

ECONOMICS

Sociology

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Introduction

In today's world, innovations and successful decision-making in entrepreneurial activities are among the most important components of successful long-term oriented

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THE IMPACT OF CULTURAL DIVERSITY ON INNOVATION PERFORMANCE: EVIDENCE FROM CONSTRUCTION INDUSTRY OF AZERBAIJAN

ABSTRACT. Studies on innovations attract many researchers all over the world due to their crucial role in today's highly competitive world. At the same time, cultural dimensions, cultural factors, and their impact on performance measures are also becoming a very popular topic for research. In our paper, we attempted to analyze the issues related to cultural diversity and its impact on innovation performance.

We used survey data-collection method with support of trade unions in regions. Then, we used quantitative techniques such as correlation-regression analyses in order to find support for the proposed hypotheses.

We found that cultural diversity has inverted U-curve relationship with innovation performance in the case of Azerbaijan also along with that we found that two components of cultural diversity, namely gender diversity and foreigners' diversity have the highest outcomes in terms of innovation performance when the diversity levels are moderate.

organizational behavior. In addition, innovation is an important driver of long-term national economic growth and an important policy goal (Romer, 1990; Schumpeter, 1962).

As the twice Nobel Laureate Linus Pauling stated: “The best way to have a good idea is to have a lot of ideas”. According to him, the success of creativity depends a lot on having various ideas. Most of studies on diversity emphasize that different ideas play a significant role in change making and this is the key factor for knowledge accumulation.

According to Berliant and Fujita (2012), ideas in general help us to communicate, while exclusive ideas help us bring in originality to collaborative work.

Today, when non-rivalrous knowledge (Romer, 1993) is widespread and easy to be accessed as never before, it is a challenging task for firms to transform potentially new knowledge into productivity growth. In order to understand the effect of these pervasive phenomena, we consider only within-firm diversity. We are of the opinion that despite limited information availability, people are still the main factor, which influences how information is circulated, and ideas understood, interpreted and used.

There is a number of works on the growing importance of cultural diversity for innovation (e.g. Østergaard *et al.*, 2011; Ozgen *et al.*, 2011; Pozzoli *et al.*, 2012; Kemeny, 2012; Nathan & Lee, 2012). In our research when we use “culture”, we refer to national characteristics and not to corporate culture.

The results of our research can be useful for managers in the process of making decisions on the selection and implementation of the strategies related to employees and creating suitable environment for them. Also our findings will help better understand the process of innovation, understand the factors, which can influence innovation activity and help to know how these mechanisms work under conditions of diversity inside a firm.

The remainder of this article is structured as follows. Section 1 reviews the existing literature on the components of cultural diversity: racial, gender, foreigners’ diversity and its relationship with innovation performance. Section 2 discusses the methodology, as well as the data used to test the hypotheses. Section 3 contains the empirical results, followed by a short summary and conclusions.

1. Literature review

1.1. Cultural diversity and innovation

We have identified from reviewed literature that there is a range of works, which found the positive and negative impacts of cultural diversity on innovation and firm performance. The overall impact remains an open question, especially regarding to impact on innovativeness of the firm. There are studies which found an inverted U-shape relationship between diversity and economic performance (see e.g. de Graaff and Nijkamp, 2010), meaning that there is an optimal diversity. Can the same effect be true regarding to the relationship between cultural diversity and innovation? Results of a literature review show that, a wide range of models, which used random effects find that there is a significantly positive impact of diversity rather than curvilinear relationship. The effect is even higher when migrants are skilled and when the sector is knowledge-intensive.

Blau (1977) had an idea that firms with different levels of cultural diversity in the end have different levels of development and organizational outcomes. There are some views, which argue that low diversity is beneficial for members of groups. In groups, which have homogeneous structure participants will communicate to each other more often and in different ways, due to similarity of worldviews and common culture. This brings to the situation when group members get closer to each other and start sharing perceptions (Earley & Mosakowski, 2000). Social identity theory claims that cultural homogeneity in

management groups may increase satisfaction and cooperation and decrease emotional conflict (Tajfel & Turner, 1985; Williams & O'Reilly, 1998). As there are no barriers for interaction between groups and homogeneous groups do not have significant cultural barriers to social intercourse, positive social contacts and associations within the group are encouraged (Blau, 1977).

Blau (1977) also proposes that moderate levels of cultural heterogeneity may cause barriers to effective social interrelations, while high levels of diversity could weaken these barriers.

High levels of cultural diversity in firms increases the probability of interaction of different members of racial, gender or nationality groups. According to Blau (1977) in groups with high heterogeneity, the out-group discrimination less frequently.

In groups with relatively high levels of diversity, there is a small probability that can appear smaller groups with similar social identity (Earley & Mosakowski, 2000). However, highly diverse environment in terms of culture improves the performance, especially in fields where diversity associated with the value-in-diversity paradigm (Cox *et al.*, 1991; Watson *et al.*, 1993). Firms with high levels of cultural diversity may not be inhibited by social identity processes due to high amount of firm members' out-group contacts and instead, can even greatly benefit from a diverse pool of resources.

On the other hand, Ott and Dohse (2014) in their recent research have shown that the right balance of economic agents with different skills play a critical role on becoming countries technologically advanced.

Lazear's (2004, 2005) study suggested that homogenous economic agents have little to learn from each other. Logically it is clear that the direction favorable for innovation and financial performance is towards increasing the diversity. Noteworthy to mention that there are forces, which can have an opposite effect. Too high a level of diversity can cause disturbances in communication and problems in cooperation due to misunderstandings and conflict. Thus, we can assume that there exists an optimal level of diversity, which can be explained in inverted U-shape form regarding to relationship between cultural diversity and innovation.

Following the previous research's nonlinear relationship of different types of capital (Hitt *et al.*, 2001) on performance, we expected the same results in terms of cultural diversity and thus proposed the following hypothesis:

Hypothesis 1. Cultural diversity has an inverse U shape relationship with innovation performance of the firm.

Culture itself is a broad concept and is difficult to measure, thus we will use the diversity of more observable characteristics of its main components to check our hypothesis, such as race, gender and presence of foreigners in the firm.

1.2. Racial diversity and innovation

We argue that the relationship between racial diversity and firm's innovation performance may be nonlinear. The logic comes from the fact that the diverse ethnic minorities in the firm may create value by enhancing its strategic decision-making capabilities. Diversity opens the chance to obtain the information from higher range of resources and perspectives. Additionally, overall racial diversity may create broader professional and social network ties, which may improve its access to resource and diverse stakeholder groups (Finkelstein & Hambrick, 1996). This can result in an increase of innovation performance. There is research, which suggests that moderate levels of diversity also have the potential for subgroup or coalition formation (Lau & Murnighan, 1998). In their opinion, subgroups may hinder communication and decision-making within the larger group

(Murnighan & Brass, 1991) resulting in limiting the potential performance effects of such diversity. This might be true for financial performance; however, we argue that moderate levels do have opposite effect and improves the innovation performance.

Firms with high diverse groups may have a broader range of perspectives and skills, but in the same time may increase the tension and subgrouping, bringing to high likelihood of conflicting, thus can negatively impact on innovation processes in the firm.

Overall, we propose that very low and very high levels of racial diversity will be associated with decreased innovation performance, whereas moderate levels of racial diversity will relate to higher levels of firm performance. We hypothesize:

Hypothesis 1a. Racial diversity has an inverse U shape relationship with innovation performance of the firm.

1.3. Gender diversity and innovation

There is much research, which has studied a gender diversity, especially studies about diversity on board composition (Huse, 2007; Kang, 2007; Mahadeo *et al.*, 2012). According to studies the presence of women on boards bring specific perspectives, experiences and working styles in comparison with their male counterparts, and thus bring different knowledge and expertise (Daily and Dalton, 2003; Hillman *et al.*, 2007; Huse, 2007). Following the logic, this plurality of ideas and perspectives become the cause of creating new opportunities (Miller and Triana, 2009). Østergaard *et al.* (2011) in their study found that there is a positive relationship between gender diversity and the likelihood to introduce a new product or service.

Most studies found the only positive effect of gender diversity was on innovation performance while the true relationship between these two factors can be much more complex. Assumption comes from the following logic: there should be positive and negative competing forces, which describe the relationship of these factors. The resource-based view proposes that the higher diversity is the better one. On the other hand, self-categorization and social identity theories claim that lower diversity is better. These two views in the end can create the inverted U-shaped relationship between factors under study.

Higher levels of gender diversity can decrease the innovation performance due to the following factors: first, the members of too diverse groups start sort themselves into male and female group-members (Kanter, 1977). This type sorting and psychological belonging to groups bring to the situation when employees behavior in undesired way, thus decreasing communication (Kravitz, 2003) and increasing the conflicts (Pelled, 1996), which can decrease the innovativeness level of the firm. Thus, it is proposed:

Hypothesis 1b. Gender diversity has an inverse U shape relationship with innovation performance of the firm.

1.4. Foreigners diversity and innovation

There is not much previous research, which studied the next relationship. Østergaard (2011) found that his results support the idea that the benefits of migrant run firms are non-linear, that there is a diversity effect rather than a migrant-run firm effect. Across all six regressions, he had a negative sign on the quadratic term and a positive sign on the migrant run variable. In his case the results were more conclusive for process innovation: both coefficients were significant for the general measure of any process innovation; for the two more specific measures of innovation the linear term was positive and significant while the quadratic term was negative, although not significant. Thus, in contrast to findings from other researches he found the evidence of an inverse U-shaped effect, with the share of migrants

having diminishing returns to innovation (Østergaard *et al.*, 2011). Thus we can propose the following hypothesis:

Hypothesis 1c. Foreigners' diversity in the firm has an inverse U shape relationship with innovation performance of the firm.

2. Research methodology

2.1. Research design

Data collection for this study was carried out by using a research survey design. A research survey design is a method of collecting information by administering questionnaires to a sample of individuals. The research was performed through a survey using a mixture of semi-structured questionnaires. The population of the study were Azerbaijan construction firms. The method of selection of sample was random sampling in order to find 50 firms, by using the sample frame taken from Azerbaijan Ministry of Economic Development. Efforts were focused on selecting a range of firms with different characteristics such as markets, sizes, a history and duration of their operation, cultural characteristics of employees and employers, innovation activity indicators.

Each participant of firms has been asked to answer identical questions. Descriptive statistical methods used to analyze the obtained data, inferential statistics method with non-parametric focus were used to construct models and make predictions of future behavior of subjects under observation.

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
<i>Dependent variables</i>	
Innovation performance	Total sum of all types of innovation.
Any product innovation	Number of new products or registered patents in previous 12 months.
Learned product innovation	Number of introduced new or significantly improved products, which are new to the firm.
Original product innovation (Radical innovation)	Number of introduced new or significantly improved products, which are entirely new to the firm.
Process innovation	Number of newly introduced any process innovation in previous 12 months.
<i>Independent variables</i>	
Racial diversity Gender diversity Foreigners diversity	Blau's index (calculated as $1 - \sum P_i^2$, where P is the proportion of individuals in a category and i is the number of categories) could thus theoretically range $(1 - \frac{1}{i})$ Low index will mean less cultural diversity.
<i>Control variables</i>	
Company age	The number of years since a company was found
Firm size	Total number of employees in the firm

Source: Developed and summarized by author.

2.2. Data collection

The process of data collection was organized by two main ways of data gathering: primary sources and secondary sources. In order to collect primary-source data we have conducted survey among 76 firms in Azerbaijan. Azerbaijan is chosen as a sample due to multicultural environment, which exists in Azerbaijan. This environment was formed as a result of historical events taken place in Azerbaijan and also because of reforms conducted during the Soviet era of the country, when most of people from different locations of Soviet Union were forced to relocate. Construction industry is chosen as a sample for the study as this sector according to State Committee of Statistics of the Republic of Azerbaijan is second on innovativeness following the IT industry. This fact is important because in order to test the provided hypotheses there is a need on certain amount of innovativeness level, with other words it would be impossible to prove the provided hypotheses if firms do not innovate at all. The survey has been conducted along with the gathering of factual data collection purpose and also with the aim of collecting opinions, views, or perceptions of respondents. Thus, our survey has some questions, which include the Likert scale, and has a purpose to evaluate the opinion of sample respondents. Survey in this research mainly consisted of quantity questions. Quantity questions enable responses in the form of a number (including decimals), which gives the amount of a characteristic, to be collected as primary data (Saunders *et al.*, 2012).

Sampling process has been organized on the form of random cluster sampling method. Cluster (area) sampling is a probability sampling method involving sampling from different clusters (a collection of sampling units based on clustering) via two sampling frames. During this process, we have gone through the following steps: first, a sampling frame of clusters was created via random sampling, then sampling units were selected randomly from each cluster, and finally, all the sampling units randomly selected constitute the sample under the study.

Survey has been conducted personally by the researcher and delivered to each firm. After a week-time answers were collected from sources. Respondents have replied 50 (66% response rate) of 76 distributed survey papers. After checking for mistakes, non-filled responds and errata we have selected 40 suitable responds, which can be used as a primary source data for our analyses.

We have presented the correlation analyses and used Negative binomial regression model due to the count data nature of our data.

3. Analyses and discussion of results

3.1. Data analyses

Data, which has been collected during an iterative process of data collection was gathered in one database and processed through the process of putting the data into standard form. Our data has been collected through the survey method. As we have mentioned above number of respondent firms which were suitable for analyses was equal to 40.

Summary statistics for the data collected is given in *Table 1*. Here we can see that for innovation performance, which included new patents, new design, and new products and services and processes the biggest number for the firm is equal to 249 new innovative elements. Most of firms had on average around 43 innovative elements and the smallest number of innovations for the firm was equal to only two. Main explanatory variables include their square forms also, due to the need of finding the relationship, which was proposed in hypotheses, where we said that the relationship between cultural diversity and innovation performance has inverted U curve form. In order to find such a relationship we simply took squares of variables as inverted U curve has a function of parabola, which spreads

downwards. Therefore, if the variable has a positive coefficient and its square has negative coefficient we can say that the relationship here is in the form of inverted U curve.

Table 2. Summary statistics for variables

Variable	Mean	Median	Min	Max	Std. Dev.	C.V.	Skewness	Ex. kurtosis
Innovation	43	24.5	2	249	53.67	1.24	2.84	8.1
Race	0.16	0.13	0.02	0.58	0.13	0.84	1.11	0.83
Gender	0.23	0.21	0.02	0.49	0.1	0.47	0.18	-0.53
Foreigners	0.15	0.16	0.02	0.47	0.1	0.66	0.61	0.27
Race sq	0.04	0.01	0.0004	0.34	0.07	1.55	2.53	6.68
Gender sq	0.06	0.04	0	0.24	0.05	0.84	1.16	1.42
Foreigners sq	0.03	0.02	0.0004	0.22	0.04	1.19	2.42	7.9
Firm size	1416.8	483	82	10481	2516.54	1.77	2.58	6.15
Firm age	20.05	16	6	49	12.24	0.61	0.98	0.09

Using the observations 1 – 40.

Such variables as race, gender and foreigners show the diversity of these parameters. They were calculated through the Blau’s index where the formula is as following $1 - \sum P_i^2$, where P is the proportion of individuals in a category and i is the number of categories. For example, let’s say we want to find the gender diversity for the firm one in the sample and it has 200 employees and 180 of them are men and 20 of them are women, thus the calculation will take the following form:

Table 3. Correlation matrix for variables under study

	1	2	3	4	5	6	7	8
1 Innovation	1							
2 Race	-0,17	1						
3 Gender	-0,01	0,05	1					
4 Foreigners	0,04	-0,07	-0,08	1				
5 Race sq	-0,19	0,94	-0,03	-0,14	1			
6 Gender sq	-0,13	0,14	0,96	-0,11	0,06	1		
7 Foreigners sq	-0,1	0,05	-0,11	0,93	-0,01	-0,08	1	
8 Firm size	0,85	-0,32	-0,03	0,10	-0,26	-0,11	-0,01	1
9 Firm age	0,74	-0,25	-0,08	0,02	-0,26	-0,22	-0,16	0,55

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

$$Gender\ diversity = 1 - \left[\left(\frac{Men}{Total\ number\ of\ employees} \right)^2 + \left(\frac{Women}{Total\ number\ of\ employees} \right)^2 \right]$$

From our example, it is equal to 0.18. Low index will mean less diversity and hence high index will mean high diversity in the firm. This is done in order to check if these diversity levels do effect on innovation of firms. A low diversity level will indicate that in the firm workers more or less are same in terms of race, gender and country origin, which in our opinion can be the proxy for cultural diversity. All other three diversity measures were calculated in the same way, with the same logic.

For the race diversity the highest diversity level was equal to 0.58 and lowest was equal to 0.02. Gender diversity, despite a lower deviation, had on average higher level of diversity than racial diversity. The lowest diversity measure was for foreigner’s diversity as it

had mean equal only to 0.15, which means that there are not that many foreigners from different countries in firms of the sample and it is likely that the share of local workers is higher. We included the firm size and firm age variables as control variables. Firm size was calculated with the number of employees, where the biggest firm in our sample had more than 10000 workers and accordingly the smallest had only 82 employees working for the firm. Firm age on the other hand had to control the time of operating of the firm in the market. Where the oldest firm was equal to 48 years and the youngest was operating only 6 years. On average firms' age is equal to 20 years, thus most of firms started their activities after the independence of Azerbaijan.

The table, which defines correlations of factors under the study, has low value for analyses as most of relationships are expected to have non-linear relationship. Thus the coefficients can vary from negative to positive signs. However, coefficients itself show that the power of relationships is also low. The relationship between innovation performance and control variables is much higher, which also was expected as control variables are chosen as main factors, which can universally affect the dependent variable in spite of the sample origin.

Obviously, correlation rate is high for those variables, which were squared in order to find the U curve relationship, thus this kind of high correlation rates will not be taken into consideration.

High correlation between innovation performance and control variable *Firm size* led us to worry about multicollinearity problem, and we decided to check with VIF analyses to check these variables for multicollinearity and we found that there is no such statistical problem exists in our sample data. If to compare with some previous studies indeed we can find the high correlation between these two variables, however the direction of relationship can vary from one study to another, thus firm size and innovation have complex relations and results are not always coinciding. Rogers (2004) found that small manufacturing firms exhibit a positive association with innovation. Symeonidis (1996) claims that there is a little evidence that large firms stimulate innovations. According to Ettl and Rubenstein (1987) there is a high correlation between firm size and innovation, but the relationship is non-linear.

3.2. Discussion of results: regression models

In order to test the given hypotheses, we used regression analyses method and tested on the basis of evidence from construction firms in Azerbaijan. We have proposed the inverse U shape relationship between cultural diversity and innovation performance of the firm. As the dependent variable is in the form of count data, where innovation performance accumulates the number of all types of innovations it would not have given the best results if we would have used the Ordinary least squares method, thus we have decided to use the Negative binomial regression method. We could also use Poisson regression, but it could give us some overdispersion problems, thus the decision to avoid additional efforts on making statistical correction was made towards the Negative binomial regression method.

In the first model, which we ran, we have used only control variables, where firm size and age were used as a term for control. Both control variables show high significance level, which shows that we have chosen the right variables to control the relationship between the main variables. Model 2 from regression analyzes show the results for all predictors. Later we left only those variables, which have statistically significant results. Our hypotheses were explaining the relationship in inverted U curve, non-linear form.

That is why we have used quadratic forms of variables. Model 2 show that all variables are significant with at least 10 percent chance of error, except race diversity. As race diversity showed insignificant results, we had to exclude it from the list and to run the regression again in model 3.

Table 4. Negative binomial regression: Innovation performance (n=40)

Innovation	Model 1: Control only	Model 2: All predictors	Model 3: Only significant predictors
	Coefficient (S. e.)	Coefficient (S. e.)	Coefficient (S. e.)
Constant	2.31 (0.18) ***	0.97 (0.31) ***	1.10 (0.33) ***
Race		3.04 (1.62) *	
Gender		11.73 (4.34) ***	13.05 (4.8) ***
Foreigners		6.02 (2.73) **	4.78 (2.82) ***
Race sq		-5.31 (3.89)	
Gender sq		-24.43 (9.37) ***	-26.58 (10.75) ***
Foreigners sq		-17.55 (8.1) **	-13.89 (8.17) ***
Firm size	0.00 (3.62) ***	0.0001 (2.09) ***	0.00 (2.15) ***
Firm age	0.04 (0.009) ***	0.02 (0.006) ***	0.02 (0.007) ***
Alpha	0.20 (0.06) ***	0.06 (0.02) ***	0.07 (0.02) ***
Log likelihood	-161.99	-144.29	-147.2116
Akaike criterion	331.9824	308.5890	310.4232
Hannan-Quinn	334.4249	314.6954	315.3084

***P<.01, **P<.05, *P<.10

QML standard errors.

In model 3, all variables are statistically significant. Now we can analyze the obtained results. Here we can see that gender diversity's coefficient has positive sign and its quadratic form has negative sign, it means that antennas of parabola are looking down and that it has inverted U curve relationship. Thus, it confirms our hypothesis 1b.

Foreigners' diversity in the firm also has an inverted U curve form, as we got similar results compared with gender diversity. Again, we have positive sign for coefficient of variable and negative sign for its quadratic form. Thus, this model (model 3) can be chosen as a best-fit one, due to using only significant variables, and after rerunning it, it showed even higher significance level. Because variables, with noise were eliminated. All of variables got only 1% chance of error. Thus, we can say that our hypothesis 1b and 1c, found its support from evidence on sample of Azerbaijan construction firms. Only hypothesis 1a was not supported. We can explain it with the fact that race, as a category of defining culture is a weak parameter. Many people do not know their own race, and sometimes they do not associate themselves with particular race. In case of the sample country, which is Azerbaijan, we know that there are mainly homogeneous race exists and that there is not enough chance for firms to hire various types of people different with its race. If to compare with other results from literature, we can find that empirical studies show inconsistent findings regarding the consequences of racial diversity. In Williams and O'Reilly (1998)'s intensive review of the last 40 years' diversity literature, 29 studies were concerned with racial diversity. Some of these studies showed that racial diversity were positively associated with creativity, improved decision-making and problem-solving and performance. Other reviewed studies showed that racial diversity related to increased conflict, reduced social interaction, and lower performance. The authors concluded that that similarity attraction and categorization perspectives acquired more support than information and decision-making perspectives did in the case of racial diversity. Numerous studies showed that racial similarity is related to interpersonal liking, increased communication, less emotional conflict and turnover (Chatman *et al.*, 1998; Chattopadhyay, 1999; Ensher and Murphy, 1997; Gothelp and Glunk, 2003; O'Reilly *et al.*, 1989; Pfeffer and O'Reilly, 1987; Riordan & Shore, 1997; Sørensen, 2004; Tsui *et al.*, 1992). Recent reviews (Jackson *et al.*, 2003; Webber and Donahue, 2001) also showed that racial diversity had either negative or no effect on performance. Moreover,

whether racial diversity is beneficial or detrimental is conditional on task complexity or the strategy pursued by an organization.

In addition, it is important to mention again about control variables. Here we can see that high amount of employees, which identifies the size of the firm has a positive and significant association with innovation performance of the firm. We can conclude here that the bigger the company in terms of employees the higher the innovation performance of the firm. Although noteworthy that this variable has very low almost close to zero coefficient, thus it is associated but more likely that does not cause the growth in innovation performance. Beside this, we found that another control variable *firm age* also has a positive and significant association with innovation performance. It means that it is likely that older the firm the more innovation it is capable to make.

3.3. Final notes

Results, which we obtained after long iterative process of data collection, data processing, data analyses brought us to some strong conclusions regarding to our hypotheses. We have made our hypotheses based on reviewed literature, common sense, personal experience and judgment and through empirical tests on the basis of chosen sample. The hypotheses proposed were tested through statistical ways of analyses. The main research question was mainly based on finding the relationship between cultural diversity and innovation performance. In order to find this relationship we had to measure cultural diversity using other observable variables, which could represent the cultural diversity, such as race, gender and foreigners in firms. We suggest that hypotheses 1 has been supported due to the fact that two components were found to have the evidence from the sample of the study. We found an inverted U-shaped relationship between cultural diversity and innovation performance. In general, we can say that the diversity-innovation relationship was low when cultural diversity had low values; the relationship leveled off at a moderate level of cultural diversity and then became again low at high values of cultural diversity.

The inverted U-shaped cultural diversity – innovation performance relationship supports the integration of the resource-based view of the firm (Barney, 2001) with self-categorization and social identity theories (Tajfel, 1978; Turner *et al.*, 1987). By combining a strong theoretical framework with a rigorous test of the curvilinear effect, we are able to identify the ‘tipping point beyond which the negative psychological effects of cultural diversity predicted by self-categorization and social identity theories overcome the positive effects of cultural diversity predicted by the resource-based view of the firm.

Table 5. Summary results

#	Hypotheses	Relationship with innovation performance	Proposed relationship form	Accepted model in regression table	Results	Finding
1.	H 1	Cultural diversity	Inverted U curve	Model 3	Supported	Inverted U curve
2.	H 1a	Racial diversity	Inverted U curve	None	Rejected	Unclear
3.	H 1b	Gender diversity	Inverted U curve	Model 3	Supported	Inverted U curve
4.	H 1c	Foreigners’ diversity	Inverted U curve	Model 3	Supported	Inverted U curve

Source: Based on regression analyzes from Table 4.

4. Conclusions and recommendations

4.1. Value of new findings, overall contribution and conclusions

The 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 in industry is high and when requirements for technological update and for existence of advanced innovative tools is very important. It becomes a very significant issue for researches conducted by firms to find additional aspects, which can increase their competitiveness. 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. But what make firms become innovative and what forces push them, sometimes intentionally and sometimes unintentionally was still not clear. Heuristically we understand that cultural factors in firms and in its internal and external environment does make its effect. And there was a strong need to prove it scientifically through empirical tests particularly in the industry of our interest – the construction industry of Azerbaijan. This industry suits perfectly answering such research questions due to its high level of innovativeness and due to the fact a wide range of its cultural aspects came from its diverse employees, which traditionally is common for construction industry.

As we have mentioned growing cultural diversity is increasingly seen as important for innovation. Research has suggested that this can happen in different firms within the same industry. Yet no study has tested these factors on the scale it has been done here. This paper has addressed this gap using a survey of over 40 Azerbaijan's construction industry firms with data on cultural diversity and innovation performance.

To summarize the main findings we can say that we found that the cultural diversity has an inverted U curve relationship with innovation performance. We found that one of components of cultural diversity, such as gender diversity, gives the highest outcomes in terms of innovation performance when the diversity levels are moderate. Finally, we found that foreigners' diversity also needs to have moderate levels and that it has an inverted U curve relationship with innovation performance.

4.2. Limitations and recommendations for further study

The current study's results have several theoretical implications that suggest some interesting directions for future research. First, the results support the value of integrating theories to understand the effects of cultural diversity.

We encourage researchers to continue to integrate theories to examine alternative nonlinear diversity-innovation performance relationships and to include direct measures of the group behaviors (e.g., communication and conflict) that self-categorization and social identity theories position as mediators in those relationships.

Second, this study's focus on curvilinear predictions provides a clearer understanding of the form of the cultural diversity – innovation performance relationship. Cohen *et al.* explained that the focus on a linear relationship is like 'forcing this constant regression of Y on X across the range of X' (2003, p. 194). Such focus captures the overall increase or decrease in Y at different values of X and does not account for the change in the X-Y relationship as X increases. For instance, this study's results show that the overall relationship between cultural diversity and innovation performance was positive when a constant regression of innovation performance was forced on cultural diversity across the range of

cultural diversity. However, when a polynomial term of cultural diversity was introduced in the equation, the regression results indicated a significant inverted U-shaped relationship. The curvilinear relationship qualified (positive at most levels of cultural diversity), complemented (negative at high levels of cultural diversity), and refined (gradual increase in performance at low and moderate levels of cultural diversity) the positive linear relationship between cultural diversity and innovation performance. A linear regression line overstated the benefits of diversity at low and high levels of cultural diversity and understated the benefits of diversity at moderate levels of cultural diversity. Therefore, the results suggest that scholars should test a curvilinear relationship even when their analyses reveal a significant linear relationship (Cohen *et al.*, 2003).

This study provides managers with some useful insights into the impact of cultural diversity on innovation performance in the context of construction industry.

It might be that managers cannot expect to see immediate benefits of focusing on cultural diversity. Our research had cross-sectional nature thus, it might be that changes over time were not taken into account. Managers may feel disillusioned when their organizations fail to realize the anticipated benefits of increased workforce cultural diversity (e.g., Kochan *et al.*, 2003). The results show that managers may need to ‘grow’ cultural diversity substantially to experience positive effects: The benefits of diversity were most visible at the peak point of cultural diversity index.

In addition, it needs to be noted that result may be different in other countries due to different historical and ethnical components of population (Nishii & Özbilgin, 2007). Organizations in Azerbaijan are not legally required to conduct racial or ethnic audits of their workforces. It is important to note that when we have measured the variables we have used proxy measures and there is a need for future research to retest the hypotheses through using different measuring techniques. Also for future research, we suggest to test these hypotheses in other industries, which have high tendency to innovate, such as IT or pharmacology industry and to test in other societies where the historical preconditions are different than in Azerbaijan.

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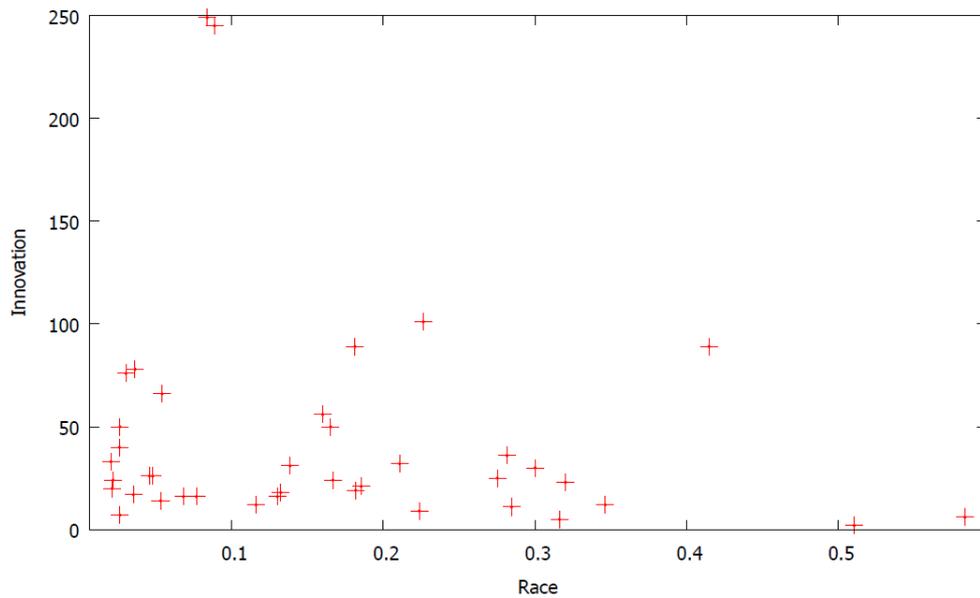
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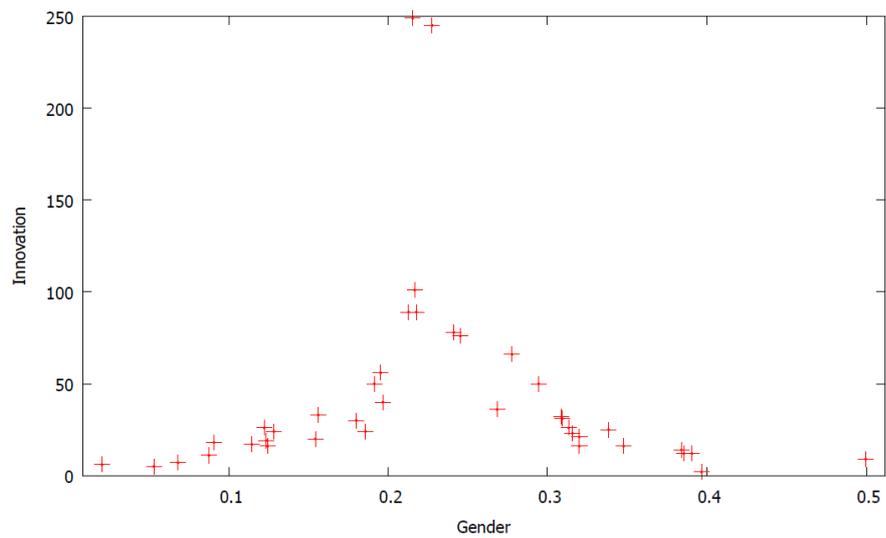
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Appendixes

Appendix 1. Relationship between Race diversity and Innovation (insignificant)



Appendix 2. Relationship between Gender diversity and Innovation (significant)



Appendix 3. Relationship between Foreigners diversity and Innovation (significant)

