

# Evaluation of the Technology Policy

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## Limitations to the evaluation of the technology program in Brazil

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## Objectives

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- How do the developed countries assess the economic impacts of the technology policies?
- How is it possible to evaluate the Brazilian technology policy using the international methodologies- and considering all the Brazilian peculiarities, the information and the institutional capacity of this country?



## Methodology

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- Literature review on NIS, Technology Policy and Evaluation;
- Analysis of the International Methodologies of Evaluation
- Case Study of Brazil: fiscal incentives for R&D

# National Innovation System and the objectives of the Technology Policy

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- Objectives of the technology policy: generate technological capacity, encourage private investments, exchange interaction and technology among different economic agents.
- The technology policy should be orientated by two elements: “a) that the process of innovation cannot be seen as an isolated element of the national context by sector, region or institution; therefore, b) the importance of the policy should be focused on the relevance of each involved subsystem, as well as on the articulations among these and between the different agents”.  
(Cassiolato, 1999, p. 183)



# Evaluating the effects of the Technology Policy

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- Many developed countries are measuring the economic effects through an evaluation of the impacts of their technology policy
  - How do we capture all these effects in an evaluation?
  - How do we evaluate all effects generated by the technology policy in the economy?

# Evolution of the Complexity to Measure the Economic Effects of the Technology Policy \*

<b>1993</b> <b>Federal Government of Canada</b>	<b>1997</b> <b>Melkers &amp; Cozzens</b>	<b>1998</b> <b>Bach &amp; Georghiou</b>
<p><b>Economic:</b> Increased sales</p> <p><b>Social:</b> Environmental enhancement, Reduced health and safety risks, Improvements in quality of life, Improved quality and accessibility to information.</p>	<p><b>Economic:</b> Number of projects the organization funds, Spin-off, Patent and license application, New products, Increase sales, Number of collaborations, Profits, Number of publications.</p> <p><b>Social:</b> Creation of new jobs, Jobs retained, Average salary of jobs retained and created.</p>	<p><b>Competitiveness:</b> Sales, Market share, Create new markets, lower costs.</p> <p><b>Employment:</b> Jobs created, jobs in regions of high unemployment.</p> <p><b>Organisation:</b> Formation of new firms, new joint venture, new technological networks, new market networks, improved capacity to absorb knowledge, core competence improvement, change in strategy.</p> <p><b>Quality of life:</b> Healthcare, Social Development and services.</p> <p><b>Control and Care of the Environment:</b> Reduced pollution, improved information on pollution and hazard, reduced energy consumption.</p>

\* Georghiou et al. "Assessing the Socio-Economic Impacts of the Framework Programme". June, 2002.



# Methodologies of Evaluation

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## **Quantitative:**

- peer review,
- 'administrative information',
- liquid present value,
- cost-benefit,
- econometric methods,

## **Qualitative:**

- questionnaires,
- case studies.



# Some cases of the Evaluation of Technology Program

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## **ATP – Advanced Technology Program**

USA (1988)

## **EUREKA Initiative**

European countries (1985)

## **“Deep Water” Program- PETROBRÁS**

Country: Brazil (1986-1992)

# Difficulties to evaluate the impacts of the technology program

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- Capture all the effects:
  - Direct: generation of new products,
  - Indirect: the processes of diffusion of a certain technology and the spreading of information outside the company.

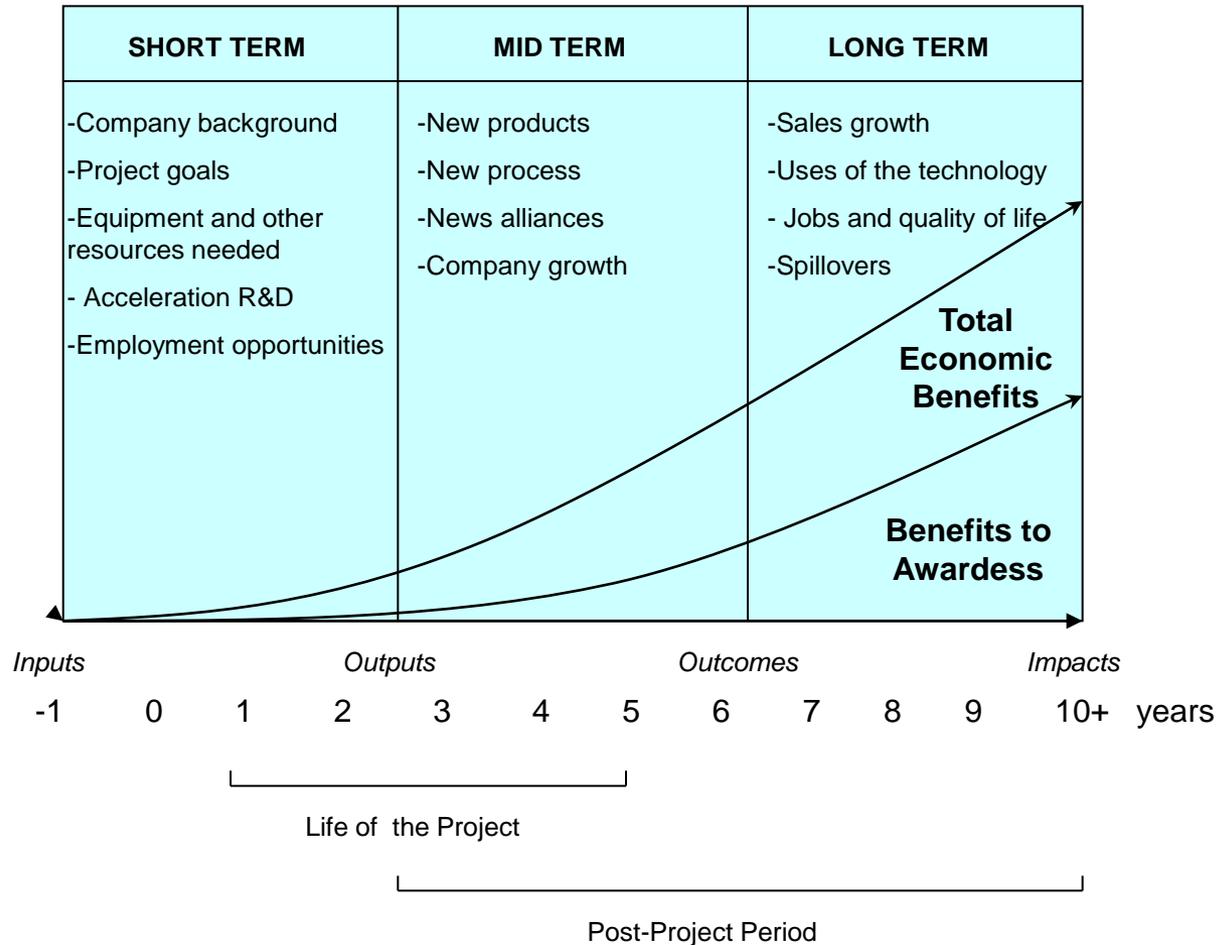


## Difficulties to evaluate the impacts of the technology program

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- Identification of the socioeconomic benefits of a policy involves an analysis of the innovation dynamics, in both the short and long terms, in relation to the development of new capacities by the agents.

# Timeline: What Measures and When\*



\* Annual Report ATP, 2004, p.10.



## Next stage of this research: The Brazilian case

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- In the next stage, this study intends to analyze a specific case of the Brazilian technology program: fiscal incentives for R&D
  - Industrial Technology Development Program (PDTI)
- Are the present methodologies able to capture the impacts on the agents involved in the technology policy, considering the peculiarities of the Brazilian economy and all the complexity of the generation and of diffusion of knowledge?