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FACTOR STATE IN INNOVATIVE ECOSYSTEMS: A COMPARISON BETWEEN BRAZIL AND GERMANY

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ABSTRACT

Innovation is an extensively used term in modern management jargon, especially due to its capacity of giving competitive advantage to whoever is able to develop it. Consequently, due to this "special power", innovation has been pursued by organizations worldwide, especially in the private sector. The strengths of innovation were also perceived by governments, as they began developing public policies oriented to foster innovation. In order to understand this phenomenon, this research studies the experience of two cities located in two different countries, Brazil and Germany, that are recognized nationally as having well succeeded public policies aimed on developing innovation. The paper is based on an in depth qualitative research and its main theoretical foundations are based on the contributions of Isenberg (2010) on innovation, Dye (1972) and Sebatier (1986) on public policy and Cantwell and Mudambi (2000), Etzkowitz and Leydesdorff (2000) and Etzkowitz (2008) on innovative public policies. Despite all political, social and economic differences between Brazil and Germany, the strategies implemented in both cities followed a similar pattern and were successful in fostering an ecosystem that enabled the development of companies that generated innovations in products, services and processes. The outcomes, in both regions, were related to economic development, and creation of strong cluster of highly innovative and competitive organizations.

Keywords: Innovative Ecosystems; Public Policy; Innovative and Competitive Organizations; Strategy Management.

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FATOR ESTADO EM ECOSSISTEMAS INOVADORES: UMA COMPARAÇÃO ENTRE BRASIL E ALEMANHA

RESUMO

Inovação é um termo utilizado intensamente no jargão moderno da administração, especialmente em função de sua capacidade de dotar de vantagem competitiva àqueles que são capazes de desenvolvê-la. Consequentemente, em função desses "poderes especiais", a inovação tem sido buscada por organizações em todo o mundo, especialmente no setor privado. As vantagens da inovação também foram percebidas pelos governos, na medida em que começaram a desenvolver políticas públicas orientadas à promoção da inovação. Para entender esse fenômeno, esta pesquisa estuda a experiência de duas cidades localizadas em dois diferentes países, Brasil e Alemanha, as quais são reconhecidas nacionalmente por terem políticas públicas bem sucedidas voltadas ao desenvolvimento da inovação. Este trabalho é baseado em uma pesquisa qualitativa em profundidade realizada em ambas localidades. As principais bases teóricas são alicerçadas nas contribuições de Isenberg (2010) em inovação, Dye (1972) e Sebatier (1986) em políticas públicas, e Cantwell e Mudambi (2000), Etzkowitz e Leydesdorff (2000) e Etzkowitz (2008) em políticas públicas inovadoras. Apesar das diferenças entre Brasil e Alemanha, as estratégias implementadas em ambas as cidades seguiram padrão similar e foram bem sucedidas no desenvolvimento de ecossistemas que permitiram o nascimento de empresas que geraram inovações em produtos, serviços e processos. Os resultados, em ambas as regiões, foram o desenvolvimento econômico e a criação de um forte cluster de organizações inovadoras e competitivas.

Palavras-chave: Ecossistemas Inovadores; Políticas Públicas; Organizações Inovadoras e Competitivas; Gestão Estratégica.

INTRODUCTION

Innovation is an extensively used term in modern management jargon, especially due to its capacity of giving competitive advantage to whoever is able to develop it.

Consequently, due to this "special power", innovation has been pursued by organizations worldwide, especially in the private sector.

The strengths of innovation were also perceived by governments, as they began developing public policies oriented to foster innovation. This process is seen worldwide, even though in some regions the innovative spirit is stronger than in others.

In order to understand this phenomenon, this research studies the experience of two cities located in two different countries, Brazil and Germany, that are recognized nationally as having well succeeded public policies aimed on developing innovation among their organizations. Although, with different economic, social, educational and political characteristics, both cities were able to develop conditions that enabled the birth of numerous well succeeded innovative industries.

The objective of this paper is to analyze the development of an innovative ecosystem in both cities and provide a deeper understanding how it is influenced by public policies. The governmental contribution to the process of creating an innovative environment is the aim of this research.

The paper is based on an in depth qualitative research and its main theoretical foundations are based on the contributions of Isenberg (2010) on innovation, Dye (1972) and Sebatier (1986) on public policy and Cantwell and Mudambi (2000), Etzkowitz and Leydesdorff (2000) and Etzkowitz (2008) on innovative public policies.

The strategies implemented in both cities followed a similar pattern and were successful in fostering an ecosystem that enabled the development of companies that generated innovations in products, services and processes. The outcomes, in both regions, were related to economic development, and creation of strong cluster of highly innovative and competitive organizations.

INNOVATION

Ever since Schumpeter (1934) framed the concept innovation through his factors of "creative destruction", innovation as reorganization of knowledge and existing resources is one of the most pursued factors in modern organizations. This importance is basically due to the belief that innovation is capable of bringing competitive advantage, which leads to valuable resources, with barriers of imitation at least for a period of time.

Whereas in history, innovation is often referred to the launch of new products, research embraced a wider perspective of innovation, such as the innovation of processes and business models (Bouncken & Friedrich, 2016). Gradually, the concept of innovation was broadened and applied directly to business strategies and management.

In a more recent research, Adner and Kapoor (2015) and Allahar and Brathwaite (2016) highlighted the important role of an ecosystem as a *locus* for innovation. Dosi (1988) adds that development of innovation occurs mainly in locations where there is cooperation (Braga & Forte, 2016) among different actors, such as enterprises, universities, research centers, forming so called networks. It seems clear that innovations are more abundant where there is integration among different actors that combine their knowledge (Chiesa, 1995). This happens to be a result of the increasing specialization of knowledge in different types of organizations.

Innovative localities have a central role stimulating a growing demand for more efficient, sustainable, and livable model of urban development (Greenburg, 2004; Cozens, 2008; Toppeta, 2010; Zygiaris, 2011). These authors present a relevant marginal contribution of innovative cities, which is the increase in sustainable urban developments that contribute to increase of quality of life. According to the economist Cowen (2013), ambitious and talented people desire to work in a small number of cities or regions, especially in the ones that were able to

develop favorable conditions, such as vibrant business environments.

There are three levels of innovation according to Isenberg (2010). The first level represents the assets of an ecosystem. Innovative ecosystems generally emerge in locations that consist of specific assets, such as established companies, universities, and investors. The second level is represented by the vibrancy of these assets, which can be measured by four indicators: Density, Fluidity, Connectivity, and Diversity (Strangler & Bell-Masterson, 2015). The third level is reflected by the domains of managerial, innovative and entrepreneurial ecosystems.

PUBLIC POLICY

Governments are responsible for planning, organizing, executing and controlling its activities. This role is specially challenging due to the complexity of the governmental activity. A large number of actors with competing interests are responsible for transforming governmental work in complex task.

Public policy deals with the production of policies, strategies, plans and actions in order to deal with problems faced by society. Dye (1972) has a broad definition for the term, he describes it as everything that governments choose to do or not to do. In his view, the lack of action over a certain issue is also public policy.

Public policy production is not only studying, analyzing and planning solutions to public demands, but it also involves the important implementation phase. During this phase, governmental intentions are translated into actions (O'Tolle Jr., 2003), become real and reveal their efficiency.

Sabatier (1986) classifies public policy in to two types: (a) top down approach; (b) bottom up approach. While in the first, the decision making process occurs at the higher levels and the implementators are at the lower levels, in the second model the implementators are responsible for analyzing the situation and deciding the solution. In the bottom up model, the higher management legitimates the decisions taken at lower levels.

However despite the model used on the implementation of public policies, Lindblom (1959) states that "muddling through" is the most efficient manner of giving the appropriate answers to public demands. The interaction between policy makers and policy takers is one of the most important parts of this production process.

The maturity of public policies takes time to occur, so any evaluation or control effort must consider the specificities and the appropriate timing. Sebatier (1986) affirms that public policies, generally, become tangible after 10 years of implementation. Therefore, a precise evaluation process must be able to consider the maturity of the public policy implementation process, otherwise it might produce biased results.

Public policies, according to Howlett (2000), are materialized through 4 different governmental strategies: (a) providing directly goods and services; (b) using voluntary organizations, families and communities; (c) stimulating the market to provide what is necessary; (d) reorganizing governmental activities. Government might combine different strategies, when in certain conditions.

INNOVATIVE AND CREATIVE PUBLIC POLICIES

As organizations pursue innovations and innovative practices, governments also have been pursuing it. However, these governments work on two basic sides of innovation: (a) developing innovation for their internal processes and administrative work; (b) stimulating the development of innovative organizations and innovations among existing organizations.

The development of innovation occurs mainly in locations where there is cooperation and integrative efforts among different actors that combine their knowledge (Chiesa, 1995). In this sense, it is important to mention Etzkowitz and Leydesdorff (2000) and Etzkowitz's (2008) Triple Helix innovation model in which government, university and corporations cooperate and integrate their R&D activities and develop an environment that is innovation friendly. In this model, this cooperation brings gains to all participants and attracts new participants.

Government despite being only one of the 3 helix mentioned in Etzkowitz and Leydesdorff (2000) and Etzkowitz's (2008) model, are a very powerful one, since generally has vast resources for investment, influence over other actors and mobilizing capabilities. Therefore, governments can play an important role in order to create this innovative friendly environment. A number of public policies have been designed by national and sub national governments worldwide stimulating innovation.

Authors, such as Doz (1986), Cantwell and Mudambi (2000), Helble and Chong (2004) described how governments in different parts of the world have been able to generate conditions that incentive companies to innovate. In their study, Cantwell and Mudambi (2000) found that the main incentives that governments can give to stimulate MNEs to invest in R&D are related in first place to location factor and secondly tax incentives.

More recently the innovative environment pursued by governments all over the world began being called innovative ecosystems. This new term is a very recent one and is gradually replacing other terms that were used by management literature. Spinosa, Schlemm and Reis (2015) define innovative ecosystems as independent factors that act jointly, in a random and spontaneous manner, enabling the action of entrepreneurs and innovators, allowing innovation and entrepreneurship to occur in a sustained process in a given territory.

Public policies and actions are necessary to create an environment that is able to attract the people and the organizations that the region desires. Nowadays, the competition for the most talented people and prosperous companies is not only between countries, but also between sub national actor, such as States and municipalities (Ohmae, 2003). Consequently, public policies that enable the development of an innovation environment are crucial to the attraction of creative and innovative organizations.

METHOD

This paper researches how local governments have been developing public policies that stimulate innovation in their territory and create real innovative ecosystems. The study is centered on a comparison between Brazil and Germany. Both countries unite in their high demand for innovative ecosystems on a local level, although they come from separate points of departure.

This study focuses on the experience of two cities located in two different countries, Brazil and Germany, that are recognized nationally as having well succeeded public policies aimed on developing innovation among their organizations. This is an in-depth case study of a qualitative nature (Yin, 1984), based mainly in document analysis and non participant observation.

The access to all these sources was facilitated as the researchers had the opportunity to engage in direct non participant observation with governmental authorities and entrepreneurs in both cities, over a period of six months. Direct non participant observation enabled the researchers to obtain descriptive data and facts that are part of the real life of the organization (Jaccoud & Meyer, 2008). The documents used in the study were mainly internal reports. The observation, the access to company documents and the information collected were extremely important to the analysis of the focus of the study. Data was collected locally in both cities between November, 2015 and April, 2016.

The focus on local governments becomes more relevant than comparisons on a national level, such as conducted by Gibbs, Kraemer and Dedrick (2003) and Stenholm, Acs and Wuebker (2013), as this is where public policies are implemented. Local governments are also closest to population and, consequently, to their demands and needs. This ends up making local governments more agile and creative in the development of solutions to the problems they face, when compared to national governments. On the other hand, government action generally has long term effects, especially when compared to other stakeholders, such as companies or investors. Ohmae (2005) supports this research orientation, by stating that the global competition to attract investments nowadays is not among countries, but among sub national actors such as regions, states or cities.

To gain this knowledge, the authors researched the assets of each ecosystem. Innovative ecosystems

generally emerge in locations that consist of specific assets, such as established companies, universities, and investors. The special focus lies on the role of public policies in stimulating the formation of the innovative environment.

This research reflects insights of two in-depth case studies located in two totally different institutional environments. It discusses their differences, their analogies and provides an informative basis for further research on the framework it relies on.

DATA DISCUSSION

Two cities were considered in this research. One is a city located in an island in the Southern Coast of Brazil, called Florianopolis. The other is the city of Münster, located in the North-Rhine Westphalia region, in Germany. Despite all differences both cities have a common the creation of a favorable environment that stimulated innovation in their regions.

Florianopolis

Florianopolis is the capital of the State of Santa Catarina, with a population of around 450,000. The city used to have its economy centered in governmental services, tourism and commerce. Since the early 90's the city began working on the development of a technology oriented economy. This process had a relevant participation of State government in the creation of the necessary conditions to conduct this new development, although Federal and Municipal government also contributed.

Nowadays, Florianopolis has nationally recognized tech industry, with a high number of innovative companies and with two innovative clusters in software development and gamming sectors. This development is supported by two major government investments in tech infrastructure: Alfa Technology Park and Sapiens Park.

The main reason behind the development of Florianopolis as tech city in Brazil was the Federal University of Santa Catarina (UFSC). Nationally known as a research oriented higher education institution, UFSC was able to develop high quality programs in the fields of engineering and computer science, which produced hundreds of highly skilled technology oriented new professionals in the city's labor market every year. This certainly constituted the base of the development of technology entrepreneurs. UFSC is a public university financed by Brazilian National government.

In 1993, the State Government of Santa Catarina decided to stimulate entrepreneurism in Florianopolis by creating Alfa Technology Park, a cluster of high technology companies. It is a governmental structure that materialized the innovation environment by hosting, nowadays, two technology incubators and 70 technology firms, in an area of 100,000 square meters (Prefeitura de Florianópolis, 2016). This tech park was the beginning of the materialization of the public policies (O'Toole, 2003) that fostered innovation in Florianopolis.

It is important to mention that UFSC, specially the Engineering Programs, gave a very important contribution to the beginning of Alfa Technology Park. This partnership was very important to overcome the problems that came with its implementation.

This technology oriented drive in Florianopolis was a strategy envisioned by a State Governor that was an engineer with work experience in computer science, prior to his political engagement. This public policy shift was important milestone to construct the city`s innovative ecosystem.

The success achieved by Alfa Technology Park, in terms of economic development and innovative stimulus to entrepreneurs, was remarkable and the State government decided to implement a new major investment in infrastructure in order to strengthen the technology innovative industry in Florianopolis in 2002. It was called Sapiens Park and is basically an urbanized area, of 4,500,000, square meters, directed to host companies that are interested in working with science and technology. The areas are acquired by private or public organizations for a subsidized cost and the approval of plan of activities.

In 2006, Florianopolis was chosen by the North American magazine Newsweek one of the 10 most dynamic cities in the world (Prefeitura de Florianopolis, 2016). In 2009, the third technology park was created in town. For the first time it was not a governmental investment, but a private one led by the Association of Technology Firms of Santa Catarina.

In Florianopolis, tax incentives were not used by governmental authorities to stimulate innovative companies or to attract large MNEs. Instead, government invested in a grassroots strategy, giving small startups conditions to prosper. The consequence was the emergence of a highly innovative environment made up of several different technology clusters.

Actually, information technology is the most important industry in town. There are more than 400 companies in Florianopolis that produce software, hardware and related services, and employ more than 5,000 direct workers (Prefeitura de Florianopolis, 2016).

Münster

With a population of around of around 300,000 inhabitants Münster, is considered as the cultural center of Westphalia, Germany. It is one of only three growing cities in North-Rhine-Westphalia and has a long lasting history as a place for the local administration, which goes back to the Treaty of Westphalia ending the Thirty Years' War in 1648, the first internationally known peace agreement reached by negotiations. It is also the home of the Westfälische-Wilhlems-University and 17 other universities, with a total of more than 55.000 students. The university buildings are spread all around the city, which makes Münster a true university town and not a campus university.

As the city has almost no manufacturing industry, most of the jobs are based in the knowledge sector, meaning public authorities, consulting companies, insurance companies, pharmacy and health companies, banks, publishing houses, advertising and design, which leads to its cognomen "creative desk of Westphalia".

To foster new innovation, the city established a tech park denominated "Technologie Hof" which provides office space and laboratories to start-ups. The city of Münster also initiated, in partnership with the University of Münster and the University of Applied Science, small programs to support innovations. Findings also link to private engagement in the area, which is not directly linked to official initiatives.

Tax incentives for start-up companies were also not identified, as in Florianopolis. All financial supports given by government were generated on the State level and not on the municipal government, which doesn't create a factor of differentiation compared to other cities in the region.

The lively ecosystem for new established companies that often enables them to become so called "hidden champions", is due to a key factor for the ecosystem, which is the well educated people in the area. This critical element gives companies access to an abundant and talented workforce.

Research also reveals that local government over time tries to keep these well educated inhabitants in the area by establishing a family friendly environment. This led to the LivCom, an award given by the United Nations Environment Program, rewarding Münster as the most livable city in the world in 2004 for cities with population ranging between 200,000 – 750,000 inhabitants.

The reward was given due to five factors that also have an influence on the entrepreneurial ecosystem: (1) improvement of the cities landscape; (2) structuring of the historical heritage; (3) environmentally aware living; (4) integration of the citizens; (5) integrated future planning. All these factors indicate good breeding grounds for entrepreneurial culture, but also show that they go beyond proactive direct investment.

The findings of this research highlight a distinction between traditional and growth oriented entrepreneurial policy (Mason & Brown, 2014). This means, that an innovative ecosystem can only be generated by focusing on specific kinds of appropriation, e.g. for special industries or sectors, leading to a "temporary" cluster of innovation in a special area which could lead to a broader innovative

ecosystem over time. This is a disagreement with the traditional perspective on public policy where programs are designed to support specific geographical areas and not sectors.

The findings also present a contrast with traditional approaches, where the generation of new firm-based intellectual property and innovation, though R&D was seen as vitally important. The development of innovation systems is deeply linked to a holistic perspective on Business Models, which should be centered in the development of new public policies to foster innovative ecosystems.

ANALYSIS

Florianopolis and Münster are recognized for having fostered innovative ecosystems, although have different political, economic and social characteristics. This was made possible thanks to a combination of contributions from public and private sectors.

Six important common elements were identified in both cases. The first is the presence of strong higher education institutions that contributed in many aspects to development of an innovative ecosystem. The presence of these universities was especially important due to their capacity of forming a highly skilled labor force. This evidence corroborates the findings of Dosi (1988) and Isenberg (2010).

The second is that the public policies that led to the development of their innovative ecosystems were headed by State government, rather than municipal or federal levels of government. This supports Ohmae (2003) when he mentions the importance of sub national states generating conditions to achieve their desired model of development and compete with other regions of the world.

The third is that both governments directed their public policies toward the development of local companies and not attracting large MNEs through tax incentives. This evidence refutes the findings of Cantwell and Mudambi (2000). This grassroots approach is important to foster creativity and small enterprise development, as it gives a symbolic message to the market that government is supporting small businesses. Tax incentives was not perceived by the researchers as a critical element to the success of both cities in promoting entrepreneurship and innovation.

The fourth is that cooperation (Braga & Forte, 2016) between companies, government and universities was a central factor in the success of the development of the innovative environment (Isenberg, 2010) of both cities. This corroborates the relevance of the Triple Helix in innovative development, described by Etzkowitz and Leydesdorff (2000) and Etzkowitz (2008). In both cases, we can see the importance of the creation of technological parks in Florianopolis and Münster, which provided the adequate environment to promote innovative technological entrepreneurism. Investing in the environment is the critical element for generating innovative companies (Adner & Kapoor, 2015; Allahar & Brathwaite, 2016) in Florianopolis and Münster.

The fifth is that both cities with the development of the innovative environment there was also a push in the investments in sustainability and public infrastructure that are improve the quality of life in each city (Greenburg, 2004; Cozens, 2008; Toppeta , 2010; Zygiaris, 2013). These investments are majorly municipal government ones and are important to attract creative and innovative entrepreneurs.

Analyzing the public policies that were used in both cases, there was a main difference. According to Sebatier (1986), while in Florianopolis there was a top down approach to implementing the public policies. In Münster, the approach was mainly bottom-up. This is due to the fact that the actors were more organized and developed when the State Government began to foster the innovation ecosystem. Even though, the two cities adopted these two different approaches to public policy implementation, the results in terms of creating innovative environments were similar.

Analyzing the type of public policy used in both cases using Howlett's approach (2000) indicates that there is the sixth similarity. Stimulating the market was the predominant type in both cases. Although, in Germany and Brazil, State government provided

infrastructure directly to the other actors, the stimulus to the market and the private sector was the main one.

FINAL CONSIDERATIONS

The cases of the development of an innovative environment in Florianopolis and Münster provide a clear example of the need of shifting the traditions public policies directed towards incentives of R&D in large companies. In both cities the fostering of innovative ecosystems occurred thanks to support to grassroots technology entrepreneurs.

Despite all political, social and economic differences between Brazil and Germany, it is possible to see that it is possible to develop successful innovative environments using the adequate public policies and integrating actors that are able to work with synergy. The cases of both cities provided a clear example of the relevance of Etzkowitz and Leydesdorff (2000) and Etzkowitz's (2008) Triple Helix and reveal the importance of increasing the understanding of the dynamic relation of companies-universities-government.

The analyses of both cases provided evidence of five main similarities and one different in public policy implementation, which prove that both locations followed a similar pattern when creating their innovation ecosystems. Although, both cities have different economic, educational and social environments they presented a similar pattern of fostering their innovative ecosystems.

It is also important to notice that despite the different strategies adopted to public policy implementation in both cities, the results achieved were similar. The cases of Florianopolis and Münster demonstrated that it innovative environments were created based upon top-down and bottom-up approaches, respectively.

Further studies, should study the implementation of public policies directed to fostering innovative ecosystems in other parts of the world. This type of study would enable the identification of common patterns or differences between them and, consequently, increase the understanding of the dynamics that exist in an innovative ecosystem. Other complementary research would be the study of the effects of environmental factors in the implementation of innovative ecosystems, in order to identify common elements that support and challenge this process.

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