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CORPORATE ENTREPRENEURSHIP, ENVIRONMENT DYNAMISM AND FIRM PERFORMANCE: EVIDENCE FROM SERBIA*

Korporativno preduzetništvo, dinamičnost okruženja i performanse preduzeća – slučaj Srbije

Abstract

Findings and knowledge about the relationship between corporate entrepreneurship and firm performance are not yet integrated and cumulative. While some authors support the ongoing entrepreneurial activities of established enterprises, others highlight its negative impact on their performance. Consequently, the question posed is that of significance of innovations' appropriate extent and adequate measurement. The focus of the present research is investigation of the nature of the relationship between corporate entrepreneurship and firm performance, as well as identification of factors with significant impact on the said relationship. By using data on 136 medium-sized and large enterprises operating in Serbia, this study shows that it is not always justified to increase the level of corporate entrepreneurship, i.e., that there is an optimal level of entrepreneurial activities. Moreover, the identified optimal level of corporate entrepreneurship is determined by the dynamism of the environment in which a firm operates. A high level of corporate entrepreneurship is desirable for dynamic environments, whereas in static environments the best performance is achieved at the medium (moderate) corporate entrepreneurship level.

Keywords: *corporate entrepreneurship, firm performance, environment dynamism, Serbia.*

Sažetak

Saznanja o vezi između korporativnog preduzetništva i performansi preduzeća još uvek nisu integrisana i kumulativna. Dok jedni autori podržavaju kontinuirano sprovođenje preduzetničkih aktivnosti etabliranih preduzeća, drugi ističu njegov negativni doprinos performansama. Posledično, nameće se pitanje važnosti doziranja i adekvatnog upravljanja inovativnim aktivnostima pojedinih privrednih subjekata. Centralna tema ovog istraživanja je ispitivanje prirode veze korporativnog preduzetništva i performansi preduzeća, ali i identifikovanje faktora koji bitno utiču na tu vezu. Koristeći podatke o 136 srednjih i velikih preduzeća koja posluju u Srbiji, u radu je pokazano da nije uvek opravdano povećavati nivo korporativnog preduzetništva, odnosno da postoji optimalni nivo preduzetničkih aktivnosti. Dodatno, identifikovani optimalni nivo korporativnog preduzetništva determinisan je stepenom dinamičnosti okruženja u kome preduzeće posluje. Dok je za dinamično okruženje poželjan visok nivo, najbolje performanse u statičnom okruženju ostvaruju se na srednjem (umerenom) nivou korporativnog preduzetništva.

Ključne reči: *korporativno preduzetništvo, performanse preduzeća, dinamičnost okruženja, Srbija.*

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Introduction

In the era of the Fourth Industrial Revolution and an increasing significance of disruptive technologies, innovation and entrepreneurship are critical factors of corporate survival. Such a turn toward innovation-based economy promotes knowhow, data analysis and the internet as central concepts, while the market is being shifted to the field of new competitiveness. While competitive advantage of established companies used to be based on their size and experience and focused on competition with peers, nowadays innovation of small firms, relying on disruptive technologies, may disrupt large and rigid systems. In such a context, in order to survive in the market, the already established companies employ various strategies to initiate innovative entrepreneurial activities within their businesses. Corporate entrepreneurship is a term used to explain the entrepreneurial efforts of established medium-sized and large enterprises. In the early 1970s, several researchers discovered the significance of entrepreneurship and its role in the restoration of the existing companies. Due to its remedial effects on the revitalization of firms and increased performance, corporate entrepreneurship then became a focus of interest for a number of researchers. Interest in corporate entrepreneurship development is present among authors today, as well, as a result of the need to introduce new managerial tools that ought to enable competitiveness in environments subject to constant change. The continuing substantial concern with the contribution of entrepreneurial activities to firm performance is well illustrated by the fact that different views on this matter expressed in the past have remained unreconciled and far from unified. Numerous authors, who used to be uncompromising with regard to the contribution of the corporate entrepreneurship to the viability of firms and business, now state that corporate entrepreneurship is merely a short-term factor and not a strategic one. The subsequently conducted studies highlight the positive effects and contribution of corporate entrepreneurship and support the ongoing instigation of such activities within companies. There are also empirical analyses that illustrate adverse effects of corporate entrepreneurship on performance. Despite the required higher innovation levels within the context of the Fourth Industrial Revolution, based on the aforesaid opposing results of the previous studies, and in order to shed more light on the said relationship for corporate managers, it is important to determine whether there is an optimal level of entrepreneurship within firms, and if so, what determines such an optimal level. To resolve this dilemma, we have conducted an empirical research on a sample of medium-sized and large enterprises operating in Serbia.

The present paper is structured as follows: after the introductory considerations, we present a detailed review of literature, which provided a basis for defining the research hypotheses; the second section describes the research method including sampling, measures, and data collection; thereafter, we test our hypotheses; and finally, we detail and discuss the results.

Literature review and hypotheses development

Corporate entrepreneurship

The corporate entrepreneurship concept has been a subject of scientific research and practitioners' interest for over four decades. Although they did not use the term corporate entrepreneurship to describe entrepreneurial behavior of the already established companies, Peterson and Berger were among the first authors who examined the manner of introducing entrepreneurship into medium-sized and large companies [32]. However, the definition of the construct of corporate entrepreneurship is associated with the works of Burgleman in the early 1980s. This author says that corporate entrepreneurship refers to the process of a company's diversification through its internal development. Such diversification requires a completely new combination of resources to help the firm extend its activities into new spheres of business that are marginally related or fully unrelated to its current area of business activity [9, p. 1349]. Vesper views corporate entrepreneurship as bottom-up innovation, coming from an individual within a large organization, which needs not be known to or expected by this individual's manager [45, p. 295]. Gifford Pinchot is another scholar that has made a significant contribution to this field, having explained the difference between an

independent entrepreneur and an entrepreneur within a large corporation, i.e., intrapreneur [33, p. ix]. Sharma and Chrisman explain corporate entrepreneurship as a process whereby an individual or a group of individuals, in association with an existing organization, create a new organization, or instigate renewal or innovation within that organization [39, p. 18]. Jennings and Lumpkin define corporate entrepreneurship as the extent to which new products or new markets are developed, and an organization as entrepreneurial if it develops a higher than average number of new products and/or new markets [21, p. 489]. Schendel provides a somewhat different understanding of corporate entrepreneurship. This author holds that corporate entrepreneurship should be seen not only as creation of new products and processes, but also as transformation of the company itself. Schendel links the concept to the creation of new businesses within the existing companies and their strategic transformation [40, p. 2]. This is reaffirmed by Sathe, who defines corporate entrepreneurship as a simple process of organizational self-renewal [36], [17, p. 2]. In 1990, Guth and Ginsberg provided a potentially reconciling view on corporate entrepreneurship, closest to the one used nowadays. These two authors identify two forms of corporate entrepreneurship, one exclusively relating to the birth of new business within existing organizations by developing new products and/or processes, and the other relating to strategic transformation of organizations through renewal of the key ideas upon which they are built [19, p. 5]. A step further in defining corporate entrepreneurship was made by Zahra, for whom corporate entrepreneurship is a combination of innovation and entrepreneurial efforts to enter new businesses, as well as to revitalize the company's operations, whereby each of the three components have special significance [50, p. 1715]. The aforesaid components are known in the literature as corporate entrepreneurship dimensions and are designated as innovation, corporate venturing and strategic renewal. Although there are studies that deal with specific corporate entrepreneurship dimensions separately, the view prevailing in the literature is that upon determining the corporate entrepreneurship level, it is necessary to consider all of the three dimensions simultaneously [34], [39], [41], in order to eliminate possible deficiencies of using those dimensions in isolation, such as ignoring their complementarity [41, p. 83] or neglecting the effects of their interaction [39, p. 20]. Understanding, as well as measuring corporate entrepreneurship in the present paper relies on the views of the aforesaid authors.

Corporate entrepreneurship and performance

Most of the research into the relationship between corporate entrepreneurship and firm performance emphasizes a positive contribution of entrepreneurial activities to the performance. This particularly refers to the period of early investigation of the said relationship. For instance, although not yet completely defining the concept of corporate entrepreneurship, in 1986, Zahra revealed that a focus on entrepreneurial activities has positive and significant effects on the achieved net sales revenues [12, p. 19]. Subsequent to his definition of corporate entrepreneurship dimensions, a few years later, this author once again tested and confirmed the contribution of corporate entrepreneurship to profitability of companies by assessing its impact on the accounting and financial performance indicators [48]. Covin and Slevin also assumed that there is a positive correlation between entrepreneurial approach to business operations and performance [12]. In addition to the correlation between corporate entrepreneurship and profitability, these researchers emphasize the significance of entrepreneurship for company growth. There were studies that, focusing on the contribution of entrepreneurial activities to performance, analyze such effects in the international operations of companies. Use of innovation and entrepreneurial activities as a source of competitive advantage is directly correlated with sales growth, both in domestic and foreign markets. According to Bloodgood [7, p. 61], this positive effect will also affect the overall firm performance. Significance of corporate entrepreneurship within global corporate foreign operations was confirmed by Gavris and Zahra [51], as well. Numerous subsequent studies have only reaffirmed the evident contribution of corporate entrepreneurship to performance, and justified the ongoing initiation of entrepreneurial activities within companies [35], [41], [52], emphasizing its positive correlations with profitability [3], [49], [51], [53], innovation [27] and

growth [12], [26]. They often underlined the contribution of corporate entrepreneurship to competitive advantage of companies, as well [10].

Somewhat later, Andersen provided a critical review of the long-established positive correlation between the observed variables and highlighted a number of factors that were neglected within it, which could substantially affect the direction of the relationship [2]. At the same time, instances of negative effects of corporate entrepreneurship on performance appeared both in theory and in practice [1], [18], [23], [37]. Lekmat and Selvarajah claim that not all of the corporate entrepreneurship dimensions have positive effects on the firm performance. In their research, these authors conclude that innovation, as well as strategic renewal, may lead to considerable improvement in operations of a company, but at the same time, corporate venturing may have powerful adverse effects on profitability [37, p. 117]. Interestingly, other scholars obtained similar results for the remaining two corporate entrepreneurship dimensions. Samsudin finds that innovation and strategic renewal do result in negative financial performance [37, p. 127]. Similarly, in 2011, Su, Xie and Lishowed that in young companies, the positive effects of increasing entrepreneurial activities on their performance decline [42, p. 558]. In addition, numerous examples from corporate practice suggest contradictory conclusions regarding the role of corporate entrepreneurship. For instance, a pharmaceutical company Eli Lilly and Google Ventures (CVC) confirmed the significance of entrepreneurial activities and their ongoing initiation and promotion. Contrary to this, the case of Enron shows how the negative impact of the high-volume corporate entrepreneurship utterly ruined some of the most successful companies [6].

Although a great many studies suggested and documented the existence of either a purely positive or a purely negative linear relationship between corporate relationship and firm performance, Tang underlines that not one of them specified whether such positive or negative correlation is indefinite [43, p. 219]. While on one hand the results obtained indicate that ongoing innovation within companies is a necessity, there are significant adverse consequences of excessive corporate entrepreneurship on the other hand. Based on the aforesaid contradictory findings, it is justified to assume that an optimal level of entrepreneurial activities does exist in established enterprises.

In support of the foregoing, results of numerous empirical studies indicate in various manners that there is an optimal level of entrepreneurial activities [43], [46]. According to Wales [46, p. 96], for better recognition of the nature of the link between corporate entrepreneurship and firm performance, it is useful to monitor continuously the difference between the marginal benefits and marginal costs associated with the increase in the company's increased entrepreneurial activities. The aggregate effect on the performance will depend on the relationship between the marginal benefits and marginal costs arising from performing entrepreneurial activities. If the potential costs incurred due to decrease in available resources exceed the potential benefits from the use of those resources, the company will face a decline in the overall performance. According to Wales, a middle (moderate) level of entrepreneurial activity will lead to a maximal performance, while both extremely low and extremely high levels of entrepreneurial behavior will disrupt the company's performance. Wales explains the adverse effect of high entrepreneurship levels on the performance as a consequence of the need to withdraw resources from the basic business activities and to deploy them in implementation of new, innovative activities.

Speaking about the risk-return paradox, Bowman explains that positive financial returns are achieved when an organization conducts risky activities at a certain optimal level [8]. If the aforesaid risky activities are understood as the activities belonging to the context of corporate entrepreneurship, this is another confirmation that there is an optimum. Davis, Morris and Allen suggest the same conclusion. They ask whether there is a so-called "entrepreneurial trap", i.e., whether corporate entrepreneurship activities are always desirable and, if not, at what point they need to be discontinued so as not to result in chaos and loss of control [13, p. 43]. Ten years later, three scholars from the most eminent universities in the world underlined the existence of the optimal level of the entrepreneurial structure within the context of the balance between rigid and flexible. They explained that the worst performance is connected with high

flexibility (flexible structure), as well as with extensively high efficiency (rigid structure). The best performance is achieved at the level of moderate organizational structure [14, p. 427]. Given the fact that a rigid structure is related to inhibition of innovation and that more freedom and flexibility encourage entrepreneurial behavior, based on these authors' results, there is an analogy with the aforesaid optimal level of corporate entrepreneurship.

Based on all of the foregoing, it may be assumed that the relationship between corporate entrepreneurship and performance is not simple and linear, and that companies need to strive for a certain optimal level of entrepreneurial activities in order to achieve superior financial performance. With regard thereto, there is a need to conduct additional investigation into the nature of the relationship between the observed variables. This is confirmed by Wales, who stated that a possibly adverse impact of entrepreneurial activities on performance has not yet been sufficiently investigated in the literature, and invited researches to do in-depth analyses of this relationship [46, p. 114]. Other scholars have also joined this invitation for additional examination of the relationship between corporate entrepreneurship and performance, as they hold that a better understanding of its nature would make an important contribution to the theory, as well as a practical insight into the manner of managing such a strategic renewal effectively and efficiently in companies operating in diverse environments [5, p. 70]. Taking into account that evidence on the nature of this relationship is not complete and definite, in this paper we define the following hypothesis. *H1: The relationship between corporate entrepreneurship and firm performance is not linear, i.e., there is an optimal level of corporate entrepreneurship.*

Corporate entrepreneurship, firm performance and environment dynamism

Ignoring the context within which an enterprise operates stands out as a major restriction to a closer and more detailed definition of the nature of the relationship between corporate entrepreneurship and firm performance. According to a number of authors, environment dynamism is a crucial element of a more in-depth analysis of the nature of the issue at hand. Based on an extensive review of the available literature in this field, it may be concluded that a predominant view is that a company will have more benefits from conducting entrepreneurial activities if operating in a highly dynamic environment [20], [31]. In other words, environment dynamism has a moderating role in defining the relationship between corporate entrepreneurship and firm performance in terms that a higher environment dynamism intensifies the already established relationship between the two elements [31], [44], [49], [53].

The more dynamically the environment grows, the more useful it becomes for the company to behave in a more flexible manner and with increased innovation, i.e., to increase the level of corporate entrepreneurship. On the other hand, in predictable and stable environments, there is little need for entrepreneurial activities. In certain studies, it is emphasized that, compared to firms in stable environments, firms in turbulent environments will much rather endeavor to be innovative, proactive and less risk-averse in order to achieve superior results [13, p. 49], [29, p. 146]. Miller reaffirms the hypothesis that, in comparison to inferior firms, the more successful ones are characterized by a much higher correlation between the increase in environment dynamism and increase in innovation [28, p. 225]. Explaining the entrepreneurial trap, Davis [13, p. 49] says that it exists due to the turbulence in the environment the companies operate in.

Covin and Slevin also explain that managing the level of entrepreneurial behavior in a dynamic environment plays an important role in achieving superior performance. On a sample of 161 companies, these researchers showed that in dynamic environments, firm performance is positively correlated with entrepreneurship. On the other hand, in a stable environment, high performance was related not to innovation but to the entity characteristics that had inhibiting effects on innovation, such as conservative strategic approaches and mechanistic organizational structure [11, p. 75]. This was reaffirmed by Miller and Freisen [28, p. 227], who remark that the relationship between entrepreneurial activities and firm performance may be less positive or even negative in case of a "benign" environment, i.e., an environment that does not pose a source of uncertainty for a company.

Otache and Mahmood set a new research framework for the relationship between corporate entrepreneurship and firm performance, where environment dynamism has both direct and indirect moderating roles. The indirect moderating role is achieved through organizational elements, because changes in the environment often stimulate the management and employees to think and act in an entrepreneurial manner [31, p. 529]. Some authors see environment dynamism as the cause of high corporate innovation [25, p. 47], since entrepreneurial activities emerge as a response to the changes in the environment faced by the company. Khandwalla shares this view, stating that organizations actually fight the challenges posed before them in highly dynamic environments by means of their entrepreneurial attitudes based on proactive behavior and willingness to assume risks [12, p. 11].

The research conducted by Ting and Wang also suggests that innovation is particularly necessary in industries where huge technological changes occur. Assessing that the high-technology industries are the most powerful means for strengthening national competitive advantage, these authors hold that innovation within companies in those areas not only boosts their performance, but produces significant effects on the performance of the entire economy of a nation [44, p. 517]. Similarly, besides the institutional support, an important factor of success of innovation-based strategies for Li [24, p. 1125] is the ability of a company to assess well the characteristics of the environment it operates in. A turbulent environment with ongoing technological changes compels companies to erase their old routines and triggers adoption of innovation strategies and new business creation, which will certainly improve their current market position. According to the research results, only companies that successfully respond to the challenges of such an environment will survive in the long run. The key instrument to their survival is corporate entrepreneurship activity.

Based on the above-presented empirical studies, it may be concluded that if a company faces particularly rapid and unpredictable changes, volatile market and intense competition, it will be in greater need of innovation. In such a situation, survival is often dependent on the ability of the company to adapt to the changes in an innovative manner. In contrast, if a company operates in relatively stable conditions, in an environment with no changes or with easily predictable ones, entrepreneurial activities are less required. In other words, corporate entrepreneurship activities have a more significant role in dynamic than in static environments. All this is indicative of the fact that a dilemma about the role of environment dynamism in definition of the corporate entrepreneurship optimal level is justified. That is to say that, in addition to investigating whether an optimal level of corporate entrepreneurship exists, it is also necessary to examine what level that is or, more precisely, whether the moderate level thereof always leads to the best performance, as some authors claim in their papers [4], [43], or the optimal level depends on the context a company operates in.

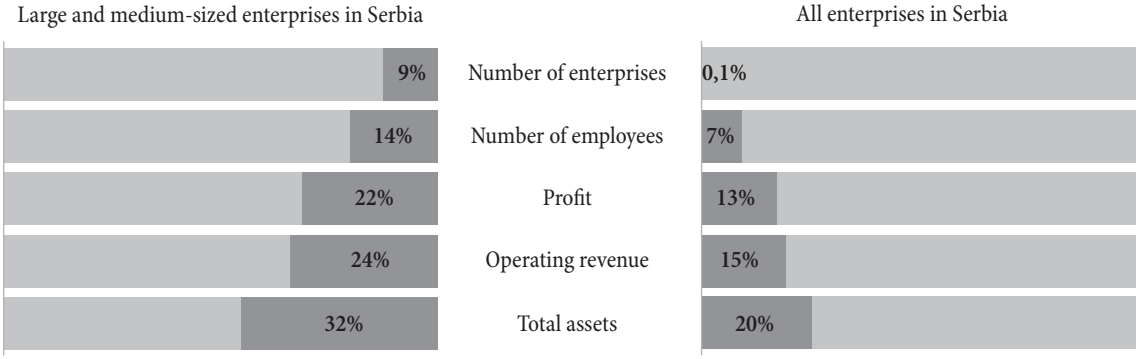
Considering all of the foregoing, it is justified to assume that the optimal level of corporate entrepreneurship, i.e., the level thereof leading to the best performance, is not identical for companies in different environments, but rather depends on the environment dynamism. With regard thereto, we define the following hypothesis. *H2: The optimal level of corporate entrepreneurship for companies operating in static environments differs from that for the companies operating in dynamic environments. The optimal level of corporate entrepreneurship is higher in dynamic environments.*

Methodology

Sample

The sample providing the basis for this research comprises 136 medium-sized and large enterprises operating in Serbia. Based on the data illustrated in Figure 1, it is evident that the share of the sampled companies in the total assets of all business companies in Serbia was 20%, while their share in the total operating revenues and profits generated by all the companies in Serbia was around 15%. The sample is even more significant in light of the comparative analysis of KPIs of all the medium-sized and large companies in Serbia (the population) and the medium-sized and large companies within the sample. The sampled medium-sized and large companies account for almost a third of the total assets of the population observed, while their shares in

Figure 1: Comparative overview of the selected performance indicators of the sampled enterprises and (a) the entire economy in Serbia – right and (b) population of all large and medium-sized enterprises in Serbia – left



Source: Author's calculation based on the Financial Statements Annual Bulletin.

the total operating revenues and profits of the population both equal over 20%. The sampled firms make up about 9% of the entire population. Based on the aforesaid, the sample may be considered to be of an optimal size.

Variables, measures and data collection

Corporate entrepreneurship: for measuring the corporate entrepreneurship level, we used the original instrument developed in 1993 by Zahra [49, p. 338]. The level of corporate entrepreneurship is obtained by evaluating the stages of its three basic dimensions: innovation, corporate venturing and strategic renewal. The said three dimensions were evaluated by means of six factors: new business creation, new product introduction, technological entrepreneurship, mission reformulation, reorganization and system-wide change. The stage of each of the factors was determined based on 28 questions to which the examinees responded to evaluate the level of corporate entrepreneurial activities by using a 5-point Likert scale[1].

The first three factors were used to evaluate the innovation and corporate venturing dimensions. The stage of the first factor, new business creation, was established based on five questions examining the extent to which a company: stimulates demand for current products in the current market through aggressive marketing policies; broadens its business lines within the industry it operates in; executes new business deals in completely new industries related to its current business area; finds new and undiscovered market niches for its products in the current market; and enters completely new business deals offering new products and/or services. The following factor, new product introduction, was assessed as an extent to which a company is focused on the development of new products. The new product introduction was further examined based on the rate of introducing new products into the market; amount of money spent on the new product development activities; number of new products the company introduced into the market, as well as the number of new products the company added to its mix, which were developed by its competitors. The third factor, technological entrepreneurship, was evaluated based on the significance the enterprise assigned to the investments made in new technology development; and their focus on their own independent development of new technologies, as well as adaptation of the new technological solutions created by other firms or industries. In addition, technological entrepreneurship was assessed based on the significance the company assigns to the technological innovation in general, and to the pioneer technological discoveries in the industry it operates in.

The third corporate entrepreneurship dimension, strategic renewal, was evaluated by using the remaining three factors – mission reformulation, reorganization and system-wide change. The mission reformulation factor was assessed based on three questions asked to determine to what extent an enterprise focuses on the definition of its business mission, change of the business concept and redefinition of the industry it operates in.

1 1 – very low value of the observed element; 2 – low value of the observed element; 3 – medium value of the observed element; 4 – high value of the observed element; 5 – very high value of the observed element.

Four questions were used to assess the reorganization factor. Those questions examine the extent to which a company implements organizational and structural changes in order to encourage innovation. This refers to the extent in which the company reorganizes its business units and divisions, ensures coordination among them, defines their autonomy in the creative work processes and creates a flexible organizational structure in order to intensify innovation. The stage of the final, sixth factor, system-wide change, was determined by means of six questions asked to evaluate the extent to which the company organizes staff trainings in employment of various creative techniques, develops procedures for finding and implementing innovative solutions proposed by employees, rewards and internally promotes the staff for their creativity and innovation, and as well as to what extent the company allocates financial and other resources to the implementation of innovation.

The questionnaire was answered by top managers or chief executives of the firms sampled. The response rate was 14.7%, and 136 enterprises were used in the analysis. In order to examine the reliability of the instrument, the Cronbach's alpha coefficient was computed. The reliability analysis showed the value of Cronbach's alpha for the six factors as equal to 0.755; 0.870; 0.870; 0.802; 0.879; and 0.900, respectively. Given that the acceptable value of Cronbach's alpha coefficient is a value above 0.7, sometimes even above 0.6 [30, p. 252], it was concluded that the use of the original questionnaire in computation of the corporate entrepreneurship of the sampled enterprises was justified and plausible. The results of the performed reliability analysis are provided in Appendix 1. Following the reliability analysis resulting in the precise number of each of the factor components, i.e., after it was confirmed that all the questions in the questionnaire used to obtain the factor value were relevant for further analyses, we computed scores for each individual factor. The scores for each of the six factors were obtained as the average of the questions pertaining to the particular factor. Given the fact that these six factors define the abovesaid three dimensions of corporate entrepreneurship, and that the three dimensions in turn define the overall corporate entrepreneurship level, we calculated the corporate entrepreneurship level for each enterprise sampled as the average value of the six factors.

Performance: for measuring the overall performance, we used the return on assets (ROA) obtained as the ratio of the net profit from continuing operations and the total operating assets. Current performance was calculated as the average of ROA values for the past three years. The reason for opting for the said three-year ROA average was to neutralize a potential volatility of the observed indicator over the period, i.e., to mitigate potential extreme ROA values from non-representative years and obtain a more stable performance indicator for the period. The data required for ROA calculation were taken from the publicly available financial statements of the sampled companies.

Environment dynamism: by analogy to the works of Dess and Beard [15], Ensley, Pearce and Hmieleski [16] and Sharfman and Dean [38], dynamism of each separate industry was calculated based on the market and technology instability indices for each industry. The market instability index for each industry was calculated by assessing the linear trend of two dependent variables, the number of companies within the industry and the number of employees within the industry, by using simple linear regressions for the period of six years. Time was used as an explanatory variable, as presented in equations (1) and (2) below:

$$Y_{emp_t} = \beta_0 + \beta_1 t + \varepsilon_t , \quad t = 1,2,\ldots \tag{1}$$

$$Y_{comp_t} = \beta_0 + \beta_1 t + \varepsilon_t , \quad t = 1,2,\ldots \tag{2}$$

In equations (1) and (2), β_1 coefficient represents a regression slope, and its standard error (S_{b1}) was divided by the mean of the relating dependent variable ($\bar{Y}$). Thus, two indicators of market instability were calculated for each industry (number of companies and number of employees), as presented in equations (3) and (4). The market instability index is represented as the sum of the two indicators, as shown in equation (5).

$$MII_{emp_i} = \frac{Sb1_{emp_i}}{\bar{Y}_{emp_i}} , \quad i = 1,2,\ldots,25, \tag{3}$$

$$MII_{comp_i} = \frac{Sb1_{comp_i}}{\bar{Y}_{comp_i}} , \quad i = 1,2,\ldots,25, \tag{4}$$

$$MII_i = MII_{emp_i} + MII_{comp_i} , \quad i = 1,2,\ldots,25. \tag{5}$$

In order to assess the technology instability index, we analyzed the movements of the share of technologically innovative firms in the total number of companies within the industry over the period of the past six years.[2] The average value of the observed indicator for the said period is the technology instability index for a specific industry. The calculation of the technology instability indices is presented by equation (6) below:

$$TII_i = \frac{\sum_{t=1}^{6} \sum_{i=1}^{25} \frac{TIP_{it}}{UP_{it}}}{t} \qquad (6)$$

Data on the number of employees and number of companies per industry for the last six years were obtained from the Republic of Serbia's Statistics Office publication Enterprises by size and unincorporated enterprises in the Republic of Serbia, whereas the information on technological innovators per industry was taken from the Report on innovation activities of enterprises in Serbia.[3]

Finally, dynamism of a specific industry was presented as the sum of the obtained market and technology instability indices. Consistently with the original methodology [38, p. 700], the instability indices were standardized before summation. Index standardization was performed in order to ensure that the two instability indices are at the same a measuring scale and that they have equal impact on determining the industry dynamism index. In addition, in order to ensure positive value of the dynamism indices per industry, we added constant 3. Equation (7) illustrates the calculation of the industry dynamism index:

$$Din_i = Z(MII_i) + Z(TII_i) + 3, \quad i = 1,2,\ldots,25. \qquad (7)$$

The obtained market and technology instability indices and dynamism indices for each industry are provided in Table 1 within Appendix 2. Based on the assessed dynamism index, and using its average value as the borderline value (2.84), we classified all industries into two groups – static and dynamic industries. Following the said classification, the number of sampled companies operating within dynamic industries was 55, while there were 81 companies operating within static industries. Separation of the dynamic from the static industries was performed so that the impact of a change in the extent of corporate entrepreneurship on the firm performance could be separately analyzed in each of the two environment types.

Analysis and results

The literature review revealed contradictory conclusions with regard to the relationship between corporate entrepreneurship and firm performance. While some authors emphasize the plausibility of the ongoing initiation of entrepreneurial activities, others hold that excessive entrepreneurship may have a destructive impact on the performance. It is therefore justified to raise a question whether the relationship between the two variables changes after certain corporate entrepreneurship levels are reached, i.e., whether the relationship between corporate entrepreneurship and firm performance is identical for each level of entrepreneurial activities or it varies depending on the corporate entrepreneurship level attained by the firm. Moreover, consistently with the previous studies [31], [44], [49], [53], the present research uses as its starting point the assumption that the nature of the observed relationship and the effects of corporate entrepreneurship on the performance achieved will vary depending on the firm's environment dynamism. Taking all of the aforesaid into account, the central part of the methodological analysis refers to the examination of the nature of the relationship between corporate entrepreneurship and firm performance within the context of the environments in which medium-sized and large companies in Serbia operate.

To test the defined hypotheses, we performed a multiple regression analysis with three explanatory dummy variables. The said three dummy variables represent three different corporate entrepreneurship levels. As previously stated, the corporate entrepreneurship level is expressed as a value ranging from 1 to 5, with the interval divided

2 In selection of the market and technology instability indicators for the environments that the sampled Serbian companies operate in, the author consulted the creator of the elected methodology. Due to the small number of patents registered in Serbia (particularly by entities), which are used within the original instruments as the technology instability indicators, in the present paper the author used the share of the technologically innovative firms within the total number of companies in the specific industry as the technology instability indicator.

3 The report does not include data for processing industry, yet the results of the research on innovation activities for the observed period were subsequently obtained at the author's request (regular triannual survey of RSSO entitled Innovation activities of commercial entities).

into three sections: low, medium and high levels. The low level of corporate entrepreneurship, represented by variable *CE*1, covers values from 1 to 3. The medium level of corporate entrepreneurship, represented by variable *CE*2, covers values from 3 to 4, while the high level of corporate entrepreneurship covers values from 4 to 5 and is represented by variable *CE*3. Depending on the corporate entrepreneurship level of a specific firm, one dummy variable will have value 1 (the variable representing the corporate entrepreneurship level that the firm belongs to), while the two remaining variables for that firm will equal to 0 (the other two levels of corporate entrepreneurship that the firm does not belong to). As a dependent variable, we used the performance (ROA) achieved by the firm, here designated as . As the sample was divided into two segments, the analysis was first conducted for the group of companies within dynamic industries and thereafter for the group of those within static industries.

The regression model used is presented by equation (8) below, whereas the regression results are presented in Table 1.

$$ROA\_o_i = \beta_0 + \beta_1 CE1_i + \beta_3 CE3_i + \varepsilon_i, \quad i = 1,2,\ldots, 55. \quad (8)$$

As presented in Table 1 above, the regression results show that the set model's explanatory power, expressed by the coefficient of determination (R^2), equals 24.9%, whereas the adjusted coefficient of determination equals 22.0%. The model is statistically significant at the significance level of 1.0% (*F* test's *p* value equals 0.001). In addition, the estimated values of the intercept β_0 and the regression coefficient for explanatory variable *CE*3 are statistically significant, at the significance level of 1.0% (*p* values equal 0.000 and 0.010, respectively), while the estimated value of the regression coefficient for *CE*1 is statistically significant at the significance level of 5.0% (*p* equals 0.035). The estimated value of the constant β_0, which represents average firm performance at the medium corporate entrepreneurship level, equals 7.0%. The estimated value of the coefficient β_1, which represents a difference between the average performances of the companies with low and medium levels of corporate entrepreneurship, is negative and equals –5.2%. Consequently, the average performance of companies with low corporate entrepreneurship levels is statistically significantly lower than the average performance of companies with low corporate entrepreneurship levels and equals 1.8% ($\beta_0 + \beta_1$). On the other hand, the estimated value of the regression coefficient for explanatory variable *CE*3 is positive and equals 7.3%, which implies that the average performance of companies with high corporate entrepreneurship levels is statistically significantly higher than that of companies with medium corporate entrepreneurship levels. The average performance of

Table 1: Evaluation of the dummy variable regression model parameters – dynamic industries

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.499[a]	.249	.220	.0765796	2.375

a. Predictors: (Constant), CE3, CE1
b. Dependent Variable: ROA_o

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.101	2	.051	8.636	.001[b]
	Residual	.305	52	.006		
	Total	.406	54			

a. Dependent Variable: ROA_o
b. Predictors: (Constant), CE3, CE1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.070	.014		4.832	.000		
	CE1	-.052	.024	-.274	-2.160	.035	.897	1.114
	CE3	.073	.027	.339	2.672	.010	.897	1.114

a. Dependent Variable: ROA_o

Source: SPSS output.

companies with high corporate entrepreneurship levels equals 14.3% ($\beta_0 + \beta_3$). In this analysis, performed only on the sampled companies operating within dynamic industries, it may be claimed that there are statistically significant differences between performances, and that the best performance on the average is that of companies with a high corporate entrepreneurship level. In other words, in a dynamic environment, it is desirable to achieve as high a level of entrepreneurial activities as possible.

Based on the data presented in Table 1 (Durbin–Watson statistic equals 2.375; VIF coefficients equal 1.114 for both explanatory variables), we concluded that the model faced neither the problem of autocorrelation nor the problem of multicollinearity. Furthermore, based on the Shapiro-Wilk test of distribution normality presented in Table 2, it may be claimed that the residuals are normally distributed (*p*-value equals 0.164).

In the same manner as described above, we tested the relationship between corporate entrepreneurship and firm performance on the group of sampled companies belonging to static industries. The regression model used is presented by equation (9), and the results of the regression with assessed regression model parameters are shown in Table 3.

$$ROA\_o_i = \beta_0 + \beta_1 CE1_i + \beta_3 CE3_i + \varepsilon_i, \quad i = 1,2,\ldots, 81. \quad (9)$$

Compared to the regression results for dynamic industry enterprises, the model's explanatory power in case of the static industry companies sampled is considerably lower (with the coefficient of determination of 9.7%, and the adjusted coefficient of determination of 7.4%). In addition, based on the results provided in Table 3, it is evident that the entire model, as well as the estimated values of the regression coefficients for each of the explanatory variables *CE*1 and *CE*3, are significant at the significance level of 5.0% (where *F* test's *p* value equals 0.019, while *p* values for testing significance of the estimators of coefficients for *CE*1 and *CE*3 equal 0.017 and 0.029, respectively). As in the previous case of dynamic industry enterprises, the estimated value of the coefficient for *CE*1 is negative

Table 2: Normality tests of regression residuals with dummy variables in dynamic industries

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	.141	55	.009	.969	55	.164

a. Lilliefors Significance Correction
Source: SPSS output.

Table 3: Evaluation of the dummy variable regression model parameters – static industries

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.311[a]	.097	.074	.0702650	1.536

a. Predictors: (Constant), CE3, CE1
b. Dependent Variable: ROA_o

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.041	2	.021	4.188	.019[b]
	Residual	.385	78	.005		
	Total	.426	80			

a. Dependent Variable: ROA_o
b. Predictors: (Constant), CE3, CE1

Coefficients[a]								
		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.076	.011		6.897	.000		
	CE1	-.042	.017	-.275	-2.439	.017	.908	1.101
	CE3	-.051	.023	-.251	-2.224	.029	.908	1.101

a. Dependent Variable: ROA_o
Source: SPSS output.

and equals −0.042. This implies that in static industries as well, the average performance of companies with low corporate entrepreneurship levels is statistically significantly lower than that of companies with medium corporate entrepreneurship levels. A significant difference in comparison to the dynamic industry enterprises arises upon interpretation of the estimated value of coefficient β3 for explanatory variable *CE*3, which is here negative and equals −5.1%, while for dynamic industry enterprises it is positive and equals 7.3%. This means that, within the sample analyzed, the average performance of companies with high corporate levels is significantly below the average performance of the companies with medium corporate entrepreneurship levels. The average performance of the companies with medium corporate entrepreneurship levels, expressed by the estimated value of constant β_0, equals 7.6%. The average performance of the companies with high corporate entrepreneurship levels, presented as the sum of the estimated value of constant β_0 and the estimated value of the regression coefficient for *CE*3, equals 2.5%, and, as underlined above, it is statistically significantly lower than the performance of the companies with medium corporate entrepreneurship levels. In parallel to the previous case calculations, the companies with low corporate entrepreneurship levels have statistically significantly lower performance than those with medium corporate entrepreneurship levels, equaling to 3.4% (obtained as the sum $\beta_0 + \beta_1$). Based on the results obtained and presented above, we may conclude that, in contrast to the dynamic industry companies, the highest performance of the companies operating in static industries is achieved by the companies with medium (moderate) entrepreneurial activity levels.

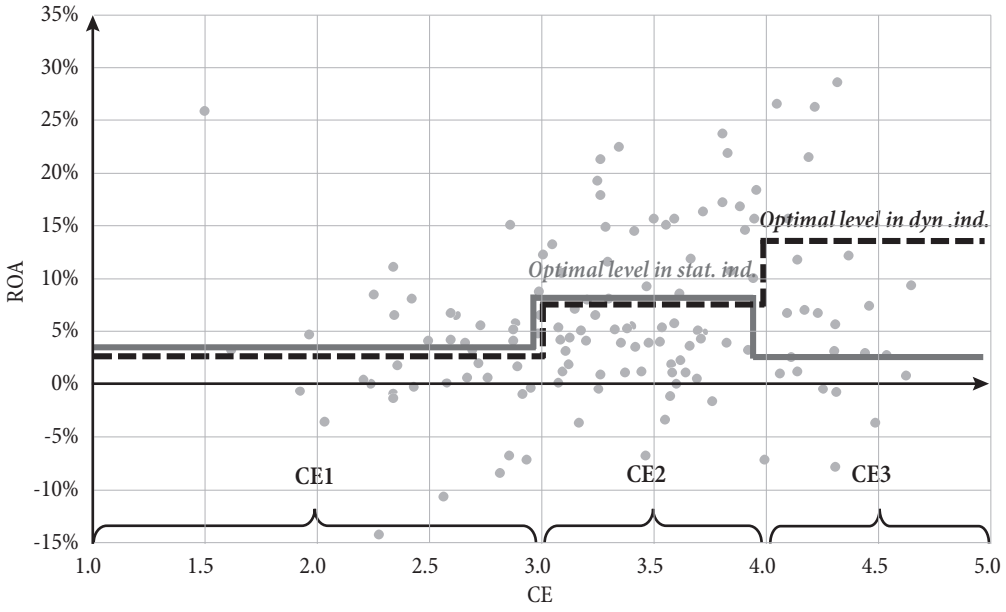
As with the dynamic industry enterprises examined, based on the value of the Durbin–Watson test of 1.536, we concluded that the model did not face a problem of obvious autocorrelation. There was no multicollinearity either, since VIF coefficients equal 1.101 for both explanatory variables (Table 3). With regard to the regression residual distribution assumptions, based on

Table 4: Normality tests of regression residuals with dummy variables in static industries

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	.076	81	.200*	.982	81	.328

* This is a lower bound of the true significance
a. Lilliefors Significance Correction
Source: SPSS output.

Figure 2: Relationship between corporate entrepreneurship and firm performance



Source: SPSS output, supplemented by the author.

the normality testing using the Kolmogorov-Smirnov and Shapiro-Wilk tests (Table 4), the assumption of normal residual distribution cannot be rejected (p-values for the Kolmogorov-Smirnov test and Shapiro-Wilk test equal 0.200 and 0.328, respectively).

In the previous steps, we examined the relationship between corporate entrepreneurship and firm performance separately for sampled enterprises operating in dynamic industries and those belonging to static industries. We provide below a comparative presentation of the results obtained. More precisely, Figure 2 below illustrates the difference between the average performances of companies with different corporate entrepreneurship levels in dynamic and static industries.

In Figure 2, the dashed line represents the average performances of the companies for each corporate entrepreneurship level in dynamic industries, while the solid line represents the average performances of the companies for each corporate entrepreneurship level in static industries. Within dynamic industries, the highest average performance is achieved by companies with high corporate entrepreneurship levels. Contrary to this, in static industries, the highest average performance is achieved by companies with medium corporate entrepreneurship levels. In other words, the optimal level of corporate entrepreneurship, i.e., the level associated with the highest performance, is *CE*3 in dynamic environments, whereas in static environments, it is the *CE*2 level. Unlike companies operating in dynamic industries, where high corporate entrepreneurship levels are desirable, companies with such high entrepreneurship levels (above *CE*2) in static industries record, on the average, lower than optimal performance. All of the foregoing leads us to the conclusion that an optimal level of corporate entrepreneurship exists, and that such an optimal level is different for dynamic industry companies than that for static industry companies. Consequently, there is no sufficient evidence for rejecting our hypotheses *H*1 and *H*2.

Discussion and conclusion

The results of the analysis conducted and presented in this paper supplement the findings of the previous empirical research into the relationship between corporate entrepreneurship and firm performance. The overall conclusion reached is that an optimal level of corporate entrepreneurship exists, and that it is determined by the context within which companies operate. Although previous studies associated the optimal level solely with the medium (moderate) level of corporate entrepreneurship [4], [43], the results of the present research demonstrate that the optimal levels differ for companies belonging to dynamically different environments.

The results show that companies operating in peaceful, relatively stable and predictable environments will achieve the best performance at the medium (moderate) level of entrepreneurial activities. In contrast to such firms, those with high corporate entrepreneurship levels will record lower financial results. It is a paradox that the companies with high corporate entrepreneurship levels in such environments would achieve average performance, or even lower than that of the companies that are least prone to innovation. The following reasons for the foregoing are most commonly found in the literature [46, p. 112], [47, p. 355]: limited resources for implementing innovation; selection of a radical rather than an incremental innovation strategy, using up significant investment; due to already attained significant level of entrepreneurial activities, each further investment in new corporate entrepreneurship activities requires transfer of resources from the current operations, which makes their implementation even more difficult and has adverse effects on the successful functioning of the entire company. Kreiser [22, p. 287] confirms that frequent undertaking of risky entrepreneurial activities is not worth the effort, explaining that even those firms that operate on somewhat lower corporate entrepreneurship levels can achieve satisfactory performance.

In dynamic environments, the best performance is achieved by enterprises with the highest entrepreneurial activity levels, while those implementing little or no innovation at all record the poorest performance. This is consistent with the premise of numerous authors that the significance of entrepreneurial activities increases with the growing dynamism of the environment [44, p. 518], [53, p. 49]. The results obtained support the views of Kreiser [22, pp. 286-287] that in a dynamic environment,

proactive and entrepreneurially oriented firms are more able to position themselves better within their industry, exploit the market opportunities much sooner than their competitors, and create new opportunities for themselves by shaping the environment to their own advantage. In other words, the requirement for ongoing entrepreneurial action comes from the environment. Constant changes that corporate entities are faced with are an inexhaustible source of opportunity. However, if a company does not or cannot observe that or is unable to use the opportunity appropriately, the ultimate effect thereof on the business performance will be negative.

The foregoing also leads to the conclusion that low entrepreneurial activity levels are not desirable in the market, irrespective of the environment dynamism. In both dynamic and static environments, companies operating at a low level of corporate entrepreneurship achieve poor performance on the average. There must be a certain extent of innovation and entrepreneurial behavior, because the market requirements, although at a different pace, are always changing in the long run. Considering the context in which companies operate, the results of the present research suggest what the said extent is.

References

1. Agca, V., Topal, Y., & Kaya, H. (2012). Linking intrapreneurship activities to multidimensional firm performance in Turkish manufacturing firms: An empirical study. *International Entrepreneurship and Management Journal, 8*(1), 15-33.
2. Andersen, J. (2010). A critical examination of the EO-performance relationship. *International Journal of Entrepreneurial Behavior & Research, 16*(4), 309-328.
3. Antoncic, B., & Hisrich, R. D. (2001). Intrapreneurship: Construct refinement & cross-cultural validation. *Journal of Business Venturing, 16*(5), 495-527.
4. Bhuian, S. N., Menguc, B., & Bell, S. J. (2005). Just entrepreneurial enough: The moderating effect of entrepreneurship on the relationship between market orientation and performance. *Journal of Business Research, 58*(1), 9-17.
5. Bierwerth, M., Schwens, C., Isidor, R., & Kabst, R. (2015). Corporate entrepreneurship & performance: A meta-Analysis. *Small Business Economics*, *45*(2), 255-278.
6. Birkinshaw, J. M. (2003). The paradox of corporate entrepreneurship. *Strategy & Business*, *30*(Spring), 46-57.
7. Bloodgood, J. M., Sapienza, H. J., & Almeida, J. G. (1996). The internationalization of new high-potential U.S. ventures: Antecedents & outcomes. *Entrepreneurship Theory & Practice*, *20*(4), 61–76.
8. Bowman, E. H. (1980). A risk/return paradox for strategic management. *Sloan Management Review*, *21*(3), 1-46.
9. Burgelman, R. A. (1983). Corporate entrepreneurship & strategic management: Insights from a process study. *Management Science*, *29*(12), 1349-1364.
10. Covin, J. G., & Miles, M. P. (1999). Corporate entrepreneurship & the pursuit of competitive advantage. *Entrepreneurship Theory & Practice*, *23*(3), 47-63.
11. Covin, J., & Slevin, D. (1989). Strategic management of small firms in hostile & benign environments. *Strategic Management Journal*, *10*(1), 75-87.
12. Covin, J. G., & Slevin, D. P. (1991). A conceptual model of entrepreneurship as firm behavior. *Entrepreneurship Theory & Practice*, *16*(1), 7-25.
13. Davis, D., Morris, M., & Allen, J. (1991). Perceived environmental turbulence & its effect on selected entrepreneurship, marketing, & organizational characteristics in industrial firms. *Journal of the Academy of Marketing Science*, *19*(1), 43-51.
14. Davis, J. P., Eisenhardt, K. M., & Bingham, C. B. (2009). Optimal structure, market dynamism, & the strategy of simple rules. *Administrative Science Quarterly*, *54*(3), 413-452.
15. Dess, G. G., & Beard, D. W. (1984). Dimensions of organizational task environments. *Administrative Science Quarterly*, *29*(1), 52-73.
16. Ensley, M. D., Pearce, C. L., & Hmieleski, K. M. (2006). The moderating effect of environmental dynamism on the relationship between entrepreneur leadership behavior & new venture performance. *Journal of Business Venturing*, *21*(2), 243-263.
17. Ferreira, J. (2002). *Corporate entrepreneurship: A strategic & structural perspective*. International Council for Small Business ICSB 2002-001 47th World Conference San Juan, Puerto Rico. Retrieved from http://www.hadjarian.com/esterategic/tarjomeh/kiaei.pdf.
18. Fitzsimmons, J., Douglas, E., Antoncic, B., & Hisrich, R. (2005). Intrapreneurship in Australian firms. *Journal of Management & Organization*, *11*(1), 17-27.
19. Guth, W. D., & Ginsberg, A. (1990). Guest editors' introduction: Corporate entrepreneurship. *Strategic Management Journal*, *11*(1), 5-15.
20. Ireland, R. D., Kuratko, D. F., & Morris, M. H. (2006). A health audit for corporate entrepreneurship: Innovation at all levels: Part I. *Journal of Business Strategy*, *27*(1), 10-17.
21. Jennings. D. F., & Lumpkin, J. R. (1989). Functioning modeling corporate entrepreneurship: An empirical integrative analysis. *Journal of Management, 5*(3), 485-502.
22. Kreiser, P. M., Marino, L. D., Kuratko, D. F., & Weaver, K. M. (2013). Disaggregating entrepreneurial orientation: The non-linear impact of innovativeness, proactiveness & risk-taking on SME performance. *Small Business Economics*, *40*(2), 273-291.
23. Lekmat, L., & Selvarajah, C (2008). Corporate entrepreneurship & firm performance: An empirical study in auto parts manufacturing firms in Thailand. *Proceedings of the 2nd International Colloquium on Business and Management* (ICBM 2008), Bangkok, Thailand, 17-18.
24. Li, H., & Atuahene-Gima, K. (2001). Product innovation strategy & the performance of new technology ventures in China. *The Academy of Management Journal*, *44*(6), 1123-1134.
25. Luo, Y. (1999). Environment-strategy-performance relations in small businesses in China: A case of township & village

enterprises in Southern China. *Journal of Small Business Management*, *37*(1), 37–52.

26. McDougall, P. P., Covin, J. G., Robinson, R. B., & Herron, L. (1994). The effects of industry growth & strategic breadth on new venture performance & strategy content. *Strategic Management Journal, 15*(7), 537–554.
27. McFadzean, E., O'Loughlin, A., & Shaw, E. (2005). Corporate entrepreneurship & innovation part 1: The missing link. *European Journal of Innovation Management*, *8*(3), 350-372.
28. Miller, D., & Friesen, P. H. (1983) Strategy-making & environment: The third link. *Strategic Management Journal*, *4*(3), 221-235.
29. Naman, J. L., & Slevin, D. P. (1993). Entrepreneurship & the concept of fit: A model & empirical tests. *Strategic Management Journal, 14*(2), 137–153.
30. Nunnally, J. C. (1978). *Psychometric theory*. New York: McGraw-Hill.
31. Otache, I., & Mahmood, R. (2015). Corporate entrepreneurship & business performance: The role of external environment & organizational culture: A proposed framework. *Mediterranean Journal of Social Sciences*, *6*(4), 524-531.
32. Peterson, R., & Berger, D. (1971). Entrepreneurship in organisations: Evidence from the popular music industry. *Administrative Science Quarterly*, *16*(1), 97-107.
33. Pinchot, G. (1985). *Intrapreneuring: Why you don't have to leave the corporation to become an entrepreneur*. New York: Harper & Row.
34. Sakhdari, K., & Burgers, J. H. (2018). The moderating role of entrepreneurial management in the relationship between absorptive capacity and corporate entrepreneurship: An attention-based view. *International Entrepreneurship and Management Journal*, *14*(4), 927-950.
35. Salimath, M. S., Cullen, J. B., & Umesh, U. N. (2008). Outsourcing and performance in entrepreneurial firms: Contingent relationships with entrepreneurial configurations. *Decision Sciences*, *39*(3), 359–381.
36. Sathe, V. (1989). Fostering entrepreneurship in large diversified firm. *Organizational Dynamics*, *18*(1), 20–32.
37. Shamsuddin, S., Othman, J., Asmady, S. M., & Zakaria, Z. (2012). The dimensions of corporate entrepreneurship & the performance of establishes organisation. *ACRN Journal of Entrepreneurship Perspectives, 1*(2), 111-131.
38. Sharfman, M. P., & Dean, J. W. (1991). Conceptualizing & measuring the organizational environment: A multidimensional approach. *Journal of Management, 17*(4), 681–700.
39. Sharma, P., & Chrisman, J. J. (1999). Toward a reconciliation of the definitional issues in the field of corporate entrepreneurship. *Entrepreneurship Theory & Practice, 23*(3), 11-27.
40. Schendel, D. (1990). Introduction to the special issue on corporate entrepreneurship. *Strategic Management Journal, 11*(Summer Special Issue), 1-3.
41. Simsek, Z., & Heavey, C. (2011). The mediating role of knowledge-based capital for corporate entrepreneurship effects on performance: A study of small- to medium-sized firms. *Strategic Entrepreneurship Journal, 5*(1), 81–100.
42. Su, Z., Xie, E., & Li, Y. (2011). Entrepreneurial orientation & firm performance in new ventures & established firms. *Journal of Small Business management, 49*(4), 558-577.
43. Tang, J., Tang, Z., Marino, L. D., Zhang, Y., & Li, Q. (2008). Exploring an inverted U-shaped relationship between entrepreneurial orientation and performance in Chinese ventures. *Entrepreneurship Theory and Practice, 32*(1), 219–239.
44. Ting, H., Wang, H., & Wang, D. (2012). The moderating role of environmental dynamism on the influence of innovation strategy & firm performance. *International Journal of Innovation, Management & Technology, 3*(5), 517-520.
45. Vesper, K. H. (1984). Three faces of corporate entrepreneurship: A pilot study. In J. A. Hornaday, F. Tarpley, J. A. Timmons & K. H. Vesper [Eds.], *Frontiers of entrepreneurship research* (pp. 294-320). Wellesley, MA: Babson College.
46. Wales, W. J., Patel, P. C., Parida, V., & Kreiser, P. M. (2013). Nonlinear effects of entrepreneurial orientation on small firm performance: The moderating role of resource orchestration capabilities. *Strategic Entrepreneurship Journal, 7*(2), 93-121.
47. Wiklund, J., Patzelt, H., & Shepherd, D. (2009). Building an integrative model of small business growth. *Small Business Economics, 32*(4), 351–374.
48. Zahra, S. A. (1991). Predictors & financial outcomes of corporate entrepreneurship: An exploratory study. *Journal of Business Venturing*, *6*(4), 259-286.
49. Zahra, S. A. (1993). Environment, corporate entrepreneurship, & financial performance: A taxonomic approach. *Journal of Business Venturing, 8*(4), 319-340.
50. Zahra, S. A. (1996). Governance, ownership & corporate entrepreneurship: The moderating impact of industry technological opportunities. *Academy of Management Journal, 39*(6), 1713-1735.
51. Zahra, S. A., & Garvis, D. M. (2000). International corporate entrepreneurship & firm performance: The moderating effect of international environmental hostility. *Journal of Business Venturing, 15*(5), 469–492.
52. Zahra, S. A., Neubaum, D. O., & Huse, M. (2000). Entrepreneurship in medium-size companies: Exploring the effects of ownership & governance systems. *Journal of Management, 26*(5), 947–976.
53. Zahra, S. A., & Covin, J. G. (1995). Contextual influences on the corporate entrepreneurship-performance relationship: A longitudinal analysis. *Journal of Business Venturing, 10*(1), 43-58.

Appendices

Appendix 1. Results of the reliability analysis for the individual factors and the complete instrument (SPSS output)

Table 1: Cronbach's alpha values for factors: new business creation, new product introduction and technological entrepreneurship

Reliability Statistics			Reliability Statistics			Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.755	.758	5	.870	.874	5	.870	.867	5

Table 2: Cronbach's alpha values for factors: mission reformulation, reorganization and system-wide change

Reliability Statistics			Reliability Statistics			Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.802	.806	3	.879	.880	4	.900	.901	6

Table 3: Cronbach's alpha values for the corporate entrepreneurship level (complete instrument)

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.938	.939	28

Appendix 2. Index of industry (business activity) dynamism for sampled enterprises

Table 1: Overview of the market and technology instability indicators and industry dynamism indices

Industry	Instability indicators				Dynamism index	Industry classification
	Market instability indices			Technology		
	#Employees	#Companies	Index			
Manufacture of computer, electronic and optical products	0.0159	0.0134	0.0293	66%	6.11	D
Manufacture of tobacco products	0.0262	0.0193	0.0456	50%	5.89	D
Financial and insurance activities	0.0186	0.0077	0.0263	34%	3.71	D
Manufacture of electrical equipment	0.0096	0.0084	0.0180	36%	3.41	D
Manufacture of basic pharmaceutical products and pharmaceutical preparations	0.0099	0.0163	0.0262	29%	3.36	D
Manufacture of weapons and ammunition	0.0071	0.0039	0.0110	39%	3.22	D
Information and communication	0.0112	0.0070	0.0182	33%	3.17	D
Manufacture of food products	0.0069	0.0049	0.0118	36%	3.06	D
Professional, scientific, innovation and technical activities	0.0084	0.0024	0.0107	35%	2.89	D
Manufacture of wearing apparel	0.0036	0.0070	0.0106	34%	2.84	D
Manufacture of basic metals	0.0027	0.0011	0.0038	38%	2.74	S
Administrative and support service activities	0.0082	0.0034	0.0116	32%	2.73	S
Electricity, gas, steam and air conditioning supply	0.0015	0.0020	0.0035	38%	2.69	S
Manufacture of chemicals and chemical products	0.0024	0.0024	0.0048	35%	2.57	S
Construction	0.0055	0.0110	0.0165	26%	2.57	S
Manufacture of leather and related products	0.0043	0.0134	0.0177	24%	2.52	S
Accommodation and food service activities	0.0087	0.0032	0.0119	28%	2.47	S
Manufacture of rubber and plastic products	0.0044	0.0026	0.0069	29%	2.31	S
Water supply; sewerage, waste management and remediation activities	0.0039	0.0111	0.0150	22%	2.26	S
Wholesale and retail trade; repair of motor vehicles and motorcycles	0.0074	0.0030	0.0104	22%	1.96	S
Printing and reproduction of recorded media	0.0058	0.0036	0.0094	21%	1.89	S
Transportation and storage	0.0024	0.0026	0.0050	25%	1.86	S
Manufacture of beverages	0.0057	0.0038	0.0095	20%	1.76	S
Agriculture, forestry and fishing	0.0013	0.0037	0.0050	23%	1.74	S
Manufacture of paper and paper products	0.0073	0.0072	0.0146	10%	1.38	S

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