

Relationship between Innovation and Cultural Diversity: Review of Concepts

Rahim Mirbabayev

School of Management, Shanghai University 99, Shangda rd. Shanghai, China

Abstract

Innovation, cultural background and diversity in firms has attracted a serious research attention over the last few years. In our paper, we have attempted to make a literature review of innovation and cultural diversity concepts and theories. First, we have looked through definitions and characteristics of diversity itself and then we have covered definitions for culture and innovation. Then, we focused on the relationship between innovation and cultural diversity. We defined that existence of foreigners in firms can influence on innovation performance, as well as that diasporas can play significant role in enhancing the innovativeness. In addition, we found from the review the high importance of city and migrant diversity for firms aiming to increase its innovativeness. Results of the literature review reveals a considerable spurt and existence of a lot of knowledge gaps in this field. The aim of this study was to provide an up-to-date and detailed review of the literature on relationship between innovation and cultural diversity.

Keywords: innovation, cultural diversity, literature review, cultural background

1. Introduction

Today's globalization level makes impossible for businesses to survive without innovations, where innovations already became a key factor to define future behavior of companies for successful and long-term sustainable progress. Moreover, innovation is an important driver of long-term national economic growth and an important goal of policy intervention (Romer 1990, Schumpeter 1962). Nobel Laureate Linus Pauling emphasizes the importance of having various ideas in creative success through his popular expression: "The best way to have a good idea is to have a lot of ideas." The idea of this statement is same as most literature on studies of diversity focuses is that not so much ideas that are common are essential but instead ideas that are different. This kind of ideas those which have chance to make the change and spur knowledge accumulation. Ideas in the public domain help us to communicate, whereas exclusive ideas are important to bring in originality in collaborative work (Berliant and Fujita, 2012). Today when non-rivalrous knowledge (Romer, 1993) is everywhere and access is not a problem, it is very a serious task for firms to transform potentially new knowledge into a productivity growth. In order to find the effect of these pervasive phenomena, we focus on within firm diversity. It is a fact that information became widely available, but it is important to mention that still people and the interaction amongst them is the main factor, which makes difference in the end. Because information can be understood, interpreted and used in various ways by different people and thus creating a basis for something new. Special attributes of countries make individuals to be different, even though they might have similar educational backgrounds (Mattoo et al., 2012). It may significantly influence on knowledge endowments because of various factors. It may be explained with individuals' location and migration over time and space or with the dynamic nature of knowledge accumulation. Public mechanisms are not the only tools of knowledge transfer due to the mobility of labor. Therefore, in our review we focus on researches where cultural diversity is considered as main object of the study but on a firm level. There are some evidences, which claim that firms can transcend their skill limitations through employing relevant people whose experiences help to close the skill-gap firms face, and who bring in unique knowledge, that assists firms to be innovative.

Despite of fact that there are number of studies about diversity and its impact on growth, still here remains a question if cultural characteristics influence on innovation performance in firm level? Cultural diversity is increasingly seen as important for innovation (e.g. Østergaard et al. 2011; Ozgen et al. 2011; Pozzoli et al. 2012; Kemeny 2012; Nathan & Lee 2013). In our paper we made a review of previous studies, of concepts and cover some literature on theoretical aspects of cultural diversity and innovation concepts. Then we tried to cover as much literature as possible on related topic and discussed impact of cultural diversity and of other cultural factors on innovativeness of firms.

2. Definition of diversity

First, we need to define the term diversity as the majority of studies offered a brief definition of diversity, not all offered a clear differentiation between functional, cultural and social diversity. Gonzales and Denisi (2009) gave a basic definition for diversity: "differences between individuals on any personal attributes that determine how people perceive one another". Their definition is very general and not categorized. Richards and Kirby (1999) offered one of the most limited definitions; they claim that the diversity is defined by the subset of demographic characteristics including gender, race-ethnicity, and age. The authors Jehn and Bezkrkova (2004) clarified the

issue of visibility of diversity thus gave wider and one of the more comprehensive definitions to diversity. Majority of studies did not discuss at all or discussed briefly the issue of visibility of diversity. However, the most comprehensive definition of diversity identified information diversity, social diversity, and value diversity as separate constructs and identified different factors in each of these constructs (Jehn, Northcraft and Neale, 1999).

If compare definitions by its usefulness most useful one was provided by Zanoni and Janssens (2004). They identified a definition actually in use in the organizations they studied and also encompassed the idea of power and its relation to diversity, a factor that is most cases omitted from the formal academic definitions. If to consider that power has high importance in identifying social identities it is more likely that this would be a useful factor in implementation of these findings in practice. Thus, its lack in the formal definitions of the academic literature is significant.

Bunderson and Sutcliffe (2002) focused on functional diversity, but did not define functional diversity as a general concept, referring instead to their two sub-constructs in their definition. Pitts, et al. (2010) also did not offer a core definition of diversity, but still they well did define the overarching construct of diversity management. Østergaard, Timmermans and Kristinsson (2011) could not give an explicit definition but showed the various types of diversity.

3. Effects of diversity: evidence from previous studies

Results of our literature review indicate that there is a broad range of definitions of diversity used by different scientists. Findings of researches are linked to the definition in use. (Christian, Porter and Moffitt, 2006). Christian, Porter and Moffitt (2006) have conducted a review where they found that the most diversity researches focus on demographic attributes, including “age, gender, race-ethnicity, functional background, educational background, and tenure”. Still some other forms of diversity also have been mentioned in the reviewed researches, but in most cases, they are much rarer. The empirical literature has a mixed nature when it tries to answer to the question does or does not the expected improvements in organizational effectiveness actually occur because of diversity in the firm. There are findings which claim that a reduction in diversity actually increases group performance as well as cohesion (Christian, Porter and Moffitt, 2006). The studies that were examined had a wide range of different definitions and understandings of diversity, with some focusing on functional diversity some focusing on cultural diversity, some on social diversity, and some attempting to integrate all perspectives. In two cases, the researches were unusual in their focus. The study by Gonzales and Denisi (2009) is the only study identified that had an organizational rather than a workgroup or team orientation. According to theoretical literature review this kind of results are expected. It seems that the vast majority of such studies are based on the workgroup rather than on the organization as a whole (Van Knippenberg and Schippers, 2007). Although there are researches in this issue but in our opinion the amount of such studies is surprisingly few. Another study, which is different from the set of studies, was the one done by Zanoni and Janssens (2004). They integrated the views of the human resources professionals identified into the study rather than focusing entirely on received definitions from academic literature. Their finding has a value due to the importance of the issue of social power introduced by these authors. And it is apparently not covered in the rest of the literature on diversity. In reviewed studies there have been used a number of different lights, with major themes being allowed to come to light through multiple analysis. The focus that were chosen for analysis in these studies included accuracy of definition of diversity and selection of diversity types and typologies. The implications of these definitions for the practice of diversity management also were not avoided.

4. Diversity classification

There are many types of diversity classification proposed in the literature. Our review has shown that not all of them are defined consistently. A majority of these diversity characteristic classifications is based on perception and is dichotomous in nature. According to Christian, Porter and Moffitt (2006) in the literature there are classifications which can be identified as, task-related or relations-oriented, highly job-related or less job related, surface-level or deep-level, role-related or inherent dimensions, readily detectable or less observable. Still most of these classifications can be put into more general categories. We conditionally can propose two perspectives, the social organization perspective and the information and decision-making perspective (Christian, Porter and Moffitt, 2006).

Cox and Blake (1991) stated that cultural diversity would influence on six direct aspects of organizational effectiveness, including creativity, the issues of innovation, cost, the capability to attract human resources, and problem solving, organizational flexibility and the marketing advantages of a diverse workforce. We have reviewed the major literature of the period for these six elements. For the information and decision making perspective, the most relevant fields examined by the authors were innovation and creativity, organizational flexibility and problem solving capacity. We can summarize the authors’ argument on these three perspectives in the following form. Creativity and innovation can be aided by “diversity of perspectives and less

emphasis on conformity to the norms of the past” (Cox and Blake, 1991), which will increase the ability of the organization to create and innovate. The problem-solving argument holds that better decisions would be produced through more perspectives inherent in heterogeneous problem solving groups (Cox and Blake, 1991). Last, the flexibility argument indicates that multicultural management practices would result in changes that meant, “that the system will become less determinant, less standardized, and therefore more fluid” (Cox and Blake, 1991). These kind of changes seems have higher probability to increase the power of the organization to react to changing environments. Three arguments of diversity discussed above form the core of what is defined as functional diversity. Authors do not offer a specific definition of diversity in common with later discussions of this type of diversity. The forms of diversity is tend to be affected by this mechanism, although the discussion touches on issues of bilingualism and gender diversity (Cox and Blake, 1991). This can be seen to be a persistent theme throughout the literature, with many of the studies that were reviewed not clarifying what types of diversity were reflected in their studies.

5. Definition of culture

Cultural diversity is one of main types in analyzes of diversity and it is a very broad term. There are number of definitions for it. These definitions can form a base to study the cultural diversity. But first we need to define culture itself and we can start with an example of the research conducted in Washington State University. WSU defined culture as the apprehended patterns of thinking that affect individuals and organizations in societies in terms of their behavior and consciousness.

Another definition was proposed by Trompenaars (1993). In his research he defines culture as “the shared ways in which groups of people understand and interpret the world”. His definition can be a basis for the believe that all actions of entities as well as individuals are partially biased by their cultural background.

Dutch researcher Geert Hofstede established the so-called cultural differences research and determined a number of cultural dimensions via which countries can be separated according to their scores on a number of variables. He has conducted the study around 50 countries of the world and has chosen as a sample for his study employees of IBM Company. In the end of his studies, it has been proposed five dimensions of culture which have the following definitions (Hofstede 1991):

1. Power distance. Is a measurement showing to what extent participants of entities and institutions confirm and expect the fact that power is not shared equally. It points out that depending on the level of Power distance, powerful members as well as lower cadres endorse the status quo (in terms of power distribution).
2. Individualism. Is a dimension plotting immediately two different sides of the same coin against one another. It focuses upon the expectation towards the extent by which individuals are rather integrated into groups versus the assumption that individuals are supposed to look after themselves. This leads to the establishment of the two characteristics, either Individualism or Collectivism. It is important though to keep in mind that those traits are rather directed at entities and small groups like families, instead of states.
3. Masculinity. A dimension referring to a society’s assumption of fulfillment of gender roles. Here we can distinguish between masculinity and its opposite femininity. In this context apart from the fulfillment of roles, masculinity is characterized/defined by highly assertive and competitive actions, while femininity rather shows modest and caring behavior.
4. Uncertainty avoidance. Concerns itself with a society’s tolerance towards uncertainty and ambiguity. It partly shows to what degree members of a cultural circle are conditioned to feel comfort or discomfort in “unstructured situations”. These unstructured situations can be characterized as new, stranger, surprising or simply varying from the norm. To illustrate the effect upon cultures: it translates partly into a measurement of to what extend cultures try to avoid “such situations” by implementing precautionary safety nets or on the contrary to what degree they simply take it as it comes without hesitation. It also has an effect on a religious or philosophical level that, by believes in one unique, impeccable truth and the fact that a society owns and understands this truth. While on the other hand if Uncertainty avoidance is low, tolerance for other opinions, truths or philosophies is far greater and acceptance of differences highly likely.
5. Long term orientation. The fifth and final dimension, with its opposite short term orientation describes a cultures stand towards Virtue without considering Truth into account. The two sides are expressed by standards in behavior, which are respectively: Long-term orientation, which is persistence in ones persecution of tasks and goals and prudence and short-term orientation, which is conservative, congruence with social rules and the perseverance of one’s own reputation and face.

We have provided Hofstede’s five dimensions above and briefly described it. However, there not yet clear evidences on the effect of those dimensions on innovation performance and still there is a gap in knowledge to define it. The main contribution of researches, which study the factors of culture and their effect on other variables, is that they have proven the connection between behavior or perceptions/expectations and a cultural background.

Nevertheless, apart from the distinction between cultures according to Hofstede’s dimensions in a

theoretical manner, cultures mark scores in terms of dimensions, which makes them graspable as recordable data.

6. Innovation performance

In order to review concepts focused on the relationship of cultural diversity and innovation performance, which is the main purpose of our paper, we need to define what the innovation performance is so far. "Innovation performance" is a term comprised of a number of characteristics that is supposed to measure the strength, profitability, or amount of progressive (innovative) business activities such as the patenting of new products and practices. "Innovation performance" is a very wide term, so we need thoroughly explore the existing literature on its definition.

First, innovation in general can be described according to Van de Ven (1999) as performing new activities or performing old activities in modified, renewed ways. No doubt that this is the most basic definition for it, but still can perform as a possible basis for the definition of innovation performance.

In the world of business, innovation means the development of new products and practices and therefore is in the highest level of importance for firms in order to stay ahead of the competition and to secure or possibly augment their market shares (Hamel 2000). In order to illustrate the relevance of research and development activities for companies a small part of Porter's (1985) research on value chain can help on this.

Porter (1985) defines in his value chain primary and support activities. According to him, these are the two core groups of actions that determine a company's performance. While the primary activities are concerned with the actual transformation of resources and production/provision of services to customers, are the support activities the administration and orientation tasks, including additional actions that are necessary for running a business. Under the term "support activities" the following tasks are grouped: Gartner (1985) reviewing Porter's theories accessed their quality and predicted: "Porter's two frameworks (industry structure and value chain) will become central methods by which we explore the nature of organization behavior in environmental contexts." Innovative performance of businesses is highly associated with Technology Development. The task Technology Development (Porter 1985) implies the research for new practices and products, whose results determine the future of a company not only in terms of its market performance but also choice of products and processes.

Therefore measurements which let us to check upon overall innovation performance, to access the quality and efficiency of a company's innovative actions and strategies, possibly even a simple measurement of the amount of innovations, need to be found.

Yamin and Otto (2004) proposed a measurement called "innovative performance" and collect their data upon it by dividing the number of patents registered to a company by the amounts of financial resources that companies spend on Research and Development activities within a given timeframe. Therewith controlling for differences in firm sizes which could result in possible larger numbers of patents registered (for larger firms) and simply measuring how efficiently money was spend on average on an innovation/registered patents.

$$\text{Innovative Performance} = \text{Number of Patents} / \text{Research and Development activities}$$

If to look from another perspective, innovation performance could also be measured by simply verifying the amount of radical innovations (Thellis, Prabhu and Chandy, 2009) which is in its nature is a type of innovation where completely new tasks and actions are performed resulting in revolutionary, innovative products or the entry in new markets. It results in broadening of a company's activities and in some cases substitute the old knowledge and skills by new models.

7. Impact of diversity on innovation in firm level

The results of diversity can more effective than homogenous results in solving problems and in generating new ideas. Cognitively diverse groups can generate a broader set of perspectives and skills. If to look deeper, cultural diversity is a good proxy for cognitive diversity (Page 2007). Hong and Page (2004) show that in experiments with large teams of problem solvers, the best problem-solvers often come up with similar solutions. Therefore, a diverse group may be preferable to a homogenous group, even if the homogenous groups have more experience and better abilities. These dynamics may be particularly important in research-based or knowledge-intensive activities (Fujita and Weber 2003). In the process when new firms are founded diversity performance also can be seen. Literature on management studies claim that team-based ventures tend to outperform firms with sole founders; conversely, ethnic homogeneity is one of the most powerful predictors of team formation, so diverse teams in young firms will be relatively rare (Hart 2010). However, there are some problems that these groups can have such as difficulty in communicating and low levels of mutual trust (Alesina and La Ferrara 2004). It lead to the situation when organizations may find it harder to make decisions or allocate resources, and the quality of those decisions may be lower than in more homogenous organizations. It can have negative impact on both initial goals of diversity - ideas generation and commercialization activity. Cultural diversity is thus good for team performance if its ongoing benefits outweigh initial disadvantages. In a study, which was recently conducted by Nielsen where he studies on example of 165 Swiss firms found that for nationality mix in top

management teams are linked to higher rates of foreign market entry and to higher firm profitability (Nielsen 2010, cited in Hart 2010). Another paper done by Hart, where he analyses 24,000 'highimpact' US firms, found suggestive evidence that team diversity is linked to employment. After deeper reviews, we found that there are researches, which discuss the 'diversity advantage' (Page 2007, Landry and Wood 2008). Usually all firms can suffer from the negative effects of diversity due to communication and trust problems, but these negative effect in most cases are outweighed by positive effects of diversity over time. This implies that younger firms may find it harder to knit diverse teams together. Our review shows that there a knowledge gap in these perspective and that there are no studies have yet tested firm-level diversity-innovation effects directly.

8. Role of diasporas in increasing innovativeness

Diverse workforces and management teams may have better access to international upstream and downstream markets, through effectively using another tool such as diaspora social capital. As a result, hypothetically, that may foster innovation via changes to supply chains and production functions; opening up access to new consumer markets may also increase the demand for new products and services. Diasporas may reduce information and communication costs as knowledge is exchanged through groups with greater mutual understanding and trust (Rodríguez-Pose and Storper 2006). They also increase trust, and so facilitate supply chain links (Bresnahan and Gambardella 2005). There is good evidence that diasporas can engage in innovative activity. Saxenian (2006) provides detailed evidence on the roles of migrant diasporas in Silicon Valley, which have strong links to production clusters in India, Taiwan and increasingly in China. Similarly, Kapur and McHale (2005) detail the roles of diasporas in the development of ICT clusters in Ireland, Israel and South East Asia.

9. Impact of different cultural factors on innovation

Finally, here we will discuss cultural and ethnic diversity which can impact on innovation performance of firms. As we see from our reviewed literature, most studies have concentrated on the impact of *economic* diversity rather than cultural or ethnic diversity. According to Jacobs (1969), diversity of geographically proximate industries promotes innovation and growth in cities. Glaeser et al. (1992) as well as Feldman and Audretsch (1999) provide corresponding empirical evidence for US cities. Romer (1990) highlights in his seminal endogenous growth model the significance of a variety of intermediate inputs for productivity. Empirical evidence provided by Anderson et al. (2005) proposes that creativity is greater in regions marked by more diverse employment bases, and in the same time, Duranton and Puga (2001) investigate the role that a diversified urban environment plays in fostering innovation at the regional level. Despite of fact that the number of theoretical literature, which are focused on the economic effects of cultural diversity (e.g. Fujita and Weber 2004, Lazear, 2000), is growing there are still surprisingly few empirical studies within the field of economics. The purpose of theoretical models is to think of tradeoffs between costs and benefits of diversity and to find various relations and bonds between diversity and economic performance. However, based on the existing empirical works it is hard to determine the vector of effect of cultural diversity, to know if the effect positive or negative. Most of the literature is in form of cross-country studies and researches focusing on growth and productivity effects in US regions (Easterly and Levine 1997; Ottaviano and Peri 2006). Results of our review show that comprehensive empirical studies dealing with innovation and cultural diversity do not exist at all. Investigations that analyses the relationship between innovation input and output fail to take cultural diversity into account (e.g. Greunz 2003, Anselin et al. 1997, Bode 2004). There are some authors that also recognize that there is a trade-off with respect to heterogeneity. Lazear (2000) considers positive productivity effects of ethnic diversity, but there are also costs of diversity arising from barriers to communication caused by different languages and cultures. So we can conclude based on literature that there is an optimal degree of diversity which is influenced by the nature of production. Some of the literature on this topic also tests the importance of institutions in this context (e.g. Easterly 2001). Significance of this research is that the implementation of growth enhancing effects of diversity may require a specific set of rules, or regulatory framework. Ottaviano and Peri (2006) mention in their work about the role of a core of shared norms that might constitute a prerequisite for realizing the potential benefits of diversity. It seems that there is a link between the costs and benefits of diversity on the one hand and the concept of ethnic identity discussed in paper of Constant et al. (2006) on the other hand. According to them, migrants start out from their ethnicity, i.e. permanent characteristics associated with the country of origin, and then develop their ethnic identity as they are exposed to the culture and values of the host country. Ethnic identity is defined as the balance between commitments with the host country and commitments with the country of origin. Constant et al. (2006) defined four states of ethnic identity: separation, marginalization, assimilation and integration. In case if migrants are primarily identified as marginalized or separated, cultural diversity may mainly cause high costs. In contrary assimilation appears to imply a strong decline of both costs and benefits of cultural diversity since it is characterized by a strong identification with the host country and conformity to the corresponding norms and codes. If to look with perspectives of economic

effects of diversity, integration could be considered as the best state due to involvement of commitment to the host society but in the same time having a strong dedication to the culture of origin, and as a result still ensuring high benefits but relatively low costs of diversity. R&D sector might be considered as one of the most effected from with the benefits of diversity, while in industries specialized on more standardized forms of production the costs of a diverse labor force can easily overbalance the positive effects. Alesina and La Ferrara (2005) claim that cultural diversity may lead to innovation and creativity. This statement is based on the fact that abilities and knowledge itself by its nature has variety. Fujita and Weber (2004) argue that knowledge production relies heavily on talents and skills of employees coming from a wide range of cultural backgrounds. The nature of R&D activity results in interaction between different workers and pools different ideas and abilities. Berliant and Fujita (2004) also mention the importance of cultural diversity for knowledge creation and transfer. The heterogeneity of people is important for the creation of new ideas. As discussed by Alesina and La Ferrara (2005), ethnic diversity can impact on economic and innovation performance in different ways. Diversity might have a direct impact on economic outcomes through various preferences or by influencing individual strategies. More than that, diversity might impact on the production process. Fujita and Weber (2004) consider a production function that includes diversity effects. They analyzed the heterogeneity between the native population and immigrants that is related with a production complementarity.

Constant et al. (2006) argue that therefore migration research that treats immigrants as a homogenous group will become less important. Paper done by him assumes that cultural diversity at the firm level may help innovation, with a number of theoretical mechanisms suggested for this kind of relation. Cultural diversity may help bring new cognitive perspectives, improving problem solving and helping create new products and processes. In situations of new product or process development, a variety of diverse cultures can help introduce ideas from elsewhere to be adapted and introduced in new forms (Syrett & Sepulveda 2011; Nijkamp & Poot 2011). Diverse perspectives on a single problem may produce better solutions than similar, homogenous teams, even when these teams have higher human capital (Hong & Page 2004). Still there are some aspects of cultural diversity which prevent innovation. Misunderstandings and conflict can arise between individuals with different backgrounds and diverse teams may find it harder to communicate (Pozzoli et al. 2012). Individuals can subconsciously favor and support own ethnic group members, leading to sub-optimal decision making (King et al. 2011). Due to this we can see that the link between diversity and innovation is potentially non-linear – increasing with initial diversity, and then diminishing and even turning into negative returns (Niebuhr 2010). It is likely that the nature of the link between diversity at a firm level and innovation is mixed. Simonen and McCann (2008) use data for Finnish high-technology firms and show that firms hiring labor from outside the region are more likely to introduce new products and processes. Nathan and Lee (2013) showed in their research where they used London as a sample for study that culturally diverse firms are more innovative. Nathan (2013) does a similar research based on firm-level dataset for the UK and finds an inverse U-shaped relationship between ethnic minority senior management and process innovation, although the effect is significant at only the 10% level. Results of these researches suggest that the magnitude of any effect is significant. Nathan and Lee (2013) show that firms with a migrant founder are 1.75 times more likely to introduce a new product or service and that firm with at least half minority owners or founders are 1.25 times more likely to do so. However not all studies find a positive effect, for example Østergaard et al. (2011) find in case of Danish firms that in those firms ethnically diverse workforces is no more innovative than in others. Here is one point which is important to note is that evidence linking migrant diversity and innovation is stronger than that for ethnic diversity.

10. Impact of cultural diversity in cities on innovation

Another huge set of literature suggests that it is at the city level through which diversity may aid innovation, because of a number of related reasons. The diversity of economic actors which cities provide was suggested by Jacobs (1969) to help firms share ideas and innovate. Same effects may happen with cultural diversity: as cities can play the role of the meeting point for people from different backgrounds, and in the end, culturally diverse cities may help innovation. Alongside with these assumptions, others have discussed problems where they covered the issue of skilled workers, where they may be attracted to diverse consumption opportunities (Ottaviano & Peri 2005). In a series of controversial but important studies, Florida (2002) argues that members of the ‘creative class’ – an economically important group of workers working in creative, innovative occupations – would be attracted to cities with tolerant environments and diverse populations. In simple words, we can say that above-mentioned factors may have its effect on innovativeness of the firm in cities with a large number of diverse firms.

Most city level studies investigating the economic impact of cultural diversity have compared city level cultural diversity with indicators such as wages. These city level researches found positive relationship between cultural diversity (measured both using ethnicity and migration proxies) and economic or innovation performance. In the seminal study in this field, Ottaviano and Peri (2005) showed that US cities that saw increases in their foreign-born population also experienced wage growth and rising rental values. This finding

robust to endogeneity challenges. From that time on there were a number of similar studies. Most of them have used wages as a proxy for productivity rather than focusing on innovation specifically. These find positive links between racial diversity and wages in US cities (Sparber 2010) and diversity of country of birth and wages in the UK (Nathan 2011), Germany (Suedekum et al. 2012) and, with some empirical caveats, the Netherlands (Bakens et al. 2013).

Opposite to that, Longhi (2011) uses UK longitudinal data on individual wages combined with measures of local cultural diversity. In her research she concludes that cultural diversity has a positive impact on wages in cross-sectional regressions, while she shows that there is no impact when considering panel data on individual wages. In the end, it seems that context is important when one tries to determine about the existence of the link. Kemeny (2012) in his paper shows that increase in wages in US cities with high levels of trust is due to cultural diversity. Moreover, according to the research other city characteristics may be important in helping translating cultural diversity to innovation.

Several studies have also considered the link between cultural diversity and innovation specifically at the city level. Case study work of Silicon Valley suggests migration can facilitate knowledge sourcing, new firm creation and innovation (Saxenian 2006). These case studies were supported through econometric estimations. Niebuhr (2010) shows that cultural diversity is a significant determinant of patenting levels in German regions. On the other hand, Gagliardi (2011) suggests that skilled migrants increase average innovative activity in British travel to work areas.

There are not that many studies which have used firm level data linked to local cultural diversity to investigate city specific effects. Although they do not control for firm level diversity Maré et al. (2013) show that while there is a link between the share of migrants in the labor market and the average level of innovation amongst local firms, such an effect is not robust to controls such as firm size and sector. They used a sample of around 6,000 firms in New Zealand. Pozzoli et al. (2012) based on data from Denmark find a robust relationship between ethnic diversity and innovation in different firms. Their focus is not explicitly on city diversity rather their instrument for diversity is a lagged measure of local workforce diversity. Therefore, we may say that there may be link between local and city level diversity. One study does find that both firm level and local diversity matters. Trax et al. (2012) in their work where they analyze the large panel of German firms for workforce, rather than management, diversity and find that whereas firms with *more* foreign-born workers are no more productive, those with a *greater diversity* of foreign-born workers are. Similarly, region specific diversity of foreign-born workers is a determinant of firm productivity with this effect similar in magnitude. These results is robust to most controls with the exception of one for migrant human capital. Reviewed literature show good evidence linking diversity at a city level with positive economic outcomes, although some of them has focused on wages with fewer results considering innovation. Despite of fact that evidence at the firm level is mixed context still seems important. However, on this field also there is a knowledge gap as there is no study has yet tested the impact of the two effects simultaneously on innovation.

11. Impact of foreigners in firms on innovation

As we already discussed the essence of innovation where it is positioned as an introduction of something new that is primarily built by means of analytical knowledge must lead to *radical, major and dramatic change*., improvement of an existing product can also be viewed as an innovation. It is clear that all industries and sectors can be innovative, since innovation is not equal to, but more than, R&D intensity. As we already know all innovations have complex technological, human, and organizational dimensions. According to Romer (1990) technological advances come from things that people do. Knowledge transforms by the impact of people when they carry, bring in and add to knowledge, or take knowledge with them. After all discussions about cultural diversity we can summarize its effect also on knowledge, as Poot (2008) says many workers' characteristics, such as age, education, occupation, cultural background and language may affect their knowledge acquisition and their mobility. In situations when people are the part of the same occupational group, any differences in their cultural backgrounds may influence their performance and productivity, in the way how they work or do business. If roughly, assume that there are more than 200 million immigrants in the world, the massive flows of knowledge, cultures, and languages through the mobility of these people give opportunities for firms to be more creative and innovative. Logically we can say that accumulated efforts is the cause of current knowledge. Each person who innovates starts from the point where the previous predecessors stopped. The inventor explores the latest generation of products, and makes use of market knowledge that embodies a cumulative investment in time to develop products and processes (Grossman and Helpman, 1994). This cumulative effort accelerated due to the presence of foreigners with diverse backgrounds in a labor market. Along with the studies, we observed up to this point there has been a massive number of studies that have analyzed the impact of *infrastructural and organizational* aspects of firms on innovativeness. However, contrary to the physical assets, the ideas as an important object recently became popular. (Jones and Romer, 2010). The biggest change in the recent scientific literature is that it is now not the firm but the employees that are seen as a major source of innovation. One key

focus of this new approach is the impact of foreign workers on the innovativeness and productivity of host firms and countries. There is a one branch of such literature that analyze the impact of foreign entrepreneurs, students or inventors on innovation (Kerr, 2010; Lobo and Strumsky, 2008; Faggian and McCann, 2008; Kerr and Lincoln 2010; Hunt and Gauthier-Loiselle, 2008; and Zucker and Darby, 2007). Even professional sports is not out of the cover scope where benefits from skilled foreigners joining an organization is discussed (Alvarez et al. 2011). Such studies focus on determining the success and spillover benefits of skilled immigrant on the host economies. These studies rely on detailed information about the 'inventors', which allows the researchers to control for education and knowledge acquisition of foreigners in the host countries.

Another group of literature discusses the innovative and productive effects of externalities created by clusters of immigrant groups with diverse backgrounds in particular regions (Ozgen et al., 2011; Niebuhr, 2010; Mazzolari and Neumark, 2009; Südekum, 2009). The objects of these analyses are mostly at the regional level, and group immigrant populations into a number of sub-continental large area origins based on their place of birth and/or nationality. Thus, the major focus of the latter type of studies is the average effect of immigrant diversity on regional productivity or innovation. The major methodological approach in the process of analyzing the innovativeness of firms has been through utilizing the knowledge production function (Acs et al., 2002). This kind of view does not take into account the cultural background the workers have and considers the number of R&D workers and the quantity of human capital generally as only inputs into innovation.

Firms consider innovation as a major factor, which motivates firms to act in order to reach monopoly in competition. Innovation can give the opportunity to invent 'things' with economic value. Literature suggests that in order to increase chances for innovating there is a need for firms to have heterogeneous workforce to sustain diversified knowledge. It is obvious that the type of production and activities determines the compositional structure of a firm. For example, if the firm comprises of various sub-units, and require cooperation and understanding between these units, then this firm will be more concerned about the ability to transfer the knowledge across these units, rather than diversity (Prat, 2002). Knowledge exchange is very dependent on the firm, as firm appears to be one of its main components. Beside of it knowledge accumulation that provides an input to innovation can originate within and/or from the outside of the firm. We can bring the firms' investments in R&D, machinery and other fixed capital assets as an example of such internal inputs. However, from modern management realities we know that firms can import new knowledge through simply employing talented workers that already embodies such knowledge. It is common when companies hire a foreign workforce, just because they hypothetically can produce a wide range of products and services or because they can sell to a wide range of countries. Alternatively, for many sectors spatial proximity provides a critical mechanism through which knowledge flows may take place. Hence, firms may enjoy the presence of cumulative knowledge that is present in their vicinity, and this knowledge may be enhanced by a diverse community.

12. Impact of migrant diversity on innovation

Usually firms hire workers of many types based on their skills, experience and occupation. Employment plays an important role in innovation, as technological advances come from things that people do (Romer, 1990). Firm's labor force may exhibit a cultural mix that reflects the cultural composition of the workforce in the local labor market. Sometimes this can happen even when there are no spillover benefits from cultural diversity. Due to many reasons such as networks, international airport locations, past migratory behavior and job opportunities, migrants, especially skilled ones are disproportionately attracted to large metropolitan areas (e.g., Poot et al. 2008). Because such metropolitan areas are also the areas where much innovation activity takes place (e.g. Lobo and Strumsky, 2008; Audretsch and Feldman, 2004). Thus, spatial correlation between cultural diversity and innovation may be observed, even when there is no causal link.

A positive causal link from diversity to innovation may nonetheless exist for different reasons. The first is that firm expansion may be constrained by local scarcity of highly skilled and specialized labor, in which case recruitment from abroad may be essential (Beaverstock and Hall, 2012). The growth in knowledge - intensive industries has led to global competition for talent, which is complementary to locally available skills and can therefore contribute to firm expansion and the associated innovation activity.

It is clear with direct effects of diversity on innovation but there are also knowledge spillovers from the employment of workers with different cultural backgrounds, which do effect on innovation. Similarly, successful migrant entrepreneurship can also spill over to host country entrepreneurs (Jaeger and Duleep, 2010). More than that having various perspectives and approaches to problem solving, migrants may contribute to better decision making (Page, 2007). Of course, the effectiveness of such spillovers are contingent on production conditions, such as the organizational culture, labor market structure and institutions that jointly determine the receptivity of foreign knowledge at the destination (Jones and Romer, 2010).

Beside the positive impact here, it is important to mention a possible opposite effect from cultural diversity on innovation, due to some reasons as staff may trigger discrimination of minority groups, which in turn lowers the productivity of the firm. Migrants are generally young and have a high degree of labor mobility.

While this ‘greases the wheels’ of the local labor market (Borjas, 2001), it also implies that at the workplace level immigrants often have less job tenure and therefore less job - specific training. If they contemplate repeated migration, they may also exhibit less commitment to the firm. As a result such phenomena could negatively impact on knowledge spillovers. A further consequence of growing ethnic diversity is that it tends to lead to greater geographical clustering and segregation (see e.g. Cutler et al. 2008). While ethnic precincts may have positive urban consumption externalities, it may also limit the supply of foreign workers outside the precincts or increase commuting distances of ethnic workers employed elsewhere in the city, with associated increased employment costs.

13. Conclusion

In this paper, the attempt has been made to review the literature on cultural diversity and innovation performance. We have tried to cover researches where cultural diversity directly or indirectly affects innovation performance. Literature for review was chosen in random way. Some reviewed papers are from same category, but we did not take into consideration papers with same results. Therefore, papers can be very close in results, but there no papers with identical result are included. We tried to use the discussion method in analysis of these papers and had no attempt to make any quantitative analysis, which can be used in future researches.

Cultural differences are the biggest problems for firms but in the same time as studies show carry opportunities to innovate more thus to be more successful in competition. How to solve the cross-cultural problems or how to use the benefits of cultural heterogeneity deserves the long-term attention and study.

Results of studies which attempt to find the answer whether cultural diversity has negative or positive effect on innovation performance varies. We defined that existence of foreigners in firms can influence on innovation performance, as well as that diasporas can play significant role in enhancing the innovativeness. In addition, we found from the review the high importance of city and migrant diversity for firms aiming to increase its innovativeness.

Results of the literature review reveals a considerable spurt and existence of a lot of knowledge gaps in this field. The aim of this study was to provide an up-to-date and detailed review of the literature on relationship between innovation and cultural diversity.

References

1. Acs, Z.J., Groot, H.L.F. de, Nijkamp, P. (2002) *The Emergence of the Knowledge Economy: A Regional Perspective Series, Advances in Spatial Science*, Springer.
2. Agrawal, A., Kapur, D., McHale, J. (2008) How do spatial and social proximity influence knowledge flows. Evidence from patent data, *Journal of Urban Economics*, 64 (2): 86-111.
3. Alesina, A. and La Ferrara, E. (2005) Ethnic diversity and economic performance. *Journal of Economic Literature* 43(3): 762 - 800.
4. Alvarez, J., Forrest, D., Sanz, I., Tena, J.D. (2011) Impact of importing foreign talent on performance levels of local co-workers. *Labour Economics*. 18: 287–296.
5. Anderson, R., J.M. Quigley and M. Wilhelmsson (2005) Agglomeration and the spatial distribution of creativity, *Papers in Regional Science* 83(3): 445-464.
6. Anselin, L., A. Varga and Z. Acs (1997) Local Geographic Spillovers between University Research and High Technology Innovations, *Journal of Urban Economics* 42 (3): 422-448.
7. Audretsch, D.B. and Feldman, M.P. (2004) Knowledge spillovers and the geography of innovation, *Handbook of Regional and Urban Economics* 4: 2713 - 2739.
8. Berliant, M. and Fujita, M. (2012) Culture and Diversity in Knowledge Creation, MPRA Paper No. 36996.
9. Berliant, M. and M. Fujita (2009) The Dynamics of Knowledge Diversity and Economic Growth. 56th Annual North American Meeting, Regional Science Association International. San Francisco.
10. Borjas, G.J. (2001) Does immigration grease the wheels of the labor market? *Brookings Papers on Economic Activity* 2001(1): 69 - 119.
11. Bunderson, J. S., Sutcliffe, K. M. (2002) Comparing alternative conceptualizations of functional diversity in management teams. *The Academy of Management Journal*, 45(5), 875-893.
12. Caragliu, A., Nijkamp, P. (2011) The impact of regional absorptive capacity on spatial knowledge spillovers: The Cohen and Levinthal model revisited. *Applied Economics*.
13. Christian, J., Porter, L. W., Moffitt, G. (2006) Workplace diversity and group relations: An overview. *Group Processes & Intergroup Relations*, 9(4), 459-466.
14. Cohen, W.M., Levinthal, D.A. (1990) Absorptive capacity: a new perspective on innovation and learning, *Administrative Sciences Quarterly*, 35: 128-152.
15. Constant, A., L. Gataullina and K.F. Zimmermann (2006) Ethnosizing Immigrants. IZA Discussion Paper No. 2040.
16. Cox, T. H., Blake, S. (1991) Managing cultural diversity: Implications for organizational competitiveness. *Executive*, 5(3), 45-56.
17. Cutler, D. M., Glaeser, E. L. and Vigdor, J. L. (2008) Is the melting pot still hot? Explaining the resurgence of immigrant

- segregation. *Review of Economics & Statistics* 90(3): 478 - 497.
18. Duranton, G. and D. Puga (2001) Nursery cities: urban diversity, process innovation, and the life cycle of products, *American Economic Review* 91(5): 1454-1477.
19. Easterly, W. and R. Levine (1997) Africa's Growth Tragedy: Policies and Ethnic Divisions, *Quarterly Journal of Economics* 111 (4): 1203-1250.
20. Economists. Beaverstock, J.V., Hall, S. (2012). Competing for talent: global mobility, immigration and the City of London's labour market. *Cambridge Journal of Regions, Economy and Society*, 5: (271-287).
21. Faggian, A. and P. McCann (2009). Human capital, graduate migration and innovation in Entrepreneurship. Paper presented at the 2010 conference of the European Association of Labour. Irwin Professional Publishing, Burr Ridge, IL.
22. Florida, Richard, (2002) *The rise of the creative class: And how it's transforming work, leisure, community and everyday life*, New York, NY: Basic Books.
23. Fujita, M. and Weber S. (2003) *Strategic Immigration Policies and Welfare in Heterogenous Countries*. Institute of Economic Research Working Papers. Kyoto, Kyoto University.
24. Gagliardi, L., (2011) *Does Skilled Migration Foster Innovative Performance? Evidence from British Local Areas*. SERC Discussion Paper, 97.
25. Gartner, William B. (1985) Review on Porter's Competitive Strategy and Competitive Advantage of British regions. *Cambridge Journal of Economics* 33: 317-333.
26. Gonzales, J. A., Denisi, A. S. (2009) Crosslevel effects of demography and diversity climate on organizational attachment and firm effectiveness. *Journal of Organizational Behavior*, 30(1), 21-40.
27. Greunz, L. (2003) Geographically and Technologically Mediated Knowledge Spillovers between European Regions, *Annals of Regional Science* 37(4): 657-80.
28. Griliches, Z. (1979) Issues in Assessing the Contribution of R&D to Productivity Growth, *Bell Journal of Economics* 10 (1): 92-116.
29. Hamel G. (2000) *Leading the Revolution*, Harvard Business School Press, Boston.
30. Hart, D. (2010) *What Do Foreign-Born Founders Bring To Entrepreneurial Teams? An Exploration in the U.S. High-Tech Sector*. School of Public Policy Working Papers, Arlington, VA, George Mason University.
31. Hill, Ch. W.L. and Jones, G. R., (2001) *Strategic management: an integrated approach*, Houghton Mifflin, Boston.
32. Hofstede, G. (1991) *Culture and Organizations: Software of the Mind*, McGraw-Hill, London.
33. Hofstede, G., (2001) *Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations*, Sage Publications.
34. Hong, L. and Page, S., (2004) Groups of diverse problem solvers can outperform groups of high-ability problem solvers. *Proceedings of the National Academy of Sciences in the United States*, 101(46).
35. Hunt, J., Gauthier - Loisele, M. (2010) How much does immigration boost innovation? *American Economic Journal: Macroeconomics* 2: 31 - 56.
36. Jacobs, J. (1969) *The Economy of Cities*, New York, Random House.
37. JEHN, K. A., and Bezrukova, K. (2004) A field study of group diversity, workgroup context, and performance. *Journal of Organizational Behavior*, 25(6), 703-729.
38. Jehn, K., Northcraft, G. and Neale, M. (1999) Why Differences Make a Difference: A Field Study of Diversity, Conflict, and Performance of Workgroups. *Administrative Science Quarterly*, pp. 741-763.
39. Kapur, D. and McHale J. (2005) *Sojourns and Software: Internationally mobile human capital and high tech industry development in India, Ireland and Israel. From Underdogs to Tigers: The Rise and Growth of the Software Industry in Brazil, China, India, Ireland and Israel*. A. Arora and A. Gambardella. Oxford, OUP.
40. Kemeny, T., (2012) Cultural diversity, institutions, and urban economic performance. *Environment and Planning A*, 44(9), 2134-2152.
41. Kerr, W.R. (2010) Breakthrough inventions and migrating clusters of innovation. *Journal of Urban Economics* 67: 46 - 60.
42. Kerr, W.R., Lincoln, W. (2010) *The Supply Side of Innovation: H1-B Visa Reform and US Ethnic Invention*. NBER Working Paper 15768, National Bureau of Economic Research, Cambridge Mass.
43. King, E.B. et al., (2011) Why organizational and community diversity matter: Representativeness and the emergence of incivility and organizational performance. *Academy of Management Journal*, 54(6), 1103-1118.
44. Lazear, E.P. (2000) *Diversity and Immigration*, in: G. J. Borjas (ed.), *Issues in the Economics of Immigration*, Chicago: University of Chicago Press, pp. 117-42.
45. Lobo, J. and Strumsky, D. (2008) Metropolitan patenting, inventor agglomeration and social networks: A tale of two effects. *Journal of Urban Economics* 63: 871-884.
46. Longhi, S., (2011) Impact of cultural diversity on wages and job satisfaction in England. ISER Working Paper, 19.
47. Maré, D.C., Fabling, R. & Stillman, S., (2013) Innovation and the local workforce. *Papers in Regional Science*.
48. Mattoo, A., Neagu, I. C., Ozden, C., (2012) Performance of skilled migrants in the U.S.: A dynamic approach. *Regional Science and Urban Economics* 42(5), 829-843.
49. Mazzolari, F. and D. Neumark (2009) *Beyond Wages: The effects of immigration on the scale and composition of output*. NBER Working Papers. Cambridge, MA, NBER.
50. Nathan, M. & Lee, N., (2013) Cultural Diversity, Innovation, and Entrepreneurship: Firm-level Evidence from London. *Economic Geography*, 89(4): 367-394.

51. Nathan, M. (2005) *The Wrong Stuff? Creative Class Theory, Diversity and City Performance*. Centre for Cities Discussion paper 1. London, Centre for Cities.
52. Niebuhr, A. (2010) Migration and innovation: Does cultural diversity matter for regional R&D activity? *Papers in Regional Science* 89: 563–585.
53. Nielsen, S. (2010) Top Management Team Internationalization and Firm Performance. *Management International Review* 50: 164-180.
54. Nijkamp, P. and Poot, J. (2012) Cultural diversity: a matter of measurement. Department of Spatial Economics. VU University Amsterdam.
55. Østergaard, C.R., Timmermans, B. and Kristinsson, K. (2011) Does a different view create something new? The effect of employee diversity on innovation. *Research Policy* 40: 500 - 509.
56. Ottaviano, G. and G. Peri (2006) *The Economic Value of Cultural Diversity: Evidence from*
57. Ozgen, C., Nijkamp, P. and Poot, J., (2011) The impact of cultural diversity on innovation: Evidence from Dutch firm-level data. IZA Discussion Paper, 6000.
58. Page, S. (2007) *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools and Societies*. Princeton, Princeton University Press.
59. Pitts, D. W., Hicklin, A. K., Hawes, D. P., Melton, E. (2010) What drives the implementation of diversity management programs? Evidence from public organizations. *Journal of Public Administration Research & Theory*, 20(4), 867-886.
60. Poot, J. (2008) Demographic change and regional competitiveness: The effects of immigration and ageing. *International Journal of Foresight and Innovation Policy* 4(½): 129 - 145.
61. Porter Michael E. (1985) *Competitive Advantage: creating and sustaining superior performance*, New York: Free Press.
62. Pozzoli, D., Pytlikova, M. & Parrotta, P., (2012) The Nexus between Labor Diversity and Firm's Innovation. IZA Discussion Paper, 6972.
63. Prat, A. (2002) Should a team be homogeneous?. *European Economic Review*, 46; 1187-1207.
64. Richards, O. C., Kirby, S. L. (1999) Organizational justice and the justification of work force diversity programs. *Journal of Business & Psychology*, 14(1), 109-118.
65. Romer, P. (1990) Endogenous Technological Change. *Journal of Political Economy* 98(5):71-102.
66. Romer, P. (1993) Idea gaps and object gaps in economic development. *Journal of Monetary Economics*, 32: 543-573.
67. Saxenian, A.L. (2006) *The New Argonauts: Regional Advantage in a Global Economy*. Cambridge, MA, Harvard University Press.
68. Schumpeter, J. (1962) *The Theory of Economic Development*. Berlin, Springer.
69. Simonen, J. and McCann, Philip, (2008) Firm innovation: The influence of R&D cooperation and the geography of human capital inputs. *Journal of Urban Economics*, 64(1), 146–154.
70. Sparber, C., (2010) Racial Diversity and Macroeconomic Productivity across US States and Cities. *Regional Studies*, 44(1), 71–85.
71. Südekum, J., Wolf, K., Blien, U. (2009) Cultural Diversity and Local Labour Markets, IZA Discussion paper 4619.
72. Südekum, J., Wolf, K. & Blien, U., (2012) Cultural Diversity and Local Labour Markets. *Regional Studies*. The Academy of Management Review, 10 (4), 873 - 875.
73. Syrett, S. and Sepulveda, L., (2011) Realising the diversity dividend: population diversity and urban economic development. *Environment and Planning A*, 43(2), 487–504.
74. Tellis G.J., Prabhu, J.C. Chandy, K., (2009) Radical Innovation Across Nations: The Preeminence of Corporate Culture, *Journal of Marketing*, 73(1): 3 - 23
75. Trax, M., Brunow, S. & Südekum, J., (2012) Cultural Diversity and Plant-Level Productivity. IZA Discussion Paper, 6845.
76. Trompenaars, F. (1993) Riding the Waves of Culture: Understanding Diversity in Global Business, US Cities. *Journal of Economic Geography* 6: 9-44.
77. Van de Ven, Andrew; Polley, Douglas; Garud, Raghu and Venkataraman, S., (1999) *The Innovation Journey*, New York: Oxford University Press.
78. Van Knippenberg, D., Schippers, M. C. (2007) Work group diversity. *Annual Review of Psychology*, 58(1), 515-541.
79. Yamin, M., Otto, J., (2004) Patterns of knowledge flows and MNE innovative performance,
80. Zucker, L.G., Darby, M.R. (2007) Star Scientists, Innovation and Regional and National Immigration. NBER Working Paper 13547, National Bureau of Economic Research, Cambridge Mass.