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# THE IMPACT OF DIVERSITY ON INNOVATION IN COUNTRIES

## O IMPACTO DA DIVERSIDADE SOBRE A INOVAÇÃO DOS PAÍSES

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### ABSTRACT

The objective of the study was to identify the factors of diversity that influence innovation in countries. For that, a quantitative methodology was adopted regarding the approach, being descriptive regarding the objectives. The multivariate statistical technique used for data analysis was multiple linear regression. The sample was composed of 127 countries from secondary data, extracted from the indexes: *World Economic Forum and Social Progress Imperative*. The results showed that among the eleven variables of the diversity used in the study analysis, six variables had an impact on the innovation of the countries, which are: women's study years, education inequality, homosexual tolerance, freedom over life decisions, religious tolerance and discrimination and violence against minorities. Although it is not yet possible to generalize conclusions from the results found, being that a limitation of the present study, it has also showed that there are indeed implications between innovation and aspects of diversity.

**Keywords:** Innovation; Diversity; Countries.

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## RESUMO

*O objetivo do estudo é identificar os fatores da diversidade que influenciam na inovação dos países. Para tanto, adotou-se uma metodologia quantitativa quanto a abordagem e descritiva quanto aos objetivos. A técnica estatística multivariada utilizada para análise dos dados foi a regressão linear. A amostra é composta por 127 países. Os resultados demonstraram que dentre as onze variáveis da diversidade utilizadas no estudo, seis impactam sobre a inovação dos países: anos de estudo das mulheres, desigualdade na realização de educação, tolerância a homossexuais e liberdade sobre decisões da vida, tolerância religiosa e discriminação e violência contra as minorias. Deste modo conclui-se que aspectos da diversidades apresentam influência sobre a inovação.*

**Palavras-chave:** Inovação, Diversidade, países.

## 1. INTRODUCTION

According to Schumpeter (1982), what causes the change in the state of economic equilibrium, advancing to a process of expansion, is the emerging of some innovation. According to the author, the opening of new markets, the creation of new goods and services, the discovery of a new production or marketing method, the use of new technologies or the change of the existing market structure can be considered innovation indicators.

For Brown and Eisenhardt (1995), innovation research is divided into two broad areas of study. The first (economic orientation) analyzes the differences in patterns of innovation among countries and industries. The second (organizational orientation) is concentrated at a micro level and concerns how new products are developed within the organization. Santos, Calíope and Silva Filho (2016) corroborate and affirm that innovation holds relevant importance for the growth of firms, in a micro sense, and for the economic development of the countries, from a macro perspective.

Crespi (2004) and DiRienzo and Das (2015) argue that innovation is a complex and multifaceted phenomenon, and there are many factors that influence its production. For example, higher levels of economic development, economic freedom, democracy, property rights and income equality can serve to encourage innovative activities. Castro et al. (2008) argue that, in addition, bureaucratic, economic and political difficulties retard innovation and hinder the innovative environment and are commonly observed in developing countries.

According to Simões et al (2009), the competitive pressures determined by a globalized world impose on most companies the need for rapid adaptation to technological changes, forcing most of the world's countries to improve their institutional apparatus. The growth of the productive sector, and of its host economies, has gradually become more dependent on specific institutional relationships that have become more important at the end of the twentieth century, as is the case of R&D activities within firms. According to Floriani, Bauren and Machado (2013), the implementation of technological innovations and innovative actions is the way through which companies can create new expectations and needs in the consumers and differentiate themselves in relation to the other competitors.

An environment of competitiveness imposes on companies new challenges and demands, productivity, innovation and social commitment. In this way, increasingly, diversity management has been stimulated by organizations and the reasons range from social responsibility to the attempt to make the environment more innovative, by the agglutination of profiles, formations, race, age, gender and different experiences (OLIVEIRA; RODRIGUEZ, 2004).

Zhan, Bendapudi and Hong (2015) argue that cultural diversity can add a greater variety of perspectives and ideas in a country's ethos and therefore could result in more creative and

innovative solutions than cultural homogeneity. Different cultural elements and perspectives can be rich ingredients that can be innovatively integrated to produce unconventional and effective solutions to existing problems.

Dunn, Orellana and Singh (2009) argue that countries with greater diversity in political views express higher levels of social tolerance in relation to countries with low political discourse. Consequently, this may imply that a country with greater religious diversity can also be indicative of a more tolerant and open society to different points of view, opinions and ideas (DIRIENZO, DAS, 2015), favoring the development of an environment conducive to innovation.

In view of the above, there is a link between diversity and innovation, and it is relevant to study this relationship at the country level, since they can reflect on the companies and the development of the economy and society. Thus, given the relevance of innovation for the economic development of companies and countries, as well as the characteristics of diversity existing in society, this study seeks to identify the determinants of diversity that influence innovation in countries.

According to DiRienzo and Das (2015) it is widely accepted in the economic and business literature that innovation is a relevant engine of national economic growth, since the countries that generate the most innovations are richer and grow faster. However, as Niebuhr (2010) and DiRienzo and Das (2015) point out, there are no comprehensive empirical studies that examine the relationship between diversity and innovation. Although there is a significant discussion in the literature between diversity and innovation, empirical studies exploring the themes are necessary so that new directions can be employed in order to optimize the results in innovation.

In Brazil, specifically known for its diversity, creativity and innovation, empirical studies relating the themes are practically absent. In the international scenario, the studies by Van Der Vegt and Janssen (2003), Ostergaard, Timmermans and Kristinsson (2011), DiRienzo and Das (2015), Lee (2015), Zhan, Bendapudi and Hong (2015) Steelee Derven (2015), Cheung et al (2016), Kristinsson, Cand and Emundsson (2016), Lucena and Roper (2016), Ramasamy and Yeung (2016), Subramanian et al (2016), Valls, González-Romá and Tomás (2016) and Sun et al (2017) stand out.

Although leaders and business managers cannot manage diversity within their countries or organizations, understanding how different types of differences can affect innovation is important to develop policies that favor an innovative environment for the development of a country. In addition, business managers and leaders operating in diversified societies or organizations should recognize the benefits of diversifying ideas and developing mechanisms to improve communication among different groups, overcoming aspects such as intolerance, inequality or discrimination.

## 2. THEORETICAL BACKGROUND

This section is divided into three parts: innovation, diversity and related studies.

### 2.1 Innovation

Innovation can be studied in terms of a product or a process. Researchers who have the product vision of innovation tend to examine it as a materialized end result, such as finalized product, patents or trademarks. However, the product view of innovation does not provide a comprehensive understanding of the complex dynamics of the innovative process (ZHAN; BENDAPUDI; HONG, 2015).

Van de Ven (1986) states that the innovation process is defined as the development and implementation of new ideas over time, by people that engage in transactions with others within an institutional context. According to the author, this definition can be applied to a wide variety of techniques, products, processes and types of administrative innovations.

In order to understand the process of innovation, it is necessary to understand the factors that facilitate and limit its development. These factors, according to Van de Ven (1986), involve ideas, people, transactions and institutional context. Innovation must necessarily be implemented or institutionalized to become an innovation. Otherwise, it remains only within the scope of a creative idea or invention.

Innovation represents the process of renewal in any organization. The prescription of models works in stable and controllable environments. However, the environment presents complexities and unforeseen events. The innovation process requires sophisticated and active management. Organizations need to adapt, configure and learn. Often it is necessary to build a new trajectory and to implant or leverage accumulated knowledge, networks and skills so that the organization can improve its competence through the construction of a new opportunity and thus leave a steady state of innovation (Bessant et al 2005). The challenge, says Bessant et al (2005), is to develop forms of innovation management in highly uncertain and rapidly changing environments. In this sense, the following types of organizational behavior are required: agility, flexibility, ability to learn quickly, lack of biases about how things can evolve, and more.

Despite its distinctions, innovation is often associated with creativity. Creativity can be defined as the production of new ideas and innovation as the successful implementation of creative ideas within a company or nation (PERRETTI; NEGRO, 2007; ZHAN; BENDAPUDI; HONG, 2015). Zhuang, Williamson, and Carter (1999) argue that creating a culture of innovation encourages and develops effective innovation policies by allowing creativity to exist by putting people in positions that best achieve and develop their potential.

Ahmed (1998) argues that for a company to become innovative it is necessary to have a culture that feeds innovation and is conducive to creativity. In this case, culture is one of the main determinants of innovation as it creates positive cultural characteristics with necessary ingredients and conducive to innovation. Culture involves all institutionalized forms and implicit beliefs, norms, values, and premises that control behavior. The existence of an innovative culture can facilitate the implementation of strategies and innovation plans.

High competitiveness, product quality and fierce competition require companies to be technologically innovative, putting new products in the market, with greater cost-benefit for the customer, better quality and faster speed than competitors. Within this context, research and development (R&D) plays a prominent role, actively influencing the technological innovation process of companies (ANDREASSI; SBRAGIA, 2002).

In particular, national innovative capacity is the ability of a country to produce and commercialize a stream of innovative technology in the long run. The development of a country's national innovation capacity depends on three key factors. The first are strong national institutions such as educational systems, technical and scientific institutions, government policies and industrial relations. The second factor is a strong industrial environment for innovation, such as private investment in research and development (R&D) and technical expertise. The last factor is a strong link between public institutions and industry (FURMAN, PORTER, STERN, 2002, ZHAN, BENDAPUDI, HONG, 2015).

The *World Economic Forum* (WEF) annually presents the countries' overall competitiveness index, which is made up of 12 pillars, being the Innovation and R&D pillar one of them. The

WEF (2016) considers innovations relevant to economies due to the possibility of generating value. In this case, companies must design and develop cutting-edge products and processes to maintain a competitive advantage, necessitating an environment conducive to innovative activity and supported by the public and private sectors. Specifically, it means a sufficient investment in R&D; the presence of high quality scientific research institutions that can generate the basic knowledge necessary for the construction of new technologies; wide collaboration in research and technological development between university and industry; and the protection of intellectual property, among others.

## **2.2 Diversity**

Definitions of diversity range from narrow to overly broad concepts. Restricted definitions emphasize race, ethnicity, and gender. The broader definitions refer to all individual differences among people (NKOMO; COX JR., 1999). Thomas (1991) states that diversity includes not only race or gender but also includes age, educational background, function, personality, lifestyle, sexual preference, demographic origin, length of service in the organization, privilege status in the organization, among others .

For Triandis (2003) diversity results from differences in the human characteristics that fragment society, such as gender, social class, race, ethnicity, culture, age, sexual orientation, lifestyle and religion, among others. Oliveira and Rodriguez (2004) define diversity as a mixture of people with different group identities within the same social system, the heterogeneity of cultures, beliefs, methodologies, age, length of service, sexual orientation, way of thinking and acting and creativity in solving problems, reporting this concept to a study within organizations.

Hanashiro and Carvalho (2005) argue that the literature on diversity is predominantly American and, to a lesser extent, Canadian. In both countries the debate on diversity comes from compulsory (government-determined) devices, the need to deal with strong racial issues, and growing pressures from ethnic and minority groups.

Thus, the discussion about diversity has been established in the business agenda, mainly due to differences in the workforce. In part, from the perspective that the inclusion of historically discriminated minorities would improve the work environment, making it more diverse and democratic (SARAIVA; IRIGARAY, 2009).

The debate over diversity conducted in the 1980s questioned the hegemonic/technicist view that individual differences little influenced the environment and the organization's results. From this discussion emerged the approach to the topic of diversity management, being a way to convert social concern into results, optimize the exchange of information about experiences, values, attitudes and the apprehension of new approaches, stimulating creativity, flexibility, change and innovation, as well as improving the decision-making process (ARANHA; ZAMBALDI; FRANCISCO, 2006; SARAIVA; IRIGARAY, 2009).

Alves and Galeão-Silva (2004) affirm that the management of diversity has been defended based on two points. First, internal programs of diversity-oriented companies would be socially fairer than imposed policies. Second, good management of the diversity of people in organizations would lead to the creation of competitive advantage, which, in theory, would increase the organization's market performance due to the positive influence of a multicultural internal environment.

Oliveira and Rodrigues (2004) demonstrated in their study that companies with cultural diversity programs had better performance than those who did not have them, proving that by valuing diversity management, organizations are able to make better use of the internal resources available to them, stimulating innovation and improving productivity.

The issue of diversity in a social system context is characterized by a majority group and by minority groups, that is, those groups with less representation in the social system, compared to the majority group. This group also corresponds to those members who have historically more power and economic resources when compared to members of the minority groups (HASHASHIRO, CARVALHO, 2005).

The justifications for the adoption of diversity promotion policies and practices can be divided into two categories: ethics and competitive advantage. These two categories are a reflection of the fact that companies are both economic institutions and social institutions that have a profound impact on the communities in which they are inserted. The work environment, with its projects, its relations and its contracting policies, offers a unique opportunity to deal with diversity and inclusion. The innumerable advantages and synergies that a diversified environment brings to the performance of the company and society are practically unexplored (CARNEIRO, 2002; MYERS, 2003).

Market adaptation and innovation / creativity are the economic justifications relevant to the promotion of diversity. The mix of people, experiences and ideas stimulate creativity and allow the company to find innovative solutions to the challenges encountered (MYERS, 2003). For example, if more religiously diverse societies and organizations are also more tolerant and willing to adopt new ideas and technologies, business leaders and managers operating in such societies or organizations should consider policy-making to harness and use this positive attribute (DIRIENZO; DAS, 2015).

### 2.3 Related Studies

In this section, papers that propose to study the themes of diversity and innovation are presented, since other studies have already tried to relate the two themes and to verify the influence between them. Table 1 presents some of the most recent studies that relate the theme of innovation and diversity.

**Table 1:** Studies on innovation and diversity.

Objectives and Results	Authors
The objective was to analyze the direct and mediating relationships among team diversity, individual and team learning, and individual and team innovation performance. Using a sample of 266 professionals from Hong Kong, it was discovered that team diversity plays a substantial role in improving individual and team learning.	Sun <i>et al</i> (2017).
The study examines the influence of diversity in the level of education on the quality of team communication and team performance. The study sample consisted of 57 bank branches. It was found that diversity in the education level positively influenced the quality and performance of team communication when the innovation team's climate level was high, but negatively when it was low.	Valls, González-Romá e Tomás (2016).
Two aspects of diversity - ethnicity and values - and their impact on national innovation production were analyzed. It has been found that ethnic diversity and diversity of values are distinct and, while the former has a negative effect on innovation, the latter contributes positively to it. However, countries are required to have both types of diversity. It has been found that countries that are ethnically homogeneous but diverse in value orientation are the best innovators.	Ramasamy e Yeung (2016).
Examining how companies perceive the benefits associated to a diverse range of technology alliances. Using panel data for Spanish manufacturing companies over the period 2004-2011, evidence has shown that firms' absorptive capacity and ambidexterity in R&D serve as mediation mechanisms between the diversity of technological alliances and innovative performance.	Lucena e Roper (2016).



It examined the effects of perceived task interdependence of individual team members and perceived goal interdependence on innovative behavior in teams characterized by different levels of group diversity. Multilevel analyzes revealed that the individual's perception of task and interdependence was not related to innovative behavior in homogeneous teams. In heterogeneous teams, however, task interdependence was strongly and positively related to the innovative behavior of individuals who perceived high levels of interdependence of goals and not related to innovative behavior for those who perceived low levels of goal interdependence.	Van Der Vegt e Janssen (2003).
Examining the influence of gender diversity on top management teams on business success. The results suggest that there is a negative and significant relationship between gender diversity in executive management in the specific context of the biotechnology industry. However, the effect of innovation capacity reduces and does not cause significant influence of such demographic diversity on senior management teams.	Kristinsson, Cand e Emundsson (2016).
The objective was to investigate how functional diversity can influence team innovation and when such influence may or may not occur. The results, based on a sample of 96 research and development teams, indicate that functional diversity had a negative indirect relationship with team innovation through knowledge sharing when trust based on affect in a team was low, and this relationship became less negative when the level of affection based on a team increased. The relationship was not significant when the trust based on affection in a team was high.	Cheung et al (2016).
It was explored the extent to which the diversity of educational levels between researchers and engineers in the context of a company's level of technological diversity influences the performance of innovation. The results of 366 firms in different industries indicate that, when a company's technological domains are heterogeneous, companies with a workforce with similar educational levels perform positively in innovation.	Subramanian et al (2016).
The aim of the paper was to clarify the reciprocal relationship among diversity and inclusion and innovation to demonstrate how each one can be effectively leveraged to benefit the other one in order to help companies grow. Set in the context of the challenges faced by business leaders, the article provides insights, recommendations and case examples on how diversity and inclusion can be leveraged to produce innovative products, services and business solutions.	Steele Derven (2015)
The purpose of the study was to analyze separately the influence of ethnic-cultural diversity, ethnic group categories and cultural distance on innovation, specifically on national innovative capacity. Ethnic diversity negatively affects innovation, while cultural diversity contributes positively to innovation.	Zhan, Bendapudi e Hong (2015).
The study used the Global Innovation Index to empirically explore the impact of corruption and its interactive relationship with economic development, as well as the effect of three different diversity measures on innovation in the country. The results of this analysis suggest that corruption significantly impairs innovation activities among countries, but the effect is mitigated in the richer countries. As expected, ethnic diversity weakens innovation activities. However, religious diversity, which can be a substitute for tolerance, contributes positively to innovation.	DiRienzo e Das (2015).
The study links the cultural diversity caused by migration to innovation in the UK. Companies with a larger share of owners or migrant partners are more likely to introduce new products and processes. This effect has decreasing returns, suggesting that it is an effect of diversity and not just the benefits of migrant enterprises. However, there is no relationship between the proportion of foreign workers in a local labor market or country-by-country breakdown and innovation at the enterprise level, nor do migrant enterprises in many cities appear particularly innovative. But the urban context matters and businesses in London with more migrant owners and partners are more innovative than others. Companies in cities with high levels of human capital are also more innovative.	Lee (2015).
The study investigates the relationship between employee diversity and innovation in terms of gender, age, ethnicity and education. As results a positive relationship between diversity in education and gender in the probability of introducing an innovation were found. And it was found a negative effect of diversity age and no significant effect of ethnicity on the likelihood of the company to innovate.	Ostergaard, Timmermans e Kristinsson (2011).

Source: Developed by the authors.

As shown in Table 1 there are several studies relating the two themes: diversity and innovation. However, only the studies by Zhan, Bendapudi and Hong (2015), DiRienzo and Das (2015), Lee (2015) and Ramasamy and Yeung (2016) contributed to studies whose analysis was reported at country level, contributing to a broader perspective on the subject.

Although the aim was to demonstrate, through more recent studies, the debate about the subjects involved, as can be observed, the possibilities are diverse and there are different research

opportunities. Future studies could more consistently show the relationship of themes over time and point out gaps that may be studied, thus contributing to the advancement of the theme.

### 3. METHODOLOGY

In order to identify the factors of diversity that influence innovation in a country-level analysis, a methodology of quantitative nature, regarding the research approach, was adopted, and descriptive, regarding the objectives.

Secondary data extracted from publicly available databases were used through the *World Economic Forum I (The Global Competitiveness Report 2016-2017)* website and the *Social Progress Imperative (Social Progress Imperative 2016)*. The extraction occurred in January 2017. The data were imported into an Excel spreadsheet and then into SPSS® (*Statistical Package for Social Sciences*) version 22 to perform linear regression.

The statistical technique used to treat the data was multiple linear regression. Marôco (2011) states that multiple linear regression can be understood as the establishment of a functional relationship between two or more variables involved in the description of a phenomenon.

In this study, the dependent variable is represented by the Innovation pillar and the R&D made available by WEF and the independent variables are represented by some variables available in the Social Progress Index related to the literature on diversity: freedom of expression; freedom of assembly / association; freedom of movement; freedom over life decisions; freedom of religion; tolerance towards immigrants; tolerance towards homosexuals; discrimination and violence against minorities; religious tolerance; women's years of study; and, inequality in the achievement of education.

It should be noted that the use of this technique has limitations, since it requires a list of assumptions to be reached. For it to be effective, the researchers must first examine their assumptions of linear regression, as well as identify the consequences of their violation. As shown by Corrar et al. (2014), the assumptions are: (1) normality of residues, (2) homoscedasticity of residues, (3) linearity of coefficients, (4) absence of serial autocorrelation in residues, and (5) multicollinearity between the independent variables. Although it is imperative that the researchers examine these assumptions before beginning their analysis, Multiple Regression is considered an effective model against violation of most of the assumptions. It is emphasized that if the assumptions are not followed, the estimates may be inconsistent and biased, implying a larger standard error or greater dispersion around the line, impairing the regression analysis. In this case, it should be noted that the assumptions of multiple linear regression were reached.

The study sample is composed of 127 countries that have Global Competitiveness Index (dependent variable) and Social Progress Index (independent variables). It should be noted that countries whose indexes were absent were excluded, delimiting the population in a sample of 127 countries. Table 2 shows the dimensions, variables and sources of the study.



**Table 2:** Dimensions and study variables.

Dimensions	Variables	Source	Index
Innovation	Pillar 12 - Innovation and R&D	<i>World Economic Forum (2016)</i>	Global Competitiveness Index
Diversity	Freedom of expression; freedom of assembly / association; freedom of movement; freedom over life decisions; freedom of religion; tolerance towards immigrants; tolerance towards homosexuals; discrimination and violence against minorities; religious tolerance; women's years of study; and, inequality in the achievement of education.	<i>Social Progress Imperative (2016)</i>	Social Progress Index

Source: Developed by the authors.

The Social Progress Index, launched in 2014 by the Social Progress Imperative, measures a comprehensive set of social and environmental performance components. The Global Competitiveness Index of the World Economic Forum has been published annually since 1979. The index consists of twelve pillars, with only one pillar being used in this study. The next section will present the results regarding the analysis of the study data.

## 4. RESULTS PRESENTATION AND DISCUSSION

To identify the factors of diversity that influence the innovation of the countries, the statistical technique multivariate logistic regression was used. The sample used to perform the analysis was composed of 127 countries that presented the indicators of Innovation and R&D of the Global Competitiveness Index. Countries that did not have the indicator were excluded. The results are shown in Tables 1 and 2. Table 1 presents, first, the summary of the model.

**Table 1:** Model Summary.

Model	R	Square R	Durbin-Watson	ANOVA Sig.
1	.784 <sup>a</sup>	.614	1.975	0.000

Source: Research data.

It can be observed in Table 1 that the Analysis of Variance (Anova) demonstrates the significance (Sig.) Of the model (p-Value <0.01) and thus rejecting the null hypothesis, that is, it confirms the alternative hypothesis and the linear regression is shown to be significant.

R (ratio coefficient) reflects the degree of relationship between the dependent variable Innovation and R&D, and the independent variables represented by the diversity variables. According to the result shown in Table 1, the correlation is considered strong (78.4%).

Square R (coefficient of determination) indicates how much of the variation in the dependent variable is explained by the variations in the independent variables. As shown in Table 1, it can be verified that the independent variables account for 61% of the dependent variable (Innovation and R&D), characterizing, according to the literature, a moderate correlation. Table 2 presents the results of the regression model.

**Table 2:** Model Results.

Model	Non-standardized coefficients	Standardized coefficients	T	Sig.	Collinearity statistics	
	B	Beta			Tolerance	VIF
(Constant)	1.890		2.077	.040		
Freedom of expression	.143	.104	1.184	.239	.508	1.970
Freedom of assembly/ association	-.011	-.010	-.103	.918	.392	2.553
Freedom of movement	-.088	-.108	-1.272	.206	.546	1.832
Freedom over life decisions	1.433	.227	2.830	.006	.612	1.635
Freedom of religion	-.132	-.139	-1.498	.137	.458	2.183
Tolerance towards immigrants	.181	.035	.403	.688	.537	1.863
Tolerance towards homosexuals	.901	.287	2.646	.009	.334	2.994
Discrimination and violence against minorities	-.133	-.319	-3.265	.002	.414	2.418
Religious tolerance	-.171	-.200	-2.464	.015	.596	1.677
Women`s years ofstudy	.147	.634	3.867	.000	.146	6.831
Inequality in the achievement of education	2.777	.440	2.725	.008	.151	6.621

Source: Research data.

As shown in Table 2, one can infer that the diversity variables that impact on the innovation of the countries are: women's study years (0.634), inequality in education achievement (0.440), discrimination and violence against women minorities (0.319), tolerance towards homosexuals (0.287), freedom over life decisions (0.227) and religious tolerance (0.200). This result is consistent with that found by Zhan, Bendapudi and Hong (2015).

Hence, in this case, the variables discrimination and violence against minorities negatively affect countries' innovation and religious tolerance, differently from what was found in the study of DiRienzo and Das (2015) in which it was verified that the religious diversity contributes positively to the innovation of the countries. It should be noted that DiRienzo and Das (2015) used another indicator of innovation, the Global Innovation Index.

As it can be seen, the diversity in its multiplicity of definitions, some of them described by Thomas (1991), Nkomo and Cox Jr (1999), Triandis (2003) and Oliveira and Rodriguez (2004), can contribute to innovation. According to Saraiva and Irigaray (2009), differences in the workforce, including the inclusion of historically discriminated minorities, make the environment diverse and democratic, fostering innovation.

In this case, it can be inferred, according to Meyers (2003), that the mix of people, experiences and ideas stimulate creativity and allow the company to find innovative solutions to the encountered challenges. However, leaders and business managers operating in such societies or organizations should consider policy-making to make use of this positive attribute (DIRIENZO, DAS, 2015).

Organizations can, through diversity management programs, seek to make better use of internal resources, encouraging innovation and improving productivity (OLIVEIRA; RODRIGUES, 2004). This is a way of converting social concern into results, optimizing the exchange of information about experiences, values, attitudes and the apprehension of new approaches, stimulating creativity, flexibility, change and innovation (ARANHA; ZAMBALDI; FRANCISCO, 2006; SARAIVA; IRIGARAY, 2009).

In addition to the management of diversity in companies, one can include efforts to develop a country's national innovative capacity, which, according to Furman, Porter and Stern (2002) and Zhan, Bendapudi and Hong (2015), depend on strong national institutions (educational networks, technical and scientific institutions, government policies and industrial relations), a strong industrial environment for innovation, such as private investment in R&D and technical specialization. And also, it depends on a strong link between public institutions and industry. In this way, countries need to invest in developing policies that foster their capacity for innovation.

Van de Ven (1986) argues that in order to understand the process of innovation it is necessary to understand the factors that facilitate and limit its development. Innovation must necessarily be implemented to become an innovation. In this sense, the creation of a culture of innovation encourages and develops effective innovation policies, allowing creativity to exist by placing people in positions that can best fulfill and develop their potential (ZHUANG; WILIAMSON; CARTER, 1999).

Creativity and innovation come from the interaction among employees. Diversity leads to different perspectives and new solutions. Thus, it is inferred that the adoption of a culture of innovation coupled with the management of diversity can significantly contribute to the advancement of innovation in organizations and countries, improving competitiveness and social cohesion.

## 5. CONCLUSION

Diversity is a relevant theme as it results from differences in existing human characteristics and interferes in the dynamics of the workforce, in the results, competitiveness and innovations of organizations and countries. Diversity not only addresses social issues or concerns, but also opportunities generated that may be relevant to companies or countries. Innovations, on the other hand, stimulate development, growth and the possibility of generating value for both organizations and economies.

This study aimed to promote a debate about the two themes, innovation and diversity, in order to identify the diversity factors that influence the innovation of the countries. The variables (independent ones) of diversity considered in the study were: freedom of expression, freedom of assembly / association, freedom of movement, freedom over life decisions, freedom of religion, tolerance toward immigrants, tolerance toward homosexuals, discrimination and violence against minorities, religious tolerance, women's years of study, and inequality in education achievement. These variables were taken from the Social Progress Index. The variable innovation used (dependent one) was taken from the Global Competitiveness Index.

Considering a sample of 127 countries, linear regression analysis revealed that the diversity variables women's years of study, inequality in education achievement, homosexual tolerance, and freedom over life decisions contribute positively to countries' innovation. However, religious tolerance and discrimination and violence against minorities negatively affect countries' innovation.

Although it is not yet possible to generalize about the results found, and this is a limitation of the present study, other studies have also found evidence of the impact of the relationship between innovation and aspects of diversity. Even if this impact is negative or positive, the fact is that there is a relationship between the themes and that they deserve more attention and study, both from organizations and from countries that have to deal with diversity and at the same time be competitive looking for opportunities, development and innovation.

It is suggested that new studies can investigate the relationship between innovation and diversity in different contexts, for example in developed, underdeveloped and emerging countries, in order to verify if the impact could be the same.

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