decision-making. Hence, within behavioral economic sciences, there also exists a related and developing branch of neuroeconomics, neurofinance, and neuroraccounting. Neuroeconomics is understood as “the study of the biological microfoundations of economic cognition and economic behavior. Biological microfoundations are neurochemical mechanisms and pathways, like brain regions, neurons, genes, and neurotransmitters. Economic cognition includes memory, preferences, emotions, mental representations, expectations, anticipation, learning, perception, information processing, inference, simulation, valuation, and the subjective experience of reward. In general, neuroeconomic research seeks to identify and test biologically microfounded models that link cognitive building blocks to economic behavior” (Camerer, Cohen, Fehr, Glimcher, & Laibson, 2015, p. 153). This definition, however, if slightly adjusted to financial and accounting conditions, will also “fit” to neurofinance and neuroraccounting. It seems then that the evolutionary approach legitimates inclusion into behavioral economic sciences also their “neuroversions.” Such inclusion, based only on cognitive paradigm, would not be fully justified.

The trends development confirms the openness of behavioral economic sciences, as scientific subdisciplines, to new theoretical and empirical inspirations. The idea of bounded rationality was introduced to the economic discourse by Simon (1955). However, relations between behavioral economics and evolutionism are very modern and involve the search for evolutionary sources of economic behavior. Bounded rationality examines, for example, evolutionary conditions for risk aversion (Kahneman & Tversky, 1979) and the question of trust and reciprocity (Fehr & Schmidt, 1999; Falk, Fehr, & Zehnder, 2006; Fehr, 2009; Fehr & List, 2004). Studies on the evolutionary aversion to risky decisions or unconscious motives for purchasing consumer goods, related to our species’ past, form problems that can be solved by means of scientific methods deriving from various disciplines, which might be one of the reasons for their innovative character. According to G. Loewenstein, however,

evolutionary conditions cannot be the only variable factor that is taken into account while making informed economic decisions (Camerer et al., 2001).

It seems that evolutionism (neoevolutionism) can be of benefit to researchers and practitioners of behavioral economic sciences as it proposes a coherent paradigm explaining human economic behaviors, providing detailed behavioral theories related to decision-making, and proposing an innovative research methodology as well as pragmatic guidelines. An evolutionary approach adopts some assumptions that are different from those applied by cognitive psychologists and that integrate a cognitive approach with other human-related sciences (Tooby & Cosmides, 1992). The main assumption is that the human mind consists of many information-processing mechanisms that evolved in the course of evolution and are embedded in the human nervous system. Those mechanisms are adaptations resulting from the laws of natural selection functioning in the environment of our ancestors and are functionally specialized, that is certain mechanisms are responsible for resolving certain adaptive problems. To be able to be functionally specialized; however, these mechanisms must be imbued with content (in contrast to a cognitive canon where the content is neglected) (Buss, 2001).

Ecological rationality

Due to the above assumptions, the evolutionary approach tends to question, at least to some extent, the conclusions from research conducted within the cognitive canon. The main doubt is whether human cognition is, in fact, full of errors and biases stemming directly from the imperfections of our information processing skills. Having in mind that our ancestors were able to solve quite numerous and complicated problems connected with their survival and reproduction, the answer is no longer as simple as it initially seemed. Another argument for the fact that the human mind cannot be boiled down only to the category of an imperfect machine with limited data processing abilities is that even artificial intelligence systems (although they are guided by the principles of iron logic and use formal decision-making procedures) sometimes encounter difficulties in solving tasks which the living person copes well with. Tooby and Cosmides (1992) thus propose an approach that they called “ecological rationality.” Their logic is that the human race in the course of evolution observed various kinds of patterns (named “ecological structure”); for example, rain falls on thunder, angry shouts precede violence, moving closer to a snake may result in a bite. Ecological rationality is made of mechanisms that use an ecological structure to resolve problems (Buss, 2001). In other words, our cognitive abilities are closely related to the patterns that occurred in the environment of our ancestors. Tooby and Cosmides explain

that cognitive biases are due to a discrepancy between the problem and the mechanism set up to solve it. Our brain has been “evolutionally shaped” so that we have a fear of snakes or spiders as those animals may be dangerous for our lives. But we are not afraid of electrical sockets, because they appeared in our environment relatively recently, and that is too short for our internal anxiety mechanism to develop. Evolutionary psychologists claim that problem solving strategies have evolved in response to a specific problem, and in solving that particular problem, they are doing very well. However, they do not cope with new or artificially created problems, i.e. those that did not exist in their evolutionary environment (Buss, 2001).

According to Tooby and Cosmides (1992), formal logic rules that people should follow while making their choices are not suitable for solving real adaptive problems. From the perspective of evolution and natural selection, the real measure of success is survival and reproduction, not “objective truth” or logical consistency. There is no general rational rule being able to solve problems regardless of their specifics. Problem solving contains three factors: the problem itself, available tools, and circumstances. None of those three is general. For example, there are some plants that are poisonous for human beings but life-giving for other creatures. Logic cannot help to resolve the adaptive task of whether to eat a certain plant or avoid it in general. It can be solved by a mechanism tuned to a specific problem that was evolutionarily shaped by observation of the consequences of harmful substances consumption. The real environment of our ancestors was a kind of laboratory where various, differently “forged” cognitive mechanisms were tested, and only those that worked endured.

Probability comprehension

“Cognitive school” focuses on showing biases in estimating the probabilities of certain events occurrence. “Evolutionary school” indicates that in Pleistocene numerical procedures to assess the probability did not exist. Our ancestors simply had no idea what the probability was. That is why the suggestion is to rather speak about frequency (how many times lately I was in the forest and I found mushrooms), not a probability (what is the probability of finding mushrooms in the forest). The frequency hypothesis was tested by Cosmides and Tooby (1996) in the so-called medical diagnosis problem. Although the research task had a medical nature, it can be easily adapted to economic situations e.g. bankruptcy predictions based on discriminant models. The original task was (probability “frame”):

“If a test to detect a disease whose prevalence is 1/1000 has a false positive rate of 5%, what is the chance that a person found to have a positive result actually has the disease, assuming that you know nothing about the person’s symptoms or signs? ___%.”

Only 18% of subjects who belonged to the group of faculty, staff and fourth-year students at Harvard Medical School answered “2%”, which is correct. But when the problem was formulated as follows (frequency “frame”):

“1 out of every 1000 Americans has disease X. A test has been developed to detect when a person has disease X. Every time the test is given to a person who has the disease, the test comes out positive (i.e., the “true positive” rate is 100%). But sometimes the test also comes out positive when it is given to a person who is completely healthy. Specifically, out of every 1000 people who are perfectly healthy, 50 of them test positive for the disease (i.e., the “false positive” rate is 5%). Imagine that we have assembled a random sample of 1000 Americans. They were selected by a lottery. Those who conducted the lottery had no information about the health status of any of these people. Given the information above: on average, how many people who test positive for the disease will actually have the disease? ___ out of ___” 76% of respondents answered correctly.

However, scholars had another idea to improve the results. So far, the task was presented in words. Knowing that writing has been known to people for only 5000 years, there was a supposition that graphical representation should result in even better outcomes. Hence researchers adjusted their test and presented a sample of 100 people in the form of squares (1 square = 1 person) and asked the subjects to depict the information in a visual form (to circle the square that represents a person actually having the disease, to fill in the square indicating the person that has tested positive for the disease). Then respondents were asked to estimate how many people who test positive for the disease will have the disease (___ out of ___). It turned out that as many as 92% of the respondents gave correct answers (Cosmides & Tooby, 1996). The scholars concluded that people did not neglect information if they were presented in a way similar to that familiar to our ancestors. These findings seem to question, to some extent, the concept of the disability of human problem-solving mechanisms proclaimed by cognitivism. Maybe then, the suitable formulation of a problem using graphic forms or frequency representations instead of probability measures in financial reports would reduce the number of the traps that decision-makers “fall into” and would transform into better economic choices.

Somatic marker hypothesis

The impact of evolutionism, although not mentioned “by name,” on behavioral economic research can be especially visible in experiments making use of various neuroimaging techniques. Let then an experiment based on the Iowa Gambling Task (IGT) and using galvanic skin response (GSR) be another illustration of the “evolutionary thought” in behavioral economic sciences. It has been discovered that people with frontal lobe lesion exhibit defects in decision-making, consisting primarily of their inability to choose options beneficial in the long term (Bechara, 2002). The research aimed to test the “somatic marker hypothesis” which belongs to a group of “risk as emotion” hypothesis that interpret decision-making as a process developed as a result of the biological evolution of the human mind. Briefly speaking, human choices are highly adaptive, so decision variants that trigger fear will be rejected, while those generating positive emotions will be accepted. It means that our “evolutionary brain” will decide “for us,” and our consciousness will just try to find satisfactory justification for our choice. In IGT, participants were presented with four decks of cards on a computer screen. On each deck, there were cards that bring a prize or a fine. The goal of the game was to win as much money as possible. Decks differed from one another by balancing reward cards and penalty cards. Two decks were “bad decks,” and the other two were “good decks”. Then, consistent selection of bad decks turned out to be unfavorable in the long term. People with frontal lobe lesion chose more cards from the “bad decks” regardless of whether they did it for the first time or after an hour, a month, or a half year. It was because they were missing the physiological warning response (measured by GSR), which was activated by a healthy brain. For healthy subjects, a warning signal (stronger galvanic skin response) appeared before the card was pulled out of the “bad deck” even before they realized the real nature of the task. Hence, in the course of evolution, the human brain was shaped so as to even unconsciously help us to choose more favorable strategies.

CONCLUSION

Behavioral economic sciences constitute a relatively new area of knowledge that does not yet have well-grounded theoretical foundations. However, bearing in mind their dynamic development, there is an increasing need for theoretical discussion on paradigms or concepts that may contribute to the process of shaping the scientific identity of this stream. The outcomes of the above considerations are as follows:

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- so far, the behavioral stream in economic sciences has been mostly based on the cognitive paradigm, which dominated the research perspective in this area. The cognitive paradigm serves well if its main aim is to denude human limitations in information processing capacities, logical thinking, memory, etc.
 - a great problem related to the application of the cognitive paradigm in research into behavioral economic sciences is that it does not offer a satisfactory basis for searching for methods of preventing violations of rationality in economic decisions (apart from the supposition that by making the decision-makers aware of the existence of decision traps, their impact may be slightly mitigated);
 - explaining economic behaviors can be based on various paradigms i.a. behavioristic and evolutionary. It does not mean, however, that a cognitive approach should be discredited in favor of the theory of evolution or behaviorism, or lead to a split between academics, thus creating competing schools: the cognitive, behaviorist, and evolutionary. Some mechanisms were created in the course of evolution. However, in the case of economics, finance and accounting, there are different abstract categories that we can learn to apply in the course of socialization;
 - evolutionism, especially evolutionary psychology, provides explanations of the genesis of specific automatic response patterns that have developed in the course of evolution that may help to create a new image of the human economic mind, economic society, or culture;
 - evolutionary adaptation mechanisms show quite a different picture of the human cognitive potential. It turns out that there might be no single (general) intelligence but many variants, no single thinking ability, but many specific mental skills dependent on factors influencing their formation, no general learning, memorizing, imitation, or term creation ability, but many specialized cognitive mechanisms;
 - thanks to the application of the behavioristic approach, perhaps it would be possible to find ways of eliminating the effects of mind traps by formulating recommendations on how to structure decision-related tasks (environment modeling), so as to ensure (nudge) responses (behaviors) that are proper (free of errors) in a given situation. Another advantage could be creating some guidance on how to teach or train people dealing with various economic problems to make them develop (learn) appropriate response mechanisms relevant to specific decision-making situations;
 - to have a comprehensive view on particular economic behavior, triangulation of paradigms i.e. a theory basis, as well as research methods, is highly advisable. It could help to change the way of thinking about these areas of knowledge and would be a spur to structuring research in a different way, using different research

methods and taking a different perspective of the results, which could translate into valuable new discoveries in the functioning of the human mind under different economic situations;

- the integration of methods specific to different paradigms could lead to research programs realized by representatives of various scientific disciplines, including economists, psychologists, radiologists, or doctors. Advancements in brain imaging techniques, especially noticeable in recent years, have significantly expanded the possibilities of studying economic behaviors. Discovering brain areas that respond to specific economic problems can help in finding answers to theoretical dilemmas that have not yet been resolved by other methods. Thanks to “neuroexperiments” it is also possible to analyze some automatic response patterns or emotions, which are often not available to the consciousness, and therefore “not suitable” for research utilizing e.g. “pure” laboratory experiments (mostly based on the cognitive paradigm).

The paper’s intention is not only to support scientists in placing their scientific ventures in a proper theoretical framework but also to encourage them to search for other theories and concepts, not only within cognitive, behavioristic, or evolutionary paradigms. To that end, further discussion and research development, e.g. in the form of a systematic literature review which could probably lead to discovering other approaches applicable to behavioral economic sciences or testing new ones in terms of their epistemic potential, seems highly desirable.

References

- Anderson, K.G., Velkey, A.J., & Woolverton, W.L. (2002). The generalized matching law as a predictor of choice between cocaine and food in rhesus monkeys. *Psychopharmacology* 163(3-4), 319–26.
- Angner, E., & Loewenstein, G. (2006). Behavioral economics. In P. Thagard & J. Woods (Eds.), *Handbook of the Philosophy of Science*. Amsterdam: Elsevier. Retrieved from <http://www.cmu.edu/dietrich/sds/docs/loewenstein/BehavioralEconomics.pdf>
- Arnold, V., & Sutton, B. (Eds.) (1997). *Behavioral Accounting Research. Foundations and Frontiers*. Sarasota, FL: American Accounting Association.
- Artienwicz, N. (2015). Neurorachunkowość jako potencjalny, ale trudny kierunek rozwoju rachunkowości. *Zeszyty Teoretyczne Rachunkowości*, 82(138), 9-17. <http://doi.org/10.5604/16414381.1155803>
- Artienwicz, N. (2018). *Rachunkowość Behawioralna*. Warszawa: CeDeWu.
- Baum, W.M. (1975). Time allocation in human vigilance. *Journal of the Experimental Analysis of Behavior*, 23(1), 45–53.

- Bąbel P., & Ostaszewski P. (Eds.). (2008). *Współczesna Psychologia Behawioralna. Wybrane Zagadnienia*. Kraków: Wydawnictwo Uniwersytetu Jagiellońskiego.
- Bechara, A., & Damasio, H. (2002). Decision-making and addiction (part I): Impaired activation of somatic states in substance dependent individuals when pondering decisions with negative future consequences. *Neuropsychologia*, 40(10), 1675-89.
- Belkaoui, A. (1989). *Behavioral Accounting. The Research and Practical Issues*. New York, London: Quorum Books.
- Birnberg, J.G., & Shields, J.F. (1989). Three decades of behavioral accounting research: A search for order. *Behavioral Research in Accounting*, 1, 23–74.
- Bloom, R., Elgers, P., & Murray, D. (1984). Functional fixation in product pricing: A comparison of individuals and groups. *Accounting, Organizations and Society*, 9(1), 1-11. [http://doi.org/10.1016/0361-3682\(84\)90026-6](http://doi.org/10.1016/0361-3682(84)90026-6)
- Brzeziński, M., Gorynia, M., & Hockuba, Z. (2008). Ekonomia a inne nauki społeczne na początku XXI. In *Między imperializmem a korporacją. Ekonomista*, 2, 217-218.
- Buss, D.M. (2001). *Psychologia Ewolucyjna. Jak Wytłumaczyć Społeczne Zachowania Człowieka? Najnowsze Koncepcje*. Gdańsk: Gdańskie Wydawnictwo Psychologiczne.
- Camerer, C.F., Loewenstein, G., & Rabin, M. (Eds.). (2001). *Advances in Behavioral Economics*. Princeton, NJ: Princeton University Press.
- Camerer, C., Cohen, J., Fehr, E., Glimcher, P., & Laibson, D. (2015). Neuroeconomics. In *Handbook of Experimental Economics*. Retrieved from https://scholar.harvard.edu/files/laibson/files/camerer_cohen_fehr_glimcher_laibson_2014.pdf
- Cartwright, E. (2011). *Behavioral Economics*. London, New York: Routledge (Kindle Edition, loc. 116).
- Cieciura, M. (2015). Behawioralne aspekty rachunkowości we współczesnej gospodarce – zarys problemu. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 388, 32-40. <http://doi.org/10.15611/pn.2015.388.03>
- Cosmides, L., & Tooby, J. (1996). Are humans good intuitive statisticians after all? Rethinking some conclusions from the literature on judgment under uncertainty. *Cognition*, 58, 1–73.
- Dopfer, K. (2001). *Evolutionary economics*. Program and scope, Boston: Kluwer Academic Publishers.
- Dudziak, S. (2013). Ekonomia behawioralna – interdyscyplinarne podejście do zachowań ekonomicznych. *Studia i Prace Wydziału Nauk Ekonomicznych i Zarządzania*, 2(32), 23-35.
- Falk, A., Fehr, E., & Zehnder, Ch. (2006). Fairness perceptions and reservation wages - The behavioral effects of minimum wage laws. *The Quarterly Journal of Economics*, 121(4), 1347-1381. <http://doi.org/10.1093/qje/121.4.1347>
- Fehr, E. (2009). On the economics and biology of trust. *Journal of the European Economic Association*, 7(2-3), 235-266. <http://doi.org/10.1162/JEEA.2009.7.2-3.235>

- Fehr, E., & List, J.A. (2004). The hidden costs and returns of incentives-trust and trustworthiness among CEOs. *Journal of the European Economic Association*, 2(5), 743-771. <http://doi.org/10.1162/1542476042782297>
- Fehr, E., & Schmidt, K.M. (1999). A theory of fairness, competition, and cooperation. *Quarterly Journal of Economics*, 114(3), 817-868.
- Foxal, G.R. (1999). The substitutability of brands. *Managerial and Decision Economics*, 20(5), 241-257.
- Green, L., & Fisher, E.B. (2000). Economic substitutability: Some implications for health behavior. In W.K. Bickel & R.E. Vuchinich (Eds), *Reframing Health Behavior Change with Behavioral Economics*, (pp. 115-144). New Jersey: Lawrence Erlbaum Associates Publishers.
- Herrnstein, R.J. (1970). On the law of effect. *Journal of The Experimental Analysis of Behavior*, 13(2), 243-266.
- Jahan, N., Naveed S., Zeshan, M., & Tahir, M. (2016). How to conduct a systematic review: A narrative literature review. *Cureus*, 8(11): e864. <http://doi.org/10.7759/cureus.864>
- Hersh, S. (2002). *Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing*, New York: Oxford University Press.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263-291.
- Korzeniowska, D. (2018). Zjawisko fiksacji funkcjonalnej w rachunkowości. *Entrepreneurship and Management*, XIX, 10(1). 209-224.
- Maruszewski, T. (1996). *Psychologia Poznawcza*. Warszawa: Polskie Towarzystwo Semiotyczne.
- Materska, M., & Tyszka, T. (Eds). (1997). *Psychologia i Poznanie*. Warszawa: Wydawnictwo Naukowe PWN.
- Micherda, B. (2007). *Podstawy Rachunkowości. Aspekty Teoretyczne i Praktyczne*. Warszawa: Wydawnictwo Naukowe PWN.
- Nęcka, E., Orzechowski, J., & Szymura, B. (2006). *Psychologia Poznawcza*, Warszawa: Wydawnictwo Naukowe PWN.
- Nowak, M. (2015). Pomiędzy rachunkowością a psami Pawłowa, czyli krytyka pojęcia "rachunkowość behawioralna". *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 389, 287-296. <http://doi.org/10.15611/pn.2015.389.26>
- Poirot, C. (2007). How can institutional economics be an evolutionary science? *Journal of Economic Issues*, 41(1), 155-179.
- Report of the Committee on the Relationship of Behavioral Science and Accounting. (1974). *The Accounting Review*, 49(4), 127-139.
- Ricciardi, V., & Simon, K.H. (2000). What is behavioral finance?. *Business, Education & Technology Journal*, 2(2), 1-9.
- Sen, A. (1973). Behaviour and the concept of preference. *Economica New Series*, 40(159), 241-259.
- Siegel, G., & Ramanauskas-Marconi, H. (1999). *Behavioral Accounting*. Mason, OH: Thomson South-Western.
- Simmel, G. (1997). *Filozofia Pieniądza*. Poznań: Wydawnictwo Fundacji Humaniora.

- Simon, H. (1955). A behavioral model of rational choice. *The Quarterly Journal of Economics*, 69(1), 99-118. <http://doi.org/10.2307/1884852>
- Sithole, S.T.M. (2016). The effects of presentation formats on understanding financial accounting: An experimental study. *Australasian Accounting, Business and Finance Journal*, 10(2), 76-92. <http://doi.org/10.14453/aabfj.v10i2.5>
- Staddon, J. (2016). Theoretical behaviorism, economic theory, and choice. *History of Political Economy*, 48(1), 316–331.
- Sterling, R. (1970). On theory construction and verification. *The Accounting Review*, 45(3), 444-457.
- Thaler, R., & Sunstein C. (2008). *Nudge*. New York: Penguin Books.
- Thorndike, E.L. (1970). *Animal Intelligence. Experimental Studies*. New Brunswick, London: Transaction Publishers.
- Tooby, J., & Cosmides, L. (1992a). Psychological foundations of culture. In J. Barklow, J. Cosmides, & J. Tooby (Eds), *The Adapted Mind* (pp. 19-136). New York: Oxford University Press.
- Tooby, J. & Cosmides, L. (1992b). *Ecological rationality and the multimodular mind*. Center for Evolutionary Psychology. Technical Report #92-1. Santa Barbara, CA: University of California.
- Tooby, J., & Cosmides, L. (1996). Are humans good intuitive statisticians after all? Rethinking some conclusions from the literature on judgment under uncertainty. *Cognition*, 58, 1-73
- Tyszka, T. (2003). *Psychologia Ekonomiczna*. Gdańsk: Gdańskie Wydawnictwo Psychologiczne.
- Wilk, J. (1999). Mind, nature and the emerging science of change: An introduction to metamorphology. In G. Cornelis, S. Smets, & J. Van Bendegem (Eds.), *Einstein Meets Magritte: An Interdisciplinary Reflection and Science, Nature, Art, Human Action and Society* (pp. 71-87). Netherlands: Springer.
- Winstanley, J. (2008). *Klucz do Psychologii. Najważniejsze teorie, pojęcia, postaci*. Warszawa: Wydawnictwo Naukowe PWN.
- Winterhalder, B. (2007). Risk and decision-making. In L. Barrett & R. I. M. Dunbar (Eds.), *Oxford Handbook of Evolutionary Psychology* (pp. 433-446). New York: Oxford University Press. <http://doi.org/10.1093/oxfordhb/9780198568308.013.0029>
- Witt, U. (2008). Evolutionary economics. In *The New Palgrave Dictionary of Economics* (pp. 67-68). London: Palgrave.
- Zaleśkiewicz, T. (2011). *Psychologia Ekonomiczna*. Warszawa: Wydawnictwo Naukowe PWN.
- Zielonka, P. (2019). *Giełda i Psychologia. Behawioralne Aspekty Inwestowania na Rynku Papierów Wartościowych*. Warszawa: CeDeWu.
- Zielonka, P. (2003). Czym są finanse behawioralne, czyli krótkie wprowadzenie do psychologii rynków finansowych. *Materiały i Studia NBP*, 158, 40-43.

Abstrakt

Artykuł stanowi propozycję włączenia w podbudowę teoretyczną behawioralnego nurtu w naukach ekonomicznych, bazującego dotychczas przede wszystkim na podejściu poznawczym, również perspektyw behawioralnej oraz ewolucyjnej. Wykorzystano narracyjny przegląd literatury obecnej w zasobach Internetu. Piśmiennictwa poszukiwano przede wszystkim w elektronicznych bazach publikacji naukowych w oparciu o hasła odzwierciedlające tematykę artykułu. Ostateczny wybór obejmował 37 artykułów i 21 monografię, które poddano dalszej analizie. Analiza zgromadzonej literatury wykazała, że nurt behawioralny w naukach ekonomicznych, dzięki przyjęciu innych perspektyw niż tylko poznawcza, może istotnie wzbogacić swoje podstawy teoretyczne i empiryczne, w tym narzędzia badawcze, i stymulować nowe odkrycia dotyczące ludzkich zachowań w sytuacjach ekonomicznych. Podejmowane są już pewne próby badawcze oparte na podejściu behawiorystycznym, na przykład dotyczące kwestii wpływu mechanizmu warunkowania na decyzje czy wykorzystaniu tzw. szturchania (nudging) w indukowaniu bardziej racjonalnych wyborów. Wydaje się także, iż obecnie na znaczeniu zyskują coraz bardziej koncepcje ewolucyjne, co w szczególności przejawia się w rosnącej popularności metod neuronauki stosowanych do badania funkcjonowania ludzkiego mózgu w trakcie podejmowania decyzji ekonomicznych. Kombinacja trzech omawianych tu podejść wydaje się dość obiecująca, nie tylko z uwagi na fakt, że umożliwi głębsze poznanie mechanizmów leżących u podstaw zachowań ekonomicznych, ale także może pomóc stworzyć narzędzia pozwalające ludziom podejmować lepsze decyzje. Zestawienie w niniejszym artykule trzech podejść (paradygmatów), co dotychczas nie było praktykowane w literaturze przedmiotu, może a) stanowić inspirację dla badaczy zajmujących się ekonomią behawioralną (czy też dyscyplinami pokrewnymi) do poszukiwania innych, niż te funkcjonujące w kanonie poznawczym, teoretycznych podstaw swych badań, b) ułatwić osadzenie tych badań we właściwym paradygmacie, w tym odnalezienie odpowiedniej koncepcji, teorii czy modelu, a także c) utworować rozpoznanie niszowych lub uzupełniających się obszarów badawczych. Z powyższych względów artykuł ten stanowi uzupełnienie dyskusji na temat teoretycznych podstaw behawioralnego nurtu w naukach ekonomicznych i stanowi wkład w proces kształtowania się jego tożsamości naukowej.

Słowa kluczowe: ekonomia behawioralna, finanse behawioralne, rachunkowość behawioralna, behawioryzm, ewolucjonizm

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Conflicts of interest

The authors declare no conflict of interest.

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Explicating failure among nascent entrepreneurs in West Sumatra: The nexus of psycho-economic factors and opportunistic behavior

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Abstract

This paper investigates and discusses individuals' internal circumstances as factors that may cause entrepreneurial failure, which consists of psycho-economic phenomenon and opportunistic behavior of individuals. The study is a quantitative study, and it operates relational analysis that relates existing arguments regarding psycho-economic factors to entrepreneurial failure. The study further adds and analyses the construct of opportunistic behavior as another possible factor that may cause entrepreneurial failure. The sample of the study is 1541 young entrepreneurs in West Sumatra Province, Indonesia, who have experienced failures in their previous businesses. The analysis was undertaken by using multiple and partial regression analysis in which the statistical protocol was operated. It is found that psycho-economic factors, together with opportunistic behavior of individuals in a lesser to a greater degree, have caused entrepreneurial failure to the context of the study. The study also implies and argues that opportunistic behavior may not only be viewed as a source of entrepreneurial success, as it also contributes to entrepreneurial failure. This finding clearly demonstrates the originality and value of this study since it argues that opportunistic behavior can also be viewed as a factor – apart from the other existing psycho-economic factors (deterministic, voluntaristic, and emotive) – that can cause entrepreneurial failure. The study further suggests that strengthening entrepreneurial personality, characteristics and psychological aspects should be a focus for the Indonesian government in promoting and developing young-nascent entrepreneurs.

Keywords: *deterministic-voluntaristic-emotive factors, entrepreneurial failure, psycho-economic factors, opportunistic behavior*

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INTRODUCTION

The most important entrepreneurial learning that can be absorbed by entrepreneurs supposes to be sourced from their experience regarding failures. Almost all entrepreneurs have experienced failure when they undertook their business. In a study about the anatomy of entrepreneurs, Wadhwa, Holly, Aggarwal, and Salkever (2009) came out with the finding that successful entrepreneurs have experienced, on average, two to three failures in new ventures that they established before they reached success. This situation, and the condition of failure, has triggered entrepreneurs to become tougher, more resilient and, crucially, more able to learn from failures. Therefore, analyzing failure as a part of an entrepreneurial journey is necessary, since entrepreneurs cannot avoid it to achieve success. The existence of failure as an event in an entrepreneurial journey – followed by mental and learning processes and an experiential process – has raised a particular concept in entrepreneurship, which is introduced as the concept of serial entrepreneurship.

Lafontaine and Shaw (2014) mentioned that the serial entrepreneurship could be understood as an entrepreneurial process which happens to an entrepreneur in achieving success in new ventures after he/she has experienced failures, in which the following element exists: [a] the learning process from the failure, [b] the process of change in entrepreneurial behavior after the failure, and [c] the experience of managing the business. There are no uniform arguments and opinions from scholars to state the number of venture failures that occurred and were experienced by entrepreneurs before he/she reached entrepreneurial success. It is believed that the number of venture failures before achieving entrepreneurial success is situationally, conditionally, and contextually related to an entrepreneur as a person. This means that most entrepreneurs will experience entrepreneurial failure – and the number of failures varies among them. However, one common argument raised and approved by the scholars is that entrepreneurial success is very seldom achieved in the first single venture creation/establishment.

Studies and research to reveal the determinants of entrepreneurial success factors have clearly identified that entrepreneurial success is influenced by: [a] the internal and external environments of the entrepreneur, [b] the psychological condition and situation of the entrepreneur, and [c] the sociological situation of the entrepreneur (Rahman & Day, 2014). A recent study from Bratnika-Myśliwiec, Wronka-Pośpiech, and Ingram (2019) mentioned that socioemotional wealth (SEW) would be beneficial for the creation of competitive advantage of the family business. Therefore it should be regarded as a strategic antecedent for firm performance. Each factor has

its own specific determinants, in which opportunism is considered as one major psychological determinant that can lead to entrepreneurial success (see, for example, the studies from Chang, Liu, & Chiang, 2014; Herath, 2014; Wasdani & Matthew, 2014).

An interesting question, therefore, is: what would be the other sensible psycho-economic construct apart from the existing deterministic, voluntaristic, and emotive factors that may cause entrepreneurial failure? Further, is there any determinant in entrepreneurial success factors that can play intersection roles with the determinant of entrepreneurial failure? Based on that consideration, part of this study tries to examine and discuss the possibility of opportunistic behavior being identified and introduced as a possible determinant that may not only be viewed as the determinant in entrepreneurial success but also influences entrepreneurial failure. As previously described by Andrunik and Svetlakov (2013), the existence of opportunistic behavior will always create conflicts and bargain situations inside individuals, and they tend to choose a decision which they prefer emotionally and makes them feel comfortable. This tendency would reasonably put individuals in a decision dilemma, whether they will follow their emotional feeling or their rationality. In many cases, the proclivity to choose to follow an emotional feeling is rather more prominent than to use rationality.

In the context of business and management, the opportunistic behavior of individuals has also been proven to bring negative consequences. Unsal and Taylor (2011), for example, have empirically demonstrated that the opportunistic behavior of individuals negates the negative practices in project collaboration and will result in inefficiency. Previously and similarly, Yaqub (2009) mentioned that collective benefits would not be obtained by members of an organization if there are self-interest-based actions undertaken by certain individual members of that respective organization. Self-interest from individuals will result in a moral hazard that also leads to other negative actions such as shirking and free-riding, which have an impact on an organization. Meanwhile, in the context of the firm, Cordes, Richerson, McElreath, and Strimling (2010) found that the existence of high opportunism-related behavior amongst individuals within the firm will cost the growth of the firm. Firms will remain small in size, and social learning processes within the firm will remain stagnant.

Taking nascent entrepreneurs in West Sumatra – Indonesia as the unit of analysis and context of the study, it tries to reveal the psycho-economic phenomenon experienced by nascent entrepreneurs that have led to entrepreneurial failure. In detail, this study reveals entrepreneurial failure within nascent entrepreneurs in West Sumatra, which was caused as the result of psycho-economic phenomenon together with opportunistic behavior.

Culturally, the West Sumatran people are characterized as a society that has high uncertainty avoidance, as found by Hofstede (2018) and Mangundjaya (2010). This cultural dimension has made the West Sumatran prefer and tend to choose and to maintain a stable situation in their life. In their mindset, this stability can only be achieved when they have regular income to finance their daily needs. In the turbulent and unstable situation of the Indonesian economy, the opportunity to get a regular income can only be achieved if people have a formal job where they get a monthly salary and get a pension in the future. Related to young-nascent entrepreneurs, unfortunately, there is no guarantee that every newly started micro-small-medium business can survive in a more challenging business situation in Indonesia. Therefore, there is a phenomenon of young-nascent entrepreneurs in the context of the study, choosing to have a regular job – even though they have actually started a business.

This study was quantitatively undertaken with 1541 nascent entrepreneurs in West Sumatra, who have experienced entrepreneurial failure. Our preliminary investigation through a pilot study found that the number of entrepreneurial failures experienced by the West Sumatran nascent entrepreneurs averagely reaches three to four times until they can settle the business and achieve success. This situation is a challenging one – as people usually undertake the necessary steps and efforts to reduce the failure rate. Therefore, this study is interesting and valuable as it tries to reveal the entrepreneurial failure phenomenon experienced by nascent entrepreneurs, which can be used as a reliable source and foundation to state and support government policies regarding nascent entrepreneurs.

LITERATURE REVIEW

In general, entrepreneurial failure can be understood as the cessation of an entrepreneurial process undertaken by entrepreneurs as a result of failures that occurred during the preparation, implementation, and management of the venture. One main possible sign of this failure can be seen in the inability of the entrepreneur to manage financial matters, which has further resulted in the cessation of business operation, and worse – bankruptcy. However, even though the inability to manage financial matters is closely linked to bankruptcy, it cannot be viewed as the only reason for entrepreneurial failure. Instead of the inability to manage financial matters of the venture, entrepreneurial failure is mainly viewed as a result of the combination and interaction between the psychological and economic factors of an entrepreneur. It is perceived that psychological factors of individuals will lead them to decide and further, to undertake error actions – which will

further result in entrepreneurial failure. As Smida and Khelil (2010) point out, entrepreneurial failure is a psycho-economic phenomenon which will lead entrepreneurs to undertake error actions to allocate resources and will result in further consequences, in terms of the psychological situation in the form of disappointment. However, entrepreneurial failure can be concluded as the situation in which the psycho-economic phenomenon relates to:

- the individual situation and condition (in particular behavior and personality);
- the organization as a business entity where an entrepreneur undertakes entrepreneurial process;
- the social environment which is directly and/or indirectly relates to individuals;
- the entrepreneurial process happening to individuals.

However, these four factors individually cannot influence entrepreneurial failure as it does not have sufficient power to lead to failure. There should be a combination and an interaction between these factors and elements which will impact the failure of the businesses run by entrepreneurs.

Knowledge and observation regarding entrepreneurial failure are considered important, as one of the main concerns in entrepreneurship is to minimize the failure rate of new businesses. Even though entrepreneurs are described as individuals who can tackle risks (including business risks), we view the information and knowledge regarding failures as a guidance that can also be used by nascent entrepreneurs in preparing their business. The information and knowledge regarding failures can also be used to reduce the rate of the serial entrepreneurship process that happened to entrepreneurs. In addition, failures will also be a learning event, and experience from the post-mortem assessment to analyze the reasons for entrepreneurial failure. One of these post-mortem assessments is in the form of a cognitive structural analysis that can be used by entrepreneurs to analyze the type of failure and re-motivate themselves to be back in business, getting experiences from cases, finding a new ability to face and tackle failures and, the most important, to determine the transformation process of failures into opportunities. Entrepreneurs can use their failure experiences to reflect on themselves and take further benefits for the operation of their business from the future. The positive impact of failure may also be categorized as a eustress for entrepreneurs, who can take reflective practices from these failures (Tikkamäki, Heikkilä & Ainasoja, 2016).

Study and research regarding new venture failures are usually emphasized by the analysis of the following topics: [a] what new ventures fail and why? (Artinger & Powell, 2015; van Gelder, Fries, Frese, & Goutbeek, 2007), and [b] what are the consequences that need to be borne by entrepreneurs as the

result of their failures (Jenkins, Wiklund, & Brundin, 2014; Singh, Corner & Pavlovich, 2015; Yamakawa, & Cardon, 2015; Ucbasaran, Westhead, Wright, & Flores, 2010)? Contextually, most of the studies and research that have been completed analyzed that the consequences of business failure belong to the entrepreneur – which means that the analysis has mainly been done on the business as an entity. Considering this, research contexts were mostly centered on the question ‘why can be a business fail?’ Wennberg, Wiklund, DeTienne, and Cardon (2010) concluded that business mainly fails because of the following reasons: [a] low business performance, [b] the problem of resources, and [c] unachievable positive goals and growth of the business. On a broader scale, Hammer (2014), and Wennberg and DeTienne (2014), further identified the existence of three conditions that can lead to a failure in business, which are: [a] business environment, [b] the business itself – mainly inappropriate resources and competence, and [c] the entrepreneur as an individual/person – mainly less commitment from entrepreneurs in managing the business.

If we objectively observe business failure, in particular new ventures, failure is closely related to the analysis of those who are operating the business. This means that the entrepreneur, as a person, is considered as an individual who has a prominent role in determining whether a business can succeed or fail. Therefore, the unit analysis of the research cannot always be focused on the business as an entity. That is why we put the emphasis on our focus and analysis merely to the entrepreneur as an individual. According to Smida and Khelil (2010), the concept of business and organizational failure can be viewed from the entrepreneur as an individual, and it is sourced from: [a] deterministic factors, and [b] voluntaristic factors. A deterministic factor is defined as the failure of a new venture which is sourced from the entrepreneur’s environment, as its existence cannot be minimally controlled by the entrepreneur. As Cardon, Stevens, and Porter (2011) mentioned, the deterministic factor of business failure comes from the entrepreneur’s environment, which cannot be avoided by entrepreneurs in their business operation. In reverse, Mellahi and Wilkinson (2010) mentioned that voluntaristic factors related to business failure are sourced from errors made by entrepreneurs in making decisions and conducting actions. It can be inferred from Mellahi and Wilkinson (2010) that the deterministic factor is not the only factor that results in business failure – it can also be voluntaristic factors.

Cardon et al. (2011) further stated that business failure is not a result/consequence of an uncontrollable situation and condition by the entrepreneur, such as the environment factor. One possible source of the business failure instead comes from a stigma that is embedded inside entrepreneurs which makes them try as hard as they can to avoid it – but unfortunately, they end

up making false decisions and wrong actions, and as a result of these, their business fails (Singh et al., 2015). Khelil (2016) further mentioned that apart from deterministic and voluntaristic factors, as did Cardon et al. (2011), there is also an emotive factor inside entrepreneurs, which is a decisive factor in entrepreneurial failure. An emotive factor, as meant by Khelil (2016), is described as a factor that can show interaction and combination between business performances achieved by entrepreneurs (in terms of failure) and the disappointment of that unachieved business performance. In relation to this, the finding of Hammer (2014) also showed us the indication of a goal-setting bias in entrepreneurs as a major source of business failure. Goal setting bias happens because of the unlatch situation between expectation and real business performance experienced by entrepreneurs. This emotive factor (Khelil, 2016) is an interaction and combination between deterministic and voluntaristic factors in entrepreneurial failure. Therefore, failure is not only sourced from an uncontrollable/difficult-to-control environment, but it is also sourced from errors in decision making and wrong-doing actions done by the entrepreneur in managing the business.

In previous studies, Khelil (2012) mentioned that failure in a new venture mostly happened because of the following patterns and types that are embedded in an entrepreneur as an individual: [a] gambler – ones who would like to start a business without resources and without any clear orientation, [b] supported at arm's length – ones who have limited resources, [c] bankrupt – ones who have limited competencies, [d] megalomaniac – ones who have too much self-confidence, and [e] dissatisfied with the Lord – ones who do not fully rely on God's will. We can further categorize these reasons into two categories: [a] individual personality as a source of failure (consists of gambler, megalomaniac, dissatisfied with the Lord), and [b] the environmental situation as a source of failure [consists of supported at arm's length and bankrupt). Meanwhile, Hammer and Khelil (2014) strengthened the analysis about entrepreneurial failure by saying that it was based on the consideration of input, process, and output in the new venture creation process at individual and enterprise levels. They further draw this in Figure 1 below, which shows the model of entrepreneurial failure that would be experienced by entrepreneurs.

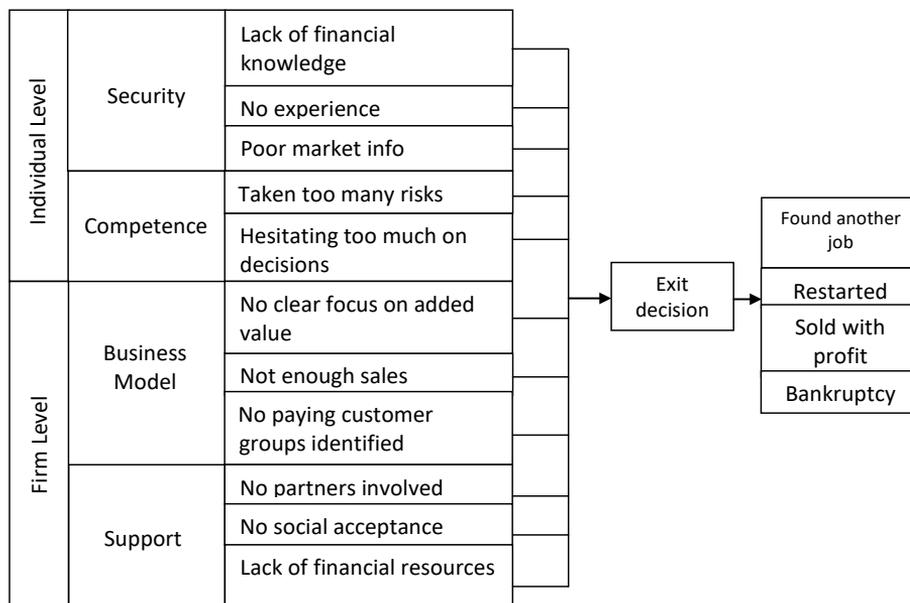


Figure 1. The Model of Entrepreneurial Failure

Source: Hammer and Khelil (2014).

The model infers that entrepreneurial failure in the form of an exit decision from the business is drawn as the result of: [a] individual level which has competency and security as its dimensions, and [b] firm level which has support and business model as its dimensions. The existence of both factors will lead entrepreneurs to a decision to cease their business – and, therefore, the business fails. A further impact of this exit decision can lead entrepreneurs to try to find other jobs, restarting a new venture, or selling their business with the hope that they will get some profits or worst, bankruptcy.

Concept and studies regarding opportunism mostly related to the opportunistic behavior of individuals, and it mentioned that this opportunistic behavior is a hidden will of an individual which can have a negative impact on the business and it is shown by efforts to achieve that hidden will (Cordes et al., 2010). Andrunik and Svetlakov (2013) and Cordes et al. (2010) have further revealed that the existence of opportunistic behavior is closely related to the transaction cost concept and will create conflicts and bargain situations in which individuals need to choose the one most appropriate choice from many alternative decisions. Both of those concepts are clearly related to the topic of this paper and study – and they demonstrate an indication that an entrepreneur will prefer a situation that brings more benefits to him/her personally. This situation can be in terms of an alternative to secure a better

job compared with a career in entrepreneurship, or the desire to start other new businesses but in the condition that the earlier business is still unstable or immature. This situation will put entrepreneurs in a conflict or a bargaining position that requires them to make their own decision – securing and entering a job, or starting another new venture, or maintaining the earlier venture to reach its maturity. Sometimes the decision is a good and powerful decision, but it can also be a poor decision, which will lead them to the failure of the earlier venture. We can see here that entrepreneurs can be trapped in an individual level psychological situation (Hammer & Khelil, 2014), where they are asked to secure their future life on the possibility of a future career that they do not possess at the moment.

In the study of impacts and consequences of entrepreneurial failure, Mantere, Aula, Schildt, and Vaara (2013) mentioned that entrepreneurial failure is a social construction where the process of individual psychology in terms of [a] the existence of emotional processes and [b] cognitive process to justify every action, exists. In entrepreneurship, an increasing cognitive load within individuals is viewed to bring high intrinsic motivation (Liang & Liang, 2015), which will be used as a psychological factor to start a business. We can conclude from this opinion that entrepreneurial failure may bring psychological impacts to the failed entrepreneurs – and as a result, they are trying to do their best to maintain their self-esteem and to avoid losing their own business. Psychological impacts can also be seen in efforts to reduce, and moreover, to eliminate the stigma that arises from failure (Singh et al. 2015). An interesting phenomenon regarding the existence of stigma lies in the fact that it can also be a source of the next failure. As Singh et al. (2015) say, the fear of failure and efforts to stay away from the stigma of failure have, contradictively, resulted in negative situations for an entrepreneur – as he/she will probably make a poor decision and take a wrong action in the business. As a result, this will make entrepreneurs sink into failure (again). Therefore, the stigma of failure can be seen as a psychological reason and impact on why an entrepreneur fails in the business.

Following the studies and opinions from Arasti (2011), Fatoki (2014), and Mellahi and Wilkinson (2010) regarding entrepreneurial failure, there is a clear indication that deterministic factor can be viewed as one of the major reasons that cause entrepreneurial failure. We use this as our foundation to state the initial hypothesis in this study. Combining it with the opinion from Khelil (2010) and Hammer and Khelil (2014), we further formulate our first hypothesis as the following:

H1: A deterministic factor in terms of [a] the existence of support to entrepreneurs, [b] social situation and social environment, [c] competition

in the industry, and [d] the high operation cost of the business has brought positive and significant influence to the creation of entrepreneurial failure within nascent entrepreneurs in West Sumatra.

In a study about the economic situation and its influence on the success and failure factor of a business, Devece, Peris-Ortiz, and Rueda-Armengot (2016) mentioned that the individual characteristics of an entrepreneur in a specific economic situation would influence the success or failure of a business start-up. Based on this study and opinion, as well as Khelil (2010), we further state the second hypothesis in our study.

H2: A voluntaristic factor in the form of [a] individual competencies, [b] individual orientation and [c] entrepreneurial behavior towards customers will bring a positive and significant influence to the creation of entrepreneurial failure by nascent entrepreneurs in West Sumatra.

In relation to the emotive factor, Khelil (2016) and, previously, Mellahi and Sminia (2009) argued that this factor has a close relationship with the motivation, commitment, and aspiration of an entrepreneur when they undertake their business. We further posit that the emotive factor, as a psychological construct inside an entrepreneur as an individual, will determine the success or failure in his/her business. From Khelil (2016), we view that this psychological condition will create pressure, within the nascent entrepreneur and his/her social environment, to get a job soon. We consider this situation as a necessity-based situation where individuals have limited employment opportunities, failed to get a job, and failed during an application/interview for a job. As this is the primary motivation, there will be a significant impact on the creation of failure in business. We further formulate our third hypothesis as below.

H3. An emotive factor in the form of [a] psychological pressure to get income and [b] the indication of a necessity-based motive in entrepreneurship has brought positive and significant influence to entrepreneurial failure experienced by nascent entrepreneurs in West Sumatra.

In the context of developing countries (such as Indonesia), which still have very limited employment opportunities, the existence of its cultural dimension (Hofstede, 2018) and the nature of its cultural values (Mangundjaya, 2010) have been perceived as a burden for entrepreneurship. In relation to this, the study viewed that there is a tendency of pattern and opportunistic behavior that exists within nascent entrepreneurs in Indonesia.

As Yakovleva, Grigoryeva and Grigoryeva (2016) mentioned, opportunistic behavior can be seen as behavior manipulations of individuals and the nature of exogenous opportunistic manifestations as a society and economic phenomenon. This opportunistic behavior will lead nascent entrepreneurs to leave their business once they get a job offer or an opportunity to get a job (either in a public or private institution). In the context of corporate management, Andrunik and Svetlakov (2013) mentioned that the moral hazard has become an acute problem in corporate management, due to the results of the transformation of social relations, the changes to the status of company employees and managers, the development of stock markets, and the increasing complexity of products. It is viewed that opportunistic behavior is the mode of action for the economic entity, not limited by moral considerations, accompanied by the acts of deception, contradicting the interests of other agents, and characterized by a tendency to implement only proper interests.

In addition to that overview, this study also considers aggressivity inside individuals as a construct of opportunistic behavior that belongs to nascent entrepreneurs. Aggressivity will lead nascent entrepreneurs to neglect their initial business since they have an uncontrollable passion for creating and establishing other businesses. In relation to the consideration regarding aggressivity, this study added one concept regarding opportunistic behavior as an additional construct that can cause entrepreneurial failure. Therefore, this study formulates its fourth hypothesis in the following statement.

H4. Opportunistic behavior which is related to an opportunity to get a job, get higher income, future security, and aggressivity in starting businesses, will positively and significantly influence entrepreneurial failure within nascent entrepreneurs in West Sumatra.

H5. Furthermore, this study also formulates the next hypothesis by saying that [a] deterministic, [b] emotive, [c] voluntaristic, and [d] opportunistic behavior will simultaneously influence entrepreneurial failure experienced by nascent entrepreneurs in West Sumatra.

Based on these five hypotheses, this study has further developed its framework and research method.

RESEARCH METHOD

The study is an explanatory study, and it operates a quantitative methodology as its leading research approach. Causal analysis is used to investigate the simultaneous as well as partial relationship and the influence of every psycho-economic factor and opportunistic behavior as variables of the research to the entrepreneurial failure. A small portion of qualitative analysis to the open answers from the respondents was also used to support the quantitative part of the study. Cross-sectional cohort data and information were mainly collected by using a questionnaire as the research instrument.

The population of failed nascent entrepreneurs in West Sumatra is unknown since there is no recorded formal data regarding its number. Therefore, we used a simple random method as the sampling technique, and the questionnaire was distributed to the failed nascent entrepreneurs in eighteen regencies and municipalities in West Sumatra. The study firstly intended to collect data from 100 respondents in each regency and municipality in West Sumatra Province. Therefore, as many as 1800 questionnaires were prepared and distributed to the prospective respondents of the study. 1541 of them (85.61%) were completely filled in by the respondents and can be analyzed. This number was further used as the sample size of the study. The study considers its samples as gender neutral, which means that gender is not considered as the sampling criteria, and it does not consider certain business branches as the business background of the samples.

The operation of variables in the research uses the following guidelines.

Specifically, and as in Table 1, opportunistic behavior is measured based on the conceptual foundation that there will be transactional circumstances that occur to individuals regarding the choice of their future life. In this study, it is reflected with the possibility of a person: [a] to choose a better job rather than entrepreneurship, [b] to choose to secure a job in a longer period, and [c] the possibility of a person to follow his/her desire to immediately establish other new ventures but in the condition that the earlier business is still unstable or immature. Both these possibilities are then connected to the possibility of failure in the earlier business that an entrepreneur has. For this purpose, findings and results of the study were analyzed by using multiple regression analysis and supported by the use of SPSS as the statistical tool. Design of the research framework in this study uses Figure 2 below.

Table 1. Operation of variables

No	Variables	Dimension	Indicators	Measurement
1	Entrepreneurial failure	a. Failure to allocate resources b. Failure in decision-making c. Failure in actions	a. Ineffectivity and inefficiency in allocating resources b. Decision-making is not based on data, information, and facts c. Actions do not fit with what is supposed to be done	Likert scale 1- 5 9 questions
2	Deterministic factors	a. The availability of support b. Social environment of entrepreneurs c. Competition d. High operational cost of the business	a. The existence of social support from the nearest social environment b. Response of social environment to the choice of becoming an entrepreneur c. Degree of competition Level of operational cost	Likert scale 1-5 11 questions
3	Voluntaristic factors	a. Competencies b. Individual orientation c. Behavior related to customers	a. Level of knowledge, skills, motivation and personal characteristics b. Personal orientation of the entrepreneurs c. Response to customers complaints and needs	Likert scale 1-5 14 questions
4	Emotive factors	a. Psychological pressures to get income b. Necessity motives	a. Level of psychological pressure to get income b. Necessity-based motives in entrepreneurship	Likert scale 1-5 8 questions
5	Opportunistic behavior	a. The possibility to get a better job b. Job security in a longer period c. Desire and much passion to start other businesses	a. Level of income that would be received continuously b. High level of social status c. Opportunity to get a better career d. Level of intention to start other businesses	Likert scale 1-5 8 questions

Source: Mellahi and Wilkinson (2010), Khelil (2010), Hammer and Khelil (2014), Devece et al. (2016), Cordes et al. (2010), and Yakovleva et al. (2016).

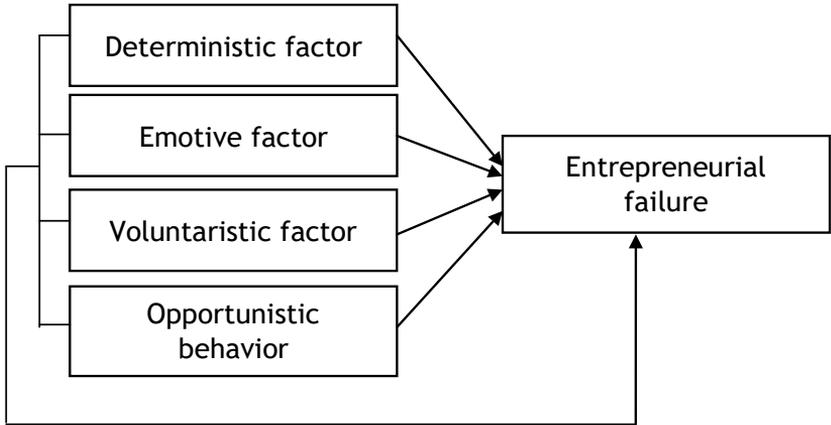


Figure 2. Research Framework

Source: conception of the authors, adopted from Mellahi and Wilkinson (2010), Khelil (2010), and Hammer and Khelil (2014).

Based on the research framework developed in Figure 2, we further arrange it in the following statistical equation that will be used as the multiple regression model of the study.

$$Y_{ef} = a + b_1X_v + b_2X_d + b_3X_e + b_4X_o + e \tag{1}$$

where:

- Y_{ef} = entrepreneurial failure
- X_v = voluntaristic factors
- X_d = deterministic factors
- X_e = emotive factors
- X_o = opportunistic behaviour
- e = error
- a = constant

The statistical model which is developed for this study is used as the basis to measure the simultaneous influence of: [a] voluntaristic, [b] deterministic, [c] emotive, and [d] opportunistic behavior to entrepreneurial failure. As the concept of entrepreneurial failure and nature of the data analyzed in the study, we use the F-test statistic to test this model. To measure the influence of each independent variable on entrepreneurial failure as the dependent variable, we operate a t-test statistic.

RESULTS AND FINDINGS

Our first task in this study is to investigate and further to reveal profiles of our sample, which is divided into two categories: [a] personal profile and [b] business profile, which belongs to the sample. Our major intention is to prove that descriptively, our samples fit with the sampling criteria previously stated in the methodology part of this paper. The personal profile of our sample is shown integrated into Table 2 below.

Table 2. Sample profile of the study (personal profile)

Category	Characteristic	Number of sample	Percentage (%)	Valid percent
Gender	Male	840	54.51	54.51
	Female	701	45.49	100.00
Level of Education	Elementary & Junior High School	147	9.60	9.60
	Senior High School	724	47.00	56.60
	Undergraduate	669	43.40	100.00
Age (years)	18-20	62	4.23	4.23
	21-25	716	46.46	50.69
	26-30	763	49.51	100.00
Age when first starting a business (years)	18-20	491	31.86	31.86
	21-23	726	47.11	78.97
	24-26	252	16.35	95.32
	27-30	72	4.68	100.00

Source: survey data, processed.

Despite showing a gender profile of our sample in Table 2, we consider our sample as gender neutral. This means that we do not consider and do not concentrate our study on the gender perspective of our samples as we believe that both (either male or female) may experience the same business failure. We are more interested in discussing our sample profiles from the perspectives of age, level of education, and the age when they are first starting a business because we think those profiles are more related to the exposition and the elaboration on why entrepreneurs fail in their business.

We can see from Table 2 that the majority of our sample is the male respondent and is dominated by individuals who are in the age of 26-30 years, have attended the higher education institution and were mostly in the age of 21-23 years when they first started the business. The demographic characteristics of our samples are viewed to bring influence

to entrepreneurial failure experienced by them, considering their ability to absorb new knowledge and skills in business. As the justification for using the demographic characteristics in our study, we consider the opinion of Talas et al. (2013), who previously argued that gender, age, education and the type of school previously attended by individuals are the demographic factors that can influence entrepreneurship. Meanwhile, the profile of the business belonging to our sample is shown in Table 3 below.

Table 3. Sample profile of the study (business profile)

Category	Characteristic	Number of sample	Percentage (%)	Valid Percent
Current business is the..	2nd	990	64.24	64.24
	3rd	426	27.64	91.89
	4th	84	5.45	97.34
	5th	13	0.84	98.18
	>5 th	28	1.82	100.00
Number experiencing failure	1	1101	71.45	71.45
	2	353	22.91	94.35
	3	57	3.70	98.05
	4	16	1.04	99.09
	5	1	0.06	99.16
	>5	13	0.84	100.00

Source: survey data, processed.

Table 3 suggests that our samples had a business that previously experienced failures. The majority of our samples' current businesses are second businesses, which means that the previous one had failed. Our sample also revealed that they mostly (1101 samples) experienced business failure once. If we look at Table 2 closely, there is an indication of the process of serial entrepreneurship that happened to our sample. Our samples still have courage in the business (either in the same business as the previous one or starting a completely new one with a different business branch). As Lafontaine and Shaw (2014) previously argued, serial entrepreneurship is the journey of an entrepreneur experiencing failures in order to achieve success, in which the processes of [a] learning from the failure, [b] change in entrepreneurial behavior after the failure, and [c] experience in managing the business, are taking place during the failure. Processes and experiences during business operations, which result in failures, will bring a further impact on the creation of entrepreneurial resilience. Entrepreneurs can take benefits from this process by improving their personal capacity to make realistic business plans, have self-confidence and a positive self-image, possess communication skills,

and have the capacity to manage strong feelings and impulses (American Psychological Association [APA], 2010). Those will be further used as the main sources of entrepreneurial learning. As Jenkins et al. (2014) and Wadhwa et al. (2009) argued, learning from failure is an essential characteristic of entrepreneurs – and once an entrepreneur learns from the failures they experienced then there are more possibilities to rebuild the business and to achieve success in the business.

Our second task in the study is to measure whether the questions in our research instrument (questionnaire) are valid and reliable. For this purpose, we use an r-table with a value of 0.1308 as the basis for the validity analysis. Our validity measurement shows that the value of Corrected Item-Total Correlation for deterministic, voluntaristic, emotive, and opportunism factors are bigger than the value of the r-table (0.1308). We then conclude that questions in our research instrument are valid. The measurement of reliability in our study uses the reliability statistics table – in which the rule says that variables are reliable if they have a value of Cronbach's alpha of more than 0.7. The measurement of reliability statistics from our research instrument shows the following results.

Table 4. Reliability statistics of the variables

Variables	Cronbach's Alpha
Entrepreneurial failure [EF]	0.843
Deterministic factors [DEF]	0.783
Voluntaristic factors [VEF]	0.828
Emotive factors [EEF]	0.823
Opportunistic behaviour [OEF]	0.766

Source: survey data, processed.

As we can see from Table 4, the reliability measurement shows that Cronbach's alpha for all variables of entrepreneurial failures [EF], deterministic [DEF], voluntaristic [VEF], emotive [EEF] and opportunistic behavior [OEF] factors are bigger than 0.7 – which means that all points in our questionnaire are reliable. We then measured the simultaneous influence of DEF, VEF, EEF, and OEF to entrepreneurial failure. Using multiple regression analysis, the finding shows the following result.

Table 5. The result of multiple regression analysis (f-test) to measure the simultaneous influence of DEF, VEF, EEF, and OEF to entrepreneurial failure

Model	Sum of Squares	Df	Mean Square	F	Sig.
¹ Regression	30720.010	4	7680.003	217.249	.000 ^a
Residual	106795.989	3021	35.351		
Total	137515.999	3025			

Note:¹ Predictors: (Constant), DEF, VEF, EEF, OEF ²dependent variable: EF

Source: primary data analysis.

It can be seen from the result of the multiple regression analysis undertaken in this study that the value of F is 217.249 with the Sig. 0.000. As this value is less than $\alpha=5\%$, we can summarize that the regression model of this study can be used to predict entrepreneurial failure. Our finding indicates that the four independent variables in this study, namely, deterministic [DEF], voluntaristic [VEF], emotive [EEF] and opportunistic behavior [OEF] are simultaneously and statistically significant in influencing entrepreneurial failure. This finding is further used as the statistical proof and solid basis regarding the acceptance of hypothesis 5 (H5) of the study which says that [a] deterministic factor, [b] emotive factor, [c] voluntaristic factor, and [d] the opportunistic behavior will simultaneously influence entrepreneurial failure experienced by nascent entrepreneurs in various regencies and municipalities West Sumatra.

The final task of the study is to measure the result of the t-test in order to get results regarding the possible relationship between each independent variable of the study, which is deterministic factor [DEF], voluntaristic factor [VEF], emotive factor [EEF] and the opportunistic behavior [OEF] to entrepreneurial failure [EF]. The t-test of the study allows us to analyze the partial relationship between each of the independent variables to the dependent variable. The result is then shown in Table 6 below.

The partial regression analysis using the t-test is used to measure the relationship between [a] EF and DEF, [b] EF and VEF, [c] EF, and EEF and [d] EF and OEF. The t-test of each relationship between dependent and independent variable shows the values 3.470 (for EF and DEF), 7.396 (for EF and VEF), 16.168 (for EF and EEF), and 9.236 (for EF and OEF). We also found that Sig. value for all relationships is between 0.000 and 0.001. Since they are less than $\alpha=5\%$, we can summarize that the partial regression model from each of the variables DEF, VEF, EEF, and OEF are statistically significant with entrepreneurial failure. This significance is also supported by the finding of the p-value for each relationship between variables of the study, which is 0.001 for EF_DEF and 0.000 for each of EF_VEF, EF_EEF, and EF_OEF.

Table 6. The result of partial regression analysis (t-test) to measure the influence of DEF, VEF, EEF, and OEF to entrepreneurial failure

Model	Unstandardized coefficients		Standardized coefficients		Sig.	P-Value
	B	Std. Error	Beta	t		
(Constant)	7.393	1.049		7.045	0.000	
EF_DEF	0.068	0.019	0.062	3.470	0.001	0.001
EF_VEF	0.126	0.017	0.126	7.396	0.000	0.000
EF_EEF	0.323	0.020	0.300	16.168	0.000	0.000
EF_OEF	0.195	0.021	0.167	9.236	0.000	0.000

Note: Predictors: (Constant), DEF, VEF, EEF, OEF; dependent variable: EF

Source: primary data analysis.

The results of the partial regression analysis using the t-test were further used as the basis to stipulate the statistical model of the study, which is:

$$Y_{ef} = 7.393 + 0.126X_v + 0.068X_d + 0.323X_e + 0.195X_o + e \quad (2)$$

where:

- Y_{ef} = entrepreneurial failure
- X_v = voluntaristic factors
- X_d = deterministic factors
- X_e = emotive factors
- X_o = opportunistic behaviour
- e = error
- a = constant

We further used the results of the partial regression analysis as the basis to prove that hypotheses 1, 2, 3, and 4 (H1, H2, H3, and H4) of this study can be accepted. Recalling the H1, H2, H3, and H4, there is a positive and significant influence between [a] deterministic factor (H1), [b] voluntaristic factor (H2), [c] emotive factor (H3), and [d] opportunistic behavior (H4) to the occurrence of entrepreneurial failure within nascent entrepreneurs in West Sumatra.

In supporting the finding for H1, respondents of the study qualitatively revealed from the open answers that they experience inability and often struggle to calculate the most efficient business and operational costs of their business. A respondent directly answered the following:

“Honestly, we are not able to and don’t have any idea of how to keep the costs as low as possible.” (source: respondent number 792, male, 27 years old, not yet married, bachelor degree).

This expression has clearly indicated that respondents of the study have problems related to the deterministic factor that has brought an impact on entrepreneurial failure. Related to H3, respondents of the study expressed the following:

“...since I have graduated and gained my bachelor degree, I automatically have to fulfill all my daily needs. I feel a pressure about this, and it always haunts me when I undertake my business.” (source: respondent number 1037, female, 22 years old, not yet married, bachelor degree).

“Well, it becomes more difficult and more challenging for me once I married and have my family...As you know, our culture requires us to fill the needs of our family once we have married, and it is very difficult for me because my business is still not settled yet.” (source: respondent number 346, male, 28 years old, married, senior high school degree).

Both of these expressions from respondents of the study inferred that the feeling of responsibility to fulfill personal needs and the daily needs of the family have contributed to the creation of pressures inside nascent entrepreneurs, which has further resulted in entrepreneurial failure.

Meanwhile, in relation to the hypotheses H4 regarding opportunistic behavior, many of the respondents of the study revealed the following:

“...I think it is not a mistake to wait for a job even though I am currently doing my own business, is it? ...” (source: respondent number 784, female, 24 years old, not yet married, senior high school degree).

“Of course I will choose to have a job, rather than staying in this business” (source: respondent number 1377, male, 27 years old, not yet married, bachelor degree).

“As you know, there is no guarantee that you will succeed once you have entered into a business. It was a simple choice for me that I need to secure my own future as well as my family’s. Where can I get this? Pension...” (source: respondent number 1439, female, 29 years old, married, bachelor degree).

Opinion and expression regarding the feeling of respondents (the failed entrepreneurs) above have clearly given us an insight that choosing to have a job in order to secure the future life has been a major decision for respondents in the study. They don't care even if they have already had a business and tend to leave it once they have secured a job for their future.

As a response to the findings of the study, we specifically put our attention to the construct of opportunistic behavior (OEF) and its relationship to entrepreneurial failure. From the partial regression model above, it has a t-value of 9.236 with Sig. 0.000 – which means that the construct of opportunistic behavior is statistically significant enough to influence entrepreneurial failure. Using our understanding of this model and its relationship, we further argue that the opportunistic behavior which arises within individuals can be predicted as another factor (apart from the deterministic, voluntaristic, and emotive factors) that can cause entrepreneurial failure experienced by nascent entrepreneurs.

DISCUSSION

Our study proves that the psycho-economic phenomenon of individuals, which consists of: [a] voluntaristic factor, [b] emotive factor, and [c] deterministic factor are influencing the entrepreneurial failures experienced by West Sumatran nascent entrepreneurs. If we look at the descriptive results gathered from our sample, the most deterministic factor that causes failure is the inability of our respondents to meet the most efficient operational costs in their business. In emotive factors, most of our respondents revealed that the pressure to fulfill their personal and family needs have stressed them and have contributed to their failure in business. In the descriptive analysis of the construct of opportunistic behavior, most of our sample was found to think and view that getting into entrepreneurship is just a way to wait for a formal job – and once that opportunity comes, they will simply cease and leave their business. The main findings of the study, which are related to the psycho-economic phenomenon of individuals, empirically support and confirm the opinion of Hammer and Khelil (2014) and Smida and Khelil (2011) about organizational failure, which is sourced from those three factors (deterministic, voluntaristic and emotive). Similar to Mellahi and Wilkinson (2010) and as the main result of our finding, we also argue that the interaction and combination of the psychological and economic circumstances of individuals in terms of deterministic, voluntaristic, and emotive factors have caused and contributed to business and organizational failure.

Further, our study also argues that proxies of [a] choosing a better job rather than entrepreneurship, [b] choosing to secure a job in a longer period, and [c] the possibility of individuals to follow their desire to immediately establish other new ventures, but in the condition that the earlier business is still unstable or immature, are representing the construct of opportunistic behavior. We argue that when the opportunistic behavior of individuals is simultaneously combined with their psycho-economic circumstance as an entrepreneur, then it will cause and positively contribute to the occurrence of entrepreneurial failure experienced by them. As in the partial regression analysis, we also found that the opportunistic behaviour of individuals could partially cause entrepreneurial failure. In this essence, the correlation between the opportunistic behaviour of the respondents and entrepreneurial failure is explained as the following.

Firstly, our sample that already had a business but then had an opportunity to enter into the formal job market tends to leave his/her business and will concentrate on working in a job as an employee. Our further investigation clarifies the fact about the reason for respondents to concentrate on a job rather than on the business. It is mostly related to the motive and interest in securing their future life. If we consider the culture of Indonesian people in general, one particular cultural dimension and value of Indonesian people is the high uncertainty avoidance (Hofstede, 2018) and Mangundjaya, 2010). This culture and value have made Indonesian people prefer to choose a stable situation in their life – and in their mind-set, this stability can only be achieved when they have a formal job where they can get a regular monthly salary and a pension in the future. Although the cultural perspective of Indonesian people shows this, psychologically, we can understand why our sample prefers to have a job to maintain them, rather than to stay in business. The feeling of insecurity regarding their future life is impacted by [a] the limited chances and severe competition in the job market and [b] the insecure business environment, which includes severe business competition, inconsistent government rules, less supported regulation and laws about business environments (especially those which are related to small and medium scale enterprises), as well as insecure sustainable business operation have psychologically influenced respondents to choose to have a job once the opportunity appears. This psychological circumstance has made respondents leave his/her business, and as a consequence, the attention to their business vanishes, and further, the business fails. Our finding is also relevant to the opinion of Hammer and Khelil (2014) who argued that the exit decision of entrepreneurs could be in the form of finding another job. Our empirical study has proven the mechanism as to why this occurs in the context of our study.

This situation is also relevant to the condition of the opportunistic behavior of individuals, as previously described by Andrunik and Svetlakov (2013) and Cordes et al. (2010). They revealed that there would be a creation of conflicts and bargain situations in which individuals tend to choose one most appropriate choice from many alternative decisions. In the case of the respondents of the study, this is shown by their preference to choose a formal job rather than staying in the business that they have started. We consider and are viewing this psychological circumstance as a sign of opportunistic behavior that impacts and causes entrepreneurial failure.

Secondly, our study also found that within our sample, some have an uncontrollable passion in business that led them to be very aggressive in terms of creating new ventures. They believe that business is always about taking new opportunities only – but they forget that they also need to concentrate on the existing business that has been started earlier. This uncontrollable passion has made some respondents tend to follow their desire to immediately establish other new ventures even though the condition of the previous/earlier business is still unstable or immature. We also view this as a psychological circumstance sourced from opportunistic behavior. This circumstance leads individuals to choose their passion and desire (which could be uncontrollable) to get success quickly (i.e., by immediately starting other new ventures) rather than being patient until their initial business reaches maturity stage.

In this essence, we carefully put our attention to the construct of opportunistic behavior by considering the maturity of the initial and earlier business as an event that may or may not raise opportunistic behavior. If an entrepreneur follows his/her desire and has (uncontrollable) passion in creating new ventures in the situation where his/her earlier business has not yet reached the maturity stage, then we view this circumstance as opportunistic behavior. In contrast, if an entrepreneur creates a new venture after his/her earlier business has reached the maturity stage, we view this as a consequence to develop and improve the business scale. Entrepreneurs always want to improve their business scale, and one of the strategies is through business diversification, acquisition, or merger. Therefore, in this particular case and circumstance, we would not say that entrepreneurs have opportunistic behavior.

Following the findings of our study and a deeper elaboration, we argue that the construct of opportunistic behavior should not only be considered as a psychological factor that can influence entrepreneurial and firm success. Unlike most of the scholars, who argued that opportunistic behavior is considered as an entrepreneurial success factor, we rather believe that this construct may have two positions: [1] as a factor for entrepreneurial success and [2], at the same time, as a factor in entrepreneurial failure.

The findings of our empirical study regarding the opportunistic behavior of individuals, which are proxied by the opportunity to choose a much better alternative for their future life and the existence of much (uncontrolled) passion/desire inside a human being, have clearly shown and can be used as the basic foundation of our theory. This is the reason why we believe that opportunistic behavior should also be considered and counted as a factor that can cause entrepreneurial failure.

The study has empirically shown that there is a significant relationship between the psychological construct of individuals in terms of psycho-economic factors and opportunistic behavior and entrepreneurial failure in the context of the study. As we consider that the psychological element is a major part of preparing resilient young-nascent entrepreneurs, this study implies that strengthening and preparing the psychological aspects of young-nascent entrepreneurs should be used and viewed as a major focus for the creation of resilient young-nascent entrepreneurs. The use of a psychological approach could be one alternative way of preparing young-nascent entrepreneurs.

However, we also realize that this study has a particular limitation, and it still needs further exploration in broader contexts. As our study has only discussed one particular context (nascent entrepreneurs in one province in Indonesia), it would be worth expanding the topics of this study into a comparative study regarding the entrepreneurial failure of young-nascent entrepreneurs (between cities or regions) and to consider the causes of entrepreneurial failure in certain business branches. Another limitation is related to the single research methodology that was used in this study, which is a quantitative methodology. It would be worth expanding the methodology of this topic into a qualitative one, i.e. by using the resources of the study to fully explore the reasons for failure (psychological related, business ecosystem related and social-environmental related reasons), how the failure occurred in their business, what the impact of failure is to them, etc. This would enrich our understanding and knowledge about entrepreneurial failure and the spectrum surrounding it.

CONCLUSION

The study inferred that, simultaneously and partially, the deterministic, voluntaristic and emotive factors together with the construct of opportunistic behavior have contributed to the cause of entrepreneurial failure experienced by nascent entrepreneurs in the context of the study. We further believe and argue that the opportunism, which is reflected by the opportunistic behavior

of individuals, should be considered both as an entrepreneurial success factor and as an entrepreneurial failure factor. We stress this and put our main attention to this issue as the originality and value of our study.

Our study implies that the creation of resilient entrepreneurs should follow entrepreneurial processes, and one of the processes could be the failure process where nascent entrepreneurs will learn from the mistakes they have made. Thus, government intervention to strengthen entrepreneurial personality and to focus on the psychological aspects regarding nascent entrepreneurs would be a sensible and reasonable policy alternative to be chosen. This can be undertaken by arranging capacity building schemes and programs for nascent entrepreneurs in order to strengthen their psychological aspects that are related to motives, maturity, logical consideration to choose alternatives, decision-making processes, dealing with social pressures, etc. Other capacity-building schemes can be related to the improvement of business knowledge where nascent entrepreneurs can learn to manage their business in more effective and efficient ways.

We also view and consider that it is worth relating this study in entrepreneurial failure to the study of entrepreneurial resilience and serial entrepreneurship. We believe that those three particular fields, with the mediation effect of the learning process, are interrelated to each other – and this could be one of the research directions related to this topic.

References

- Andrunik, A.A., & Svetlakov, A.G. (2013). Overcoming opportunistic behavior of personnel in modern companies. *World Applied Sciences Journal*, 22(1), 57-62. <https://doi.org/10.5829/idosi.wasj.2013.22.01.13313>
- American Psychological Association (APA). (2010). The road to resilience: Resilience factors and strategies. Retrieved from <http://www.apa.org/helpcenter/road-resilience.aspx.12>
- Arasti, Z. (2011). An empirical study on the causes of business failure in Iranian context. *African Journal of Business Management*, 5(17), 7488-7498. <https://doi.org/10.5897/AJBM11.402>
- Artinger, S., & Powell, T. C. (2015). Entrepreneurial failure: Statistical and psychological explanations. *Strategic Management Journal*, 37(6), 1047-1064. <https://doi.org/10.1002/smj.2378>
- Bratnicka-Myśliwiec, K., Wronka-Pośpiech, M., & Ingram, T. (2019). Does socioemotional wealth matter for competitive advantage? A case of Polish family businesses. *Journal of Entrepreneurship, Management and Innovation*, 15(1), 123-146. <https://doi.org/10.7341/20191515>
- Cardon, M. S., Stevens, C. E., & Potter, D. R. (2011). Misfortunes or mistakes? Cultural sense making of entrepreneurial failure. *Journal of Business Venturing*, 26(1), 79-92. <https://doi.org/10.1016/j.jbusvent.2009.06.004>

- Chang, W., Liu, W.G.H., & Chiang, S. (2014). A study of the relationship between entrepreneurship courses and opportunity identification: An empirical survey. *Asia Pacific Management Review*, 19(1), 1-24. <http://dx.doi.org/10.6126%2fAPMR.2014.19.1.01>
- Cordes, C., Richerson, P., McElreath, R., & Strimling, P. (2010). How does opportunistic behaviour influence firm size? An evolutionary approach to organizational behaviour. *Journal of Institutional Economics*, 7(1), 1-21. <https://doi.org/10.1017/S1744137410000123>
- Devece, C., Peris-Ortiz, M., & Rueda-Armengot, C. (2016). Entrepreneurship during economic crisis: Success factors and paths on failure. *Journal of Business Research*, 69(11), 5366-5370. <https://doi.org/10.1016/j.jbusres.2016.04.139>
- Fatoki, O. (2014). The entrepreneurial intention of undergraduate students in South Africa: The influences of entrepreneurship education and previous work experience. *Mediterranean Journal of Social Sciences*, 5(7), 294-299. <http://dx.doi.org/10.5901/mjss.2014.v5n7p294>
- Hammer, M.H.M. (2012). *How business management benefit from entrepreneurship*. Paper presented at the 10th Conference of Management, Enterprise and Benchmarking, Budapest, Hungary. Retrieved from http://www.kgk.uni-obuda.hu/sites/default/files/12_Matthijs%20Hammer.pdf
- Hammer, M.H.M., & Khelil, N. (2014). *Exploring the different patterns of entrepreneurial exit. The causes and consequences*. Proceedings of the 59th ICSB World Conference on Entrepreneurship, Dublin, Ireland. Retrieved from <https://pdfs.semanticscholar.org/4980/d14545dba7a3adf7f8fdb8bb2acabb0c0ef3.pdf>
- Herath, H.M.T.S. (2014). Conceptualizing the role of opportunity recognition in entrepreneurial career success. *International Journal of Scientific Research and Innovative Technology*, 1(3), 73-82.
- Hofstede, G. (2018). *National culture of Indonesia*. Retrieved from <http://geert-hofstede.com/indonesia.html>
- Jenkins, A.S., Wiklund, J., & Brundin, E. (2014). Individual responses to firm failure: Appraisals, grief, and the influence of prior failure experience. *Journal of Business Venturing*, 29(1), 17-33. <https://doi.org/10.1016/j.jbusvent.2012.10.006>
- Khelil, N. (2012). *What are we talking about when we talk about entrepreneurial failure?* RENT XXVI - Research in Entrepreneurship and Small Business, Lyon, France.
- Khelil, N. (2016). The many faces of entrepreneurial failure: Insights from an empirical taxonomy. *Journal of Business Venturing*, 31(1), 72-94. <https://doi.org/10.1016/j.jbusvent.2015.08.001>
- Lafontaine, F., & Shaw, K. (2014). Serial entrepreneurship: Learning by doing? *Journal of Labour Economics*, 34(S2), S217-S254. <https://doi.org/10.1086/683820>

- Liang, C-T., & Liang, C. (2015). Interaction of psychological factors in shaping entrepreneurial intention among computer and electrical engineering students. *Journal of Entrepreneurship, Management and Innovation*, 11(2), 5-29. <https://doi.org/10.7341/20151121>
- Mangundjaya, W.L.H. (2010). *Is there cultural change in the national cultures of Indonesia?* Proceeding International Conference on Association of Cross Cultural Psychology (IACCP), Melbourne, Australia. Retrieved from https://scholarworks.gvsu.edu/cgi/viewcontent.cgi?article=1032&context=iaccp_papers
- Mantere, S., Aula, P., Schildt, H., & Vaara, E. (2013). Narrative attributions of entrepreneurial failure. *Journal of Business Venturing*, 28(4), 459-473. <https://doi.org/10.1016/j.jbusvent.2012.12.001>
- Mellahi, K., & Sminia, H. (2009). Frontiers of strategic management research. *International Journal of Management Reviews*, 11(1), 1-7. <https://doi.org/10.1111/j.1468-2370.2008.00248.x>
- Mellahi, K., & Wilkinson, A. (2010). Managing and coping with organizational failure: Introduction to the special issue. *Group and Organization Management*, 35(5), 531-541. <https://doi.org/10.1177%2F1059601110383404>
- Rahman, H., & Day, J. (2014). Involving the entrepreneurial role model: A possible development for entrepreneurship education. *Journal of Entrepreneurship Education* 17(2), 163-171.
- Singh, S., Corner, P.D., & Pavlovich, K. (2015). Failed, not finished: A narrative approach to understanding venture failure stigmatization. *Journal of Business Venturing*, 30(1), 150–166. <http://dx.doi.org/10.1016/j.jbusvent.2014.07.005>
- Smida, A., & Khelil, N. (2010). Repenser l'échec entrepreneurial des petites entreprises émergentes. Proposition d'une typologie s'appuyant sur une approche intégrative. *Revue Internationale P.M.E.: économie et gestion de la petite et moyenne entreprise*, 23(2), 65-106. <https://doi.org/10.7202/1005762ar>
- Talas, E., Celik, A.K., & Oral, I.O. (2013). The influence of demographic factors on entrepreneurial intention among undergraduate students as a career choice: The case of a Turkish university. *American International Journal of Contemporary Research*, 3(12), 22-31.
- Tikkamäki, K., Heikkilä, P., & Ainasoja, M. (2016). Positive stress and reflective practice among entrepreneurs. *Journal of Entrepreneurship, Management and Innovation*, 12(1), 7-34. <https://doi.org/10.7341/20161212>
- Ucbasaran, D., Westhead, P., Wright, M., & Flores, M. (2010). The nature of entrepreneurial experience, business failure and comparative optimism. *Journal of Business Venturing*, 25(6), 541-555. <https://doi.org/10.1016/j.jbusvent.2009.04.001>
- Unsal, H.I., & Taylor, J.E. (2011). An empirical investigation of opportunistic behaviour in project networks and its impact on market efficiency. *Engineering Project Organization Journal*, 1(2), 95-106. <https://doi.org/10.1080/21573727.2011.569931>

- van Gelder, J.L., Vries, R.E., Frese, M., & Goutbeek, J.P. (2007). Differences in psychological strategies of failed and operational business owners in the Fiji Islands. *Journal of Small Business Management*, 45(3), 388–400. <https://doi.org/10.1111/j.1540-627X.2007.00219.x>
- Wadhwa, V., Aggarwal, R., Holly, H., & Salkever, A. (2009). *Anatomy of an entrepreneur: Family background and motivation*. The Ewing Marion Kauffman Foundation Research Report, July 2009. <https://dx.doi.org/10.2139/ssrn.1431263>
- Wasdani, K.P., & Mathew, M. (2014). Potential for opportunity recognition: Differentiating entrepreneurs. *International Journal of Entrepreneurship and Small Business*, 23(3), 336–362. <https://doi.org/10.1186/2251-7316-2-7>
- Wennberg, K., & DeTienne, D.R. (2014). What do we really mean when we talk about ‘exit’? A critical review of research on entrepreneurial exit. *International Small Business Journal*, 32(1), 4-16. <https://doi.org/10.1177/0266242613517126>
- Wennberg, K., Wiklund, J., DeTienne, D. R., & Cardon, M. S. (2010). Reconceptualising entrepreneurial exit, divergent exit routes and their drivers. *Journal of Business Venturing*, 25(4), 361-375. <https://doi.org/10.1016/j.jbusvent.2009.01.001>
- Yakovleva, E., Grigoryeva, N., & Grigoryeva, O. (2016). Opportunistic behaviour as behaviour manipulations. *American Journal of Applied Sciences*, 13(9), 996-1005. <http://doi.org/10.3844/ajassp.2016.996.1005>
- Yamakawa, Y., & Cardon, M. S. (2015). Causal ascriptions and perceived learning from entrepreneurial failure. *Small Business Economics*, 44(4), 797-820. <https://doi.org/10.1007/s11187-014-9623-z>
- Yaqub, M. Z. (2009). Antecedents, consequences and control of opportunistic behaviour in strategic networks. *Journal of Business & Economics Research*, 7(2), 15-31.

Abstrakt

Artykuł omawia wewnętrzne okoliczności jednostek jako czynniki, które mogą powodować niepowodzenie przedsiębiorczości, na które składają się zjawiska psycho-ekonomiczne i zachowania oportunistyczne. Jest to badanie ilościowe i opiera się na analizie relacyjnej, która wiąże istniejące argumenty dotyczące czynników psycho-ekonomicznych z niepowodzeniem przedsiębiorczości. Badanie dodatkowo dodaje i analizuje konstrukcję zachowań oportunistycznych jako kolejny możliwy czynnik, który może powodować porażkę przedsiębiorczości. Próbką badania jest 1541 młodych przedsiębiorców z prowincji West Sumatra w Indonezji, którzy doświadczyli niepowodzeń w swoich wcześniejszych firmach. Analizę przeprowadzono przy użyciu analizy regresji wielokrotnej i częściowej, w której użyto protokołu statystycznego. Stwierdzono, że czynniki psychoekonomiczne wraz z oportunistycznymi zachowaniami jednostek w mniejszym lub w większym stopniu spowodowały przedsiębiorczą porażkę w kontekście badania. Badanie sugeruje również, że zachowania oportunistycz-

ne mogą być nie tylko postrzegane jako źródło sukcesu przedsiębiorczości, ale także przyczyniają się do niepowodzenia przedsiębiorczości. To odkrycie wyraźnie pokazuje oryginalność i wartość tego badania, ponieważ dowodzi, że zachowania oportunistyczne można również postrzegać jako czynnik – oprócz innych istniejących czynników psychoekonomicznych (deterministycznych, dobrowolnych i emocjonalnych) – które mogą powodować porażkę przedsiębiorczości. Badanie sugeruje, że wzmocnienie osobowości przedsiębiorczej, cechy i aspektów psychologicznych powinno być celem rządu indonezyjskiego w promowaniu i rozwijaniu młodych przedsiębiorców. Aspekty psychologiczne mogą odnosić się do wysiłków zmierzających do wzmocnienia motywów, dojrzałości, racjonalnych procesów decyzyjnych oraz sposobów radzenia sobie z presją społeczną, środowiskową i biznesową.

Słowa kluczowe: deterministyczne, dobrowolne, emocjonalne czynniki, niepowodzenia przedsiębiorcze, czynniki psychoekonomiczne, zachowania oportunistyczne

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Conflicts of interest

The authors declare no conflict of interest.

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The mystery of high performance – mediation by entrepreneurial orientation and organizational citizenship behavior

Przemysław Zbierowski¹ 

Abstract

The search for high performance is one of the leading themes in management science with a number of frameworks developed over the decades. The purpose of the paper is to investigate if the effect of high performance organization (HPO) characteristics has a direct effect on actual organizational performance or if the effect is mediated by organizational citizenship behavior (OCB) and entrepreneurial orientation (EO). Previous research states that the framework of HPO characteristics answers the question of ‘what’ high performers do, but does not answer the question of ‘how’ they do it, suggesting a mediating effect. The study attempts to establish which of the pair of OCB and EO (if any) has a stronger mediating effect. The hypotheses were tested using a cross-sectional research design with a random and representative sample of 406 enterprises. The research was carried out using the technique of personal interview (CAPI). Established scales were used to measure high performance indicators, organizational citizenship behavior, entrepreneurial orientation, and organizational performance. The conceptual framework with mediated effects was tested using a structural equations modeling approach. Research results indicate that there is a strong direct positive relationship between high performance indicators and organizational effectiveness. Moreover, there is a strong positive effect of high performance indicators on entrepreneurial orientation and organizational citizenship behavior. However, the effect of those two constructs on organizational effectiveness is rather weak, and, in the case of OCB, negative. That leads to the conclusion that the direct effect of high performance indicators is stronger, although the positive mediation by entrepreneurial orientation is statistically significant. The study contributes to the scientific debate in at least three ways. First, it confirms that high performance characteristics have a strong effect on actual performance. Second, it points to entrepreneurial orientation

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as a partial mediator in that relationship. Finally, it uncovers the very strong effect of high performance characteristics on organizational citizenship behavior. The research results also allow one to formulate practical recommendations. They mainly consider enhancing OCB, EO, and performance by skillful use of high performance factors. The study is novel in its approach to use OCB and entrepreneurial orientation as mediators in the effect of high performance characteristics on organizational performance, as no such attempts were made in the past.

Keywords: *high performance indicators, entrepreneurial orientation, organizational citizenship behavior*

INTRODUCTION

High organizational performance is one of the ultimate results that are investigated in management science. Scholars and practitioners have tried for decades to unlock the mystery of extraordinary outcomes and answer the question of why some organizations are extremely successful while others fail. One of the most coherent frameworks of high performance indicators has been presented by De Waal (2012). However, it only answers the question ‘what’ high performers do to be successful and not ‘how’ they do it. Therefore, current study is placed in the research stream that attempts to uncover the mechanism underlying the activities of market leaders. In practical terms, there is a mediated effect suggested between high performance factors and the actual achieved performance. The present study argues that much explanation in that regard could be proposed by another dynamic research notion – positive organizational scholarship. It draws attention to phenomena that are normatively positive and extraordinarily effective. The research stream provides another possible way of investigation in this regard on entrepreneurship, especially organizational entrepreneurship. Therefore, two ways of thinking of mediation are competitive – positive vs. entrepreneurial. The current study focuses on two possible mediators: entrepreneurial orientation (EO) and organizational citizenship behavior (OCB). The former was chosen because it is the most commonly used conceptualization and operationalization of organizational entrepreneurship. The choice of the latter is more complex. It reflects a positive way of organizational behavior in the most comprehensive way and encompasses five various aspects of positivity. The purpose of the paper is to establish which (if any) of those two phenomena mediate the relationship between high performance indicators and organizational performance in a stronger way. Therefore, the main research question is:

RQ: How do organizations achieve high performance and how do they use OCB and EO in that process?

Research results indicate that there is a strong direct positive relationship between high performance indicators and organizational effectiveness. Moreover, there is a strong positive effect of high performance indicators on entrepreneurial orientation and organizational citizenship behavior. However, the effect of those two constructs on organizational effectiveness is rather weak, and, in the case of OCB, negative. That leads to the conclusion that the direct effect of high performance indicators is stronger, although the positive mediation by entrepreneurial orientation is statistically significant.

The study contributes to the scientific debate in at least three ways. It confirms that high performance characteristics have a strong effect on actual performance, it points to entrepreneurial orientation as a part mediator in that relationship, and it uncovers a very strong effect of high performance characteristics on organizational citizenship behavior. The study is novel in its approach to use OCB and entrepreneurial orientation as mediators in the effect of high performance characteristics on organizational performance, as no such attempts were made in the past.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

High performance organization

The beginning of the notion of the high performance organization dates back to the early 1980s. Perhaps the first publication that can be placed within that notion is the work by Peters and Waterman (1982). It describes the behaviors of the most successful American companies. The study discovered that they share a couple of common phenomena: action orientation, being close to the customer, autonomy and entrepreneurship, productivity thanks to employees, strong values, clear profile of activity, simple form and low employment, and reconciling the contradiction between centralizing and decentralizing. Moreover, the key highlighted aspect is organizational alignment. They propose a framework of seven organizational components named McKinsey 7S. According to this framework, the organization might be successful only if all seven components (strategy, structure, systems, staff, style, skills, and shared values) are properly aligned with each other and with the external environment (strategy is the element that allows the organization to align itself with the outside world).

Other significant contributions to the notion that need to be mentioned are by Collins and Porras (1994) and Collins (2001), who state that there are nine factors that distinguish leaders from other companies: continuity and change, key values and mobilizing goals, stability and non-linearity, 'cult' culture and specific people, consequence and innovations, discipline and creativity, systematic methods and experimental approaches, meaning and achievements, maintaining the core activities and stimulation of growth. The notion of the high performance organization was later continued by Holbeche (2005), Light (2005), Miller and Le Breton-Miller (2005), Lawler and Worley (2006). For instance, Light (2005) presents a list of four main traits of successful organizations: (1) alertness achieved by thinking in future terms, (2) agility in empowering members of the organization achieved by supporting communication and organizing, (3) adaptation achieved by building freedom in learning and imagination, using all available measures to avoid a lack of precision, (4) alignment achieved by leading towards vision and mission. On the other hand, Holbeche (2005) states that the main trigger of organizational development is the reconciliation of contradicting factors in the pursuit of creating dynamic stability and permanent success by managing change.

All of the above considerations are, however, not methodologically robust, and they lack a clear methodological approach. Moreover, the considerations of various authors are not consistent in their approaches, which makes it difficult to compare the results of their research (Peters & Waterman, 1982; Collins & Porras, 1994). The above limitations were taken into consideration by De Waal (2012), who proposed a coherent framework of 35 high performance indicators grouped within five high performance factors that are described below.

'Continuous improvement' includes adopting the strategy that sets the organization apart from others. Moreover, the organization makes a constant effort to develop, and the organization's processes are continuously improved, simplified, and aligned. For continuous improvement, it is also important that everything that matters to performance is explicitly reported, and both financial and non-financial information is reported to organizational members (De Waal, 2012, p. 34). To achieve continuous improvement, it is important to constantly innovate, and high performers continuously innovate their competencies, products, processes, and services (De Waal, van Nierop, & Sloot, 2017).

'Openness and action orientation' is the factor that stresses the constant drive towards activity and performance (De Waal, 2010, p. 87). For that reason, the whole organization must be performance-driven. It is based on a frequent dialogue of the management with the employees. Organizational members spend much time on communication, knowledge exchange, and learning. Moreover, they are always involved in important processes.

Openness and action orientation also require a particular style from the management (De Waal & Heijtel, 2017). Managers must allow employees to make mistakes and welcome change.

The style of leadership is more broadly described in the factor 'management quality'. In high performing organizations, leaders have integrity, and they are role models for organizational members (De Waal, 2012, p. 33). Moreover, they are fast, both in decision making and taking the necessary action. Leaders are very effective, but they also focus on achieving results and coach organizational members to do the same. Leaders are also decisive with regard to non-performers (De Waal, van Nierop, & Sloot, 2017). Leadership in high performing organizations is strong, and their leaders are confident and are trusted by organizational members.

Management quality is also reflected in 'workforce quality' (De Waal & Meingast, 2017). That is achieved by holding organizational members responsible for their results. Management inspires organizational members to accomplish extraordinary results, organizational members are trained to be resilient and flexible, and the organization has a diverse and complementary workforce (De Waal & Heijtel, 2017).

Finally, highly performing organizations are oriented at being successful in the long run (De Waal, 2012). That is achieved in several ways. High performers maintain good and long-term relationships with all stakeholders (De Waal & Meingast, 2017). They are aimed at servicing their customers as effectively as possible. The organization grows through partnerships with suppliers and customers (De Waal, Mroueh, & Schiavo, 2017). Long-term orientation is also achieved by a specific approach to human resource management. It aims at keeping managers and employees in the organization for a long time, which makes it a secure workplace for organizational members (De Waal & Heijtel, 2017). Moreover, new managers are, in most cases, promoted from within the organization rather than being hired from the outside (De Waal, van Nierop, & Sloot, 2017).

The strength of the De Waal's (2012) construct is that it has been very carefully conceptualized and operationalized. It was also tested in many research projects in an international context. De Waal (2012) tested it on a sample of 1470 enterprises from a couple of countries. He proves that the framework is independent of a national context. More recently, the framework was tested in many other countries, for instance, in the Arab world (De Waal, Mroueh, & Schiavo, 2017). Moreover, the construct has also been tested in many industries, for instance, farming (De Waal & Meingast, 2018). All of the research conducted proves that the framework might be applied to a variety of contexts. All of the above, and many other papers by

De Waal and colleagues demonstrate that high performance indicators result in higher performance, therefore it can be hypothesized:

H1. High performance indicators positively influence organizational performance.

Entrepreneurial orientation

The base assumption for the entrepreneurial orientation (EO) scale is that entrepreneurial firms differ from other types of firms. They tend to take more risks than other types of firms, proactively search for new business opportunities and have a strong emphasis on new product innovation (Khandwalla, 1977; Miller & Friesen, 1982; Mintzberg, 1973). Some researchers operationalized the behavior of entrepreneurial firms as consisting of product-market innovation, proactiveness of decision-making, and risk-taking. They maintained that the level of entrepreneurship presented by a firm was the aggregate total of these three sub-dimensions: “the extent to which top managers are inclined to take business-related risks (the risk-taking dimension), to favor change and innovation in order to obtain a competitive advantage for their firm (the innovative dimension), and to compete aggressively with other firms (the proactive dimension)” (Covin & Slevin, 1988, p. 218) These scholars also argued that a firm that was truly entrepreneurial should exhibit high levels of each dimension. Some researchers even consider aggressive behavior toward competitors as a dimension of EO that is separate from proactiveness (Zarei, 2017). Freiling and Schelhow (2014) propose a meta dimension of EO (system exploitation) composed of two dimensions (coordination and arbitrage).

The idea that innovativeness is the fundamental undertaking of EO was first raised by Schumpeter (1934). Innovation is evidenced here by the creation and development of new products and processes. In contemporary research in the field, innovation is always put at the very heart of entrepreneurship. Lumpkin and Dess define entrepreneurial innovation as “the willingness to support creativity and experimentation in introducing new products/ services, and novelty, technological leadership and R&D in developing new processes” (2001, p. 431). Innovation is sometimes used as the sole indicator of entrepreneurship in a way that only innovative firms are considered entrepreneurial. Some researchers stress that without innovation, there is no corporate entrepreneurship.

Also, the concept of risk-taking has long been closely associated with entrepreneurship. Even in the 19th century, John Stuart Mill argued that risk-taking was the attribute of entrepreneurs. The idea of propensity to take risk

as a core element of entrepreneurship gained support during the 20th century. Entrepreneurship used to be defined as activity centered on the willingness to engage in calculated business-related risks (Brockhaus, 1980). Nowadays, no researchers oppose the notion that every entrepreneurial activity involves taking risk. Moreover, entrepreneurs don't perceive themselves as taking more risk than average. They tend to categorize business situations as possessing less risk than non-entrepreneurs (Palich & Bagby, 1995; Busenitz, 1999).

The concept of proactiveness received less attention from entrepreneurial scholars compared to the other two dimensions of entrepreneurial orientation. Researchers present different approaches and different definitions of proactiveness. Knight (1997) understood proactiveness as aggressive execution and follow through, driving toward achievement of the firm's objectives by whatever reasonable means are necessary. This aggressive behavior may be directed at rival firms. Stevenson and Jarillo (1990) conceptualized proactiveness as the organizational pursuit of business opportunities that were deemed by the firm to be positive or favorable. Similarly, Lumpkin and Dess view proactiveness as an "opportunity-seeking, forward-looking perspective involving introducing new products or services ahead of the competition and acting in anticipation of future demand to create change and shape the environment" (2001, p. 431).

The most widely used operationalization of an entrepreneurial orientation construct comes from Covin and Slevin (1989), based on Khandwalla (1977) and Miller and Friesen (1982). They stated that innovativeness, proactiveness, and risk-taking act together, creating a uni-dimensional strategic orientation and should be aggregated together. This assumption and the operationalization itself proved reliable and valid in many studies. However, later works raised concern pertaining to the dimensionality of the measure and the independence of the sub-dimensions (Dess, Lumpkin, & McGee, 1999; Lumpkin & Dess, 1996; Zahra, 1993). As opposed to a uni-dimensional measure constructed by Covin and Slevin (1989), a multi-dimensional measure, reflecting each of the sub-dimensions, was proposed (e.g., Lumpkin & Dess, 1996). Proponents of a later approach argued that each sub-dimension of an EO construct uniquely contributes to the entrepreneurial process. They highlight the potential of each sub-dimension to have a different impact on key outcome variables such as firm performance (Lumpkin & Dess, 2001).

Another critical issue concerning entrepreneurial orientation is its validity for research in different countries. Formerly, the constructs used were developed originally for studies in the United States and then utilized for research in international entrepreneurship without adequately examining their validity. Steensma, Marino, Weaver, and Dickson (2000) found that

contemporary management theories may not be applicable in all international research contexts due to differences in national culture. Following this concern, Kreiser, Marino, and Weaver (2002) employed a multi-country sample to explore the cross-cultural validity of an EO construct. Their study provided strong support for the cross-cultural validity of this scale.

The relationship between high performance indicators and EO was tested and proven by Zbierowski (2012). The EO dimension that is to the greatest extent under the influence of HPO factors is innovativeness, especially in the context of continuous improvement of processes and constantly introduced innovations in products, services, and processes. Similarly, proactiveness is also under the influence of continuous improvement, but also openness and action orientation. Also, Jiang, Mao, Liu, and Zhao (2012) prove that organizational entrepreneurship mediates the relationship between high performance work systems and organizational performance. To sum up, even though the literature evidence is scarce, it can be hypothesized that:

H2. High performance indicators positively influence entrepreneurial orientation.

There is plenty of evidence that entrepreneurial orientation is positively linked to organizational performance, just to mention Covin and Slevin (1991), Zahra (1993), Lumpkin and Dess (1996), Wiklund and Shepherd (2005) as the most famous. Therefore, it can be hypothesized:

H3. Entrepreneurial orientation positively influences organizational performance.

Hypotheses H2 and H3 taken together allow one to assume that entrepreneurial orientation is a mediator in the relationship between high performance indicators and organizational performance, therefore:

H4. Entrepreneurial orientation mediates the relationship between high performance indicators and organizational performance.

Organizational citizenship behaviors

Organizational citizenship behaviors (OCB), also called prosocial work behaviors, are behaviors aimed at providing help or benefit to others (Cameron, Dutton, & Quinn, 2003). The essential part of this kind of behavior is exceeding standard work roles and expectations and being grounded in altruistic assumptions on the intrinsic need to help another person, although the authentic motivation

for OCB is still a matter of scholarly discussion. Organ (1998), who is considered to be the founder of organizational citizenship behavior, presents its frames and components. According to him, OCBs are “behaviors of a discretionary nature that are not part of formal requirements presented to employees, but nevertheless contribute to the effective functioning of the organization” (1988, p. 4). Organizational citizenship behaviors go beyond the work role but have organizational consequences. It is, however, essential to differentiate OCB from organizational prosocial behaviors that are aimed at improving the well-being of an individual, group, or organization (Brief & Motowidlo, 1986) but might not be related to the organization itself.

Organ (1988) highlights three important aspects of organizational citizenship behaviors: (1) they are not formally recognized by a remuneration system, are not part of a job description, are performed in a fully discretionary manner based on an employee’s personal choice, (2) they go beyond what can be coerced from the employees based on their job description, (3) they positively contribute to the performance of other employees and, consequently, to the performance of the whole organization. There is an ongoing debate on the degree of discretionarity of OCB. Some scholars claim that they might not be as altruistic as expected, and part of the motivation might be related to expected reciprocity according to social exchange theory. Also, the assumption that is exceeding the job description is criticized. Organ himself (1997) decided to revise that assumption due to the development of organizational procedures towards creating more general job roles instead of detailed and specific job descriptions. Organ (1988) also presents a five-dimensional model of organizational citizenship behavior with the following dimensions:

- 1) Altruism – discretionary behaviors that aim to result in helping another person to perform an organizationally important task or solving an organizationally important problem. Altruistic behaviors might be limited to an internal organizational context, but may also go beyond organizational borders and be directed at the outside world. Moreover, in most cases, there is no direct relation between such behaviors and benefits for the organization. It is assumed that cumulated altruistic behaviors contribute to higher performance in the long-run.
- 2) Conscientiousness – discretionary employee behaviors which go beyond the minimal requirements of the job description. They may relate to a lack of absenteeism, obeying the rules, breaks at work, etc. They indicate that the employee accepts and submits to all regulations at the organization.
- 3) Civic virtue – behaviors that indicate the deep concern of the employee towards organizational life and his or her active involvement. They also include a positive identification with the problems of the organization. Civic virtue is manifested through active participation in meetings, knowledge

- of the activities of the organization, and talking discretely outside the company, for instance, in order to protect its activities and image.
- 4) Courtesy – discretionary behaviors directed at preventing conflicts with other members of the organization. It is a helpful behavior that aims to prevent the occurrence of problems. It also encompasses civility, good manners, and politeness. Courtesy might be manifested in many ways – from verbal civility to providing other employees with information that is necessary for their work.
 - 5) Sportsmanship – willingness of the employee to tolerate conditions of work that are less than ideal without complaining and exaggerating problems. Sportsmanship is also about submitting to changes in the organization, even though the employee does not agree with them, or they will result in a worsening of his or her conditions of work. By reducing the number of complaints from employees' sportsmanship results in saving time and energy.

The five-dimensional model of organizational citizenship behavior has been confirmed in scientific research. Some scholars, however, propose some new dimensions or components, such as organizational loyalty, initiative, or self-development. Some authors also point to the fact that dimensions of organizational citizenship behaviors are highly correlated among each other, which can result in their strong multicollinearity and, in consequence, the unidimensionality of the construct of OCB. This view is not shared by some scholars. For instance, Williams and Anderson (1991) claim that five dimensions could be divided into two factors: OCB directed at other people (altruism and courtesy) and OCB directed at the organization (conscientiousness, civic virtue, and sportsmanship).

The measure of OCB was proposed by Podsakoff, MacKenzie, Moorman, and Fetter (1990). It was based on the definitions of components of OCB by Organ (1988), as discussed above. Definitions were used to create items measuring each of the components. The list was then presented to ten scholars for Q-sorting. Each of the academics was presented with the definitions of five dimensions and was asked to attribute items to components which, in their opinion, matched the item in the best way. Scholars could also attribute items to a sixth category marked as "other" in case they thought that they do not fit any of the components. The final list of items included only those that were attributed by at least 80% of the scholars. The items were answered on a 7-point Likert scale.

Organizational citizenship behaviors might be the result of the application of high performance solutions, especially regarding human resource management. Godard (2001) claims that this relationship is non-linear, and the highest OCBs are achieved with a medium level of high performance work practices. Sun, Aryee, and Law (2007) point to OCB as a mediating

factor between HPWP and organizational performance. Also, analysis of the content of HPO factors allows one to assume the positive effect of OCBs. For instance, conscientiousness should be strongly influenced by openness and action orientation, management and workforce quality. Civic virtue is assumed to be the result of openness and action orientation (frequent dialogue between managers and employees, frequent communication), and long-term orientation (secure workplace). Therefore, it can be hypothesized:

H5. High performance indicators positively influence organizational citizenship behaviors.

The positive effect of OCB on organizational performance is part of the definition of OCB and the review of early evidence on this relationship is presented by Podsakoff and MacKenzie (1997). They claim that the impact of altruism is stronger than that of sportsmanship and civic virtue. Positive influence is also reported in more recent works, although some authors point to a possible negative effect (Bolino, Klotz, Turnley, & Harvey, 2013). Also, Bryl (2018) points to the fact that HR-based resources have an impact on performance. Taking all of the above into consideration, it can be hypothesized that:

H6. Organizational citizenship behaviors positively influence organizational performance.

Hypotheses H5 and H6 taken together allow one to assume that OCBs are a mediator in the relationship between high performance indicators and organizational performance, therefore:

H7. Organizational citizenship behaviors mediate the relationship between high performance indicators and organizational performance.

Hypotheses H4 and H7 are contradictory and also compete with hypothesis H1. That situation is deliberate and is aimed at measuring which of the relationships between high performance indicators and organizational performance is stronger: direct one, mediation by entrepreneurial orientation, or mediation by organizational citizenship behaviors. The conceptual framework is presented in Figure 1.

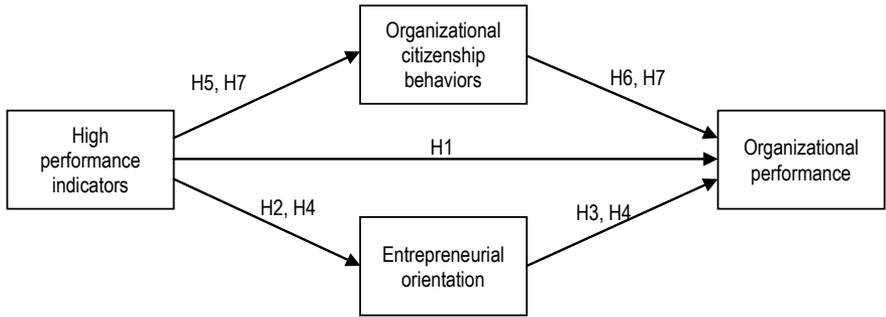


Figure 1. Conceptual framework

METHOD

Research design and sample

The research was carried out in a cross-sectional design on a random and representative sample of 406 enterprises using the technique of personal interview (CAPI). In each enterprise, two people were surveyed: a senior manager (owner-manager or member of the board if possible) and the direct subordinate of that person. Sampling was random, and the sample frame was the database of Polish enterprises employing from 50 to 1000 employees. A random automated selection from the sample frame was conducted. The choice to exclude small and very large enterprises was caused by the nature of researched relationships. In small organizations, the relationships are mostly informal, and high performance indicators are very rarely adapted. Contrary, in very large companies relations, are highly formalized, and data on organizational performance is not reliable. A couple of industries were excluded from the sampling: section A (PKD – Polish Classification of Activity) – farming, forestry, hunting and fishing, section B – mining and extraction of natural resources, section E – water supply, sewage and waste management, recultivation, section O – public administration, national defense, obligatory social security, section Q – healthcare and social support, section T – households employing workers, households producing goods and serving services for their own needs, section U – extraterritorial organizations and groups. Organizations in those sections run specific activities that could distort the research results. The average age of the companies in the sample was 21 years (SD=15), and the average employment was 172 employees (SD=230).

Variables and measures

To measure high performance factors, the measure created by De Waal (2012) was used. Each of the dimensions was measured using three questions. The established convention of factor analysis was used to confirm the dimensionality of the constructs and Cronbach's alpha statistic to test the reliability of the scales. The following Cronbach alpha reliability coefficients were calculated: continuous improvement (.877), openness and action orientation (.762), management quality (.836), workforce quality (.825), long-term orientation (.791). To measure organizational citizenship behaviors, the scale developed by Podsakoff, MacKenzie, Moorman, and Fetter (1990) was used. Three items measure altruism (.839), four items measure conscientiousness (.859), four items measure civic virtue (.834), four items measure courtesy (.789), and four items measure sportsmanship (.836). Entrepreneurial orientation was measured using Kreiser, Marino, and Weaver's (2002) scale with three dimensions: innovativeness (three items, .842), proactiveness (three items, .834), risk taking (two items, .833). For high performance factors and entrepreneurial orientation, confirmatory factor analysis was conducted that confirmed the dimensionality of the constructs. However, for further analyses, the dimensions were aggregated to single measures of high performance indicators (HPO) and entrepreneurial orientation (EO). Organizational performance was measured as a mean of five subjective indicators of performance (employment growth, sales growth, market share dynamics, profit, and customer loyalty). The correlation is presented in Table 1.

Table 1. Descriptive statistics and correlations

	Mean	SD	N	OCB	EO	Performance	HPO
OCB	4.9501	.74420	406	1	.254**	.207**	.733**
EO	4.1679	1.18798	406	.254**	1	.251**	.332**
Performance	4.5394	.80392	406	.207**	.251**	1	.362**
HPO	5.3322	.85571	406	.733**	.332**	.362**	1

Analytical techniques

To test the hypotheses, the mediation modeling was chosen. To further test the model, the bootstrapping procedure was used with 200 bootstrap samples and a bias-corrected confidence level at 90%. Structural equation modeling was used to create and test the model, and calculations were performed using SPSS AMOS 25 software.

RESULTS

The results of the mediation analysis indicate the direct influence of high performance indicators on organizational performance, a strong impact of high performance indicators on organizational citizenship behaviors and entrepreneurial orientation, a weaker positive influence of entrepreneurial orientation on organizational performance, and a weak negative effect of OCB on organizational performance. The results of the mediation model are presented in Figure 2 and Tables 2-4.

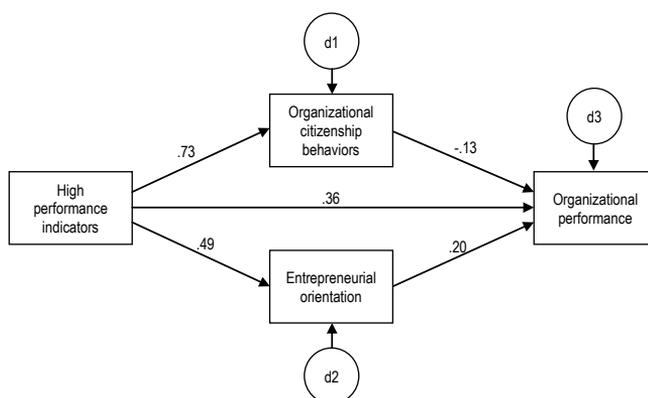


Figure 2. Mediation model with standardized weights

Table 2. Regression weights

			Estimate	S.E.	C.R.	P
OCB	<---	HPO	.638	.029	21.707	***
EO	<---	HPO	.679	.060	11.387	***
Performance	<---	OCB	-.139	.072	-1.931	.054
Performance	<---	EO	.137	.035	3.871	***
Performance	<---	HPO	.335	.067	4.999	***

Further analysis of the research results suggests that all of the relationships in the model are statistically significant except for the relationship between organizational citizenship behaviors and organizational performance. Therefore, high performance indicators affect OCB, EO, and organizational performance, which is also under the influence of EO, but not OCB. Table 3 presents the exact standardized regression weights.

Table 3. Standardized regression weights

			Estimate
OCB	<---	HPO	.733
EO	<---	HPO	.492
Performance	<---	OCB	-.129
Performance	<---	EO	.201
Performance	<---	HPO	.357

Standardized regression weights point to a very strong impact of high performance indicators on organizational citizenship behaviors, a weaker influence of HPO factors on entrepreneurial orientation, and directly on organizational performance. Tables 4 presents standardized total, direct, and indirect effects.

Table 4. Standardized total, direct, and indirect effects

Standardized total effects			
	HPO	EO	OCB
EO	.492	.000	.000
OCB	.733	.000	.000
Performance	.362	.201	-.129
Standardized direct effects			
	HPO	EO	OCB
EO	.492	.000	.000
OCB	.733	.000	.000
Performance	.357	.201	-.129
Standardized indirect effects			
	HPO	EO	OCB
EO	.000	.000	.000
OCB	.000	.000	.000
Performance	.005	.000	.000

As can be seen, almost the entire total (direct and indirect) effect of high performance indicators on organizational performance is explained by direct impact. However, the indirect effect on organizational citizenship behaviors is negative. It is probably statistically insignificant, and therefore the model does not yield results for the indirect impact of high performance indicators on organizational performance mediated by entrepreneurial orientation. The statistical significance of the obtained results was tested by bootstrapping. For

this procedure, the number of bootstrap samples was set at 2000, and the bias-corrected confidence level was set at 90%. The statistical significance was then tested in a bias-corrected percentile method by comparing the lower bounds and upper bounds in standardized total effects, standardized direct effects, and standardized indirect effects. The results are presented in Table 5.

Table 5. Standardized total, direct, and indirect effects

Standardized total effects			
	HPO	EO	OCB
Lower bounds			
EO	.404	.000	.000
OCB	.687	.000	.000
Performance	.293	.122	-.262
Upper bounds			
EO	.553	.000	.000
OCB	.768	.000	.000
Performance	.421	.288	-.011
Standardized direct effects			
	HPO	EO	OCB
Lower bounds			
EO	.404	.000	.000
OCB	.687	.000	.000
Performance	.247	.122	-.262
Upper bounds			
EO	.553	.000	.000
OCB	.768	.000	.000
Performance	.466	.288	-.011
Standardized indirect effects			
	HPO	EO	OCB
Lower bounds			
EO	.000	.000	.000
OCB	.000	.000	.000
Performance	-.094	.000	.000
Upper bounds			
EO	.000	.000	.000
OCB	.000	.000	.000
Performance	.107	.000	.000

The bootstrapping procedure proves that all of the direct, indirect, and total effects are statistically significant with a confidence level of 90% except for the indirect impact of high performance indicators on organizational performance. The above results provide full support for hypotheses H1, H2, H3, and H5. Hypotheses H6 and H7 have to be rejected. Thus, high performance indicators have a direct and indirect effect on organizational performance with entrepreneurial orientation as a mediator. As for hypothesis H4 that is central to the study considering the assumption of mediation, the research results are inconclusive. That is because the indirect effect of high performance indicators on organizational performance with the mediation of entrepreneurial orientation cannot be established, as the results of indirect effects sum both mediated relationships. For that reason, another model was tested with the exclusion of mediation by OCB. The results are presented in Figure 3 and Tables 6 and 7.

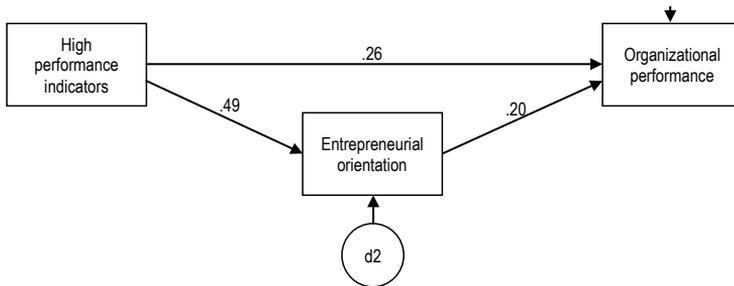


Figure 3. Mediation model with standardized weights.

As can be seen, in the second model, the direct effect of high performance indicators on organizational performance is weaker (the coefficient of 0.26 compared to 0.26 in the first model) than in the first model. That is because the negative indirect effect of OCB is not taken into consideration, and it partly explains the higher direct effect.

Table 6. Standardized indirect effects

	HPO	EO
EO	.000	.000
Performance	.099	.000

The standardized indirect effect of high performance indicators on organizational performance with the mediation by entrepreneurial orientation is estimated at the level of .099. As the results of the bootstrapping procedure

indicate, the indirect impact is statistically significant. However, it is not very strong compared to the direct effect of model 1 and model 2. Therefore, hypothesis H4 is supported, but the mediating effect is only partial.

Table 7. Standardized indirect effects (lower and upper bounds)

	HPO	EO
Lower bounds		
EO	.000	.000
Performance	.054	.000
Upper bounds		
EO	.000	.000
Performance	.136	.000

DISCUSSION

The main question of the study concerned the impact of high performance indicators on organizational performance. Hence, the mediation model was tested, including direct effect and indirect effect with the mediation of two constructs—organizational citizenship behavior and entrepreneurial orientation. The results provide some valuable insights into complex relationships. First of all, there is a rather strong and statistically significant direct impact of high performance indicators on actual organizational performance. That confirms previous results (e.g., De Waal, 2012; De Waal & Meingast, 2017; De Waal, Mroueh, & Schiavo, 2017) that indicate a strong relationship in that regard.

High performance indicators also have a strong positive effect on organizational citizenship behaviors. That also confirms previous research results (Goddard, 2001; Sun, Aryee, & Law, 2007; Zbierowski, 2012). That result (and comparison to impact of HP factors on EO) is slightly unexpected. That is because high performance frameworks tend to focus on personal and organizational effectiveness while organizational citizenship behaviors in part are about positive behaviors towards co-workers (altruism, courtesy - Podsakoff, MacKenzie, Moorman, & Fetter, 1990). The deeper analysis of the impact of HPI on OCB reveals that all high performance indicators affect dimensions of OCB. Altruism is under the effect of workforce quality and long-term orientation, for conscientiousness especially important are openness and action orientation, management quality and workforce quality, sportsmanship is created by continuous improvement (negatively) and long-term orientation (positively). Courtesy is dependent on management quality,

workforce quality, and long-term orientation, and civic virtue is shaped by all high performance indicators.

The effect of high performance indicators on entrepreneurial orientation is also positive and weaker than in terms of OCB. A more in-depth analysis of the effects between dimensions of HPO and EO indicates that continuous improvement and management quality have a positive effect on innovativeness and proactiveness. At the same time, risk taking is shaped positively only by continuous improvement. Generally, the coefficients of the effect of continuous improvement on all three dimensions of entrepreneurial orientation are very high (0.60-0.64).

The impact of entrepreneurial orientation on organizational performance is not very strong, contradictory to the results of previous research (Covin & Slevin, 1991; Zahra, 1993; Lumpkin & Dess, 1996; Wiklund & Shepherd, 2005). This might be due to the fact that the research design was cross-sectional, and the effect of organizational entrepreneurship might have shifted in time, which is discussed in the 'limitations' section of the paper. It can be assumed that with time, the influence of entrepreneurial orientation on organizational performance gains strength, although it is statistically significant from the beginning. Entrepreneurial orientation is, therefore, a good way to increase performance, and mobilized resources yield a return without any delay. The same issue applies to organizational citizenship behaviors, although the situation is a bit different, as in the direct effect of OCB on organizational performance is negative. It is consistent with some previous results (Bolino, Klotz, Turnley, & Harvey, 2013) that suggest that the immediate effect of OCB on performance might be negative due to the time necessary for positive behaviors to be adapted and aligned with other components of the organization. Generally, it is one of the assumptions of the construct of organizational citizenship behaviors that the accumulated positive effect on performance can be observed in the long run.

The negative impact of OCB on performance has its consequence in the indirect influence of high performance factors on organizational performance with the mediation of OCB that is weak (although statistically significant) and negative. Therefore, attention is focused on entrepreneurial orientation as a possible mediator. To establish the exact strength and significance of that relationship, another mediation model was tested with the exclusion of OCB. It shows that entrepreneurial orientation has a mediating power in the relationship between high performance indicators and organizational performance. However, even though the mediating effect is statistically significant, it is much weaker than a direct effect, so the mediation is an only partial one.

CONCLUSION

The results allow the formulation of a couple of recommendations for practice. The introduction of a high performance framework in the organization enables both organizational citizenship behaviors and entrepreneurial orientation to be supported. Which way is more important, taking into consideration internal and external conditions, must be the decision of the company's management. Supporting entrepreneurial orientation also has a positive effect on organizational performance, and therefore it is in the interests of the management of the organization to foster innovativeness, proactiveness, and risk taking. Definitely, supporting those three behaviors will bring benefits for performance. However, it has to be aligned with the strategy of the organization, and, additionally, the positive effect on performance should be expected in the mid- and long-run, as in the short-run, the effect could be not apparent or even negative. High caution is advised in promoting organizational citizenship behaviors. It seems that some of those behaviors are supportive of organizational performance (civic virtue, conscientiousness, sportsmanship) while others might have no or negative effect (altruism, courtesy). In both cases (entrepreneurial attention, organizational citizenship behavior), the effect of those behaviors on organizational performance should be continuously monitored and assessed.

The study has a few limitations. The research design that was applied in the study was a cross-sectional design, and all data was gathered at one point in time. It is not the most suitable design to test complex relationships that can be lagged in time, like for example, the impact of organizational citizenship behaviors and entrepreneurial orientation on organizational performance. That result could probably be observed after a certain time, such as 1-3 years. Therefore it is difficult to draw conclusions based on cross-sectional design results. Another limitation concerns the aggregation of dimensions into constructs. It refers to almost all constructs under research: high performance indicators, entrepreneurial orientation, and organizational citizenship behaviors. That procedure was performed to avoid the overcomplication of the model; however, it does have its disadvantages. Mainly, it does not allow one to measure the effects between separate dimensions and does not allow one to draw specific and detailed conclusions. For instance, in the present study, what the exact impact of the separate high performance factors is on the dimensions of organizational citizenship behavior cannot be observed. This would be very interesting considering the strength of the relationship between those two constructs. Finally, as the constructs bear similar meaning, some collinearity and tautology among them could be expected. That especially concerns high performance indicators and entrepreneurial

orientation as HPI might partly encompass EO. However, high performance indicators refer to practices that are employed in the organization, while entrepreneurial orientation relates to actions that are undertaken.

My suggestion for future research partly addresses the mentioned limitations. To truly confirm the existence of causal effects, some stronger research designs should be applied, like a longitudinal design or at least a cross-sectional design with a time lag for performance measurement. Also, future research could focus on individual dimensions of the constructs that could bring interesting results by uncovering the complex relationships existing among components of researched constructs. Moreover, as the current study does not take into consideration the possible interplay of organizational citizenship behaviors and entrepreneurial orientation, that path could also be explored in future studies.

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References

- Bolino, M. C., Klotz, A. C., Turnley, W. H., & Harvey, J. (2013). Exploring the dark side of organizational citizenship behavior. *Journal of Organizational Behavior, 34*, 542-559. <http://dx.doi.org/10.1002/job.1847>
- Brief, A. P., & Motowidlo, S. J. (1986). Prosocial organizational behavior. *Academy of Management Review, 11*, 710-725. <http://dx.doi.org/10.2307/258391>
- Bryl, Ł. (2018). Human capital orientation and financial performance. A comparative analysis of US corporations. *Journal of Entrepreneurship, Management and Innovation, 14*(3), 61-86. <https://doi.org/10.7341/20181433>
- Brockhaus, R. (1980). Risk taking propensity of entrepreneurs. *Academy of Management Journal, 23*, 509-520. <http://dx.doi.org/10.5465/255515>
- Busenitz, L. W. (1999). Entrepreneurial risks and strategic decision making. *The Journal of Applied Behavioral Science, 35*, 325-340. <http://dx.doi.org/10.1177/0021886399353005>
- Cameron, K. S. (2008). *Positive Leadership. Strategies for Extraordinary Performance*. San Francisco: Berrett Koehler.
- Cameron, K. S., Dutton, J. E., & Quinn, R.E. (2003). *Positive Organizational Scholarship. Foundations of a New Discipline*. San Francisco: Berrett-Koehler Publishers, Inc.
- Collins, J. C., & Porras, J. I. (1994). *Built to Last. Successful Habits of Visionary Companies*. New York: Harper Business.

- Collins, J. C. (2001). *Good to Great: Why Some Companies Make the Leap... and Others Don't*. New York: Harper Business.
- Covin, J. G., & Slevin, D. P. (1988). The influence of organization structure on the utility of an entrepreneurial top management style. *Journal of Management Studies*, 25(3), 217–234. <http://dx.doi.org/10.1111/j.1467-6486.1988.tb00033.x>
- Covin, J. G., & Slevin, D. P. (1989). Strategic management of small firms in hostile and benign environments. *Strategic Management Journal*, 10, 75–87. <http://dx.doi.org/10.1002/smj.4250100107>
- Covin, J. G., & Slevin, D. P. (1991). A conceptual model of entrepreneurship as firm behavior. *Entrepreneurship Theory and Practice*, 16(1), 7-25. <http://dx.doi.org/10.1177/104225879101600102>
- De Waal, A. A. (2010). Achieving high performance in the public sector: What needs to be done? *Public Performance & Management Review*, 34(1), 81-103. <http://dx.doi.org/10.2753/PMR1530-9576340105>
- De Waal, A. A. (2012). Characteristics of high performance organizations. *Business Management and Strategy*, 3(1), 28–45. <http://dx.doi.org/10.1108/17515630710684178>
- De Waal, A., van Nierop, E., & Sloot, L. (2017). Analysing supermarket performance with the high-performance organization framework. *International Journal Of Retail & Distribution Management*, 45(1), 57-70. <http://dx.doi.org/10.1108/IJRDM-03-2016-0042>
- De Waal, A., & Heijtel, I. (2017). Developing a change approach for the transition to a high performance organization. *Measuring Business Excellence*, 21(2), 101-116. <http://dx.doi.org/10.1108/MBE-03-2016-0015>
- De Waal, A., & Meingast, A. (2017). Applying the high performance organization framework in the horticulture and greenhouse sector. *Measuring Business Excellence*, 21(2), 136-151. <http://dx.doi.org/10.1108/MBE-05-2016-0028>
- De Waal, A., Mroueh, M., & Schiavo, L. (2017). Analyzing performance in the UAE manufacturing industry using the high performance organization framework. *Middle East Journal of Business*, 12(1), 3-11. <http://dx.doi.org/10.1002/joe.21561>
- Dess, G. G., Lumpkin, G. T., & McGee, J. E. (1999). Linking corporate entrepreneurship to strategy, structure, and process: Suggested research directions. *Entrepreneurship Theory & Practice*, 23(3), 85–102. <http://dx.doi.org/10.1177/104225879902300306>
- Freiling, J., & Schelhowe, Ch. L. (2014). The impact of entrepreneurial orientation on the performance and speed of internationalization. *Journal of Entrepreneurship, Management and Innovation*, 10(4), 169-199. <http://dx.doi.org/10.7341/20141047>
- Holbeche, L. (2005). *The High Performance Organization. Creating Dynamic Stability and Sustainable Success*. Oxford: Elsevier/Butherworth Heinemann.
- Khandwalla, P. N. (1977). *The Design of Organizations*. New York: Harcourt Brace Janovich.
- Kreiser, P. M., Marino L., & Weaver, K. M. (2002). Assessing the psychometric properties of the entrepreneurial orientation scale: A multi-country

- analysis. *Entrepreneurship Theory and Practice*, 26(4), 71–94. <http://dx.doi.org/10.1177/104225870202600405>
- Lawler, E. E. III, & Worley, C. G. (2006). *Built to Change. How to Achieve Sustained Organizational Effectiveness*. San Francisco: Jossey-Bass.
- Light, P. C. (2005). *The Four Pillars of High Performance. How Robust Organizations Achieve Extraordinary Results*. New York: McGraw-Hill.
- Sun, L.-Y., Aryee, S., & Law, K. S. (2007). High-performance human resource practices, citizenship behavior, and organizational performance: A relational perspective. *Academy of Management Journal*, 50(3), 558–577. <http://dx.doi.org/10.5465/amj.2007.25525821>
- Lumpkin, G. T., & Dess G. G. (2001). Linking two dimensions of entrepreneurial orientation to firm performance: The moderating role of environment and industry life cycle. *Journal of Business Venturing*, 16(5), 429–451. [https://doi.org/10.1016/S0883-9026\(00\)00048-3](https://doi.org/10.1016/S0883-9026(00)00048-3)
- Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Journal*, 21(1), 135–172. <http://dx.doi.org/10.2307/258632>
- Miller, D., & Friesen, P. H. (1982). Innovation in conservative and entrepreneurial firms: Two models of strategic momentum. *Strategic Management Journal*, 3(1), 1–25. <http://dx.doi.org/10.1002/smj.4250030102>
- Miller, D., & Le Breton-Miller, J. (2005). *Managing for Long Run. Lessons in Competitive Advantage from Great Family Businesses*. Boston: Harvard Business School Press.
- Mintzberg, H. (1973). Strategy-making in three modes. *California Management Review*, 16(2), 44–53. <http://dx.doi.org/10.2307/41164491>
- Nam, D., Parboteeah, K., Cullen, J., & Johnson, J. (2014). Cross-national differences in firms undertaking innovation initiatives: An application of institutional anomie theory. *Journal of International Management*, 20(2), 91–106. <http://dx.doi.org/10.1016/j.intman.2013.05.001>
- Organ, D. W. (1988). *Organizational Citizenship Behavior. The Good Soldier Syndrome*. Lexington: Lexington Books.
- Palich, L. E., & Bagby, D.R. (1995). Using cognitive theory to explain entrepreneurial risk-taking: Challenging conventional wisdom. *Journal of Business Venturing*, 10(6), 425–438. [http://dx.doi.org/10.1016/0883-9026\(95\)00082-J](http://dx.doi.org/10.1016/0883-9026(95)00082-J)
- Peters, T. J., & Waterman, R. H. (1982). *In Search of Excellence: Lessons from America's Best-Run Companies*. New York: Harper & Row.
- Podsakoff, P. M., & MacKenzie, S. B. (1997). Impact of organizational citizenship behavior on organizational performance: A review and suggestion for future research. *Human Performance*, 10(2), 133–151. http://dx.doi.org/10.1207/s15327043hup1002_5
- Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors.

- Leadership Quarterly*, 1(2), 107–142. [http://dx.doi.org/10.1016/1048-9843\(90\)90009-7](http://dx.doi.org/10.1016/1048-9843(90)90009-7)
- Schumpeter, J. A. (1934). *The Theory of Economic Development*. Cambridge: Harvard University Press.
- Steensma, H. K., Marino, L. D., Weaver, K. M., & Dickson, P.H. (2000). The influence of national culture on the formation of technology alliances by entrepreneurial firms. *Academy of Management Journal*, 43, 951-973. <http://dx.doi.org/10.5465/1556421>
- Stevenson, H. H., & Jarillo, J. (1990). A paradigm of entrepreneurship: Entrepreneurial management. *Strategic Management Journal*, 11, 17-27. http://dx.doi.org/10.1007/3-540-48543-0_7
- Wiklund, J., & Shepherd, D. (2005). Entrepreneurial orientation and small business performance: A configurational approach. *Journal of Business Venturing*, 20(1), 71-91. <http://dx.doi.org/10.1016/j.jbusvent.2004.01.001>
- Williams, L. J., & Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of Management*, 17(3), 601-617. <http://dx.doi.org/10.1177/014920639101700305>
- Zahra, S.A. (1993). Environment, corporate entrepreneurship, and financial performance: A taxonomic approach. *Journal of Business Venturing*, 8, 319–340. [http://dx.doi.org/10.1016/0883-9026\(93\)90003-N](http://dx.doi.org/10.1016/0883-9026(93)90003-N)
- Zarei, M. (2017). Entrepreneurial tournaments: Towards disclosing the rivalry process among corporate entrepreneurs. *Journal of Entrepreneurship, Management and Innovation*, 13(2), 33-57. <http://dx.doi.org/10.7341/20171322>
- Zbierowski, P. (2012). *Orientacja Pozytywna Organizacji Wysokiej Efektywności*. Warszawa: Wolters Kluwer.

Abstrakt

Poszukiwanie źródeł wysokiej efektywności jest jednym z najbardziej trwałych tematów w nauce o zarządzaniu, który zaowocował stworzeniem znaczącej liczby modeli na przestrzeni dziesięcioleci. Celem opracowania jest zbadanie czy wpływ czynników wysokiej efektywności (high performance organization (HPO)) na faktyczną efektywność organizacji jest mediowany przez obywatelskie zachowania organizacyjne (organizational citizenship behavior (OCB)) oraz orientację przedsiębiorczą (entrepreneurial orientation (EO)). Wyniki wcześniej prowadzonych badań wskazują, że model czynników wysokiej efektywności odpowiada na pytanie 'co' robią liderzy efektywności, ale nie odpowiada na pytanie 'jak' to robią, sugerując efekt pośredniczenia. Obecny artykuł ma na celu sprawdzenie który z konstruktów (OCB czy EO) pośredniczy w tej relacji. Hipotezy zostały testowane przy wykorzystaniu badań przekrojowych na losowo dobranej i reprezentatywnej próbie 406 przedsiębiorstw. Badania zostały przeprowadzone metodą wywiadu bezpośredniego (CAPI). Ugruntowane w literaturze narzędzia badawcze posłużyły do pomiaru obywatelskich zachowań organizacyjnych, orientacji przedsiębiorczej, czynników wysokiej efektywności i efektywności organizacyjnej. Teo-

retyczny model zależności został poddany weryfikacji przy wykorzystaniu modelowania równań strukturalnych. Wyniki badań wskazują na to, że istnieje silny bezpośredni wpływ czynników wysokiej efektywności na efektywność organizacji. Ponadto, istnieje silny pozytywny wpływ czynników wysokiej efektywności na organizacyjne zachowania obywatelskie i orientację przedsiębiorczą. Wpływ tych dwóch konstruktów na efektywność organizacji jest jednak niski i, w przypadku organizacyjnych zachowań obywatelskich, negatywny. Prowadzi to do wniosku, że bezpośredni wpływ czynników wysokiej efektywności jest silniejszy, mimo że mediacja za pośrednictwem orientacji przedsiębiorczej jest istotna statystycznie. Artykuł wnosi wkład do debaty naukowej na co najmniej trzy sposoby. Po pierwsze, potwierdza duże znaczenie czynników wysokiej efektywności w kreowaniu sukcesu przedsiębiorstwa. Po drugie, wskazuje na fakt, że orientacja przedsiębiorcza jest częściowym pośrednikiem w tej relacji. Po trzecie, ujawnia bardzo duże znaczenie czynników wysokiej efektywności we wspieraniu organizacyjnych zachowań obywatelskich. Wyniki badań pozwalają również na sformułowanie rekomendacji praktycznych. Dotyczą one głównie wspierania postaw obywatelskich, orientacji przedsiębiorczej oraz poprawy efektywności organizacji poprzez umiejętne zarządzanie czynnikami wysokiej efektywności. Przeprowadzone badania są nowatorskie w zakresie ujęcia obywatelskich zachowań organizacyjnych oraz orientacji przedsiębiorczej jako pośredników w relacji między czynnikami wysokiej efektywności i sukcesem organizacji, podobne podejście nie było testowane w przeszłości.

Słowa kluczowe: czynniki wysokiej efektywności, orientacja przedsiębiorcza, organizacyjne zachowania obywatelskie

Biographical note

Przemysław Zbierowski is an associate professor at University of Economics in Katowice. His research interests focus on entrepreneurship, positive organizational scholarship, positive psychology and organizational behavior. He is an author of over 150 academic papers. He has been a leader of four externally funded projects and since 2011 has been the national team leader of the Global Entrepreneurship Monitor project. Currently, he performs a Maria Skłodowska-Curie fellowship awarded by the European Commission at King's College London.

Conflicts of interest

The author declares no conflict of interest.

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Exploring resistance factors on the usage of hospital information systems from the perspective of the Markus's Model and the Technology Acceptance Model

Çiğdem Sıcakyüz¹ , Oya Hacire Yüregir² 

Abstract

Although information systems provide many benefits to the organization, many organizations are experiencing difficulties with the process of change. Resistance to change is one of the most considerable challenges in this phase. This study aimed to investigate the causes of resistance by healthcare personnel to IT in Adana Numune Hastanesi, which is a state-run hospital located in Adana, Turkey. The Technology Acceptance Model (TAM) was expanded by adding factors such as affective commitment, gender, and age. Logistic regression analysis was carried out on the research model through 291 collected survey data using SPSS (version 21). The overall percentage accuracy prediction was 55.3% for parameters of the initial model and 80.8% for the stepwise model after the third step. According to the results, while the factors "perceived usefulness of IT," "perceived ease of use of IT," and "affective commitment" were found to have an influence on the resistance of use of IT, demographic factors such as age, gender, position, and tenure were not related. Managers should create an environment for increasing staff commitment by including them in decision-making and process changing. Thus, not only could the manager use the organizations' resources productively, but also future change projects could be carried out effectively, roughly, and timely. Therefore, through its committed personnel, the hospital could sustainably compete with its competitors in the market and make more profit.

Keywords: healthcare information systems, organizational affective commitment, resistance to innovation, change management, Technology Acceptance Model, TAM, Markus's Model

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INTRODUCTION

With the rapid development of technology, organizations are buying new technologies in order to gain competitive advantage over their rivals. Recently, information technology (IT) is gaining grounds in healthcare. The leading information technologies used in health systems are Hospital Information Technology (HIT), Electronic Patient Record (EMR), Clinical Decision Support (CDS), e-Health and RFID technology, and Computerized Physician Order Entry (CPOE) system. These systems have the potential to improve the health of individuals by providing improved quality and minimizing cost. For example, EMR systems allow processes such as displaying, editing, and recording patient graphs on the computer. These systems provide quick access to patient information by providing a digital information area for physician notes (Walter & Lopez, 2008) and facilitate administrative work by providing e-mail access; control through the internet and clinical decision support (Van Slyke et al., 2007).

Although technology offers organizations many advantages, the use of IT in hospitals remains low in the USA (Buntin et al. 2011; Van Slyke et al. 2007). The reasons for failure in change projects can be multifarious, such as organizational, individual, or technological. The individual-based reasons can range from the personnel's lack of motivation for change (Bertolini et al., 2011) in which scheduled and unscheduled operations often have to coexist and be managed, ways to minimise patient inconvenience need to be studied. A framework based on event-driven process chains (EPCs to resistance of the end-user to technology (Bhattacharjee & Hikmet, 2007; Meissonier & Houzé, 2010) we conceptualise a whole theoretic-system we call IT Conflict-Resistance Theory (IT-CRT. Such lack of communication in the team or incompetent management (Hadjimanolis, 2003) can be thought of as organizational reasons, whereas the complexity and difficulty of technology are regarded as technological reasons (Rogers et al., 2019).

According to Barutçugil (2013), the output of resistance to IT did not only result in non-use but also led to work-related accidents, an increase in compensation claims, increased absenteeism, sabotage, an increase in expenditure due to health and falling productivity. Moreover, an unsuccessful transition process of a purchased innovation in the organization brings costs to the organizations.

The main aim of this study was to determine whether affective commitment and demographic factors, as external factors, have an impact on the resistance to IT in the healthcare sector in Adana, Turkey. The sub-objective of this study was to shed light on managers by assessing their personnel's underlying attitudes and behaviors regarding the emotional

aspect of IT projects. This will ensure maximum utilization of existing resources (people, money, time, and machine) through the right productive strategies so that they can compete and increase their profit. In this context, the following research questions were examined.

RQ1: Is there any relationship between resistance and the organizational affective commitment of healthcare personnel to the resistance they display on the use of hospital information systems in Adana, Turkey?

RQ2: Is there any relationship between resistance and the demographic factors such as age, gender, tenure, and position of the healthcare personnel to the resistance they display on the use of hospital information systems in Adana, Turkey?

RQ3: Is there any relationship between resistance and perceived usefulness and perceived ease of use of the hospital information systems to the resistance they display on the use of hospital information systems in Adana, Turkey?

This study gives different perspectives of non-use of IT from the literature. In the literature, most of the studies were based on the Technology Acceptance Model (TAM) by Davis (1989), in which the perceived ease of use and usefulness of new technologies have been demonstrated as the main factors in their acceptance, to predict the intention of employees towards the use of IT rather than resistance to technology.

The literature on resistance to change is very rich. There are studies emphasizing that the psychological dimension, as well as the technical dimension of change, are important in managing the change in the process of applying technology. Sıcakyüz and Yüregir (2018) asserted that reasons such as fear of authority and job loss, lack of IT interest, lack of management and technical support, complexity of IT, and unreadiness for change can play roles in technology adoption. The human-based resistance such as personality, emotions, talents should not be ignored since there are many studies that have found that feelings and individual differences affected the acceptance of change (Mdletye et al., 2014; Vishwanath Venkatesh & Morris, 2000) which forms part of the human dimension of transformational change. This paper presents empirical evidence gathered from the Correctional Centres of the South African Department of Correctional Services in the Province of KwaZulu-Natal on resistance-to-change behavior displayed by the employees of Correctional Services, namely Correctional Officials regarding the

fundamental culture change from the punishment-oriented philosophy to the rehabilitation-driven philosophy in terms of the treatment of sentenced offenders (herein referred to as DCS change).

There are also researchers who argue that the attitude of employees should be considered as a critical success factor in managing the change process of the organization (Foster & Wilson-Evered, 2006). Since other studies have pointed out that user resistance is the second most important factor costing time and money (Ali et al., 2016). One reason for workers' resistance could stem from a weakness of commitment to their organization. (Laumer, 2012) process characteristics, technology characteristics, and characteristics of the change process. Moreover, it can be shown that user resistance is not only related to the observed usage behavior, but also in work- and process-related consequences. The results contribute not only to IT adoption and change management literature, but also to the literature on Human Resources Information Systems (HRIS pointed to the resistance of employees to a new system implementation at a financial services provider. Consequently, this can decrease both organizational commitment of employees and overall job satisfaction but can increase turnover intention. Thus, affective commitment can be seen as a critical factor in accepting or implementing technology or change in the organization. It can be a consequence of the resistance of employees, or it can be a reason why employees resist a new system.

To predict resistance, it is necessary to understand why there is resistance to technology, rather than investigating why it is not adopted (Ram & Sheth, 1989). Although there is some research about the resistance model, a valid and adaptable model has not yet been found (Samhan & Joshi, 2015). Moreover, some researchers have pointed out the psychological reasons for non-acceptance of technology (Ram & Sheth, 1989). Still, no research has been found on the impact of the affective commitment of an organization's employees on the resistance to change and/or technology in the process of organizational change. Due to investigation of the impact of both the main factors of TAM and the affective commitment of personnel on the resistance to IT, the study differs from the other researches in the literature.

Not only is this study going to show the effects of TAM's main variables on the resistance of personnel to use IT, but also pave the way for more attention on the strong impact and importance of emotion and the relationship of the personnel to their organization on the resistance to organizational change in the near future. Another contribution of this study is that it will give some practical insights to managers on the steps they can take to prevent emerging resistance. Furthermore, it will enable managers to use their organizations' resources productively so that future change projects can be carried out effectively, smoothly, and timely. Therefore,

through its committed personnel, the hospital can sustainably compete with its competitors in the market and make more profit.

LITERATURE REVIEW

Organizational development and change management

Organizational development (OD) has been around since the early 1930s (Worren et al., 1999). Indeed, organizational development dates back to Fredrick Taylor, who reformed it into the productivity of work shortening time and arranging motion in the workplace. His focus on the elimination of inefficient work, and guidance to managers on how to organize tasks and manage workers, was a standard for most managers (Lewis et al., 2016). This mechanistic view of an organization, although it leads to the best people being employed and an optimum way to manage work and employees in order to make more profit, changed at the time of Kurt Lewin, whose work is prevalent in the field of sociology and psychology. Al-haddad and Kotnour (2015) expressed that most researchers had been under Lewis's influence. Probably, for this reason, organizational development and organizational learning are often seen as having the same meaning (Rothwell et al., 2010).

In the literature, organizational learning has been given more importance because it is understood that humans are the most essential factor in the driving wheel of the organization. That is why, to compete in the market and work efficiently, several techniques were developed, namely Continuous Improvement (CI), Business Process Redesign (BPR), Total Quality Management (TQM), and Balanced Scorecard (BSC) (Paton & McCalman, 2008). The performances of organizations were different, even though they were using the same methodology or technology because technology alone could not perform everything (Powell & Dent-Micallef, 1997). They needed to have both contemporary technology and the knowledge of management techniques, as well as a leadership style to protect the existence of the organization. Due to the complexity of external organizational factors like government policy, globalization, rapidly changing technology or unclear, extra and various consumer demands, organizations had to keep developing themselves and introducing more radical changes than classical organizational development. As such, many definitions of organizational development can be seen in the literature. For example, Anderson and Anderson (2010) have defined it in three ways according to the intense and technical level of change such as developmental, transitional and transformational, while Al-Haddad

and Kotnour (2015) have pointed out that organizational development is related to change management in the social research field.

Furthermore, Worren et al. (1999) have defined change management as a new and different field rather than an extension of classical organizational development because it requires a range of activities such as employee performance, process consulting, business restructuring, strategic human resource management, information technologies and many more. Thus, the classical manager could not deal with these complexities, so organizations required special managers called change agents to manage the change processes. Nevertheless, this was not enough for successful change implementation, and about 70% of change projects failed, according to Beer and Nohria (2000).

Some authors have developed strategies to carry out change projects (Kotter & Schlesinger, 2008), whereas others have investigated the causes of failing projects. The reasons found differ, such as the size and hierarchy of the organizations (Frambach & Schillewaert, 2002), management approach (Hadjimanolis, 2003; Keen, 1981), unreadiness of personnel (Armenakis et al., 1993; Jones et al., 2005), personality (Oreg, 2007), open communication and agreement with personnel (Powell & Dent-Micallef, 1997), and the personnel's lack of motivation for change (Bertolini et al., 2011) in which scheduled and unscheduled operations often have to coexist and be managed, ways to minimise patient inconvenience need to be studied. A framework based on event-driven process chains (EPCs). Others claim that the resistance of employees, customers, suppliers, partners and decision-makers (Oreg, 2003; Zwick, 2002) shown towards change was a barrier, preventing the successful implementation of innovation (Nisbet & Collins, 1978), and that this resistance can arise from different factors such as the difficulty and complexity of innovation (Rogers et al., 2019).

Furthermore, Markus (1983) stated that people are resistant to change both for new system-based reasons as well as the interaction of the characteristics between people and the new system. Besides, Markus (1983) defined the interaction as a perspective in which people perceive that new technology will alter their current social and job structure, and power relations.

Ali et al. (2016) categorized six interaction-based user resistances in their literature review. These resistances were the interaction of system-based and human-based characteristics (Markus, 1983), increased access to the data but lesser autonomy (DeSanctis & Courtney, 1983; Jiang et al., 2000; Joshi, 1991; Krovi, 1993; Lapointe & Rivard, 2005) implementation research suggests that it is not enough that the technology be friendly to the user. The user must also be friendly to the system. In formulating solutions to implementation problems, the field of organization development (OD

Lapointe & Rivard, 2005; we used a multilevel, longitudinal approach. We first assessed extant models of resistance to IT. Using semantic analysis, we identified five basic components of resistance: behaviors, object, subject, threats, and initial conditions. We further examined extant models to (1 2007), psychological contract and new technology (Klaus & Blanton, 2010), a lack of organizational fit (Meissonier & Houzé, 2010) we conceptualise a whole theoretic-system we call IT Conflict-Resistance Theory (IT-CRT, social influence (Eckhardt et al., 2009), and uncertainty (Jiang et al., 2000; Waddell & Sohal, 1998). The relationship between employee and management, the experiences and tenure of the employee in the workplace could also affect the adoption of technology by employees. Eckhardt et al. (2009) induced that social influence from workplace experiences has a significant impact on IT adoption (Ali et al., 2016).

True management as an enabler to success in the change process

In a related study, it was reported that the emotional reactions of managers to change had an impact on their work attitudes. The more positive the manager's approach to work was, the higher the turnover they made, compared to managers whose approach to their work was negative (Mossholder et al., 2000). This shows that it is mandatory that managers adopt change processes before gaining employment. The right person to lead change projects ranges from organization to organization.

Although change agents could be from either outside or inside an organization (Paton & McCalman, 2008; Rothwell et al., 2010), external change agents are paid more than internal ones and are responsible for only the current change project (Paton & McCalman, 2008), which often allows organizations to seek a new change agent for each project. Due to the easy access of information, the internal change agent has advantages over an external agent.

Moreover, Winklhofer (2002) emphasized that it is necessary for project managers to be aware of minor organizational events and cope with them by acting efficiently. Because of their technical, interdisciplinary, and integrative business skills (Lannes, 2001), managers can act as change agents. In addition, their competences in interpersonal communication, integrating marketing and economics, as well as the management of engineering (Duimering et al., 2013), make it possible for managers to identify the gaps between the disciplines and choose the right strategies for problem-solving. Their responsibilities for the project's topics, such as determining actual projects, defining clear project goals, building teams, managing time, and stopping the project (Spurgeon, 1997), give managers a broad scope. Furthermore, their knowledge about products, processes, and the personnel who are

responsible for business processes in the organization (Baker, 2009), may facilitate enhanced operation and control over change projects. Therefore, managers could play an important role in the change process by committing the personnel and themselves to change, hence paving the way for sustainable success in future change projects.

Commitment as an enabler to success in change process

The previously mentioned reasons for the reactions of personnel to change can stem from beliefs, a lack of interest to change, misunderstanding, and a lack of trust. Indeed, Schalk, Campbell, and Freese (1998) believe that psychological agreement is mandatory to deal with their resistance to change. For example, in Japan, those who migrate through change processes are models of inspiration because their personnel integrates to adapt their goals. The reason for their success is the commitment of the employee to the organization (Bakan, 2011).

Moreover, in the King Faisal Hospital in Al-Taif Governorate (KSA), it was reported that organizational commitment played an important role in the employees' acceptance of changes. The more committed the personnel were to their organization, the more they wanted to participate in a change project (Nafei, 2014). Organizational commitment is related to the emotional conditions of the person in that organization. For example, an employee who is satisfied with the organization acts with a sense of commitment to the purpose and values of the organization and, as a result, the quality of the work experience is observed to be positive (Cook & Wall 1980). Mowday et al. (1979) are the most renowned researchers on this topic. According to them, those with organizational commitment have a strong belief in accepting the aims and values of the organization. They are also eager to demonstrate the effort required for the organization and are very willing to stay in the organization (Mowday et al., 1979). It is expected that those who are committed to the organization will, therefore, act accordingly to the organization's aims and will not immediately reject any innovation that will benefit the organization. In an organization where the personnel has a lower commitment, it could lead to failure due to poor work outputs. For example, absenteeism, lateness and resigning are some of the actions of personnel who have a lower commitment to their firms (Morris & Steers, 1980). Controversially, affective commitment and normative commitment has an impact on readiness of change, personal and organizational valence (Visagie & Steyn, 2011).

Theoretical model and hypotheses

This research model is based on the mixed model of the study of Markus (1983) and a modified TAM. Markus analyzed the resistance factors in three contexts as human, system, and interaction of system and human. According to Markus (1983), employees can fear that new systems will change their status, such as losing authority. The perception of people can be different due to their characteristics or social status in the workplace. The features of a new system can be determinative of the perception of people. Therefore, the perceived usefulness and ease of use of IT were considered as an interaction of human and system.

In this study, affective commitment, as an indicator of the level of the relationship between people and organization, was assumed to examine the interaction between human and system factors mentioned in the model of Markus. In the following section, it can be seen that committed people have a positive relation to the organization and can accept change when they are involved in the implementation of change, as Markus (1983) pointed out. It is expected that the more committed employees are to their organization, the less resistant they are to the new technology or system.

Laumer & Eckhardt (2010) stated that resisting a new system lessens employees' commitment to their organization. Although the authors consider this factor to be a result of the resistance of employees to a new system or technology, affective commitment can also be the reason for resistance since affectiveness could be a good indication of organizational performance, as concluded by Authayarat and Umemuro (2012). Thus, in this study, affective commitment was seen as an interaction between people and organization, and as an external variable of TAM. The other external variables were chosen from the demographic factors which Joia, Gradwohl De Macêdo, and Gaete De Oliveira (2014) by reviewing the extant literature with respect to resistance behavior to information systems, a theoretical model containing the factors that influence user resistance behavior to enterprise systems was compiled. Then, via a web survey, 169 valid questionnaires filled out by Brazilian IT managers who had already implemented enterprise resource planning (ERP suggested in their studies. The conceptual model of the research is shown in Figure 1.

As a mixed model of Markus's model (1983) and TAM, this study researched whether the relationship between personnel and management in addition to system properties (as usefulness and ease of use of system) and personal characteristics such as gender, age, working years and position affect the user resistance to information technology or not.

Perceived usefulness and perceived ease of use

The variables of TAM are utilized in this study. The hypotheses are explained below and their theoretical justification in order to set and analyze the research model. The most pervasive employed model of the adaption of technology is TAM (Davis et al., 1989; Vishwanath Venkatesh & Morris, 2000; Viswanath Venkatesh & Davis, 2000). There are three main constructs in TAM.

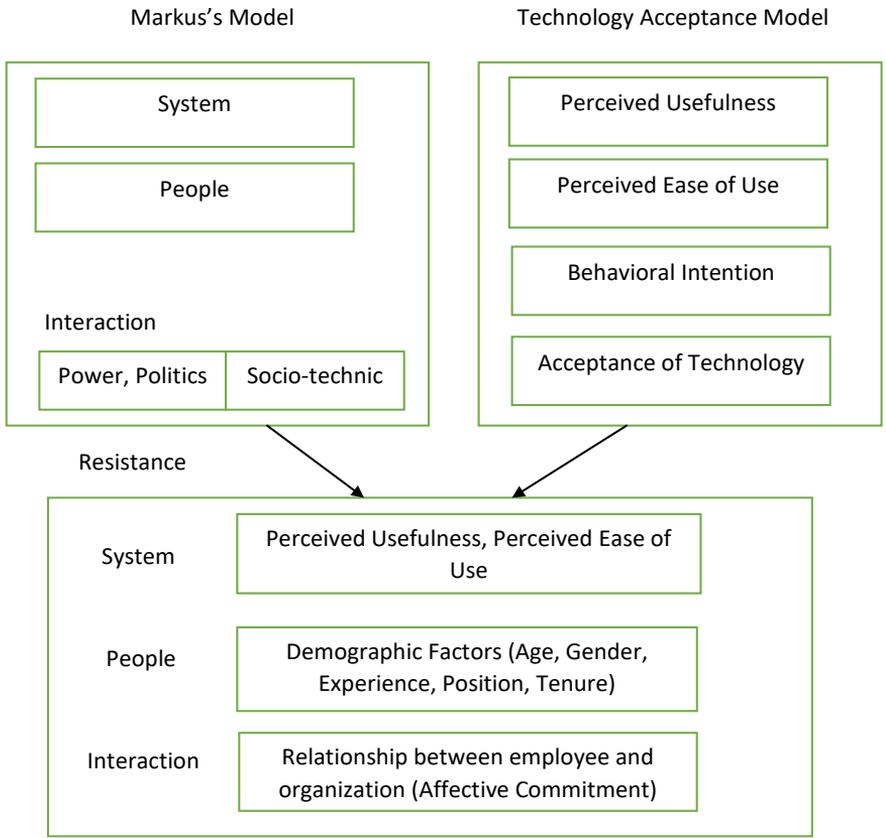


Figure 1. Conceptual model

These are 'perceived usefulness' (PU) and 'perceived ease of use' (PEU), which describe the beliefs related to IT by the end-users, and acceptance of technology (TA), which indicates that the users have an intention to use the technology. PU stands for the belief that using IT results in efficient job performance, and PEU stands for using IT without any effort. According to

TAM, users should see the benefits of technology and use it easily before they accept it.

Past studies have expanded TAM by adding the external variables to the main variables PU, PEU, and BI (behavior intention). The external variables are individual differences and demographic properties (ages, gender, etc.), system characteristics, social efficiency, and facilitating conditions (Viswanath Venkatesh & Bala, 2008). Furthermore, in the study of Venkatesh and Bala (2008), they mentioned that PEU belief worked in the beginning phase and post-implementation phase of the technology. In the beginning phase of the technology, they added factors such as computer self influence, computer anxiety, computer playfulness, and perceptions of external control. In the post implementation phase, perceived enjoyment, objective usability, and efficiency especially were added in order to increase the interaction with the technology. The other expanded model, called TAM2, in which the variables experienced and voluntariness were mediated in, was suggested by the study of Viswanath Venkatesh and Davis (2000) and this model was also composed of subjective norms, image, job relevance, output quality, resulting in demonstrability variables apart from TAM. Afterward, TAM was integrated with TAM2 and so emerged TAM3 (Viswanath Venkatesh & Davis, 2000), UTAUT (Davis, 1989). All the extended models are related to TAM. However, in this study, perceived usefulness (PU) and perceived ease of use (PEU) were used to predict resistance to hospital information systems. Thus, the hypotheses related to PU and PEU beliefs are:

H1: The perceived usefulness (PU) of the hospital information system has no effect on the resistance of hospital personnel to the hospital information system (IT).

H2: The perceived ease of use (PEU) of the hospital information system has no effect on the resistance of hospital personnel to the hospital information system (IT).

Affective commitment of personnel to organization

Unlike technological reasons, the emotions and affective reactions of personnel and events within the organization have effects on the acceptance and use of IT (Stam & Stanton, 2010). It is reported that facilitating factors such as perceived organizational supports affect the acceptance of change or use of IT (Taylor & Todd, 1995; Vishwanath Venkatesh & Morris, 2000). The potential adopters of technology have willingly accepted the change or technology and have not felt any obligation to the acceptance of it. Hence, the voluntariness variable was used as mediated. This variable is related to

willingness only in terms of the feature of technology. As mentioned above, the positive relations of personnel with their organizations have led to positive attitudes and behaviors, and better work output, even if they do not want to act towards change. These efforts given by the personnel are because of their commitment to the organization.

Hence, in this study, we have concentrated on the relationship between organizational commitment and resistance to change in IT usage in the healthcare industry. While there are many types of research on resistance to change, no records on organizational commitment were found in the literature in this context. This research tries to underscore the importance of this factor in order to benefit IT at a maximum level. Based on the literature reviewed, the following hypothesis is proposed:

H3: There is no relationship between the hospital personnel's affective commitment to the organization and their resistance to the hospital information system (IT).

Demographic factors

Demographic factors such as age, gender, etc. have been added to TAM to examine their impacts on the PU and BI. For example, Kiefer (2005) found that demographic factors such as gender, age, and tenure are held as control variables, which negatively affected the work conditions of changes associated with personnel relationship to their organization. Indeed, their effects were directed at the PU (Viswanath Venkatesh & Bala, 2008). Thus, in this study, age, gender, tenure, and occupation were taken into account as demographic variables.

Age

In an organization, the age of employees can be crucial because it can be a risk factor in some situations such as job satisfaction, workplace autonomy, work intensity, mobility, and employees' loyalty to their organization (Fabisiak & Prokurat, 2012). Age can also be a risk factor in the change process. For example, there are many different findings of the relationship between age and PU. Some researchers found that age had no significant effects on the variables of TAM, significantly in the studies of Bax and McGill (2009). However, older employees were more adaptable to change than younger employees (Chiu et al., 2001).

Additionally, the impact of PU on the intention to use IT was weaker in younger people than in older people (Pan & Jordan-Marsh, 2010; Vishwanath

Venkatesh & Morris, 2000). Thus, the proposed hypothesis is designed to determine the effect of the age factor on the resistance to IT:

H4: The hospital personnel's ages do not have any effect on their resistance to the hospital information system.

Gender

In the literature, there are many issues about the role of gender differences on technological change. As an exemplar, PU and PEU influence men and women differently. For example, women pay attention to PEU more than PU, and vice versa (Vishwanath Venkatesh & Morris, 2000). (Bax & McGill, 2009) concluded that women found the computer less useful than men, while they approach adaption to change more positively than men (Chiu et al., 2001). Owing to these distinctions, the following hypothesis is set:

H5: There is no relationship between the hospital personnel's genders and their resistance to the hospital information system (IT).

Tenure

Tenure was found to be related with change process. The more changes there are in an organization, the more employees feel negatively about them (Kiefer, 2005). In another study, individual differences such as tenure, education level, and previous experiences had indirect effects on the intention of using technology (Agarwal & Prasad, 1999). According to a study by Majchrzak and Cotton (1988)), the workers who had less work experience were more committed to changes. Thus, a relevant hypothesis is established:

H6: There is no relationship between the hospital personnel's longevity and their resistance to the hospital information system (IT).

Occupation

In one study, the resistance of physicians to hospital information systems was higher than in nurses (Lapointe & Rivard, 2005)we used a multilevel, longitudinal approach. We first assessed extant models of resistance to IT. Using semantic analysis, we identified five basic components of resistance: behaviors, object, subject, threats, and initial conditions. We further examined extant models to (1. However, these physicians worked there as independent entrepreneurs while the nurses worked under the administration. The main

reasons for the resistance of physicians were the perceived loss of authority and power. On the contrary, it was remarked that physicians should be able to adapt to new technologies more than the other staff because of their professionalism and general competence (Hu et al., 2012). As a result, the following hypothesis was designed:

H7: There is no relationship between the hospital personnel's occupation and their resistance to the hospital information system (IT).

METHOD

Research sample

This study is about the doctors and nurses working actively in Adana Numune Hospital in Adana province of Turkey. 950 surveys were handed over to authorized persons in the hospital, and 400 (42.1%) of the delivered surveys were collected. Some of the collected surveys were removed due to conflicting answers and blank responses, giving a total of 291 surveys that were included in the study. Personnel working in different departments ranging from cardiology to gynecology units were included in the study.

Research scale

Organizational Commitment Questionnaire (OCQ) with 15 questions is widely used in the literature to evaluate the commitment of employees to their organization. However, Mowday et al. (1979) utilized six emotional commitment questionnaires for this purpose. The results showed strong evidence of internal consistency, pre-test post-test reliability, and covariance validity on OCQ. As a result, the authors have adopted this scale for this study.

There are many different scales in the literature to measure TAM parameters, but in this study, PU and PEU scales have been used, each consisting of ten questions. PU and PEU scales were chosen as they provided strong content validity (Benbasat & Moore, 1991). However, because there were closed questions, some questions were omitted, and six questions for each scale were taken into account.

A five-point Likert-type scale was used in the questionnaires (1 - strongly disagree, 2 - disagree, 3 - neither agree nor disagree, 4 - agree, 5 - ssstrongly agree). Averages of the six questions were taken to calculate the average levels of commitment, average perceived usefulness, and perceived ease of use. In order to measure the resistance, the hospital employees responded

with the binary options of 0 and 1 (0 - I did not resist, 1 - I showed resistance) to the question "Did you show resistance when using this system?"

Statistical analysis and reliability of the research

An SPSS 21 package program was used in the analysis of the data. The method of analysis used for the testing of hypotheses is the logistic regression analysis method. Exploratory factor analysis was conducted to show that the scales explained the relevant factor. The maximum likelihood method was chosen as the extraction method. After the calculation, high factor loading items were found in the component matrix shown in Table 1. The absolute high values in the component matrix present a strong relationship between the item and related factor. Extraction method: maximum likelihood. 3 factors extracted and 18 iterations required.

According to the results of the factor analysis, the mentioned factors were grouped into three categories. However, two measurement items were not seen in appropriate categories. All of the perceived usefulness questions were collected together. *Still*, two questions measuring perceived ease of use and another one measuring affective commitment to the organization were included in another group. For this reason, these three questions were not included in the analysis because these items were not meaningful and did not contribute to the factors. The empty value on the table shows loadings, which are less than 0.30, and it was suppressed so that the table could be easily read. The items measuring Affective Commitment resulted in both negative and positive values in Table 1. The positive values explain the relevant factor absolutely better than negative values and, therefore, the negative values were ignored.

In the following Table 2, as a result of the exploratory factor analysis, a reliability analysis was performed to measure the reliability of the scale, and Cronbach's α coefficient was calculated. Cronbach's α coefficient was used to analyze the reliability of the scales. There is some argument that this coefficient should be 70%, even though it is reduced to 60% in exploratory studies (O'Fallon et al., 1973). For this reason, the authors used Cronbach's α coefficient to measure the consistency of the questionnaire before descriptive factor analysis.

The reliability of the perceived ease of use increased from 60.3% to 78.6%, and Cronbach's α coefficient increased from 78.2% to 81.9%, as one question about commitment to the organization was omitted.

Table 1. Exploratory factor analysis - component matrix

	Items	Factor		
		1	2	3
Perceived Usefulness (PU)	PU1	0.721	-	-
	PU2	0.554	-	-
	PU3	0.713	-	-
	PU4	0.612	-	-
	PU5	0.726	-	-
	PU6	0.682	-	-
Perceived Ease of Use (PEU)	PUE1	-	0.815	-
	PUE2	-	-	-
	PUE3	0.623	-	-
	PUE4	0.603	-	-
	PUE5	0.686	-	-
	PUE6	0.689	-	-
Affective Commitment (AC)	AC1	0.679	-	-0.372
	AC2	0.525	-	-
	AC3	0.535	-	-0.320
	AC4	0.636	-	-0.351
	AC5	0.657	-	-0.320
	AC6	-	0.345	-

The reliability of all these scales, along with resistance, was found to be 0.895 for all 16 questions. Tolerance and VIF values were used to examine the multicollinearity problem among the questions in the scale (Table 3). The tolerance value is a term that directly measures the multicollinearity problem, and this term measures the amount of variability between the selected independent variables (O’Fallon et al., 1973).

Another term that gives information about the multicollinearity problem is the Variance Inflation Factor (VIF) value. Tolerance and VIF values are given in Table 3 below for all independent variables in the model.

The lower limit of the tolerance value should be 0.1 and the VIF values should not exceed 10. However, the ideal value should be between three and five (O’Fallon et al., 1973). Since all VIF values were less than 10 and all tolerance values were greater than 0.1, there was no multicollinearity problem between the independent variables.

Table 2. Reliability analysis of scales

Factors	Items	Mean	Std. deviation	N	Cronbach's alpha	N of Items
Perceived Usefulness (PU)	PU1	3.5636	.90891	291	.851	6
	PU2	3.3849	.91895	291		
	PU3	3.5601	.96793	291		
	PU4	3.5017	1.09347	291		
	PU5	3.5842	1.03172	291		
	PU6	3.5636	1.00614	291		
Perceived Ease of Use (PEU)	PUE3	3.5155	.91101	291	.786	4
	PUE4	3.4983	.95186	291		
	PUE5	3.6632	.95952	291		
	PUE6	3.6289	.97188	291		
Affective Commitment(AC)	AC1	3.2887	1.17701	291	.819	5
	AC2	3.2165	1.05595	291		
	AC3	3.5086	1.10910	291		
	AC4	3.3608	1.09720	291		
	AC5	3.5326	1.05445	291		

Table 3. Examination of a multicollinearity problem

Model	Unstandardized coefficients		Std. coeff.	t	Sig.	Collinearity statistics	
	B	Std. error	Beta			Tolerance	VIF
(Constant)	2.154	.195		11.018	.000		
Perceived ease of use	-.237	.055	-.281	-4.293	.000	.516	1.938
Perceived usefulness	-.072	.045	-.109	-1.624	.106	.493	2.030
Affective commitment	-.193	.043	-.295	-4.519	.000	.519	1.928
Gender	.031	.059	.025	.521	.603	.930	1.075
Age	-.031	.035	-.054	-.886	.376	.605	1.653
Tenure	.045	.031	.078	1.435	.153	.739	1.353
Occupation	.037	.044	.042	.837	.403	.877	1.140

RESULTS AND DISCUSSION

Sample

The distribution of the sample hospital employees according to their position in the hospital is shown in Table 4. As can be seen in Table 4, 291 hospital personnel were included in the study, with 56 (25 + 31) of them being doctors,

195 (17 + 178) of them nurses, and 40 (21 + 19) of them were working in other positions.

Table 4. Distribution of the personnel according to position, age, and gender

Gender	Occupation Age	Age group in year				Total
		18-24	25-34	35-44	45-54	
Male	Doctor	0	6	12	7	25
	Nurse	4	11	2	0	17
	Other	4	8	9	0	21
Subtotal		8	25	23	7	63
Female	Doctor	0	5	24	2	31
	Nurse	23	58	74	23	178
	Other	5	12	1	1	19
Subtotal		28	75	99	26	228
Total		36	100	122	33	291

All of the participants were below the age of 55 and the majority (99 + 23 = 122 persons) was between the ages of 35-44. The personnel involved in the survey were mostly women (228). They were mostly working as nurses (178). Most of the men working as doctors (12 people) were between 35-44 years old.

Logistic regression analysis results

Logistic regression analysis was used to estimate the resistance of the hospital personnel to the hospital information system they used. As a method of logistic regression analysis, a stepwise forward likelihood ratio method was chosen. All hypotheses established in the study were evaluated at the 5% significance level. In the first step, all of the resisters (161) were correctly predicted, but the rate of those who did not resist could not be predicted, and the overall accuracy estimate was calculated to be 55.3% (Table 5).

Table 5. Initial model accuracy estimates

Observed			Predicted		Percentage correct
			Resistance No	Yes	
Step 0	Resistance	No	0	130	0.0
		Yes	0	161	100.0
Overall percentage					55.3

In the first step, constant coefficients and related statistics were calculated, and these values are given in Table 6 below. These statistics were Wald statistics, constant regression coefficient, and exponential logistic regression coefficient (odds ratio). Wald statistics explains the significance of the model.

Table 6. Logistic regression initial statistics

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.214	.118	3.290	1	.070	1.238

As shown in Table 7, the overall chi-square value of the model was 108.883 ($p < 0.05$), meaning the model was significant at the 5% significance level. In other words, at least one of the variables presented in Table 7 could make the model more powerful. Since the highest independent variable was the “Perceived Ease of Use” variable among the chi-Square error values calculated for the independent variables to be included in the analysis, this was the first variable to be analyzed. This variable had a significant effect on the dependent variable, i.e. resistance ($p < 0.05$ for chi-Square = 83.486).

Other variables with a significant effect on the dependent variable were analyzed at each step according to the chi-square value they got.

Table 7. Initial model showing significance levels of all variables

Independent Variables		Score	df	Sig.
Step 0	Gender(1)	.810	1	.368
	Perceived Usefulness	65.703	1	.000
	Perceived Ease of Use	83.486	1	.000
	Affective Commitment	80.430	1	.000
	Occupation	5.975	1	.015
	Tenure	.041	1	.839
	Age	17.172	1	.000
	Overall statistics	108.883	7	.000

A logistic regression model was conducted through a stepwise method and each significant variable was put sequentially in the model according to their score shown in Table 7. In each step, the model was supposed to be better from the previous one. This process continues until the overall chi-square is statistically insignificant. In Table 7, the effect of the variables “Gender” and “Tenure” on resistance was not statistically significant ($p \Rightarrow 0.05$) in the initial

model. These factors were excluded from the model since they do not have the potential to improve the model. Factors such as "Occupation" and "Age" also were insignificant, and they do not contribute to the model, resulting in these variables being extracted from the model. The model achieved the best result in three steps. These changes were not considered because the changes after the fourth iteration were below 0.001.

Coefficient estimates calculated for the conceptual logistic regression model are listed in Table 8.

Table 8. Coefficient estimates for conceptual model variables

		B	S.E.	Wald	df	Sig.	Exp(B)	95% CI. for EXP(B)	
								L	U
Step 1a	Perceived_Ease of Use	-2.850	.372	58.839	1	.000	.058	.028	.120
	Constant	10.332	1.343	59.172	1	.000	30706.546		
Step 2b	Perceived_Ease of Use	-2.257	.419	28.953	1	.000	.105	.046	.238
	Affective Commitment	-1.854	.352	27.754	1	.000	.157	.079	.312
	Constant	14.745	1.854	63.223	1	.000	2532673.116		
Step 3c	Perceived_Usefulness	-1.509	.427	12.479	1	.000	.221	.096	.511
	Perceived_Ease of Use	-1.859	.447	17.319	1	.000	.156	.065	.374
	Affective Commitment	-1.719	.374	21.190	1	.000	.179	.086	.373
	Constant	18.464	2.410	58.705	1	.000	104413761.55		

The independent variables of the model together entered the model in the last third stage, and the effects of the variables entering the model on the resistance were significant ($p < 0.05$). The Wald statistic shows the significance of the model and the contribution of each variable to the model. If the third step is taken into consideration, it can be seen that the most contributing variable to the model was the 'perceived ease of use' variable. Apart from that, the value of Exp (B) indicates the ratio of Odds (actual), and one unit of change in the independent variable shows the amount of change in the dependent variable.

The variables that contributed to the logistic regression model in the last step were found to be the 'perceived ease of use and the perceived utility of the information system and affective commitment to the organization.'

The logistic regression model that emerges with the probability of showing resistance to information systems “p” can be formulated as follows:

AC: Affective Commitment, PEU: Perceived Ease of Use and PU: Perceived Usefulness

$$\text{Logit (p)} = 18.464 - 1.719 (\text{AC}) - 1.859 (\text{PEU}) - 1.509 (\text{PU}) \quad (1)$$

In the logistic regression method, the sign of the coefficient indicating the relation between the independent variable and the dependent variable being positive indicates the probability of the increase in the dependent variable of the increase seen in the independent variable. The negative relationship reduces the probability of the dependent variable. In this model, the resistance decreases with the increase of these three variables entering the model.

In the exponential coefficients, if the direction of the relationship is over 1.0 it indicates a positive relationship, and if it is less than 1.0 it indicates a negative relationship. The Exp (B) values of the independent variables in the model were less than 1 and the sign was negative in both the coefficient and the equation. A one-unit increase in perceived usefulness will reduce resistance by 0.221 times, a one-unit increase in affective commitment to the organization will reduce resistance by 0.179, and a one-unit increase in perceived ease of use will reduce resistance by 0.156 times. The affective commitment to the organization would cause a reduction of about 17.9% in resistance to the hospital information system compared to those with less affective commitment.

Similarly, resistance to information systems, which had higher perceived usefulness, was 15.6% less likely when compared to those with lower perceived usefulness. The most influential variable was the system’s ease of use, and easier-to-use information systems would cause a reduction in resistance of about 22.1% when compared to hard-to-use information systems.

GOODNESS OF MODEL FIT

To interpret the goodness of model, the values of Cox & Snell R² and Nagelkerke R² were used. For each iteration, -2 Log likelihood and Cox & Snell R² and Nagelkerke R² values were calculated, and in the next step, the resultant values were better than the previous one (Table 9). The parameter “-2 Log likelihood” reflects the chi-square value used in order to test the overall model significance. The closer to zero the parameter is, the better the

observed variables in the model are represented. In each step, the parameter is supposed to be an improvement over the previous one.

The values of Cox & Snell R^2 and Nagelkerke R^2 represent the proportion of the variance in the dependent variable explained by the independent variable(s), such as the R^2 value of the multiple regressions, and these two R^2 values are different since they are estimated from different paths.

Table 9. The parameters of goodness of model

Step	-2 Log likelihood	Cox & Snell R^2	Nagelkerke R^2
1	296.894a	.299	.400
2	255.738b	.391	.523
3	241.586c	.420	.562

Nagelkerke R^2 is calculated since Cox & Snell R^2 never reaches 1 and, therefore, is not so easy to interpret (Field, 2005; Garson, 2008). Examining the values of Nagelkerke R^2 presented in Table 9, when only the “perceived ease of use” independent variable is entered in the first step, it explains 40% of the variance in resistance. For each additional variable, the R^2 values improved at each step, and the last step took the best value as the result of the other variables entering the analysis. As seen in the last step, the three variables contributing to the model account for about 56.2% of resistance against information systems. This reveals the difference between the initial model and the stepwise model.

When the classification obtained from the stepwise logistic regression model is examined, in the first step, that is, the classification made according only to the perceived ease of use independent variable, 117 of the 161 personnel in the group of resisters were correctly estimated, 44 were incorrectly estimated and the correct guess rate was 72.7.

The rate of the correct estimate of non-resistance was found to be 71.5%. Because of 161 people who did not resist, 93 were classified as unresistant. The remaining 37 people were misclassified. In this case, the overall estimate accuracy rate was calculated as 72.2%. With the addition of other variables, the correct estimation rates increased, and in the last step, the overall accuracy rate increased to 80.8%. Another compliance indicator is the Hosmer and Lemeshow test. Also known as the chi-square goodness-of-fit test, it provides the possibility of seeing the logistic regression model as a whole.

Table 10. Classification table

Observed			Predicted		
			Resistance		Percentage
			No	Yes	Correct
Step 1	Resistance	No	93	37	71.5
		Yes	44	117	72.7
	Overall Percentage				72,2
Step 2	Resistance	No	103	27	79.2
		Yes	36	125	77.6
	Overall Percentage				78,4
Step 3	Resistance	No	105	25	80.8
		Yes	31	130	80.7
	Overall Percentage				80.8

Table 11. Hosmer and Lemeshow test result

Step	Chi-square	df	Sig.
1	2.553	7	.923
2	10.892	8	.208
3	13.813	8	.087

In Table 11, the Hosmer and Lemeshow tests were calculated for each of the three steps, and the results of all steps were meaningless ($p > 0.05$). To say that this test is meaningless is to accept that there is no difference between the given data and the proposed logistic regression model (Hosmer et al., 1991). In this sense, as a result of the Hosmer and Lemeshow test in this study, the fact that the available model was good, i.e. there was no difference between the proposed model and the observed values were obtained ($0.087 > 0.05$).

In the logistic regression, one of the criteria for model fit is the accuracy of estimates. The more accurately the model is predicted, the more compatible it is. If the initial classification results presented (Table 5) are to be recalled, the correct classification rate was found to be 55.3%; 161 persons in the resistance group and 130 persons in the non-resistance group (observed condition).

Hypothesis testing and summary

The conclusion of hypothesis tests suggested for the conceptual model is listed in Table 12 below.

Table 12. Hypothesis test results

Hypothesis	Test results
H1=PU -->Resistance	Yes
H2=PEU-->Resistance	Yes
H3= AC -->Resistance	Yes
H4=Age-->Resistance	No
H5=Gender-->Resistance	No
H6=Tenure-->Resistance	No
H7=Occupation-->Resistance	No

In the conceptual model, the effect of the years worked in the hospital, age of the employee, gender of the employee and occupation in the workplace variables on the demonstrated resistance to the hospital information system was not observed.

CONCLUSION

This study took doctors, nurses and other health personnel working in a hospital in Adana province in Turkey into consideration. It investigated the impact of affective commitment of the personnel to the organization, the perceived usefulness and the perceived ease of use of the information system they used, and certain demographic characteristics of the personnel on the resistance to the hospital information system they used. A logistic regression method was chosen as the research method. At the end of the study, it was determined that the age, gender, position, and working time of the hospital personnel were not effective on the resistance to the hospital information systems. However, it was concluded that the information systems' perceived usefulness and ease of use and the affective commitment of personnel to the organization had an effect on the resistance they showed to these systems. These variables were found to be inversely related to the resistance to the information systems.

Although the point of the scale used in this analysis was nominal, the results are very similar to previous studies. For example, TAM studies have shown that the perceived usefulness and ease of use have a positive effect on the acceptance of information systems (Davis, 1989; Oreg, 2003). The findings in this study confirm Davis's original model. As expected, the TAM factors have been negatively related to the resistance of technology. In this sense, the study was also parallel to the results of TAM studies. One of the findings of this study was that the strength of PEU on resistance was stronger than PU. In contrast, the relationship between PEU and TA is weaker than the

relationship between PU and TA according to the study of Ma and Liu (2005). It shows that technology was resisted strongly when technology was not easy to use compared to its effect on the acceptance of it.

Another finding of this study was the negative relationship between the affective commitment of employees and the resistance to technology. This supports a study conducted by Peccei et al. (2011), who found that the usefulness of change and organizational commitment had a negative effect on the resistance to change. This study is consistent with other studies as well. For example, organizational commitment was found as one of the most important determinants of organizational change (Iverson, 1996; Mossholder et al., 2000; Nafei, 2014; Schalk et al., 1998; Visagie & Steyn, 2011) support and participation. The relationship between these processes and employee behaviour was examined by testing a theoretical model, in which two mediating concepts are used: the psychological contract and employee job attitudes. The research was carried out in two main divisions of a large telecommunications firm on a sample of 220 employees. The theoretical model (perceived change implementation influencing the psychological contract, influencing employee attitudes, influencing employee behaviour. The findings of this study differ from Czaja and Sharit (1998), who pointed out that easy-to-use tasks had a positive effect on usage compared to others. However, it has been determined that the age factor was effective on the ease of use and perceived usefulness, and the elderly could identify the benefits more than the younger ones.

Age did not significantly influence resistance to IT in this study, and this finding is consistent with the study of Bax and McGill (2009), whereas some researchers reported that age had an effect on the intention of physicians to use electronic records (Chiu et al., 2001; Viswanath Venkatesh et al., 2011; Walter & Lopez, 2008). One reason can be the average age of personnel in the examined organization as they were mostly mid-aged. In this study, the relationship between gender and the resistance of employees to IT was not significant. This finding is contrasted by other studies (Bax & McGill, 2009; Chiu et al., 2001), but on a par with the findings of Viswanath Venkatesh et al. (2011), who stated that gender had no impact on the use of computers. The result regarding gender in this study also did not comply with the other studies in the literature. For example, Gosavi (2017) found that firms that have a female owner adopt the Internet more than the firms that have a male owner.

One of the results of this study is that tenure did not affect resistance to IT. This finding is in accordance with that of Agarwal and Prasad (1999). However, Kiefer (2005) found that the tenure effect depended on the implementation frequency of change in the organization. The profession of healthcare personnel in this study also had no significant effect on the resistance to IT.

However, (Lapointe & Rivard, 2005) stated that the resistance to IT differs from nurses to physicians in cases where the physicians were administrators.

In summary, factors such as perceived usefulness, perceived ease of use and affective commitment, have affected the resistance to information systems negatively and are compatible with the literature, while the other factors such as gender, profession, and tenure have remained uncertain. The age factor was incompatible with previous studies.

This study has underscored that organizational affective commitment has an effect on the resistance to IT, as well as the other factors like perceived ease of use and perceived usefulness of IT. The organization could have troubles in the change process, both in pre- and post-implementation phases, in spite of their openness to change and keeping up with technological changes but for their commitment. Thus, gaining the emotion of personnel is an inevitable part of change management as well as sustainability in working performance. As a result, the employee does not just do what he/she needs to do; he/she also does what he/she does best. It is not expected that organizations, whose personnel have bad relationships with them will achieve their goals. Knowing personnel's attitude to work or any change process provides an advantage because of the previous prediction of them; further increasing awareness of their personnel's commitment to themselves by assessing their current situation is relevant. Therefore, they can take essential precautions in order to achieve better quality service to the patient and increase patient satisfaction. Eventually, they both can challenge their competitors and enhance trust and good image on patients.

The organization should pay attention to the factors that appear to be effective on the resistance to IT. By this means, potential resistance could be predicted before any change, and the necessary precautions could be taken accordingly. Unless steps are taken to understand and solve these behavioral and/or social problems, the benefits of the millions of dollars that organizations spend on the development of their information systems will be minimized (Langefors, 1978). Consequently, an employee might leave an organization because of job dissatisfaction and lower commitment (Laumer, 2012).

Implications for managers

It is important for administrators to focus on the pace of change, especially before implementation, in terms of the need to predict user resistance, which may lead to potential conflicts and changes to failure (Meissonier & Houzé, 2010) we conceptualise a whole theoretic-system we call IT Conflict-Resistance Theory (IT-CRT. Necessary measures can be taken if the displayed resistance to innovation in organizations can be predicted. The unpredicted change

makes it more challenging to respond more effectively, whereas the predicted change gives time for the preparation of change (Appelbaum & Wohl, 2000). High diversity of personnel is a fundamental issue in hospitals due to the existence of different age groups and professions. According to Thamhain (2011), promoting commitment was one of the ten guidelines for working effectively with culturally diverse project teams. Therefore, managers in IT implementation should find ways to increase the commitment of personnel.

It is complicated for a company whose employees have a low sense of commitment to have a successful output. Organizations that give importance to the effects of their employees have better financial returns (Authayarat & Umemuro, 2012). Thus, the organization also earns the commitment of its employees by providing job security, status, and other non-material prizes to them during the change transition. As a result, the process of change becomes more manageable, more effective, and faster.

Managers should see the resistance not as a threat but as an opportunity to be aware of their weaknesses so that they can improve both the relationship between management and their personnel and the designs of used information systems in their organization. Furthermore, managers should predict the potential resistance of personnel by using related prediction techniques like simulation and statistical analyses by looking back at their past performances and current behavior. The manager should inform employees about new changes and make them ready for change. Otherwise, it can cause misunderstanding amongst employees, and some negative consequences regarding their work and health, as Laumer (2012) stated.

Should the managers determine resistance regarding some emotional situation or affective commitment, then they must communicate with their personnel to gain their trust and ensure their personal continuity in the organization. Thus, managers should develop strategies to gain the personnel's commitment to themselves and to the hospital. For example, Japanese companies show the importance they give to their employees with the win-win strategy. They try to win them with strategies such as providing lifetime employment, profit sharing, intensive in-service training and senior-based compensation, high levels of sincerity, and participatory decision-making (White & Trevor, 1983).

It is important to involve personnel in current and future change processes so that they can approach the change and choose how to function cooperatively. Consequently, they can take responsibility for creating the results of change and making the system strong (Rothwell et al., 2010). For this reason, managers should create an open platform for enhancing suggestions and complaints from personnel about the new system and assessing the existing climate in the workplace before making any changes. Thus, future

change processes could be deployed more easily and on time in the hospital through gaining the personnel's commitment by involving them in both the decision-making related to the change process and change process itself.

Limitation and future work

This research takes into consideration the affective commitment of the hospital personnel to the organization, the perceived usefulness and the ease of use of the information systems, and the demographic characteristics of the hospital personnel. Since the information system used in each hospital would differ from one another, the way employees perceive it might be different. This is because personnel, who are highly committed to the organization and act in the direction of the organizational objectives, might be able to withstand the potential disadvantages of the information system. In such a case, it would be evident why the personnel who are emotionally committed to the organization are resistant to innovation. For this reason, further research should consider the characteristics of different information systems. Additionally, as there will be resistance, if it is not comfortable to use, the system developer should improve the use of technology. However, ease of use may differ from age to age. Therefore, future research should examine whether the ease of use of technology alters with age or not.

Furthermore, the sample size should be increased, or other hospitals should be included in the study, and the research should be extended. In addition, the characteristics of the information systems in the relevant hospital should be evaluated separately. Finally, the next study should include differences in hospital type, consider information systems, and compare the results.

References

- Agarwal, R., & Prasad, J. (1999). Ritu Agarwal. *Decision Sciences*, 30(2), 361–391. <https://doi.org/10.1111/j.1540-5915.1999.tb01614.x>
- Al-Haddad, S., & Kotnour, T. (2015). Integrating organisational change literature. *Journal of Organisational Change Management*, 28(2), 234–262. <https://doi.org/10.1108/JOCM-11-2013-0215>
- Ali, M., Zhou, L., Miller, L., & Ieromonachou, P. (2016). User resistance in IT: A literature review. *International Journal of Information Management*, 36(1), 35–43.
- Anderson, L. A., & Anderson, D. (2010). *The Change Leader's Roadmap: How to Navigate Your Organization's Transformation*. San Francisco: Pfeiffer.
- Appelbaum, S. H., & Wohl, L. (2000). Transformation or change: Some prescriptions for health care organizations. *Managing Service Quality: An International Journal*, 10(5), 279–298. <https://doi.org/10.1108/09604520010345768>

- Armenakis, A. A., Harris, S. G., & Mossholder, K. W. (1993). Creating readiness for organizational change. *Human Relations*, 46(6), 681–703.
- Authayarat, W., & Umemuro, H. (2012). Affective management and its effect on management performance. *Journal of Entrepreneurship, Management and Innovation*, 8(2), 5–25. <https://doi.org/10.7341/2012821>
- Bakan, İ. (2011). *Örgütsel bağlılık: Kavram, kuram, sebep ve sonuçlar [Organizational Commitment: Concept, Theory, Causes and Effects]*. Gazi.
- Baker, M. (2009). My involvement in engineering management during its pioneer years. *Engineering Management Journal*, 21(3), 9–12. <https://doi.org/10.1080/10429247.2009.11431809>
- Barutçugil, İ. (2013). *Stratejik yönetim [Strategic Management]*. Kariyer Yayıncılık.
- Bax, S., & McGill, T. (2009). From beliefs to success: Utilizing an expanded tam to predict web page development success. *Cross-Disciplinary Advances in Human Computer Interaction: User Modeling, Social Computing, and Adaptive Interfaces*, 3(3), 37–58. <https://doi.org/10.4018/978-1-60566-142-1.ch003>
- Beer, M., & Nohria, N. (2000). HBR's 10 must reads on change. *Harvard Business Review*, 78(3), 133–141. <https://doi.org/10.1097/JPN.0000000000000208>
- Benbasat, I., & Moore, G. C. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2(3), 192–222.
- Bertolini, M., Bevilacqua, M., Ciarapica, F. E., & Giacchetta, G. (2011). Business process re-engineering in healthcare management: A case study. *Business Process Management Journal*, 17(1), 42–66. <https://doi.org/10.1108/14637151111105571>
- Bhattacharjee, A., & Hikmet, N. (2007). Physicians' resistance toward healthcare information technology: A theoretical model and empirical test. *European Journal of Information Systems*, 16(6), 725–737. <https://doi.org/10.1057/palgrave.ejis.3000717>
- Buntin, M. B., Burke, M. F., Hoaglin, M. C., & Blumenthal, D. (2011). The benefits of health information technology: A review of the recent literature shows predominantly positive results. *Health Affairs*, 30(3), 464–471. <https://doi.org/10.1377/hlthaff.2011.0178>
- Chiu, W. C. K., Chan, A. W., Snape, E., & Redman, T. (2001). Age stereotypes and discriminatory attitudes towards older workers: An East-West comparison. *Human Relations*, 54(5), 629–660. <https://doi.org/10.1177/0018726701545004>
- Cook, J., & Wall, T. (1980). New work attitude measures of trust, organizational commitment and personal need non-fulfillment. *Journal of Occupational Psychology*, 53(1), 39–52. <https://doi.org/10.1111/j.2044-8325.1980.tb00005.x>
- Czaja, S. J., & Sharit, J. (1998). Age differences in attitudes toward computers. *Journals of Gerontology - Series B Psychological Sciences and Social Sciences*, 53(5), 329–340. <https://doi.org/10.1093/geronb/53B.5.P329>

- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, 13(3), 319–339. <https://doi.org/10.2307/249008>
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982–1003. <https://doi.org/10.1287/mnsc.35.8.982>
- DeSanctis, G., & Courtney, J. F. (1983). Toward friendly user MIS implementation. *Communications of the ACM*, 26(10), 732–738. <https://doi.org/10.1145/358413.358419>
- Duimering, P. R., Elhedhli, S., Jewkes, B., & Smucker, M. D. (2013). Management engineering: The engineering of management systems. A discussion paper. Retrieved from <http://docplayer.net/11969146-Management-engineering-the-engineering-of-management-systems-a-discussion-paper-by.html>
- Eckhardt, A., Laumer, S., & Weitzel, T. (2009). Who influences whom? Analyzing workplace referents' social influence on IT adoption and non-adoption. *Journal of Information Technology*, 24(1), 11–24. <https://doi.org/10.1057/jit.2008.31>
- Fabisiak, J., & Prokurat, S. (2012). Age management as a tool for the demographic decline in the 21st century: An overview of its characteristics. *Journal of Entrepreneurship, Management and Innovation*, 8(4), 83–96. <https://doi.org/10.7341/2012846>
- Field, A. (2005). *Discovering Statistics Using SPSS*. London: Sage Publications.
- Foster, S., & Wilson-Evered, E. (2006). A multidisciplinary approach to assess readiness for change in enterprise system implementations a multidisciplinary approach to assess readiness for change in enterprise system implementations. *Proceedings of the 20th ANZAM Conference*, 1–22. Retrieved from <https://pdfs.semanticscholar.org/f0dd/8887a41ee97872df7fe06990cf3bf623d589.pdf>
- Frambach, R. T., & Schillewaert, N. (2002). Organizational innovation adoption: A multi-level framework of determinants and opportunities for future research. *Journal of Business Research*, 55(2), 163–176. [https://doi.org/10.1016/S0148-2963\(00\)00152-1](https://doi.org/10.1016/S0148-2963(00)00152-1)
- Garson, G. D. (2008). *Logistic Regression: Statnotes*. North Carolina: North Carolina State University.
- Gosavi, A. (2017). Use of the Internet and its impact on productivity and sales growth in female-owned firms: Evidence from India. *Journal of Entrepreneurship, Management and Innovation*, 13(2), 155–178. <https://doi.org/10.7341/20171327>
- Hadjimanolis, A. (2003). The barriers approach to innovation. In L.V Shavinina (Ed.), *The International Handbook on Innovation* (pp. 559-573). Elsevier Science. <https://doi.org/10.1016/B978-008044198-6/50038-3>
- Hosmer, D. W., Taber, S., & Lemeshow, S. (1991). The importance of assessing the fit of logistic regression models: A case study. *American*

- Journal of Public Health*, 81(12), 1630–1635. <https://doi.org/10.2105/AJPH.81.12.1630>
- Hu, P. J., Chau, P. Y. K., Sheng, O. R. L., & Tam, K. Y. (2012). Examining acceptance model using physician of acceptance telemedicine technology. *Journal of Management Information Systems*, 16(2), 91–112.
- Iverson, R. D. (1996). Employee acceptance of organizational change: The role of organizational commitment. *International Journal of Human Resource Management*, 7(1). <https://doi.org/10.1080/09585199600000121>
- Jiang, J. J., Klein, G., & Crampton, S. M. (2000). A note on SERVQUAL reliability and validity in information system service quality measurement. *Decision Sciences*, 31(3), 725–744. <https://doi.org/10.1111/j.1540-5915.2000.tb00940.x>
- Joia, L. A., Gradwohl De Macêdo, D., & Gaete De Oliveira, L. (2014). Antecedents of resistance to enterprise systems: The IT leadership perspective. *Journal of High Technology Management Research*, 25(2), 188–200. <https://doi.org/10.1016/j.hitech.2014.07.007>
- Jones, R. A., Jimmieson, N. L., & Griffiths, A. (2005). The impact of organizational culture and reshaping capabilities on change implementation success: The mediating role of readiness for change. *Journal of Management Studies*, 42(2), 361–386. <https://doi.org/10.1111/j.1467-6486.2005.00500.x>
- Joshi, K. (1991). The change: Information systems technology implementation. *MIS Quarterly*, 15(2), 229–242.
- Keen, P. G. W. (1981). Information systems and organizational change. *Communications of the ACM*, 24(1), 24–33. <https://doi.org/10.1145/358527.358543>
- Kiefer, T. (2005). Feeling bad: Antecedents and consequences of negative emotions in ongoing change. *Journal of Organizational Behavior*, 26(8), 875–897. <https://doi.org/10.1002/job.339>
- Klaus, T., & Blanton, J. E. (2010). User resistance determinants and the psychological contract in enterprise system implementations. *European Journal of Information Systems*, 19(6), 625–636. <https://doi.org/10.1057/ejis.2010.39>
- Kotter, J. P., & Schlesinger, L. A. (2008). Choosing strategies for change. *Harvard Business Review*, July-August. Retrieved from https://projects.iq.harvard.edu/files/sdpfellowship/files/day3_2_choosing_strategies_for_change.pdf
- Krovi, R. (1993). Identifying the causes of resistance to IS implementation. A change theory perspective. *Information and Management*, 25(6), 327–335. [https://doi.org/10.1016/0378-7206\(93\)90082-5](https://doi.org/10.1016/0378-7206(93)90082-5)
- Langefors, B. (1978). Discussion of the article by Bostrom and Heinen: MIS problems and failures: A socio-technical perspective. Part I: The causes. *MIS Quarterly*, 2(June), 55–64. <https://doi.org/10.2307/248942>
- Lannes, W. J. (2001). What is engineering management? *IEEE Transactions on Engineering Management*, 48(1), 107–110. <https://doi.org/10.1109/17.913170>

- Lapointe, L., & Rivard, S. (2005). A multilevel model of resistance to information technology implementation. *MIS Quarterly: Management Information Systems*, 29(3), 461–491. <https://doi.org/10.2307/25148692>
- Laumer, S. (2012). Resistance to it-induced change. Theoretical foundation and empirical evidence. Doctoral thesis. Retrieved from <http://opus4.kobv.de/opus4-bamberg/files/574/LaumerResistanceopusseA2.pdf>
- Laumer, S., & Eckhardt, A. (2010). Why do people reject technologies? - Towards an understanding of resistance to it-induced organizational change. *ICIS 2010 Proceedings - Thirty First International Conference on Information Systems*. Retrieved from <https://www.semanticscholar.org/paper/Why-do-People-Reject-Technologies-Towards-an-of-to-Laumer-Eckhardt/df00ed304c657f41ef51c664c1f5addb1e9bf835>
- Lewis, S., Passmore, J., & Cantore, S. (2016). *Appreciative Inquiry for Change Management: Using AI to Facilitate Organizational Development*. London: Kogan Page Publishers.
- Ma, Q., & Liu, L. (2005). The Technology Acceptance Model: A meta-analysis of empirical findings. *Advanced Topics in End User Computing*, 4(May 2014), 112–127. <https://doi.org/10.4018/978-1-59140-474-3.ch006>
- Majchrzak, A., & Cotton, J. C. (1988). A longitudinal study of adjustment to technological change: The case of job transfers from mass to computer-automated batch production. *Journal of Occupational Psychology*, 61(1), 43–66.
- Markus, M.L. (1983). Power, politics, and MIS Implementation. *Communications of the ACM*, 26(6), 430–444. <https://doi.org/10.1145/358141.358148>
- Mdletye, M. A., Coetzee, J., & Ukpere, W. I. (2014). The reality of resistance to change behaviour at the Department of Correctional Services of South Africa. *Mediterranean Journal of Social Sciences*, 5(3), 548–560. <https://doi.org/10.5901/mjss.2014.v5n3p548>
- Meissonier, R., & Houzé, E. (2010). Toward an IT conflict-resistance theory: Action research during IT pre-implementation. *European Journal of Information Systems*, 19(5), 540–561. <https://doi.org/10.1057/ejis.2010.35>
- Morris, J. H., & Steers, R. M. (1980). Structural influences on organizational commitment. *Journal of Vocational Behavior*, 17(1), 50–57. [https://doi.org/10.1016/0001-8791\(80\)90014-7](https://doi.org/10.1016/0001-8791(80)90014-7)
- Mossholder, K. W., Settoon, R. P., Armenakis, A. A., & Harris, S. G. (2000). Emotion during organizational transformations: An interactive model of survivor reactions. *Group and Organization Management*, 25(3), 220–243. <https://doi.org/10.1177/1059601100253002>
- Mowday, R. T., Steers, R. M., & Porter, L. W. (1979). The measurement of organizational commitment: A progress report. *Journal of Vocational Behavior*, 14(2), 224–247.
- Nafei, W. A. (2014). Assessing employee attitudes towards organizational commitment and change: The case of King Faisal Hospital in Al-Taif

- Governorate, Kingdom of Saudi Arabia. *Journal of Management and Sustainability*, 4(1). <https://doi.org/10.5539/jms.v4n1p204>
- Nisbet, R. I., & Collins, J. (1978). Barriers and resistance to innovation. *Australian Journal of Teacher Education*, 3(1). <https://doi.org/10.14221/ajte.1978v3n1.1>
- O'Fallon, W. M., Cooley, W. W., & Lohnes, P. R. (1973). Multivariate data analysis. *Technometrics*, 15(3), 648. <https://doi.org/10.2307/1266874>
- Oreg, S. (2003). Resistance to change: Developing an individual differences measure. *Journal of Applied Psychology*, 88(4), 680–693. <https://doi.org/10.1037/0021-9010.88.4.680>
- Pan, S., & Jordan-Marsh, M. (2010). Internet use intention and adoption among Chinese older adults: From the expanded technology acceptance model perspective. *Computers in Human Behavior*, 26(5), 1111–1119. <https://doi.org/10.1016/j.chb.2010.03.015>
- Paton, R. A., & McCalman, J. (2008). *Change Management: A Guide to Effective Implementation*. London: Sage.
- Peccei, R., Giangreco, A., & Sebastiano, A. (2011). The role of organisational commitment in the analysis of resistance to change: Co-predictor and moderator effects. *Personnel Review*, 40(2), 185–204. <https://doi.org/10.1108/004834811111106075>
- Powell, T. C., & Dent-Micallef, A. (1997). Information and technology as competitive advantage: The role of human, business, and technology resources. *Strategic Management Journal*, 18(5), 375–405. https://doi.org/10.1057/9780230513426_8
- Ram, S., & Sheth, J. N. (1989). Consumer resistance to innovations: The marketing problem and its solutions. *Journal of Consumer Marketing*, 6(2), 5. <https://doi.org/10.1108/EUM0000000002542>
- Rogers, E. M., Singhal, A., & Quinlan, M. M. (2019). Diffusion of innovations. In D.W. Stacks, M.B. Salwen, & K.C. Eichhorn (Eds.), *An Integrated Approach to Communication Theory and Research* (pp. 1-20). Third Edition. New York: Routledge. <https://doi.org/10.4324/9780203710753-35>
- Rothwell, W. J., Stavros, J. M., Sullivan, R. L., & Sullivan, A. (2010). *Practicing Organization Development: A Guide for Leading Change* (34th ed.). New Jersey: John Wiley & Sons.
- Samhan, B., & Joshi, K. D. (2015). Resistance of healthcare information technologies; Literature review, analysis, and gaps. *Proceedings of the Annual Hawaii International Conference on System Sciences, 2015-March*, 2992–3001. <https://doi.org/10.1109/HICSS.2015.362>
- Schalk, R., Campbell, J. W., & Freese, C. (1998). Change and employee behaviour. *Leadership & Organization Development Journal*, 19(3), 157–163. <https://doi.org/10.1108/01437739810210202>
- Sıcakyüz, Ç., & Yüregir, O. H. (2018). The resistance factors to using health information technology in Turkey. *Research Journal of Engineering Sciences*, 1(1), 1–11.

- Spurgeon, W. M. (1997). What is an engineering manager? *ASEE Annual Conference Proceedings*. Retrieved from <https://peer.asee.org/what-is-an-engineering-manager.pdf>
- Stam, K. R., & Stanton, J. M. (2010). Events, emotions, and technology: Examining acceptance of workplace technology changes. *Information Technology and People, 23*(1), 23–53. <https://doi.org/10.1108/09593841011022537>
- Taylor, S., & Todd, P. A. (1995). Understanding information technology usage. *Information Systems Research, 6*(2), 144–176. <https://doi.org/10.1287/isre.6.2.144>
- Thamhain, H. J. (2011). Critical success factors for managing technology-intensive teams in the global enterprise. *Engineering Management Journal, 23*(3), 30–36. <https://doi.org/10.1080/10429247.2011.11431906>
- Van Slyke, C., Ilie, V., Lou, H., & Stafford, T. (2007). Perceived critical mass and the adoption of a communication technology. *European Journal of Information Systems, 16*(3), 270–283. <https://doi.org/10.1057/palgrave.ejis.3000680>
- Venkatesh, Vishwanath, & Morris, M. G. (2000). Why don't men stop asking for directions? Gender, social influence and their role in society. *MIS Quarterly, 24*(1), 115–139.
- Venkatesh, Viswanath, & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences, 39*(2), 273–315. <https://doi.org/10.1111/j.1540-5915.2008.00192.x>
- Venkatesh, Viswanath, & Davis, F. D. (2000). Theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. *Management Science, 46*(2), 186–204. <https://doi.org/10.1287/mnsc.46.2.186.11926>
- Venkatesh, Viswanath, Sykes, T. A., & Zhang, X. (2011). “Just what the doctor ordered”: A revised UTAUT for EMR system adoption and use by doctors. *Proceedings of the Annual Hawaii International Conference on System Sciences, 1*–10. <https://doi.org/10.1109/HICSS.2011.1>
- Visagie, C. M., & Steyn, C. (2011). Organisational commitment and responses to planned organisational change: An exploratory study. *Southern African Business Review, 15*(3), 98–121.
- Waddell, D., & Sohal, A. S. (1998). Resistance: A constructive tool for change management. *Management Decision, 36*(8), 543–548. <https://doi.org/10.5061/dryad.ft56mn76\r10.1086/665031>
- Walter, Z., & Lopez, M. S. (2008). Physician acceptance of information technologies: Role of perceived threat to professional autonomy. *Decision Support Systems, 46*(1), 206–215. <https://doi.org/10.1016/j.dss.2008.06.004>
- White, M. R. M., & Trevor, M. (1983). *Under Japanese Management: The Experience of British Workers*. New Hampshire: Heinemann Educational Publishers.

- Winklhofer, H. (2002). Information systems project management during organizational change. *Engineering Management Journal*, 14(2), 33–37. <https://doi.org/10.1080/10429247.2002.11415160>
- Warren, N. A. M., Ruddle, K., & Moore, K. (1999). From organizational development to change management: The emergence of a new profession. *The Journal of Applied Behavioral Science*, 35(3), 273–286.
- Zwick, T. (2002). Employee resistance against innovations. *International Journal of Manpower*, 23(6). <https://doi.org/10.1108/01437720210446397>

APPENDIX. Measurement instruments

Perceived Usefulness

- PU1: Using IT in my job increases my productivity.
- PU2: Using IT gives me greater control over my work.
- PU3: Using IT in my job enables me to accomplish tasks more quickly.
- PU4: Using IT improves my job performance.
- PU5: Using IT makes it easier to do my job.
- PU6: Overall, I find IT useful in my job.

Perceived Ease of Use

- PEU1: Using IT is often frustrating.
- PEU2: Using IT requires a lot of mental effort.
- PEU3: Learning to operate IT is easy for me.
- PEU4: I find it easy to get IT to do what I want it to do.
- PEU5: My interaction with IT is clear and understandable.
- PEU6: I find IT easy to use.

Affective Commitment

- AC1: I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful.
- AC2: I talk up this organization to my friends as a great organization to work for.
- AC3: I feel very little loyalty to this organization. (R)
- AC4: I would accept almost any type of job assignment in order to keep working for this organization.
- AC5: I find that my values and the organization's values are very similar.
- AC6: I am proud to tell others that I am part of this organization.

Abstrakt

Chociaż systemy informacyjne zapewniają wiele korzyści, wiele organizacji ma trudności z procesem zmian. Odporność na zmiany jest jednym z największych wyzwań na tym etapie. Badanie to miało na celu zbadanie przyczyn oporności personelu medycznego na IT w Adana Numune Hastanesi, szpitalu państwowym w Adanie w Turcji. Model akceptacji technologii (TAM) został rozszerzony o czynniki, takie jak zaangażowanie afektywne, płeć i wiek. Analiza regresji logistycznej została przeprowadzona na modelu badawczym za pomocą 291 zebranych danych ankietowych przy użyciu SPSS (wersja 21). Ogólna procentowa prognoza dokładności wyniosła 55,3% dla parametrów modelu początkowego i 80,8% dla modelu krokowego po trzecim etapie. Zgodnie z wynikami, chociaż stwierdzono, że czynniki „postrzegana użyteczność IT”, „postrzegana łatwość korzystania z IT” i „zaangażowanie afektywne” mają wpływ na odporność na korzystanie z IT, czynniki demograficzne, takie jak wiek, płeć, stanowisko nie były powiązane. Menedżerowie powinni stworzyć środowisko dla zwiększenia zaangażowania personelu poprzez włączenie ich w proces decyzyjny i zmianę procesu. W ten sposób menedżer mógłby nie tylko produktywnie wykorzystać zasoby organizacji, ale także przyszłe projekty zmian mogły być przeprowadzane skutecznie i terminowo. Dlatego dzięki zaangażowanemu personelu, szpital mógłby w sposób zrównoważony konkurować z innymi na rynku i osiągać większe zyski.

Słowa kluczowe: *systemy informacyjne opieki zdrowotnej, zaangażowanie afektywne, odporność na innowacje, zarządzanie zmianami, model akceptacji technologii, TAM, model Markusa*

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Conflicts of interest

The authors declare no conflict of interest.

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How managerial coaching enables thriving at work. A sequential mediation

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Abstract

The psychological state in which an individual experiences a form of vitality and a sense of learning at work is known as thriving at work. Since the new millennium, empirical research is evident that thriving (employees' sustainability) is critical for organizational sustainability. However, this human dimension of sustainability is understudied, and little is known about how individual characteristics and managers promote employee thriving at work. To address the gap, this pioneering study investigates the work context and individual differences in promoting thriving at work. The intervening mechanism of self-efficacy and prosocial motivation in the association between managerial coaching and thriving at work has been examined using a sequential mediation approach. Data has been analyzed using a Hayes' PROCESS Model 6 (based on 1,000 bootstrap resampling) with an actual sample of 221 respondents. Our results provide support for our hypothesized model. The study finds a direct association between managerial coaching and self-efficacy. It is concluded that self-efficacy is directly related to prosocial motivation, hence enhanced employee thriving at work. It is also found that self-efficacy and prosocial motivation play a vital role in explaining the association between managerial coaching and thriving at work.

Keywords: managerial coaching, self-efficacy, prosocial motivation, thriving at work, sequential mediation

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INTRODUCTION

Scholarly and corporate interest in creating sustainable organizations has been emerging for over two decades (Fritz, Lam, & Spreitzer, 2011; Kira & Van Eijnatten, 2008; Lee & Ha-Brookshire, 2017; Spreitzer, Porath, & Gibson, 2012). Sustainability states that human and other lives will be nourished on the planet forever (Ehrenfeld, 2008). Kira and Van Eijnatten (2008) stated organizational sustainability was a capacity to adjust and continue working while having a proactive and innovative approach. Organizations that exhibit efficiency, creativity, and endurance are sustainable (El Bedawy, 2015). Elkington (1997) and Spreitzer, Porath, and Gibson (2012) argued that organizations with sustainability emphasize on three dimensions concurrently, i.e. human, environmental and economic performance (also refers to three p's, i.e. profit, planet, and people). If individuals learn the philosophy to work with natural systems rather than exploiting them, both humans and nature flourish simultaneously. Organizations that are social entities play an influential role in transforming norms of the industry by taking into account environmental and social concerns as well as harvesting the positive economic, environmental and social benefits by competing on the basis of sustainability (Hoffman & Haigh, 2010). Various research (El Bedawy, 2015; Fritz, Lam, & Spreitzer, 2011; Lee & Ha-Brookshire, 2017; Spreitzer et al., 2012) has claimed that practitioners and researchers have least focused on the human facet of sustainability compared to the other two dimensions. In this era, organizations have to operate in an environment of flux and competitiveness (Mushtaq, Abid, Sarwar, & Ahmed, 2017). Their survival, success, and growth are contingent on employees' creativity, energy, ideas, skills and knowledge (Abid & Ahmad, 2016; Bryl, 2018; Kira & Van Eijnatten, 2008; Paterson, Luthans, & Jeung, 2014; Pereverzieva, 2019; Spreitzer, 2007). Thus, sustainability of employees (flourishing and thriving) is essential for an organization to be sustainable, and for their competitive advantage and sustainable performance (Abid, 2016; Abid, Zahra, & Ahmed, 2016b; El Bedawy, 2015; Pfeffer, 2010; Walumbwa, Muchiri, Misati, Wu, & Meiliani, 2017).

Porath, Spreitzer, Gibson, and Granett (2012) and Spreitzer, Sutcliffe, Dutton, Sonenshein, and Grant (2005) narrated the concept of thriving as a psychological, subjective experience of feeling vital and constantly learning in the workplace. Two dimensions of thriving i.e., the cognitive component (learning) and affective component (vitality), are recognized. Employees grow in the short run and adapt in the long run based on these dimensions (Spreitzer et al., 2005). Thriving workers exhibit a comparatively greater functioning and energy. In addition, Wallace, Butts, Johnson, Stevens, and

Smith (2016) emphasized that thriving also delivers various other benefits and advantageous work outcomes.

A review study on the thriving at work phenomenon, carried out by Abid (2016), explored how thriving generates positive outcomes like improved, innovative work behavior, improved performance, less absenteeism, increased commitment, enhanced well-being, better psychological health, better vocal behavior, reduced turnover intention, and high work engagement. Likewise, the same outcomes relevant to thriving were also supported by theoretical argumentations in various empirical studies.

From these studies, thriving is associated with self-development (Paterson, Luthans, & Jeung, 2014), adaptability and adjustment in career (Jiang, 2017; Shan, 2016), happiness in the workplace (Qaiser, Abid, Arya, & Farooqi, 2018), life satisfaction (Flinchbaugh, Luth, & Li, 2015), job satisfaction (Abid, Khan, & Hong, 2016a), work engagement (Abid, 2016; Abid, Sajjad, Elahi, Farooqi, & Nisar, 2018; Levene, 2015; Ren, Yunlu, Shaffer, & Fodchuk, 2015; Spreitzer, Lam, & Fritz, 2010), being helpful at work (Frazier & Tupper, 2016), creativity (Abid, Zahra, & Ahmed, 2015; Carmeli & Spreitzer, 2009; Wallace et al., 2016), better performance (Elahi, Abid, Arya, & Farooqi, 2019; Paterson et al., 2014; Shan, 2016), less burnout (Porath et al., 2012), low absenteeism (Abid, 2014), lower turnover and intention to quit (Abid et al., 2015; Abid, Zahra, & Ahmed, 2016b; Ren et al., 2015). A meta-analysis conducted by Kleine, Rudolph, and Zacher (2019) found that thriving is significantly associated with job satisfaction, subjective health, organizational commitment, creative performance, attitude towards self-development, extra and in-role performances. Furthermore, they also found that it is negatively related to burnout and intention to leave the organization as well.

Although researchers have acknowledged the role of thriving at work for different industries (Gerbas, Porath, Parker, Spreitzer, & Cross, 2015; Spreitzer & Porath, 2012), empirical studies on an individual's thriving is insufficient in the existent literature regarding thriving (Niessen, Sonnentag, & Sach, 2012; Paterson, 2014). For example, the role of leader and manager is considered understudied while we take into account the promotion of thriving (Paterson et al., 2014). Similarly, limited knowledge is available in response to the question of how individual characteristics are linked to thriving at work (Fritz et al., 2011; Walumbwa et al., 2017). As a result, Walumbwa et al. (2017) stated that very little is known regarding the way in which personal and contextual factors on an independent and mutual basis are linked to employee thriving.

A socially-rooted model of thriving was presented by Spreitzer and her research companions in 2005. They suggested that learning and vitality are promoted through contextual aspects (managerial coaching and prosocial

motivation) and individual differences (i.e., self-efficacy). The definition of managerial coaching refers to “the actions of the manager or leader who acts as a coach and facilitates learning in the workplace environment through specific behaviors that enable the employee to learn and develop” (Ellinger, Ellinger, & Keller, 2003). The focus of managerial coaching revolves around the activities that facilitate a relationship among superiors and subordinates, thereby helping in performance improvement, motivating subordinates to face the upcoming challenging tasks, and promoting the confidence to take action (Pousa & Mathieu, 2015). Self-efficacy is defined as an individual’s belief about his/her capability to perform any task (Bandura, 1977). This specific investigating study advocates that, for people in the workplace, self-efficacy can play the role of a catalyst in enhancing prosocial motivation because they possess a feeling of competency and ability to carry out their work-related tasks. They exhibit a facilitating behavior towards their colleagues for the successful accomplishment of goals. The definition of prosocial motivation is explained as the aspiration to disburse effort in order to benefit others (Grant & Sumanth, 2009).

Therefore, this study incorporates a twofold objective: investigating the predictors of thriving at work (self-efficacy, managerial coaching, and prosocial motivation) and exploring the underlying mechanism through which managerial coaching impacts thriving at work via sequential mediation of self-efficacy and prosocial motivation. The sequential mediating mechanism, through which managerial coaching impacts thriving at work, has not been addressed by scholars to the best of our knowledge.

To attain the overall development and growth of the organization, the proficiency of workers to develop at work is essential (Abid et al., 2016b; Paterson et al., 2014). Therefore, the significance of this study can be advocated for both fields, i.e., for academia and for industry as well. The curiosity regarding investigation of employee thriving in the workplace prevails among researchers. They are fascinated to inspect the backgrounds and mechanism of employee thriving (Elahi et al., 2018; Paterson et al., 2014; Qaiser et al., 2018), most specifically the individual differences and contextual factors that promote thriving.

In the same manner, the understanding of key constructs through which firms can achieve favorable outcomes from employees can be considered as a matter of interest for practitioners and managers (Abid, Contreras, Ahmed, & Qazi, 2019). Thoughtful attention must be directed towards the proxy outcomes of the managerial coaching process by managers. In this context, the findings of this study provide managers with a strong rationale for employing coaching practices in their organizations and industrial practices. The consideration of managerial coaching as a predictor of self-

efficacy, thriving at work and prosocial motivation, is advocated by the results of empirical evidence and after assessing its growing need in the industry when the problems are unstructured and human capital is considered as a competitive advantage (Bryl, 2018). To attain the motives of the said constructs, management needs to stress the significance of managerial coaching, which may not only coach their subordinates but also encourage them to help other colleagues in the workplace, ultimately achieving its realistic insights in work settings.

THEORETICAL BACKGROUND AND HYPOTHESES

Thriving at work

“Thriving” has gained unprecedented attention from divergent domains by researchers and practitioners (e.g., youth development and work), resulting in a diverse knowledge and a lack of consensus on conceptual and operational definitions that underpin the concept (Brown, Arnold, Fletcher, & Standage, 2017). The term ‘thrive’ denotes the ability of an individual for growth and flourishing (Merriam-Webster Dictionary, 2019). In the management literature, this promising concept is socially embedded and is elaborated as “a psychological state [in] which individuals experience both a sense of vitality and a sense of learning at work” (Spreitzer et al., 2005) and the said state is modified over time (Niessen et al., 2012). Vitality (or vigor) is the subjective experience of an individual related to energy (Shirom, 2004). In contrast, a cognitive element of thriving is known as learning, which relates to growing through attaining and exploiting the skills and knowledge in a work setting.

According to Spreitzer et al. (2005) and Porath et al. (2012), the experience regarding thriving is an intersection of both components – vitality and learning. An individual is not thriving if lower energy levels are felt, but he or she has acquired any novel skill. So, thriving at work can not be achieved if burnout results from knowledge acquisition. In contrast, if the skill or knowledge acquisition is not accompanied by an experience of vitality, then an individual is also not thriving because of deficit thrust regarding workplace development. Hence, a psychological condition in which the feeling of being energetic, and a state of enhancing knowledge and skill is achieved, is known as thriving.

The two elements work as complementary forces, as feeling more energized results in positive feelings that motivate one towards self-development, which includes learning both in and out of the workplace. When individuals thrive at work, they feel energetic, exhibit high levels of psychological functioning (O’Leary & Ickovics, 1995; Porath et al., 2012),

experience progress and thrust at work (Carmeli & Spreitzer, 2009). Thriving individuals are generally unsatisfied with the status quo because they are self-learners who vigorously find ways to keep on learning and growing (Niessen et al., 2012), and navigate their own path for sustaining their development (Spreitzer et al., 2005). Therefore, these individuals want to prolong or renew this positive state.

Thriving at work plays an essential role in mitigating absenteeism, which can be one of the resultants from workplace stressors like burnout, incivility, depression, harassment, and costs organizations around \$84 billion per annum in lost productivity across 14 different job types (Forbes, 2013; Gallup, 2013). Also, the time spent on activities regarding work-related factors has a significant influence on employee health (Beehr & Newman, 1978). The health of any individual is crucial for both the organization and society at large. Thriving at work is associated with physical health likewise, and the risk of heart disease is more threatening to employees who feel inadequate growth at work (Alfredsson, Spetz, & Theorell, 1985).

Managerial coaching, self-efficacy, and prosocial motivation

In this modern era, organizational development and the manager-subordinate relationship is significant for an organization's success. Hagen (2012) stated that coaching could serve as a tool for a positive manager-subordinate relationship and also promote organizational development. Executive coaching (Grant, 2014), coaching leadership (Beattie, Kim, Hagen, Egan, Ellinger, & Hamlin, 2014) and peer coaching (Parker, Kram, & Hill, 2014) are a few of the well-known types in the coaching literature. It is defined as "the actions of the manager or leader who acts as a coach and facilitates learning in the workplace environment through specific behaviors that enable the employee to learn and develop" (Ellinger, Ellinger, & Keller, 2003). Whereas, managerial coaching or hierarchical coaching (Beattie et al., 2014) integrates the two well-known constructs of i.e. coaching and leadership and it focuses on the practices in which managers use their leadership abilities in order to motivate and enhance the performance of their subordinates (Ellinger et al., 2003). It is an emerging and very important concept in the field of management, and a lot of empirical work has been done to find out the significance of managerial coaching (Baron & Morin, 2010; Gordon Bar & St. Rosh-Ha'Ayin, 2014; Moen & Allgood, 2009). It is considered as the core activity for managers in attaining the optimal performance of their subordinates (Evered & Selman, 1989; Hamlin, Ellinger, & Beattie, 2006). Managerial coaching is also referred to as a strategy that can dramatically improve the competitiveness of the firm as it stimulates

a positive relationship among managers and subordinates (Hagen, 2012). It also inspires subordinates and helps them to grow (Kim et al., 2014). Literature on managerial coaching has reported many beneficial outcomes (Zhang, Jensen, & Mann, 1997) including performance improvement (Ellinger et al., 2003; Liu & Batt, 2010), employee learning (Hagen et al., 2012), commitment to quality (Elmadag et al., 2008), job satisfaction (Kim, 2014), motivation (Gilley, Gilley, & Kouider, 2010) and self-efficacy (Pousa & Mathieu, 2015). In support of earlier work, this study proposes that managerial coaching is significantly linked to an employee's self-efficacy.

Self-efficacy is the "individual's belief that he or she is capable of performing a task" (Bandura, 1977). Self-efficacy leads to greater confidence and perseverance while confronting complications. It is derived from the social cognitive theory (Pousa & Mathieu, 2015; Zieba & Golik, 2018). Social cognitive theory explains "how people acquired and regulated their behaviors in order to cope with circumstances and achieve outcomes" (Bandura, 1977). Scholars have mentioned that the beliefs of personal efficacy of individuals are based on the four primary sources: 1) vicarious experience, 2) verbal persuasion, 3) past performance accomplishment, and 4) physiological states (Bandura, 1977; Wood & Bandura, 1989). Self-efficacy or personal efficacy is "a comprehensive summary or judgment of the perceived capability of performing a task" (Gist & Mitchell 1992, p. 184). Managerial coaching focuses on the activities that facilitate a relationship among superiors and subordinates, thereby helping performance improvement (Hagen, 2012), motivating subordinates to face the upcoming challenging tasks, and boosting confidence to take action (Pousa & Mathieu, 2015). Therefore, it is hypothesized that managerial coaching also enhances the sense of perceived self-efficacy in employees. Based on the above arguments, this study hypothesizes that:

H1: Managerial coaching is positively related to self-efficacy.

Since the association between managerial coaching and thriving at work was established empirically initially (Abid et al., 2019), we do not test it as a hypothesis. However, we do study the association between managerial coaching and thriving at work to complete the development of our sequential mediation model.

How does self-efficacy facilitate the sense of prosocial motivation in a work setting? To answer this question, this study further proposes that the feeling of self-efficacy may promote prosocial motivation of employees at work. The self-efficacy construct has links with several work-related outcomes such as performance, stress, job attitudes (Bandura, 1997;

Stajkovic & Luthans, 1998). This study suggests that self-efficacy may fuel prosocial motivation at work because when individuals feel that they are competent and capable of doing their work, then they also try to help their peers with tasks and hence this has an impact on their lives. Self-efficacy explains what the beliefs of individuals are, how they think and act (Bandura, 1977), and activate their motivation (Pousa & Mathieu, 2015; Wood & Bandura, 1989). When employees experience self-efficacy, it can directly activate the positive moods that help them to engage in extra-role behavior and prosocial behavior. Prosocial motivation is a construct that is distinct from self-interested motivation, as it is the desire of an individual to help, defend and encourage the welfare of “others” (Grant & Berry, 2011). Recent revisions explored that it is allied with job performance and core self-evaluations (Judge & Bono, 2001), creativity (Grant & Berry, 2011), and other similar variables (Grant & Sumanth, 2009). Here, the current study proposes that when an individual feels that he or she is capable of performing his task, then he or she is in a better position to help others in their task. On the basis of the above discussion, it is hypothesized that:

H2: Self-efficacy is positively related to prosocial motivation.

Prosocial motivation and thriving at work

Prosocial motivation is defined as “the desire to expend effort in order to benefit other people” (Grant & Sumanth, 2009). Gebaeur et al. (2008) identify two possible underlying motives for prosocial behavior: such as being helpful for personal pleasure or “pleasure-based prosocial motivation” and being helpful in order to conform to generally accepted social standards or “pressure-based prosocial motivation.” The distinction between the two types of prosocial motivation is that one can see it as intrinsic and extrinsic motivation, where pleasure-based motivation is intrinsically derived, whereas pressure-based motivation is extrinsically driven. The literature suggests that prosocial behavior, whether derived from intrinsic or extrinsic motivation, is linked to subjective welfare and, more precisely, to an individual’s feeling of relatedness (Deci & Ryan, 1985; Maslow, 1954, Organ & Ryan, 1995). Prosocial behavior has been linked to persistence, higher productivity, and better performance in employees (Grant, 2008). A prosocial personality has been found to be one of the pre-requisites for extra-role behavior (i.e., OCB) (Borman, Penner, Allen, & Motowidlo, 2001). Rioux & Penner (2001) present a strong case for prosocial motivation being a critical factor in organizational citizenship behavior, which benefits other individuals (as opposed to the organization as a whole).

Scholars have demonstrated the benefits of organizational citizenship behavior. They include, among other things, an increase in trust between coworkers and a work environment that lends itself to the growth and development of individuals (Cameron, 2012; Dudley & Cortina, 2008). Prosocial behavior is also paramount in creating a forgiveness climate in the workplace, which increases employee perception of organizational justice, encourages conflict management through individual engagement, and improves trust between coworkers (Fehr & Gelfand, 2012). Prosocial motivation also helps to mitigate the effects of incivility in the workplace (Liu, Steve Chi, Friedman, & Tsai, 2009), which, as theorized in the previous section, is related to thriving in the workplace. Furthermore, prosocial behavior helps in both individual and organizational growth because it is reciprocated by coworkers and results in a more efficient fulfillment of goals (Zhu & Akhtar, 2014). Crant and Bateman (2000) identified prosocial assertiveness as one of the personality traits of charismatic leaders. In other words, both leaders and followers experience growth as a result of prosocial behavior. Prosocial motivation leads to prosocial behavior through which employees develop stronger interpersonal connections in the workplace, making their work-life more satisfying (Grant & Rothbard, 2013). Grant and Berry (2011) instituted that prosocial motivation enabled employees to be more creative. Drawing on the above, prosocial motivation contributes to thriving in several ways. For instance, pleasure-based or intrinsic prosocial motivation leads to feelings of personal satisfaction i.e. increased vitality, both intrinsic and extrinsic prosocial motivation help in growth and development as the behavior is reciprocated by co-workers leading to the faster accomplishment of goals (individual and organizational), and prosocial behavior contributes towards fostering a work environment that is based on trust and close interpersonal relationships (relatedness).

Furthermore, the consideration provided to prosocial motivation is regarded as an attractive phenomenon (Hu & Liden, 2015). The facilitating behavior of an employee stimulates the same act in the other employees accordingly. Similarly, the employee is expected to become learning-oriented, which is vital in attaining a shield of prosocial motivation as an emphasizing factor, and ultimately promotes thriving at work (Abid et al., 2018; Nawaz, Abid, Arya, Bhatti, & Farooqi, 2018). Therefore, based on the above discussion, it can be theorized that prosocial motivation leads to an individual thriving in the workplace.

H3: Prosocial motivation is positively related to thriving at work.

Sequential mediation of self-efficacy and prosocial motivation

Lastly, the current study proposes that self-efficacy and prosocial motivation sequentially mediate the link between managerial coaching and thriving at work. Thriving is a psychosomatic process and a mutual experience of cognition (learning) and affect (vitality) (Spreitzer et al., 2005). Managerial coaching, self-efficacy, and prosocial motivation are all essential antecedents that foster thriving. Managerial coaching is crucial to motivating employees and contributing to their growth and development (Gilley et al., 2010). With the help of a coaching role, managers assist employees in solving complicated problems, building confidence (Pousa & Mathieu, 2015), and helping achieve task performance, thereby, increasing self-efficacy among those employees as self-efficacy is the perceived capability of performing tasks. Figure 1 presents the theoretical model.

H4: Self-efficacy mediates the relationship between managerial coaching and thriving at work.

H5: Prosocial motivation mediates the relationship between managerial coaching and thriving at work.

H6: Self-efficacy and prosocial motivation mediates the relationship between managerial coaching and thriving at work.

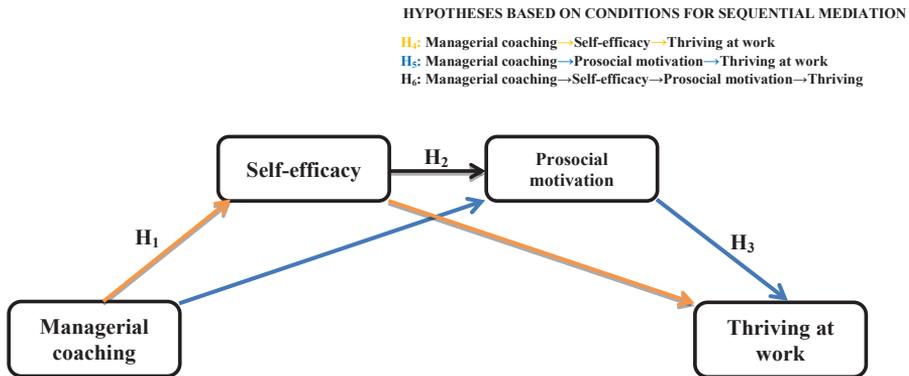


Figure 1. Theoretical model

When employees experience self-efficacy, it can directly activate the positive moods that help them to engross in extra-role behavior and prosocial behavior. Prosocial motivation is the desire of an individual to support, protect, and promote the well-being of “others” (Grant & Berry, 2011). When

an individual feels that he or she is capable of performing his task, then he or she is in a better position to help others with the intent to build long-term relationships. Moreover, pleasure-based or intrinsic prosocial motivation leads to feelings of personal satisfaction i.e. increased vitality. Both intrinsic and extrinsic prosocial motivation help in growth and development as the behavior is reciprocated by co-workers, leading to the faster accomplishment of goals (individual and organizational). Prosocial behavior contributes to fostering a work environment that is based on trust and close interpersonal relationships (relatedness) and can enhance vitality and boost learning at work (Abid et al., 2016b). Therefore, on the basis of the above discussion, it is theorized that prosocial motivation leads to an individual thriving in the workplace.

METHODS

Sample

The present study focuses on the variables that predict an employee's thriving. The concept of thriving is not context-specific and prevails in different industries and various types of occupations. Therefore, a heterogeneous sample has been collected purposively (purposive sampling) to keep the scope more comprehensive. The study sample (221) from which data was collected included employees working in both public and diverse private industries as data controllers, coordinators, teachers, and administrative staff. A structured questionnaire was utilized as a data-gathering technique to minimize the interference of the researcher. 41 (18.6%) female respondents and 180 (81.4%) male respondents took part in the study. The majority were married 134 (60.6 %). The age was classified (years denoted as yrs) as 20yrs – 29yrs, 30yrs – 39yrs, 40yrs – 49yrs, and above 49yrs for which the number of respondents was 89, 76, 47, and 9 respectively with an average age of 33.8 yrs. The working tenure of the majority of participants was less than 5yrs, with an average of 8yrs. The sample consists of employees whose average education was 15 years (Table 1).

Table 1. Sample characteristics

Control Variables		Frequency	Percent
Gender	Female	41	18.6
	Male	180	81.4
Marital status	Single	85	38.5
	Married	134	60.6
	Divorced	2	0.9
Age	20yrs – 29yrs	89	40.3
	30yrs – 39yrs	76	34.4
	40yrs – 49yrs	47	21.3
	above 49yrs	9	4.1
Working tenure	less than 5 yrs	100	45.2
	5yrs – 9yrs	46	20.8
	10yrs – 14yrs	25	11.3
	15yrs – 19yrs	13	5.9
	20yrs – 24yrs	8	3.6
	25yrs – 29yrs	13	5.9
	above 29yrs	5	2.3
Missing	11	5	

Measures

A five-point Likert-type scale (1 = strongly disagree, 5 = strongly agree) was used for all mentioned study variables (managerial coaching, self-efficacy, prosocial motivation, and thriving at work).

Managerial coaching

Coaching is defined as an ongoing, face-to-face process on influencing behavior by which the manager and employee collaborate to assist in achieving increased job knowledge, improved skills in carrying out job responsibilities, a higher level of job satisfaction, a stronger, more positive working relationship, and opportunities for personal and professional growth (Allenbaugh, 1983). Managerial coaching is measured through 5 of the 7 items developed and validated in Ellinger et al.'s (2003) research. A sample item from this scale was "My manager sets expectations with employees and communicates the importance of those expectations to the broaden goals of the company."

Self-efficacy

Self-efficacy is “the individual’s perceptual judgment or belief of how well one can execute courses of action required to deal with prospective situations” (Bandura, 1982). Chen, Gully, and Eden’s (2001) scale, which consists of 8 items, was used to assess the self-efficacy in this study. A sample item from this scale was, “I will be able to achieve most of the goals that I have set for myself.”

Prosocial motivation

It refers to “the desire to expend effort in order to benefit other people” (Grant & Sumanth, 2009). Prosocial motivation was assessed using a 5-items scale developed by Grant and Sumanth (2009). A sample item from this scale was, “It is important to me to have the opportunity to use my abilities to benefit others.”

Thriving at work

Thriving is a psychological state in which employees experience both a sense of vitality and learning at work (Spreitzer et al., 2005). A 10-items scale developed by Porath et al. (2012) was adopted to capture both the dimensions of thriving at work. A sample item from this scale was, “I find myself learning often.”

Control variables

The study controls the demographics that might influence the results: *gender, age, tenure, and marital status*. Age relates to the vitality and learning factors of thriving. It is stated that work might be exhausting for older employees and diminish their vitality (Niessen et al., 2012; Uchino, Berg, Smith, Pearce, & Skinner, 2006). Moreover, age is also negatively associated with the willingness and ability to learn. Gender and tenure at work are also critical (Galup, Klein, & Jiang, 2008). A meta-analysis suggests that women tend to be exhausted and less vital at work compared to men (Purvanova & Muros, 2010). Finally, workers who worked fewer years might have a higher capacity for learning than those who worked for a more extended period in one company.

Analytical strategy

The theoretical model was tested in two stages. At first, the measurement model was examined by forming parcels of items (Hall et al., 1999) as well as without parcels. The current study tested and compared the measurement

model with other alternate models with the traditional Chi-square/degree of freedom, goodness-of-fit index (GFI), comparative fit index (CFI), non-normed fit index (NNFI), incremental fit index (IFI), and standardized root mean square residual (SRMR) (Browne & Cudeck, 1993; Hooper, Coughlan & Mullen, 2008; Hoyle, 1995; Hu & Bentler, 1999; Marsh, Balla, & Hau, 1996). The acceptable values for SRMR should be <0.08 and >0.90 for all other indexes. Moreover, the value higher than 0.80 is considered a permissible fit for CFI and IFI. In the second step, the hypothesized model is tested with the help of Hayes' process (Hayes, 2012).

A total of six parcels of all the items pertaining to three study constructs has been studied. A parcel refers to an "aggregate-level factor comprising of computing two or more items" (Bakker, Tims, & Derks, 2012). The psychometric advantage of the measurement model created through parcels is that the results are more reliable (Little, Cunningham, Shahar, & Widaman, 2002). Parceling helps in eliminating a Type I error in the item correlations because it takes less iteration to converge, minimizing the chance of model miss-specification, thereby, resulting in more stable solutions (Bakker et al., 2012). Therefore, this technique is advisable instead of using many items as indicators of the construct. Parcels of items for "self-efficacy," "thriving at work," and "prosocial motivation" were formed. These three constructs were included in the measurement model as latent factors with two parcels each. Self-efficacy was specified with two parcels comprising of four items each and five items for both of the parcels of thriving at work. Moreover, prosocial motivation was specified with two parcels, including two and three items, respectively.

The current study tested the sequential indirect effect of self-efficacy and prosocial motivation in the relationship between managerial coaching and thriving at work by mean of bootstrapping. The bootstrap is a "statistical resampling technique that estimates the parameters of the model and their standard errors strictly from the sample" (Preacher & Hayes, 2008). This technique calculates precise and correct confidence intervals of indirect effects, as compared to the causal steps strategy of Baron and Kenny (1986). The reason for this is that it does not assume normal sampling distribution (Preacher & Hayes, 2008).

RESULTS

The current study examined the measurement model through parcels tapping the four study variables. The proposed hypothesize four factor measurement model (with parcels) revealed an adequate fit to data ($\chi^2(35)=133.22$,

GFI=0.90, CFI=0.90, NFI=0.88, IFI=0.91, RMR=0.04), which is better than the alternate one factor model ($\chi^2(350)=1339.32$, GFI=0.67, CFI=0.59, NFI=0.52, IFI=0.59, RMR=0.08), two factor model (MC+SE,PM+T: $\chi^2(349)=1295.64$, GFI=0.67, CFI=0.60, NFI=0.53, IFI=0.61, RMR=0.08), and three factor model (MC,SE+PM,T: $\chi^2(347)=1122.53$, GFI=0.71, CFI=0.67, NFI=0.59, IFI=0.68, RMR=0.08). Moreover, our four factor measurement model (without parcels) also revealed an adequate fit to data ($\chi^2(331)=740.37$, CFI=0.83, TLI=0.80, IFI=0.83, RMR=0.06, RMSEA=0.08) as compared to other alternate models.

Robustness check

Given that scholars have identified some limitations of parceling, we also conducted a robustness check without item parcels. Results indicate that the full measurement model has a better model fit indices ($\chi^2(153)=362.40$, GFI=0.85, CFI=0.88, TLI=0.80, IFI=0.85, RMR=0.06), RMSEA=0.08) compared with alternative one factor, two factors, and three-factor models.

Table 2 exhibits correlations and descriptive analysis among variables. Consistent with the hypotheses, the correlations show that managerial coaching is positively linked with self-efficacy ($r=0.46$, $p<0.01$), prosocial motivation ($r=0.40$, $p<0.01$), and thriving at work ($r=0.41$, $p<0.01$). Also, self-efficacy is positively linked to prosocial motivation ($r=0.63$, $p<0.01$), and thriving at work ($r=0.68$, $p<0.01$). Moreover, results also show a positive relationship between prosocial motivation and thriving at work ($r=0.57$, $p<0.01$).

Table 2. Mean, sd and correlation matrix

Variables	Mean	SD	1	2	3	4	5	6
1. Age	33.85	8.65	1					
2. Education	15.12	2.19	-0.16*	1				
3. Tenure	8.58	8.25	0.71**	-0.30**	1			
4. Managerial coaching	3.75	0.67	0.03	0.02	0.03	1		
5. Self-efficacy	3.89	0.50	-0.11	0.04	-0.10	0.46**	1	
6. Prosocial motivation	4.03	0.60	-0.13	0.10	-0.13	0.40**	0.63**	1
7. Thriving at work	3.73	0.67	-0.11	-0.02	-0.04	0.41**	0.68**	0.57**

Notte: ** $p < 0.01$; * $p < 0.05$.

To test the model and hypotheses further, Hayes' process (Hayes, 2012) has been used, which, according to Field (2013), is by far the best way to tackle moderation and mediation. According to the conceptual framework, thriving mediates the relationship between curiosity and constructive voice behavior, and this relationship is moderated in the presence of incivility in

the environment; thus a Hayes process model 6 has been used to test the propositions on a sample of 221 with parameter estimates based on 1,000 bootstrap samples. The bias-corrected and accelerated 90% confidence intervals were then examined.

The results from output Table 3 show that the model is a good fit at $p=0.00<.05$ and that managerial coaching significantly predicts self-efficacy, $\beta=0.35$, 90% CI [0.28, 0.43], $t=7.75$, $p=0.00$. The R^2 value tells that managerial coaching explains 22% of the variance in self-efficacy. As the β is positive, it means the relationship is positive: as managerial coaching increases, so does self-efficacy.

Table 3. Outcome: Self-efficacy

Model summary							
	R	R-sq	MSE	F	df1	df2	p
	0.46	0.22	0.20	60.03	1.00	219.00	0.00
Model							
	Coeff	Se	t	p	LLCI	ULCI	
Constant	2.58	0.17	14.99	0.00	2.30	2.9	
Managerial coaching	0.35	0.05	7.75	0.00	0.28	0.43	

Output Table 4 shows the results of regressing prosocial motivation with self-efficacy and managerial coaching. Self-efficacy significantly predicts prosocial motivation, with a total effect of $\beta=0.68$, 90% CI [0.56, 0.80], $t=9.59$, $p=0.00$; managerial coaching also significantly predicts prosocial motivation, of $\beta=0.12$, 90% CI [0.03, 0.21], $t=2.26$, $p=0.03$. The R^2 value tells that the model explains 41 % of the variance in prosocial motivation. These relationships are in the predicted direction.

Table 4. Outcome: Prosocial motivation

Model summary							
	R	R-sq	MSE	F	df1	df2	p
	0.64	0.41	0.22	74.57	2.00	218.00	0.00
Model							
	Coeff	Se	t	P	LLCI	ULCI	
Constant	0.94	0.26	3.65	0.00	0.51	1.36	
Self-efficacy	0.68	0.07	9.59	0.00	0.56	0.80	
Managerial coaching	0.12	0.05	2.26	0.03	0.03	0.21	

Output Table 5 shows the results of regressing thriving at work with self-efficacy, prosocial motivation, and managerial coaching. Self-efficacy significantly predicts thriving at work, with a total effect of $\beta=0.51$, 90% CI [0.40, 0.62], $t=7.67$, $p=0.00$; prosocial motivation also significantly predicts thriving at work, of $\beta=0.19$, 90% CI [0.10, 0.28], $t=3.56$, $p=0.001$. Moreover, managerial coaching also significantly predicts thriving at work, of $\beta=0.08$, 90% CI [0.01, 0.15], $t=1.78$, $p=0.08$. The R^2 value tells that the model explains 50% of the variance in thriving at work. These relationships are in the predicted direction.

Table 5. Outcome: Thriving at work

Model summary						
R	R-sq	MSE	F	df1	df2	p
0.71	0.50	0.13	72.83	3.00	217.00	0.00
Model						
	Coeff	Se	T	P	LLCI	ULCI
Constant	0.94	0.21	4.55	0.00	0.60	1.28
Self-efficacy	0.51	0.07	7.67	0.00	0.40	0.62
Prosocial motivation	0.19	0.05	3.56	0.00	0.10	0.28
Managerial coaching	0.08	0.04	1.78	0.08	0.01	0.15

The output of Table 6 is the most important part of the output because it displays the results for the indirect effect of managerial coaching on thriving at work (i.e., the effect via relationships of self-efficacy and prosocial motivation). The result shows the indirect effects (coefficients) are significant for all the paths (*hypotheses H4*, $\beta=0.18$, 90% BCa CI[0.12 - 0.25]; *hypotheses H5*, $\beta=0.02$, 90% BCa CI[0.01 - 0.05]; *hypothesis H6*, $\beta=0.05$, 90% BCa CI[0.02 - 0.09]), as well as bootstrapped standard error and confidence interval. The Boot CI [LLCI, ULCI] does not contain zero, which indicates the presence of indirect effects. Hence hypotheses H4, H5, and H6 are supported. On the other side, self-efficacy and prosocial motivation mediates the relationship between managerial coaching and thriving at work. Employees are most probably thriving when they are prosocially motivated, feel self-efficacy, and receive managerial coaching at work.

Table 6. Indirect effect of managerial coaching on thriving at work

Direct effect of X on Y	Effect	Se	T	p	LLCI	ULCI
	0.08	0.04	1.78	0.08	0.01	0.15
Indirect effect(s) of managerial coaching on thriving						
			Effect	Boot SE	BootLLCI	BootULCI
Total			0.25	0.05	0.17	0.34
H4: Coaching →Efficacy→Thriving			0.18	0.04	0.12	0.25
H6: Coaching→Efficacy→Motivation→Thriving			0.05	0.02	0.02	0.09
H5: Coaching→Motivation→Thriving			0.02	0.01	0.01	0.05

DISCUSSION

The current study investigated the serial-mediated relationship between managerial coaching and thriving at work via self-efficacy and prosocial motivation. The findings are based on a diverse sample and reinforced the serial-mediated effect of managerial coaching on thriving via self-efficacy and prosocial motivation.

Our research attempt also encompasses the emerging literature on thriving at work in several means. Mainly, outcomes validate that managerial coaching increases the self-efficacy of employees. The theme behind the coaching is to enhance the employee’s self-efficacy related to the specific work activity so that they can perform tasks effectively and efficiently. The outcomes are aligned with the findings of Pousa and Mathieu (2015). The efficacy among employees directly activates positive moods. These moods help them to engage in extra-role behavior and prosocial behavior, creating and enabling a work context in which employees experience a sense of vitality and learning. This study is a contribution to dig out the awareness related to the affiliation between prosocial motivation and thriving and deliver a comprehensive supplementary analysis of the procedure behind the optimistic effects of managerial coaching. Attention to thriving as an outcome of managerial coaching is imperative, seeing that thriving is key in extenuating the adverse effects (Abid et al., 2015; Abid et al., 2016b), enhancing the individual and organizational performance (Porath et al., 2012) and facilitating employees to improve the navigation of their careers in tempestuous modern times (De Janasz, Sullivan, & Whiting, 2003). This study demonstrates that managerial coaching, self-efficacy, and prosocial motivation are to be considered expressive for evolving intellect of thriving in the workplace. The said consequences are aligned with foregoing research outcomes (Paterson et al., 2014) indicating that vigilant associations

with an administrator are critical for nurturing individual learning and the added expansion of studies signifying the rank of self-efficacy and prosocial motivation in growing a positive energy at work (efficacy and motivation to energy). Thus, this study encompasses this mark of conjecturing about the procedure by which employees can achieve self-confidence, be prosocially motivated, and thereby experience thriving in the workplace.

Secondly, in non-western countries, managerial coaching stimulates better thriving for employees. This judgment has imperative theoretical insinuation for thriving research, as it reacts to modern appeals for further research on the antecedents of thriving (Paterson, 2014) and spreads research on thriving by examining how individuals thrive in a South Asian country.

CONCLUSION

The present study has quite a few boundaries. Data collection was at one point in time through self-reported questionnaires from the same source. Therefore the results can be inflated by common method variance (Podsakoff, Mackenzie, & Podsakoff, 2012). The biases may have confounded the results and may restrain the assurance of conclusions about the causality. Even though efforts (methodological measures) are made to minimize same-source bias in the current study, the non-availability of autoregressive research design (which directs the data collection of all study variables at all points in time) appeals for thoughtfulness concerning the causal ordering of the study's variables. Future researchers can strengthen the methodology as well. For example, by collecting data on the variables at all points in time in order to examine whether managerial coaching engenders self-efficacy, self-efficacy prosocially motivates employees, and thereby prosocial motivation promotes thriving at work. Therefore, there is a need to embrace a longitudinal approach or experimental methods to authenticate the causal relationships. Future researchers should also employ multilevel data to minimize common method bias.

Moreover, for collecting the information regarding the existence of managerial coaching, self-efficacy, prosocial motivation, and thriving from other sources, a mono-method bias can be avoided if different measurement strategies are employed. Additionally, data have been analyzed by utilizing a Hayes PROCESS (2012). Ironically, it is considered an authentic and reliable method for analyzing sequential mediation. Also, future studies can be better directed to conduct a unique technique, Structural Equation Modelling (SEM), for analysis purposes. The present research attempt has only explored two sequential mediators for the managerial coaching and thriving association. It is rational to presume that other mediators may be present to clarify

the mechanisms underlying this association, as demonstrated in results that self-efficacy and prosocial motivation plays a role of partial, instead of full, mediators. Future studies need to incorporate other mediators in the connection between managerial coaching and thriving and probe the strengths of these mediating variables. Such mediators may include; perceived organizational support, trust, grit, compassion at work, and other individual-level variables.

The above-mentioned limitations are countered with the help of the study's strengths. First, the current research offers a relatively additional understanding of how to boost thriving at work. This study must be considered one of the first to probe the sequential mediation mechanism for the effect of managerial coaching on thriving. With the help of proposing self-efficacy and prosocial motivation to investigate the underlying process, this research study identified a new antecedent of thriving at work that has not been examined previously. Second, moving beyond existing studies, this research is the earliest to explore the connotation between managerial coaching and thriving at work among working adults, rather than focusing on students. In the current study, a representative sample from an extensive array of occupations in various private and public organizations has been utilized, which assured the generalizability of the finding, particularly among South Asian workers.

References

- Abid, G. (2014). Promoting thriving at work through job characteristics for performance and absenteeism. Unpublished Master of Philosophy dissertation. Lahore, Pakistan: National College of Business Administration & Economics.
- Abid, G. (2016). How does thriving matter at workplace. *International Journal of Economics and Empirical Research*, 4(10), 521-527.
- Abid, G., & Ahmad, A. (2016). Multifacetedness of thriving: Its cognitive, affective, and behavioral dimensions. *International Journal of Information, Business and Management*, 8(3), 121-130. <https://ssrn.com/abstract=2774601>
- Abid, G., Contreras, F., Ahmed, S., & Qazi, T. (2019). Contextual factors and organizational commitment: Examining the mediating role of thriving at work. *Sustainability*, 11(17), 4686. <http://doi.org/10.3390/su11174686>
- Abid, G., Khan, B., & Hong, M. C. W. (2016a, January). Thriving at work: How fairness perception matters for employee's thriving and job satisfaction. *Academy of Management Proceedings*, 2016(1), 11948. <https://doi.org/10.5465/ambpp.2016.11948abstract>
- Abid, G., Sajjad, I., Elahi, N. S., Farooqi, S., & Nisar, A. (2018). The influence of prosocial motivation and civility on work engagement: The mediating

- role of thriving at work. *Cogent-Business & Management*, 5(1), 1-19. <http://doi.org/10.1080/23311975.2018.1493712>
- Abid, G., Zahra, I., & Ahmed, A. (2015). Mediated mechanism of thriving at work between perceived organization support, innovative work behavior and turnover intention. *Pakistan Journal of Commerce and Social Sciences*, 9, 982-998. <https://ssrn.com/abstract=2728112>
- Abid, G., Zahra, I., & Ahmed, A. (2016b). Promoting thriving at work and waning turnover intention: A relational perspective. *Future Business Journal*, 2(2), 127-137. <https://doi.org/10.1016/j.fbj.2016.08.001>
- Alfredsson, L., Spetz, C. L., & Theorell, T. (1985). Type of occupation and near-future hospitalization for myocardial infarction and some other diagnoses. *International Journal of Epidemiology*, 14(3), 378-388. <http://doi.org/10.1093/ije/14.3.378>
- Allenbaugh, G. E. (1983). Coaching... a management tool for a more effective work performance. *Management Review*, 72(5), 21-26.
- Bakker, A. B., Tims, M., & Derks, D. (2012). Proactive personality and job performance: The role of job crafting and work engagement. *Human Relations*, 65(10), 1359-1378. <https://doi.org/10.1177/0018726712453471>
- Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215. <http://dx.doi.org/10.1037/0033-295X.84.2.191>
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37(2), 122-147. <http://dx.doi.org/10.1037/0003-066X.37.2.122>
- Bar, S. G. (2014). How personal systems coaching increases self-efficacy and well-being for Israeli single mothers. *International Journal of Evidence Based Coaching and Mentoring*, 12(2), 59-74.
- Baron, L., & Morin, L. (2010). The impact of executive coaching on self-efficacy related to management soft-skills. *Leadership & Organization Development Journal*, 31(1), 18-38. <http://dx.doi.org/10.1108/01437731011010362>
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182. <http://doi.org/10.1037//0022-3514.51.6.1173>
- Beattie, R. S., Kim, S., Hagen, M. S., Egan, T. M., Ellinger, A. D., & Hamlin, R. G. (2014). Managerial coaching: A review of the empirical literature and development of a model to guide future practice. *Advances in Developing Human Resources*, 16(2), 184-201. <http://dx.doi.org/10.1177/1523422313520476>
- Beehr, T. A., & Newman, J. E. (1978). Job stress, employee health, and organizational effectiveness: A facet analysis, model, and literature review. *Personnel Psychology*, 31(4), 665-699. <http://dx.doi.org/10.1111/j.1744-6570.1978.tb02118.x>

- Borman, W. C., Penner, L. A., Allen, T. D., & Motowidlo, S. J. (2001). Personality predictors of citizenship performance. *International Journal of Selection and Assessment*, 9(1-2), 52-69. <https://doi.org/10.1111/1468-2389.00163>
- Brown, D. J., Arnold, R., Fletcher, D., & Standage, M. (2017). Human thriving: A conceptual debate and literature review. *European Psychologist*. <http://dx.doi.org/10.1027/1016-9040/a000294>
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. *Sage Focus Editions*, 154, 136-136. <https://doi.org/10.1177/0049124192021002005>
- Bryl, Ł. (2018). Human capital orientation and financial performance: A comparative analysis of US corporations. *Journal of Entrepreneurship, Management and Innovation*, 14(3), 61-86. <http://doi.org/10.7341/20181433>
- Cameron, K. (2012). *Positive Leadership: Strategies for Extraordinary Performance*. San Francisco: Berrett-Koehler Publishers.
- Carmeli, A., & Spreitzer, G. M. (2009). Trust, connectivity, and thriving: Implications for innovative behaviors at work. *The Journal of Creative Behavior*, 43(3), 169-191. <https://doi.org/10.1002/j.2162-6057.2009.tb01313.x>
- Chen, G., Gully, S. M., & Eden, D. (2001). Validation of a new general self-efficacy scale. *Organizational Research Methods*, 4(1), 62-83. <https://doi.org/10.1177/109442810141004>
- Crant, J. M., & Bateman, T. S. (2000). Charismatic leadership viewed from above: The impact of proactive personality. *Journal of Organizational Behavior*, 63-75. [https://doi.org/10.1002/\(SICI\)1099-1379\(200002\)21:1<63::AID-JOB8>3.0.CO;2-J](https://doi.org/10.1002/(SICI)1099-1379(200002)21:1<63::AID-JOB8>3.0.CO;2-J)
- Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality*, 19(2), 109-134. [http://dx.doi.org/10.1016/0092-6566\(85\)90023-6](http://dx.doi.org/10.1016/0092-6566(85)90023-6)
- Dudley, N. M., & Cortina, J. M. (2008). Knowledge and skills that facilitate the personal support dimension of citizenship. *Journal of Applied Psychology*, 93(6), 1249-1270. <http://dx.doi.org/10.1037/a0012572>
- Ehrenfeld, J. (2008). *Sustainability by Design: A Subversive Strategy for Transforming our Consumer Culture*. New Haven, Connecticut: Yale University Press.
- El Bedawy, R. (2015). A review for embedding human dimension of sustainability to maintain energetic organizations in Egypt. *Journal of Management and Sustainability*, 5(1), 158-167. <http://doi.org/10.5539/jms.v5n1p158>
- Elahi, N. S., Abid, G., Arya, B., & Farooqi, S. (2019). Workplace behavioral antecedents of job performance: Mediating role of thriving. *The Service Industries Journal*, 1-22. <https://doi.org/10.1080/02642069.2019.1638369>
- Elkington, J. (1997). *Cannibals with Forks. The Triple Bottom Line of 21st Century*. New York: John Wiley & Son.

- Ellinger, A.D., Ellinger, A.E., & Keller, S.B. (2003). Supervisory coaching behavior, employee satisfaction, and warehouse employee performance: A dyadic perspective in the distribution industry. *Human Resource Development Quarterly*, 14(4), 435-458. <https://doi.org/10.1002/hrdq.1078>
- Elmadağ, A. B., Ellinger, A. E., & Franke, G. R. (2008). Antecedents and consequences of frontline service employee commitment to service quality. *Journal of Marketing Theory and Practice*, 16(2), 95-110. <https://doi.org/10.2753/MTP1069-6679160201>
- Evered, R. D., & Selman, J. C. (1989). Coaching and the art of management. *Organizational Dynamics*, 18(2), 16-32. [https://doi.org/10.1016/0090-2616\(89\)90040-5](https://doi.org/10.1016/0090-2616(89)90040-5)
- Fehr, R., & Gelfand, M. J. (2012). The forgiving organization: A multilevel model of forgiveness at work. *Academy of Management Review*, 37(4), 664-688. <https://www.jstor.org/stable/23416291>
- Field, A.P. (2013). *Discovering Statistics Using IBM SPSS Statistics: And sex and Drugs and Rock 'N' Roll* (fourth edition). London: Sage Publications.
- Flinchbaugh, C., Luth, M. T., & Li, P. (2015). A challenge or a hindrance? Understanding the effects of stressors and thriving on life satisfaction. *International Journal of Stress Management*, 22(4), 323. <http://doi.org/10.1037/a0039136>
- Frazier, M. L., & Tupper, C. (2016). Supervisor prosocial motivation, employee thriving, and helping behavior: A trickle-down model of psychological safety. *Group & Organization Management*. <https://doi.org/10.1177/1059601116653911>
- Fritz, C., Lam, C. F., & Spreitzer, G. M. (2011). It's the little things that matter: An examination of knowledge workers' energy management. *The Academy of Management Perspectives*, 25(3), 28-39. <http://doi.org/10.5465/AMP.2011.63886528>
- Galup, S. D., Klein, G., & Jiang, J. J. (2008). The impacts of job characteristics on IS employee satisfaction: A comparison between permanent and temporary employees. *Journal of Computer Information Systems*, 48(4), 58-68. <http://doi.org/10.1080/08874417.2008.11646035>
- Gebauer, J. E., Riketta, M., Broemer, P., & Maio, G. R. (2008). Pleasure and pressure based prosocial motivation: Divergent relations to subjective well-being. *Journal of Research in Personality*, 42(2), 399-420. <https://doi.org/10.1016/j.jrp.2007.07.002>
- Gerbasi, A., Porath, C. L., Parker, A., Spreitzer, G., & Cross, R. (2015). Destructive de-energizing relationships: How thriving buffers their effect on performance. *Journal of Applied Psychology*, 100(5), 1423. <http://doi.org/10.1037/apl0000015>
- Gilley, A., Gilley, J. W., & Kouider, E. (2010). Characteristics of managerial coaching. *Performance Improvement Quarterly*, 23(1), 53-70. <https://doi.org/10.1002/piq.20075>

- Gist, M. E., & Mitchell, T. R. (1992). Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review*, 17(2), 183-211. <http://dx.doi.org/10.2307/258770>
- Grant, A. M. (2014). The efficacy of executive coaching in times of organisational change. *Journal of Change Management*, 14(2), 258-280. <http://dx.doi.org/10.1080/14697017.2013.805159>
- Grant, A. M., & Berry, J. W. (2011). The necessity of others is the mother of invention: Intrinsic and prosocial motivations, perspective taking, and creativity. *Academy of Management Journal*, 54(1), 73-96. <https://doi.org/10.5465/amj.2011.59215085>
- Grant, A. M., & Rothbard, N. P. (2013). When in doubt, seize the day? Security values, prosocial values, and proactivity under ambiguity. *Journal of Applied Psychology*, 98(5), 810-819. <http://doi.org/10.1037/a0032873>
- Grant, A. M., & Sumanth, J. J. (2009). Mission possible? The performance of prosocially motivated employees depends on manager trustworthiness. *Journal of Applied Psychology*, 94(4), 927-944. <http://doi.org/10.1037/a0014391>
- Hagen, M. S. (2012). Managerial coaching: A review of the literature. *Performance Improvement Quarterly*, 24(4), 17-39. <https://doi.org/10.1002/piq.20123>
- Hall, R. J., Snell, A. F., & Foust, M. S. (1999). Item parceling strategies in SEM: Investigating the subtle effects of unmodeled secondary constructs. *Organizational Research Methods*, 2(3), 233-256. <https://doi.org/10.1177/109442819923002>
- Hamlin, R. G., Ellinger, A. D., & Beattie, R. S. (2006). Coaching at the heart of managerial effectiveness: A cross-cultural study of managerial behaviours. *Human Resource Development International*, 9(3), 305-331. <http://dx.doi.org/10.1080/13678860600893524>
- Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling. Retrieved from <http://www.afhayes.com/public/process2012.pdf>
- Hoffman, A.J.; Haigh, N. (2011). Positive deviance for a sustainable world: Linking sustainability and positive organizational scholarship. In K. Cameron & G. Spreitzer (Eds.), *The Oxford Handbook of Positive Organizational Scholarship* (pp. 953-964). New York, NY: Oxford University Press.
- Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modelling: Guidelines for determining model fit. *Journal of Business Research Methods*, 6(1), 53-60. <http://www.ejbrm.com/vol6/v6-i1/v6-i1-papers.htm>
- Hoyle, R. H. (1995). *Structural Equation Modeling: Concepts, Issues, and Applications*. London: Sage.
- Hu, J., & Liden, R. (2015). Making the difference in the teamwork: Linking team prosocial motivation to team processes and effectiveness. *Academy*

- of Management Journal*, 58(4), 1102–1127. <http://doi.org/10.5465/amj.2012.1142>
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: a Multidisciplinary Journal*, 6(1), 1-55. <https://doi.org/10.1080/10705519909540118>
- Jiang, Z. (2017). Proactive personality and career adaptability: The role of thriving at work. *Journal of Vocational Behavior*, 98, 85-97. <https://doi.org/10.1016/j.jvb.2016.10.003>
- Judge, T. A., & Bono, J. E. (2001). Relationship of core self-evaluations traits—self-esteem, generalized self-efficacy, locus of control, and emotional stability—with job satisfaction and job performance: A meta-analysis. *Journal of Applied Psychology*, 86, 80. <http://doi.org/10.1037/0021-9010.86.1.80>
- Kim, S., Egan, T. M., & Moon, M. J. (2014). Managerial coaching efficacy, work-related attitudes, and performance in public organizations: A comparative international study. *Review of Public Personnel Administration*, 34(3), 237-262. <https://doi.org/10.1177/0734371X13491120>
- Kira, M., & van Eijnatten, F. M. (2008). *Human and Social Sustainability in Work Organizations. Proposal International Research Program SUSTAIN*. Espoo/ Eindhoven: Helsinki University of Technology, Department of Industrial Engineering/ Eindhoven University of Technology, Department of Technology Management.
- Kleine, A. K., Rudolph, C. W., & Zacher, H. (2019). Thriving at work: A meta analysis. *Journal of Organizational Behavior*, 40(9-10), 973-999. <http://doi.org/10.1002/job.2375>.
- Lee, S. H., & Ha-Brookshire, J. (2017). Ethical climate and job attitude in fashion retail employees' turnover intention, and perceived organizational sustainability performance: A cross-sectional study. *Sustainability*, 9(3), 465-475. <https://doi.org/10.3390/su9030465>
- Levene, R. A. (2015). Positive psychology at work: Psychological capital and thriving as pathways to employee engagement. Retrieved from http://repository.upenn.edu/mapp_capstone/88
- Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling*, 9(2), 151-173. https://doi.org/10.1207/S15328007SEM0902_1
- Liu, W., Steve Chi, S. C., Friedman, R., & Tsai, M. H. (2009). Explaining incivility in the workplace: The effects of personality and culture. *Negotiation and Conflict Management Research*, 2(2), 164-184. https://ink.library.smu.edu.sg/sooss_research/2048
- Liu, X., & Batt, R. (2010). How supervisors influence performance: A multilevel study of coaching and group management in technology-mediated services. *Personnel Psychology*, 63(2), 265-298. <http://doi.org/10.1111/j.1744-6570.2010.01170.x>

- Marsh, H. W., Balla, J. R., & Hau, K. T. (1996). An evaluation of incremental fit indices: A clarification of mathematical and empirical properties. In G. A. Marcoulides, & R. E. Schumacker (Eds.), *Advanced Structural Equation Modeling Techniques* (pp. 315-353). Mahwah, NJ: Lawrence Erlbaum.
- Maslow, A. H. (1954). The instinctive nature of basic needs. *Journal of Personality*, 22(3), 326-347. <http://doi.org/10.1111/j.1467-6494.1954.tb01136.x>
- Moen, F., & Allgood, E. (2009). Coaching and the effect on self-efficacy. *Organization Development Journal*, 27(4), 69-82.
- Mushtaq, M., Abid, G., Sarwar, K., Ahmed, S. (2017). Forging ahead: How to thrive at the modern workplace. *Iranian Journal of Management Studies*, 10(4), 783-818. <http://doi.org/10.22059/IJMS.2017.235409.672704>
- Nawaz, M., Abid, G., Arya, B., Bhatti, G. A., & Farooqi, S. (2018). Understanding employee thriving: The role of workplace context, personality and individual resources. *Total Quality Management & Business Excellence*. <http://doi.org/10.1080/14783363.2018.1482209>
- Niessen, C., Sonnentag, S., & Sach, F. (2012). Thriving at work—A diary study. *Journal of Organizational Behavior*, 33(4), 468-487. <https://doi.org/10.1002/job.763>
- O'Leary, V. E., & Ickovics, J. R. (1995). Resilience and thriving in response to challenge: An opportunity for a paradigm shift in women's health. *Women's Health*, 1(2), 121-142.
- Organ, D. W., & Ryan, K. (1995). A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behavior. *Personnel Psychology*, 48(4), 775-802. <http://dx.doi.org/10.1111/j.1744-6570.1995.tb01781.x>
- Parker, P., Kram, K. E., & Hill, D. T. T. (2014). Peer coaching: An untapped resource for development. *Organizational Dynamics*, 43(2), 122-129. <http://doi.org/10.1016/j.orgdyn.2014.03.006>
- Paterson, T. A., Luthans, F., & Jeung, W. (2014). Thriving at work: Impact of psychological capital and supervisor support. *Journal of Organizational Behavior*, 35(3), 434-446. <https://doi.org/10.1002/job.1907>
- Pereverzieva, A. (2019). A methodical approach to the assessment of human resources interactions. *Journal of Entrepreneurship, Management and Innovation*, 15(1), 171-204. <https://doi.org/10.7341/20191517>
- Pfeffer, J. (2010). Building sustainable organizations: The human factor. *The Academy of Management Perspectives*, 24(1), 34-45. <https://doi.org/10.5465/amp.24.1.34>
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 63, 539-569. <https://doi.org/10.1146/annurev-psych-120710-100452>
- Porath, C., Spreitzer, G., Gibson, C., & Garnett, F. G. (2012). Thriving at work: Toward its measurement, construct validation, and theoretical

- refinement. *Journal of Organizational Behavior*, 33(2), 250-275. <https://doi.org/10.1002/job.756>
- Pousa, C., & Mathieu, A. (2015). Is managerial coaching a source of competitive advantage? Promoting employee self-regulation through coaching. *Coaching: An International Journal of Theory, Research and Practice*, 8(1), 20-35. <https://doi.org/10.1080/17521882.2015.1009134>
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879-891. <https://doi.org/10.3758/BRM.40.3.879>
- Purvanova, R. K., & Muros, J. P. (2010). Gender differences in burnout: A meta-analysis. *Journal of Vocational Behavior*, 77(2), 168-185. <http://doi.org/10.1016/j.jvb.2010.04.006>
- Qaiser, S., Abid, G., Arya, B., & Farooqi, S. (2018). Nourishing the bliss: Antecedents and mechanism of happiness at work. *Total Quality Management & Business Excellence*. <http://doi.org/10.1080/14783363.2018.1493919>
- Ren, H., Yunlu, D. G., Shaffer, M., & Fodchuk, K. M. (2015). Expatriate success and thriving: The influence of job deprivation and emotional stability. *Journal of World Business*, 50(1), 69-78. <https://doi.org/10.1016/j.jwb.2014.01.007>
- Rioux, S. M., & Penner, L. A. (2001). The causes of organizational citizenship behavior: A motivational analysis. *Journal of Applied Psychology*, 86(6), 1306-1314. <http://doi.org/10.1037/0021-9010.86.6.1306>
- Shan, S. (2016). Thriving at workplace: Contributing to self-development, career development, and better performance in information organizations. *Pakistan Journal of Information Management & Libraries*, 17, 109-119.
- Shirom, A. (2004). Feeling vigorous at work? The construct of vigor and the study of positive affect in organizations. In P. L. Perrewé & D. C. Ganster (Eds.), *Research in Occupational Stress and Well-Being: Vol. 3. Emotional and Physiological Processes and Positive Intervention Strategies* (pp. 135–164). Elsevier Science/JAI Press.
- Spreitzer, G. (2008). Toward the integration of two perspectives: A review of social-structural and psychological empowerment at work. Retrieved from https://www.researchgate.net/profile/Gretchen_Spreitzer/publication/228915522_Toward_the_integration_of_two_perspectives_A_review_of_social-structural_and_psychological_empowerment_at_work/links/54b8f8b70cf269d8cbf72818/Toward-the-integration-of-two-perspectives-A-review-of-social-structural-and-psychological-empowerment-at-work.pdf
- Spreitzer, G. M., Lam, C. F., & Fritz, C. (2010). Engagement and human thriving: Complementary perspectives on energy and connections to work. In A. B. Bakker & M. P. Leiter (Eds.), *Work Engagement: A Handbook of Essential*

- Theory and Research* (pp. 132-146). Rotterdam: Erasmus University Rotterdam.
- Spreitzer, G., Porath, C. L., & Gibson, C. B. (2012). Toward human sustainability: How to enable more thriving at work. *Organizational Dynamics*, 41(2), 155-162. <http://dx.doi.org/10.1016/j.orgdyn.2012.01.009>
- Spreitzer, G., Sutcliffe, K., Dutton, J., Sonenshein, S., & Grant, A. M. (2005). A socially embedded model of thriving at work. *Organization Science*, 16(5), 537-549. <https://doi.org/10.1287/orsc.1050.0153>
- Stajkovic, A. D., & Luthans, F. (1998). Self-efficacy and work-related performance: A meta-analysis. *Psychological Bulletin*, 124(2), 240-261. <http://dx.doi.org/10.1037/0033-2909.124.2.240>
- Uchino, B. N., Berg, C. A., Smith, T. W., Pearce, G., & Skinner, M. (2006). Age-related differences in ambulatory blood pressure during daily stress: Evidence for greater blood pressure reactivity with age. *Psychology and Aging*, 21(2), 231-239. <http://doi.org/10.1037/0882-7974.21.2.231>
- Wallace, J. C., Butts, M. M., Johnson, P. D., Stevens, F. G., & Smith, M. B. (2016). A multilevel model of employee innovation: Understanding the effects of regulatory focus, thriving, and employee involvement climate. *Journal of Management*, 42(4), 982-1004. <https://doi.org/10.1177/0149206313506462>
- Walumbwa, F. O., Muchiri, M. K., Misati, E., Wu, C., & Meiliani, M. (2017). Inspired to perform: A multilevel investigation of antecedents and consequences of thriving at work. *Journal of Organizational Behavior*. <https://doi.org/10.1002/job.2216>
- Wood, R., & Bandura, A. (1989). Impact of conceptions of ability on self-regulatory mechanisms and complex decision making. *Journal of Personality and Social Psychology*, 56(3), 407-415. <http://dx.doi.org/10.1037/0022-3514.56.3.407>
- Zhang, J., Jensen, B. E., & Mann, B. L. (1997). Modification and revision of the leadership scale for sport. *Journal of Sport Behavior*, 20(1), 105-122.
- Zhu, Y., & Akhtar, S. (2014). How transformational leadership influences follower helping behavior: The role of trust and prosocial motivation. *Journal of Organizational Behavior*, 35(3), 373-392. <https://doi.org/10.1002/job.1884>
- Zieba, K. & Golik, J. (2018). Testing students' entrepreneurial self-efficacy as an early predictor of entrepreneurial activities. Evidence from the SEAS project. *Journal of Entrepreneurship, Management and Innovation*, 14(1), 91-10. <http://doi.org/10.7341/20181415>

Other sources

- Forbes (2013). The causes and costs of absenteeism in the workplace. Retrieved from <https://www.forbes.com/sites/investopedia/2013/07/10/the-causes-and-costs-of-absenteeism-in-the-workplace/#4ffa949b3eb6>

Gallup (2013). In U.S., poor health tied to big losses for all job types. Retrieved from <http://www.gallup.com/poll/162344/poor-health-tied-big-losses-job-types.aspx>

Merriam-Webster Dictionary (2019). Retrieved from <https://www.merriam-webster.com/dictionary/thrive>

Abstrakt

Stan psychiczny, w którym jednostka doświadcza formy witalności i poczucia uczenia się w pracy, jest znany jako dobrze prosperujący w pracy. Od nowego tysiąclecia badania empiryczne pokazują, że dobrze prosperujący (zrównoważony rozwój pracowników) ma kluczowe znaczenie dla stabilności organizacyjnej. Jednak ten ludzki wymiar zrównoważonego rozwoju jest zanizony i niewiele wiadomo na temat tego, w jaki sposób indywidualne cechy i kierownicy promują dobrze prosperujących pracowników w pracy. Aby wypełnić tę lukę, to pionierskie badanie bada kontekst pracy i różnice indywidualne w promowaniu dobrze prosperującego miejsca pracy. Interwencyjny mechanizm własnej skuteczności i motywacji prospołecznej między coachingiem menedżerskim a dobrze prosperującym w pracy został zbadany przy użyciu sekwencyjnego podejścia mediacyjnego. Dane zostały przeanalizowane przy użyciu modelu 6 w procesie Hayesa (opartego na ponownym próbkowaniu 1000 ładowań początkowych) z rzeczywistą próbą 221 respondentów. Nasze wyniki wspierają nasz hipotetyczny model. Badanie wykazuje bezpośredni związek między coachingiem menedżerskim a poczuciem własnej skuteczności. Stwierdza się, że poczucie własnej skuteczności jest bezpośrednio związane z motywacją prospołeczną, a tym samym poprawia rozwój pracownika w pracy. Stwierdzono również, że skuteczność i motywacja prospołeczna odgrywają istotną rolę w wyjaśnianiu związku między coachingiem menedżerskim a dobrze prosperującym miejscem pracy.

Słowa kluczowe: *coaching menedżerski, skuteczność własna, motywacja prospołeczna, dobrze prosperujący w pracy, sekwencyjna mediacja*

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Ghulam Abid is an assistant professor of Management in School of Business Administration at National College of Business Administration & Economics (NCBA&E), Lahore, Pakistan. He received his Ph.D. degree from the NCBA&E. His research focuses on employee thriving and positive organizational scholarship. His most recent research is on examining how organizations can create a more positive environment where individuals can thrive; and how organizations benefit in terms of positive behavioral outcomes. He is among one of the too few authors in the world who are working on these emerging issues of the 21st century. He has made a remarkable contribution to novel literature through Impact Factor, ISI and Scopus indexed journals in addition to national/international conferences. In the domain of data analysis, he has proven himself an expert in the field by conducting numerous workshops,

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Conflicts of interest

The authors declare no conflict of interest.

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Map of the existing research on business innovation, funding, and policy framework

Edmund Mallinguh¹ , Zeman Zoltan²

Abstract

In the last decade, empirical studies focusing on business-related innovation, funding of innovation activities, and policy (implications) have continued to increase. However, not enough effort has been undertaken yet to investigate existing literature on the subject matter. To fill the gap, the present study seeks to synthesize and map out existing empirical studies on business innovation, financing, and policy framework published between 1990 and February 2019. Bibliographic analysis of relevant articles retrieved from the Web of Science Core Collection was performed using Vosviewer. The bibliometric results show the prominent publication outlets, authoritative scholars and items, dominant higher learning institutions, and countries. Still, selected articles were content analyzed, providing a summary of the publications, the methodology adopted, country and period covered. The papers were classified into different themes based on the study focus, thus pinpointing areas that have received more or less scholarly attention. The identified gaps from both bibliographic and content analysis offer future research opportunities in different aspects touching on business innovation, how its financed and related policy issues.

Keywords: *business innovation, funding, policy framework, bibliometrics, citation analysis, Scientometrics*

INTRODUCTION

Gault (2018), from a general point of view, defines innovation as the implementation of an original or significantly distinct process or product.

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A product could be a good or service, whereas a process may entail production or delivery, organizational, and marketing processes. Kahn (2018) expounds further by stating that innovation is a combination of three different conditions; innovation as an outcome, as a process, and innovation as a mindset. Kahn explains that as an outcome, it may include but not limited to; product, process, marketing, business model, supply chain, and organizational innovation. These outcomes of innovation have been researched. For example, product innovation (Hannigan, Seidel, & Yakis-Douglas, 2018; Wang, Wang, Chang, & Kang, 2019); process innovation (Aliasghar, Rose, & Chetty, 2019; Diéguez-Soto, Garrido-Moreno, & Manzaneeque, 2018; Möldner, Garza-Reyes, & Kumar, 2018); marketing innovation (Aksoy, 2017; Fiore, Silvestri, Contò, & Pellegrini, 2017; Gupta, Malhotra, Czinkota, & Foroudi, 2016); business model innovation (Ciulli & Kolk, 2019; Hamelink & Opdenakker, 2019); supply chain innovation (Chen, Dimitrov, & Pun, 2018; Sabri, Micheli, & Nuur, 2018); and organizational innovation (Anzola-Román, Bayona-Sáez, & García-Marco, 2018; Azar & Ciabuschi, 2017). Competitiveness and sustainable development in the current highly competitive business environment is achievable through innovation (Pelikánová, 2020). Also, small and medium enterprises must take stock of factors that influence their competitiveness in international markets (Stawasz, 2019)

The framework governing innovation remains critical for any economy, whether emerging or mature, as it can either stifle or stir outcomes, and should never static. Borrás and Laatsit (2019) examined the system-oriented innovation policy focusing on the European Union 28 member states and finds that despite the many positives, there are obstacles with the system that need attention. Policies on innovation are crossing cutting, for instance, Arundel, Bloch, and Ferguson (2019) focused on the public sector; Hermans, Geerling-Eiff, Potters, and Klerkx (2018) on public-private partnerships; private sector (Lopez-Berzosa & Gawer, 2014); emerging economies (Fernández-Sastre & Montalvo-Quizhpi, 2019); business survival (Ortiz-Villajos & Sotoca, 2018). The significance of funding innovation is crucial due to associated benefits and risks. Funding remains a hurdle for most firms keen on engaging intensively in innovative activities. That notwithstanding, the link between innovation and its funding has been scrutinized for varying reasons. Yanbo Wang, Li, and Furman (2017) probed the relationship between the performance of a firm and its innovation activities funded by the government; main funders of food and health innovations in the European Union (Strähle et al., 2016); crowdfunding (Wonglimpiyarat, 2018); hedge funding (Brav, Jiang, Ma, & Tian, 2018) among other studies.

Equally, a considerable number of review studies on the subject exist such as indicators of innovation (Dziallas & Blind, 2018); in the supply chain (Wong & Ngai, 2019); innovation nature and variety (Edwards-Schachter, 2018); business model (Geissdoerfer, Vladimirova, & Evans, 2018; Pieroni, McAlloone, & Pigosso, 2019); and innovation in organizations (Hauser, Linos, & Rogers, 2017). Bibliographic coupling, a technique that uses citation analysis to create a similarity link of articles, is an idea by Kessler (1963). Hass (1974) reviewed the theoretical grounding of bibliographic coupling and its practical usage by following the works of Kessler. One advantage of bibliographic review is the ability to eliminate humanly related biases. Small and Koenig (1977) used the technique in earlier times to perform journal clustering. Over the years, the researcher has continued to use the method to map scientific work in various fields. The technique continues to be improved to make the findings more comprehensive and comprehensible (Garfield, 2001).

Hence based on the above, it is crucial to map out existing literature on innovation, funding, and governance. Therefore, this article aims to; perform a bibliographic review to determine the most critical papers on business innovation, finance, and policy; group these articles based on their main themes; present a summary of each of selected publications; highlight areas of possible future research based on the analysis. The authors anticipate that this review will provide a good starting point for future studies on innovation, funding, and policy since no study has attempted to evaluate current literature. Also, it may be relevant to policymakers charged with formulating the right plans on novelty as well as its funding. The study addresses the issues identified by providing answers to the following questions:

RQ1: What is the co-authorship level per country?

RQ2: What is the extent of collaborative authorship on innovation between or among institutions of higher learning?

RQ3: What are the main themes of the literature reviewed? What are the influential publications on innovation, funding, and policy from a business perspective, their summary?

To the best knowledge of the authors, the current study is the first to analyze scholarly literature on funding critically, policy framework (as well as their effect) on and business innovation. The study is structured as follows: the next part, part two, is about the methodology and articles reviewed in this study. In section three, the study presents co-authorship from a country-

specific point of view, scientific publications authored through collaboration between institutions of higher learning, and central themes of the papers examined. Part four is a summary of selected articles. Finally, section five is in the conclusion and possible opportunities for future studies.

MATERIAL AND METHOD

This study employs bibliographic coupling to map out the current literature on business-related innovation, funding, and policy. Furthermore, authors have applied bibliographic review approaches to present a comprehensive picture of research status in various fields, for example, (Chen, 2011; Chen et al., 2014; Jarneving, 2007; Ferreira, 2018). For this analysis, documents were searched in the Web of Science core collection database. “Innovation,” “Policy,” (and) “Funding” were the key terms used in the search. The search is limited to the period between 1990 and mid-February, 2019. The key words resulted in 2,845 articles, and so to further scale down the figure, another keyword, “Business,” was introduced. The final search query was [‘innovation’ AND/OR ‘policy’ AND/OR ‘funding’ AND ‘business’]. The publications considered are those with query words in the title only. Additionally, the introduction of the ‘business’ as part of the query, limited the search specifically to business-focused publications. The search resulted in 437 papers, as illustrated in Table 1, and articles per year in Figure 1. The authors used Vosviewer software to perform a bibliographic analysis of the document retrieved. Moreover, the 437 articles assessment for association and linkage aimed at singling out related studies, and this resulted in 310 publications.

Also, the 310 documents were analyzed on co-authorship by country and collaborative articles between institutions of higher learning (Finardi, 2014; Talab, Scholten, & van Beers, 2018). The 310 articles must have been cited at least once for inclusion in the analysis. The citing criterion resulted in 242 publications, out of which only 183 had an association with each other. These 183 articles were grouped differently depending on their themes, as shown by both Table 2 and Figure 6. Finally, to identify essential publications, a document must have had a minimum of 20 citations to be considered. Thus, from the remaining 183 papers, 44 papers met the cut, but only 32 articles were related, and these are the ones summarised as illustrated by Table 4. By use of VosViewer, the authors were able to visually present the network of scientific articles on innovation, its funding, and policies from a business point of view. The clustering of reviewed publications shown in Figure 6. The clustering also allowed for the grouping of reviewed articles under particular themes. Figure 1 is a summary of the methodology applied.

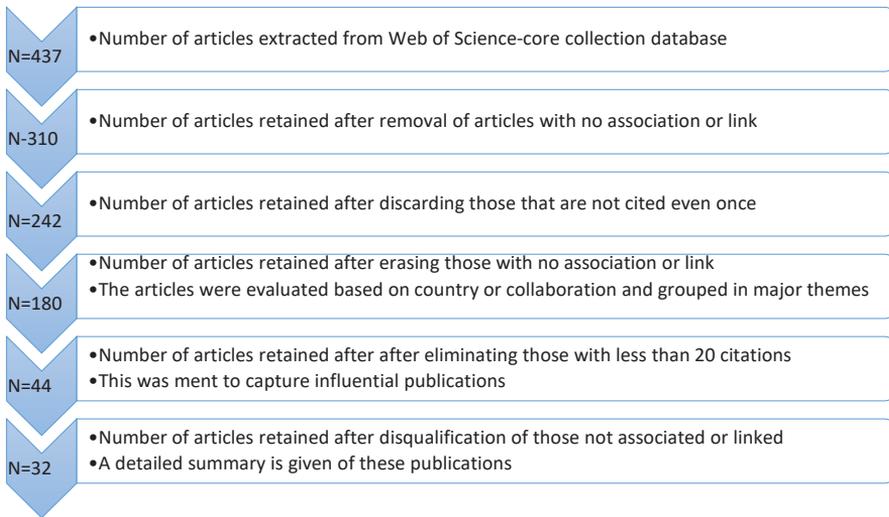


Figure 1. Study sampling process

The reviewed articles were visualized in 13 different clusters depending on their strength of association. From a practical point of view, certain documents would have been placed in more than one group or instead appeared to be not so closely related to the chosen cluster; nevertheless, the authors wish not to manipulate the clustering manually. Likewise, these clusters had different numbers of articles, some having more and other less, but the authors, to the best of their abilities, attempted to find the right theme for each group. Under the analysis of the theme, the authors omitted documents that were in a language other than English, articles with limited access, textbooks, which are non-research work and sections of publications on conference proceedings. Using Vosviewer: Bibliographic coupling and Co-authorship were the basis of analysis with the unit of analysis being documents and countries, while the full counting method was adopted. In summary, the outcome comprised of 242 publications analyzed, 64 clusters, 1413 links, and a total strength standing at 2207.

RESULTS AND DISCUSSION

Scientometrics

This section examines reviewed articles under three main headings: 1) co-authoring to determine the level of academic cooperation between countries on the subject matter at an international level; 2) collaboration in conducting

and publishing scientific work by institutions of higher learning, whether locally, in the region or global angle. Collaboration helps in the sharing or spreading of knowledge, based on the strength of the institution and avoid duplication of research efforts; 3) provide a summary of reviewed publications deemed necessary on innovation, funding, and policy business-wise. The retrieved literature was published in various journals and conference proceedings, as typified in Table 1. Most papers were in the journals relating to innovation, business, and entrepreneurship.

Number of publications per journal

Table 1 epitomizes the different journals and conference proceedings for reviewed articles. The journals are many, but generally, most of them are in the field of innovation, business/entrepreneurship, economics, management, and technology

Table 1. Publication in different journals

Journal	No. of Articles	Journal	No. of Articles
Research Policy	11	Technology in Society	2
Technovation	7	International Journal of Innovation & Technology Management	2
European Planning Studies	7	Transformations in Business & Economics	2
Science & Public Policy	6	International Journal of Technology Management	2
Journal of Technology Transfer	6	Journal of Entrepreneurship & Public Policy	2
Baltic Journal of Economic Studies	6	European Journal of Innovation Management	2
Sustainability	5	Competitiveness Review	2
Small Business Economics	5	Health Research Policy & Systems	2
Tomsk State University Journal	5	Energy Policy	2
Technological Forecasting & Social Change	5	Journal of New Economics Association	2
Marketing & Management of Innovations	4	Research Evaluation	2

Journal	No. of Articles	Journal	No. of Articles
Journal of Rural Studies	4	Entrepreneurship and Regional Development	2
Venture Capital	3	Industry and Innovation	2
Scientific Bulletin of Polissa	3	International Journal of Cultural Policy	2
Journal of Small Business & Enterprise Development	3	Climate Policy	2
Industry and Higher Education	3	Journal of Economic & Policy	2
Journal of Knowledge-Economy	3	Terra Economicus	2
Food Policy	3	Entrepreneurial Knowledge, Technology & the Transformation of Regions	2
Health Affairs	3	Policy Studies	2
Foresight & STI Governance	3	Economics of Innovation and New Technology	2
BMC International Health and Human Rights	3	Economics of Innovation and Technology	2
Asia Pacific Journal of Innovation and Entrepreneurship	3	Regional Studies	2
Journal of Macroeconomics	3	Asia Pacific Journal of Innovation and Entrepreneurship	2
Journal of Cleaner Production	3	Others- Journals with (1) Publication	184
Tourism Management	3	Others- Conference Proceedings	97

Table 1 highlights the 437 articles published in 320 different journals and conference proceedings. Research Policy is the only journal with a high ten publication mark, few within 5-10 range, and a number falling in the 2-4 scope. Nevertheless, most of the journals had just one publication, whereas conference proceedings had a significant amount of documents.

Number of publications per year

Figure 2 presents the number of articles that have published over the years. There was moderate growth in a number of these publications between 1992 and 2008. From a general perspective, however, there is a steady rise in published articles from 2009 to 2018. Innovation is critical for the survival of any firm given the dynamism of the business environment, changes in technology, and ever-growing consumer demands. The importance of innovation in enhancing the competitiveness of an entity cannot be over-emphasized (Ciocanel & Pavelescu, 2015; Distanont & Khongmalai, 2018). Besides, business is now forced to find strategic fits between adopted innovation strategies and the business environment in which they operate to improve on their performance and delivery (Prajogo, 2016). The 2007/8 Global Financial Crisis (GFC) was a turning point for most businesses, and this has captured in many studies (Driver & Muñoz-Bugarin, 2019; Tsuruta, 2019).

Similarly, technological changes dictate reviewing of business models, for example, Lin (2017) explains the importance of collaborations aimed at transferring (innovation) knowledge between universities and the industry (Baglieri, Baldi, & Tucci, 2018). Additionally, some firms are now forming strategic partnerships to harness their respective competitive advantages. Therefore, the reasons mentioned above may partly explain the increase in studies focusing on innovation.

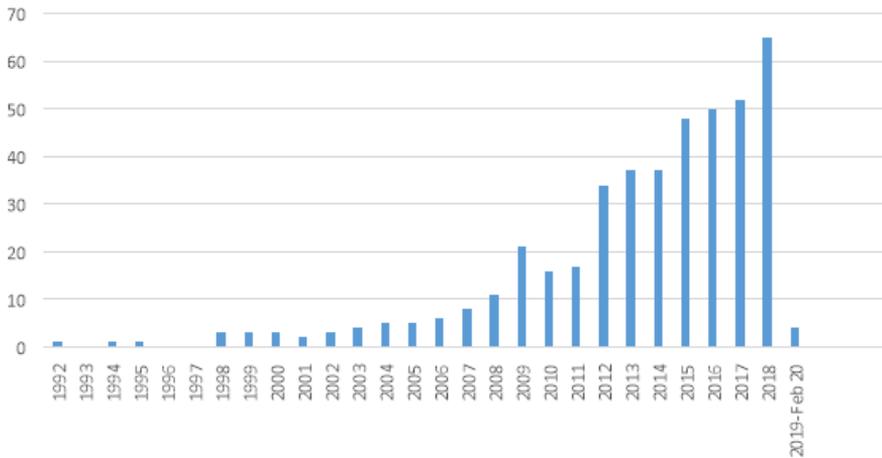


Figure 2. Number of articles published per year

Studies focusing on innovation continue to increase over the years, and this may be the trend in the foreseeable future for some reason. According to [1], 84 percent of the executives concur that innovation is key to a firm’s

growth strategies; however, only 6 percent are satisfied with the performance of innovation or rather understand what the problem is precisely and how to enhance innovation and R&D activities in their enterprises. For a firm to survive today's competitive business environment, innovation has to be part of the strategy. [2] report shows that only 12 percent of the Fortune 500 enterprises from 1955 are still operational. Moreover, [3] shows that 50 percent of the S&P 500 firms may be replaced in the next decade, signifying the importance of rapid response to external challenges. There is a clear distinction in both revenues (11 percent) and Earnings before Inflation Tax Depreciation and Amortization (22 percent) growth favoring more innovative enterprises [4].

Publications per country

Figure 3 shows affiliated publications in a given state. To be considered under this category, a country must have had a minimum of 5 publications. International collaborations in research are crucial for any country; uneven global collaboration impacts negatively the practicality of countries' scientific results and expected technological and social effect (Zanotto, Haeffner, & Guimarães, 2016). From the findings, the United States has the most significant number of co-authored articles, followed by England and then the rest.

Furthermore, apart from the United States, most articles are from European countries, few from Latin America and Asia. However, no country from Africa or the Middle East met the cut implying a low level of co-authorship from these two regions. However, innovative, collaborative studies between countries are crucial in the production and dissemination of knowledge. Zhao, Wu, Xi, Na, and Liu (2018) analyzed how a collaborative innovation approach can evolve into a competitive knowledge-intensive alliance by focusing on China, Korea, and Germany. The study also provides new insights and methods for performing collaborative studies between researchers in different countries. Gorraiz, Reimann, and Gumpenberger (2012) explain the principal elements and what should be in the evaluation of international research collaboration by examining Austria and six other countries (Choi, 2012; Kim, 2006).

The under this category publications examined the extent to which countries (authors) engage in collaborative scholarly work across borders. Based on the findings, it is possible to deduce that economies with the higher implementation of innovative activities also have a higher output of collaborative studies.

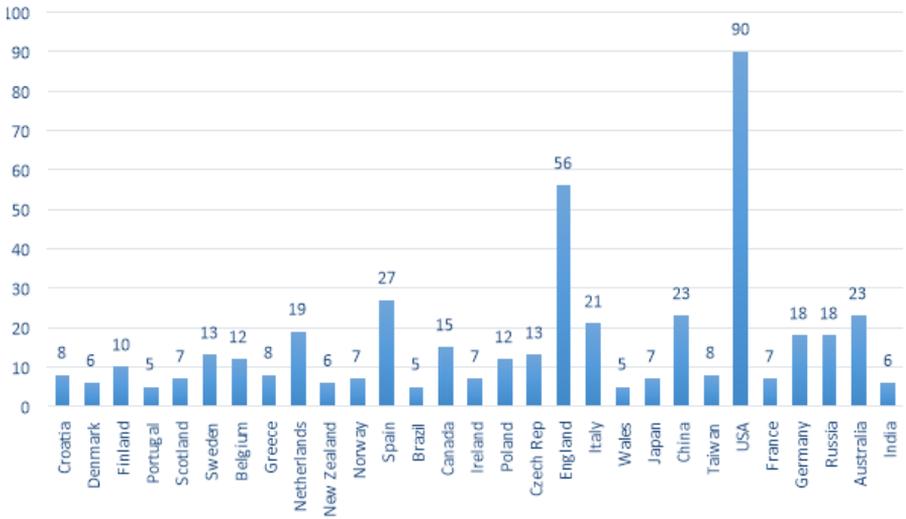


Figure 3. Publications affiliations by country

Number of published articles through collaborations of higher education institutions

Figure 4 illustrates articles published by way of institutional partnerships. Enough empirical literature exists to support continued collaborative studies among academic institutions. Bozeman, Fay, and Slade (2013) probed individual-level collaborations among academic researchers, focusing on university researchers’ partnerships with researchers in other areas and industry. The study offers recommendations for improving on such collaborative studies such as increased consideration to multi-levels of analysis and the interplay amongst them; realistic evaluation of impacts rather than outputs; highlighting ‘malpractice’ and exploitations in these collaborations if any; giving some attention to collaborators’ inspiration or the motivation of collaborative teams. Figure 2 shows that based on related research, collaborative studies among institutions of higher learning range between 2 and 5, the cut-off had been set at a minimum of two. England has more academic institutions’ engaging in collaborative research.

Additionally, based on the findings, institutions of higher learning in Africa, Asia, and Middle East engagement in collaborative research is almost non-existent. Moreover, collaboration breadth has a direct effect, whereas collaboration depth has a curvilinear impact on academic research performance (Yuandi Wang, Hu, Li, Li, & Li, 2015). Collaborative research is an

alternative way of measuring research performance in institutions of higher learning (Kim, Lim, & Lee, 2014).

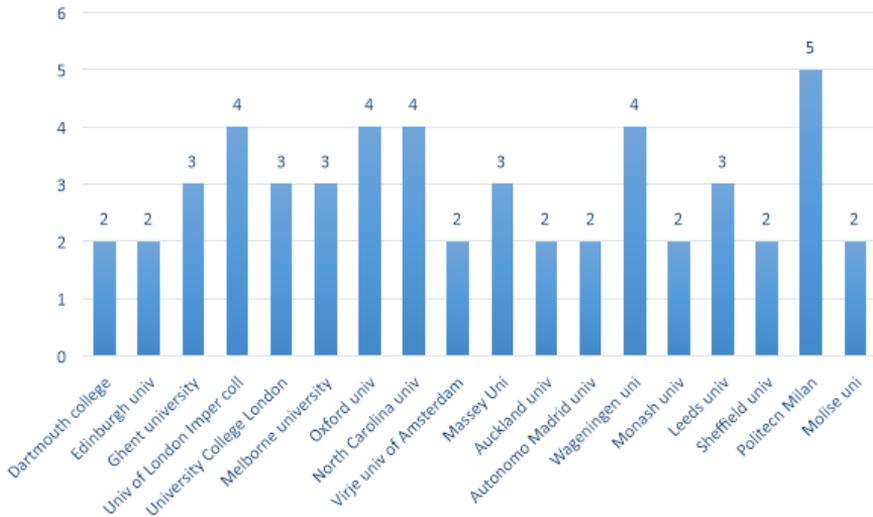


Figure 4. Number of articles authored through institutional collaboration

The findings under this section tend to support those found in the affiliation publications in a given country. Most of the institutions of higher learning partnering in academic work on innovation are from those countries highlighted in the previous section. These findings concur with the work of Crudu (2020), who explains that innovation is more pronounced in states with higher incomes and higher development levels.

Figure 5 is the scientific network of reviewed documents that comprised of 13 clusters, as illustrated by the different color shades. A particular group consists of articles associated with each other based on the strength of the links. Related articles are clustered together under one shade, whereas those in between or among different clusters take the mixture of the associated groups, as shown by the linking lines. Still, the stronger the tone of a circle (article) and track (network), the stronger the link between the publications.

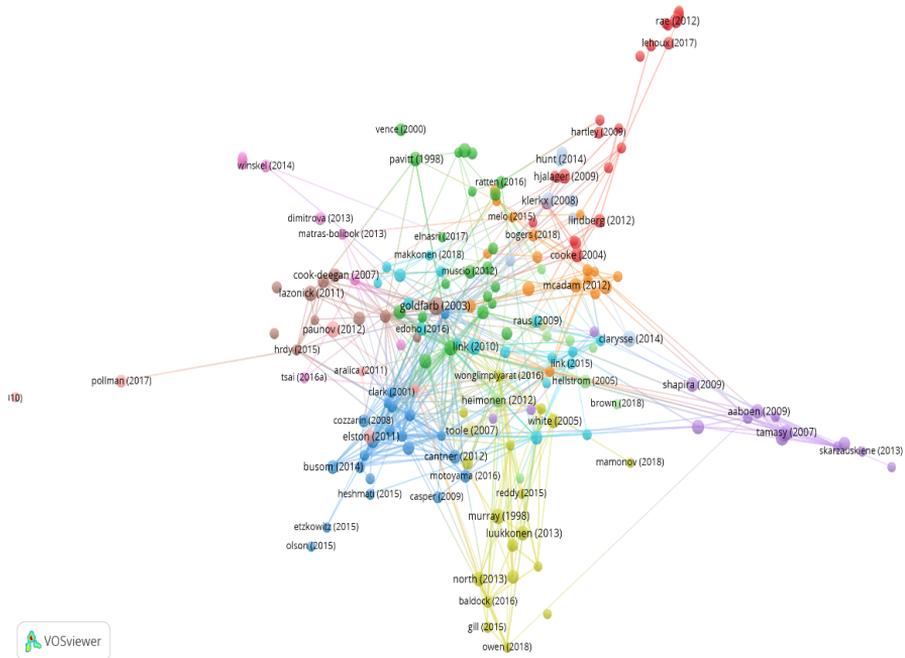


Figure 5. A bibliographic system of connected articles

Themes of reviewed publications

Figure 6 shows the items used to group the 13 clusters presented in Figure 5. These themes or the 13 clusters can be broken down further into three main categories based on the number of articles. These categories are very high, high, moderate, and intermediate impact publications groupings. Type one, on very high impact, consists of themes or clusters with a high number of publications, the items are; policy, economic growth, and research and development/incentives. Category two, top impact publications consist of themes with the second-highest number of documents, which include; funding, business incubation, entrepreneurship, and institutionalization of innovation. Category three consists of life science innovation, and the last category have themes focusing on; sustainability, financial decisions, network/ecosystem, agriculture, and biotechnology.

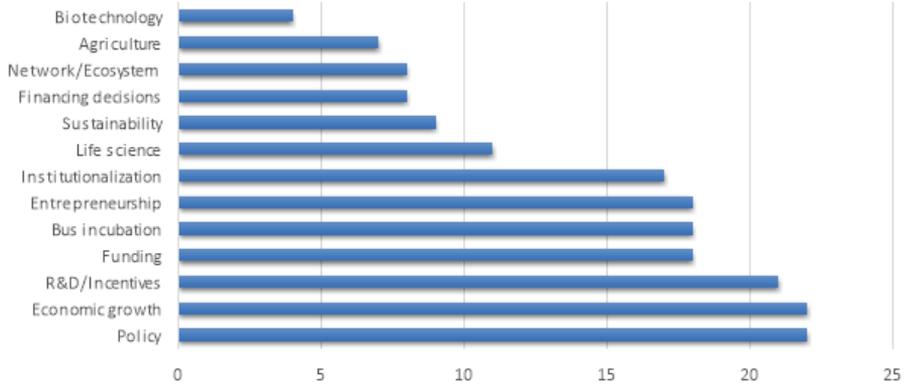


Figure 6. Themes of reviewed articles

Themes and summaries of selected reviewed publications

This section has into three parts; part one contains the various materials examined, part two outlines the 32 selected articles, and their corresponding citations, while part three, is a summary of these chosen articles.

Themes and associated publications

Table 2 represents the articles that constitute a given theme. That notwithstanding, some documents were not included in this section for reasons expounded on under methodology. The higher the standing/level of the group or theme, the higher is the number of the document.

Citation analysis

The citation evaluation of the reviewed literature was done using the document as a unit of study. Only 242 out of the 437 articles had been cited at least once or more, which was the cut-off criteria, as presented by Figure 7. Table 3 shows selected documents from the 242 and their associated level of citation as per the Web of Science. Based on association rule and a requirement of 20 citations, 32 articles were finally selected, as shown. The most cited article is by Goldfarb and Henrekson (2003) at 231 citations, whereas a study by comes a distant second, Clarysse et al. (2014), at 96 citations. The remaining publications had citations ranges of between 22 and 81.

Table 2. Themes of reviewed studies

Group	Theme	Article/Author
1	Policy/Regulation	Sá, Kretz, and Sigurdson (2013); Calo (2018); Cooke (2004); de Laurentis (2012); De Lucia, Balena, Stufano Melone, and Borri (2016); Dodescu and Chirilă (2013); Gilmore and Comunian (2016); Kasa Underthun (2010); Jordan, Lemken, and Liedtke (2014); Greenhalgh et al. (2017); Hartley and Montgomery (2009); Reficco and Gutiérrez (2016); Moreton (2016); Rae et al. (2012); Gurzawska, Mäkinen, and Brey (2017); Parvizi and Parvizi (2017); Seppo, Rõigas, and Varblane (2014); Tan (2018); Witten et al. (2018); Lindberg, Danilda, and Torstensson (2012).
2	Economic Growth/Collaboration	Antonlioli, Marzucchi, and Montesor (2014); Cumming, Johan, and Zhang (2014); Klerkx and Leeuwis (2008); Lynskey (2004); Domingo and Soriano (2014); Mendes, Serrasqueiro, and Nunes, (2014); Nelson (1995); Pavitt (1998); Muscio and Nardone (2012); Lynch, Lenihan, and Hart (2009); Hemphill (2013); Vickers and North (2000); Rubach (2013); Fogg (2012); Yan, Chien, Hong, and Yang (2018); Vence and Gunti (2000); Ratten, Ferreira, and Fernandes (2016); Elnasri and Fox (2017); Fundeanu and Badele (2014).
3	R&D/Incentives	Afcha and León López (2014); Kenney and Patton (2018); Cozzarin (2008); Lanahan (2016); Wu, Popp, Bretschneider, Maxwell, and Policy (2007); Engel, Rothgang, and Eckl (2016); Heshmati (2015); Cantner and Kösters (2012); Olson and Young (2016); Etzkowitz and Etzkowitz (2015); Busom, Corchuelo, and Martínez-Ros (2014); Czarnitzki (2014); Archibugi and Filippetti (2018); Wang, Li, and Furman (2017); Jr. and Paolucci (2004); Michalsen (2006).
4	Funding	Owen, Brennan, and Lyon (2018); Campos, Coville, Fernandes, Goldstein, and McKenzie (2014); Gill (2015); Baldock (2015); North, Baldock, and Ullah (2013); Collewaert, Manigart, and Aernoudt (2010); Henrekson and Sanandaji (2018); Luukkonen, Deschryvere, and Bertoni (2013a); Murray (1998); Mamonov and Malaga (2018); Kolesnyk (2017); White, Gao, and Zhang (2005); Das, Hui, and Sha (2018); Wonglimpiyarat (2016).
5	Business Incubation	Aaboen (2009); Frenkel, Shefer, and Miller (2005); Mubarak et al. (2015); Löfsten and Lindelöf (2003); Tamásy (2007); Tang, Baskaran, Pancholi, and Lu (2013); Dvouletý, Longo, Blažková, Lukeš, and Andera (2018); Cumming and Fischer (2012); Shapira and Wang (2009); Appelbaum, Gebbie, Han, Stocking, and Kay (2016); Breznitz and Ornston (2018); Walwyn and Cloete (2016); Perampaladas et al. (2010); Chakma, Masum, and Singer (2010).

Group	Theme	Article/Author
6	Entrepreneurship	Bearse and Link (2010); Costa, Laureano, and Laureano (2014); Pergelova and Angulo-Ruiz (2014); Welsh, Kaciak, Trimi, and Mainardes (2018); Link and Scott (2010); Divisekera and Nguyen (2018); Makkonen, Williams, Weidenfeld, and Kaisto (2018); Kalisz and Aluchna (2012); Rószkiewicz (2014); (Petrescu, 2009); Edoho (2016); Sjøvaag and Krumsvik (2017);(Link and Wright (2015).
7	Institutionalization/Academia	Venturini and Verbano (2017); Bengtsson (2017); Rizos et al. (2016); Rosli and Rossi (2016); Wolley (2016); McAdam, Miller, McAdam, and Teague (2012); Minshall, Schmithausen, Kouris, Mortara, and Weiss (2013); Jaekel, Wallin, and Isomursu (2015); Holm (2015); Bogers, Chesbrough, and Moedas (2018); Meissner (2018); Zhang et al. (2018); Catulli and Frye, (2012); Antony, Johnson and, Sin field (2008).
8	Life science	Bar-Shalom and Cook-Deegan (2002); Lazonick and Tulum (2011); Bar-Shalom and Cook-Deegan (2002); Goldfarb and Henrekson (2003); Evens and Kaitin (2015); Džupka, Klasová, and Kováč, (2016); Ghauri and Rao (2009); Kolympiris, Kalaitzandonakes, and Miller (2014);Rdy et al. (2014).
9	Sustainability	Malen and Marcus (2017); Chirambo (2018); Dimitrova (2013); Winskel, Radcliffe, Skea, and Wang (2014); Kolk (2015); Bumpus (2015); Bointner, Pezzutto, Grilli, and Sparber (2016).
10	Financing decisions	Concilio, Molinari, and Morelli (2017); Elston and Audretsch (2011); Pike (2010); Paunov, (2012); Padilla-Ospina, Medina-Vásquez, and Rivera-Godoy (2018); Pollman and Barry (2016).
11	Network/Ecosystems	Heimonen (2012); Heimonen (2012); Begonja, Čiček, Balboni, and Gerbin (2016); Hellström and Jacob (2005); Rubach (2013); Brown et al. (2018); Samford, Warriar, and Goracinova (2017).
12	Agriculture	Klerkx and Leeuwis (2008); Clarysse, Wright, Bruneel, and Mahajan (2014); Sisko Patana, Pihlajamaa, Polvinen, Kanto, and Carleton (2013); Hoppe and Sanders (2014); Hunt, Birch, Vanclay, and Coutts (2014); Ton, Klerkx, de Grip, and Rau (2015); Gava, Favilli, Bartolini, de Brunori (2017).
13	Biotechnology	Toole and Czarnitzki (2007); Bagchi-Sen and Scully (2004); Chang and Tsai (2016).

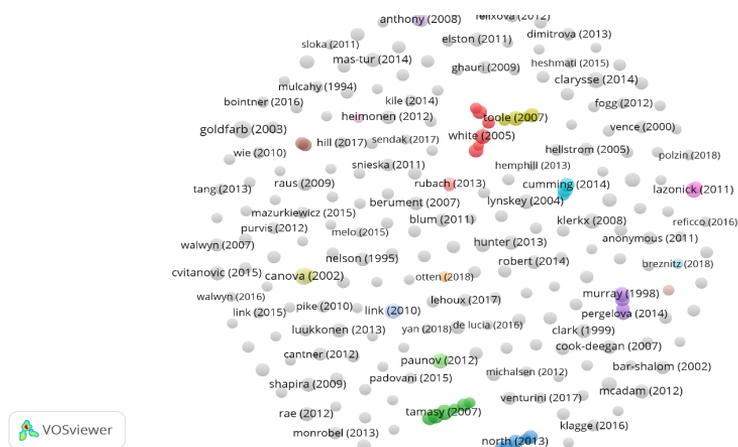


Figure 7. Citation network of 242 out of 437 publications reviewed

Table 3. Ranking publications by the number of citations received

Author	Title	Citations
Aaboen (2009)	Explaining incubators using a firm analogy	35
Clarysse, Wright Bruneel and, Mahajan (2014)	Creating value in ecosystems: Crossing the chasm between knowledge and business ecosystems	96
Cumming and Fischer (2012)	Publicly funded business advisory services and entrepreneurial outcomes	28
Löfsten and Lindelöf (2003)	Determinants of entrepreneurial milieu: Science parks and business policy in growing firms	44
Shapira and Wang (2009)	From lab to market: Issues and strategies in the commercialization of nanotechnology in China	37
Sofouli and Vonortas (2007)	S&T parks and business incubators in middle-sized countries: The case of Greece	34
Tamásy (2007)	Rethinking technology business-oriented incubators: Developing a robust policy instrument for entrepreneurship, innovation and, development	60
Czarnitzki (2014)	Innovation subsidies: Does the funding source matter for innovation intensity and Intensity? Empirical evidence from Germany	23
Link and Scott (2010)	Government as an entrepreneur: Evaluating the commercialization success of SBIR projects	71
Lynskey (2004)	Determinants of innovative activity in Japanese Technology-based start-up firms	44
Domingo and Soriano (2014)	The level of innovation among young innovative companies: The impacts of knowledge-intensive services use, firm characteristics and the entrepreneur attributes	33

Author	Title	Citations
Paunov (2012)	The global crisis and firms' investments in innovation	71
Toole and Czarnitzki (2007)	Biomedical academic entrepreneurship through the SBIR program	41
Bar-Shalom and Cook-Deegan (2002)	Patents and innovation in cancer therapeutics: Lessons from CellPro	21
Cooke (2004)	Life science clusters and regional science policy	27
Hjalager (2009)	Cultural Tourism Innovation Systems – The Roskilde Festival	26
Klerkx and Leeuwis (2008)	Balancing multiple interests: Embedding innovation intermediation in the agricultural knowledge infrastructure	81
Lazonick and Tulum (2011)	US biopharmaceutical finance and the sustainability of the biotech business model	63
Antony, Johnson and, Sin field (2008)	Institutionalizing innovation	27
Cumming, Johan and, Zhang (2014)	The economic impact of entrepreneurship: Comparing international datasets	30
Goldfarb and Henrekson (2003)	Bottom-up versus top-down policies towards the commercialization of university intellectual property	231
Heimonen (2012)	What are the factors that affect innovation in growing SMEs?	22
Collewaert, Manigart and, Aernoudt (2010)	Assessment of government funding of business angel networks in Flanders	22
Elston and Audretsch (2011)	Financing the entrepreneurial decision: An empirical approach using experimental data on risk attitudes	27
Elston and Audretsch (2011)	Funding the growth of UK technology-based small firms since the financial crash: are there breakages in the finance escalator?	32
Luukkonen, Deschryvere and, Bertoni (2013)	The value added by government venture capital funds compared with independent venture capital funds	30
Murray (1998)	A policy response to regional disparities in the supply of risk capital to new technology-based firms in the European Union: The European seed capital fund scheme	48
White, Gao and, Zhang (2005)	Financing new ventures in China: System antecedents and institutionalization	41
McAdam, Miller, McAdam and, Teague (2012)	The development of university technology transfer-stakeholder relationships at a regional level: Lessons for the future	35
Rizos et al. (2016)	Implementation of circular economy business models by small and medium-sized enterprises (SMEs): Barriers and enablers	26
Nelson (1995)	Why should managers be thinking about technology policy?	26
Pavitt (1998)	The inevitable limits of EU R&D funding	33

A summary of selected publications

Table 4 provides an overview of the 32 chosen documents considered significant based on the citation levels. The summary is necessary for providing information on these studies in a short and precise way. Most of the publications focused on mature economies in Europe, the United States, and a few on emerging such as China. Once again, there are no studies on emerging economies. Nevertheless, the publications are even for quantitative and qualitative studies.

Table 4. Summaries of selected articles

Theme	Study	Summary of the Study
Funding	Aaboen (2009)	The case study uses the analogy of a professional service firm to describe an incubator by stressing on attributes related to resources. The important attributes being an enlistment of new technology-based firms (NTBFs), service delivery, knowledgeable staff, and resource base. Moreover, an improvement in these attributes relates to the incubator's progress with the increased complicatedness of the resource base minimizing chances of imitation. The authors submit that an incubator may have numerous clients with diverse value creation processes or none at all, depending on the context. <i>Region: Sweden; Study: qualitative; Period:2003-2005.</i>
Business Incubation	Cumming and Fischer (2012)	The authors empirically interrogate the effectiveness of publicly financed business advisory services and entrepreneurial results. The study finds a positive relationship between advisory services and growth in firms, patents, financing, and strategic alliances. <i>Region: Canada; Study: quantitative; Duration: over five years Period: 2008-2009.</i>
	Löfsten and Lindelöf (2003)	The survey study differentiates between new technology-based entities (NTBFs) within and without Science Parks to single out any factor of the added value provided by the parks to these new technology-based firms. NTBFs inside the Park is found to have a greater market distribution within and without Sweden as compared to typical small entities. <i>Region: Sweden; Study: quantitative; Period:1996-1998.</i>
	Shapira and Wang (2009)	The conceptual study analyses the gap between nanotechnology researches and assesses future commercialization trajectories of such researches. The study offers two avenues for commercializing enhanced R&D developments in nanotechnology. The commercialization can be through spill-over from the academic sector and spill-over from foreign firms. <i>Region: China; Study: qualitative; Period:1990-2006.</i>
	Tamásy (2007)	The survey queries political rationales, explores appraisal literature, and outlines proposals for the future of the business incubation industry. The study argues against public funding of technology-oriented business incubators, instead suggests that they are running as private organizations.

Theme	Study	Summary of the Study
	Sofouli and Vonortas (2007)	The conceptual study connects the policy on science and technology to the goals and features of the well-established parks and incubators. The authors argue that science, technology parks, and incubators in-country ownership and management have moved from academic or research institutes to private players.
		Similarly, financing, the supply of seed capital and venture capital has shifted from government to the private sector. <i>Region: Greece; Study: qualitative..</i>
R&D/Incentive	Czarnitzki (2014)	The survey study explores the impact of European policies and public financing on both innovation input and output for the firm. On innovation input, the policies complement each other. On output, subsidy beneficiaries are active in terms of patents. Thus, public funding stimulates socially beneficial research endeavors, while the presence of both national and European policies has no crowding-out effect. <i>Region: Germany; Study: quantitative; Period:1992-1994</i>
	Paunov (2012)	The survey analyses the long term effect of the global financial crisis on business innovation activities to formulate necessary post-recovery policy framework. The authors focus on firms in eight Latin American countries. The study finds that such a crisis results in many firms halting ongoing innovation program; however, entities accessing public funding are unlikely to stop these projects. <i>Region: Latin America; Study: quantitative; Period: 2008-2009.</i>
Collaboration/ Economic Growth	Lynskey (2004)	The study examines the determinants of innovation, based on patent registrations and new products for technology-based start-up firms in Japan. The authors conclude that technological capacity, the availability of internal financial resources, venture capital funding, and academia-industry collaborations are crucial determinants of innovation at the firm level. Additionally, educational qualifications and the ability of the chief executive officer to network with researchers are fundamental managerial characteristics. <i>Region: Japan; Study: qualitative.</i>
	Domingo and Soriano (2014)	The survey probes on the characteristics that improve innovation and adoption of knowledge-intensive business services support for driving innovation in young innovative firms. Further, the study links the level of innovation among these innovative firms to the entities' attributes and the entrepreneurs' characteristics. The authors conclude that the use of knowledge-intensive business services stirs innovation in young innovative companies. <i>Region: Spain; Study: quantitative; Period: 2009- 2010.</i>
	Pavitt (1998)	The study aimed at provoking a discussion at a time when there was a general feeling that policies and systems for funding of research and development in the European Union had challenges relating to budgetary constraints, political hurdles, and varying ideas on what the right policy ought to have been <i>Region: EU; Study: qualitative.</i>

Theme	Study	Summary of the Study
	Nelson (1995)	The author details three significant aspects of contemporary technology policy, which are significantly crucial to the business. These are; applied for research support by the government, managing declines in basic research funded by corporations, and complex matters on intellectual property rights (IRS) <i>Region: general; Study: qualitative.</i>
Funding	Collewaert, Manigart and, Aernoudt (2010)	The survey appraises whether government intervention, such as the subsidization of business angel networks (BANs), promotes regional economic development. The study concludes that BANs minimize the challenges associated with information and financing faced by entrepreneurial firms. Additionally, these firms add to economic growth or expansion. Finally, such a program has several desirable indirect effects, implying that BAN support by the public is necessary. <i>Region: Belgium; Study: qualitative.</i>
Entrepreneurship	Link and Scott (2010)	The survey focuses on the Small Business Innovation Research (SBIR) program. The authors show that the innovative utilization of public resources through the SBIR programs aimed at targeting and supporting research activities in small firms tends to minimize innovation impediments that make small entities to underinvest in research and development. <i>Region: United States; Study: quantitative.</i>
	Hjalager (2009)	The case study examines cultural tourism from an innovation point of view. Focusing on Denmark's Roskilde Festival as a case study, the authors describe how different organizational frameworks have been developed with political backing to stimulate spin-offs. Additionally, there is a more substantial representation of both the academic and research players. <i>Region: Denmark; Study: qualitative.</i>
	Cumming, Johan and, Zhang (2014)	The comparative study is focusing on the effect of entrepreneurship on gross domestic product/capita, levels of unemployment, exports/gross domestic product, and patents registration per population across countries. The study finds entrepreneurship has a significant positive impact on total domestic product/capita, exports/ gross domestic product, and patents registration per population; nonetheless, it hurts levels of unemployment. <i>Region: 12 countries in western and eastern Europe; Study: quantitative; Period: 2004-2009.</i>
Policy/Regulation	Cooke (2004)	The comparative analysis probes the likely impact on the science-policy of shifts in R&D-based clusters attributed to the boost of knowledge-economies. The study focuses on life sciences and ways by which Research and Development led groupings to provide crucial resources such as innovative businesses, research funding, and infrastructure in fewer clusters. The authors recommend the provision of new region-based science-policy tools for redistributing this knowledge economy, which is an advantage more significant than just supporting innovation. <i>Region: the United States and the United Kingdom; Study: qualitative.</i>

Theme	Study	Summary of the Study
Institutionalization/ Academic	Antony, Johnson and, Sin field (2008)	The case study illustrates that successful innovation depends on three main elements. These include growth blueprints, where managers must know where the entity intends to be and provide the necessary resources; innovation systems and engines; their creation requires developing mechanisms to screen and reduce uncertainty in the projects; right mind-sets, through the creation of a supportive innovation environment by senior managers. The authors finalize by detailing a blueprint and checklist for converting an entity into an innovation hub. <i>Region: United States; Study: qualitative.</i>
	McAdam, Miller, McAdam and, Teague (2012)	The case study reviews the link between Government funding entities and technology transfer procedures by the university. The findings indicate that higher targeted funding and policy attributable to the stakeholder relationship mechanism results in the expansion of joint systems with close positioning of performance measures between the technology transfer office and the regional development agencies. <i>Region: UK; Study: qualitative.</i>
	Rizos et al. (2016)	
Network/Ecosystem	Heimonen (2012)	The authors explain factors that affect the innovativeness of thriving small and medium-sized entities using intellectual property rights (trademarks, patents, registered designs, and utility modes) as a measure of innovation. The findings suggest that flourishing intellectual property rights intensive entities face more financial pressures as compared to those producing nothing at all. Funding research and development through public finances enhances the chances of desirable innovation <i>Region: Finland; Study: qualitative; Period: 2002-2005.</i>
Financing Decisions	Elston and Audretsch (2011)	The study combines both survey and experimental research designs to explore the importance of personal funds in the entry decisions for high-tech entrepreneurs. The findings reveal that; small business innovation research grants (SBIR), use of credit cards, and salary for employed people top sources of funding for entrepreneurs wishing to set-up a firm. Furthermore, firm set-up depends on accessing capital in both initial and early phases of development, also funded by the government covering SBIR grants, is a vital source of financing high technology entrepreneurs. <i>Region: US; Study: qualitative; Period: 2004.</i>
	Luukkonen, Deschryvere and, Bertoni (2013)	The comparative study examines the significance of an entity's growth of post-investment, value-added actions by government venture capital firms (GVC) and independent venture capital entities (IVC), based on a survey of growing high tech venture capital-backed firms in seven European countries. The study finds no significant disparity between the two sets of investors. However, the value-added varies depending on the type of investor, with the contributions of IVC funding being significantly higher than those of GVC funding. Besides, this is so in instances such as in the advancement of the business idea, exit strategy, and professionalization. <i>Region: Belgium, Finland, Germany, France, Italy, Spain & UK; Study: qualitative; Period: 2010</i>

Theme	Study	Summary of the Study
	White, Gao and, Zhang (2005)	Through a survey study, the authors recommended a general structure for the financing of new ventures as a result of government policy on technology. The situation was at a time when innovation was still a new phenomenon in China in the 80s to early 2000s. The study had a policy and managerial ramifications touching across varying venture funding systems. <i>Region: China; Study: qualitative.</i>
	Murray (1998)	The study examines the European Seed Capital Fund Schemes meant to address regional disparities in the availability of risk-free capital for start-ups or new technology-based firms within the European Union in the early 1990s. The scheme was as a result of private venture capital providers lessening their support for start-ups and early-stage technology-based firms in the European Union; and, the presence of spatial concentrations in the availability of venture capital disadvantaged the creation of new, innovative entities in under-developed parts of the Union. The scheme was found to have achieved its objective of stimulating private funding into young innovative technology-based businesses <i>Region: European Union; Study: qualitative.</i>
Agricultural	Clarysse, Wright Bruneel and, Mahajan (2014)	The authors empirically examine the knowledge and business ecosystem of the financial support network. The study finds that the knowledge ecosystem has a good framework coalescing around some central actors, whereas the business ecosystem is practically non-existent at the local stage. Additionally, the financial support network is entirely publicly supported and does not link to the knowledge and business ecosystem. <i>Region: Belgium; Study: quantitative; Period:2005-2011.</i>
	Klerkx and Leeuwis (2008)	The case study focuses on the link between the for-profit intermediary entity and numerous players for which it carries out diverse bridging roles. The study findings indicate that whereas innovation intermediation remains beneficial, misunderstandings may emerge concerning the innovation intermediary's management framework, modes of revenue generation, and various activities it performs. To minimize such challenges, the authors recommend the demarcation of the intermediary role to avoid competition with other financiers of R&D or knowledge-intensive business services. Equally, funding of innovation intermediaries should be between the public and private sectors. <i>Region: Netherlands; Study: quantitative; Period: 2005.</i>
Biotechnology	Toole and Czarnitzki (2007)	The survey interrogates the Small Business Innovation Research (SBIR) program as a policy facilitating entrepreneurship in institutions of higher learning. The findings demonstrate that the program is commercialization avenue by biomedical academic researchers. Equally, the SBIR firms having scientists are significantly better in terms of performance as compared to other SBIR firms; more so on follow-up venture capital financing, SBIR project completion, and patenting. <i>Region: US; Study: quantitative; Period: 1972-1996.</i>

Theme	Study	Summary of the Study
Life Science	Bar-Shalom and Cook-Deegan (2002)	The case study highlights the existing link between the utilization of publicly funded research and academia-positioned intellectual property. The study explains how to patent legislation might or might not have a different outcome in the medical sector when compared to other highly technological areas. For example, medical innovations tend to be subjected to more scrutiny from both moral and political perspectives, unlike other non-medical sectors. <i>Region: United States; Study: qualitative.</i>
	Lazonick and Tulum (2011)	The case study offers an answer to the "Pisano puzzle," providing a base for investigating the industrial and institutional environments under which the development of the biopharmaceutical (BP) industry can be sustainable. One component of the solution relates to the readiness of the investors at the stock markets to soak in the initial public offerings of a BP project yet to generate a commercial product with the probability of never do so. The other component of the solution is on the knowledge base tapped by BP firms to develop products, to a large extent, this tends to come from government financing and expenditure than from business financing. <i>Region: United States; Study: qualitative; Period: 1983-2009.</i>
	Goldfarb and Henrekson (2003)	The comparative study examines the question of what national policies are suitable for enhancing the commercialization of academia-created knowledge. The findings point to laggard levels of commercialization of university-generated research output. The authors attribute this partly to the top-down style of Swedish policies targeting commercialization of innovations and academic surrounding that demotivates academicians from actively engaging in the marketing of their results. On the contrary, in the United States, institutional context is defined by competition between universities and researchers for research funding. The competition, in turn, leads to higher academic flexibility, increased interaction with the industry, especially with new firms. <i>Region: Sweden and the United States; Study: qualitative.</i>

CONCLUSION

The authors performed a bibliographic review of published literature on innovation, funding, and policy from a business point of view. The survey examined documents published between 1990 and February 2019 extracted from the Web of Science core collection. A total of 437 articles were retrieved and went through various staged before settling on 32 publications. The analysis of retrieved documents focused on the journal of publication, articles per year, affiliations (publications) per country, co-authorship collaborations of the university, and the main themes of the reviewed studies. Still, the study outlines the citations received by each of the 32 selected publications and their summaries. The summaries grouped in themes have shown areas

that have received more or less attention from researchers. The number of papers in the field has been growing over the years owing to reasons outlined earlier. Generally, countries engaged in higher levels of innovation had higher authoring. Interestingly, few studies on the subject matter were authored in emerging economies such as Africa and Asia, other than China and Taiwan, but to mention a few. The situation is the same for countries in the Middle East. Likewise, most of the collaborative studies are from institutions in the United States and European countries, while other regions lag. Equally, most of the reviewed studies focused on short periods of 5 years and below, probably due to rapid changes innovations. Finally, a case study was the preferred research approach for most authors, followed by comparative studies and the least being experimental; this is not to say there are no other study designs. Therefore, these could be opportunities for future studies.

Limitation, the authors appreciate that reviewing articles by the use of bibliographic techniques is not a substitute for the traditional comprehensive reading approach but rather a compliment. Thus, the method could be a limitation in itself. Moreover, the study used data retrieved from one database, whereas there are other well-established ones. The authors may have been subjective in their omission of articles in languages other than English. Still, it may not have been possible to present all the articles extensively, thus a summary of selected publications. Nonetheless, the findings show a picture of the present state of authoring on innovation, funding, and policy.

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Reference

- Aaboen, L. (2009). Explaining incubators using a firm analogy. *Technovation*, 29(10), 657–670. <https://doi.org/10.1016/j.technovation.2009.04.007>
- Afcha, S., & León López, G. (2014). Public funding of R&D and its effect on the composition of business R&D expenditure. *BRQ Business Research Quarterly*, 17(1), 22–30. <https://doi.org/10.1016/j.cede.2013.01.001>
- Aksoy, H. (2017). How do innovation culture, marketing innovation, and product innovation affect the market performance of small and medium-sized enterprises (SMEs). *Technology in Society*, 51, 133–141. <https://doi.org/10.1016/j.techsoc.2017.08.005>
- Aliasghar, O., Rose, E. L., & Chetty, S. (2019). Where to search for process innovations? The mediating role of absorptive capacity and its impact

- on process innovation. *Industrial Marketing Management*, 82, 199–212. <https://doi.org/10.1016/j.indmarman.2019.01.014>
- Antonioli, D., Marzucchi, A., & Montresor, S. (2014). Regional innovation policy and innovative behavior: Looking for additional effects. *European Planning Studies*, 22(1), 64–83. <https://doi.org/10.1080/09654313.2012.722977>
- Anzola-Román, P., Bayona-Sáez, C., & García-Marco, T. (2018). Organizational innovation, internal R&D, and externally sourced innovation practices: Effects on technological innovation outcomes. *Journal of Business Research*, 91, 233–247. <https://doi.org/10.1016/j.jbusres.2018.06.014>
- Appelbaum, R. P., Gebbie, M. A., Han, X., Stocking, G., & Kay, L. (2016). Will China's quest for indigenous innovation succeed? Some lessons from nanotechnology. *Technology in Society*, 46, 149–163. <https://doi.org/10.1016/j.techsoc.2016.03.004>
- Archibugi, D., & Filippetti, A. (2018). The retreat of public research and its adverse consequences on innovation. *Technological Forecasting and Social Change*, 127, 97–111. <https://doi.org/10.1016/j.techfore.2017.05.022>
- Arundel, A., Bloch, C., & Ferguson, B. (2019). Advancing innovation in the public sector: Aligning innovation measurement with policy goals. *Research Policy*, 48(3), 789–798. <https://doi.org/10.1016/j.respol.2018.12.001>
- Azar, G., & Ciabuschi, F. (2017). Organizational innovation, technological innovation, and export performance: The effects of innovation radicalness and extensiveness. *International Business Review*, 26(2), 324–336. <https://doi.org/10.1016/j.ibusrev.2016.09.002>
- Bagchi-Sen, S., & Scully, J. L. (2004). The Canadian environment for innovation and business development in the biotechnology industry: A firm-level analysis. *European Planning Studies*, 12(7), 961–983. <https://doi.org/10.1080/0965431042000267867>
- Baglieri, D., Baldi, F., & Tucci, C. L. (2018). University technology transfer office business models: One size does not fit all. *Technovation*, 76, 51–63. <https://doi.org/10.1016/j.technovation.2018.05.003>
- Baldock, R. (2015). An assessment of the business impacts of the UK's Enterprise Capital Funds. *Environment and Planning C: Government and Policy*, 34(8), 1556–1581. <https://doi.org/10.1177/0263774X15625995>
- Bar-Shalom, A., & Cook-Deegan, R. (2002). Patents and innovation in cancer therapeutics: Lessons from CellPro. *The Milbank Quarterly*, 80(4), 637–676. <https://doi.org/10.1111/1468-0009.00027>
- Bearse, P. M., & Link, A. N. (2010). Economic implications of raising the threshold funding limits on US Small Business Innovation Research awards. *Science and Public Policy*, 37(10), 731–735. <https://doi.org/10.3152/030234210X534896>
- Begonja, M., Čiček, F., Balboni, B., & Gerbin, A. (2016). Innovation and business performance determinants of SMEs in the Adriatic region that introduced social innovation. *Economic Research-Ekonomska Istraživanja*, 29(1), 1136–1149. <https://doi.org/10.1080/1331677X.2016.1213651>

- Bengtsson, L. (2017). A comparison of university technology transfer offices' commercialization strategies in the Scandinavian countries. *Science and Public Policy, 44*(4), 565–577. <https://doi.org/10.1093/scipol/scw086>
- Bogers, M., Chesbrough, H., & Moedas, C. (2018). Open innovation: Research, practices, and policies. *California Management Review, 60*(2), 5–16. <https://doi.org/10.1177/0008125617745086>
- Bointner, R., Pezzutto, S., Grilli, G., & Sparber, W. (2016). Financing innovations for the renewable energy transition in Europe. *Energies, 9*(12), 990. <https://doi.org/10.3390/en9120990>
- Borrás, S., & Laatsit, M. (2019). Towards system-oriented innovation policy evaluation? Evidence from EU28 member states. *Research Policy, 48*(1), 312–321. <https://doi.org/10.1016/j.respol.2018.08.020>
- Bozeman, B., Fay, D., & Slade, C. P. (2013). Research collaboration in universities and academic entrepreneurship: The-state-of-the-art. *The Journal of Technology Transfer, 38*(1), 1-67. <https://doi.org/10.1007/s10961-012-9281-8>
- Brav, A., Jiang, W., Ma, S., & Tian, X. (2018). How does hedge fund activism reshape corporate innovation? *Journal of Financial Economics, 130*(2), 237–264. <https://doi.org/10.1016/j.jfineco.2018.06.012>
- Breznitz, D., & Ornston, D. (2018). The politics of partial success: Fostering innovation in innovation policy in an era of heightened public scrutiny. *Socio-Economic Review, 16*(4), 721–741. <https://doi.org/10.1093/ser/mww018>
- Brown, E., Campbell, B., Cloke, J., To, L. S., Turner, B., & Wray, A. (2018). Low carbon energy and international development: From research impact to policymaking. *Contemporary Social Science, 13*(1), 112–127. <https://doi.org/10.1080/21582041.2017.1417627>
- Bumpus, A. G. (2015). Firm responses to a carbon price: Corporate decision making under British Columbia's carbon tax. *Climate Policy, 15*(4), 475–493. <https://doi.org/10.1080/14693062.2014.937389>
- Busom, I., Corchuelo, B., & Martínez-Ros, E. (2014). Tax incentives... or subsidies for business R&D? *Small Business Economics, 43*(3), 571-596. <https://doi.org/10.1007/s11187-014-9569-1>
- Calo, A. (2018). How knowledge deficit interventions fail to resolve beginning farmer challenges. *Agriculture and Human Values, 35*(2), 367–381. <https://doi.org/10.1007/s10460-017-9832-6>
- Campos, F., Coville, A., Fernandes, A. M., Goldstein, M., & McKenzie, D. (2014). Learning from the experiments that never happened: Lessons from trying to conduct randomized evaluations of matching grant programs in Africa. *Journal of the Japanese and International Economies, 33*, 4–24. <https://doi.org/10.1016/j.jjie.2013.12.007>
- Cantner, U., & Kösters, S. (2012). Picking the winner? Empirical evidence on the targeting of R&D subsidies to start-ups. *Small Business Economics, 39*(4), 921–936. <https://doi.org/10.1007/s11187-011-9340-9>
- Catulli, M., & Fryer, E. (2012). Information and communication technology-enabled low carbon technologies: A new subsector of the economy?

- Journal of Industrial Ecology*, 16(3), 296–301. <https://doi.org/10.1111/j.1530-9290.2011.00452.x>
- Chakma, J., Masum, H., & Singer, P. A. (2010). Can incubators work in Africa? Acorn Technologies and the entrepreneur-centric model. *BMC International Health and Human Rights*, 10(1), S7. <https://doi.org/10.1186/1472-698X-10-S1-S7>
- Chang, H.-C., & Tsai, C.-L. (2016). Evaluation of critical factors for the regional innovation system within the HsinChu science-based park. *Kybernetes*, 45(4), 699–716. <https://doi.org/10.1108/K-02-2015-0059>
- Chen, J. Y., Dimitrov, S., & Pun, H. (2019). The impact of government subsidy on supply Chains' sustainability innovation. *Omega*, 86, 42-58. <https://doi.org/10.1016/j.omega.2018.06.012>
- Chen, M. Y. (2011). Predicting corporate financial distress based on the integration of decision tree classification and logistic regression. *Expert Systems with Applications*, 38(9), 11261–11272. <https://doi.org/10.1016/j.eswa.2011.02.173>
- Chen, Yi., Fei, Tang., Tie-Gang, L. I., Jiu-Ming, H. E., Abliz, Z., Li-Tao, L. I. U., & Xiao-Hao, W. A. N. G. (2014). Application of factor analysis in imaging mass spectrometric data analysis. *Chinese Journal of Analytical Chemistry*, 42(8), 1099-1103. [https://doi.org/10.1016/S1872-2040\(14\)60757-X](https://doi.org/10.1016/S1872-2040(14)60757-X)
- Chirambo, D. (2018). Towards the achievement of SDG 7 in sub-Saharan Africa: Creating synergies between Power Africa, Sustainable Energy for All and climate finance in-order to achieve universal energy access before 2030. *Renewable and Sustainable Energy Reviews*, 94, 600-608. <https://doi.org/10.1016/j.rser.2018.06.025>
- Choi, S. (2012). Core-periphery, new clusters, or rising stars?: International scientific collaboration among “advanced” countries in the era of globalization. *Scientometrics*, 90(1), 25–41. <https://doi.org/10.1007/s11192-011-0509-4>
- Ciocanel, A. B., & Pavelescu, F. M. (2015). Innovation and Competitiveness in the European Context. *Procedia Economics and Finance*, 32(15), 728–737. [https://doi.org/10.1016/s2212-5671\(15\)01455-0](https://doi.org/10.1016/s2212-5671(15)01455-0)
- Ciulli, F., & Kolk, A. (2019). Incumbents and business model innovation for the sharing economy: Implications for sustainability. *Journal of Cleaner Production*, 214, 995–1010. <https://doi.org/10.1016/j.jclepro.2018.12.295>
- Clarysse, B., Wright, M., Bruneel, J., & Mahajan, A. (2014). Creating value in ecosystems: Crossing the chasm between knowledge and business ecosystems. *Research Policy*, 43(7), 1164–1176. <https://doi.org/10.1016/j.respol.2014.04.014>
- Collewaert, V., Manigart, S., & Aernoudt, R. (2010). Assessment of government funding of business angel networks in Flanders. *Regional Studies*, 44(1), 119–130. <https://doi.org/10.1080/00343400802070860>
- Concilio, G., Molinari, F., & Morelli, N. (2017, May). Empowering citizens with open data by urban hackathons. In *2017 Conference for E-Democracy*

- and Open Government (CeDEM)* (pp. 125-134). IEEE. <https://doi.org/10.1109/CeDEM.2017.28>
- Cooke, P. (2004). Life sciences clusters and regional science policy. *Urban Studies*, 41(5–6), 1113–1131. <https://doi.org/10.1080/00420980410001675814>
- Costa, S., Laureano, L. M. S., & Laureano, R. M. S. (2014). The debt maturity of Portuguese SMEs: The aftermath of the 2008 financial crisis. *Procedia - Social and Behavioral Sciences*, 150, 172–181. <https://doi.org/10.1016/j.sbspro.2014.09.024>
- Cozzarin, B. P. (2008). Data and the measurement of R&D program impacts. *Evaluation and Program Planning*, 31(3), 284–298. <https://doi.org/10.1016/j.evalprogplan.2008.03.004>
- Crudu, R. (2019). The role of innovative entrepreneurship in the economic development of EU member countries. *Journal of Entrepreneurship, Management and Innovation*, 15(1), 35–60. <https://doi.org/10.7341/20191512>
- Cumming, D. J., & Fischer, E. (2012). Publicly funded business advisory services and entrepreneurial outcomes. *Research Policy*, 41(2), 467–481. <https://doi.org/10.1016/j.respol.2011.09.004>
- Cumming, D., Johan, S., & Zhang, M. (2014). The economic impact of entrepreneurship: Comparing international datasets. *Corporate Governance: An International Review*, 22(2), 162–178. <https://doi.org/10.1111/corg.12058>
- Czarnitzki, D., & Lopes-Bento, C. (2014). Innovation subsidies: Does the funding source matter for innovation intensity and performance? Empirical evidence from Germany. *Industry and Innovation*, 21(5), 380–409. <https://doi.org/10.1080/13662716.2014.973246>
- Das, B., Hui, X., & Sha, S. J. (2018). Investment policies that support SME self-development. *Human Systems Management*, 37(1), 15–25. <https://doi.org/10.3233/HSM-17131>
- De Laurentis, C. (2012). Renewable energy innovation and governance in Wales: A regional innovation system approach. *European Planning Studies*, 20(12), 1975–1996. <https://doi.org/10.1080/09654313.2012.665041>
- De Lucia, C., Balena, P., Stufano Melone, M. R., & Borri, D. (2016). Policy, entrepreneurship, creativity, and sustainability: The case of ‘Principi Attivi’ (‘Active Ingredients’) in the Apulia Region (Southern Italy). *Journal of Cleaner Production*, 135, 1461–1473. <https://doi.org/10.1016/j.jclepro.2016.06.068>
- Diéguez-Soto, J., Garrido-Moreno, A., & Manzanque, M. (2018). Unraveling the link between process innovation inputs and outputs: The moderating role of family management. *Journal of Family Business Strategy*, 9(2), 114–127. <https://doi.org/10.1016/j.jfbs.2017.11.007>
- Dimitrova, R. (2013). Growth in the intersection of eHealth and active and healthy aging. *Technology and Health Care*, 21(2), 169–172. <https://doi.org/10.3233/THC-130727>

- Distanont, A., & Khongmalai, O. (2018). The role of innovation in creating a competitive advantage. *Kasetsart Journal of Social Sciences*, 1–7. <https://doi.org/10.1016/j.kjss.2018.07.009>
- Divisekera, S., & Nguyen, V. K. (2018). Determinants of innovation in tourism evidence from Australia. *Tourism Management*, 67, 157–167. <https://doi.org/10.1016/j.tourman.2018.01.010>
- Dodescu, A., & Chirilă, L. F. (2013). Regional innovation governance in the context of European integration and multi-level governance challenges. A case study of North-West region of Romania. *Procedia Economics and Finance*, 3(12), 1177–1184. [https://doi.org/10.1016/s2212-5671\(12\)00293-6](https://doi.org/10.1016/s2212-5671(12)00293-6)
- Domingo, A. M., & Soriano, R. (2014). The level of innovation among young innovative companies : The impacts of knowledge-intensive services use, firm characteristics, and the entrepreneur attributes. *Service Business*, 8(51), 51-63. <https://doi.org/10.1007/s11628-013-0186-x>
- Driver, C., & Muñoz-Bugarin, J. (2019). Financial constraints on investment: Effects of firm size and the financial crisis. *Research in International Business and Finance*, 47, 441–457. <https://doi.org/10.1016/j.ribaf.2018.09.006>
- Dvouletý, O., Longo, M. C., Blažková, I., Lukeš, M., & Andera, M. (2018). Are publicly funded Czech incubators effective? The comparison of the performance of supported and non-supported firms. *European Journal of Innovation Management*, 21(4), 543–563. <https://doi.org/10.1108/EJIM-02-2018-0043>
- Dziallas, M., & Blind, K. (2019). Innovation indicators throughout the innovation process: An extensive literature analysis. *Technovation*, 80, 3-29. <https://doi.org/10.1016/j.technovation.2018.05.005>
- Džupka, P., Klasová, S., & Kováč, V. (2016). Analysis of innovative start-up companies – Case of Košice region. *Quality Innovation Prosperity*, 20(1), 40–56. <https://doi.org/10.12776/QIP.V20I1.641>
- Edoho, F. M. (2016). Entrepreneurship paradigm in the new millennium. *Journal of Entrepreneurship in Emerging Economies*, 8(2), 279–294. <https://doi.org/10.1108/jeeee-08-2015-0043>
- Edwards-Schachter, M. (2018). The nature and variety of innovation. *International Journal of Innovation Studies*, 2(2), 65–79. <https://doi.org/10.1016/j.ijis.2018.08.004>
- Elnasri, A., & Fox, K. J. (2017). The contribution of research and innovation to productivity. *Journal of Productivity Analysis*, 47(3), 291–308. <https://doi.org/10.1007/s11123-017-0503-9>
- Elston, J. A., & Audretsch, D. B. (2011). Financing the entrepreneurial decision: An empirical approach using experimental data on risk attitudes. *Small Business Economics*, 36(2), 209–222. <https://doi.org/10.1007/s11187-009-9210-x>
- Engel, D., Rothgang, M., & Eckl, V. (2016). Systemic aspects of R&D policy subsidies for R&D collaborations and their effects on private R&D.

- Industry and Innovation*, 23(2), 206–222. <https://doi.org/10.1080/13662716.2016.1146127>
- Etzkowitz, H., & Etzkowitz, A. (2015). Europe of the future and the future of Europe: The innovation/austerity choice. *Industry and Higher Education*, 29(2), 83–88. <https://doi.org/10.5367/ihe.2015.0250>
- Evens, R., & Kaitin, K. (2015). The evolution of biotechnology and its impact on health care. *Health Affairs*, 34(2), 210–219. <https://doi.org/10.1377/hlthaff.2014.1023>
- Fernández-Sastre, J., & Montalvo-Quizhpi, F. (2019). The effect of developing countries' innovation policies on firms' decisions to invest in R&D. *Technological Forecasting and Social Change*, 143, 214–223. <https://doi.org/10.1016/j.techfore.2019.02.006>
- Ferreira, F. A. (2018). Mapping the field of arts-based management: Bibliographic coupling and co-citation analyses. *Journal of Business Research*, 85, 348–357. <https://doi.org/10.1016/j.jbusres.2017.03.026>
- Finardi, U. (2014). Scientific collaboration between BRICS countries. *Scientometrics*, 102(2), 1139–1166. <https://doi.org/10.1007/s11192-014-1490-5>
- Fiore, M., Silvestri, R., Contò, F., & Pellegrini, G. (2017). Understanding the relationship between green approach and marketing innovations tools in the wine sector. *Journal of Cleaner Production*, 142, 4085–4091. <https://doi.org/10.1016/j.jclepro.2016.10.026>
- Fogg, H. (2012). Tracing the links between absorptive capacity, university knowledge exchange, and competitive advantage in SMEs. *The International Journal of Entrepreneurship and Innovation*, 13(1), 35–44. <https://doi.org/10.5367/ijei.2012.0061>
- Frenkel, A., Shefer, D., & Miller, M. (2008). Public versus private technological incubator programmes: Privatizing the technological incubators in Israel. *European Planning Studies*, 16(2), 189–210. <https://doi.org/10.1080/09654310701814504>
- Fundeanu, D. D., & Badele, C. S. (2014). The Impact of regional innovative clusters on competitiveness. *Procedia - Social and Behavioral Sciences*, 124, 405–414. <https://doi.org/10.1016/j.sbspro.2014.02.502>
- Garfield, E. (2001). From Bibliographic Coupling to Co-citation Analysis via Algorithmic Historio-ibliography. Philadelphia: Drexel University.
- Gault, F. (2018). Defining and measuring innovation in all sectors of the economy. *Research Policy*, 47(3), 617–622. <https://doi.org/10.1016/j.respol.2018.01.007>
- Gava, O., Favilli, E., Bartolini, F., & Brunori, G. (2017). Knowledge networks and their role in shaping the relations within the agricultural knowledge and innovation system in the agro energy sector. The case of biogas in Tuscany (Italy). *Journal of Rural Studies*, 56, 100–113. <https://doi.org/10.1016/j.jrurstud.2017.09.009>

- Geissdoerfer, M., Vladimirova, D., & Evans, S. (2018). Sustainable business model innovation: A review. *Journal of Cleaner Production*, 198, 401–416. <https://doi.org/10.1016/j.jclepro.2018.06.240>
- Ghuri, P. N., & Rao, P. M. (2009). Intellectual property, pharmaceutical MNEs, and the developing world. *Journal of World Business*, 44(2), 206–215. <https://doi.org/10.1016/j.jwb.2008.05.008>
- Gill, D. E. (2015). Consolidating the gains. *Venture Capital*, 17(1–2), 43–58. <https://doi.org/10.1080/13691066.2015.1021029>
- Gilmore, A., & Comunian, R. (2016). Beyond the campus: Higher education, cultural policy, and the creative economy. *International Journal of Cultural Policy*, 22(1), 1–9. <https://doi.org/10.1080/10286632.2015.1101089>
- Goldfarb, B., & Henrekson, M. (2003). Bottom-up versus top-down policies towards the commercialization of university intellectual property. *Research Policy*, 32(4), 639–658. [https://doi.org/10.1016/S0048-7333\(02\)00034-3](https://doi.org/10.1016/S0048-7333(02)00034-3)
- Gorraiz, J., Reimann, R., & Gumpenberger, C. (2012). Key factors and considerations in the assessment of international collaboration: A case study for Austria and six countries. *Scientometrics*, 91(2), 417–433. <https://doi.org/10.1007/s11192-011-0579-3>
- Greenhalgh, T., Ovsieiko, P. V., Fahy, N., Shaw, S., Kerr, P., Rushforth, A. D., ... Kiparoglou, V. (2017). Maximizing value from a United Kingdom Biomedical Research Centre: Study protocol. *Health Research Policy and Systems*, 15(1), 70. <https://doi.org/10.1186/s12961-017-0237-1>
- Gupta, S., Malhotra, N. K., Czinkota, M., & Foroudi, P. (2016). Marketing innovation: A consequence of competitiveness. *Journal of Business Research*, 69(12), 5671–5681. <https://doi.org/10.1016/j.jbusres.2016.02.042>
- Gurzawska, A., Mäkinen, M., & Brey, P. (2017). Implementation of Responsible Research and Innovation (RRI) practices in industry: Providing the right incentives. *Sustainability*, 9(10), 1759. <https://doi.org/10.3390/su9101759>
- Talab, A. H., Scholten, V., & van Beers, C. (2018). The role of universities in inter-organizational knowledge collaborations. *Journal of the Knowledge Economy*, 1-21. <https://doi.org/10.1007/s13132-018-0545-x>
- Hamelink, M., & Opdenakker, R. (2019). How business model innovation affects firm performance in the energy storage market. *Renewable Energy*, 131, 120-127. <https://doi.org/10.1016/j.renene.2018.07.051>
- Hannigan, T. R., Seidel, V. P., & Yakis-Douglas, B. (2018). Product innovation rumors as forms of open innovation. *Research Policy*, 47(5), 953–964. <https://doi.org/10.1016/j.respol.2018.02.018>
- Hartley, J., & Montgomery, L. (2009). Creative industries come to China (MATE). *Chinese Journal of Communication*, 2(1), 1–12. <https://doi.org/10.1080/17544750802638798>

- Hauser, O. P., Linos, E., & Rogers, T. (2017). Innovation with field experiments: Studying organizational behaviors in actual organizations. *Research in Organizational Behavior*, 37, 185–198. <https://doi.org/10.1016/j.riob.2017.10.004>
- Heimonen, T. (2012). What are the factors that affect innovation in growing SMEs? *European Journal of Innovation Management*, 15(1), 122–144. <https://doi.org/10.1108/14601061211192861>
- Hellström, T., & Jacob, M. (2005). Taming unruly science and saving national competitiveness: Discourses on science by Sweden's strategic research bodies. *Science Technology and Human Values*, 30(4), 443–467. <https://doi.org/10.1177/0162243905276504>
- Hemphill, T. A. (2013). POLICY DEBATE: The Obama innovation strategy: How will it influence U.S. business innovation and R & D management? *Innovation: Management, Policy, and Practice*, 15(3), 260–270. <https://doi.org/10.5172/impp.2013.15.3.260>
- Henrekson, M., & Sanandaji, T. (2018). Stock option taxation and venture capital activity: A cross-country study. *Venture Capital*, 20(1), 51–71. <https://doi.org/10.1080/13691066.2017.1400159>
- Hermans, F., Geerling-Eiff, F., Potters, J., & Klerkx, L. (2019). Public-private partnerships as systemic agricultural innovation policy instruments—Assessing their contribution to innovation system function dynamics. *NJAS-Wageningen Journal of Life Sciences*, 88, 76–95. <https://doi.org/10.1016/j.njas.2018.10.001>
- Heshmati, A. (2015). The effect of credit guarantees on SMEs' R&D investments in Korea. *Asian Journal of Technology Innovation*, 23(3), 407–421. <https://doi.org/10.1080/19761597.2015.1131955>
- Hjalager, A. M. (2009). Cultural tourism innovation systems - the Roskilde festival. *Scandinavian Journal of Hospitality and Tourism*, 9(2–3), 266–287. <https://doi.org/10.1080/15022250903034406>
- Holm, E. J. Van. (2015). Makerspaces and contributions to entrepreneurship. *Procedia - Social and Behavioral Sciences*, 195, 24–31. <https://doi.org/10.1016/j.sbspro.2015.06.167>
- Hoppe, T., & Sanders, P. T. M. (2014). Agricultural green gas demonstration projects in the Netherlands. A stakeholder analysis. *Environmental Engineering and Management Journal*, 13(12), 3083–3096. <https://doi.org/10.30638/eemj.2014.347>
- Hunt, W., Birch, C., Vanclay, F., & Coutts, J. (2014). Recommendations arising from an analysis of changes to the Australian agricultural research, development, and extension system. *Food Policy*, 44, 129–141. <https://doi.org/10.1016/j.foodpol.2013.11.007>
- Jaekel, M., Wallin, A., & Isomursu, M. (2015). Guiding networked innovation projects towards commercial success—a case study of an EU innovation programme with implications for targeted open innovation. *Journal of the Knowledge Economy*, 6(3), 625–639. <https://doi.org/10.1007/s13132-015-0274-3>

- Jarneving, B. (2007). Complete graphs and bibliographic coupling: A test of the applicability of bibliographic coupling for the identification of cognitive cores on the field level. *Journal of Informetrics*, 1(4), 338–356. <https://doi.org/10.1016/j.joi.2007.08.001>
- Jordan, N. D., Lemken, T., & Liedtke, C. (2014). Barriers to resource efficiency innovations and opportunities for smart regulations-the case of Germany. *Environmental Policy and Governance*, 24(5), 307–323. <https://doi.org/10.1002/eet.1632>
- Jr., W. W. C., & Paolucci, E. (2004). Commercial development of environmental technologies for the automotive industry towards a new model of technological innovation. *International Journal of Technology Management*, 21(5/6), 565. <https://doi.org/10.1504/ijtm.2001.002935>
- Kahn, K. B. (2018). Understanding innovation. *Business Horizons*, 61(3), 453–460. <https://doi.org/10.1016/j.bushor.2018.01.011>
- Kalisz, D. E., & Aluchna, M. (2012). Research and innovations redefined. Perspectives on European Union initiatives and strategic choices on Horizon 2020. *European Integration Studies*, (6), 140-149. <https://doi.org/10.5755/j01.eis.0.6.1426>
- Kasa, S., & Underthun, A. (2010). Navigation in new terrain with familiar maps: Masterminding socio-spatial equality through resource-oriented innovation policy. *Environment and Planning A*, 42(6), 1328–1345. <https://doi.org/10.1068/a4226>
- Kenney, M., & Patton, D. (2018). Sub-national technology policy and commerce: Evaluating the impacts of the California Institute for Regenerative Medicine. *Journal of Technology Transfer*, 43(1), 47–68. <https://doi.org/10.1007/s10961-017-9580-1>
- Kessler, M. M. (1963). An experimental study of bibliographic coupling between technical papers. *IEEE Transactions on Information Theory*, 9(1), 49–51. <https://doi.org/10.1109/TIT.1963.1057800>
- Kim, K. W. (2006). Measuring international research collaboration of peripheral countries: Taking the context into consideration. *Scientometrics*, 66(2), 231–240. <https://doi.org/10.1007/s11192-006-0017-0>
- Kim, Y., Lim, H. J., & Lee, S. J. (2014). Applying research collaboration as a new way of measuring research performance in Korean universities. *Scientometrics*, 99(1), 97–115. <https://doi.org/10.1007/s11192-013-1095-4>
- Klerkx, L., & Leeuwis, C. (2008). Balancing multiple interests: Embedding innovation intermediation in the agricultural knowledge infrastructure. *Technovation*, 28(6), 364–378. <https://doi.org/10.1016/j.technovation.2007.05.005>
- Kolesnyk, M. Y. (2017). Analysis of innovation indicators of European countries and Ukraine. *Marketing and Management of Innovations*, (2), 172–181. <https://doi.org/10.21272/mmi.2017.2-16>
- Kolk, A. (2015). The role of international business in clean technology transfer and development. *Climate Policy*, 15(1), 170–176. <https://doi.org/10.1080/14693062.2013.772357>

- Kolympiris, C., Kalaitzandonakes, N., & Miller, D. (2014). Public funds and local biotechnology firm creation. *Research Policy*, *43*(1), 121–137. <https://doi.org/10.1016/j.respol.2013.07.012>
- Lanahan, L. (2016). Multilevel public funding for small business innovation: A review of US state SBIR match programs. *Journal of Technology Transfer*, *41*(2), 220–249. <https://doi.org/10.1007/s10961-015-9407-x>
- Lazonick, W., & Tulum, Ö. (2011). US biopharmaceutical finance and the sustainability of the biotech business model. *Research Policy*, *40*(9), 1170–1187. <https://doi.org/10.1016/j.respol.2011.05.021>
- Lin, J. Y. (2017). Balancing industry collaboration and academic innovation: The contingent role of collaboration-specific attributes. *Technological Forecasting and Social Change*, *123*, 216–228. <https://doi.org/10.1016/j.techfore.2016.03.016>
- Lindberg, M., Danilda, I., & Torstensson, B. M. (2012). Women resource centres-A creative knowledge environment of Quadruple Helix. *Journal of the Knowledge Economy*, *3*(1), 36–52. <https://doi.org/10.1007/s13132-011-0053-8>
- Link, A. N., & Scott, J. T. (2010). Government as an entrepreneur : Evaluating the commercialization success of SBIR. *Research Policy*, *39*(5), 589–601. <https://doi.org/10.1016/j.respol.2010.02.006>
- Link, A. N., & Wright, M. (2015). On the failure of R and D projects. *IEEE Transactions on Engineering Management*, *62*(4), 442–448. <https://doi.org/10.1109/TEM.2015.2404873>
- Löfsten, H., & Lindelöf, P. (2003). Determinants for an entrepreneurial milieu: Science Parks and business policy in growing firms. *Technovation*, *23*(1), 51–64. [https://doi.org/10.1016/S0166-4972\(01\)00086-4](https://doi.org/10.1016/S0166-4972(01)00086-4)
- Lopez-Berzosa, D., & Gawer, A. (2014). Innovation policy within private collectives: Evidence on 3GPP's regulation mechanisms to facilitate collective innovation. *Technovation*, *34*(12), 734–745. <https://doi.org/10.1016/j.technovation.2014.07.005>
- Luukkonen, T., Deschryvere, M., & Bertoni, F. (2013a). The value added by government venture capital funds compared with independent venture capital funds. *Technovation*, *33*(4–5), 154–162. <https://doi.org/10.1016/j.technovation.2012.11.007>
- Lynch, N., Lenihan, H., & Hart, M. (2009). Developing a framework to evaluate business networks: The case of Ireland's industry-led network initiative. *Policy Studies*, *30*(2), 163–180. <https://doi.org/10.1080/01442870902723683>
- Lynskey, M. J. (2004). Determinants of innovative activity in Japanese technology-based start-up firms. *International Small Business Journal*, *22*(2), 159–196. <https://doi.org/10.1177/0266242604041312>
- Makkonen, T., Williams, A. M., Weidenfeld, A., & Kaisto, V. (2018). Cross-border knowledge transfer and innovation in the European neighborhood: Tourism cooperation at the Finnish-Russian border. *Tourism Management*, *68*, 140–151. <https://doi.org/10.1016/j.tourman.2018.03.008>

- Malen, J., & Marcus, A. A. (2017). Promoting clean energy technology entrepreneurship: The role of external context. *Energy Policy*, *102*, 7-15. <https://doi.org/10.1016/j.enpol.2016.11.045>
- Mamonov, S., & Malaga, R. (2018). Success factors in Title III equity crowdfunding in the United States. *Electronic Commerce Research and Applications*, *27*, 65–73. <https://doi.org/10.1016/j.elerap.2017.12.001>
- McAdam, R., Miller, K., McAdam, M., & Teague, S. (2012). The development of University Technology Transfer stakeholder relationships at a regional level: Lessons for the future. *Technovation*, *32*(1), 57–67. <https://doi.org/10.1016/j.technovation.2011.08.001>
- Meissner, D., Cervantes, M., & Kratzer, J. (2018). Enhancing university-industry linkages potentials and limitations of government policies. *International Journal of Technology Management*, *78*(1-2), 147-162. <https://doi.org/10.1504/IJTM.2018.093944>
- Mendes, S., Serrasqueiro, Z., & Nunes, P. M. (2014). Investment determinants of young and old Portuguese SMEs: A quantile approach. *BRQ Business Research Quarterly*, *17*(4), 279–291. <https://doi.org/10.1016/j.brq.2013.03.001>
- Minshall, T., Kouris, S., Mortara, L., Schmithausen, P., & Weiss, D. (2014). Developing infrastructure to support open innovation: Case studies from the east of England. *International Journal of Innovation and Technology Management*, *11*(01), 1440006. <https://doi.org/10.1142/s0219877014400069>
- Möldner, A. K., Garza-Reyes, J. A., & Kumar, V. (2020). Exploring lean manufacturing practices' influence on process innovation performance. *Journal of Business Research*, *106*, 233-249. <https://doi.org/10.1016/j.jbusres.2018.09.002>
- Moreton, S. (2016). Rethinking 'knowledge exchange': New approaches to collaborative work in the arts and humanities. *International Journal of Cultural Policy*, *22*(1), 100–115. <https://doi.org/10.1080/10286632.2015.1101081>
- Al-Mubarak, H.M., Muhammad, A.H., & Busler, M. (2015). Categories of incubator success: A case study of three New York incubator programmes. *World Journal of Science, Technology and Sustainable Development*, *12*(1), 2-12. <https://doi.org/10.1108/WJSTSD-06-2014-0006>
- Murray, G. C. (1998). A policy response to regional disparities in the supply of risk capital to new technology-based firms in the European Union: The European Seed Capital Fund Scheme. *Regional Studies*, *32*(5), 405–419. <https://doi.org/10.1080/00343409850116817>
- Muscio, A., & Nardone, G. (2012). The determinants of university-industry collaboration in food science in Italy. *Food Policy*, *37*(6), 710–718. <https://doi.org/10.1016/j.foodpol.2012.07.003>
- Nelson, R. R. (1995). Why should managers be thinking about technology policy? *Strategic Management Journal*, *16*(8), 581–588. <https://doi.org/10.1002/smj.4250160802>

- North, D., Baldock, R., & Ullah, F. (2013). Funding the growth of UK technology-based small firms since the financial crash: Are there breakages in the finance escalator? *Venture Capital*, 15(3), 237–260. <https://doi.org/10.1080/13691066.2013.804755>
- Olson, E., & Young, A. T. (2016). Discretionary monetary policy, quantitative easing, and the decline in US labor share. *Economics and Business Letters*, 4(2), 63. <https://doi.org/10.17811/ebl.4.2.2015.63-78>
- Ortiz-Villajos, J. M., & Sotoca, S. (2018). Innovation and business survival: A long-term approach. *Research Policy*, 47(8), 1418–1436. <https://doi.org/10.1016/j.respol.2018.04.019>
- Owen, R., Brennan, G., & Lyon, F. (2018). Enabling investment for the transition to a low carbon economy: government policy to finance early-stage green innovation. *Current Opinion in Environmental Sustainability*, 31, 137–145. <https://doi.org/10.1016/j.cosust.2018.03.004>
- Padilla-Ospina, A. M., Medina-Vásquez, J. E., & Rivera-Godoy, J. A. (2018). Financing innovation: A bibliometric analysis of the field. *Journal of Business and Finance Librarianship*, 23(1), 63–102. <https://doi.org/10.1080/08963568.2018.1448678>
- Parvizi, N., & Parvizi, S. (2017). New health technologies: A UK perspective comment on “Providing Value to New Health Technology: The Early Contribution of Entrepreneurs, Investors, and Regulatory Agencies.” *International Journal of Health Policy and Management*, 6(12), 721–722. <https://doi.org/10.15171/ijhpm.2017.59>
- Paunov, C. (2012). The global crisis and firms’ investments in innovation. *Research Policy*, 41(1), 24–35. <https://doi.org/10.1016/j.respol.2011.07.007>
- Pavitt, K. (1998). The inevitable limits of EU R&D funding. *Research Policy*, 27(6), 559–568. [https://doi.org/10.1016/S0048-7333\(98\)00056-0](https://doi.org/10.1016/S0048-7333(98)00056-0)
- Pelikánová, R. M. (2019). R&D expenditure and innovation in the EU and selected member states. *Journal of Entrepreneurship, Management, and Innovation*, 15(1), 13–34. <https://doi.org/10.7341/20191511>
- Perampaladas, K., Masum, H., Kapoor, A., Shah, R., Daar, A. S., & Singer, P. A. (2010). The road to commercialization in Africa: Lessons from developing the sickle-cell drug Niprisan. *BMC International Health and Human Rights*, 10(1), S11. <https://doi.org/10.1186/1472-698X-10-S11>
- Pergelova, A., & Angulo-Ruiz, F. (2014). The impact of government financial support on the performance of new firms: The role of competitive advantage as an intermediate outcome. *Entrepreneurship and Regional Development*, 26(9–10), 663–705. <https://doi.org/10.1080/08985626.2014.980757>
- Petrescu, A. S. (2009). Science and technology for economic growth. New insights from when the data contradicts desktop models. *Review of Policy Research*, 26(6), 839–880. <https://doi.org/10.1111/j.1541-1338.2009.00420.x>
- Pieroni, M. P. P., McAloone, T. C., & Pigosso, D. C. A. (2019). Business model innovation for circular economy and sustainability: A review of

- approaches. *Journal of Cleaner Production*, 215, 198–216. <https://doi.org/10.1016/j.jclepro.2019.01.036>
- Pike, M. A. (2010). Transaction and transformation at trinity: Private sponsorship, core values, and Christian ethos at England's most improved academy. *Oxford Review of Education*, 36(6), 749–765. <https://doi.org/10.1080/03054985.2010.510625>
- Pollman, E., & Barry, J. M. (2016). Regulatory entrepreneurship. *Southern California Law Review*, 90, 383. <https://doi.org/10.2139/ssrn.2741987>
- Prajogo, D. I. (2016). The strategic fit between innovation strategies and the business environment in delivering business performance. *International Journal of Production Economics*, 171, 241–249. <https://doi.org/10.1016/j.ijpe.2015.07.037>
- Matlay, H., Rae, D., Martin, L., Antcliff, V., & Hannon, P. (2012). Enterprise and entrepreneurship in English higher education: 2010 and beyond. *Journal of Small Business and Enterprise Development*. <https://doi.org/10.1177/0266242607080656>
- Ratten, V., Ferreira, J., & Fernandes, C. (2016). Entrepreneurial and network knowledge in emerging economies. *Review of International Business and Strategy*, 26(3), 392–409. <https://doi.org/10.1108/ribs-11-2015-0076>
- Hrdy, C. A. (2015). Commercialization Awards. *Wis. L. Rev.*, 13. https://www.law.berkeley.edu/files/Hrdy_Camilla_IPSC_paper_2014.pdf
- Reficco, E., & Gutiérrez, R. (2016). Organizational ambidexterity and the elusive quest for successful implementation of BoP ventures. *Organization and Environment*, 29(4), 461–485. <https://doi.org/10.1177/1086026616643136>
- Rizos, V., Behrens, A., Van der Gaast, W., Hofman, E., Ioannou, A., Kafyke, T., ... & Topi, C. (2016). Implementation of circular economy business models by small and medium-sized enterprises (SMEs): Barriers and enablers. *Sustainability*, 8(11), 1212. <https://doi.org/10.3390/su8111212>
- Rosli, A., & Rossi, F. (2016). Third-mission policy goals and incentives from performance-based funding: Are they aligned? *Research Evaluation*, 25(4), 427–441. <https://doi.org/10.1093/reseval/rvw012>
- Rószkiewicz, M. (2014). On the influence of science funding policies on business sector R&D activity. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 9(3), 9-26. <https://www.cceol.com/search/article-detail?id=50143>
- Jefferson, G. H., Huamao, B., Xiaojing, G., & Xiaoyun, Y. (2006). R&D performance in the Chinese industry. *Economics of Innovation and New Technology*, 15(4-5), 345-366. <https://doi.org/10.1080/10438590500512851>
- Rubach, S. (2013). Collaborative regional innovation initiatives: A booster for local company innovation processes? *Systemic Practice and Action Research*, 26(1), 3–21. <https://doi.org/10.1007/s11213-012-9270-8>
- Sá, C. M., Kretz, A., & Sigurdson, K. (2013). Accountability, performance assessment, and evaluation: Policy pressures and responses from

- research councils. *Research Evaluation*, 22(2), 105–117. <https://doi.org/10.1093/reseval/rvs041>
- Sabri, Y., Micheli, G. J., & Nuur, C. (2018). Exploring the impact of innovation implementation on supply chain configuration. *Journal of Engineering and Technology Management*, 49, 60–75. <https://doi.org/10.1016/j.jengtecman.2018.06.001>
- Samford, S., Warriar, P., & Goracinova, E. (2017). Public and private goods in the development of additive manufacturing capacity. *Business and Politics*, 19(03), 482–509. <https://doi.org/10.1017/bap.2017.4>
- Seppo, M., Rõigas, K., & Varblane, U. (2014). Governmental support measures for university-industry cooperation-comparative view in Europe. *Journal of the Knowledge Economy*, 5(2), 388–408. <https://doi.org/10.1007/s13132-014-0193-8>
- Shapira, P., & Wang, J. (2009). From lab to market? Strategies and issues in the commercialization of nanotechnology in China. *Asian Business and Management*, 8(4), 461–489. <https://doi.org/10.1057/abm.2009.15>
- Sisko Patana, A., Pihlajamaa, M., Polvinen, K., Kanto, L., & Carleton, T. (2013). Inducement and blocking mechanisms in the Finnish life sciences innovation system. *Foresight*, 15(6), 428–445. <https://doi.org/10.1108/FS-10-2012-0081>
- Sjøvaag, H., & Krumsvik, A. H. (2017). In search of journalism funding. *Journalism Practice*, 12(9), 1201–1219. <https://doi.org/10.1080/17512786.2017.1370972>
- Small, H. G., & Koenig, M. E. (1977). Journal clustering using a bibliographic coupling method. *Information Processing & Management*, 13(5), 277–288. [https://doi.org/10.1016/0306-4573\(77\)90017-6](https://doi.org/10.1016/0306-4573(77)90017-6)
- Sofouli, E., & Vonortas, Æ. N. S. (2007). S & T Parks and business incubators in middle-sized countries: The case of Greece, 525–544. <https://doi.org/10.1007/s10961-005-6031-1>
- Stawasz, E. (2019). Factors that shape the competitiveness of small innovative companies operating in international markets with a particular focus on business advice, *Journal of Entrepreneurship, Management and Innovation*, 15(1), 61–82. <https://doi.org/10.7341/20191513>
- Strähle, M., Raats, M. M., Neresini, F., Newton, R., Ortega, S., Coutinho, D., ... de Boer, A. (2016). The framing of innovation among European research funding actors: Assessing the potential for ‘responsible research and innovation’ in the food and health domain. *Food Policy*, 62, 78–87. <https://doi.org/10.1016/j.foodpol.2016.04.004>
- Tamásy, C. (2007). Rethinking technology-oriented business incubators: Developing a robust policy instrument for entrepreneurship, innovation, and regional development?. *Growth and Change*, 38(3), 460–473. <https://doi.org/10.1111/j.1468-2257.2007.00379.x>
- Tan, L. M., Hock, E. L. P., & Tang, C. F. (2018). Finance & Economics Readings. <https://doi.org/10.1007/978-981-10-8147-7>

- Tang, M., Baskaran, A., Pancholi, J., & Lu, Y. (2013). Technology business incubators in China and India: A comparative analysis. *Journal of Global Information Technology Management*, 16(2), 33–58. <https://doi.org/10.1080/1097198X.2013.10845635>
- Ton, G., Klerkx, L., de Grip, K., & Rau, M. L. (2015). Innovation grants to smallholder farmers: Revisiting the key assumptions in the impact pathways. *Food Policy*, 51, 9–23. <https://doi.org/10.1016/j.foodpol.2014.11.002>
- Toole, A. A., & Czarnitzki, D. (2007). Biomedical academic entrepreneurship through the SBIR program. *Journal of Economic Behavior & Organization*, 63(4), 716–738. <https://doi.org/10.1016/j.jebo.2006.05.011>
- Tsuruta, D. (2019). Working capital management during the global financial crisis: Evidence from Japan. *Japan and the World Economy*, 49, 206–219. <https://doi.org/10.1016/j.japwor.2019.01.002>
- Vence, X., & Gunti, X. (2000). Determinants of the *European Planning Studies*, 8(1). The 'Low R&D Trap,' 8(1) 29–42. <https://doi.org/10.1080/096543100110910>
- Venturini, K., & Verbano, C. (2017). Open innovation in the public sector: Resources and performance of research-based spin-offs. *Business Process Management Journal*, 23(6), 1337–1358. <https://doi.org/10.1108/BPMJ-10-2016-0208>
- Vickers, I., & North, D. (2000). Regional technology initiatives: Some insights from the English regions. *European Planning Studies*, 8(3), 301–318. <https://doi.org/10.1080/713666413>
- Walwyn, D., & Cloete, L. (2016). Universities are becoming major players in the national system of innovation. *South African Journal of Science*, 112(7-8), 1–8. <https://doi.org/10.17159/sajs.2016/20150358>
- Wang, Y., Hu, D., Li, W., Li, Y., & Li, Q. (2015). Collaboration strategies and effects on university research: Evidence from Chinese universities. *Scientometrics*, 103(2), 725–749. <https://doi.org/10.1007/s11192-015-1552-3>
- Wang, Y., Li, J., & Furman, J. L. (2017). Firm performance and state innovation funding: Evidence from China's innofund program. *Research Policy*, 46(6), 1142–1161. <https://doi.org/10.1016/j.respol.2017.05.001>
- Wang, Y., Wang, X., Chang, S., & Kang, Y. (2019). Product innovation and process innovation in a dynamic Stackelberg game. *Computers and Industrial Engineering*, 130, 395–403. <https://doi.org/10.1016/j.cie.2019.02.042>
- Weinberg, B. H. (1974). Bibliographic coupling: A review. *Information Storage and Retrieval*, 10(5-6), 189–196. [https://doi.org/10.1016/0020-0271\(74\)90058-8](https://doi.org/10.1016/0020-0271(74)90058-8)
- Welsh, D. H. B., Kaciak, E., Trimi, S., & Mainardes, E. W. (2018). Women entrepreneurs and family firm heterogeneity: Evidence from an emerging economy. *Group Decision and Negotiation*, 27(3), 445–465. <https://doi.org/10.1007/s10726-017-9544-8>

- White, S., Gao, J., & Zhang, W. (2005). Financing new ventures in China: System antecedents and institutionalization. *Research Policy, 34*(6), 894–913. <https://doi.org/10.1016/j.respol.2005.04.002>
- Winkel, M., Radcliffe, J., Skea, J., & Wang, X. (2014). Remaking the UK's energy technology innovation system: From the margins to the mainstream. *Energy Policy, 68*, 591–602. <https://doi.org/10.1016/j.enpol.2014.01.009>
- Witten, K., Carroll, P., Calder-Dawe, O., Smith, M., Field, A., & Hosking, J. (2018). Te Ara Mua—Future Streets: Knowledge exchange and the highs and lows of researcher-practitioner collaboration to design active travel infrastructure. *Journal of Transport & Health, 9*, 34–44. <https://doi.org/10.1016/j.jth.2018.03.001>
- Woolley, J. L. (2017). Origins and outcomes: The roles of spin-off founders and intellectual property in high-technology venture outcomes. *Academy of Management Discoveries, 3*(1), 64–90. <https://doi.org/10.5465/amd.2014.0138>
- Wong, D. T., & Ngai, E. W. (2019). A critical review of supply chain innovation research (1999–2016). *Industrial Marketing Management, 1–30*. <https://doi.org/10.1016/j.indmarman.2019.01.017>
- Wonglimpiyarat, J. (2016). Government policies towards Israel's high-tech powerhouse. *Technovation, 52*, 18–27. <https://doi.org/10.1016/j.technovation.2016.02.001>
- Wonglimpiyarat, J. (2018). Challenges and dynamics of FinTech crowdfunding: An innovation system approach. *Journal of High Technology Management Research, 29*(1), 98–108. <https://doi.org/10.1016/j.hitech.2018.04.009>
- Wu, Y., Popp, D., & Bretschneider, S. (2007). The effects of innovation policies on business R&D: A cross-national empirical study. *Economics of Innovation and New Technology, 16*(4), 237–253. <https://doi.org/10.1080/10438590600661939>
- Yan, M. R., Chien, K. M., Hong, L. Y., & Yang, T. N. (2018). Evaluating the collaborative ecosystem for an innovation-driven economy: A systems analysis and case study of science parks. *Sustainability, 10*(3), 887. <https://doi.org/10.3390/su10030887>
- Zanotto, S. R., Haeffner, C., & Guimarães, J. A. (2016). Unbalanced international collaboration affects adversely the usefulness of countries' scientific output as well as their technological and social impact. *Scientometrics, 109*(3), 1789–1814. <https://doi.org/10.1007/s11192-016-2126-8>
- Zhang, J., Xie, H., Li, H., Timothy, R., Pu, S., Deng, Q., & Jin, W. (2018). An integrated framework of growth management for the identification of service innovation levels and priorities. *Sustainability, 10*(9), 3319. <https://doi.org/10.3390/su10093319>
- Zhao, J., Wu, G., Xi, X., Na, Q., & Liu, W. (2018). How collaborative innovation system in a knowledge-intensive competitive alliance evolves? An empirical study on China, Korea, and Germany. *Technological Forecasting and Social Change, 137*, 128–146. <https://doi.org/10.1016/j.techfore.2018.07.001>

Other sources

[1] <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/how-we-help-clients/growth-and-innovation>

[2] https://www2.deloitte.com/content/dam/Deloitte/ie/Images/promo_images/IE_C_HCtrends2017.pdf

[3] <https://www.innosight.com/insight/creative-destruction/>

[4] <https://www.businessinsider.com/booz-and-cos-innovation-study-2011-10>

Abstrakt

W ostatniej dekadzie, badania empiryczne, koncentrujące się na innowacjach związanych z biznesem, finansowaniu działań innowacyjnych oraz polityce (implikacje), stale rosły. Nie podjęto jednak jeszcze wystarczających starań, aby zbadać istniejącą literaturę na ten temat. Aby wypełnić tę lukę, niniejsze badanie ma na celu zsyntetyzowanie i zmapowanie istniejących badań empirycznych na temat innowacji biznesowych, finansowania i ram polityki opublikowanych między 1990 a lutym 2019 r. Analizę bibliograficzną odpowiednich artykułów uzyskanych z Web of Science Core Collection przeprowadzono za pomocą Vosviewer. Wyniki bibliometryczne pokazują wybitne publikacje, autorytetów i badaczy, dominujące instytucje szkolnictwa wyższego i kraje. Wybrane artykuły poddano analizie treści, zapewniając streszczenie publikacji, przyjętą metodologię, kraj i okres badań. Artykuły zostały podzielone na różne tematy w oparciu o ukierunkowanie badania, wskazując w ten sposób obszary, które zyskały mniej lub bardziej uwagę naukową. Zidentyfikowane luki zarówno w analizie bibliograficznej, jak i treściowej oferują przyszłe możliwości badawcze w różnych aspektach dotyczących innowacji biznesowych, sposobu finansowania i powiązanych kwestii politycznych.

Słowa kluczowe: *innowacje biznesowe, finansowanie, ramy polityki, bibliometria, analiza cytowań, Scientometrics*

Biographical notes

Edmund Mallinguh (a Ph.D. candidate) is a full-time researcher in the School of Economics and Social Science at Szent István University, Hungary. He holds advanced qualifications in finance, accounting, and entrepreneurship, with his research interests revolving around these three themes. He continues to publish and co-author articles in high-quality journals and presents at international conferences. His doctoral work aims at combining his background in finance and entrepreneurship, particularly innovation, with a focus on emerging economies.

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Conflicts of interest

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Determinants of customers' adoption of mobile banking in Tanzania: Further evidence from a diffusion of innovation theory

Neema Mori¹ , Rosallia Mlambiti²

Abstract

The main goal of this study was to examine the influence of demographic factors on the adoption of innovative mobile banking services in Tanzania. It utilized Rogers' Diffusion of Innovation Theory (DIT) to ascertain the importance of situation-based demographic factors. A survey was conducted with 416 customers of a leading bank in Tanzania. The study applied self-administered questionnaires completed by the respondents who had agreed to participate. The data were analyzed using a combination of descriptive and multivariate analyses. The descriptive results revealed that the majority of respondents used mobile banking once to three times a week to check their balance, download a mini-statement, pay different bills, transfer funds from their account to a mobile telecom network, and buy airtime. The regression results further showed a positive and significant relationship between level of income and education attainment on the one hand and the adoption of mobile banking on the other. The study argues that promotional practices and awareness-raising campaigns are needed to capture the demographic profiles of customers in order to encourage them to adopt mobile banking. Theoretically, the study has shown the relevance of applying the situation-based theory to the adoption of innovative technologies as regards banking services in Tanzania. It also broadens our understanding of the importance of demographic factors that have received little attention from the dominant socio-psychological theories.

Keywords: mobile banking, Tanzania, income level, gender, age, education

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INTRODUCTION

Digitalization, increasing business competition, and innovation have revolutionized the banking services landscape, resulting in a shift from traditional face-to-face encounters to technology-based ones, thereby increasing efficiency and reducing costs (Ajide, 2016; Gosavi, 2017). This change has led to the introduction of mobile banking services, which provide an opportunity to operate virtual bank accounts and transactions through the Internet and mobile phones (Masamila, 2014; Singh & Srivastava, 2018). As this is an innovation, the adoption of it, especially in sub-Saharan Africa, has been slow. Thus, ascertaining the adoption of mobile banking, which means customers' acceptance and use of mobile terminals (Alalwan, Rana, Dwivedi, Lai, & Williams, 2015) is critical for the banking sector. Recent studies revealed that the number of customers who preferred mobile banking to incumbent forms doubled from 2008 to 2012 (Reem & Jawdat, 2018).

With the growing use of mobile phones in sub-Sahara Africa, in general, banks have the great potential to offer mobile banking services to the majority of people. However, only a few of those living in remote villages have computers connected to the Internet, and poor infrastructure does not support mobile banking (Abdinoor & Mbamba, 2017; Cruz, Neto, Gallego, & Laukkanen, 2010). However, mobile banking is advantageous as it saves time and money, is convenient, and provides customers with independence and promptness (Ajide, 2016).

The adoption of mobile banking may be related to the increased number of mobile phone and internet users (Swai, 2015), although that is not the only factor. Previous research has mainly focused on functional and socio-psychological perspectives, such as the theory of planned behavior, the technology adoption model, and social exchange theory (Venkatesh et al., 2003; Curran & Meuter, 2005; Zhou, Lu, & Wang, 2010). These studies indicated the adoption of mobile banking could be influenced by customers' perceptions of and attitudes to various dimensions of the service, such as quality, security, accessibility, performance, social influence, affordability, convenience, price, comparative advantage and the associated risks (Abdinoor & Mbamba, 2017; Curran & Meuter, 2005, Yu, 2012). Although the influence of customers' socio-economic situation, especially their demographic characteristics, has been acknowledged by researchers (Yu, 2012; Swai, 2015), it has not been given much attention.

Diffusion of innovation theory posits three significant strands of influence: attributes of innovation, the innovation-decision process, and adopter categories (Grgurović, 2014). Rogers (2003) further describes five adopter categories based on the time when the individual adopts an

innovation: innovators, early adopters, early majority, late majority, and laggards. This study uses these categories to examine the relationship between the demographics of the individual and the subsequent ability to adopt innovative solutions, in this case, mobile banking. Hence our research question is as follows:

RQ: What is the relationship between customers' demographics (level of income, gender, education, and age) and the adoption of innovative mobile banking services offered by commercial banks in an emerging economy?

According to Bhatt and Bhatt (2016), knowing about how customers' demographics relate to their adoption of mobile banking can provide an in-depth understanding of their use of mobile banking, thereby helping alternative strategies to be designed that will foster adoption. In addition, demographic factors relate to the adopters' categories, which can shape the innovation-decision process and its outcome (Grgurovic, 2014).

It would be particularly interesting to study these factors with cases from the East African region, where people have relatively low incomes and education levels, and being either female or male can impact how people engage with innovation and technological advances (Swai, 2015).

This study used customers of one of the largest banks in Tanzania as its context. This bank is known as one of the innovative banks in the country and has the largest number of customers. Customers who use mobile banking can transfer funds to other banks, mobile phones, pay utility bills, purchase airtime for themselves and others, send money to people with no bank accounts or ATM card, check their balance, register online on their mobile phone, and obtain a mini-statement and transaction alerts.

We used the adopter categories of Diffusion of Innovation Theory (DIT) to develop and test the hypotheses based on each demographic factor. Our study comprised of 416 customers. The data were analyzed using a combination of descriptive and multivariate analyses. The descriptive results show that the majority of respondents used Mobile banking once to three times a week to conduct various transactions. The regression results show that there is a positive and statistically significant relationship between income level and adoption of mobile banking. Indeed, the higher the income, the more likely a person will adopt mobile banking. A positive and significant relationship was also revealed between education attainment and adoption of mobile banking. However, although it was revealed that age was not important in determining adoption, it was found to cause a positive relationship with the adoption of mobile banking. Thus, given the accessibility of banking services

and the level of infrastructure, the older a person becomes, the more likely she or he will use mobile banking.

We contribute to a deeper understanding of mobile banking adoption by responding to calls for further investigation into the influence of customers' situational factors, especially the demographic characteristics of individuals in emerging markets (Swai, 2015). In addition, through the use of Rogers' (1995) DIT, the findings broaden our understanding of the importance of situational factors on mobile banking use in general, as well as the importance of demographic factors that have received limited attention by the dominant socio-psychological theories. From the practical point-of-view, the findings of this study provide bank managers with crucial information that will enable them to conduct appropriate marketing campaigns and customize mobile banking options to cater to specific demographic segments.

The rest of the paper is organized as follows. Section 2 presents the theory and literature review, followed by section 3 that describes the methodology. Section 4 presents the findings and discussion, while section 5 provides the conclusion.

LITERATURE REVIEW

Diffusion of Innovation Theory (DIT)

Diffusion of Innovation Theory (DIT) is considered one of the most appropriate theories for understanding the issue of the adoption of innovation and new technologies. According to Rogers (1995), an innovation is an idea, practice, or object that has distinguishable features perceived to be new. Diffusion is a process by which that innovation is communicated through specific channels over time among the members of a social system. For the purpose of this study, mobile banking is considered to be such innovation, while a bank is considered a channel through which that innovation is being communicated.

The theory further suggests five stages through which the individual can progress from the first contact with innovation to the adoption stage (Rogers, 2003). The first stage is knowledge when the individual is exposed to innovation and learns about its purpose and function. The second stage is persuasion, whereby individuals form positive or negative opinions about the innovation, which may influence the individual to adopt or not to adopt the innovation. The resulting decision to adopt the innovation is made in stage three, the decision stage, whereby before deciding, individuals may try the innovation out to see its usefulness in their setting. The fourth stage is implementation when the individual has decided to use the innovation.

Finally, if satisfied, the final stage of confirmation is attained whereby the innovation becomes wholly integrated into the ongoing routine, and the adopter may start promoting the innovation to others (Grgurovic, 2014). Each of these stages is critical and interacts with the characteristics of a person.

Because of the importance of these stages, Rogers (2003) further investigates and discusses five characteristics of adopters likely to accept innovative technology. He identified five (5) clusters of adopters of new technology, which varied according to the time the new product was adopted during its life cycle. These groups are: innovators, early adopters, early majority, late majority, and laggards (Rambocas & Arjoon, 2012). Each cluster differs according to the rate of adopting innovative technology. The first group, labeled as “innovators,” represents a group of customers that exercise tremendous eagerness and thirst for new ideas. The second cluster is “early adopters” who follow innovators in their adoption and do so relatively early in the product’s life cycle. The third group of customers, the “early majority,” first collects more information on products and services before adoption. Their tendency to adopt is highly dependent on recommendations and suggestions made by early adopters or opinion leaders. However, the “late majority” group adopts only after the product has been tried by other groups and proven to be successful. Lastly, “laggards,” who are often suspicious about new products, are frequently alienated by rapidly advancing societies (Grgurovic, 2014).

The theory further posits that certain variables are associated with an individual’s adoption of an innovation and their association with these clusters. These variables, among others, include age, gender, education, and income (Rogers, 1995). DIT assumes that these demographic variables are related to an individual’s response to innovation, thereby affecting the rate of adoption and the diffusion of the innovation. For example, according to the theory, young male high-income earners and literate individuals with more years of education are likely to belong to the first clusters of adopters compared to their counterparts (Rogers, 1995). The theory assumes that members of the former category have a greater awareness, as well as the resources and courage to take risks by engaging with a new phenomenon such as innovation.

DIT, with its assumptions, has been criticized for being linear and ignoring an individual’s context when adopting an innovation (van de Wijngaert and Bouwman, 2009). However, DIT and its concept of early adopters and laggards, as well as its assumptions on the influence of demographics, remains the bedrock on which much research is based. Innovation further determines the standards and directions of development of a firm, and consequently, on its development and competitive advantage (Golejewska, 2018). Because of its focus, this theory helps us understand the extent to which the demographics

of bank customers can influence the ease with which they adopt the new technology of mobile banking as a complement to traditional banking.

Hypotheses development

Income level

Level of income refers to an individual's state of earning with reference to money measured either per month or year (Munisi, 2015). Several studies have stated that income level is an essential factor that has a strong influence on adoption level (Sulaiman, Jaafar, & Mohezar, 2007). This is because higher-income earners are often associated with possessing a computer and having access to the internet and a mobile phone (Lohse, Bellman, & Johnson, 2000). Harma and Dubey (2009) clarified that people who work in a good, well-paid profession do not perceive mobile banking to be risky, unlike other customers. According to Rogers (1995), younger people with a high level of income are the early adopters of mobile-banking. A study in the United States of America (USA) found that income level has a positive impact on adoption level (Kolodinsky, Hogarth, & Hilgert, 2004).

Similarly, Lee, Lee, and Kim (2007) found that income level has a positive influence on the adoption of internet banking. Mattila (2003) further found that having a high income poses a significant and positive effect on the adoption of internet banking. With regard to DIT, early adopters of an innovation are more likely to be high-income earners than late adopters. A number of studies (such as Lohse et al., 2000; Sulaiman et al., 2007) supported this assumption. Mattila (2003) found that having a high income has a significant and positive effect on the adoption of internet banking. From these arguments it is hypothesized that:

H1: There is a positive relationship between customers' income level and the adoption of mobile banking.

Gender

Gender refers to an individual's identification in terms of sexual status, i.e. male or female (Munisi, 2015). According to Laforet and Li (2005), males are more interested in using various types of technology than females. Venkatesh and Morris (2000) found that gender is an important determinant of technology adoption and usage in Germany and the UK, in that males are more likely than females to adopt new technology. Regarding online shopping, Monsuwe, Dellaert, and de Ruyter (2004) found that males are

more positive about shopping online, whereas females prefer the traditional way of shopping or by catalog. Similarly, in Iran, Mirza, Beheshti, Wallstrom, and Mirza (2009) found that internet banking is used much more by males than females. Sulaiman et al. (2007) found that 70% of males in Malaysia use mobile banking, as opposed to 34.4% of females. Alafeef, Singh, and Ahmad (2011) found that the percentage of male Jordanian Internet users is higher than that of females, as males are willing to take higher risks and are keener than women to try out new technological products. However, DeBaillon and Rockwell (2005) found an insignificant relationship between gender and the adoption of internet banking. With reference to Tanzania, the relationship may be significant because of longstanding cultural traditions and entrenched social norms that distinctly define gender roles. For example, there is a division of labor between males and females in Tanzania (Krogh, Hansen, Wendt, & Elkjaer, 2009). Females have, traditionally, not adequately participated in the Tanzanian workforce (Krogh et al., 2009), and so it might be difficult for females to adopt different types of technology. Unfortunately, there is limited gender-disaggregated evidence on the adoption of innovation from the point-of-view of mobile banking in emerging economies, and therefore the paper hypothesizes that:

H2: Male customers are positively associated with the adoption of mobile banking.

Education

Education refers to an individual's status in terms of her or his attainment of systematic or formal instruction at school, college, or university (Munisi, 2015). Studies have approached the education variable in terms of the number of years spent in education and level of education. Concerning the number of years, Burgess (1986) argued that individuals with more years of education are more likely to be in high-status occupations, and so are more likely to adopt new technology. These findings indicate a relatively positive relationship between education and the adoption of mobile banking technology.

With reference to the level of education, researchers have put it into four categories: university degree or above, diploma/higher diploma, secondary education, and primary education. Several prior studies found a positive relationship between the level of education and the adoption of mobile banking. Hill (1998) found that level of education is an essential factor influencing the adoption of new technologies because education is correlated with an individual's level of internet literacy. This means that those who have received formal instruction at school, college, or university are much more

likely to embrace new technologies. Most schools, colleges and universities today teach computer skills as a compulsory part of the curriculum. The level of education is most important for improving one's social standing in African and Arab countries. Harma and Dubey (2009) found that customers who are less educated are significantly more opposed to banking innovations than other members of a social system.

Ahmed, Moreton, Mehdi, and Elmaghraby (2013) indicated that the high rate of illiteracy has greatly hindered the implementation of e-commerce in Libya. Sulaiman et al. (2007) revealed that 75% of adopters have a high level of education (university level). DIT states that early adopters of an innovation are more likely to be literate, with more years of education than late adopters (Rogers, 2003). However, in emerging economies such as Tanzania, there are not many individuals with a university degree (Mori, 2014). In this context, the potential users of mobile banking will be expected to have secondary education and above. It is, therefore, interesting not only to investigate the influence of education in terms of the number of years in school but also the level and type of education, especially in a context of Tanzania. Therefore:

H3: There is a positive relationship between education attainment and the adoption of mobile banking.

Age

Age refers to the length of time that a person has lived, frequently expressed in terms of the number of years (Munisi, 2015). Past research has noticed the influence of age on the adoption of mobile banking. Wood (2002) found that younger adults under 25 are more interested in adopting new technology than older customers. Similarly, Mattila, Karjaluoto, and Pento (2003) found that the majority of internet banking users are middle-aged, ranging from 25 to 34 years old, whereas non-users were older. Venkatesh and Morris (2000) asserted the importance of understanding the age difference in the adoption of new technology. Sulaiman et al. (2007) found that mobile banking in Malaysia is more prevalent among younger customers. Also, Harma and Dubey (2009) found that younger people do not perceive mobile banking to be risky, unlike older customers.

In the Middle East, especially in Saudi Arabia, the factor of age was important in influencing differences in the adoption of information technology, because the population of Saudi Arabia is relatively young. Younger people were also found to help Arab organizations to introduce and adopt new technologies. The majority of potential users of mobile banking are between 17 and 35 years old in Jordan because they are familiar with the latest

mobile technologies (Alafeef et al., 2011). These results have encouraged the banking sector to target younger cohorts. However, contradicting results were noted by Mirza et al. (2009), who found that age does not have a prominent influence on the adoption of mobile banking services, especially internet banking. Thus, age was found not to be a critical variable for banks that plan to offer internet banking, thereby indicating the prevailing contradiction in the results, which justifies the need for a further investigation into the relationship from the under-researched region of East Africa. Based on these findings and DIT, which further states that early adopters are usually younger than late adopters, we assert that:

H4: Increased age is negatively associated with the adoption of mobile banking.

METHODOLOGY

The context of the study

Over the last three decades, Tanzania has undergone an economic transition aimed at promoting a market-driven economy. One of the sectors that have undergone substantial reforms is the financial sector, which includes the banking industry and other financial institutions. The banking sector is made up of commercial banks, non-bank financial institutions, community banks, and microfinance companies (MFCs). There are currently 40 commercial banks in Tanzania. The Bank of Tanzania (BoT) is a regulatory authority for the banking sector.

Despite the increase in the number of banks and the expansion of the financial sector, formal financial institutions reach only 18.4% of the population. This low percentage indicates that, in the face of increasing competition in the financial industry, the demand for finance is still high because of the high financial exclusion rate (FSDT, 2017). Digital banking and the use of mobile phones is one way of increasing financial inclusion.

The statistics from the Tanzanian Communication Regulatory Authority (TCRA) show the number of mobile phone subscribers to be over 32 million. This means mobile banking is one of the most feasible ways of providing a mass-market alternative to branch banking in Tanzania (Masamila, 2014). Collaboration between mobile network providers and banks offering mobile financial services presents the potential to extend beyond traditional bank coverage to include rural areas, which are characterized by low population density and poor infrastructure. This potential implies that understanding

individual characteristics and their influence on adopting mobile financial services is vital in this context as it sheds more light on how to promote financial inclusion.

Data and sampling

The target population for this study was customers of one of the largest banks in Tanzania as it was among the first banks to introduce mobile banking in the country. The bank has more than 200 branches spread throughout the country. Because it is one of the largest banks and the first to introduce mobile banking, it represented a unique case to study the adaptability of its customers, the majority of who use mobile phones and access bank services. Furthermore, the bank has over 40 branches in the largest city of Dar es Salaam. Three branches were selected to participate in this study. These branches were the largest in the city in terms of the number of customers served and their diversity.

We sampled a total of 450 customers from the three branches. The respondents were selected randomly based on convenient sampling, which involved the researchers selecting customers due to their willingness to participate or their availability at the bank's premises. The respondents were introduced to the study as they were waiting for banking services in the bank. Upon agreeing to participate in the study, they were recruited for a survey. This sampling procedure was suitable for recruiting customer respondents in the banking environment. Only customers aged 18 and over were accepted as participants.

The study applied self-administered questionnaires completed by the respondents who had agreed to participate. Whoever entered the banking hall and waited to be served was approached, and the researcher introduced the study and asked whether she or he would participate in the study and fill in the questionnaire. Each respondent was assured of anonymity and confidentiality of the information and told that filling in the questionnaire would not take much of their time. This preface encouraged honest responses and reduced respondents' tendency to give socially desirable answers.

Variables

The dependent variable was the adoption of mobile banking, which was measured using non-metric questions in order to ascertain respondents' adoption of mobile banking. It involved a four-point Likert scale that measured behavioural items ranging from 1 – never to 4 – daily. Based on the literature, seven common financial services were adopted to measure the adoption of

mobile banking (Alalwan et al., 2015). These were checking their balance, downloading bank statements, paying bills, and transferring funds. In addition, the study featured four independent demographic variables, which were income level, gender, education, and age. Table 1 provides a definition and measurements of all the variables used in the study:

Table 1. Definition of variables

Dependent variable	Measure
Mobile banking use per week to:	Measured as 1 = never; 2 = 1-3 times per week; 3 = 4-6 times per week; 4 = daily
	Check my balance
	Download mini-statement
	Pay bills, such as electricity, water bills, etc.
	Transfer funds from my account to mobile telecom network
	Buy airtime
	Access other dealers' services
	Pay for football matches
Independent variables	Measure
Income level	The amount of income (in TZS) that the person gets per month
Gender	0 = Female; 1 = Male
Education	0= below secondary; 1 = above secondary
Age	Number of years since birth

Reliability and validity checks

As a check for reliability and validity (Hair et al., 2008), the questionnaire was sent to three groups of experts for review and scrutiny, and whose comments and suggestions were incorporated. Secondly, a pilot test with 25 customers was conducted in one branch (non-participating branch), so as to get the views and ideas of customers on which areas were more critical, especially in relation to adopting mobile banking. Complex questions or items were noted and amended. The adapted results of the pilot were tested using Cronbach's alpha, which indicated an alpha value of 0.836 for the seven items measured, thus showing high internal consistency.

Analysis techniques

The data were cleaned to detect missing values, identify outliers, and prepare them for multivariate analysis. The unit of analysis was the individual customer. The number of questionnaires that were useful for further investigation was

416 out of the 450 given to the respondents. Thus, 34 questionnaires were found to have incomplete responses and were rejected for further analysis. Descriptive statistics were used to analyze the data in order to describe and summarize them in a meaningful way. Categorical and scaled data were described using frequency and percentage tables. Furthermore, measures of kurtosis and skewness were used to describe the distribution of scaled data and further assess their adherence to normality.

Prior to multivariate analysis, we conducted a principal component analysis (PCA) of exploratory factor analysis (EFA) for the dependent variable "adoption" since it was measured using seven items, which was done to derive one dependent variable for inclusion in the regression analysis (Hair et al., 2008). Correlation analysis was also run for all variables included in the regression. This was done in order to pre-test the hypotheses and determine whether there were relationships among variables. Correlations also helped in the detection of multicollinearity among independent variables. For hypothesis testing, we ran an ordinary least square (OLS) regression analysis method, whereby all independent variables were tested together. To check for robustness, each independent variable was regressed with the dependent variable "adoption." The model for the OLS regression is as follows:

$$\text{Adoption} = \text{constant} + b_1 \text{ income} + b_2 \text{ male} + b_3 \text{ education} - b_4 \text{ age} + E$$

FINDINGS

Demographic characteristics

The respondents were well-distributed along the lines of age, sex, education, and income level. With regard to age, the average was 31 years. This age group comprises the majority of college/university students, young active workers in organizations, and entrepreneurs in Dar es Salaam city (Table 2). As indicated in the table, the majority of respondents were males (66.6%), a detail which may be attributed to the fact that, in most cases, males are users of banks. This result could also be mean that women are still struggling to gain access to formal banking halls and services due to cultural dynamism (Naegels, Mori, & D'Espallier, 2018).

Table 2. Demographic characteristics and summary statistics

Characteristics	Statistics
Average age (years)	31.00
Average income (TZS)	618,961.54
Gender	
Female (%)	33.40
Male (%)	66.60
Education attainment	
Secondary and below (%)	57.40
Above secondary - College/University (%)	42.60
Occupation	
Self-employed (%)	54.60
Employed (%)	29.60
Farmers (%)	9.40
Students (%)	6.40

In terms of education, it can be seen that the majority had received a college/university education (42.6%). Also, out of 57.4%, (28.8%) have secondary education. This result can be interpreted in three ways. First, because Dar es Salaam is the largest city in Tanzania, the majority of residents are composed of educated people who engage in different activities, a characteristic common to large cities where educated people tend to live because of the opportunities that exist (Glaeser, 1999). The literature further suggests that industrial agglomeration exists in cities because individuals learn from one another when they live and work in close proximity, and they also acquire skills by interacting with one another, and city areas increase the speed of these interactions (Glaeser, 1999). Secondly, since the data were obtained from the largest branches, it is possible that people accessing them are the elite, and that is why we have these results. Thirdly, the study is on banks, and there is evidence that due to education and exposure, elite people have more confidence in accessing banks than their counterparts. Nevertheless, some respondents had not received a formal education and were likely to be among those operating small businesses, as suggested by the literature (Mori, 2014).

The study also sought to establish the level of occupation of the customers, which was done in order to connect it with income level. The results show that 54.6% were self-employed, followed by those employed in various professions. The high percentage of employees also implies that most of them were likely to receive their salaries through and save their money in the bank, thereby

forming a large part of the customer base. This trend also reflected their level of income as their average monthly income was TZS 618,961.54.

Adoption of mobile banking

This section presents the prevalence of different dimensions of the adoption of mobile banking. Table 3 presents the descriptive findings from the seven items or statements that gauged respondents' frequency of using mobile banking. According to the results, the overall mean score of three out of the seven statements examined is 2, indicating that the respondents' frequency of using mobile banking suggested by these statements was, overall, once to three times a week. The respondents used mobile banking one to three times a week to check the balance in their bank accounts (mean 2.19, SD 0.736), transfer money (mean 2.17, SD 0.841), and buy airtime for their mobile phones (mean 2.05, SD 0.889). The respondents rarely used mobile banking to obtain bank statements, pay bills, or access other dealers' services, as the statements had mean values of less than 2.

Table 3. Descriptive statistics for adoption of mobile banking (n=416)

Using Mobile banking to:	Min*	Max*	Mean	SD
Check my balance	1.00	4.00	2.19	0.736
Download mini-statement	1.00	4.00	1.93	0.805
Pay bills, such as electricity, water bills, etc.	1.00	4.00	1.86	0.811
Transfer funds from my account to a telecom network, such as Tigo, Vodacom, Airtel, etc.	1.00	4.00	2.17	0.841
Buy airtime	1.00	4.00	2.05	0.889
Access other dealers' services	1.00	4.00	1.61	0.814
Pay for football matches	1.00	3.00	1.36	0.518

Notes: * 1 = never; 2 = 1-3 times a week; 3 = 4-6 times a week; 4 = daily.

Table 4 further depicts the percentage of each of the seven items measuring the adoption of mobile banking by the respondents. The findings show that the majority of respondents used mobile banking one to three times a week to check their balance, download a mini-statement, pay bills, transfer funds from their account to a mobile telecom network, and buy airtime. Using mobile banking to buy airtime seems to be the most prevalent, as 9.9% do this daily, followed by checking their balance (8.7%) and transferring funds from their account to a mobile telecom network (8.7%). The fact that many customers transfer money from their account to either buy airtime or top

up their mobile phone account (M-Pesa, etc.) implies that many customers prefer to keep their money in their phone rather than in the bank. This behavior is in line with the findings of Finscope (2017), which found that only 17% have active bank accounts while 43% have mobile payment accounts. It also means that people prefer their money to be in a mobile account rather than a bank account, perhaps because it is easier to obtain cash from their mobile account than from a bank account due to the availability of agencies. It is also possible that the charges are less expensive when their money is on a mobile phone than in the bank. The banks need to look into in detail and find ways of collaborating with MNOs for the benefit of both.

In addition, the use of sim banking to pay for football matches is rarely used as about 66% never used this service, and only 32% used it one to three times a week. This could mean that not many people who are football fans were in our database.

Table 4. Descriptive statistics (percentages) for adoption of mobile banking (in %)

Items – using mobile banking to:	1	2	3	4
	Never	1-3 times	4-6 times	Daily
Check my balance	10.80	68.50	12.00	8.70
Download mini-statement	30.00	52.90	11.10	6.00
Pay bills, such as electricity, water bills, etc.	35.60	48.30	10.80	5.30
Transfer funds from my account to a mobile telecom network (Tigo, Vodacom, Airtel)	19.70	52.60	19.00	8.70
Buy airtime	27.20	50.50	12.50	9.90
Access other dealers' services	55.50	32.90	6.70	4.80
Pay for football matches	66.30	31.70	1.90	0.00

Factor analysis

As explained earlier, because the dependent variable was measured using seven items, a principal component analysis (PCA) of exploratory factor analysis (EFA) was conducted in order to test whether correlating items could be summarized as an 'adoption' factor with a minimum loss of information (Hair et al., 2008). PCA was also employed to reduce the information contained in a number of measurement items to a smaller set of items organized into factors. PCA considered a total of 7 items measuring the construct of adoption of mobile banking. Prior to the analysis, the suitability of items for PCA was checked and all items met the normality requirement. Afterwards, PCA varimax rotation was performed (Hair et al., 2008). The eigenvalue for

item 7 on “the use of mobile banking to pay for football matches” had a value of less than 0.5 and was therefore eliminated from further analysis. Using the latent root criterion with a cut-off value of 1.0 for the eigenvalue, the final run with 6 items resulted in a one-factor solution accounting for 54.54% of total variance. Thus, the one-factor solution representing adoption of mobile banking, which was moreover consistent with the literature, was retained (Table 5). From this, we scaled (found the average of the six items) and formulated one variable for “adoption.”

Table 5. Rotated factor matrix results

Factor: Adoption	Factor loadings	Communality
Check my balance	0.742	0.551
Download mini-statement	0.748	0.559
Pay bills, such as electricity, water bills, etc.	0.790	0.624
Transfer funds from my account to a mobile telecom network	0.746	0.556
Buy airtime	0.744	0.553
Access other dealers' services	0.655	0.550
Variance		54.544

Correlation results

Looking at the correlation among the independent variables, we see that gender is significantly correlated with income (coeff. 0.147) and education with income (coeff. 0.281). The significance of these is not of a high magnitude to attract multicollinearity. In terms of the correlation between the dependent and independent variables, the table shows that adoption is significantly and positively correlated with education (coeff. 0.216) and income (coeff. 0.356). Gender and age were also positively correlated with the adoption of mobile banking but were not statistically significant. Overall, the correlations, except for age, correspond to the theorized relationships in the conceptual framework and hypotheses, thus indicating initial support for the hypotheses and no problem with nomological validity (Hair et al., 2014).

Table 6. Correlations results

	Adoption	Gender	Age	Education
Adoption	1.000			
Gender	0.082	1.000		
Age	0.045	0.027	1.000	
Education	0.216**	0.064	-0.051	1.000
Income	0.356**	0.147**	0.078	0.281**

Note: ** correlation is significant at the 0.01 level (2-tailed).

OLS regression results and discussion

Hypothesis 1 tested the positive association between customers' income level and adoption of mobile banking. As indicated in Table 7, this hypothesis is supported (coeff. = 0.313, $p < 0.001$). This suggests that the higher the income, the more likely the customer will adopt mobile banking. Customers' level of income was measured by referring to their income per month. From their income, it seems customers are more likely to use mobile banking to transfer funds from their bank account to their mobile phone network and to buy airtime for their other needs, including business. They are also likely to be salaried employees who often check the balance in their bank account. Alternatively, it can be argued that those engaged in business are often risk-takers. As regards the notion of risk, these customers do not perceive mobile banking to be risky, unlike other customers (Makanyeza, 2017). Table 7 presents the regression results for each hypothesis tested.

Table 7. OLS regression results with adopt as a dependent variable

	Coefficient	Std. error
Level of income	0.313**	0.000
Age	0.028	0.003
Gender	0.029	0.061
Education attainment	0.128**	0.029
Adjusted r-square	0.134	
Durbin Watson	1.683	

Note: ** coefficient is significant at the 0.01 level (2-tailed).

Another interpretation of this finding is that using mobile banking often requires one to have a mobile phone. Moreover, one must have funds in the bank account. Thus, those with higher incomes are more likely to find it easy to use mobile banking frequently. The findings of this study also showed that income level is the strongest factor among the other demographic variables

considered. This corroborates previous research, which argued that income level is an important factor that has a strong influence on adoption level (Alafeef et al., 2011; Harma & Dubey, 2009; Mirza et al., 2009; Swai, 2015). However, it contradicts a few studies, such as by Laukkanen and Pasanen (2008), who found that income does not predict the use of mobile banking. The finding also supports Roger's Diffusion of Innovation Theory by showing how adoption can be influenced by high income.

Hypothesis 2 stated that male customers are positively associated with the adoption of mobile banking. As indicated in Table 7, this hypothesis is supported by indicating the presence of a positive relationship, $b=0.029$, but with no statistical significance ($p>0.05$). Although the results were not statistically significant, they still suggest that male customers are positively associated with the adoption of mobile banking. Borrowing Alafeef et al.'s (2011) reasoning, males are more willing than women to take risks to try out any new technological product. This could be the case in Tanzania where, after all, mobile banking technology was introduced no more than five years ago. However, a more logical reason is that this may be due to the cultural context of Tanzania. It is well known that longstanding cultural traditions and entrenched social norms distinctly define gender roles in the country (Krogh et al., 2009). Given the fact that it requires some kind of income from business or a salary from employment to use mobile banking, women are less likely to use it. Using similar reasoning, the cultural traditions and norms of Tanzanian society have, in the past, also limited women from owning smart mobile phones.

The fact that the results are statistically insignificant could also mean that there is not enough evidence to confirm the positive relationship. Given the high level of exposure to the modern way of life, women in these areas are more likely to own a mobile phone and try using new technologies, which might partly explain the insignificant results, a fact perhaps not unique to this study. A previous study by DeBaillon and Rockwell (2005) also found an insignificant relationship between gender and the adoption of internet banking. Nevertheless, other prior studies found a positive and significant relationship (see Laforet & Li, 2005; Venkatesh & Morris, 2000; Monsuwe et al., 2004; Mirza et al., 2009; Sulaiman et al., 2007). Most of these studies were conducted in the Arab world, where gender role and division is prominent, and men are more likely to be engaged in the workforce and be familiar with technological advances than women, who spend most of their time at home (Mirza et al., 2009). Overall, the findings of this study agree with past research on the argument that male customers are positively associated with the adoption of new technologies, including mobile banking.

Hypothesis 3 was set to test the association between customers' education attainment and adoption of mobile banking. The results provide

support for it (coeff.=0.128, $p<0.01$). These results suggest that the higher the customer's education level, the more likely she or he will adopt mobile banking. It is logical to argue from the exposure framework that those who are more educated, that is those who have received a higher level of education, are more likely to be exposed to new technologies due to their training and peer groups at colleges and universities. This result echoes Hill's (1998) argument that most schools, colleges, and universities today teach computer skills as a compulsory part of the curriculum. Customers are, therefore, more exposed to new technologies and are likely to adopt mobile banking. People who are more educated are also more likely to accept the risks associated with the use of new technologies for the reason of personal advancement. Alternatively, people with a higher education level are believed to be rational and would thus choose a way of doing something that costs less. For instance, it would cost a person more to go to a bank to enquire about her or his balance or obtain a statement than to use mobile banking. With this rational thinking, a more educated person would rather use mobile banking than those who are less educated in order to save time in terms of visiting a branch and money spent on a busfare for that purpose.

Burgess's (1986) logic can also be useful for explaining the positive relationship between the level of education and the adoption of mobile banking in the Tanzanian context. It is common knowledge that individuals with more years of education are more likely to be in high-status occupations with a higher income. They are more likely, therefore, to afford the costs involved and, due to their status, adopt new technology. The findings of this study support past research, like Hill (1998), Harma and Dubey (2009), Ahmed et al. (2013), and Sulaiman et al. (2007).

Hypothesis 4 examined the negative association between age and the adoption of mobile banking. The result was not statistically significant. The results in Table 7 further show the statistical presence of a positive relationship between age and the adoption of mobile banking ($b=0.028$), but it is not statistically significant ($p>0.05$). This suggests that the older a customer is, the more likely she or he will adopt mobile banking. However, this relationship was not statistically significant. The dominant argument in the literature, and thus the hypothesis adopted in this study, is that there is a negative relationship between increased age and the adoption of mobile banking (Matilla et al., 2003; Harma & Dubey, 2009), specifically, younger people are more likely to adopt mobile banking than older ones. In Tanzania, similar to Mirza et al. (2009), this study shows that older age is important though not significant. Furthermore, the likelihood that older people may prefer mobile banking is explained by the notion of distance and accessibility. It is known that the distance between where banks are located and where

customers are, makes it hard for older people to access them. Therefore, they would probably prefer to do some banking activities, such as buying airtime and checking their balance using mobile banking, rather than having to go to the bank, which can be difficult and tiring.

Table 8 provides a summary of our results by showing that two hypotheses (one and three) were supported, according to our expectations. Hypothesis two was not supported, and hypothesis four was not supported but was positively significant.

Table 8. Summary of the results

Hypotheses	Results
H1 There is a positive association between customers' income level and adoption of mobile banking.	Supported at $p < 0.001$
H2 Male customers are positively associated with the adoption of mobile banking.	Not supported
H3 There is a positive relationship between education attainment and adoption of mobile banking.	Supported at $p < 0.01$
H4 There is a negative association between age and adoption of mobile banking.	Not supported

CONCLUSIONS AND IMPLICATIONS

The main objective of this study was to examine the influence of demographic variables on customers' adoption of mobile banking. Four hypotheses were formulated, and data from 416 bank customers were used to test the hypotheses by employing an OLS regression technique. The results revealed that there is a positive and statistically significant relationship between income level and adoption of mobile banking. Indeed, the higher the income, the more likely a person will adopt mobile banking. The results also revealed that there is a positive relationship between education level and adoption of mobile banking. However, although it was revealed that age was not important in determining the adoption of mobile banking, it was found to have a positive relationship with the adoption of mobile banking. Thus, given the accessibility of this banking service and infrastructure, the older a person gets, the more likely she or he will use mobile banking.

The overall conclusion is that the adoption of mobile banking is best viewed from the rational-thinking perspective that people with a higher income and higher education level are more likely to find mobile banking convenient and easy to use than those with a lower income and lower

level of education. For people on a higher income, it is probably cheaper, more convenient and rational to use mobile banking than physically visiting the bank to access services such as buying airtime, checking a balance, or obtaining a statement. On the other hand, although gender and age may not be important in determining the adoption of mobile banking due to insignificant results, they show an interesting trend. With particular reference to age, older people are more likely to adopt mobile banking, perhaps due to its accessibility in the Tanzanian context.

This paper has made important contributions to the literature on the adoption of new technologies in the banking industry. First, it has shown the relevance of Diffusion of Innovation Theory (DIT) in explaining the adoption of new technologies, especially mobile banking services, in the context of sub-Saharan Africa, and especially in Tanzania, where it has rarely (if ever) been utilized. Second, it has contributed to providing an understanding of and empirical evidence on the controversial link between demographic variables, such as level of income, education attainment, sex and age, and the adoption of mobile banking. Third, it has contributed to providing an understanding of the adoption of mobile banking from the point-of-view of customers in the ignored context of sub-Saharan Africa, especially Tanzania.

Past research has paid attention to the determinants of adoption of new technologies using socio-psychological frameworks, such as the theory of planned behavior, social exchange theory, and the technology adoption model. They argued that perceived risk, trust, convenience, comparative advantage, expected performance, reduced effort, social influence, price, value, and attitudes relate to the adoption of mobile banking in general and mobile banking in particular (Venkatesh et al., 2003; Curran & Meuter, 2005, Swai, 2015; Munisi, 2015; Yu, 2012; Zhou et al., 2010).

Apart from these factors, past research has also acknowledged the importance of situational factors, especially the demographic characteristics of individuals, such as income level, sex, education attainment and age in explaining adoption (Alafeef et al., 2011; Bhatt & Bhatt, 2016; Venkatesh et al., 2003; Curran & Meuter, 2005). However, research has produced mixed and inconsistent results regarding the relationship between these demographic factors and the adoption of mobile banking. For example, while it is has become common knowledge that income positively relates to the adoption of new technology, Laukkanen and Pasanen (2008) found that income does not predict the use of mobile banking. Similarly, while Sulaiman et al. (2007), Harma and Dubey (2009) and Alafeef et al. (2011) found a significant relationship between age and the adoption of new technology, Mirza et al. (2009) found no significant relationship. Studies have also argued that education level relates positively to the adoption of new

technology, but in a poor country such as Tanzania, there are few individuals with a university degree. In this context, potential users of mobile banking might have secondary education and above. This is due to the relatively low level of education in sub-Saharan Africa compared to developed regions. Thus, there is a need for research to focus on cases in sub-Saharan Africa and Tanzania in particular. In addition, although studies (e.g. Alafeef et al., 2011) found a significant relationship between gender and adoption, DeBaillon and Rockwell (2005) found an insignificant relationship.

Moreover, this relationship remains blurred in sub-Saharan Africa where gender is known to determine how males and females engage with technological advances. This study contributed to this debate and body of knowledge by examining the influence of demographic variables on the adoption of mobile banking, drawing only on customers of a leading bank in Tanzania. In the Tanzanian context, the adoption of mobile banking is best viewed from the rational-thinking perspective. Customers with a higher income and higher education level are more likely to adopt mobile banking than those with a relatively low income and low level of education.

The study has several practical implications. The results alert Tanzanian banks to the current state of their customers' adoption of mobile banking services. The descriptive results of the adoption of mobile banking revealed that the majority of respondents used mobile banking one to three times a week to check their balance, download mini-statement, pay bills, transfer funds from their account to a telecom network and buy airtime. This obviously suggests that the majority of the respondents seem to be motivated to use mobile banking. It was observed that education plays a significant role in determining the adoption of mobile banking as it exposes people to technology and increases their confidence in using it. Bank managers should, therefore, expose customers to mobile banking technology either when they visit the bank or at their premises. This would help increase the number of users and likely the frequency of mobile banking as a result. It was also established that income significantly relates to the adoption of mobile banking, which suggests that promotional programs should focus on potential users, that is, those with a higher income, as this would lead to more customers using mobile banking services.

Despite the interesting findings and contributions, caution should be exercised when interpreting the results in the broader context because of three limitations. First, the study focused on customers in the largest city of Tanzania; if conducted in other towns, it might not produce similar results. Although the findings of this study can be generalizable to other banks, future research could use a larger sample. It would also be worthwhile for future studies to incorporate bank branches located in rural areas where

extreme poverty dominates and strict traditional gender norms that overlook women in terms of technological advances are still in practice. Perhaps in these localities, the research will reveal the effect of culturally-conditioned gender roles and expectations on the adoption of mobile banking.

Furthermore, this study is limited in that it does not utilize all elements of the Diffusion of Innovations Theory. Other aspects such as Personality Variables (i.e., dogmatism, rationality, and high aspirations), Communication Behavior (social participation, change agent contact, and mass media exposure) and Innovation Characteristics are not included, and these are potential areas for further examination. In addition, qualitative research using in-depth interviews and focus group discussions would enrich our understanding of the contextual reality underlying the effects of sex and especially age (which has shown a contradictory positive relationship) on the adoption of mobile banking.

References

- Abdinoor, A., & Mbamba, U. O. (2017). Factor influencing consumers' adoption of mobile financial services in Tanzania. *Cogent Business & Management*, 4(1), 1-19. <http://doi.org/10.1080/23311975.2017.1392273>
- Ahmed, A. M., Moreton, R., Mehdi, Q. H., & Elmaghraby, A. (2013). E-government services challenges and opportunities for developing countries: The case of Libya. Paper presented at the 2013 Second International Conference on Informatics & Applications (ICIA). Retrieved from https://www.academia.edu/24237882/E-Government_Services_Challenges_and_Opportunities_for_Developing_Countries_The_Case_of_Libya
- Alafeef, M., Singh, D., & Ahmad, K. (2011). Influence of demographic factors on the adoption level of mobile banking applications in Jordan. *Research Journal of Applied Sciences*, 6(6), 373-377. <http://doi.org/10.3923/rjasci.2011.373.377>
- Alalwan, A.A., Rana, N.P., Dwivedi, Y.K., Lai, B., & Williams, M.D. (2015). Adoption of mobile banking in Jordan: Exploring demographic differences on customers' perceptions. *IFIP International Federation for Information Processing*, 9373, 13-23. http://doi.org/10.1007/978-3-319-25013-7_2
- Ajide, F.M. (2016). Financial innovation and sustainable development in selected countries in West Africa. *Journal of Entrepreneurship, Management and Innovation*, 12(3), 85-111. <https://doi.org/10.7341/20161234>
- Burgess, R. (1986). *Key Variables in Social Investigation*. London: Routledge. <https://doi.org/10.4324/9781351170000>
- Bhatt, A., & Bhatt, S. (2016). Factors affecting customers' adoption of mobile banking services. *Journal of Internet Bank Commerce*, 21. Retrieved from <http://www.icommercecentral.com/open-access/factors-affecting-customers-adoption-of-mobile-banking-services.php?aid=70189>

- Cruz, P., Neto, L., Gallego, P., & Laukkanen, T. (2010). Mobile banking rollout in emerging markets. Evidence from Brazil. *The International Journal of Bank Marketing*, 28(10), 342-371. <http://doi.org/10.1108/02652321011064881>
- Curran, J.M. & Meuter, M.L. (2005). Self-service technology adoption: Comparing three technologies. *Journal of Services Marketing*, 19(2), 103-113. <http://dx.doi.org/10.1108/08876040510591411>
- DeBaillon, L., & Rockwell, P. (2005). Gender and student-status differences in cellular telephone use. *International Journal of Mobile Communication*, 3(1), 82-98. <http://doi.org/10.1504/IJMC.2005.005876>
- Glaeser, E.L. (1999). Learning in cities. *Journal of Urban Economics*, 46(2), 254-277. <https://doi.org/10.1006/juec.1998.2121>
- Golejewska, A. (2018). Innovativeness of enterprises in Poland in a regional context. *Journal of Management, Entrepreneurship and Innovation*. 14(1), 29-44. <https://doi.org/10.7341/20181412>
- Gosavi, A. (2017). Use of the Internet and its impact on productivity and sales growth in female-owned firms: Evidence from India. *Journal of Entrepreneurship, Management and Innovation* 13(2), 155-178. <https://doi.org/10.7341/20171327>
- Harma, M.K., & Dubey, R. (2009). Prospects of technological advancements in banking sector using mobile banking and position of India. *Proceedings of the International Association of Computer Science and Information Technology Spring Conference* (pp. 291-295). Retrieved from <https://ieeexplore.ieee.org/abstract/document/5169360>
- Hair, J., Black, B., Babin, B., Anderson, R., & Tatham, R. (2008). *Multivariate Data Analysis* New Delhi: Prentice Hall.
- Hill, A.M.(1998). Problem solving in real-life contexts: An alternative for design in technology education. *International Journal of Technology and Design Education*. 8(1), 203-220. <https://doi.org/10.1023/A:1008854926028>
- Kolodinsky, M.J., Hogarth, M., & Hilgert, A.M. (2004). The adoption of electronic banking technologies by US consumers. *International Journal of Bank Marketing*, 22(4), 238-259. <http://doi.org/10.1108/02652320410542536>
- Krogh, E., Hansen, T.N., Wendt, S., & Elkjaer, M. (2009). Promoting employment for women as a strategy for poverty reduction. Organization for Economic Cooperation and Development (OECD). Retrieved from <http://www.oecd.org/greengrowth/green-development/43514554.pdf>
- Laforet, S., & Li, X.Y. (2005). Consumers' attitudes towards online and mobile banking in China. *International Journal of Bank Marketing*, 3(5), 362-380. <http://doi.org/10.1108/02652320510629250>
- Laukkanen, T., & Pasanen, M. (2008). Mobile banking innovators and early adopters: How they differ from other online users. *Journal of Financial Service Marketing*, 13(2), 86-94. <http://doi.org/10.1057/palgrave.fsm.4760077>
- Lee, K.S., Lee, H.S., & Kim, S.Y. (2007). Factors influencing the adoption behaviour of mobile banking: A South Korean perspective. *Journal of Internet Banking*

- and Commerce*, 12,(2). Retrieved from <http://www.icommercentral.com/open-access/factors-influencing-the-adoption-behavior-of-mobile-banking-a-south-korean-perspective.php?aid=38487>
- Lohse, G.L., Bellman, S., & Johnson, E.J. (2000). Consumer buying behaviour on the Internet: Findings from panel data. *Journal of Interactive Market*, 14(1), 15-29. [https://doi.org/10.1002/\(SICI\)1520-6653\(200024\)14:1<15::AID-DIR2>3.0.CO;2-C](https://doi.org/10.1002/(SICI)1520-6653(200024)14:1<15::AID-DIR2>3.0.CO;2-C)
- Makanyeza, C. (2017). Determinants of consumers' intention to adopt mobile banking services in Zimbabwe. *International Journal of Bank Marketing*, 35(6), 997-1017. <http://doi.org/10.1108/IJBM-07-2016-0099>
- Masamila, B. (2014). State of mobile banking in Tanzania and security issues. *International Journal of Network Security and its Applications*, 6(4), 53-64. <http://doi.org/10.5121/ijnsa.2014.6405>
- Mattila, M., Karjaluo, H., & Pentto, T. (2003). Internet banking adoption among mature customers: Early majority or laggards?. *Journal of Services Marketing*, 17(5), 514-528. <https://doi.org/10.1108/08876040310486294>
- Mattila, K. (2003). Factors affecting the adoption of mobile banking services. *Journal of Internet Banking Commerce*, 8, 14-15. Retrieved from <http://www.icommercentral.com/open-access/factors-affecting-the-adoption-of-mobile-banking-services.php?aid=38725>
- Mirza, A.P., Beheshti, M.T.H., Wallstrom, A., & Mirza, O.P. (2009). Adoption of internet banking by Iranian consumers: An empirical investigation. *Journal of Applied Sciences*, 9(14), 2567-2575. <http://doi.org/10.3923/jas.2009.2567.2575>
- Monuwe, T.P., Dellaert, B.G.C., & de Ruyter, K. (2004). What drives consumers to shop online? A literature review. *International Journal of Service Industry Management*, 15(1), 102-121. <https://doi.org/10.1108/09564230410523358>
- Mori, N. (2014). Women entrepreneurship development in Tanzania. Retrieved from https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_seed/documents/publication/wcms_360426.pdf
- Munisi, R. (2015). Attitudinal factors and adoption of e-money services in Tanzania: A case of Ilala District's SMEs in Dar es Salaam. Unpublished MBA Dissertation, University of Dar es Salaam, Dar es Salaam.
- Naegels, V., Mori, N., & D'Espallier, B. (2018). An institutional view on access to finance by Tanzanian women-owned enterprises. *Venture Capital*, 20(2), 191-210. <https://doi.org/10.1080/13691066.2017.1358927>
- Rambocas, M., & Arjono, S. (2012). Using diffusion of innovation theory to model customer loyalty for internet banking: A TT millennial perspective. *International Journal of Business and Commerce*, 1(8), 1-14.
- Reem, R., & Jawdat, A. (2018). A model of mobile payment usage among Arab consumers. *International Journal of Bank Marketing*, 36(7), 1213-1234, <https://doi.org/10.1108/IJBM-05-2017-0080>
- Rogers, E. (1995). *Diffusion of Innovations* (3rd ed.). New York: Free Press.
- Rogers, E. (2003). *Diffusion of Innovations* (5th ed.). New York: Free Press.

- Singh, S., & Srivastava, R. K. (2018). Predicting the intention to use mobile banking in India. *International Journal of Bank Marketing*, 36(2), 357-378. <https://doi.org/10.1108/IJBM-12-2016-0186>
- Sulaiman, A., Jaafar, N.I., & Mohezar, S. (2007). An overview of mobile banking adoption among the urban community. *International Journal of Mobile Communications*, 5,(2), 157-168. <https://doi.org/10.1504/IJMC.2007.011814>
- Swai, F.A. (2015). Factors influencing customers' adoption and actual use of mobile phone payment services in Tanzania. Unpublished MBA Dissertation, University of Dar es Salaam, Dar es Salaam.
- Van de Wijngaert, L., & Bouwman, H. (2009). Would you share? Predicting the potential use of a new technology. *Telematics and Informatics*, 26(1), 85-102. <https://doi.org/10.1016/j.tele.2008.01.002>
- Venkatesh, V., & Morris, M. (2000). A longitudinal field investigation of gender differences in individual technology adoption decision-making processes. *Organizational Behavior and Human Decision Processes*, 83(1), 33-60.
- Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478. <http://doi.org/10.2307/30036540>
- Yu, C.S. (2012). Factors affecting individuals to adopt mobile banking: Empirical evidence from the UTAUT Model. *Journal of Electronic Commerce Research*, 13(2), 104-121.
- Zhou, T., Lu, Y., & Wang, B. (2010). Integrating TTF and UTAUT to explain mobile banking user adoption. *Computing Human Behaviour*, 26(4), 760-767. <http://doi.org/10.1016/j.chb.2010.01.01>

Abstrakt

Głównym celem tych badań było zbadanie wpływu czynników demograficznych na przyjęcie innowacyjnych usług bankowości mobilnej w Tanzanii. Wykorzystano teorię dyfuzji innowacji Rogersa (DIT), aby ustalić znaczenie czynników demograficznych zależnych od sytuacji. Ankieta została przeprowadzona z 416 klientami wiodącego banku w Tanzanii. W badaniu zastosowano kwestionariusze wypełniane przez respondentów, którzy zgodzili się wziąć udział w badaniu. Dane analizowano przy użyciu kombinacji analiz opisowych i wielowymiarowych. Wyniki opisowe ujawniły, że większość respondentów korzystała z bankowości mobilnej raz do trzech razy w tygodniu, aby sprawdzić saldo, pobrać mini wyciąg, zapłacić różne rachunki, przelać środki ze swojego rachunku do mobilnej sieci telekomunikacyjnej i kupić czas antenowy. Wyniki regresji wykazały ponadto pozytywny i znaczący związek między poziomem dochodów a poziomem wykształcenia z jednej strony a przyjęciem bankowości mobilnej z drugiej. Badanie dowodzi, że potrzebne są praktyki promocyjne i kampanie uświadamiające, aby uchwycić profile demograficzne klientów i zachęcić ich do korzystania z bankowości mobilnej. Badanie wykazało znaczenie zastosowania teorii sytuacyjnej do przyjęcia innowacyjnych technologii w zakresie usług bankowych w Tanzanii. Po-

szerza także nasze rozumienie znaczenia czynników demograficznych, na które nie zwracano uwagi w dominujących teoriach społeczno-psychologicznych.

Słowa kluczowe: bankowość mobilna, Tanzania, poziom dochodów, płeć, wiek, wykształcenie

Biographical notes

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Conflicts of interest

The authors declare no conflict of interest.

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Innovations in Polish family firms. Exploring employee creativity and management practices that stimulate innovative thinking

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Abstract

The paper aims to recognize whether family firms that introduce the creative ideas of their employees are more innovative than the other family firms, i.e. if they introduce more products, processes, marketing, and organizational innovations. Moreover, it explores the relationship between the innovation of family businesses and their involvement in activities that stimulate innovative thinking by building a trusting workplace climate, driving employees' development, and supporting team integration. The study is based on the primary research which was conducted in Poland on a sample of 353 family firms. The statistical analysis of the research results shows that family firms that implement the creative solutions of their employees introduce significantly more product innovations than other family businesses. However, there are no differences between these two groups of family firms regarding organizational, process, and marketing innovations. Our analysis also revealed that: (i) supporting employee development is an independent factor influencing the product, process and organizational innovation of family businesses; and that (ii) building team integration by the company is an independent factor that impacts process innovation.

Keywords: family firms, innovations, creativity, product innovations, process innovations, organizational innovations, marketing innovations, Poland

INTRODUCTION

Innovations are the main source of competitiveness (Madrid-Guijarro, Garcia, & Van Auken, 2009) and performance (Park, Misra, Reddy, & Jaber, 2019) of

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contemporary firms. They are also recognized as a key factor in the long-term success of companies (Kammerlander, Dessì, Bird, Floris, & Murru, 2015). Consequently, many businesses pursue strategies focused on achieving competitive advantage to implement innovations (Park et al., 2019). The ability to create and implement innovations becomes one of the major challenges for family firms (Covin & Wales, 2012; Filser, Brem, Gast, Kraus, & Calabrò, 2016). It is because they are “endowed with a bundle of beliefs and practices that constitute their tradition” (Erdogan, Rondi, & De Massis, 2019, p. 1) and they often prefer to retain historical success formulas rather than respond to changes that have occurred in the market (Classen, Carree, Van Gils, & Peters, 2014; Kellermanns, Eddleston, Sarathy, & Murphy, 2012; Lattuch, 2019). The spectrum of factors determining the innovation of family businesses is broad. Due to the influence of family ownership on organizational goals, risk-taking propensity and long-term investment horizons, family firm innovation processes and outcomes are likely to differ from those evidenced in non-family firms (De Massis, Wang, & Chua, 2018; Kotlar & Chrisman, 2018; Li & Daspit, 2016; Lorenzo & Núñez-Cacho, 2013; Urbinati, Franzò, De Massis, & Frattini, 2017). However, some determinants of family firms’ innovation are common for both family and non-family businesses. One of these is employee creativity, which is perceived as a fundamental condition of innovation (Hon & Lui, 2016; Slatten, 2014; Tang, Yu, Cooke, & Chen, 2017). An increasing number of studies have found that employee creativity contributes to organizational innovation, effectiveness, survival and long-term success (Anderson, Potocnik, & Zhou, 2014; Coelho, Augusto, & Lages, 2011; Hon & Lui, 2016; Hong, Hou, Zhu, & Marinova, 2018). Evidence suggests that the creativity of employees assists organizations in becoming more efficient and more responsive to new development opportunities (Siddiqi & Qureshi, 2016). It also supports their adaptation to changes within the business environment (Beheshtifar & Zare, 2013). Considering the positive influence of creativity on innovations, a number of firms attempt to stimulate creative thinking among their employees (Doran & Ryan, 2017).

Although previous studies explored the relationship between employee creativity and innovation (Anderson et al., 2014; Hon & Lui, 2016; Khalili, 2018), very few researchers considered these factors specifically in relation to family firms. In Poland, this issue has so far been discussed only occasionally. A review of the literature shows that there is no evidence indicating whether family businesses, in which employees generate new ideas, introduce more innovations than other family firms. Furthermore, there is a lack of evidence exploring whether family businesses stimulate employees’ creative thinking to enhance the company’s innovation by building a trusting workplace climate, driving employees’ development, and supporting team integration. Likewise, it is not clear if family firms that try to establish

a creative environment are more innovative than other family businesses. This study aims to address these gaps. As such, it explores whether family firms that introduce the creative ideas of their employees are more innovative than other family firms, i.e. if they introduce more product, process, marketing, and organizational innovations. Moreover, the study identifies the relationship between the innovation of family businesses and involvement in activities that stimulate innovative thinking by building a trusting workplace climate, driving employees' development, and supporting team integration. To reach the research aims the results of the primary research were analyzed. The study addresses two key research questions:

RQ1: Are there differences between the innovation level of family firms that introduce the creative ideas of their employees and the rest of family businesses?

RQ2: Considering the job contextual factors associated with building a trusting workplace climate, driving employees' development and supporting team integration, what are the differences between the innovation of family firms that stimulate and do not stimulate employees' creative thinking?

Answers to the presented research questions help to provide three main contributions to the family firm literature. First, the paper develops knowledge about the management of employee creativity and innovation in Polish family firms. Second, our study extends knowledge about the factors affecting the innovation of Polish family firms. Finally, it contributes to the innovation literature exploring the diffusion of innovations within family firms.

The paper comprises of six major parts. The next section discusses the literature on the subject justifying the selection of the underlying hypotheses. This is followed by the section outlining the methodology of the presented study. Next, the findings of the primary research and their analysis are presented. The following section of the paper contains conclusions drawn on the basis of the conducted research. Finally, the last section provides a brief summary of the study and suggestions for research areas to be explored in the future.

LITERATURE REVIEW

Family firms' innovations and employees' creative ideas

Family firms have many features that distinguish them from non-family firms (Astrachan, 2010). These features include family ownership, governance, management, and intergenerational succession (Beck, Janssens, Kommelen,

& Sluismans, 2009). A unique feature of family firms is the socioemotional engagement of the family in running the business (Bratnicka-Myśliwiec, Pośpiech-Wronka, & Ingram, 2019; Gómez-Meja, Kynes, Numez-Nickel, & Moyano-Tuentes, 2007; Sharama & Sharama, 2011; Zientara, 2017). Due to this form of engagement, the family shapes the organizational culture of the business and the way it sets its goals (Martin and Gomez-Mejia, 2016; Sharama & Sharama, 2011; Sułkowski & Marjański, 2009). Accordingly, the family decides about the levels and forms of business innovativeness (Lattuch, 2019).

A review of the literature on family firms reveals that many family firms are reluctant to introduce any changes to their products, choosing instead to preserve the heritage created by their forefathers (Kellermanns et al., 2012; Lattuch, 2019; Lim, Lubatkin, & Wiseman, 2010). By not deviating from the path set by the firm's founders, a lot of family firms choose less risky (Boers, Ljungkvist, Brunninge, & Nordqvist, 2017) and less innovative solutions (König, Kammerlander, & Enders, 2013). Consequently, they are more risk-averse than non-family firms (Hiebl, 2014) and prefer to introduce exploitative innovations. Such innovations are in line with the families' socioemotional concerns because they are less uncertain in nature than explorative innovations (Bammens, Notelaers, & Van Gils, 2014). However, it is important to recognize that family businesses are not a homogeneous group. There are also such family firms that are able and willing to take more risk. They implement innovations aimed at their long-term orientation (Gentry, Dibrell, & Kim, 2016) and consider these innovations as a fundamental activity that is required to deal with an unstable environment. Such family businesses are aware that to survive through generations, they are required to innovate (Hoy, 2006). Thus, although new product development is frequently expensive, and, most importantly, "often entails high levels of market and technological risk" (De Massis, Frattini, & Lichtenthaler, 2012) these family firms try to adjust their products to the changes taking place in the environment that "exerts a strong influence on family businesses innovation" (Kotlar, De Massis, Fang, & Frattini, 2014). Hence, some family businesses are innovative. The innovative strategies of such family firms can even be aggressive (Kellermanns et al., 2012).

The heterogeneity of family businesses appears not only in their different tendencies to innovate but also concerns their various approaches to absorbing employee creativity. Namely, some family firms do not consider employees' ideas as a potential source of innovation, even when they come forward with creative solutions regarding firms' products, processes, organization or firms' marketing activities. In such companies, creative employees are often not recognized as a solution to potential business problems. Mostly, it is because they are afraid of losing control over the trajectory of traditional family products. Conversely, other family firms create

innovation cultures supporting individual and team creativity to generate new ideas. For such creative companies, the insights of their employees are of crucial importance. These firms are aware that due to creative employees, firms may solve many specific challenges (Slatten, 2014) and gain competitive advantage (Granot, 2016; Hassan, Malik, Hasnain, Faiz & Abbas, 2013). Such family businesses may perceive creativity and innovation as a source of their long-term sustainability. Likewise, employee creativity can be recognized by these companies as “one of the prerequisites of firm innovation” (Bammens et al., 2014, p. 862). Such innovative family companies can promote innovative cultures by supporting the creativity of their employees and embracing their new ideas. Thus, the companies may develop processes that drive employee creativity at individual, team, and organizational levels.

Considering that creativity is the first step of innovation (Bammens et al., 2014; Slatten, 2014), and a key driver of innovative changes in organizations (Moghimi & Subramaniam, 2013), we assume that there is a relationship between employee creativity and family firms’ innovation. As there are four different types of innovation identified in the Oslo Manual (2005) – product, process, organizational, and marketing innovations – we postulate that:

H1. Employee creativity positively influences the introduction of different types of innovations in family firms.

Innovation of family businesses and stimulating employee creativity by building a climate of trust in the workplace

Although employee creativity is fundamental for firm innovation (Bammens et al., 2014, p. 862), in isolation, it is insufficient to support innovation (Slatten, 2014). Accordingly, “creativity and innovativeness require a certain level of internal force that pushes the individual to persevere in the face of challenges in creative work” (Parjanen, 2012, s. 109). Therefore, researchers have been trying to identify what is the basis of employee engagement in the creative process and innovation and they attempt to find out why people get involved in creative activity. Likewise, they try to determine the initial state of inducing creativity (Hassan et al., 2013; Tierney & Farmer, 2004; Unsworth, 2001; Zhou & George, 2003). So far, it has been widely recognized that employee creativity is driven by individual cognitive styles and personal attributes (Cekmecelioglu & Günsel, 2013). These attributes include creative ability, skills, and motivation (Granot, 2016). However, recent empirical evidence indicates that in addition to the personal characteristic affecting the creativity of employees (Hassan et al., 2013), work-related contextual factors also play a significant role in the creativity of employees and company innovation (Table 1).

Table 1. A review of job-specific contextual factors that have been mainly explored in the literature in relation to employee creativity and innovation

Author	Year of the publication	Job-specific contextual factor	Impact on innovation and employee creativity
Hassan, Malik, Hasnain, Faiz & Abbas	2013	job complexity relationship with supervisor	positive effect on firm's innovation
Rodrigues & Marques Veloso	2013	trust	increases creativity of employees and firm innovation
Cekmecelioglu & Günsel	2013	creative organizational climate	positive effect on firm's innovation
Hon & Lui	2015	individual- and group-level uncertainty	hinders creativity and innovation
Ghosh	2015	creative climate self-leadership workplace innovative orientation	all variables enhance employee creativity
Tung & Yu	2016	leadership	enhances creativity
Giustiniano, Lombardi, & Cavaliere	2016	individuals' orientation toward learning from others	significantly enhances organizational creativity
Doran & Ryan	2017	job-specific training creative thinking stimuli knowledge generation stimuli	positively relates to innovation output
Khalili	2018	leader-member exchange (LMX)	There is a positive and significant relationships between LMX and employees' creativity and innovation
Imran, Ilyas, Aslam, & Fatima	2018	knowledge processes knowledge-intensive culture	knowledge processes have a positive impact on firm performance and employee creativity; a knowledge-intensive culture has a strengthening effect on the relationship between knowledge processes and employee creativity
Zaitouni & Ouakouak	2018	leadership support coworker support	leadership support and coworker support exert positive influences on employee creativity
Xu & Wang	2019	leader creativity expectations	leader creativity expectations insignificantly and positively are related to employee radical creativity
Tien, Chang, & Kuo	2019	self-directed learning self-monitoring	Self-directed learning has an influence on the creativity of individuals with accumulated work experience; low self-monitoring influences the creativity of people with less work experience

The organizational climate that promotes trust in the company is one of the job contextual factors positively influencing the creativity of employees and innovation (Isaken, 2017). The findings of Rodrigues and Marques Veloso (2013) show that an organizational climate built on trust increases creativity and cooperation between co-workers, and leads to innovation in companies. Similarly, the study of Ceserani (2014, p. 302) reveals that “high trust releases energy, abilities, imagination, and achievements.” Low trust does the opposite. According to Ceserani (2014, p. 303) trust is the foundation of successful innovation in that “in a low-trust organization, people’s energy is focused on defending themselves. In a high-trust organization, people’s energy is released to be used on creativity, innovation, and performance”.

The organizational climate that induces trust is strongly influenced by the leaders (Dul & Ceylan, 2014; Lau & Liden, 2008; Vinarski-Peretz, & Carmeli, 2011). According to Isaken (2017), by sharing information candidly and regularly with employees, leaders may strengthen levels of organizational trust, safety, justice, and openness. Moreover, leaders can affect trust in the company by directly solving difficult problems instead of avoiding them. Similarly, Parjanen (2012) and Zhang & Zhou (2014) state that leaders can support the creativity of employees by appreciating the contribution of individual employees and showing confidence in the working group (Parjanen, 2012; Zhang & Zhou, 2014).

To facilitate innovation and creativity, the leaders of family firms may build a friendly, fear-free psychological environment, and promote organizational behavior that avoids both individual- and group-level uncertainties that hinder creativity (Hon, Bloom, & Crant, 2014; Hon & Lui, 2016). They may also support psychological safety and intergroup relationships (Dackert, 2016). All these activities should build and strengthen trust in the organization. Considering that these activities may lead family firms to greater employee creativity and consequently, to greater innovation, we postulate that:

H2. All types of innovation in family businesses are determined by building a climate of trust in the workplace.

Innovation of family businesses and stimulating employee creativity by promoting team integration

The spectrum of job-specific contextual factors related to employee creativity and innovation is wide. Team integration has been recognized as another determinant of creativity and innovation in organizations. The team’s integration mainly refers to the cooperation of individual team members and their shared understanding. This also applies to the involvement of

team members in achieving common goals and their willingness to exchange information. According to Nawi, Lee, Kamar, and Hamid (2012), the members of an effective integrated team feel a “sense of ownership” (p. 50), clearly understanding their roles and responsibilities.

Although team integration is difficult to build, family firms may influence it. To enhance innovation and employees’ creativity, family businesses may support social integration within the group of employees and develop intergroup relationships (Dackert, 2016). Their leaders can impact the team’s integration by encouraging team cohesion, enhancing social relations, and providing tasks that require cross-functional teamwork (Isaken, 2017). Leaders are also able to support team work and enhance team outcomes by organizing team integration meetings that support both task and team work (Salas, Diazgranados, Klein, Burke, Stagl, Goodwin, & Halpin, 2008). Thus, we postulate that:

H3. All types of innovation in family businesses are determined by promoting team integration.

Innovation of family businesses and stimulating employee creativity by supporting employee development

The Oslo Manual (2018) stresses that “innovation is based on a learning process” (Organisation for Economic Co-operation and Development [OECD], 2018, p. 45). It identifies different knowledge-based activities that firms can undertake in pursuing innovation. These include employee training activities. Such training is required not only to develop innovation but, in particular, it is needed to stimulate employee creativity.

Sarri, Bakouros, and Petridou (2010) state that to increase employee creativity and innovativeness, it is crucial to identify the training needs of individuals and then design training adjusted to these needs. Similarly, the study of Ghosh (2015) reveals that exposing the employee to training, mentoring, and on-the-job coaching can bring out the creative performance of an employee. These findings are in line with the recent theories of team innovation, highlighting that external knowledge acquisition develops team members in searching for novel routines and practices (Jiang & Chen, 2016).

Doran & Ryan (2017) provide an explanation of the existence of the relationship between the development of employees’ knowledge and creativity. They argue that job training boosts employees’ knowledge about job context, which in turn increases their potential to generate new ideas. Bearing this in mind, we suggest that supporting the development of

employees in family firms, influences the innovation of family firms, and we postulate that:

H4. All types of innovation in family businesses are determined by supporting the development of employees.

RESEARCH METHODS

This paper is based on the results of a primary quantitative research and is a part of a larger study dedicated to explore economic and social issues of family businesses in Poland. In this study, the ownership and management criteria were chosen to identify our population of Polish family firms. Accordingly, the term “family firm” has been applied to a business having one person or a family as the whole or majority owner, and where the owner/family are also the managers (Kraśnicka, 2017).

For the purpose of the study, we adopted a definition of innovation used by O’Sullivan and Dooley (2009), according to which innovation refers to making changes (large and small, radical and incremental) to the products, processes, and services that result in the introduction of something new for the organization that adds value to customers and contributes to the organization’s knowledge store. Using the Oslo Manual (2005) classification, we considered product, process, organizational, and marketing innovations. A product innovation is understood as “the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user-friendliness, or other functional characteristics” (OECD, 2005, p. 48). A business process innovation has come to be used to refer to “the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software” (OECD, 2005, p. 49). The term “marketing innovations” has been applied to “the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing” (OECD, 2005, p. 49). Finally, organizational innovation is defined as “the implementation of a new organizational method in the firm’s business practices, workplace organization or external relations” (OECD, 2005, p. 52). In this study, product, process, organizational, and marketing innovations were used as dependent variables.

A questionnaire was used as the method of our primary data collection. It was based on the recommendations of the Oslo Manual (2005) and research on innovation. As recommended (Oslo Manual, 2005), the questionnaire adapted

short sentences and a number of binary scale responses (yes or no). A series of questions relating to the research objectives were developed through a thorough review of existing research on innovation, employee creativity, team development and integration, trust, and other issues relevant to our project.

We chose an e-mail questionnaire to collect data as it allowed respondents to participate in the study at a convenient time—an important factor considering the busy life and work commitments of our target group. Free and flexible access to the questionnaire ensured that respondents could take their time to read and fully understand the questions and complete the questionnaire thoroughly. Finally, our data collection method was supported by research findings showing that an email survey often stimulates a higher response level than regular studies (Saunders, Lewis, & Thornhill, 2009; Seale 2004).

The questionnaire was directed to owner-managers of family firms. All respondents were asked to provide information about innovations in their company. Based on it, we identified family firms that introduced product, process, marketing, and organizational innovations. The indications of our respondents led us also to the identification of family businesses with creative employees (*employee creativity* was the first of four independent variables that were examined). We considered *employee creativity* “as the creation of a valuable and useful product, service, idea, procedure or process by individuals working in a complex social system” (Hon & Lui, 2016, p. 863). A firm was classified as a firm with creative employees when the managers who responded to the questionnaire declared that employees come up with new and innovative ideas. That question was adopted from Cekmecelioglu and Günsel (2013).

Considering the provided responses, we also identified family businesses that care about developing a trusting workplace climate (*trusting workplace climate* was the second independent variable that was examined). Following the definition of *trusting climate* of Shih, Chiang, and Chen (2012, p. 1059), a workplace climate is “rooted in three related components: (i) the belief that one’s colleagues are capable and skilled, (ii) the desire to do good for others and believe that one’s own interests will not be harmed by colleagues, and (iii) the belief that the other party is motivated by the principle of fairness.” Considering that leaders may build a trusting workplace climate by sharing information candidly and regularly with employees, and by promoting organizational behavior that avoids both individual- and group-level uncertainties (Hon et al., 2014; Hon & Lui, 2016), we asked our respondents whether these two activities are undertaken in their companies. This led us to the recognition of family firms that build a trusting workplace climate.

The third independent variable that was studied was supporting team integration. We defined *supporting team integration* as organizations’

engagement in inter-firm interactions (Franz, Leicht, Molenaar, & Messner 2017). To measure the activities that family firms perform to support team integration, we asked whether managers (i) provide tasks that require cross-functional teamwork, and simultaneously (ii) organize team integration meetings that support both task and team work (Salas et al., 2008). *The companies engaging in these two activities have been classified as companies supporting team integration.*

Finally, our fourth independent variable was *driving employees' development*. Considering the research results of Jiang and Chen (2016) to measure the family firms' activities that drive employees' development, we asked owner-managers whether (i) the company organizes job training that boosts employees' knowledge about job context, and (i) supports different employee training activities.

A research sample was generated from the database of the Polish Family Firm Initiative (*Inicjatywa Firm Rodzinnych IFR*). Initially, a pilot survey was conducted on a sample of 15 family businesses. Considering the feedback from users, a modified, final version of the questionnaire was sent to our sample.

The quality of all returned questionnaires was verified in terms of completeness and correctness. Some questionnaires were removed from the database due to discrepancies or incomplete data. Finally, 353 fully completed questionnaires were used for statistical analysis. The surveyed sample consisted of micro, small, medium, and large family businesses. The respondents represented all industries including trade, services, production and construction. There were also enterprises with mixed activities. Table 2 shows the descriptive statistics regarding the sample.

Table 2. Descriptive statistics regarding the sample

	Specification	N	%
Firms size	micro firms	183	51.7
	small firms	100	28.2
	medium firms	40	11.3
	large firms	31	8.8
Industry	construction	19	5.4
	trade	65	18.4
	mixed	101	28.5
	production	27	7.6
	services	142	40.1

Statistical analysis of the data was carried out in a few stages. Firstly, using the χ^2 test, significant differences ($p < 0.05$) for selected variables were calculated. Secondly, the correspondence analysis was used to identify the relation of analyzed variables to different types of innovations. Finally, the independent predictors of innovations were calculated based on the logistic regression equation. These calculations enabled the recognition of the chances for the implementation of different types of innovations by family firms.

RESULTS

The empirical evidence indicates that family businesses, including (i) those whose employees generate creative ideas and (ii) those whose employees do not come up with new solutions, implement all types of innovations. However, greater innovative activity is evidenced among family firms whose employees develop some creative ideas concerning firm products, processes, organization, or marketing (Figure 1). Among the family firms whose employees generated and did not generate creative ideas, no statistical differences were found, neither in the case of organizational innovations ($\chi^2 = 0.53$; $p = 0.4677$) nor in marketing ($\chi^2 = 2.19$; $p = 0.1389$) and process ($\chi^2 = 3.24$; $p = 0.0718$) innovations. Employee creativity turned out to significantly determine only the implementation of product innovations ($\chi^2 = 11.83$; $p = 0.006$) of family businesses.

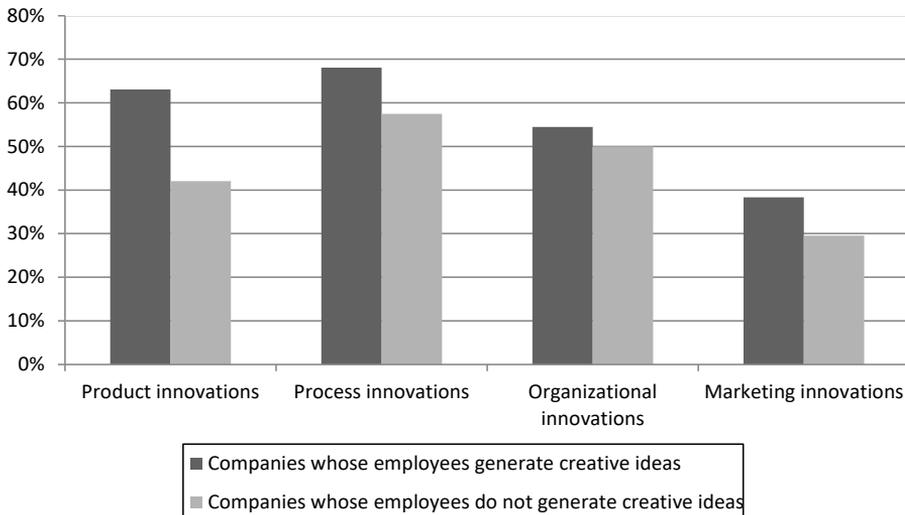
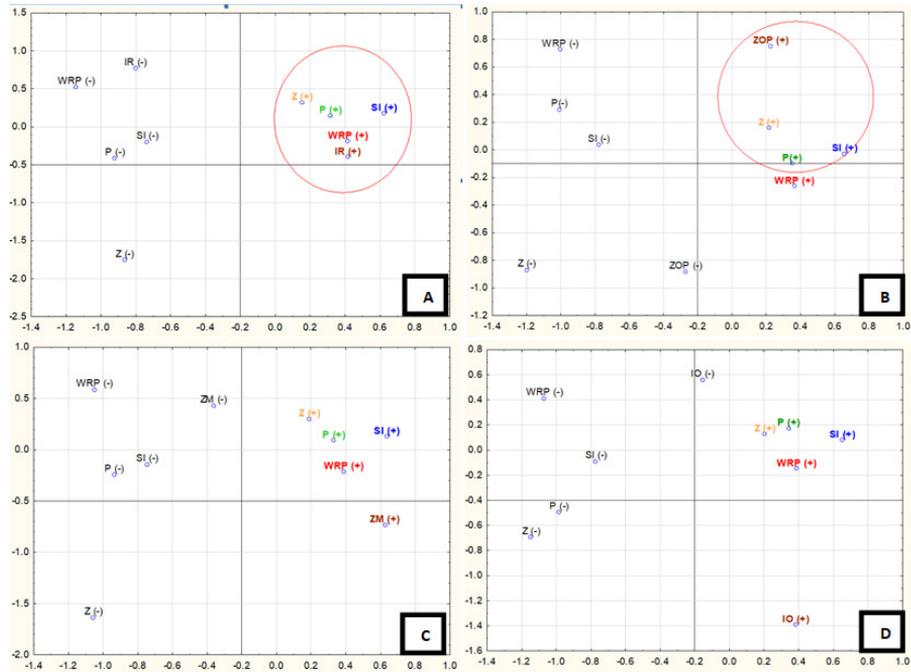


Figure 1. The implementation of products, processes, organizational and marketing innovations in family firms whose employees do and do not generate new ideas



- P(+)
P(-)
- IR (+)
IR (-)
- IP (+)
IP (-)
- ZM (+)
ZM (-)
- ZOP (+)
ZOP (-)
- SI (+)
SI (-)
- Z (+)
Z (-)
- WRP (+)
WRP (-)

Figure 2. The correspondence analysis of investigated variables and the implementation of process (A), organizational (B), marketing (C) and product (D) innovations by family firms

The correspondence analysis found out that the family firms whose employees generate creative ideas are characterized by the introduction of products and processes innovations. Contrary, the remaining family firms were

unlikely to introduce product and process innovations. The implementation of marketing innovations was not associated with (i) those family businesses whose employees generate creative ideas; nor with (ii) those family firms whose employees do not create new solutions (Figure 2).

Almost 85% of respondents declared that their firms build a trusting workplace climate (Figure 3). Interestingly, between this group of family firms and the group of family businesses that do not care about a trusting climate in their organization, there were no statistical differences concerning the implementation of any type of innovation – product ($X^2=1.4$; $p=0.2359$); process ($X^2=0.04$; $p=0.8331$); organizational ($X^2=2.69$; $p=0.01011$) and marketing ($X^2=1.52$; $p=0.2183$).



Figure 3. The implementation of product, process, organizational and marketing innovations in family firms that build and do not build a trusting workplace culture

The majority of family firms included in the study support the development of their employees. 28% of the respondents indicated that they neither organize nor finance any training of their personnel. The activity of these family businesses was similar to the rest of the companies only in the implementation of organizational innovations. Other types of innovation (product, process, and marketing innovations) were less frequent (Figure 4). Among those family firms that support and do not support employees’ development, no statistical differences were found only in the case of organizational innovations ($X^2=0.17$; $p=0.6762$). However, supporting the

development of employees significantly determined the implementation of product ($X^2=8.36$; $p=0.0038$), process ($X^2=33.75$; $p<0.001$), and marketing ($X^2=13.9$; $p=0.0003$) innovations.

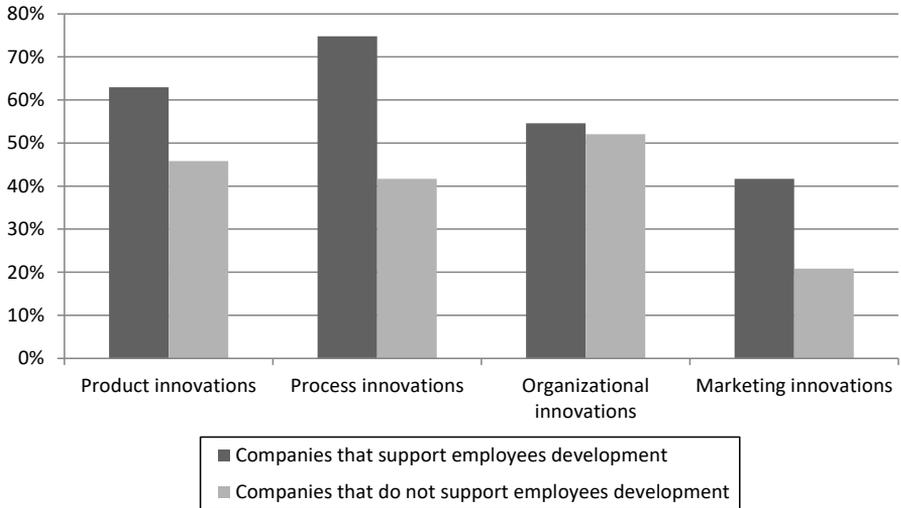


Figure 4. The implementation of product, process, organizational and marketing innovations in family firms that support and do not support employees' development

54% of family firms reported that they support team integration in the organization. The comparison of these family businesses to the rest of respondents shows that this group was characterized by greater innovation implementation (Figure 5). However, the statistical differences between these two groups of family businesses appeared only in the case of process innovation ($X^2=13.9$; $p=0.0003$).

The correspondence analysis revealed that the family firms that build a trusting workplace climate, support team integration, and drive employees' development are characterized by the implementation of processes and organizational innovations. This analysis also showed that these activities of family businesses do not correspond to organizational and marketing innovations (Figure 2).

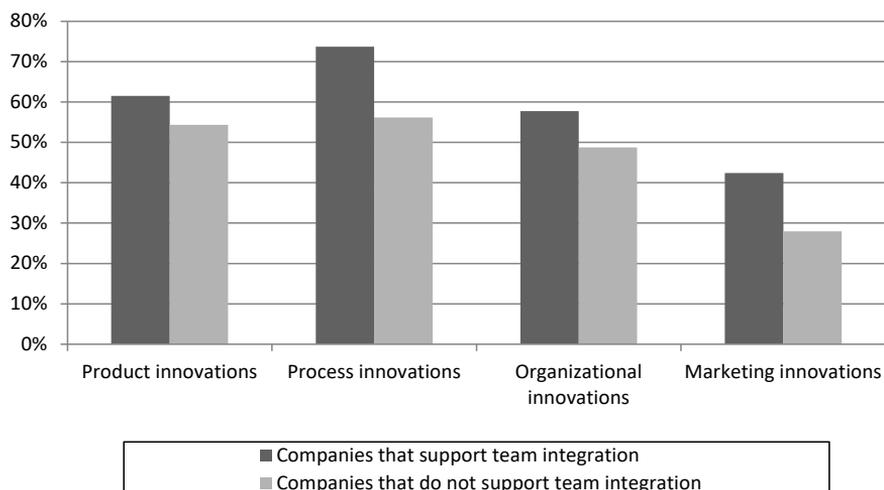


Figure 5. The implementation of product, process, organizational and marketing innovations in family firms that support and do not support team integration

To find the independent predictors of all investigated variables on innovation of family businesses, a regression analysis was performed. The results of it are presented in Table 3. In summary, the regression analysis highlighted that:

- employee creativity is an independent factor influencing product innovations;
- supporting the development of employees is an independent factor that impacts product, process and marketing innovations;
- building team integration is an independent factor that influences process innovations.

The regression analysis additionally showed that:

- the chances of the implementation of product innovation by family firms increase when the company supports employees development (1.67 times); or when the firm has employees that generate creative ideas (more than 2 times);
- the chances of the introduction of process innovation in family businesses raise when the firm supports employees' development (3.5 times); or when it builds team integration (more than 1.8 times);
- the chances of the implementation of marketing innovation by family companies increase more than 2 times when the firm supports employees' development.

Table 3. Regression analysis for chosen variables

	Companies that support employee development	Companies that have creative employees	Companies that build a trusting workplace culture	Companies that support team integration
Product innovation				
Estimation	0.516	0.771	0.231	0.055
Standard error	0.262	0.261	0.319	0.240
t(335)	1.971	2.949	0.729	0.261
p	0.045	0.003	0.467	0.818
-95%CL	<0.001	0.257	-0.393	-0.417
+95%CL	1.031	1.285	0.854	0.538
Chi-kwadrat	3.883	8.698	0.531	0.0532
p	0.048	0.003	0.466	0.816
Odds ratio	1.675	2.161	1.260	1.057
-95%CL	1.001	1.293	0.675	0.659
+95%CL	2.804	3.614	2.350	1.695
Process innovation				
Estimation	1.257	0.152	-0.298	0.595
Standard error	0.268	0.281	0.346	0.255
t(335)	4.684	0.543	-0.861	2.331
p	4.096	0.588	0.389	0.020
-95%CL	0.729	-0.399	-0.978	0.093
+95%CL	1.785	0.704	0.382	1.096
Chi-kwadrat	21.942	0.294	0.741	5.433
p	2.822	0.587	0.389	0.0198
Odds ratio	3.515	1.164	0.742	1.812
-95%CL	2.073	0.671	0.376	1.097
+95%CL	5.959	2.022	1.466	2.994
Organizational innovation				
Estimation	-0.124	0.143	0.378	0.309
Standard error	0.2593	0.258	0.311	0.233
t(335)	-0.478	0.552	1.215	1.311
p	0.633	0.581	0.225	0.190
-95%CL	-0.634	-0.365	-0.233	-0.153
+95%CL	0.386	0.650	0.9895	0.765
Chi-kwadrat	0.228	0.305	1.476	1.716

	Companies that support employee development	Companies that have creative employees	Companies that build a trusting workplace culture	Companies that support team integration
p	0.633	0.580	0.224	0.190
Odds ratio	0.883	1.153	1.459	1.357
-95%CL	0.530	0.694	0.791	0.828
+95%CL	1.471	1.916	2.690	2.148
Marketing innovation				
Estimation	0.796	0.189	0.226	0.399
Standard error	0.294	0.281	0.344	0.246
t(335)	2.705	0.675	0.659	1.618
p	0.007	0.499	0.512	0.106
-95%CL	0.217	-0.362	-0.451	-0.085
+95%CL	1.375	0.742	0.902	0.883
Chi-kwadrat	7.318	0.4556	0.430	2.619
P	0.007	0.199	0.156	0.106
Odds ratio	2.217	1.209	1.253	1.489
-95%CL	1.212	0.696	0.637	0.918
+95%CL	3.956	2.100	2.464	2.419

Note: significant parameters with p-values lower than 0.05 are highlighted.

DISCUSSION

This study identified a relationship between the creativity of employees and the innovation of family businesses. The presented evidence shows that family firms, whose employees generate creative ideas, introduce significantly more product innovations than other family businesses. Interestingly, this relationship is related only to this specific form of innovation. In the case of organizational, process and marketing innovations, no differences between these two groups of family firms were found. Thus, the study reveals that the positive impact of employee creativity on the introduction of innovations by family firms does not always exist. It applies only to one type of innovation: product innovation. Consequently, the hypothesis H1, according to which employees' creativity positively influences the introduction of all types of innovations in family firms, can be confirmed only partially.

The relationship between employee creativity and product innovation suggests that product development solutions generated by employees are

particularly useful for family businesses. This may be due to the fact that employees of family firms know both the needs of the customers and the concerns of the family regarding the possibility of losing control over the trajectory of traditional family products. As the ideas generated by employees may be rooted in the tradition of a family firm, they can be particularly valuable from the point of view of family business owners.

By showing that in family firms, employee creativity positively influences the introduction of product innovations, our findings are in line with previous studies (Hassan et al., 2013). Likewise, our results provide additional evidence to support the research showing links between creativity and innovation (Anderson et al., 2014; Hon & Lui, 2016; Slatten, 2014).

The second dimension of the study related to family firms' management practices aimed at fostering employees' creativity to increase the company's innovativeness. We considered three forms of these practices including: building a trusting workplace climate, supporting employees' development, and promoting team integration. It was assumed that all types of innovation in family businesses are determined by the above variables (H2; H3; H4). However, none of these hypotheses (H2; H3; H4) could be fully confirmed. Our analysis revealed only that: (i) supporting employee development is an independent factor influencing the product, process and organizational but not the marketing innovation of family businesses; and that (ii) building team integration by the company is an independent factor that impacts process innovation.

Unexpectedly, the creation of a trusting workplace climate was not identified as an independent variable determining the implementation of any type of innovation by family firms. The lack of a relationship between building a trusting workplace climate and innovation in family businesses may appear due to family firms being generally based on trust (Lattuch, 2019). They offer their employees job security, which typically is greater in family businesses than in non-family firms (Bassanini, Breda, Caroli, & Rebérioux, 2013). Accordingly, it may be that a trusting workplace climate is so naturally deeply rooted in the psychological environment of family businesses that it creates a friendly enough atmosphere to foster creativity and innovation. Therefore, any activities undertaken by leaders to create a climate of trust in the workplace may not lead to creating additional value in this field.

An important achievement that emerges from this study is that the support of employee development is an independent factor influencing the product, processes, and organizational innovation of family businesses. This finding supports the conclusions of the study of Sarri et al. (2010), who argue that to increase employee creativity and innovativeness, it is crucial to identify the training needs of individuals. Thus, as human resources "are

critical for long-term strategic gain” in family firms (Clinton, 2016, p. 176), and innovation is essential for their long-term competitive advantage (Gentry et al., 2016), it is extremely important for family businesses to support employee development. As the findings of this study show, due to such activities, family firms can increase their innovation. Memili and Welsh (2012) state that family businesses should especially take care of the workers outside of the family. According to them, employees that do not belong to the family can play a key role in the development of family businesses because such employees may present other than family views on the strategy of the firm.

Showing the relationship between employee development and the product, processes and organizational innovation of family businesses, this study demonstrates how crucial knowledge assets are for the family firm’s innovativeness. Importantly, such results are in line with previous research conducted by Palacios, Gil, and Garrigos (2009), which reveals that knowledge resources have a positive impact on the firm’s innovative performance. They also support the recent theories of team innovation that emphasize team processes centered on collective knowledge activities, such as knowledge acquisition. These theories have also highlighted that external knowledge acquisition develops team members in searching for novel routines and practices (Jiang & Chen, 2016).

A meaningful finding of our study is also the conclusion concerning team integration activities and the implementation of process innovation. Our results indicate that there is a relationship between these variables. Thus, the paper supports the previous studies in the field, suggesting that enhancing innovation and creativity among enterprises requires social integration within the group of employees (Dackert, 2016). Importantly, our study shows that the relationship between the social integration of the team and the firms’ innovation also applies to family businesses. Thus, similarly to the studies of Clinton (2016) and Steinerowska-Streb (2016), our study findings emphasize the role of human resources in the innovation of family firms and show that care for employees in family businesses contributes to their strategies.

The results of this study, concerning the relationships between firm innovation and supporting employee development as well as building team integration, are in line with the empirical evidence indicating that not only the personal characteristics of employees affect the creativity of employees (Hassan et al., 2013; Khalili, 2018; Rodrigues & Marques Veloso, 2013). As evidenced, job contextual factors also play a significant role in the creativity of employees and company innovativeness.

Finally, it is essential to note that this study does not identify a trusting workplace climate as an independent factor that influences family firm innovation. Thus, it can be concluded that although family businesses offer

their employees greater job security than non-family firms (Bassanini et al., 2013), they must also stimulate employee creativity in different ways to encourage them to generate new innovative ideas.

CONCLUSION, IMPLICATIONS, AND DIRECTIONS FOR FUTURE RESEARCH

It is generally accepted that contemporary employees constitute a fundamental source of creativity and innovation in organizations (Bammens et al., 2014). Thus, many firms are trying to build an organizational climate that supports employees' creativity, including management support, strategy, working environment, customer orientation, or leadership (Doran & Ryan, 2017; Tuan, Giang, & Nguyen, 2014). However, it is not a rule that the creative thinking of employees, or actions undertaken within an organization to enhance employee creativity, will shift the firm to a greater level of innovation (Drozdowski, Zakrzewska, Puchalska, Morchat, & Mroczkowska, 2010). The basis for this can be found in two main reasons. Firstly, employee creativity may not always lead to innovation because only some of the ideas provided by the employees are valuable to a firm. Thus, not all of the ideas generated by employees are introduced into business practice. Secondly, only some companies appreciate that creative employees may solve many different challenges (Slatten, 2014) and increase their long-term competitive advantage (Granot, 2016; Hassan et al., 2013). Hence, in companies that are not interested in the creativity of employees, employees generating innovative ideas do not contribute to the emergence of innovation. Nevertheless, the capabilities of organizations are often determined by entrepreneurs that are able to critically look at products, services and / or work practices in the organization. These entrepreneurs can generate ideas that may be used to create new, innovative services/products and methods of work (Dovey, 2009).

The present study reveals that family firms that are aware of the importance of creative employees and that introduce the creative ideas of their staff members into business practice are more innovative than the rest of family businesses. This study also shows that many family businesses undertake a variety of activities to develop an environment supporting employee creativity and firm innovation. Despite this, some of them succeed in their attempts to introduce greater innovation. Instead, we found that the company's innovation growth exists when the firm supports employee development.

The findings of this study contribute to both the family firm and innovation literature. They extend the knowledge about the factors affecting

the introduction of different types of innovation by family firms. The paper also exerts the knowledge about managing employees in Polish family firms.

In addition to developing knowledge in the field, the study also provides some practical implications for family businesses. Based on the findings, we suggest that family firms should promote the creativity of their employees. As evidence, there is a relationship between the employees' creativity and product innovation of family businesses. Thus, it shows that workers can be crucial actors in reshaping and improving business practices and the business performance of family firms. These findings can help to inform owner-managers of family businesses on how to manage individuals and teams for the benefit of both – their firms and employees.

Finally, the study has some policy implications, and it indicates that policies should promote and encourage companies that support the development of knowledge of their employees. The latter can lead family firms to be more innovative and, consequently, contribute to the acceleration of economic growth and development.

Drawing on this study, we call for additional research investigating employee creativity and innovation in family firms. Future studies could focus on other human resource management practices that aim to create a creative workforce. Moreover, future research may be conducted in different socio-economic environments and on a larger sample of businesses to verify and add to the findings presented in this paper. Finally, future studies can use both qualitative and quantitative methodologies to measure employee creativity in order to complement and expand research results. In-depth qualitative interviews can help to answer the “why” and “what” questions revealing reasons for employee involvement in creating new, innovative ideas.

This study has several limitations. First, we analyzed the impact of three selected activities that stimulate employees' innovative thinking on family firm innovation. Undoubtedly, different determinants and environmental factors may also play a role. Second, our research was conducted only in Poland. Thus, further research in other countries can add to the findings of the present study.

References

- Anderson, N., Potocnik, K., & Zhou, J. (2014). Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management*, 40(5), 1297-1333. <http://doi.org/10.1177/0149206314527128>
- Astrachan, J.H. (2010). Strategy in family business: Toward a multidimensional research agenda. *Journal of Family Business Strategy*, 1(1), 6-14. <http://dx.doi.org/10.1016/j.jfbs.2010.02.001>

- Bammens, Y., Notelaers, G., & Van Gils, A. (2014). Implications of family business employment for employees' innovative work involvement. *Family Business Review*, 28(2), 123-144. <http://doi.org/10.1177/0894486513520615>
- Bassanini, A., Breda, T., Caroli, E., & Rebérioux, A. (2013). Working in family firms: Paid less but more secure? Evidence from French matched employer-employee data. *ILR Review*, 66(2), 433-466. <http://doi.org/10.1177/001979391306600206>
- Beheshtifar, M., & Zare, E. (2013). Employee creativity: A compulsory factor in organizations. *Interdisciplinary Journal of Contemporary Research*, 5(2), 242-247. <http://doi.org/10.1177/0258042X16676664>
- Beck, L., Janssens, W., Kommelen, T., & Sluismans, R. (2009). Research on innovation capacity antecedents, distinguishing between family and non-family businesses. Paper presented at the EIASM Workshop on Family Firms Management Research, June 7-9, Hasselt, Belgium. Retrieved from http://www.researchgate.net/publication/228781684_Research_on_innovation_capacity_antecedents_distinguishing_between_family_and_non-family_businesses
- Bratnicka-Myśliwiec, K., Wronka- Pośpiech, M., & Ingram T. (2019). Does socioemotional wealth matter for competitive advantage? A case of Polish family businesses. *Journal of Entrepreneurship, Management and Innovation*, 15(1), 123-146. <http://doi.org/10.7341/20191515>
- Boers, B., Ljungkvist, T., Brunninge, O., & Nordqvist, M. (2017). Going private: A socioemotional wealth perspective on why family controlled companies decide to leave the stock-exchange. *Journal of Family Business Strategy*, 8(2), 74-86. <http://doi.org/10.1016/j.jfbs.2017.01.005>
- Cekmecelioglu, H.G., & Günsel, A. (2013). The effects of individual creativity and organizational climate on firm innovativeness. *Procedia - Social and Behavioral Sciences*, 99(2013), 257-264. <http://doi.org/10.1016/j.sbspro.2013.10.493>
- Ceserani, J. (2014). Innovation and trust – the path to mastery. *Industrial and Commercial Training*, 46(6), 302-306. <http://doi.org/10.1108/ICT-04-2014-0024>
- Classen, N., Carree, M., Van Gils, A., & Peters, B. (2014). Innovation in family and non-family SMEs: An exploratory analysis. *Small Business Economics*, 42(3), 595–609. <http://doi.org/10.1007/s11187-013-9490-z>
- Clinton, E. (2016). Human resources in the family business – maximising the power of your people. *The Irish Journal of Management*, 35(2), 176-178. <http://doi.org/10.1515/ijm-2016-0014>
- Coelho, F., Augusto, M., & Lages, L.F. (2011). Contextual factors and the creativity of frontline employees: The mediating effects of role stress and intrinsic motivation. *Journal of Retailing*, 87(1), 31-41. <http://doi.org/10.1016/j.jretai.2010.11.004>

- Covin, J.G., & Wales, W.J. (2012). The measurement of entrepreneurial orientation. *Entrepreneurship Theory and Practice*, 36(4), 677–702. <http://doi.org/10.1111/j.1540-6520.2010.00432.x>
- Dackert, I. (2016). Creativity in teams: The impact of team members' affective well-being and diversity. *Open Journal of Social Sciences*, 4, 19–28. <http://doi.org/10.4236/jss.2016.49003>
- De Massis, A., Wang, H., & Chua J.H. (2018). Counterpoint: How heterogeneity among family firms influences organizational change. *Journal of Change Management*, 19(1), 37–44. <http://doi.org/10.1080/14697017.2017.1419808>
- De Massis, A., Frattini, F., & Lichtenthaler, U. (2012). Research on technological innovation in family firms: Present debates and future directions. *Family Business Review* XX(X), 1–22. <http://doi.org/10.1177/0894486512466258>
- Doran, J., & Ryan, G. (2017). The role of stimulating employees' creativity and idea generation in encouraging innovation behaviour in Irish firms. *Irish Journal of Management*, 36(1), 32–48. <http://doi.org/10.1515/ijm-2017-0005>
- Dovey, K. (2009). The role of trust in innovation. *The Learning Organization*, 16(4), 311–325. <http://doi.org/10.1108/09696470910960400>
- Drozdowski, R., Zakrzewska, A., Puchalska, K., Morchat, M., & Mroczkowska, D. (2010). *Wspieranie Postaw Proinnowacyjnych przez Wzmacnianie Kreatywności Jednostki*. Warsaw: Polska Agencja Rozwoju Przedsiębiorczości. Retrieved from <https://www.parp.gov.pl/storage/publications/pdf/9721ogktouk4ue.pdf>
- Dul, J., & Ceylan, C. (2014). The impact of a creativity-supporting work environment on a firm's product innovation performance. *Journal of Product Innovation Management*, 31, 1254–1267. <http://doi.org/10.1111/jpim.12149>
- Erdogan, I., Rondi, E., & De Massis, A. (2019). Managing the tradition and innovation paradox in family firms: A family imprinting perspective. *Entrepreneurship Theory and Practice*, 44(1), 1–35. <http://doi.org/10.1177/1042258719839712>
- Filser, M., Brem, A., Gast, J., Kraus, S., & Calabrò, A. (2016). Innovation in family firms — examining the inventory and mapping the path. *International Journal of Innovation Management*, 20(06), 1–39. <http://doi.org/10.1142/S1363919616500547>
- Franz, B., Leicht, R., Molenaar, K., & Messner, J. (2017). Impact of team integration and group cohesion on project delivery performance. *Journal of Construction Engineering and Management*, 143(1), 1–12. [http://doi.org/10.1061/\(ASCE\)CO.1943-7862.0001219](http://doi.org/10.1061/(ASCE)CO.1943-7862.0001219)
- Gentry, R., Dibrell, C., & Kim, J. (2016). Long-term orientation in publicly traded family businesses, Evidence of a dominant logic. *Entrepreneurship Theory and Practice*, 40(4), 733–757. <http://doi.org/10.1111/etap.12140>
- Ghosh, K. (2015). Developing organizational creativity and innovation. Toward a model of self-leadership, employee creativity, creativity climate and workplace innovative orientation. *Management Research Review*, 38(11), 1126–1148. <http://doi.org/10.1108/MRR-01-2014-0017>

- Giustiniano, L., Lombardi, S., & Cavaliere, V. (2016). How knowledge collecting fosters organizational creativity, *Management Decision*, 54(6), 1464-1496. <http://doi.org/10.1108/MD-04-2015-0111>
- Gómez-Meja, L. R., Kynes, K. T., Numez-Nickel, M., & Moyano-Tuentes. H. (2007). Socioemotional health and business risk in family-controlled firms: Evidence from Spanish olive oil mills. *Administrative Science Quarterly*, 52, 106-137. <http://doi.org/stable/i20109899>
- Granot, E. (2011). Creative managers and managing creativity: A hermeneutic exploration. *American Journal of Business*, 26(2), 161-182. <http://doi.org/10.1108/19355181111174534>
- Hassan, M.U., Malik, A.A. Hasnain, A., Faiz, M.F., & Abbas, J. (2013). Measuring employee creativity and its impact on organization innovation capability and performance in the banking sector of Pakistan. *World Applied Sciences Journal*, 24(7), 949-959. <http://doi.org/10.5829/idosi.wasj.2013.24.07.13253>
- Hiebl, M.R.W. (2014). Risk aversion in the family business: The dark side of caution. *Journal of Business Strategy*, 35(5), 38-42. <http://doi.org/10.1108/JBS-09-2013-0087>
- Hon, A.H.Y., Bloom, M., & Crant, M. (2014). Overcoming resistance to change and enhancing creative performance. *Journal of Management*, 40(3), 919-941. <http://doi.org/10.1177/0149206311415418>
- Hon, A.H.Y., & Lui, S.S. (2016). Employee creativity and innovation in organizations. Review, integration, and future directions for hospitality research. *International Journal of Contemporary Hospitality Management*, 28(5), 862-885. <http://doi.org/10.1108/IJCHM-09-2014-0454>
- Hong, J., Hou, B., Zhu, K., & Marinova, D. (2018). Exploratory innovation, exploitative innovation and employee creativity: The moderation of collectivism in Chinese context. *Chinese Management Studies*, 12(2), 268-286. <http://doi.org/10.1108/CMS-11-2016-0228>
- Hoy, F. (2006). The complicating factor of life cycles in corporate venturing. *Entrepreneurship Theory Practice*, 30(6), 831-836. <http://dx.doi.org/10.1111/j.1540-6520.2006.00154.x>
- Isaken, S. (2017). Leadership's role in creative climate creation. In M.D. Mumford & S. Helmin (Eds.), *Handbook of Research on Leadership and Creativity*. Northampton, Massachusetts: Edward Elgar Publishing.
- Imran, M. Ilyas, M., Aslam, U., & Fatima, T. (2018). Knowledge processes and firm performance, the mediating effect of employee creativity. *Journal of Organizational Change Management*, 31(3), 512-531. <http://doi.org/10.1108/JOCM-10-2016-0202>
- Jiang, Y., & Chen, C.C. (2016). Integrating knowledge activities for team innovation. Effects of transformational leadership. *Journal of Management*, 44(5), 1819-1847. <http://doi.org/10.1177/0149206316628641>
- Khalili, A. (2018). Creativity and innovation through LMX and personal initiative. *Journal of Organizational Change Management*, 31(2), 323-333. <http://doi.org/10.1108/JOCM-09-2016-0183>

- Kammerlander, N., Dessì, C., Bird, M., Floris, M., & Murru, A. (2015). The impact of shared stories on family firm innovation: A multicase study. *Family Business Review*, 28(4), 332–354. <http://doi.org/10.1177/0894486515607777>
- Kellermanns, F.W., Eddleston, K.A., Sarathy, R., & Murphy, F. (2012). Innovativeness in family firms: A family influence perspective. *Small Business Economics*, 38(1), 85–101. <http://doi.org/10.1007/s11187-010-9268-5>
- Kotlar, J., & Chrisman, J.J. (2018). How family involvement influences organizational change. *Journal of Change Management*, 19(1), 26–36. <http://doi.org/10.1007/s11187-010-9268-5>
- Kotlar, J., De Massis, A., Fang, H., & Frattini, F. (2014). Strategic reference points in family firms. *Small Business Economics*, 43(3), 597–619. <http://doi.org/10.1007/s11187-014-9556-6>
- König, A., Kammerlander, N., & Enders, A. (2013). The family innovator's dilemma. How family influence affects the adoption of discontinuous technologies by incumbent firms. *Academy of Management Review*, 38(3), 418–441. <http://doi.org/10.5465/amr.2011.0162>
- Kraśnicka, T. (2017). Sukcesja i kondycja ekonomiczno-finansowa firm rodzinnych w Polsce i Czechach. Wyniki badań jakościowych. *Zeszyty Naukowe Politechniki Śląskiej*, 108, 203–214.
- Lattuch, F. (2019). Family firm innovation strategy, contradictions and tradition. *Journal of Business Strategy*, 40(3), 36–42. <http://doi.org/10.1108/JBS-03-2018-0046>
- Lau, D.C., & Liden, R.C. (2008). Antecedents of coworker trust: Leaders' blessings. *Journal of Applied Psychology*, 93, 1130–1138. <http://doi.org/10.1037/0021-9010.93.5.1130>
- Li, Z., & Daspit, J.J. (2016). Understanding family firm innovation heterogeneity: A typology of family governance and socioemotional wealth intentions. *Journal of Family Business Management*, 6(2), 103–121. <http://doi.org/10.1108/JFBM-02-2015-0010>
- Lim, E.N.K., Lubatkin, M.H., & Wiseman, R.M. (2010). A family firm variant of the behavioral agency theory. *Strategic Entrepreneurship Journal*, 4(3), 197–211. <http://doi.org/10.1002/sej.91>
- Lorenzo, D., & Núñez-Cacho, P. (2013). Do family firms have specific barriers to innovation? A first approach. Paper presented at the IFERA 2013 Conference, University of St. Gallen, St. Gallen. Retrieved from http://www2.uca.es/serv/catedra-empresa-familiar/docs/DO%20FAMILY%20FIRMS%20HAVE%20-Lorenzo_y_Nunez-Cacho_ifera_2013.pdf
- Madrid-Guijarro, A., Garcia, D., & Van Auken, H. (2009). Barriers to innovation among Spanish manufacturing SMEs. *Journal of Small Business and Management*, 47(4), 465–488. <http://doi.org/10.1111/j.1540-627X.2009.00279.x>
- Martin, G., & Gomez-Mejia, L. (2016). The relationship between socioemotional and financial wealth: Re-visiting family firm decision making. *Management Research. Journal of the Iberoamerican*

- Academy of Management*, 14(3), 215-233. <http://doi.org/10.1108/MRJIAM-02-2016-0638>
- Memili, E., & Welsh, H.B. (2012). Towards a theory of nonfamily employees' organizational identification and attachment in family firms. *Journal of Technology Management*, 7(3), 255-269. <http://doi.org/10.1108/17468771311325167>
- Moghimi, S., & Subramaniam, I.D. (2013). Employees' creative behavior: The role of organizational climate in Malaysian SMEs. *International Journal of Business and Management*, 8(5), 1-12. <http://doi.org/10.5539/ijbm.v8n5p1>
- Nawi, M.N.M., Lee, A., Kamar, K.A.M., & Hamid, Z.A. (2012). Critical success factors for improving team integration in industrialised building system (IBS) construction projects: the Malaysian case. *Malaysian Construction Research Journal*, 10(1), 45-63.
- OECD. (2005). *Oslo Manual, Guidelines for Collecting and Interpreting Innovation Data* (3rd ed.). Paris, France: Organization for Economic Co-operation and Development.
- OECD/Eurostat. (2018). *Oslo Manual: Guidelines for Collecting, Reporting and Using Data on Innovation* (4th ed.). Luxemburg: OECD Publishing.
- O'Sullivan, D., & Dooley, L. (2009). *Applying Innovation*. Thousand Oakes, CA: Sage Publications.
- Palacios, D., Gil, I., & Garrigos, F. (2009). The impact of knowledge management practices on innovation and entrepreneurship in the biotechnology and telecommunications industries. *Small Business Economics*, 32, 291–301. [jstor.org/stable/40344552](http://www.jstor.org/stable/40344552)
- Parjanen, S. (2012). Experiencing creativity in the organization: From individual creativity to collective creativity. *Interdisciplinary Journal of Information, Knowledge, and Management*, 7, 110-128. <http://doi.org/10.28945/1580>
- Park, H.Y., Misra, K., Reddy, S., & Jaber, K. (2019). Family firms' innovation drivers and performance: A dynamic capabilities approach. *Journal of Family Business Management*, 9(1), 4-23. <http://doi.org/10.1108/JFBM-11-2017-0039>
- Rodrigues, A.F.C., & Marques Veloso, A.L.O. (2013). Organizational trust, risk and creativity. *Review of Business Management* 14(49), 545-561. <http://doi.org/10.7819/rbgn.v15i49.1334>
- Salas, E., Diazgranados, D., Klein, C., Burke, C.S., Stagl, K.C., Goodwin, G.F., & Halpin, S. M. (2008). Does team training improve team performance? A meta-analysis. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 50(6), 903–933. <http://doi.org/10.1518/001872008X375009>
- Sarri, K.K., Bakouros, I.L., & Petridou, E. (2010). Entrepreneur training for creativity and innovation. *Journal of European Industrial Training*, 34(3), 270–288. <http://doi.org/10.1108/03090591011031755>
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research Methods for Business Students* (3rd ed.). London, UK: Financial Times/Prentice Hall.

- Seale, C. (2004). *Researching Society and Culture*. London, UK, Sage.
- Shih, H.-A., Chiang, Y.-H., & Chen, T.-J. (2012). Transformational leadership, trusting climate, and knowledge-exchange behaviors in Taiwan. *The International Journal of Human Resource Management* 23(6), 1057–1073. <http://doi.org/10.1080/09585192.2011.639546>
- Slatten, T. (2014). Determinants and effects of employee's creative self-efficacy on innovative activities. *International Journal of Quality and Service Sciences*, 6(4), 326-347. <http://doi.org/10.1108/IJQSS-03-2013-0013>
- Sharama, P., & Sharama, S. (2011). Drivers of proactive Environmental strategy in family firms. *Business Ethics Quarterly*, 21(2), 309-334. <http://doi.org/10.5840/beq201121218>
- Siddiqi, H., & Qureshi, M. (2016). The impact of employees' creativity on the performance of the firm. *Research Issues in Social Sciences*, 1, 1-12.
- Steinerowska-Streb, I. 2016, Wybrane determinanty zatrudniania pracowników w polskich przedsiębiorstwach rodzinnych. *Ekonomika i Organizacja Przedsiębiorstwa*, 3(794), 68-78.
- Sułkowski, Ł., & Marjański, A. (2009). *Firmy Rodzinne. Jak Osiągnąć Sukces w Sztafecie*. Warszawa: Poltext.
- Tang, G., Yu, B., Cooke, F.L., & Chen, Y. (2017). High-performance work system and employee creativity. The roles of perceived organisational support and devolved management, *Personnel Review*, 46(7), 1318-1334. <http://doi.org/10.1108/PR-09-2016-0235>
- Tien, H.K., Chang, B.L., & Kuo, Y.K. (2019). Does experience stimulate or stifle creativity?. *European Journal of Innovation Management*, 22(3),422-445. <http://doi.org/10.1108/EJIM-02-2018-0042>
- Tuan, N.P, Giang, P.H., & Nguyen, D.N. (2014). The impact of organizational culture on innovation activities the case of X corporation in Vietnam. *Journal of Global Management Research*. Retrieved from <http://gmrjournal.uqam.ca/documents/GMRJ-V10N1-JUN2014-29-36.pdf>
- Tung, F.C., & Yu, T.W. (2016). Does innovation leadership enhance creativity in high-tech industries? *Leadership & Organization Development Journal*, 37(5), 579-592. <http://doi.org/10.1108/LODJ-09-2014-0170>
- Tierney, P., & Farmer, S.M. (2004). The Pygmalion process and employee creativity. *Journal of Management*, 30(3), 413-32. <http://doi.org/10.1016/j.jm.2002.12.001>
- Xu, F., & Wang, X. (2019). Leader creativity expectations and follower radical creativity: Based on the perspective of creative process. *Chinese Management Studies*, 13(1), 214-234. <http://doi.org/10.1108/CMS-04-2018-0489>
- Urbinati, A., Franzò, S., De Massis, A., & Frattini, F. (2017). Innovation in family firms: A review of prior studies and a framework for future research. In A. Brem & E. Viardot (Eds), *Revolution of Innovation Management*. (pp. 213-246). London: Palgrave Macmillan.
- Unsworth, K. (2001). Unpacking creativity. *Academy of Management Review*, 26, 289-297. <http://doi.org/10.5465/amr.2001.4378025>

- Vinarski-Peretz, H., & Carmeli, A. (2011). Linking care felt to engagement in innovative behaviors in the workplace: The mediating role of psychological conditions. *Psychology of Aesthetic, Creativity, and the Arts*, 5, 43–53. <http://doi.org/10.1037/a0018241>
- Zaitouni, M., & Ouakouak, M.L. (2018). The impacts of leadership support and coworker support on employee creative behavior. *International Journal of Productivity and Performance Management*, 67(9), 1745-1763. <http://doi.org/10.1108/IJPPM-10-2017-0264>
- Zientara, P. (2017). Socioemotional wealth and corporate social responsibility: A critical analysis. *Journal of Business Ethics*, 144(1), 185-189. <http://doi.org/10.1007/s10551-015-2848-1>
- Zhang, X., & Zhou, J. (2014). Empowering leadership, uncertainty avoidance, trust, and employee creativity: Interaction effects and a mediating mechanism. *Organizational Behavior and Human Decision Processes*, 124, 150–164. <http://doi.org/10.1016/j.obhdp.2014.02.002>
- Zhou, J., & George J.M. (2003). Awakening employee creativity. The role of leader emotional intelligence. *Leadership Quarterly*, 14, 545-568. [http://doi.org/10.1016/S1048-9843\(03\)00051-1](http://doi.org/10.1016/S1048-9843(03)00051-1)

Abstrakt

Celem badania jest rozpoznanie, czy firmy rodzinne wdrażające kreatywne pomysły swoich pracowników są bardziej innowacyjne niż pozostałe firmy rodzinne, tj. czy wdrażają więcej innowacji produktowych, procesowych, marketingowych i organizacyjnych. W artykule eksploruje się związek między innowacjami wdrażanymi w firmach rodzinnych i zaangażowaniem tych firm w prowadzenie działań stymulujących innowacyjne myślenie pracowników firmy przez budowanie klimatu zaufania w pracy, wspieranie rozwoju pracowników oraz wspieranie integracji zespołu. Realizacja postawionych celów została osiągnięta w oparciu o analizę wyników badania pierwotnego przeprowadzonego w Polsce na próbie 353 firm rodzinnych. Analiza statystyczna wyników badania wykazała, że firmy rodzinne wdrażające kreatywne rozwiązania swoich pracowników, wprowadzają istotnie więcej innowacji produktowych, niż inne firmy rodzinne. Nie ma jednak różnic między tymi dwiema grupami firm rodzinnych w zakresie wdrażania innowacji organizacyjnych, procesowych i marketingowych. Nasza analiza wykazała również, że: (i) wspieranie rozwoju pracowników jest niezależnym czynnikiem wpływającym na innowacje produktowe, procesowe i organizacyjne firm rodzinnych; oraz że (ii) budowanie integracji zespołu przez firmę jest niezależnym czynnikiem wpływającym na innowacje procesowe.

Słowa kluczowe: *firmy rodzinne, innowacje, kreatywność, innowacje produktowe, innowacje procesowe, innowacje organizacyjne, innowacje marketingowe, Polska*

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Conflicts of interest

The authors declare no conflict of interest.

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