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IMPACT OF ORGANIZATION AND ENVIRONMENT RELATED CULTURAL FACTORS ON INNOVATION

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Abstract

Today it is already became a fact that innovation plays crucial role in the development of firms. Due to this fact, there are many researchers, which are interested in studying factors that can impact on innovation. In our paper, we attempted to analyze one of such factors as culture and to study its impact on innovation performance. The methodology of the research uses the survey data-collection method. The sample frame of the study was Azerbaijan's construction industry. After data collection, we used quantitative techniques such as correlation-regression analyses to find the support for proposed hypotheses. We found that the following factors such as prior experience of CEOs, openness to change, trust as a strong cultural and social component, headquarters' location, number of additional trainings per year, factor of the advice taking from the outside of the firm have a positive impact on innovation performance.

Keywords: Construction Industry, Cultural Diversity, Innovation Performance, Openness to Change, Experience of CEOS, Headquarters' Location, Additional Trainings, Advice Taking

INTRODUCTION

Today the development of the business through innovations became a guarantee of high competitiveness and long-term success of the firm. Innovations nowadays are crucial not only to firm but to whole nations (Romer 1990, Schumpeter 1962). Thus, the process of creating innovations and organization of right conditions and suitable environment for natural development of innovations is a significant topic to study. There are many factors which can impact on innovation were already studied by various researchers. Environment related factors and particularly cultural factors of the internal environment of the firm in our opinion worth focus group of factors. Despite of fact that information today is a key factor on enhancing the

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innovation still people and the interaction amongst them what makes the difference how the information is circulated and how ideas are understood, interpreted and used. People can have same level of education but the difference in country specific attributes can increase the heterogeneity among them (Mattoo et al., 2012). Here different people from with different cultural backgrounds, individual characteristics, perceptions and skills can impact on innovation processes, knowledge flow and on its absorption. Which of those factors do really impact on innovation and in what degree is an interesting question, which will be investigated here.

Results of the research will be striving to show major relationship between cultural factors and innovation performance. The results regarding to analyses of Azerbaijan's construction industry can be used by government organizations, different firms whose conditions are similar, and have an active innovation activity. In addition, research findings can be useful for current companies in their decision-making processes and for future enterprises, which are planning to start up their business in Azerbaijan's construction industry.

LITERATURE REVIEW

Language Diversity and Innovation

With language diversity, it is much easier to understand the effects of innovation comparing to other factors, as it can be explained with economic terms of cost. Increasing marginal costs of language diversity would suggest that while coping with one additional language in a given workforce may be fairly easy, further increases in language diversity will cause costs to increase exponentially due to a disproportionate increase in communication errors and translation fees. Decreasing marginal returns imply that although having one additional language in a workforce may entail a large benefit (e.g., enabling an organization to communicate directly with its most important groups of foreign customers,) such benefits will decline with each additional language added. These principles could be easily used for effect of language diversity on innovation performance, as the cost here can be understood as the cost of knowledge sharing and knowledge flow. Thus, we assume the following:

Hypothesis 1: Higher level of diverse languages spoken in the firm is positively and significantly associated with innovation performance of the firm.

Education and Innovation

There is some evidence in literature where the importance of entrepreneurship education is mentioned Plaschka and Welsch (1990), and the emphasis is placed in the contents that should be or not transmitted and how it stimulates the entrepreneurial process of the students.

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The analysis of the main axes of research around the concept of entrepreneurship and entrepreneurship education at university-level studies seem to have the best results. However, most of them study the relationship between earnings and education, and it is hard to say if earnings are proxy to innovation.

There is a small literature on the impact of college quality (Eide et.al., 1998; Hoekstra, 2009; Hussain et.al., 2009). Hoekstra (2009) is the most convincing study since it exploits a sharp discontinuity in admissions criteria to show that attending a “flagship” state university in the US increases earnings by about 20%.

Lindley and Machin (2009) use LFS data and estimate that the premium for a Masters (PhD) degree relative to a Bachelor’s degree rises from 8% (14%) in 1996 to 11% (24%) in 2009. LE also provides estimates their average figures are approximately 9% for Master and 15% for PhD.

Toivanen and Väänänen (2011) investigate whether an engineering degree has an influence on the registration of patents. They conclude that persons with engineering background have a positive effect on invention. The above-mentioned paper concentrates on the distinction between non-high-tech and high-tech startups. In their opinion, persons with technical education could have a comparative advantage in the high-tech industry because they have more knowledge in their field.

De Mel et al. (2009) in his work propose a model of innovation where the probability of being innovative depends on the manager’s ability. They examine whether the traits of the firm characteristics are able to explain different types of innovation. The authors use the Sri Lanka Longitudinal Survey of Enterprises between January and May 2008. They distinguish between four different types of innovation: product, process, marketing and organizational innovation.

Two independent regressions are conducted: one for the traits of the entrepreneur and one for firm characteristics. The authors find that beside firm size the owner characteristics also play an important role for explaining innovation. Thus, the greater the years of schooling and IQ, the more probability of the firm to be innovative. However, the authors do not include the type of education in their analysis. Sauermann and Cohen (2010) also have a different focus compared to this study. They look at how employees’ incentives influence innovation in companies. Thus, they do not analyze start-ups and concentrate on employees with a doctoral degree.

Based on some logical conclusions and on conducted literature review we propose the following hypothesis:

Hypothesis 2: Higher the level of education degree the higher will be the innovation performance of the firm.

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Headquarter Location and Innovation

Existing studies can be distinguished whether they focus on the innovative performance of foreign R&D subsidiaries or on the effect on innovations developed by the headquarter. The to-date studies mostly use patent data to analyze the impact of foreign knowledge sources on firms' innovations. Phene and Almeida (2008) have investigated the determinants of subsidiary innovation. They provide evidence that knowledge from host country firms positively affects scale (number of patents) and quality (number of citation received) of subsidiary innovation. On the contrary, knowledge assimilated from MNE headquarters and other subsidiaries play no significant role for subsidiary innovation. Frost (2001) studied the geographic sources of foreign subsidiaries' innovation. He distinguishes firms' innovation activities abroad into the exploitation of existing firm knowledge and exploring local knowledge sources abroad. His findings suggest that foreign subsidiaries' patents rather cite knowledge sources from those locations that possess the strongest expertise and technological advantage. Foreign subsidiaries' patents are therefore likely to be based on host country knowledge when it is technological advanced in that relevant field and if the foreign subsidiary is of larger scale.

The subsidiaries of a MNC are located in a wide variety of countries; some subsidiaries are located relatively close to the headquarters and others are located far away. Jandik and Kali (2009) and Oxley (1997) state that the more geographically distant the subsidiary is from the headquarters, the more difficult and costly it becomes for the headquarters to monitor the behavior and performance of the subsidiary, increasing the likelihood of opportunistic behavior by the subsidiary. In addition, subsidiaries that are far away from the headquarters find it more difficult to transfer information to the headquarters about their intentions, behavior and performance (Ciabuschi, Dellestrand, and Holm, 2012; Tsang, 2000), as distance is an important barrier to effective knowledge transfer (Zaheer and Hernandez, 2011). Moreover, managers at the headquarters are found to have difficulties to understand the subsidiaries that are further away, because of unfamiliarity with the country setting (Bouquet and Birkinshaw, 2008; Rosenkopf and Padula, 2008). Hence, as geographical distance limits the headquarters to carefully monitor and control its subsidiaries, it will be less likely to provide its fiat for alliance formation to geographically distant subsidiaries. The headquarters can also provide more support to geographically close subsidiaries. Several studies have shown that geographically close subsidiaries receive more attention from the headquarters in comparison to subsidiaries that are located faraway (Bouquet and Birkinshaw, 2008; Dellestrand and Kappen, 2012; Parmigiani and Holloway, 2011). For the headquarters, it is easier and less costly to have face-to-face contact with geographically close subsidiaries (Ambos and Ambos, 2009; Dellestrand and Kappen, 2012), facilitating the transfer of knowledge and experience. This additional

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support from the headquarters in the alliance formation could, for instance, involve sharing previous alliance experiences and assisting in the partner selection process. Hence, we expect that, when the headquarter is located far, which is usually is the case when it is located in foreign country, it becomes more difficult for the headquarters to control and support the subsidiary, which accordingly decreases the likelihood that the headquarters will give fiat to the subsidiary. Thus:

Hypothesis 3: If firms' headquarter is located abroad it positively and significantly increase the innovation performance of the firm.

Ownership and Innovation

Family firm owners' sensitivity to uncertainty and their reluctance to relinquish control not only affect their firm's innovation input, but also likely determine their firms' orchestration of resources (Carnes & Ireland, 2013) and thus how family firms convert innovation input into output, and, ultimately, their level of innovation output. We posit that family firms are particularly suited to efficiently converting innovation input into output.

We suggest that family firm owners, owing to their high level of control, their wealth concentration, and their reluctance to relinquish control, are particularly willing and able to monitor the innovation process (cf. Fama & Jensen, 1983). As the innovation literature reveals, one major source of inefficiency during the innovation process stems from managerial activities that are not beneficial to the outcome of the innovation process (Roberts &Fusfeld, 1981). For instance, managers can support their pet projects (Nohria & Gulati, 1996) while denying support for other, more promising projects, political turmoil among middle managers can delay the implementation of innovation projects (Kanter, 1983; Shane, Venkataraman, & MacMillan, 1995), and a lavish use of the granted resources can introduce substantial inefficiencies into the process (Mudambi & Swift, 2011). Such inefficiencies are commonly facilitated by the limited amount of information that (non-family) firm owners possess about the promise of specific innovation projects and their inability to closely monitor and influence the innovation process (Simester & Zhang, 2010). Because of their high level of control, family firms are well suited to overcoming these issues and ensuring efficient transformation of innovation input into output since family owners have superior power to implicitly and explicitly monitor managers (Uhlaner, 2013) and can act as "sophisticated investors" (Bushee, 1998). Moreover, their desire to avoid uncertainty and their reluctance to take on external money further motivates family firms to ensure an efficient or "parsimonious" (Carney, 2005) conversion of innovation input into innovation output. In addition, we propose that the family owners' high level of control and their attention to non-financial goals lead to the development of specific resources and capabilities

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that foster the innovation process. Family firms have been shown to pursue non-financial goals such as creating and maintaining trust-based, long-term relationships with both firm-internal and external stakeholders (Berrone, Cruz, & Gómez-Mejía, 2012). We argue that pursuing such non-financial goals, over time, goes along with the development of a firm-level network, firm-internal human capital, and routines that are beneficial for the conversion of innovation input into output. Specifically, we posit that family firms benefit from privileged network access that fosters their innovation processes. An abundant body of innovation literature emphasizes the role of a firm's network within the innovation process since "networks can provide access to knowledge and resources that are not readily available via market exchanges" (Rothaermel & Hess, 2007: 901). More specifically, network partners can propose novel and interesting ideas (Gassmann, Enkel, & Chesbrough, 2010); they can provide valuable feedback throughout the innovation process (Garud et al., 2013; Tyre & Von Hippel, 1997), for instance, through early and frequent interaction in the development and testing of prototypes (Thomke, 2003); and they can support the marketing of newly developed products (Schreier & Prügl, 2008).

In summary, their focus on ties to external stakeholders, above and beyond economic (short-term) transactions, embeds family firms in a trust-based network (Uzzi, 1997) and endows them with a superior ability to leverage external networks, which has been labeled a manifestation of dynamic capabilities (Eisenhardt & Martin, 2000; Teece et al., 1997). We further argue that the focus of family firm owners on non-financial goals leads to particularly high levels of human capital and beneficial intra-organizational processes and systems that will further support the innovation process in family firms. High levels of human capital within a firm are beneficial within the innovation process (Acs & Audretsch, 1988; Hadjimanolis, 2000) because the interaction of experienced and skilled employees leads to the accumulation of implicit or tacit knowledge (Almeida, Song, & Grant, 2002; Henderson & Cockburn, 1994; Kogut & Zander, 1992; Leonard-Barton, 1992), which, in turn, fosters the development of new technologies (Dosi, 1982). We thus expect that the high level of commitment (Donnelley, 1964) and tacit knowledge among employees (Sirmon & Hitt, 2003) in family firms will foster the transfer of valuable ideas across hierarchies and departments and thereby support the resource orchestration within the firm. In other words, the monitoring and the nonfinancial goals of family firms likely entail high levels of tacit knowledge among employees and the existence of systems and processes that are capable of efficiently transforming innovation input into innovation output over time. Thus, we propose the following hypothesis:

Hypothesis 4: Factor of ownership when the firm is family running firm is positively and significantly associated with innovation performance of the firm.

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Additional Trainings and Innovation

In his fundamental works on human capital, Becker (1964) emphasizes the importance of on the-job training to a person's productivity over the lifetime. He argues that firms will only invest in specific training if they can appropriate the future rent of training. Motivated by first empirical findings by Steedmann (1993) and also Krueger (1993) and Autor (2001), Acemoglu and Pischke (1999) extend Becker's argumentation and argue that noncompetitive labor markets, in combination with a compressed wage structure, can also provide an incentive for firm-sponsored general training because firms can appropriate parts of the expected rent. Both arguments appear to concentrate on the appropriability of future rents from the workers' increased productivity by employing a model of price competition in which firms compete over the future distribution of a given pie.

Training enables workers to experiment with the latest technologies in such a way that something new is created. Initially, this contributes to the firm's overall knowledge stock. A firm's knowledge stock, in turn, is the basis for the production of new knowledge and, eventually, the entire innovation process—from the birth of a new idea to its commercialization as a novel product or procedure. The general importance of constant innovation is described by Aghion et al. (2006) in a model where technologically advanced entry creates a competitive environment that forces incumbents to innovate constantly. In this environment, each potential entrant arrives with leading-edge technology. If the incumbent is less technologically advanced, the entrant will replace the incumbent. If the incumbent is also employing leading-edge technology, it can use its reputation advantage and block entry. In short, an incumbent who is approaching the development of leading-edge technology has a strong incentive to innovate and to keep pace with technological progress as doing so can prevent entry of competitors. However, an incumbent whose technology is out of date—regardless of whether it innovates—will find it difficult to keep pace with technological progress and, presumably, will not be able to prevent entry of leading-edge competitors. Consequently, an incumbent who lags considerably behind the times in terms of technology is discouraged from innovating and will be forced out of the market. The main implication of this model is that the threat of technologically advanced entry (escape-entry effect) or of competition in an oligopolistic market (escape-competition effect) encourages innovation by incumbents who are already in place at the technology frontier (Aghion et al. 2001, 2005). Innovation is the incumbent's weapon against entry and competition; training is the ammunition.

Important component of the knowledge stock is tacit knowledge, i.e., know-how and know-who (Lundvall and Johnson 1994). Know-how, which is gained from former experience, and know-who, which arises from social contacts, are "sticky" types of knowledge, meaning that

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they are “stuck” to the person in possession and cannot be created artificially or bought by employing new workers. This type of knowledge is the product of an evolutionary process in which colleagues have worked together in teams and know about the strengths and weaknesses of each other, leading to complementarities that raise productivity per se. Furthermore, previous experience with development processes and related problems can be relied on to avoid difficulties in further exploitation of the existing knowledge stock (see Nelson and Winter 1982). Thus, high turnover in the workforce is likely to destroy the social ties that can increase productivity. However, according to Granovetter (1973), closed networks have their dangers, too, including the risk of inflexibility and decrepit structures that can result from a lack of “new blood.” In this context, training, along with moderate labor force turnover, provides a simple way to collect new knowledge and thus prevent inflexibility and blindness that are inherent in decrepit structures, both of which are major obstacles to innovation.

We thus argue that a sustainable company’s decision to invest in training does not depend on whether it can recoup training costs by paying noncompetitive wages and/or instituting a compressed wage structure. Rather, firms have an incentive to pay at least competitive wages to preserve the tacit part of their knowledge stock and, at the same time, they have an incentive to invest in training as a way to extend the codified part of the knowledge stock and keep up with the latest technological changes and requirements. Given an incumbent firm’s reliance on experience, continuous training of the routinized workforce is a necessary investment to steadily refresh the firm’s knowledge stock that, in turn will provide the basis for further innovation.

Hypothesis 5: Number of additional trainings per year in the firm is positively and significantly associated with innovation performance of the firm.

Advice Taking and Innovation

Theoretically, board members with outside board memberships could affect corporate outcomes either positively or negatively. The literature has derived several arguments towards both perceptions. Towards a positive influence of external monitoring managers on corporate governance it is argued that external managers are more independent than their counterparts from inside the company, because their personal future career does not depend on the professional advancement of their direct board colleagues and the CEO. Moreover, external managers may provide firsthand knowledge, expertise and scarce information to the appointing firm that can hardly be acquired from sole insiders. Due to their firm- and industry-specific experiences outside directors increase the human and social capital in the boardroom and are able to advice the management on crucial strategic decisions, for instance undertaking risky

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innovative activities (Kor and Sundaramurthy 2009, Carter and Lorsch 2004 and Bailey and Helfat 2003). The value of external advice is likely to increase if an executive is appointed as a monitoring board member by a company that faces similar tasks as the executive at his home company (Kor and Sundaramurthy 2009 and Carter and Lorsch 2004). Finally, one of the most cited and straightforward arguments towards a positive assessment of simultaneous outside board mandates in general were introduced by Fama and Jensen (1983). According to these authors multiple board mandates are just a normal outcome of the market for top-managers, where the best skilled managers are appointed to the most boards. Hence, external directorships should be assessed as a sign for outstanding managerial expertise. But companies are not only limited with having board managers from outside. Taking advices from other firms or experts is also a common practice. And here these external advisers act as if they are outside-board members, and thus we can imply the same logic here as with external board members. So we can assume that the following hypothesis:

Hypothesis 6: Factor of the advice taking from the outside of the firm is positively and significantly associated with innovation performance of the firm.

METHODOLOGY

Measuring Dependent Variable

There is no best metric for innovation performance, since single measurement processes can sometimes negatively impact the innovation processes they are attempting to measure. Preferably, a suite of metrics should be used to measure the innovation process. In order to mitigate this negative impact and increase the value of the innovation measurement process, management should use these reviews as “teachable moments” to reward, correct or guide innovator performance appropriately. To this end, there are objective and subjective metrics.

Objective metrics might include:

- Deliverables to goals (e.g., preapproved innovator performance targets, meeting corporate initiatives, etc.);
- Completing activities that enhance the brand image (e.g., publications, conference presentations, interviews, etc.);
- Production of intellectual property (e.g., patents, trade secrets, etc.).

Subjective metrics include attaining reach-out goals and roadmap targets. For example, a goal such as “Develop two new processes that increase office productivity” enables the innovator(s) to identify bottom-up opportunities with significant opportunities for self-motivation.

Most companies produce products or services; if they want to compete, they need new products or services. Since many companies I have dealt with tend to “metric” themselves into a

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paralysis, there are two measurements that some literature puts emphasis on: 1) Speed to market; 2) Number of new product (services) launches.

Speed to market is valuable because it ties in all of a company's operations. Everyone understands the need to get something out before the competitor launches a competing product.

As experience shows the "number of new products" metric is more accurate in defining the level of innovativeness as because it leaves open the possibility that some of the new products may fail. That is what innovation is about.

In order to cover all types of innovation and to have the measure which indicates the overall innovation performance we have decided to ask our respondents to provide with information regarding innovation, where they had to show the total number of patents registered, number implemented new processes, number of new products and services. Understanding that most of construction companies in Azerbaijan, particularly small ones do not patent their innovative ideas and products we added corrective measure as new products and services. We can use the sum of all innovation types into single parameter for innovativeness.

Measuring Independent Variables

As most of our independent variables are diversity measures, they have the common nature in measuring them. Here in the table we provide the description of measuring each of variables, which we have attempted to use in testing our proposed hypotheses.

Table 1: Brief Description of Variables (Variables will be used in combination, so any variable can be dependent in one model and independent in another)

Variable name	Variable description
Dependent variables	
Innovation performance	Sum of overall number of all types of innovation.
Independent variables	
Language diversity	Blau's index (calculated as 1 -$\sum P_i^2$, where *P* is the proportion of individuals in a category and *i*s the number of categories) could thus theoretically range from 0 to .80 Low index will mean less number of employees speak foreign languages and closer to 1 will mean that employees speak more languages.
Education	Education degree of employees, where higher number of on Likert scale (5) will mean PhD (or equal) degree and low number (1) basic education only.
Headquarter is abroad	A dummy variable equal to '1' if the headquarters of a firm are located outside of Azerbaijan
Family running firm	A dummy variable where if family running firm is 1, and if any

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	other form of ownership is 0.
Additional training	Number of additional trainings (courses) which employee had during the last year.
Advice taking	A dummy variable where if firm takes advice (official through contract) from elsewhere is 1, and if no is 0.
Control variables	
Company Age	The number of years since a company was found
Firm size	Total number of employees in the firm

Data Collection and Used Methods

There was organized a data collection process where survey among 76 Azerbaijan located firms has been conducted. The sampling process was organized with the help of trade unions in Azerbaijan where the sampling frame was obtained. From the list of companies in the sampling frame, which are, members of different trade unions firms were randomly selected to send questionnaires. The amount in the end was equal to 76 due to absence of relevant information about firms and existence of some wrong data in database.

Collection of factual data through surveys has helped us to save time and there was no need to collect data about financial performance of the firm from other statistics providers. After collecting data we had 66 % of response rate, thus our observation amount was equal to 40 respondents. Some of questions in questionnaire were measured with Likert scale and some had direct numerical forms.

In our research we used the computer software package for statistical analyses Gretl 9.0. In data analyses we first made correlation analyses, we used Pearson correlation method. After finding the significance fact of critical values, we have tried to find the relationship between factors under the study. We used regression analyses due to some of our data is in count form we have used Negative binomial regression model.

ANALYSES AND DISCUSSION OF FINDINGS

The group of variables under study took into consideration the impact of organization and environment related cultural factors on innovation performance. Summary statistics here show that variables for diversity measures such as diversity of languages and diversity of education has higher rates of diversity for the firms of the sample. Particularly, for languages it has on average 0.69 which is very high indicator. This can be due to the specifics of the country, mix of different local languages and historical background of the country, where it was part of multicultural country Soviet Union and where it was common to be able to speak several languages. Education level also have quite high rate of diversity, mainly due to some firms

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which do work on project panning, architectural and design services, which require higher levels of special skills, which results on higher diversity of people with different education background.

Table 2: Summary Statistics

Variable	Mean	Median	Min	Max	Std. Dev.	C.V.	Skewness	Ex. kurtosis
Languages	0.69	0.69	0.65	0.76	0.02	0.04	0.17	-0.78
Education	0.43	0.41	0.20	0.80	0.17	0.40	0.57	-0.64
Headquarter	0.27	0	0	1	0.45	1.64	1.007	-0.98
Ownership	0.25	0	0	1	0.43	1.75	1.15	-0.66
Additional training	7.97	7	1	24	5.04	0.63	0.73	0.65
Advice taking	0.62	1	0	1	0.49	0.78	-0.51	-1.73

Using the observations 1 - 40

Here in this set we used three variables which were dummy variables, such as headquarter location, ownership form of the firm, if it is a family business or not, and advice taking attitude of the firm from outside. In correlation part of analyses, we see that innovation performance has a positive relationship with most of variables, except language diversity variable. Here can be the suspect that the relationship is not linear, despite of fact that we have proposed the positive relationship between variables. None of variables' correlation has the coefficient more than 0.7, which takes the need to check for multicollinierity out.

Table 3. Correlation matrix

		1	2	3	4	5	6
1	Innovation	1					
2	Languages	-0,29	1				
3	Education	0,34	-0,02	1			
4	Headquarter	0,51	0,08	0,1	1		
5	Ownership family running	0,04	-0,07	-0,21	0,16	1	
6	Additional trainings	0,6	-0,28	0,06	0,31	0,31	1
7	Advice taking	0,45	-0,02	0,16	0,24	0,32	0,69

Using the observations 1 – 40, 5% critical value (two-tailed) = 0.3120 for n = 40

Organization and environment related cultural factors are another group of factors which can hypothetically impact on innovation performance of firms.

Model 1 tests the Hypothesis 1, which claims that higher the level of diverse languages spoken in the firm higher will be the innovation performance. Results show that there is no any significant relationship between these two variables and here we reject the hypothesis 8. It can be explained as following that language spoken does not pass complex knowledge and does not become an accelerator for innovation. It means that mainly employees have basic

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knowledge on foreign languages spoken and in firms' corporate environment they still use the same language.

Model 2 checks if the higher level of education degree impacts on innovation positively. We found that there is a negative relationship between these two variables but it showed low significance level which means these results do not have any meaning and statistically it is not supported and we can conclude that hypothesis 2 has been rejected. It can be explained with the fact that most of workers of the firm are low educated as for construction industry there is not always need in high level of education, where physical power and some special skills are enough to accomplish the job.

Model 3 Next hypothesis 3 tries to find the impact of headquarter location on innovativeness of firms. Here inferential statistical results do support the proposed hypothesis, while still having low significance level, which was accepted at 10% p-value rate.

When firms' headquarter is located abroad it can absorb some knowledge and information from the country of origin, in most cases it means that the firm operating in host country is a foreign firm and usually foreign firms before entering to the market do analyze it and enter when have some comparative advantage, thus with some luggage of knowledge and innovation elements.

Model 4 does test hypothesis 4, which says that ownership if it has a family business form has a positive effect on innovation of that firm. Our results show that it is indeed has a positive effect on it and that it is significantly associated. As in part when we justified the hypothesis was mentioned family firms are more tend to contribute more on development of its firm in all aspects, and this motivation factor usually becomes the mechanism for enhancing searching of new elements and innovative factors, which in the end does increase innovation of the firm.

Model 5 Additional training is the next cultural factor, which was under our study. Some can argue that this factor is not clearly cultural, but we have our own argument, which says that taking decisions on whether to allow owning employees to have more additional training and additionally to train them also depends on cultural views of management and to the cultural environment of the firm. Hypothesis was predicting the positive effect of number of additional training per year, which got its support from field-studies. Here the significance of the relationship is very high and hypothesis is supported. More training is different that simple education background. When stuff of the firm goes for additional trainings they go those courses

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which are currently most needed. Continues upgrading of qualification and exchange of knowledge make them to be always “modern” and to be aware of current changes in market conjuncture. This as a fact does make its impact on innovation of the firm.

Model 6 Our next model checked how advice taking nature of the firm impact on our main factor. Here also we found that it has a positive effect and that these two factors are significantly associated with each other. Important also that the significance level is very high, which is accepted at 1 % p-value’s rate. Logically we can say that taking consultations in construction industry is a common practice and most of firms sometimes officially, sometimes non-officially take advices or sign consultation agreements with other firms. Usually such companies can be R&D firms or centers, which do accumulate some innovative knowledge, and which in the end can impact positively to innovativeness of firms.

Table 4. Negative Binomial Regression: Innovation Performance (n=40)

Innovation	Model 1: Languages	Model 2: Education	Model 3: Headquarter	Model 4: Ownership	Model 5: Additional training	Model 6: Advice taking	Model 7: All predictors	Model 8: Only significant predictors
	Coef. (S. e.)	Coef. (S. e.)	Coef. (S. e.)	Coef. (S. e.)	Coef. (S. e.)	Coef. (S. e.)	Coef. (S. e.)	Coef. (S. e.)
Constant	1.89 (2.11)	2.5 (0.23) ***	2.34 (0.18) ***	2.2 (0.16) ***	1.94 (0.12) ***	2.15 (0.13) ***	1.54 (1.28)	1.98 (0.1) ***
Languages	0.59 (3.07)						0.63 (1.78)	
Education		-0.68 (0.45)					-0.009 (0.31)	
Headquarter			0.27 (0.19) *				0.3 (0.13) **	0.31 (0.12)
Ownership				0.43 (0.19)			0.02 (0.14)	
Additional training					0.09 (0.02) ***		0.06 (0.02) ***	0.06 (0.01) ***
Advice						0.76 (0.17)	0.4 (0.14)	0.42 (0.12)
Firm size	0.0001 (4.31) ***	0.0001 (3.28) ***	0.01 (3.56) ***	0.01 (3.01) ***	8.43 (2.17) ***	0.00 (2.83) ***	9.81 (2.09) ***	9.35 (1.72) ***
Firm age	0.04 (0.009) ***	0.05 (0.009) ***	0.04 (0.009) ***	0.04 (0.008) ***	0.02 (0.008) ***	0.02 (0.009) ***	0.01 (0.006) ***	0.01 (0.006) ***
Alpha	0.20 (0.06) ***	0.19 (0.05) ***	0.18 (0.06) ***	0.16 (0.05) ***	0.08 (0.02) ***	0.12 (0.03) ***	0.06 (0.02) ***	0.06 (0.02) ***
Log likelihood	-161.97	-160.91	-160.9654	-158.53	-148.39	-154.35	-143.54	-143.60
Akaike	333.95	331.83	331.93	327.07	306.79	318.71	307.09	301.21
Hannan-	337.01	334.88	334.98	330.13	309.85	321.76	313.20	305.48

***P<.01, **P<.05, *P<.10, QML standard errors.

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Model 7 In this model we all of factors together to see its mutual effect. As some of individually tested variables showed insignificance, it has been expected that it also will be insignificant when we include more variables. The only exception was with Ownership variables. From model 4 we saw that individually taken it has a significant result, but in combination it does not, this kind of problem is common in econometrics, as literature suggests we tend to choose the one which has more variables, as more factors are included. The problem which we faced forces us to include only factors which are significant and re-run the regressions. Also comparing Akaike criterion and Hanna-Quinn criterion we see that for model 7 it is lower than for model 4, it means that model 7 is better one, as theory says when these criterions are lower the better is model fit.

Model 8 From model 7 we got some insignificant variables we had to exclude them. After rerunning the process we found results, where we included only significant variables from model 7. This model can be used as our final model for these set of variables. Because of all variables including control variables all are significant and Akaike and Hanna-Quinn criterions are the lowest for this model. So we can recall them again: Headquarter location, Additional trainings, Advice taking nature of the firm, and Firm size with Firm age do positively and significantly effect on innovation performance of the firm.

Table 5: Summary Results

Hypotheses	Relationship with innovation performance	Proposed relationship form	Accepted model in regression table	Results	Finding
H 1	Diverse languages	Positive	None	Rejected	Unclear
H 2	Education degree	Positive	None	Rejected	Unclear
H 3	Headquarter location	Positive	Model 8	Supported	Positive
H 4	Factor of ownership	Positive	None	Rejected	Unclear
H 5	Number of additional trainings per year	Positive	Model 8	Supported	Positive
H 6	Factor of the advice taking from the outside	Positive	Model 8	Supported	Positive

Based on regression analyzes from tables

CONCLUSIONS

Construction industry, particularly in Azerbaijan is one of the most rapidly growing industries. With needs for diversification of the economy Azerbaijan's government and businesses with understanding this fact, make a lot of efforts on enhancing the share of other non-oil industries in its contribution to national economy. It becomes even more crucial when the competition level

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in industry is high and when requirements for technological update and for existence of advanced innovative tools are very important. Taking into account the agenda of today's firms' researches on finding additional aspects, which can increase the competitiveness of firms, become very significant issue? It is not a secret that innovation is one of such components, which may give the highest competitiveness for firms and can help a long period to keep its competitive advantage. However, what make firms to become innovative and what forces push them, sometimes intentionally and sometimes unintentionally still was not clear. Heuristically we understand that cultural factors in firms and in its internal and external environment do make its effect. And there was a strong need to prove it scientifically through empirical tests particularly in the industry of our interest – construction industry of Azerbaijan. This industry matches to answer to such question perfectly due to its high level of innovativeness and due to wide range of its cultural aspects came from its diverse employees, which traditionally are involved into a construction industry.

As we have mentioned growing cultural factors is increasingly seen as important for innovation. Research has suggested that this can happen in different firms within same industry. Yet no study has tested these factors in a scale as it has been done here. This paper has addressed in fulfilling this gap using a survey of over 50 Azerbaijan's construction industry firms with data on different cultural factors and innovation performance. Here, we would like to summarize the main findings:

1. Our research found that headquarters' location might positively influence innovation. This finding might not give a lot of tips on how to behave for firms, as it is very difficult to relocate its headquarter, but this finding can be useful for government officials in conducting the policy on attracting foreign direct investments and in deciding to which firms to give incentives and support.
2. Number of additional training per year in the firm seems has a positive effect on innovation of the firm. It is clear that more training can bring more knowledge, as with quality and quantity. Firms should thoroughly plan and organize additional training for their employees and this component should not be omitted if firms are willing to increase their competitiveness through new products, services and processes.
3. Factor of the advice taking from the outside has a positive effect on innovation and most of firms are not willing to use this advantage motivating their decision with costs, data confidentiality and mistrust. This factor, at least in construction industry may be useful as consultations taken from outside may give bring new ides to the firm, which might accelerate the innovation processes.

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The relationship in this study was initially stated to have a linear form, however still there can be evidences from other industries and countries about the different nature of these relationships, thus results should be used with caution in the process of decision making. Future research can focus on testing of more complex relationship and can use other ways of measuring the innovation. We have used the total number of innovations in the firm while such proxy measure ways as patent citations were not taken into consideration. Using not only cross-sectional form of studies but inferring data in time series or panel form could give more light to the nature of relationship between factors under study.

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