FAPERJ'S CHANGING ROLE IN SUPPORTING INNOVATION IN THE STATE OF RIO DE JANEIRO, BRAZIL

Sub-theme: 11 Years of Triple Helix in Brazil
Keywords: innovation, public policy, foster, triple helix, economic development.

1. Introduction

FAPERJ (Carlos Chagas Filho Foundation for Supporting Research in the State of Rio de Janeiro) is a public foundation linked to the Rio de Janeiro State Department for Science and Technology (SECT-RJ), the aim of which is to stimulate research and foster the kind of scientific and technological activities necessary for the socio-cultural development of the state of Rio de Janeiro, Brazil.

FAPERJ was created on June 26, 1980, through the merger of FIDERJ (Foundation of the Institute for the Economic and Social Development of Rio de Janeiro) and CDRH (Foundation of the Center for the Development of Human Resources in Education and Culture), in response to declining support from the federal government, after the end of the military regime that came to power in 1964 and the subsequent return of democratic elections for the governments of all the states in Brazil in 1983, a fact that also had a strong effect on S&T policy throughout the country (Etzkowitz et alii, 1998).

Only towards the end of the 1990s did FAPERJ broaden the range of its activities. Various programs were introduced to encourage innovation, in partnership with the universities, although their scope was still limited, compared to the programs for scientific and technological development, which were the agency's forte.

As from the year 2000, with changes in the national S&T&I scenario, culminating in the federal government's Law on Innovation, enacted in 2004 and regulated in 2005, FAPERJ further broadened its scope, launching programs to stimulate company innovation.

The objective of this work was to evaluate the evolution of FAPERJ's role in regard to the public policies developed in support of innovation and to analyze the way the transition from a policy of support for scientific and technological development to a policy that also encouraged innovation came about. An evaluation was also done of the degree to which the policies and programs of support to innovation followed the Triple Helix model, which is used as the paradigm in the analysis of university-industry-government relations.

2. State of The Art About the Topic

This work was based on a study of the concepts of innovation and the triple helix.

Innovation has been viewed as the key element in economic and social development, providing a special opportunity for developing countries – and, by extension, for regions such as Rio de Janeiro, Brazil – within a globalized economy.

In the economic sphere, the importance of innovation was already recognized during the last century, particularly in the last two decades (Mowery and Rosenberg, 2005).

In the first few decades of the twentieth century, innovation was considered by economists such as Schumpeter, Abramovitz and Solow[1] as being a variable of the function of economic development.

Schumpeter (1939), in his concept of creative destruction, thought of innovation as a driver of cycles of economic development distinguished by the replacement of established companies by new companies that were offering innovative products to the market.

Important transformations began to take place in the '70s and '80s, with the development and commercial exploitation of innovations in the fields of microelectronics and information technology, telecommunications and new materials, as well as appreciation of the future importance of innovations in the biosciences, which definitively consolidated the role of scientific research and its natural location, the university, in social and economic development (Kim and Nelson, 2005; Etzkowitz and Leydesdorf, 2000; Etzkowitz, 2005).

Innovation, especially of the technological kind originating from scientific research, became the focus of interest of nations all around the world and began to more thoroughly involve the universities and business. However, linear the model, the traditional metaphor used to represent the way information is transferred between these players, and which defines specific independent tasks for each one of them and the unidirectional flow of knowledge from the former to the latter, no longer corresponds to the forms of relationship needed to attain the objective of transforming knowledge into innovation (Etzkowitz and Leydesdorf, 1998).

The triple helix, which was also used as a point of reference for this work, is a conceptual model that suggests there is a new dynamic in the relations between university, industry and government and in the participation of each one in actions to foster innovation, using scientific research to generate new knowledge, and technology (Etzkowitz, 1996, 1998).

[1] Schumpeter, R.M. Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process. Hardcover. 1939; Abramovitz, M. Resource and Output Trends in the United States since 1870. American Economic Review, v. 46, p. 5-23, 1956; SOLOW, R.M. Technical Change and the Aggregate Production Function. Review of Economics and Statistics, v.39, p.312-20, 1957.

This model was defined by its authors based on analysis of the activities of the Massachusetts Institute of Technology (MIT), during the 1930s, to foster the development of the New England region, in the United States, which includes the state of Massachusetts, where the university is located. The region was undergoing a process of economic decline, due to the migration of local companies to other parts of the country, in search of ease of access to inputs, transportation and distribution channels (Etzkowitz, 1996).

The response of the MIT director was to persuade the leaders of the region's government and industries that commercial exploitation of the knowledge generated by that center of learning and transferred to existing companies and others still to be created would help to bring about the desired economic development (Etzkowitz, 1996).

Special mechanisms in support of this process were thus created: the assisted method of knowledge transfer – through transfer offices – and the financing to set up new businesses – through venture capital, being the foremost of these (Etzkowitz, 1996).

The principal focus of this model is to analyze the way the relationship is established between the parties involved and how this process can cause changes in their behavior. It was noted that, while each one maintained its traditional specific areas of expertise, they also had to facilitate matters for the others, in order to create the openness necessary for the kind of relationship that was sought (Etzkowitz,1996).

Meanwhile, the traditional function of the university, of preparing qualified manpower for industry, has been taking on a new shape, first, with the introduction of research activities, then through the collaboration in economic development, and, finally, with the emergence of entrepreneurial universities, acting as bases for the incubation of start-ups and participating actively in local development (Etzkowitz, 2003).

The presence of scientists in companies devoted to basic research, developed for the purpose of being applied and serving the interests of the company, and of scientists conducting research at the universities and concerned about the applicability of their discoveries, made possible and facilitated the transmitting of knowledge between universities and companies, making this activity more direct, without problems regarding the language used and employing facilities for the transmission of tacit knowledge (Viale and Etzkowitz, 2005).

The university has never been an isolated entity. Over time, through an evolutional process, they have maintained close relations with the church, with the monarchs or, subsequently, with the government, and, more recently, with industry (Martin and Etzkowitz, 2000). At the same time, the universities and scientists have always generated know-how that, when suitably applied by industry, has been transformed in a variety of ways in benefit of humanity.

The entrepreneurial university, which has shown itself to be a natural development from the knowledge university, came about when US researchers, seeking resources to conduct their research at a time when funding was scarce, became entrepreneurs, as, in addition to securing resources, they found themselves guiding teams, arranging physical space, equipment and inputs, took on risk and related directly with companies, providing consultancy services or performing research that was in their interest. With this learning, together with the perception of the true value of their research, the scientists began to set up their own firms (Etzkowitz, 1996).

The transformation of the research university into an entrepreneurial university still divides opinion, with some people believing that the university's involvement with economic activities damages its ethos, since, among other considerations, such a transformation would cause the scientists to distance themselves from their academic activities, dedicating themselves more to their business activities. Another strong criticism is, within this new scenario, a lack of interest in basic research, devoted to generating the pure knowledge that, over the long term, ensures the progress of scientific development in the broader sense (Martin and Etzkowitz, 2000).

The entrepreneurial university, because it is grounded in research that has commercial potential, supports enterprise and the incubation of start-ups, and participates in regional strategies to foster innovation, among other traits, has become a key element in local development (Etzkowitz and Zhou, 2007).

The spillover from the entrepreneurial university's actions that occurs through the commercialization of its know-how, from the spin-offs, the creation of start-ups, the training of manpower, the stimulation of enterprise, the bringing together and creating of new businesses, permeates the local economic and social environments and fosters development (Etzkowitz and Zhou, 2007).

3. Research Focus

Brazil has continued the building of a scientific and technological base, which was begun in the 1950s, with the setting up of two federal agencies, the CNPq (National Council for Scientific & Technological Development) and CAPES (Coordination for the Development of University Graduates), in 1951, for the purpose of fostering scientific and technological development in the country.

Meanwhile, the Brazilian states began to implement their own S&T policies, led by São Paulo, which founded FAPESP (Foundation for Supporting Research in the State of São Paulo). FAPESP was formally set up in 1960, and FAPERJ in 1980, as part of the movement within Brazil to develop infrastructure to support S&T&I activities. It is important to note that the

respective state constitutions determine the transferring of 2% of the revenues from state taxes to the respective institutions for the fostering of R&D&I.

In 1969, the federal government established the FNDCT (National Fund for Scientific & Technological Development), which only came to be regulated on November 12, 2007, whose resources have been managed by FINEP (Funding Agency for Studies and Projects), a state-owned company that was set up in 1967, under the aegis of the MCT (Ministry of Science & Technology), since 1971.

Prior to the enacting of the aforementioned law, the Brazilian situation was shaped by the largest program for fostering innovation that had been seen, up to that time - the PADCT III. This program was created by the Brazilian government, along with the World Bank, in 1984, as an instrument to supplement the existing policy for fostering S&T&I, with a view to bringing about a quantitative increase in the financial support for research, through the introduction of new criteria, and driving mechanisms and procedures, in areas that had been defined as research priorities (Terra et alii, 2002).

According to Terra (2001), since the introduction of the new Federal Constitution (see art. 218), in 1988, the State has sought to foster and encourage scientific and technological development, research and technological training. Basic scientific research and technological research get priority treatment, aimed at developing the national and regional production systems. What is more, the State stimulates the training of human resources in the fields of science, research and technology, including special working conditions. Something worth highlighting is that support is provided under the law to companies that invest in research, allowing the states and the Federal District to link a portion of their budget to public entities that stimulate scientific and technological teaching and research.

To achieve those goals, in the 1990s, tax incentives were provided in relation to the importing of goods for the purpose of scientific and technological research; training and competitiveness in the IT (information technology) sector; and stimulating business investment in technological R&D, all aimed at increasing the competitiveness of Brazil's industrial and agribusiness companies.

Furthermore, with regard to the issue of intellectual property, there has been considerable modernization since 1995, covering the areas of genetic engineering, patents, crops and copyrights on computer programs.

The present Brazilian S&T&I situation favors an entrepreneurial model, the tangible results of which should be applied in the regions. The legal context for S&T&I in Brazil can now be mapped from a variety of laws that have changed the national scenario for research,

development and innovation. These include: the laws that created the sectorial funds, the new IT law, the biosafety law, the law popularly referred to as the "Lei do Bem" (Law n^{o} 11,196/05), the law on innovation, and their respective regulations. One can also cite, as a driver of change in the situation of Brazilian research, the bill regulating the FNDCT (National Fund for Scientific & Technological Development) and PITCE (Industrial, Technological and Foreign Trade Policy), known since 2008 as the PDP (Policy for the Development of Production). The PDP aims to define integrated actions to raise domestic industry to a higher level. To that end, it includes innovation and scientific and technological advances as part of a strategy for tackling the competition and augmenting the penetration abroad.

The legislation that created the sectorial funds was the first initiative to change the way R&D&I is financed in Brazil, laying down new standards to reinforce the national system of innovation. It is aimed at ensuring stable funding for the area and establishing a new management model, with the participation of various social segments, as well as promoting greater synergy between universities, research centers, the production sector and local government.

The sectorial funds for S&T first began to be created in 1999, in the wake of the privatization of certain sectors of the Brazilian economy, for the purpose of augmenting and ensuring a constant flow of funding for R&T&I. There are now 17 sectorial funds in Brazil, 15 of which relate to specific sectors, while two traverse sectorial boundaries. One of these, called the FVA (Green-Yellow Fund, after Brazil's national colors), is dedicated to university-company interaction, while the other, called CT-Infra, is dedicated to supporting improvements in the infrastructure of S&T institutions.

In 2001, the federal government organized a National Science, Technology and Innovation Conference and published the Science, Technology and Innovation Green Paper. The following year saw the publication of a White Paper and the beginning of the restructuring of the sectorial funds.

The Tundisi Report, portraying the results of a survey into the conditions for the development of science at the federal government research centers, which was carried out at the request of the Ministry of Science & Technology; the launching of the Science, Technology and Innovation Green Paper, which served as the basis for the II National Science, Technology and Innovation Conference, and the White Paper, all resulting from this movement, created a context for transformation that prized innovation and came to be reflected at FAPERJ.

The 2002 project regulating the FNDCT, which had been set up in 1969, reinforced in 1991 and expanded in 2001, is of an accounting nature and aims to stimulate innovation and foster scientific and technological development, with a view to ensuring a better life for society in general, with improved security and competitiveness, and economic and social development for

the country as a whole, by providing financial support to priority programs and projects for scientific and technological development in Brazil. All the resources of the sectorial funds, the only stable source of funding for science and technology provided under Brazilian law today, are allocated to the FNDCT.

Another milestone for Brazilian research was the law referred to as the new IT Law (Law n° 10,176/01), which addresses the issue of training and competitiveness in the IT sector and favors, by means of tax incentives, the producers of goods and services in the fields of IT and automation; in other words, those who invest in research.

The innovation law (Law n° 10,973/04), enacted in 2004 and regulated in 2005, augmented the legal framework governing S&T&I in Brazil. This law facilitates interaction between universities, research institutes and the production sector, thereby stimulating the development of innovative products and processes at Brazilian companies, with a consequent major impact on the country's competitiveness, all in accordance with the priorities defined in the PDP. This law is organized around three focal points: creating a favorable environment for strategic partnerships between universities, technological institutes and companies; encouraging the participation of science and technology institutions in the process of innovation; and stimulating innovation in industry.

After implementing the determinations of the federal law on innovation, the state governments began to draw up, enact and implement their own respective laws regarding innovation. In the state of Rio de Janeiro, Law 5,361 was enacted in 2008 and regulated in 2009.

In its turn, the biosafety law (Law n° 11,105/05) laid down safety standards and established mechanisms for the monitoring of activities that involve research on genetically modified organisms (GMOs) and their by-products; established the CNBS (National Biosafety Council); reorganized the CTNBIO (National Technical Committee on Biosafety); and addresses the PNB (National Biosafety Policy).

All these regulations determine procedures for conducting research in Brazil, and are of particular importance since they address with two controversial issues: the study, production and commercialization of GMOs and stem cell research. The provisions of the law state that the CTNBIO must perform a technical analysis of any applications to plant GMOs.

The "Lei do Bem", which was also enacted in 2005, aims to stimulate exports, by reducing taxes and providing incentives for research. The law consolidates the existing legislation on tax incentives for research, without making any significant changes. The principal objectives are to encourage R&D, stimulate employment in the area and get researchers to set up their own SMEs (small and medium-sized enterprises).

Under the innovation law, it has been possible to launch new federal programs in support of companies. Public notices have been issued nationwide, focused on innovation in industry, such as those offering subsidies, which have been issued annually since 2006. Another line of action, aimed at diversifying the S&T&I results, involves the state foundations that support research. Along these lines are the PAPPE (Program of Support for Company Research), launched in 2004; PAPPE Subvenção (in 2008) and PAPPE Integração (in 2010). These three measures provided for matching state government funds, as well as defining the sectors that have priority in receiving support.

FAPERJ has shifted its focus to helping companies find a collaborator in the university and professors to understand the needs of industry. According to its scientific director, "the FAPERJ Council believes that FAPERJ should play a role in economic development and they are even instigating us to find new working methods".

The Foundation's objective is to "Foster the research and scientific and technological training necessary for the socioeconomic and cultural development of the state of Rio do Janeiro"

4. Methodology

The methodology employed was of an exploratory nature and involved a bibliographical and documentary review of the topic, including books and articles published in Brazil and abroad. Additionally, four semi-structured interviews were conducted with the present and former directors of the Foundation, as well as consulting FAPERJ reports and its website.

5. Findings

The results of the FAPERJ study can be presented in terms of the following periods:
The possibility of FAPERJ supporting Science and Technology in Rio de Janeiro, back in 1998, was spelled out in the words of a former State Secretary for Science and Technology and former president of FAPERJ: "...with a budget of around twenty million reais, most of it allocated to scholarships, as was the case in 1998, one couldn't possibly look to FAPERJ as a foundation capable of boosting science in the state of Rio de Janeiro".[2]

However, from FAPERJ's closer relations with federal government bodies supporting S&T, during the period 1995-1998, came the first moves to promote interaction between universities and industry and pronouncements by those who saw innovation, particularly technological innovation, as the key to economic development, as was already being addressed and systematized by the OECD (Organization for Economic Co-operation and Development).

[2] Monitor Mercantil, May 16, 2008.

One could see a series of changes taking place at the Foundation, during the period 1999 to 2002, not only with the launching of new programs in support of scientific research – "Cientista do Nosso Estado" and "Bolsa Nota 10" – which are considered to have been a success and have been retained until today, but also through initiatives to introduce innovation as a theme in other programs (Faperj, 2006 a).

The promoting of university-industry interaction was addressed by the president, when he took over the running of FAPERJ in 2000, as necessary for the country's development, while also recognizing the lack of a favorable culture, on both sides of the equation, for such a relationship, due to the mutual distrust between the parties involved.[3]

That same year, a committee was set up, in which FAPERJ participated, with the objective of formulating a sectorial policy on technological development for the state of Rio de Janeiro (Faperj, 2006 a). This committee, which also included SECTI (Department of Science, Technology and Innovation), utilized the RIS (Regional Innovation Strategy) methodology applied by the European Union, with the Barcelona region as the point of reference (Terra, Barros and Siedl, 2003). Out of this work came the formulation of proposed policies for fostering science and technology and the production of innovative goods and services, aimed at promoting the socioeconomic development of Rio de Janeiro, based on a survey of regional aptitudes. No evidence was found to indicate that, with the change of government that occurred at the time, any defined policies had been implemented, which may have been a consequence of government political considerations taking precedence over state interests.

Another initiative in 2000 was FAPERJ's evaluation of the possible creation of "Municipal Funds to Support Scientific Research", the earliest record to be found of an initiative to address the subject of science and technology in the interior of the state (Faperj, 2006a. p. 33).

The Coordination for Technology was also set up, for the purpose of supporting technological innovation that is developed at small businesses. This initiative led to the launching of the TPE (Small Business Technology) program and the first announcement in support of innovation, with a record of the projects registered and chosen. However, this public notice is cited as being the third in support of small technology oriented businesses during that period, the first two being in support of incubated businesses and the university business incubators.[4]

Hence, it was confirmed that, in the period 1999 — 2002, there were initiatives to promote innovation and university-industry interaction, including the publication of the first public notices

[3] http://www.faperj.br/boletim_interna.phtml?obj_id=393, accessed on August 14, 2009.
[4] http://www.faperj.br/boletim_interna.phtml?obj_id=850, accessed on August 31, 2009.

offering financing and support to technology and innovation, culminating in the setting up of the Technology Board, in 2002. (Faperj, 2006 a)[5].

The analyses performed and data obtained, that are presented below, cover the events and actions, on a yearly basis, and show the actual amounts for the period being studied. A comparative study was also carried out for the years being studied, with a view to observing whether there was a positive upward trend in support of technological innovation.

Tables 1 and 2, below, consolidate the quantitative data on the number of public notices published and the resources offered, during the period 2002 — 2008.

Table 1 — Total number of Public Notices and corresponding Resources: 2002 – 2008

	2002	2003	2004	2005	2006	2007	2008
Total Nº of Public Notices	5	6	5	6	7	16	29
Resources Allocated (*)	14,94	21,30	10,26	8,85	26,44	47,17	107,44

(*) Committed funding, in U$ million. Paid out over the period specified in the announcement.

Source: Gonzalez, F. B.(2009)

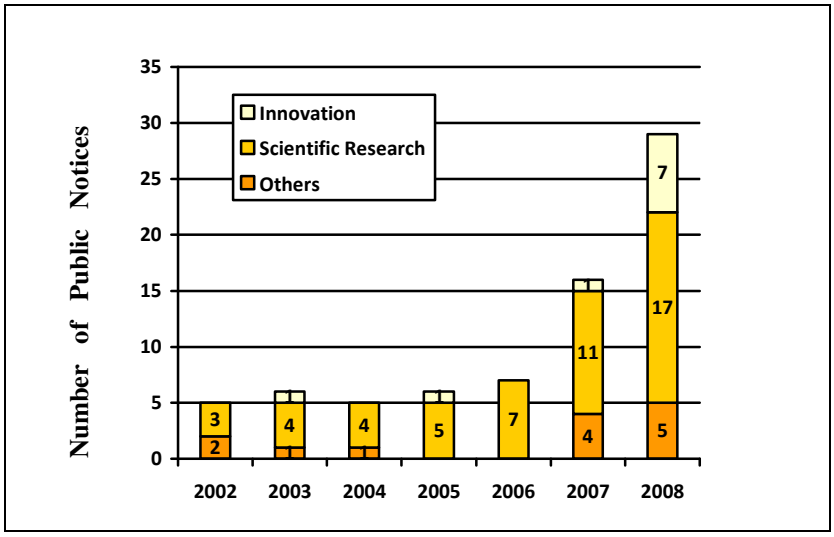
These data do not reveal any significant variation in the number of public notices, up to 2006. In 2003 and 2006, the funding available was considerably higher than in the preceding years, although this wasn't reflected in the increased number of public notices. The federal funding received under formal agreements, for very specific objectives – in 2003 it was the resources of PAPPE (Program of Support for Company Research) and in 2006 it was PRONEX (Program of Support for Centers of Excellence)[6] – had a decisive impact on the amount of funding available.

Figure 1, below, shows the changes in the number of public notices according to the principal classification criteria: support to scientific research, to innovation and for other purposes.

Figure 1- Number of Public Notices, by type, per year

[5] The data available on FAPERJ's website about public notices substantiate only those published as from 2002. There is no formal record, on that website, of public notices pertaining to previous years.

[6] Federal Government programs.



Source: Gonzalez, F. B. (2009)

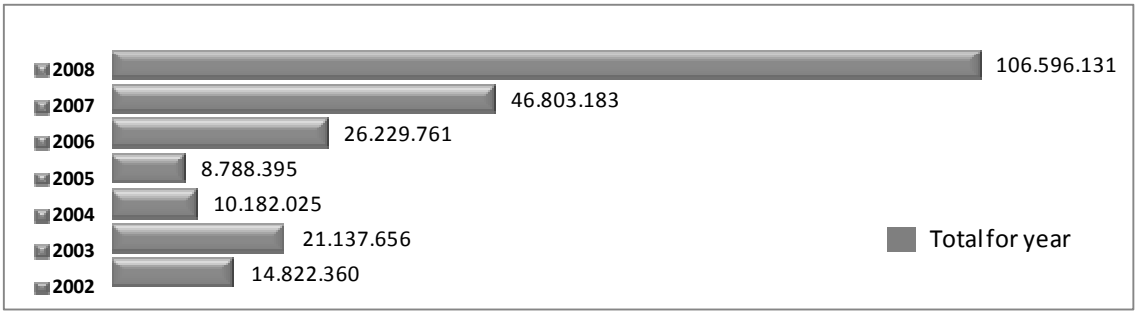
What one can observe, looking at Figure 1, is that in the years 2002, 2004 and 2006 there were no public notices in relation to support for innovation, whereas in 2003 and 2005, the ratio of public notices for innovation to those for scientific research, plus others, was 1:5. in 2007, despite the greatly increased volume of resources, this ratio was even more unfavorable to investment in innovation, at 1:15, but improved considerably in 2008, to slightly over 1:3.

An evaluation based on the number of public notices merely reveals the abovementioned classification. The issuing of seven public notices devoted to innovation, as was the case in 2008, made it possible to address a greater variety of topics and areas.

An analysis from the viewpoint of the allocation of resources complements this first assessment. This new approach also ascertained the proportional quantity of resources made available under the public notices for each type of allocation studied: scientific research, innovation and other purposes.

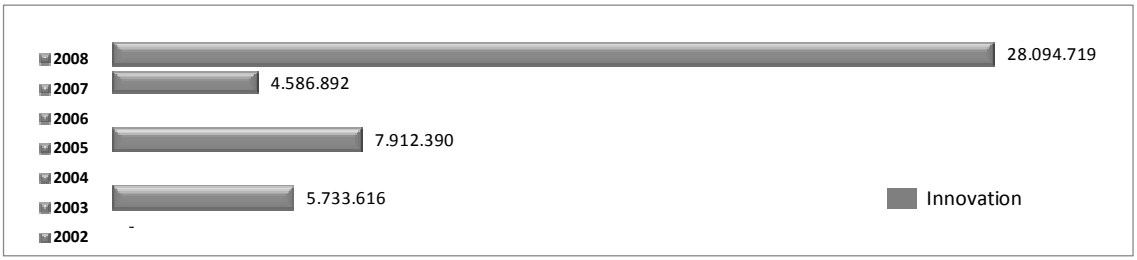
Figures 2 and 3, below, show the total amount of resources allocated under the public notices to scientific research/other purposes and to innovation, respectively, on a yearly basis, during the period 2002 – 2008. One can see that, as from 2007, the total volume of resources committed and paid out grew significantly. Figure 2 shows the annual totals allocated under all public notices, while Figure 3 shows that portion of the resources allocated to public notices supporting innovation.

Figure 2 - Resources allocated under all public notices (2002 – 2008)



Source: Gonzalez, F. B. (2009)

Figure 3 - **Resources allocated under public notices in support of Innovation (2002 – 2008)**



Source: Gonzalez, F. B. (2009)

Table 2 shows a breakdown, on an annual basis, for the period analyzed, of the total resources allocated under the public notices issued, those allocated to supporting innovation and to other purposes, and the percentage ratios between these different amounts.

Table 2 - Resources allocated, by purpose: 2002 – 2008

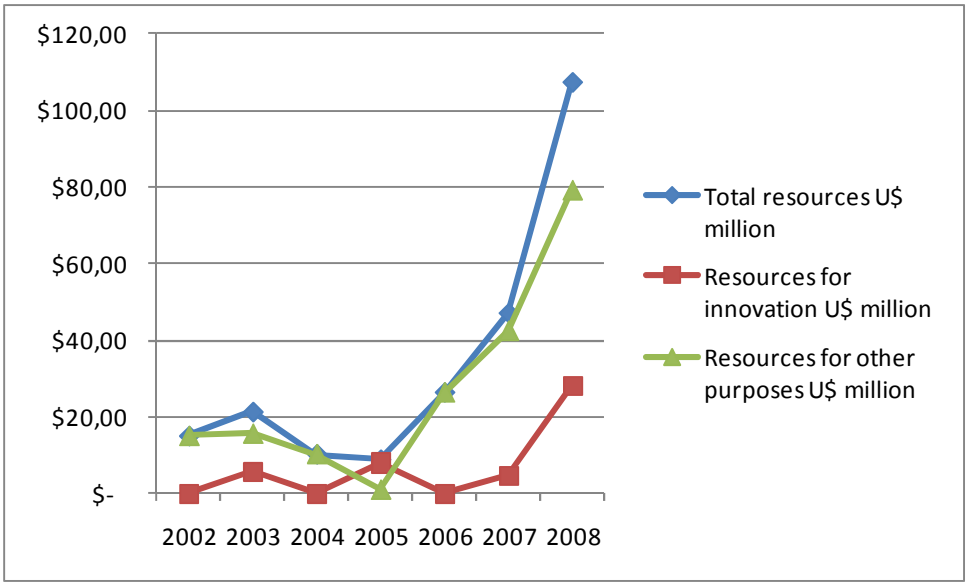
	2002	2003	2004	2005	2006	2007	2008
A - Total Resources (*)	15	21.3	10.26	8.85	26.43	47.13	107.44
B - Resources for Innovation (*)	0	5.7	0.00	7.91	0.00	4.58	28.09
C- Resources for other purposes (A - B) (*)	15	15.6	10.26	0.94	26.43	42.55	79.35
D - Ratio B /A (%)	0	26.76	0	89.37	0	9.72	26.14
E - Ratio C / A (%)	100.00	73.24	100.00	10.63	100.00	90.28	73.86

(*) Amounts in U$ million

Source: Gonzalez, F. B. (2009)

The data was used in preparing the visual representations in Figures 4 and 5, below:

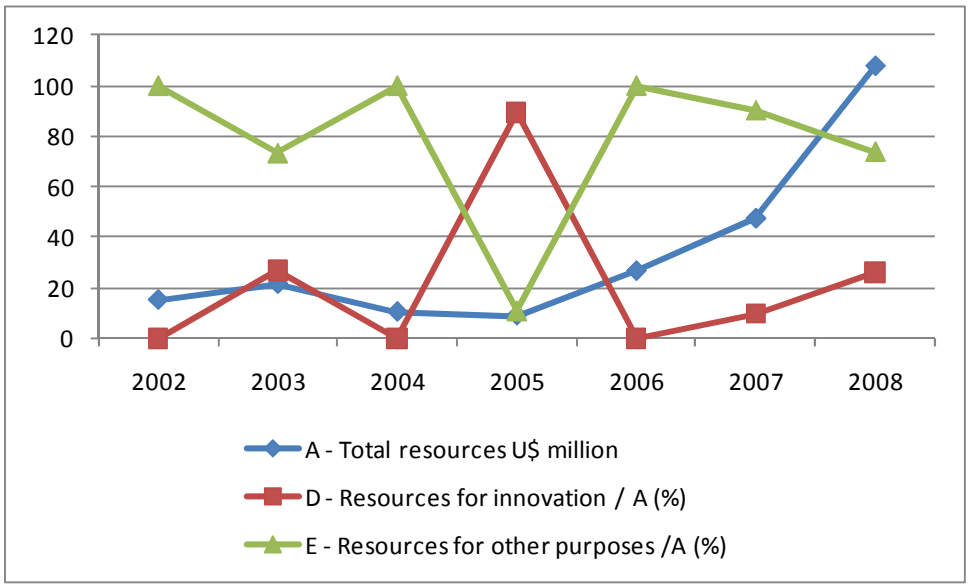
Figure 4 - Resources allocated, by purpose: 2002 – 2008



Source: Gonzalez, F. B.(2009)

One can see from Figure 4 that the resources allocated to innovation and to other purposes, under the public notices, grew considerably, as from 2007.

Figure 5 – Total resources and the proportion allocated, by purpose: 2002 – 2008



Source: Gonzalez, F. B. (2009)

One can see from Figure 5 that the changes in the amount of resources allocated to innovation were positive and showed steady growth, as from 2007, while the proportion allocated to other purposes showed a corresponding decline over the same period.

Analysis of the results obtained indicates growth in the resources allocated to innovation under the public notices, thereby favoring innovation over other programs. Nevertheless, one should

take into consideration in this analysis the influence of the federal government participation, which increased in financial terms just as FAPERJ was cutting back its matching funds under the public notice for the Rio Inovação program, in 2008.

On the other hand, no particular logic was discerned in the allocations to innovation during the period under analysis. Such reasoning is normally guided by public policy and medium / long term strategic planning.

A clear manifestation of intent was found to be underlying certain allocations, such as the level of importance, effort and impact of the restoration of research infrastructure, which was proposed to be carried out over a period of five years[7], as well as the attention to disseminating the programs implemented within the interior of the state, which is claimed to have been a success in recent years[8].

In the case of innovation, while the considerable variety of economic sectors covered by the public notices may be an indication that the increased funding has allowed a broadening of the program, it could also suggest that the program is becoming less focused.

One can question the logic behind the fact that a large proportion of the resources were allocated to innovation in 2005, when the total resources available were relatively scarce and there were few public notices in support of innovation; the allocation of a similar proportion of resources in 2003, when the total available was limited and there were few public notices, and in 2008, when the total resources were relatively abundant and there were more public notices in support of innovation; as well as the low proportion in 2007, when there was a significant increase in the total available resources, yet a very low number of public notices.

It should be noted that the resources provided to FAPERJ by the federal government and the irregular supply of its own resources were factors that influenced these variations.

A needs arising from the Foundation having become one of the agents of the Rio de Janeiro state Innovation Law, with consequently enhanced regular volume of own resources, ought to place among FAPERJ priorities the defining of policies and the planning that has so far been non-existent or has failed to be disclosed.

Supplementary to this analysis, a survey was carried out of the number of companies that have been benefited under the public notices devoted to innovation during the period of our analysis, the results of which are shown in Table 3, below.

[7] FAPERJ – Relatório de Atividades 2007 – 2008, p. 45.
[8] FAPERJ – Relatório de Atividades 2007 – 2008, pp. 16, 46, 47 and 52.

Table 3 – Public Notices in Support of Innovation: significant data: 2003 – 2008

Innovation at Companies		2003	2005	2007	2008	
		Rio Inovação I	Rio Inovação II	Support to Technological Innovation in R. J.	Rio Inovação 2008	Support to Innovation and Technological Dissemination
Public Notice No.		06/2003	08/2006	17/2007	15/2008	16/2008
Resources allocated under the Public Notice		5,73	7,91	4,58	13,76	3,44
Value of the Public Notices, by funding source	Finep	2,85	3,95	-	10,32	-
	Faperj	2,85	3,95	4,58 (*)	3,44	3,44
Resources paid out		3,94	7,47	6,59	13,76	13,44
Number of projects submitted		109	154	N. A.	98	348
Number of companies assisted		20	45	36	57	211

Note: Information about public notices is available on FAPERJ's website and in the Activities Report 2007 - 2008.

Source: Gonzalez, F. B.(2009)

7. Contributions and Implications

The topic of innovation constantly arises in the actions and words of FAPERJ's management, as from 1999.

Support for the development of technological innovation in small businesses, through the TPE program, was an isolated initiative in the year 2000, resulting from the creation of the Coordination for Technology, which led to the setting up of the Foundation's Technology Board, in 2002.

No record was found among the documents examined of the programs launched at that time, such as the ALPHA Project and the Company Scientist (PhD in Industry).

Important changes in the mechanisms of incentives sponsored and controlled by the federal government – the decentralizing of the drawing up and issuing of public notices; the creation of mechanisms for stimulating innovation through the PAPPE; the encouraging of university – company interaction through the Green-Yellow Fund and, more recently, the Innovation Law and its regulatory decree, among others – helped to make feasible and reinforce the continuity of the programs and activities to foster innovation introduced by FAPERJ. The PAPPE program was fundamental to the Foundation, in a year when the state government's resources were scarce — 2005.

It should be emphasized that the support for innovation did not take place within the context of a state government strategic policy on economic and social development, based on generating

knowledge. Initiatives with a broader scope that allocated resources to innovation in industry, introduced after 2005, resulted from the decentralized implementation of federal economic policy, defined in the PITCE, in 2004, and ratified by the PDP, in 2008.

There are records of an initiative to create policies for development through innovation, back in 2000, when the state's Special Commission for the Formulating of Development Policy was set up, for the purpose of formulating policies for fostering science and technology, with a view to stimulating innovation and the economic and social development of the state. The RIS (Regional Innovation System) methodology, used by the European Union, was chosen as the paradigm for the development of this model. No evidence was found to indicate that this initiative was actually implemented, and it was not possible to ascertain whether it was not implemented due to political injunction or another reason, due to the absence of documentation.

Various factors may be influencing the lack of policies and planning for support to innovation by FAPERJ:

- the Foundation's main function is to support the development of science, not innovation; examples of other state foundations, such as FAPEMIG (Minas Gerais State Foundation for Supporting Research), should be mentioned, since they have altered their mission[9] in the light of the political will to foster innovation;
- FAPERJ is not an economic development agency, in the strict sense of the term. Its role has been to bring universities and research centers, on the one hand, and companies, on the other, closer together; resources have always been scarce and irregular;
- the recovery of FAPERJ's investment capability is a recent phenomenon and has been used not only to expand its programs, but to settle outstanding payments and restore its credibility;
- there is a need to restore and augment the supporting infrastructure for research, which is often either lacking or degraded; new areas of knowledge and research interest need backing.

Access to the resources provided for in the state constitution, but only made available as from 2007, has enabled FAPERJ to expand its programs in support of research and innovation, allocating, particularly for innovation, a larger quantity of its own resources – in addition to seeing an increase in federal resources – and the issuing of a significantly greater number of public notices, in 2008, than was normal throughout the entire period under analysis.

[9] Drive and foster research and scientific and technological innovation for developing the state of Minas Gerais.

What hasn't been seen, however, is the existence of clear guidelines, public policies and strategic planning – setting out goals and targets – to orientate the application of resources so that it is reflected in concrete results and the economic development of the state.

Upon analyzing the mechanisms in support of development through innovation, Etzkowitz (2005) emphasizes that each country or region should find its own specific way to implement this model. It is to be hoped, then, that Brazil and the state of Rio de Janeiro, through FAPERJ, can determine enduring public policies for support to innovation, instead of interrupted initiatives or those that are still in the process of being thought out, in the wake of the federal and state innovation laws.

It is to be expected that, with ample and guaranteed resources, FAPERJ can define enduring policies and plans in support of innovation – and of scientific research.

The implementation of the state Innovation Law can accelerate the introduction of such policies and plans, with the participation of FAPERJ, to guide future programs of incentives to innovation.

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Authors:

Fernando Barreiras Gonzalez, Augusto Mota University Center; gonzalezf@globo.com
Branca Terra, Rio de Janeiro State University; brancaterra@gmail.com
Mariza Almeida, Augusto Motta University Center; almeida.mariza@globo.com