

Innovation and Organizational Performance

A study with an innovative Brazilian company

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Abstract

The study aimed to analyse the relation between a company considered innovative and its performance. The introduction of novelty or development in a social or productive setting that results in new products, processes or services represents the essence of innovation that besides being one issue of competitive advantage to the organizations and economic increasing in the nations, involves also one way of getting resources and receiving taxes incentive. The research was constituted by an enterprise that received subsidy of *Financiadora de Estudos e Projetos* (FINEP): Natura. The research showed quantitative aspects, used published data in management reports and accomplished the analysis of correlation between variables in the process of innovation and results. It was possible in point that there are positive effects between investment in innovation and sales and also training and sales. However, there is not positive correlation between investment in innovation and margin balance.

Introduction

Beyond surviving, companies must excel at the market, identify resources and tasks that bring competitive advantage, like Barney (1991) and Porter (1985) assume as condition for the superiority of performance.

Innovation is one of the process that companies have been used. Takahashi (2007) points that innovation guarantees sustainable competitive advantage. And according to Bessand & Tidd (2007) the majority of economists advocates that innovation is correlated with economic growth. The Global Innovation Index (2012), a research about innovation with the most innovative countries in the world, points that innovation brings economic growth and prosperity to the countries. According to Tigre (2006) there is only impact in economic growth when there is spread of innovation among companies, sectors and regions. In order to have impact, innovation must be largely spread and not only an isolated event.

Innovation that besides being one issue of competitive advantage to the organizations and economic increasing in the nations, involves also one way of getting resources and receiving taxes incentive. There is, for example, the Law number 11.196, known as *Lei do Bem*, which deducts Income Tax, Contribution concerning income after taxes, also deducts taxes of manufactured products such as machines and equipments for R&D (Brasil, 2005). The companies that can take advantage of this law are those that make technological research and development of technological innovation.

The *Instituto Brasileiro de Geografia e Estatística (IBGE)*, supported by *Financiadora de Estudos e Projetos (FINEP)* make a research about innovation, called *Pesquisa de Inovação (PINTEC)*. The research began in 2000 aimed to construct indicators about innovative industries activities.

In eight years the innovative tax in the Brazilian industries companies showed growth of 6.6%. But, this is not still enough for Brazil being considered as a innovative country, today the investment is less than 1% of Gross National Product (GNP) in innovation.

Table 1: Innovative Tax in the brazilian industries companies

Number of companies			
Year	Total	Innovators	Innovative Tax
1998-2000	72,005	22,698	31.50%
2001-2003	84,262	28,036	33.30%
2003-2005	91,055	30,377	33.40%
2006-2008	100,496	38,299	38.10%

Source: PINTEC (2008)

Because of this scenery, the government announced in March 14, 2013, the liberation of US\$64 billions until 2014 for companies with innovative projects (Ribeiro, 2013). This is *Plano Inova Empresa* that will consider projects in the sectors of agriculture, agro industry, energy, petrol, gas, health, defense, information technology and communication and social environmental sustainability. The plan has four areas of financing that are credit with low taxes and higher deadlines, economic subvention to companies, partnership projects among research institutions, shareholding in companies with technological base (Finep, 2013).

Therefore, innovation is a relevant issue because of its interference in economy, organizations and the importance grows due to government incentive to innovation. So, now it comes out a question: Which variables give positive effects in performance in a company considered innovative? The dilemma in this research is the relation between innovative actions and performance in a Brazilian company.

The study is aimed to analyse the relation between a company considered innovative and its performance. It has been chosen specific objectives to accomplish this purpose: to research a brazilian company considered innovative, to research innovative indicators and choose some, to describe inputs and outputs in the innovative process and analysis of the relation between innovation capacity and performance.

Literature Review

Management Innovation

In order to innovate a product, process or service it is required adequate management. Bessant & Tidd (2007) confirm that when compare innovation with a puzzle game, where it should be organized different pieces until achieve the final objective. So, it is necessary to balance creativity and discipline. There are at least, three stages inserted in management innovation: to analyse and indentify opportunities of innovation, to choose an adequate strategy to put forward ideas and implement them (Bessant & Tidd, 2007).

Maldonado, Dias & Varvakis (2009) did a case study in a small company in Brazil. When the company started using a continuous system of innovation management, showed positive points, like improvement on projects control and thereafter improvement in decision-making due to improvement in information process.

Projects of innovation can be promising, but besides that they may have high risk and high cost. Grupp & Maital (2001) point that to manage innovation is risky and hard. Besides that, only management doesn't maintain innovation (Barañano, 2005).

There are lots of factors which affect innovation success as technological, economic and social aspects. Maehler, Curado, Pedrozo & Pires (2011) point that market and customer necessity stimulate innovation growth and thereafter strategy innovation used by the organization. Hence, the strategy innovation should be adjusted using internal and external analysis.

Organizational Performance

Organizational Performance include different areas, a greater attention is given to one area due to information and resources disponibility and even so limited time. (Betrand & Gutierrez, 2005).

It has been pointed out the importance of analyzing the organizational performance in more than one area, because this is a multidimensional concept (Bulgacov & Paulin, 2009). Bulgacov & Matitz (2011) point that multidimensionality has been recognized as one of the mainly features of organizational performance.

De-Mello & Marcon (2006) researched empirical studies of companies' performance in turbulent settings. In those studies the performance differences among organizations were in resources, a factor also pointed out by Barney (1991), Bertrand & Gutierrez (2005), Porter (1985) and Takahashi (2007); management skills and competitive positioning. Those factors are placed first, meanwhile the sectors features are placed secondly.

According to Slack, Chambers, Johnston & Betts (2006) measurement helps to analyse performance operations in one organization, without measurement there is not signpost of efficiency and effectiveness of processes, products and services. The way used are indicators that must align with organization strategy and provide essential information. Ribeiro, Macedo & Marques (2012) also agree that in order to evaluate the performance it is necessary to have an alignment evaluation strategy process and organization goals, that is because the company's performance is related to the way that it defines its strategies and guides its efforts.

In some studies as from Brito, Brito & Morganti (2009), it was not found relation between innovation and profitability among Brazilian chemistry companies; however there was not relation between innovation investments and net sales. Sánchez, Lago, Ferraz & Ribera (2011) point that electronic companies which use advanced R&D methods, contribute to the products development and they have more proclivity to show improvement on sales. Gallon, Reina & Ensslin (2010) point that micro enterprises had sales growth after receiving a subvention from FINEP, a program called *Projeto Juro Zero*. Therefore, it is possible to correlate innovation or projects of innovation with sales.

In order to measure organization's performance, it is necessary to use performance indicators; the same occurs to measure innovation, using indicators of innovation. Innovation is an intangible resource; however it is possible to measure within a certain limitation.

In order to analyse innovation performance are used indicators such as Research and Development (R&D), patents and human resources qualification, these are called as traditional indicators of innovation (Marins & Zawislack, 2010). Geisler (1999) beyond proposing financial and economic indicators; propose patents as a way to measure science and technology. The Oslo Manual (1997) includes R&D and training expenses connected with innovation, other types of training are not included as indicator. Barney and Porter (1985) pointed that human resources or training and technology brings competitive advantage to organizations, so they can be considered as performance indicators.

The Bogotá Manual (2001) more focused into emerging countries; propose the success of the technological effort related to sales performance (domestic and foreign) and earnings. ASSAF Institute that has displayed indicators of the sectors of Brazilian economy since 2000 also displays sales growth, margin balance, etc.

In technological effort is considered all R&D activities, including projects of innovation. FINEP, in its program called *Subvenção Econômica*, offers projects that must be accomplished until 3 years.

According to Cruz (2010), investing in R&D brings return to the organizations, but there are great possibilities that this return would be in a long-term period. Queiroz (2009) pointed out that this R&D return could not be in a short-term period, this return happens from a medium-term period until a long-term period.

The return in R&D depends on sectors features of each organization, for example, Natura's renovation products cycle takes from 2 years until 3 years (Fernandes Jr. & Oliveira, 2010). According to Tromboni (2002), Natura's new products projects lasts 6 months to 2 years.

According to Abbad and Meneses (2009) there are not many methodologies that evaluate training results into organizational performance, many of them consider just financial impact.

Abbad & Meneses (2009) presents a logical model to evaluate training programs and in this model is proposed a long-term period analysis. Marras (2001) points that training has a short-term period effect.

Developing the Research

This research has quantitative aspect; it has been analysed company's data such as evolution of investments, comparison with its respective sectors and it was used investments data to fulfill statistical correlation. This is a descriptive research because has been used studies, manuals,

organizations that work with this issue, have been found variables that work with the dilemma between projects of innovation and organization's performance, and also has been described innovation effort values from a company with its respective performance results, it has been used a comparison between its results and its sector.

Beyond descriptively analyse company's data, it has been used quantitative analysis with inputs and outputs from process of innovation.

It was researched innovation process variables to evaluate the performance of this company; with statistical analysis were identified inputs from process of innovation that have correlation with outputs, that is, which variables is correlated with company's performance.

The correlation analysis use two variables X and Y, and identify if there is association between them. According to Cooper & Schindler (2001), through analysis it is possible to identify features as strength and direction. For example, in this research it had been identified the relation of investments in R&D with sales, margin balance and patents.

In order to make the analysis of innovation and performance were used published data in management reports, seminars, so documental and bibliographical researches have been used.

It has been used a not intentional probabilistic sample because it has chosen one of the companies which received subsidies from *Financiadora de Estudos e Projetos (FINEP)* through *Subvenção Econômica Program*. According to Silva & Menezes (2001) not intentional probabilistic samples are used when they are good representatives of the population.

FINEP was chosen for this research, because it is a public enterprise in partnership with Science and Technology Ministry in Brazil and supports IBGE to make PINTEC research. It is a reference in offering subvention to companies considered innovative, according to its criteria and it is the mainly government agency that supports science, technology and innovation. It has reports available from companies that received subvention and with its values. The availability of information and the recognizing that FINEP is a trustworthy government agency were determined to choose FINEP as a sample to find a company for this research. And *Subvenção Econômica Program* was chosen because of its non-reimbursable resources to Brazilian companies.

It was researched variables in the literature review step; it was considered these variables in their respective areas:

Table 2: Variables of the research

Theoretical Dimensions	Description	References	Variables	Vectors
Innovation	Indicators that measure innovation investments in an organization and bring competitive advantage.	Barney (1991), Geisler (1999), Bogotá Manual (2001), Oslo Manual (1997), Marins e Zawislack (2010), Porter (1985)	Projects of innovation R&D Training	Input Input Input
	Indicators of innovation and financing used to measure innovative companies' performance.	Bogotá Manual (2001), Oslo Manual (1997), Marins e Zawislack (2010)	Patents Sales growth Margin Balance	Output Output Output
Performance				

For the purpose of analysing Innovation and Performance it was considered variables in this study as inputs or outputs. When it is used an innovation effort in an organization there will be outputs, results, because of that were considered variables of innovation and financial to analyse performance from this innovation effort. Projects of innovation, R&D and training are innovation efforts from a company that is why they are considered as inputs. Patents, sales growth and margin balance are outputs, because they measure the company's result.

It was researched variables in the literature review, and it was considered those who are more important for this research. R&D, Human Resources qualification, more specifically training, and patents are considered traditional indicators of innovation, these are considered in many studies with innovation, and therefore, they are relevant for this research. Projects of innovation are also included,

because the company in this research received subvention from FINEP, the program called *Subvenção Econômica*.

In this research was also included evolution of sales and margin balance, because Bogotá and Oslo manuals propose indicators which involve sales and earnings, and also they are displayed in ASSAF Institute.

So, this is the scheme for this study. R&D investment, projects of innovation and training are inputs for this company process of innovation. For the purpose of analysing the results of these investments are used as outputs patents, net sales growth and margin balance.

FINEP began *Subvenção Econômica* Program in 2006. This program gives non-reimbursable resources to Brazilian companies considered innovative in order to develop innovative products, processes and services. This type of program shares costs and risks with subsided companies.

FINEP displays reports from companies that received subvention in 2006, 2007, 2008 and 2009. Among the companies with more subsided projects and with more information disponibility by its own source, it was chosen Natura, a company that works with cosmetics products. It was not used FINEP reports from 2006, because there are not values from these subsided projects.

Inputs (Innovation)

In this topic is showed projects of innovation, R&D and training data from Natura.

Projects of Innovation

Projects of innovation values are inputs to process of innovation. In this research are considered projects that Natura received from *Subvenção Econômica*, the FINEP program, from 2007 until 2009, the total was US\$4,632,593.26.

R&D (Investment in Innovation)

It is possible to consider investment in innovation as R&D synonym, Natura calls investment in innovation. Natura displays in its website investments in innovation. For the years 2004, 2005 and 2011 there was not data, that is why it was used an average from the years 2006 until 2010. The average for 2004, 2005 and 2011 was 2.98% from net sales. This value is close to what Eduardo Luppi, Natura's manager exposed, he said that Natura invest 3% of its net sales in R&D. (Fernandes Jr. & Oliveira, 2010). Below there are investments in R&D relativized with net sales:

It is possible to see an almost constant 3% investment in innovation tax from 2004 until 2011. This table shows investment in R&D relativized with net sales. Natura invests in average US\$211.612.023 in R&D.

Table 3: Investment in Innovation (US\$ thousands)

	2004	2005	2006	2007	2008	2009	2010	2011
Net Sales	3,574,721	4,609,971	5,569,113	6,206,856	7,308,398	8,568,955	10,376,158	11,294,575
Innovation Investment	104,526	137,377	177,356	218,968	208,060	225,836	282,194	336,578
Net Sales Tax invested in innovation	2.98%*	2.98%*	3.18%	3.53%	2.85%	2.64%	2.72%	2.98%*

Source: Natura's reports and government agency *Comissão de Valores Mobiliários* (2004 a 2011)

Training

Here it was considered investment in training and staff development. Natura displays all the investments from 2004 until 2011 in its annual reports:

Table 4: Training Investment (US\$ thousands)

Year	Investment
2004	15,907
2005	25,601
2006	32,897
2007	32,222
2008	28,405
2009	40,847
2010	52,002
2011	53,358

Natura invests in average US\$35,155,373 in training, the investments varying 37% comparing with the average.

Outputs (Performance)

In this topic are presented the variables patents, sales growth and margin balance. Also it is presented Natura's sector analysis: sectorial sales growth and sectorial margin balance.

Patents

In order to present a patent requirement is necessary that an invention be new, it results from an inventive activity and also has industrial utility. When the patent is required it is possible to submit a priority date of the patent, so, there is a deadline for the patentee patent his invention. In this way, in this research was considered the number of priority patents of Natura.

It was collected data from Derwent Innovation Index, available for Public Brazilian Universities through *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (CAPES). Afterwards it was used the software Vantage Point to analyse the number of priority patents in the period between 2004 and 2011.

Natura presented ups and downs in the number of priority patents, the years 2008 and 2009 showed 14, the biggest number Natura had. Through eight years Natura presented 72 priority patents.

Sales Growth

Other vector is sales growth. Natura had growth through the years 2004 until 2011. Natura shows sales growth, this indicates performance growth, but it is important to include sectorial analyses to compare the performance with other companies in the same sector.

Assaf Institute (2004) presents valuable indicators for publicly held company and also sectorial indicators. De-Mello & Marcon (2006) pointed that into sectorial performance analysis, the resources are important to differentiate one company from others, as well sectorial analysis that comes in second place. So, it is important to present Natura's performance comparing with its sector. However, the analysis goes from 2004 until 2010, because the Institute does not give sectorial data in 2011.

Natura showed a higher performance in sales than the sector until 2007. In 2008 the sector grew more than Natura, in 2009 the numbers were almost the same and in 2010 Natura surpassed the sector's performance.

Margin Balance

Margin Balance is the relation between net Sales and net Profits. Normally showed in percentage, it represents how much you earn from the sales.

Based on sectorial indicators from ASSAF Institute (2004), it is presented the relation between Natura and its sector. From 2004 until 2010 Natura showed margin balance bigger than the sector.

Correlation analysis results

From the collected data already presented here, it was made the correlation analysis. This analysis aimed to identify which inputs that are Projects of innovation, R&D and Training which have correlation with outputs that are Patents, Sales and Margin Balance.

According to FINEP, companies have until 3 years to accomplish their subvention projects *Subvenção Econômica*. So, according to Pareto's logic that goes in the same direction as ABC curve, it was shared the values received from the projects into 20%, 30% and 50%, considering 3 years that the companies must accomplish their projects. This logic was used because hardly these companies would receive the subvention and accomplish their projects in just one year, because they have 3 years to do that.

Queiroz (2009) pointed out that R&D return could not be in a short-term period, this return happens from a medium-term period until a long-term period. According to Cruz (2010) there are great possibilities that this return would be in a long-term period. However, in this research the R&D analysis with outputs were made in a different way insofar as depending on the sector the innovation rules will be different. It was analysed this return through development products time that is received from R&D investments. For Natura it was considered 2 years of R&D return. (Fernandes Jr. & Oliveira, 2010; Tromboni, 2002).

The training correlation analysis with outputs was made in a short-term period, because Marras (2001) points that training has a short-term period effect. Abbad & Meneses (2009) present a logical model to evaluate training programs and in this model is proposed a long-term period analysis, however this research points out that the period used is 8 years, that is why it should use short-term effects, like Marras (2001) says. Below it is a table with the correlation analysis:

Table 6: Correlation Analysis with inputs and outputs from process of innovation

		Patents	Sales	Margin Balance
Natura	R&D	0,598	0,904*	-0,459
	Projects	-0,945	0,996	0,142
	Training	-0,168	0,899*	-0,852*

*Significance p < 0,05

These are the correlated values calculated with two variables inputs and outputs. The values that present significance are those who are dependent, directly or indirectly. It is considered 5% of significance.

Natura has high and direct correlation between R&D and sales and training and sales. The inputs are correlated with net sales and there is significance. The variables training and margin balance showed indirect correlation, because the value is close to -1. As larger is the investment in training, smaller is the margin balance.

Discussions and Conclusion

The outputs are patents, sales growth and margin balance. Natura showed a positive growth and protrude in relation to the sector in almost all years; it showed just smaller sales in 2008. About margin balance Natura showed falls, but the tax remained more and less constant and it was above sector's margin balance. The number of priority events it was not constant, showing ups and downs.

Brito, Brito & Morganti (2009) and Gallon, Reina & Ensslin (2010) pointed that in their researches that investment in innovation is related with net sales, this is also observed in this research because Natura showed high and direct correlation between these variables.

As the Margin Balance is related with profits, it is possible to notice that Natura did not present profits because of investment in innovation. This was researched before with Brito, Brito & Morganti (2009).

Barney (1991) and Porter (1985) affirm that through human resources and technology it is possible to acquire competitive advantage. The resource training, considered as one of the components of human resources, projects of innovation and R&D are considered as important technological components and are inputs for process of innovation. The outputs were positive and in the majority were above the sector, so Natura transformed these resources in competencies, and consequently it acquired competitive advantage.

The companies beyond using resources that bring competitive advantage should maintain the performance, in other words, manage the innovation. Grupp & Maital (2001) point that to manage innovation is risky and hard, Barañano (2005) agrees when expose that to innovate it is important to consider other factors such as technological, economic and social.

There were some limitations during this research, starting by the research method, it was not considered all the enterprises that received the subvention from FINEP, just one.

In the innovation investment it was necessary to work with average in some years that it was not found information. The Oslo Manual (1997) consider just training investment as indicator when is related with innovation, other types of training investment are not included. Natura gives data about training in general. However, it is possible to consider the general training as a resource that brings competitive advantage (Barney, 1991), consequently, it would be an indicator of innovation.

It was considered the general results and not related with new products. So, sales and margin balance were considered as general results and not from new products or incremental products.

The payback for training it was not specified to Natura. With this research, were identified variables that give positive effects on Natura's performance. Below there is the results synthesis:

Table 7: Variables Synthesis that gives positive effects to performance

	Inputs that potentiate	Outputs that are	Outputs follow sector's
Company	performance	potentiated	growth?*
	R&D	Sales	
Natura	Training	Sales	Yes

*Patents are not included into sectorial analysis

All the variables that showed high, direct and significance correlation with outputs were considered variables that give positive effects in the performance; this is located in the first column. In the second column it is presented which variables are correlated with inputs. In the third column shows that Natura followed sector's growth, that is also a way to give positive effect on performance.

The objective of this research was accomplished, because it was found indicators that make positive effects on Natura's performance.

Limitations and Further Research

Meireles, Sanches & Sordi (2010) relate that traditional indicators are not adequate to measure successful innovations. The number of patents, for example, would include failure innovations and R&D expenses that it would not result in successful innovations.

According to Marins & Zawislack (2010) the traditional indicators do not give a wide view from how innovation activities affect organizations performance, mainly for emerging countries, where formalized R&D structures are less presented than in industrialized economies.

Saenz & Souza Paula (2002) point out that developed and developing countries must have a different methodology for indicators because developed countries have a different science & technology culture, human resources standard, horizontal integration, and financial resources availability are different for developed countries. They point out the importance of Oslo Manual to measure international competitiveness. However, for Latin American is necessary its own indicators of innovation, in order to reflect the setting and necessity of these countries. So, according to these authors Bogotá Manual is more appropriated to Latin America.

This is a similar view with Marins & Zawislack (2010); for developing countries or emerging countries is necessary indicators of innovation that complement and supplement the differences

between them and developed countries. According to World Intellectual Property Organization (2012) is necessary a wide analysis that involves developed countries as well developing countries that is why in its research Global Innovation Index, was beyond the traditional indicators of innovation.

Despite of traditional indicators limitation, pointed by some authors, these are the most used to measure innovation performance. However, Marins & Zawislack (2010) created new indicators of innovation from Economic Theory. These indicators are in four dimensions: entrepreneurship, structure, coordination and value.

The new indicators of innovation are a proposal for a deep analysis, a complement for traditional indicators and mainly a proposal to measure innovation in emerging economies that applies in this research.

Thus, new studies can be made considering new indicators of innovation, however it would be necessary more details, consequently it would not be possible to make this research using secondary data.

Another interesting proposal is checking from the projects submitted to FINEP, which patents were created, in order to check the temporal variation between project and creation of a patent, enabling to determine specifics gaps with a time of technological development.

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