PUBLIC-PRIVATE COLLABORATION IN R&D PROJECTS: AN ANALYSIS ACROSS DIFFERENT TECHNOLOGY READINESS LEVELS

ANDRÉ LUIS ROSSONI
FACULDADE DE ECONOMIA, ADMINISTRAÇÃO E CONTABILIDADE DA UNIVERSIDADE DE SÃO PAULO - FEA

EDUARDO PINHEIRO GONDIM DE VASCONCELLOS
FACULDADE DE ECONOMIA, ADMINISTRAÇÃO E CONTABILIDADE DA UNIVERSIDADE DE SÃO PAULO - FEA

ROBERTO SBRAGIA
FACULDADE DE ECONOMIA, ADMINISTRAÇÃO E CONTABILIDADE DA UNIVERSIDADE DE SÃO PAULO - FEA

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Introdução

Collaboration between public research institutions and companies plays a crucial role in the efficiency of national innovation systems. Investments in science and technology are intrinsically linked to economic progress and sustainable development. In Brazil, substantial public funding cuts since 2014 have negatively impacted the sector. Partnerships with the private sector have emerged as alternatives, with open innovation being a key strategy. The Technology Readiness Level (TRL) scale, developed by NASA, measures technology readiness and facilitates communication among stakeholders.

Problema de Pesquisa e Objetivo

No previous studies have specifically addressed the role of social capital and market orientation in R&D projects considering different TRL levels. This study aims to qualitatively analyze the distinct characteristics of R&D projects conducted in partnership between Embrapa and companies, developing technologies with low and high TRLs. The objective is to understand the role of social capital and market orientation at each TRL level, identify the main challenges, and explore other emerging elements characterizing these partnerships.

Fundamentação Teórica

Technological readiness is a challenge for commercializing academic inventions, with most technologies not commercialized. The TRL scale improves communication about technological development. University-industry collaboration can increase radical innovation and reduce R&D costs. Social capital, divided into structural, relational, and cognitive dimensions, is essential for collaborative innovation. Market orientation involves continuous market intelligence generation and response to customer demands, promoting innovation.

Metodologia

A multiple case study was adopted to analyze R&D projects conducted by Embrapa in collaboration with partner companies. Eight projects were analyzed, resulting in 14 interviews with 8 Embrapa project leaders and 6 leaders from partner companies. Data collection was conducted through semi-structured interviews and relevant document analysis. The focus was on identifying patterns related to social capital, market orientation, and the main challenges faced in projects with low and high TRLs. Interviews were transcribed and analyzed using content and thematic analysis.

Análise dos Resultados

High-TRL projects benefit from established networks and pre-existing trust. Market orientation is more validating, with detailed consumer profile analysis. Challenges include aligning objectives, knowledge transfer, regulatory hurdles, and market acceptance. Low-TRL projects require gradual trust-building, with market orientation being more exploratory. Adaptability and seeking external resources are crucial to overcoming technical and financial challenges.They face challenges like bureaucracy, market alignment, and higher risks but offer significant innovation opportunities.

Conclusão

This study achieves its objective by highlighting the distinct roles of social capital and market orientation across different TRL levels. High-TRL projects benefit from established trust and a validating market orientation, while low-TRL projects require gradual trust-building and an

exploratory approach to market orientation. Limitations include the focus on a single research institution and the qualitative nature of the research. Future studies could expand the sample to other institutions and explore the impact of different funding structures and incentive policies on R&D partnerships.

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