

# PROGRAM ASSESSMENT

## FAPESP IMPACTS SERIES

### INNOVATIVE RESEARCH IN SMALL BUSINESS (PIPE) -- MAIN RESULTS

#### General Information

- Assessment period: 1997 – 2006.
- Completed in 04/2008.
- A total of 214 projects representing investments of BRL 35.2 million were evaluated.

This document is part of a set of summaries presenting the results of impact assessments performed for the FAPESP programs. The full document and assessment can be seen at <http://www.fapesp.br/avaliacao/relatorios/pipe.pdf>

The PIPE program was created in 1997 and its setting was based in the American Small Business Innovation Research (SBIR) program. The purpose of PIPE is to finance, by means of non-refundable resources, the development of innovative research on important problems in science and technology, to be executed in small companies with a high potential of commercial or social return<sup>1</sup>.

In order to analyze the impacts of the program, an assessment of additionality with verification of causality was performed<sup>2</sup> applied to the following topics:

- Innovation and innovation culture
- Leverage of resources
- Socio-economic performance of the company
- Training and the formation of competences
- Technical-scientific production
- University-company relationship

A total of 214 projects held by 185 companies were assessed. From these, 88% were destined to companies that were already operating. The remaining projects were destined for companies created to receive the PIPE support. Chart 1 presents the characteristics found in the sample.

<sup>1</sup> At the time of the assessment, PIPE accepted proposals from companies employing up to 100 employees. Currently (2016), PIPE supports companies with up to 250 employees. Updated information on PIPE can be obtained at <http://www.fapesp.br/pipe>.

<sup>2</sup> Regarding the causality redundant verification applied to PIPE, please refer to Salles-Filho et al. *Research Evaluation*, 20(2), June 2011, pages 159–171.

It must be recorded that only 18% of the project coordinators had any kind of formal link with the companies where the projects were performed.

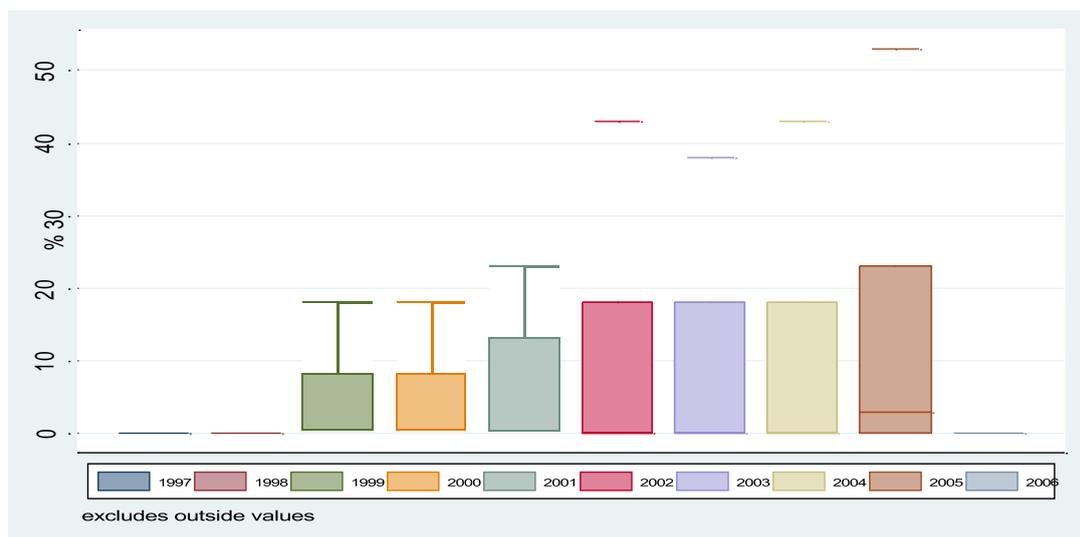
**Chart 1 – General characteristics of companies in projects assessed in PIPE**

1. They are domestic companies from several sectors of the economy; with an average of 6 years of existence; small, but positive and increasing revenue; low mortality rate (8%), not attractive for take over (only 4 were acquired or merged) and attractive for capital investment (13 of them received investments);
2. 28% were incubated before the presentation of the proposal, and 10% of them were still incubated upon the submission of the proposal to FAPESP;
3. 12% were created for submitting the project to PIPE (26 companies); these companies presented a higher mortality rate than those that were already in operation.

### Contributions of the PIPE Program for R&D, technological development and innovation in the companies.

A consistent increase in R&D expenses was observed for companies that had their projects supported by PIPE. In 1999, approximately 8% of the revenue for R&D was applied by 75% of the companies, with the upper quarter presenting values around 18% of the revenue expenses. There is a leap in 2001 (which is maintained in 2002 and 2003) of approximately 18% of the revenue for R&D (for 75% of the sample) and of approximately 42% of the revenue for the remaining 25% of the companies; and another leap in 2004, when 25% of the companies invested over 50% of their income in R&D and 50% of the companies invested more than 20% in research and development. Figure 2 shows this evolution.

**Figure 1 – Percentage of revenue invested in R&D, 1997 to 2006 -- PIPE**



From the 106 projects supported by PIPE for Phase 2 of the researched sample (Phase where there are projects with longer terms and higher value and therefore, with a higher probability of reaching technological and innovation results), 39 projects (37%) applied and/or received 77 Intellectual Property Rights (IPR), namely: 31 patents, 15 brands, 10 utility models, 8 industrial designs, 7 software registrations and 6 cultivar breeder rights. However, only 1% of the projects exploited the IPRs by licensing, and other 3% through the assignment of rights.

From the 106 Phase 2 projects, approximately 70 reached results that could be considered technological innovations, with 58% regarding product innovation and 22% regarding process innovations.

There was capital investment in 13 companies involved in PIPE (12%), a relatively high percentage for the Brazilian standards, although still far from the 25% of companies found in the SBIR program (Wessner, 2007).

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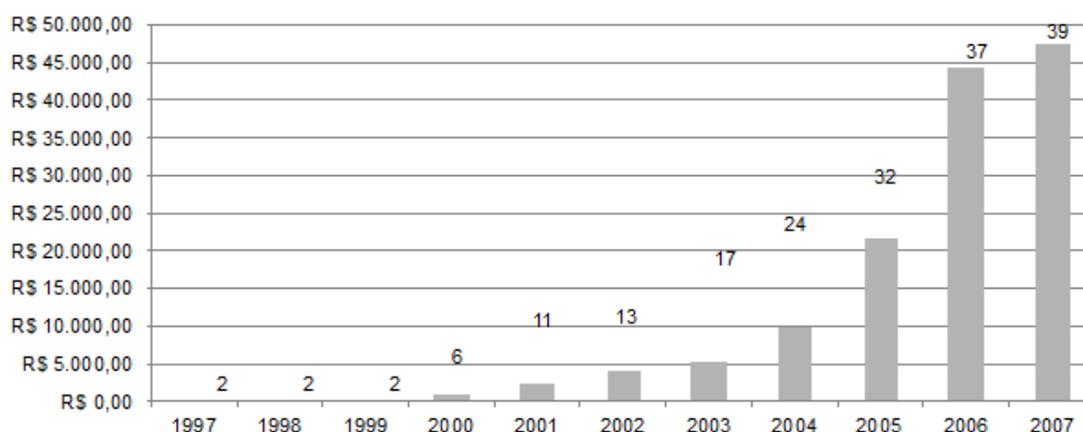
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### Economic impacts of PIPE Program

In the cost/benefit assessment of the PIPE projects, a return of approximately BRL 6 for each BRL 1 invested in the projects was measured. This figure increases to more than 10/1 if calculating only the resources invested by FAPESP in the projects.

A total of 39 Phase 2 projects presented revenue from PIPE projects reaching the aggregated value of approximately BRL 146 million (Figure 1). As expected, a small portion of companies were responsible for the greatest part of the economic results: 10% of the total projects were responsible for 90% of the total revenue resulting from PIPE's support.

Figure 1 – Evolution of PIPE revenue (in thousand BRL\*) and number of projects supported by PIPE that declared revenue in the period 1997 – 2007 (n=40)



Even though the opening of new markets and the expansion of market share have been the main motivating factors for the projects developed by the set of companies in the sample, not more than 5 companies had projects directed to the foreign market.

On the generation of jobs, considering the number of formal employees at the beginning of the projects and after one year of the projects' completion, there was an increase of approximately 40% in the number of employees, with the number of employees holding a *stricto sensu* post-graduation certificate doubling from previous evaluations, and those employees holding an undergraduate degree increasing in 75%.

Regarding tax revenue generated by the companies whose projects generated income, at the time of the assessment there was already a return in tax revenue of similar amount to the one invested by FAPESP per year in the PIPE program duringt the assessment period.

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### Brief comparison with SBIR

PIPE's assessment showed similarities and differences between both programs, as presented in Charts 2 and 3.

**Chart 2 – Variables with similar findings between PIPE and SBIR**

| Variables with similar findings between both programs                    | PIPE           | SBIR           |
|--|----------------|----------------|
| Projects presenting revenue in the companies where they were developed   | 40%            | 40%            |
| Greatest revenues (5% higher)  | BRL 20 million | USD 25 million |
| Projects generating intellectual property rights                         | 29%            | 30%            |
| Projects that would not have been developed without the support received | 50%            | 75%            |
| Projects that leveraged more resources beyond the support received       | 52%            | 56%            |

**Chart 3 – Variables with different findings between PIPE and SBIR**

| Variables with different findings between both programs    | PIPE | SBIR |
|--|------|------|
| Companies created to present projects to PIPE/SBIR         | 12%  | 20%  |
| Companies that had capital investments                     | 12%  | 25%  |
| Projects that had their property rights licensed/exploited | 4%   | 16%  |

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## Conclusion

The assessment of the PIPE program showed a positive result both in terms of technological development and in terms of innovation and economic impacts regarding revenue and return on investment. There are important similarities in relation to SBIR and differences showing critical points, such as the capital investments and the IPR licensing that deserve special consideration.