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# Cooperative technological development and business generation among startups and medium and large companies. Case Study: Nexos Program (Brazil).

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**Abstract**

Innovation is a key element aiming the generation of competitive differentials for companies who adopt it. Open innovation is a category in which external partners are sought to enable technological development and the execution of research and development (R&D) projects. The Law No 11.196/2005 ("Lei do Bem"), a public policy to foster innovation, is an attractive and facilitating instrument for medium and large companies, operating in the tax regime of real profit, to invest in technological innovation projects. This study intended to investigate the relationships between companies of different sizes, focusing on innovative small businesses and the case study of Nexos Program. An open innovation initiative undertaken by the Brazilian Micro and Small Business Support Service (SEBRAE) and the National Association of Entities Promoters of Innovative Enterprises (ANPROTEC), which was addressed in order to identify substantive elements that create synergies and increase the innovative potential of the market. The "Lei do Bem" served as a basis for boosting these relationship. It is a meritorious tool for the Brazilian innovation system for fostering business generation between companies of different sizes, connecting actors of the innovation ecosystem to work in a cooperative manner, and positioning innovative small businesses as strategic partners in the pursue R&D activities.

**Keywords:** Open Innovation, Lei do Bem, Nexos Program, Brazilian Inovative System

## Introduction

Since the publishing of The New Era of Innovation (Prahalad and Krishman, 2008), the idea of shared value for companies depends on global connections interconnected by network. This made possible to blossom relations between different actors for co-creation of ground-breaking products and solutions, with strong market adherence, granting sustainable and competitive differential in the long run.

In the last years it has been observed a growing interaction between companies, universities, research centres/institutes, innovative environments and start-ups for combining efforts that resulted in technological development and value generation for society.

Germany presents an expressive network collaborationbetween research institutes,

especially between both Fraunhofer and Max Planck Institute, areas of innovation (incubators, accelerators, coworking spaces, scientific and technological parks) and companies. They have an influx of local talents from the main universities, in special Humbolt University of Berlin, Free University of Berlin and Technical University of Berlin, encouraging the concept/ acceleration of start-ups and favouring venture capital investment opportunities, in addition to allowances and government incentives (Aranha, 2016).

In Brazil initiatives, the Startup Brasil from the Ministry of Science, Technology, Innovation and Communication (MCTIC) connect start-ups with accelerators, triggering professional training and joining clients and investors. The Connecting Startup Brazil Program also leaded by MCTIC gathers other actors (science and technology institutions, investors, mentors) and large companies to stimulate the alignment of qualified start-up to real demands fromBrazilian industries (Ministry of Science, Technology, Innovation and Communication, 2019). There are also many private innovation clusters, such as InovaBra, a co-innovation space from Bradesco Bank in São Paulo, created with the purpose of promoting integration among different actors from the national innovation environment. These are only a few of many examples of what is being called open innovation at a national level. Some catalysts of the open innovation agenda are the governmental tax instruments supporting innovation.

The Lei do Bem (Brasil - Congresso Nacional, 2005) - law nº 11.196/05 - was instituted by the Federal Government in 2005. Its purposes were: to allow companies operating in the tax regime of real profits to invest in research, technology and innovation development; to deduct from the income tax and social contribution tax based up to one hundred percent of its operating expenses.

Besides allowing the companies' taxes reduction, *Lei do Bem* stimulated the reinvestment in innovation. The tax incentives have been more and more used as a public policy instrument to promote the economic development and social wellbeing, which could bring a long run perspective and business competitiveness (Vilha, 2018).

The present work approaches the Programa Nexos (Nexos Program), an open innovative initiative led by the Brazilian Micro and Small Business Support Service (SEBRAE) and the National Association of Entities Promoters of Innovative Enterprises (ANPROTEC). The Program focuses on connecting start-ups and large and midsize enterprises looking for business and technology development for market

(Nexos Program, 2019).

One of t Nexos Program's pillars is the use of tax benefits to support innovation by larger companies, as a factor of attractiveness for investment in startups, aiming at achieving research and development (R&D) projects. Among the instruments contemplated by Nexos, the Lei do Bem is the one with the greatest potential to reach, because it is multisectoral and its immediate application.

This article analyzes two specific cases of medium and large companies that, under the Nexos Program, used the Lei do Bem as a tax reduction mechanism to carry out science, technology and innovation projects.

**Theoretical reference**

The National Association for Research and Development of Innovative Companies (Borges et.al, 2020; Pavani, 2019) formulated theMap of the Brazilian Innovation System, shown in Figure 1.

As can be seen, SEBRAE has a role as a support agency in the national innovation ecosystem. It integrates the autonomous social service, better known as "Sistema S". It is an associative corporation of private law and of public character. It offers technical assistance to micro and small companies to qualify their management, facilitate access to markets and financial services, as well as develop the potential for innovation. It consists of 28 operational units present in all federal units in Brazil, under the coordination of the national unit (COLBARI, 2014).

SEBRAE's mission is "to promote the competitiveness and sustainable development of small businesses and to stimulate entrepreneurship". In order to achieve this, it defined innovation as an intrinsic value to its model, as it understands that it is the main matrix of differentiation for companies (CARVALHO et al., 2011), thus, being mandatory the application of 20% of its resources into innovation actions (SEBRAE, 2019).

One of SEBRAE's main partners in the innovation agenda is ANPROTEC, which "gathers about 370 associates, including business incubators, technological parks, accelerators, coworking, teaching and research institutions, public agencies and other entities related to entrepreneurship and innovation. Leader of the movement in Brazil, the Association acts by promoting training activities, articulating public policies and

generating and disseminating knowledge"(ANPROTEC, 2018; Aranha, 2016; Harada, 2011).

SEBRAE and ANPROTEC, through a technical and financial cooperation agreement signed in 2017, designed an actioncalled corporate network innovation. This initiative consists of formulating a program whose premise is to bring together small innovative businesses, also known as start-ups, of medium and large companies to generate business and promote technological development. This program was formalized under the name Nexos.

(Pavani, 2019, Nexos Program, 2019).

In accordance with the Program's regulation (Nexos Program, 2019), "the Program is based on generation of economic value derived from intensive knowledge projects, contributing to innovation and the expansion of business competitiveness, through improving emerging technologies, product, processes and service development, and acceleration of new business models, contributing to the development of the National Innovation System (SNI) "

Not only large corporations and start-ups, but also incubators and accelerators are protagonists and have clear responsibilities in Nexos. As stated on the Nexos' regulation (Nexos Program, 2019), they provide a specialized support team for mentoring in the context of their areas of competence and limited to the scope of incubated or accelerated projects. Moreover, they are responsible for training startups regarding the needs related to legal aspects, marketing, finance and / or others, in the context of project implementation.

According to the Map of the Mechanisms for the Generation of Innovative Enterprises in Brazil (Ministry of Science, Technology, Innovation and Communication, 2019), incubators and accelerators are the ideal locus to create and advise companies with high potential for differentiation.

A company incubator is an entity whose goals are to offer technical assistance, connections to the market and investors. Sothat nascent companies can develop innovative ideas and turn them into successful enterprises (ANPROTEC, 2019). For this, it offers infrastructure and managerial support, guiding entrepreneurs as to the management of the business and its competitiveness (GHESTI, 2018; INPI, 2013).

On the other hand, accelerators are institutions that can help start-ups to define and to buildtheir initial products, identifying market niches and also securing financial

resources that can contribute to their long-term survival, through equity or equity (TRAVERS, 2018).

Therefore, Nexos Program has three important audiences: midsize and large corporates that demandtechnologies; start-ups with technological competence to co-develop solutions; incubators and accelerators to provide support during the technological development cycle.

Therefore, Nexos has proposals that make it unique in the national innovation market: an open innovation program for the development of cooperative R&D projects with start-ups participation; prioritizing the use of tax incentives to support innovation to reduce the impact of financial investment by medium and large companies; centrality of incubators' and accelerators' performance as mechanisms that drive technological development; and focus on low technological complexity projects (ANPROTEC, SEBRAE, 2018; Nexos Program, 2019).

Open innovation is a firm-centered paradigm and is based on the impulse of external knowledge to improve internal innovation, thus expanding the companies' economic development (CHESBROUGH, 2017). It is about overcoming barriers that protected the research and development (R&D) processes of large companies to exchange scientific knowledge and expertise that can enable technological development, sharing risks, uncertainties, and costs (LEYDESDORFF and Ivanona, 2016).

Since 2015, Corporate Startup Engagement (CSE) movement has started, in which large companiesseek startups, and vice-versa, to co-create innovations (Mosquim, 2017). There are many kinds of corporates-start-up relationships, ranging from protected technology licence agreement for commercial exploitation by large corporations to the availability of financial resources for the development of small business innovation projects that fit on the corporate's target market (Chesbrough, 2007).

The Nexos Program embraces the latest model. Based on the financial contribution of companies with a larger structure in small innovative businesses, it seeks to make research and development projects viable by sharing technological skills that result in products to be incorporated by large companies. Therefore, there is a premise that there is technological.It is not allowed in the Program for anchor companies, category

comprising of demanding technology companies, to simply find suppliers with finished products or needing small customization. It must have experimental development.

According to Frascati Manual (OCDE, 2002), experimental development consists of systematic work based on existing knowledge obtained either by research or practical experience to establish new procedures, systems, and services, or even to improve existing ones. Another key element on Nexos' structure is the use of supporting innovation tax incentives. "Tax incentive is a financial concept. It implies on the reduction of compulsory public revenue or the suppression of its enforceability".

The financial investments made by corporations in start-ups for technological development are included, a posteriori, in one of the five tax instruments to support innovation contemplated by the Program (ANPROTEC, SEBRAE, 2018). These investments have the character of a tax benefit, as in "Lei do Bem", and the duty of innovative companies that carry out research, development and innovation projects, such as the Informatics Law, Rota 2030, R&D Agência Nacional de Energia Eletrica (ANEEL) and P&D Agência National Petroleum, Natural Gas and Biofuels (ANP).

According with Nexos' website (Nexos Program, 2019), the characteristics of the prioritised instruments of the Program are:

A) *Lei da Informática (Lei* 8.248/1991) (Brasil - Congresso Nacional, 1991): grants tax incentives to hardware and automation companies that invest in R&D activities;

B) *Lei do Bem* (Lei 11.196/2005) (Brasil - Congresso Nacional, 2005): in a multisectoral way, it is destined to companies in every sector of the economy which are in the EBT regime and that generate net profit in the fiscal year;

C) ANEEL R&D (Lei 9.991/2000) (Brasil - Congresso Nacional, 2000): created to promotethe R&D in the Brazilian electric sector.

D) ANP R&D (Lei 9.478/1997) (Brasil - Congresso Nacional, 1997): RD&I clause that encourages the adoption of new technologies for the oil, natural gas and biofuel sector.

E) *Rota 2030* (Lei 13.755/2018) (Brasil - Congresso Nacional, 2018): Support Program for the automotive sector that establishes guidelines for issues such as mobility and logistics.

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*Lei do Bem*, an instrument prioritized in this article, formalized the use of tax incentives by corporations that operate under the real profit tax regime (EBT), which invest in RD&I, automatically. The tax incentives in *Lei do Bem* are shown in Table 1.

*Lei do Bem*, in its third chapter (Brasil - Congresso Nacional, 2005), allowed corporates that do or hire RD&I services to have their tax exempted. However, only the 18th article of the law deals with the possibility of tax reduction for operational costs in technology transferring to micro or small companies.

Another intrinsic characteristic of Nexos Program is the development of projects of low technological complexity, whose large and midsize corporates financial support varies between R$ 100,000.00 and R$ 250,000.00 (roughly US$24,000.00 and US$60,000.00) (Nexos Program, 2019).

According to the National Aeronautics and Space Administration (NASA, 2012), the technologies readiness level (TRL) refers to a type of measurement system used to evaluate the maturity level of a certain technology. The projects are evaluated based on parameters for each technology level and then a TRL rating is assigned based on the progress of the project.

The TRL scale varies from 1 to 9 depending on the technological maturity. TRL 1 refers to fundamental/basic research, when scientific discoveries are starting and having promising results which can evolve into R&D in the future. TRL 9 is applied when the technology is tested and validated with immediate availability to go to the marketQuintella, 2017).

Therefore, from fundamental research, when the assumptions for the technological development are surrounded by uncertainties, up to the point where the technology is finished and can be commercialized, there is a long way to go. According to Management Centre and Strategies of Science, Technology and Innovation (Velho, 2017), the valley of death occurs between the demonstration phase and pre-competitive scaling-up (TRL 3 to 7), which is where projects still present high technological risks and need large sums of investments to evolve from a lab concept (TRL 3) to a operational prototype (TRL 7).

**Methodology**

The methodological approach chosen was deductive. The research methods used throughout this article were bibliographic research and case study.

Information and data on the Nexos Program, undertaken by SEBRAE and ANPROTEC, were collected. First, the premises that govern the Program, the beneficiaries, the intrinsic characteristics, the operation model, the procedural phases and the schedule were raised.

Then to make it tangible, two technological challenges sponsored by midsize or large companies that invested in startups subsidised by *Lei do Bem* were analyzed.

The techniques proposed for the case study were as in Yin (Yin, 2009) research. In this work, important aspects mentioned in Nexos regarding technology transferring and corporate-startup interaction were studied.

**Results and discussion**

Nexos Program arose from the understanding that small innovative businesses need to access market and develop technologies to assure survival and greater competitiveness. In this context, connecting startups and larger companies is an excellent way to achieve this goal.

SEBRAE's target market has been micro and small businesses and ANPROTEC is the innovative environments such as incubators, accelerators, technological parks and coworking spaces. These environments have small businesses whose need administration and capacitation to get in the current market. Therefore, it is a common interest of SEBRAE and ANPROTEC to offer adequate conditions to assure the prosperity of innovative micro and small businesses.

SEBRAE is co-responsible for Nexos. As stated in the regulations (Nexos Program, 2019), SEBRAE is the entity which must coordinate the Program's activity as well as to take the adequate actions to assure satisfactory results for both parts. ANPROTEC is Nexos' operator. It is responsible for the administration of the Program and the execution of activities, stablishing performance indicators and acting preventively and corrective to ensure quality standards (Nexos Program, 2019).

**Program Phases**

Nexos Program has a logic operation which comprises of 9 steps as shown in Figure 2.

*Step 1 – Prospecting of anchor companies*

It is fundamental to have midsize and large anchor companies with specific technological demands to make the Program's operation feasible. As a result, it is necessary to search for medium and large companies to enroll in Nexos by completing

the application form found on the official website (Nexos Program, 2019). The proposal submission represents only an interest to the Program, not having any obligations or responsibilities.

*Step 2 – The receipt of adhesion forms*

After the companies' registration have been approved by the Program's Committee, formed by a group of SEBRAE and ANPROTEC personnel responsible for trusteeship and for activity management, it is necessary to send the adhesion term. This document must be signed by a legal representative of the company and seal the formal admission of the company into Nexos. It is a deal in which the company agrees with the terms and conditions of the stated Program.

*Step 3 – Expectation alignments and the technological challenge*

The legal advice offered to anchor corporates officially begins after sending the adhesion term. In this phase, several exploratory online meetings are held, in which it tries to comprehend the necessities and expectations regarding the demanded technologies, the timing of digital transformation, the innovative background, and most importantly, the activities developed with startups, if they have already been carried out. In addition, it is understood the tax instrument to support innovation that is most appropriate to the profile of the sponsoring company.

In accordance with Nexos' regulation (Nexos Program, 2019), sponsoring companies are midsize or large corporates which have technological challenges, binding it to the start-ups financial support to develop technology.

After alignment with the medium or large company, the Management Committee and the anchor company define the appropriate budget for the launch of calls and the expectation of the number of start-ups served. Then, it is settled at least one technological challenge which will be in the Program's official webpage. A technological challenge (Gerosa, 2016, Frey, 2019) is a barrier or difficulty to be overcome in order to achieve an evident technological improvement.

*Step 4 – Registration and selection of start-ups*

When the challenges are launched, in addiction to the communication efforts to publicise the claim, the areas of innovation associated with SEBRAE scattered all over

Brazil and accelerators associated to ANPROTEC are contacted. in order to identify small incubated or accelerated enterprises with suiting profiles or competences.

As soon as the challenge is on, start-ups can register themselves. It is important to highlight that start-up can only register after the challenge has been set. The registration forms are specific for every challenge. Several background research are made, such as the members of each start-up to check whether they are fitted for the job, with appropriate qualifications and work experience; adherence between start-up's line of work and the R&D project; the solution's TRL; the budget; as well as the midterm developments.

After this period, which lasts typically 30 days, the Committee analyses the proposals and generates a list with the most promising and relevant projects. Afterwards, it is sent to the anchor company to choose which start-ups to work with. This choice is made solely by the anchor corporate.

*Step 5 – Signature of the R&D contract between start-up and corporate*

The R&D contracts between corporates and start-up defines the final goal of each challenge as well as intermediate achievements. These contracts will contain elements related to the target object of the projects, such as: critical milestones or intermediate deliveries; disbursement schedule for payments to be made by the medium or large company; possibility of corporate participation, if it is of mutual interest; intellectual property issues, such as technology licensing and / or patent ownership to be filed.

*Step 6 – Choosing the incubator or accelerator supporting the start-up*

Shortly after the contract signature, the Nexos' Management Committee

accesses the base of incubators and accelerators accredited to the Program, which, in total, consists of 53 entities, to choose the one that has the most suitable profile to provide the necessary support to the small innovative business. . The criteria used are: (a) adherence between incubator/accelerator expertise and the technology to be developed; (b) familiarity with the fiscal incentive chosen by the anchor company, as the incubator/accelerator must assist with the accountability report; (c) and also, the geographic proximity with the start-up.

*Step 7 – Signing of the incubation/acceleration contract*

This contract is signed between the start-up and the chosen incubator or accelerator without participation of the anchor company. This contract contains the responsibilities in which the parties are bound during the technological development cycle.

Incubators and accelerators, according to the Nexos Program regulations (Nexos Program, 2019), are paid 10% of the total amount for each Project. The anchor company's financial contribution is directed to the startup, which, in turn, transfers the funds to the incubator or accelerator, according to the chronogram stipulated in the R&D contract.

*Step 8 – Technological Development*

Only after all those stages mentioned above are over is that start-ups effectively can begin the technological development.

The duration for this technological development is typically between six months and a year, due to its low complexity. The duration may vary because of technological uncertainties and market. Nexos Program prioritises the valley of death, consisting of TRL 3 to 7.

*Step 9 – Accountability*

After the technology are ready and the contracts are closed, there is a need to account for the use of the resources under the tax instruments supporting innovation. MCTIC is responsible for managing the resources of *Rota 2030*, *Lei do Bem*, *Lei da Informática* (national territory, except *Amazônia Legal*). The Ministry of Economy does the resource administration of *Lei da Informática.* ANEEL and ANP are responsible for their own R&D projects' resources (Ministry of Science, Technology, Innovation and Communication, 2019).

**Valuecreation for stakeholders**

The advice offered by the Nexos Program to all participants - small innovative businesses, medium and large companies and incubators and accelerators - ranges from the receipt of the adhesion form by the anchor companies to the final rendering of accounts to the regulatory agencies at the end of the technological development cycle.

In addition to all the benefits of the Nexus through almost customized monitoring on a case-by-case basis, the Program is free for the three audiences. The only financial commitment comes exclusively from the medium and large company that invests in the start-up to co-create the technology made possible by its demand. Both SEBRAE and ANPROTEC do not allocate resources to either party.

MCTIC, the regulatory agency responsible for three of the five fiscal instruments to support innovation contemplated by the Program, formalized official support for the Nexus in April 2019. In this way, the Nexus increased its credibility in the market, and the Ministry's seal of approval saw an excellent opportunity to boost investments by the beneficiaries of the "Lei do Bem" in micro and small companies, extending coverage to Brazilian business innovation chains.

**Nexos' chronogram**

The Nexos Program was launched on November 23, 2018, at InovaBra Habitat, a co-innovation space sponsored by Banco Bradesco, in São Paulo (SP). From that date on, registrations were opened for both incubators and accelerators, as well as for medium and large companies. For the first public, the registrations extended until February 28, 2019, while for the second, until May 30, 2019, according to Figure 3.

The startup registration depends on the technological challenges sponsored by the anchor corporates. In this work, two cases have been reported. The financial support, in both cases, were framed *Lei do Bem*.

***Lei do Bem***

One of the premises of the Nexos Program, as mentioned, is the prioritization of the use of tax incentives to support innovation as a public policy of great relevance to the market, since it fosters the development of R&D activities considered important to society and which are not carried out by the federal government. (Nassif, 2014).

*Lei do Bem* may be restrictive, as only companies in the EBT may have benefit from it, but it has a positive impact on national economy. The many advantages of the Good Law can be listed as follows:

1) reduces the taxes for company which invest in R&D;

2) instigates technological innovation activities at a national level, regardless of the company sector;

3) encourages the training of the R&D staff of corporations and the presence of researchers and engineers in their human resources;

4) promotes the protection of intellectual property assets, especially patents and cultivars;

5) stimulates machinery and equipment acquisition to R&D activities with reduced taxes;

6) brings companies closer to universities and science and technology institutes;
7) brings companies closer to innovative small businesses for cooperative technological development..

**Technological Challenges**

Steffen (Figure 4) was the first to send the adhesion term to Nexos in March 3rd, 2019. It is one of the largest distributors of cleaning products in Rio de Janeiro (RJ). It has been in the market for almost 50 years with a portfolio of more than 1,000 products and utensils, including own brand items. In addition to its value offer, it also provides clients with advice on the rational and economic use of products to reduce consumption.

A medium size company, according to the criteria adopted by the National Bank of Economic and Social Development (BNDES), with annual gross operating revenue between R$ 4.8 million and R$ 300 million, Steffen is experiencing a moment of expansion, in which it intends to implement the culture of digital transformation to expand its results.

The corporation identified in Nexos an excellent opportunity to find start-ups that could co-develop technologies that contribute to its growth. Moreover, it had never been benefited by the “Lei do Bem”, an important factor to make its intent viable from the recovery of part of its investment with tax waiver.

The challenge launched - Digital Cleaning - aimed at developing solutions in the areas of market intelligence, self-service, self-training and customer loyalty. It was expected to obtain technologies specialized in machine learning for digital supervision of the customer experience. The solution developed by start-up should contemplate customer segmentation and, from that, obtain a learning about the profile and purchase history so that the relationship is optimized and can generate additional sales (upselling). This process is measured through statistical analyses over subsequent years.

The challenge foresees an input of up to R$ 120,000.00 in each project. From the 25 entries made by small innovative companies, from May 10th until June 23rd, 2019, the start-up miner Sankhya Code was selected on July 5th, specialized in developing algorithms that analyse market and business data to predict future purchase behavior.

After signing the R&D contract between Steffen and Sankhya Code, the Program Management Committee conducted a search in the base of incubators and accelerators

accredited to the Nexus to see which had better adherence to the start-up to provide technical and managerial support. The incubator was the Entrepreneurial Activities Incubation Center (CIAEM) of the Federal University of Uberlândia (UFU), in Minas Gerais (MG).

L`Oréal (Figure 5) is a French multinational operating in the beauty segment. The largest cosmetics company in the world, with more than 100 years of history, 36 global brands and presence in 150 countries.

L'Oréal joined Nexos seeking a biotech start-up capable of developing an organic compound which could be used in a formulation of a new cosmetic product.

L'Oréal sent a term of adhesion to Nexos on August 9th, 2019 and launched the challenge Formula L`Oréal a week later, which provided a financial contribution of up to R$ 150,000.00 per project to be developed within 12 months. According to the document found on the Program's website (sebrae.com.br/nexos), proposals of technologies and solutions from other economic and industrial sectors were also considered, with potential applicability to the area of cosmetic formulations (technology transfer).

Fifty-two applications were submitted for the challenge, between August 16th and September 30th, 2019. The result was published in the Nexos website in October 15th, 2019 and had as winner Biosolvit start-up, from Barra Mansa (RJ). The start-up acts in the applied biotechnology area and develops new materials from organic residues, providing ecologically correct solutions with the focus on reducing the environmental impact. The incubator chosen for the follow-up was the Technological Park of São José dos Campos.

According to the magazine Pequenas Empresas, Grandes Negócios (PEGN), in its electronic edition of May 27th, 2019, Biosolvit participated in the international startup competition "Startup World Cup Global Pitch Competition & Conference", in San Francisco (USA), in 2019, and had excellent prominence, being among the 12 finalists, among companies from all over the world. The technology presented was an organic oil absorber, considered the best in the world, from palm residue.

**Conclusion**

This article has often contemplated the Nexos Program and contextualized it in two cases of companies that launched technological challenges and had their investments framed in the “Lei do Bem”.

The companies Steffen and L'Oréal are concrete examples that reinforce the multisectoriality and reach heterogeneity of tax instruments as technological development and innovation promoters at a national level.

The Nexos program has contributed for a medium company to enjoy the "Lei do Bem" for the first time. In addition, it brought Steffen closer to a software factory - Sankhya Code - to enable its digital transformation. A landmark chapter in the trajectory of these two corporations, which have joined forces to generate shared value. In the other case, it connected a highly renowned brand (INPI, 2013) of the French multinational L'Oréal with an internationally awarded biotechnology start-up with high potential for differentiation and environmental awareness. In other words, the "Lei do Bem" served as an element of catalysis to achieve the relationship in distinct cases of anchor companies connected with start-ups.

Although Nexos is in its first year of execution, its impact on the national innovation ecosystem, especially on the open innovation agenda, is notorious. It has mobilized 53 incubators and accelerators in the 5 regions of the country; it has allowed the increase of relations between medium and large companies with start-ups for the development of R&D projects, with the "Lei do Bem" serving as a basis for tax reduction; it has promoted the possibility of developing emerging technologies with small innovative businesses; besides mobilizing the start-ups that are served by SEBRAE in the 27 units of the federation.

Cases such as the Nexos Program need to occur on a larger scale, both to insert small businesses into the national innovation system by bringing them closer to the value chains of large corporations, and to increase the number of companies benefiting from tax instruments to support innovation.

The reduction in the tax burden encourages new entrants to the open innovation agenda, as happened with Steffen. But it cannot be a conditioning element for research and development activities among companies of different sizes. Regardless of the tax impact on the company's cash flow, technological innovation is an imperative to ensure corporate survival in the long term. And when carried out in a cooperative manner, sharing risks and costs, the probability of prosperous results increases.

The National Innovation System, as shown in Figure 1, shows the interdependence relationships among the various actors that compose it. Large and medium-sized companies, start-ups, universities, ICT, incubators and accelerators, development

agencies, government and investors sharing knowledge and expertise are vectors of Brazilian scientific and technological development. SEBRAE and ANPROTEC, members of this ecosystem, have formatted the Nexos Program to be a vehicle that allows innovative small businesses to travel the technological routes of medium and large companies and develop their potential for differentiation

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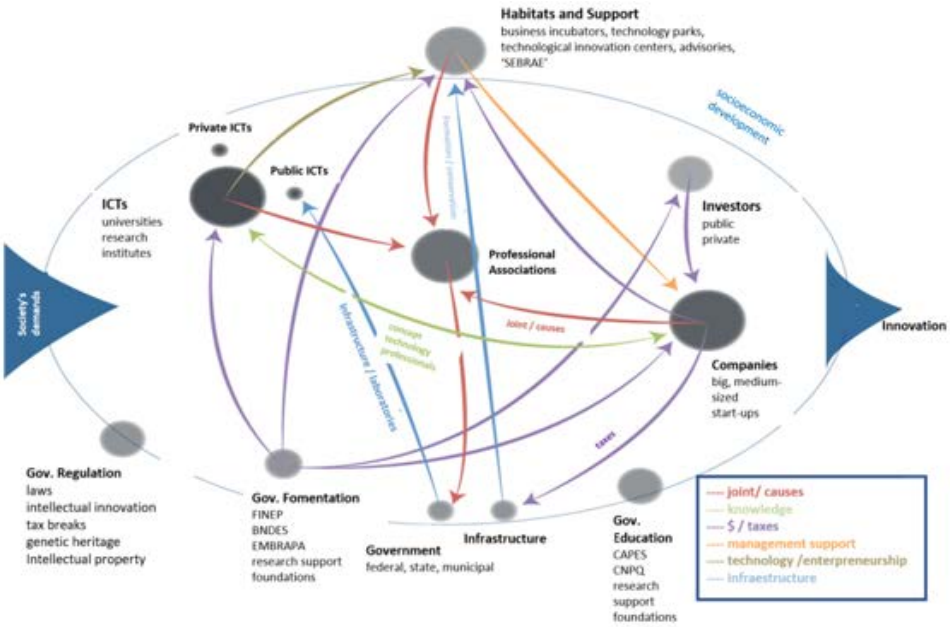
Table 1 – Tax incentives from *Lei do Bem*. Source: (Soly, 2014).

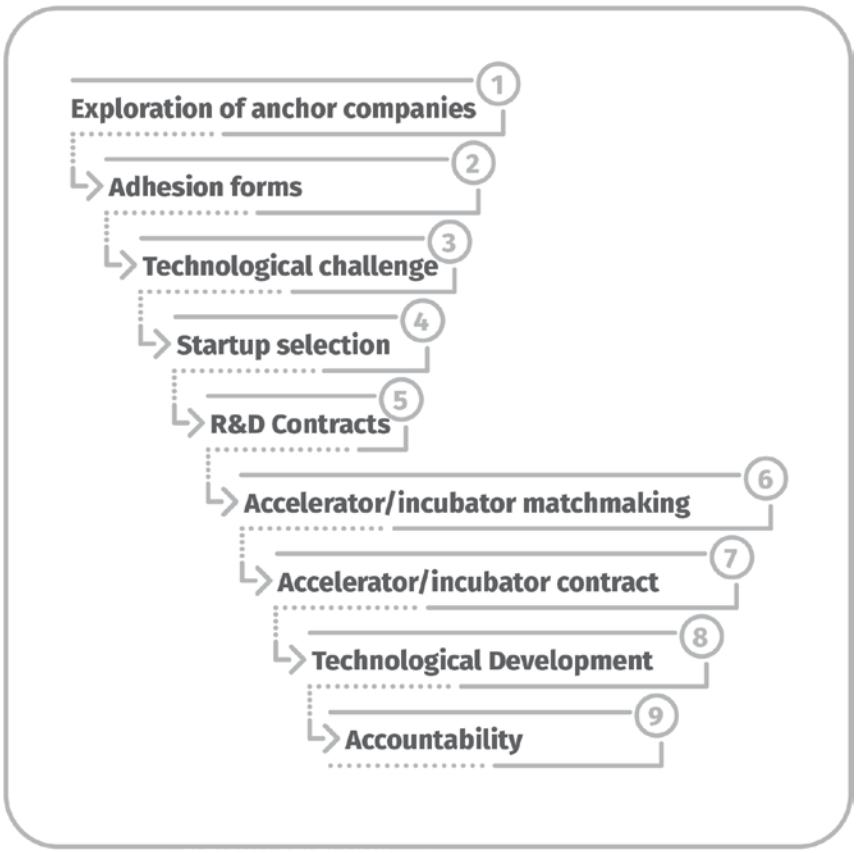
| Tax benefits | Description | Tax expenditures | Tax recovery |
|---|---|---|---|
| from 60% to100% | Tax break for innovation activities | Operational costs | 20.4 – 34% |
| from 50% to 250% | Tax break for innovation activities by Research Institutes | Services from science and technology institutes | 10 – 51% |
| Tax deduction on industrialised products | 50% tax reduction on R&D machinery | R&D machinery | 50% |
| Full depreciation | Full depreciation in the same period of the acquisition of machinery and equipment used for R&D | R&D machinery | Financial benefit |
| Accelerated amortization | Accelerated amortization in the same period of the acquisition of intangible assets used for R&D | R&D human resources | Financial benefit |
| Total deduction of income tax | Income tax reduced to zero on patents and brand payments overseas | Patents and brands payments overseas | 100% |

Figure 1. Map of the Brazilian System of Innovation.




Source: Borges et. al., 2020.

Figure 2. Steps of Nexos Program




Source: own authorship

Figure 3. Nexos Program chronogram

Source: own authorship

Figure 4. Digital Cleaning challenge

Source: SEBRAE, 2019

Figure 5. L'Oréal Formula challenge

Source: SEBRAE, 2019