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Structural Commercial Risk Matrix. "Technological Marketing Tool Series # 01"

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Abstract

All technological innovation inherently carries a certain level of uncertainty or risk regarding its adoption by the market, but most of innovators are unaware of them. Commercial risks cover a wide range, from consummers / users resistance to adoption, to the competitive resistance that will be faced[1].

The Structural Commercial Risk Matrix (SCR) was created by Mercadeando S.A. in 1999, taking inspiration from the Ansoff Matrix, but modifying the variables of analysis. The focus shifted from a prospective or descriptive reading of the strategic options synthesized in Ansoff's model to a forward-looking approach aimed at raising awareness and guiding decision-making regarding the inherent logic of the innovation process that any stakeholder may wish to undertake.

The 4 quadrants of the matrix (supernova, blindness at origin, blindness at destination, and complete maturity, are identified and developed, moving from analysis to practical application in a simple but consistent way, under a strategic approach that facilitates the universalization of the tool

The Structural Commercial Risk Matrix (SCR) enables the anticipation of the different risk positions that may be assumed in the *Go to Market*, as well as the identification of a series of transaction costs that would be automatically generated when opting for any of the four positions / quadrants.

Keywords: Marketing, innovation, marketing tools, commercial risk, technology diffusion / technology adoption

1. Introduction

[1] 2nd law of Technological Innovation Marketing**: "***Paradox of invention: a product or technology that does not currently exist will always face pre-existing competition" (Zelada: in edition)*

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Since this document is part of a larger effort to develop marketing tools for technological innovation, it is appropriate to retrieve an excerpt from my first paper (*Market Driven Fit – MDF: Marketing Evaluation of Technogical Innovations)* on the subject to frame this new proposal.

"The WIPO world statistics indicate that only 5% of patented inventions worldwide actually reach the market, while global investment in R&D is 2.55% of GDP by 2020 (World Bank) , we are talking about an economic volume of 2.17 trillion dollars. The development of tools or instruments that improve the current performance of R&D&I would have an important impact on global economic development and the well-being of humanity". (Zelada: 2024)

Although the concept of innovation established by the Oslo Manual is based on the process of "*introduction to…(the market or the organization)",* and the processes of introducing a product to the market are, in essence, the field of work of marketing by concept and nature, a review of the literature on Marketing in the world shows us that in the specific field of technological innovation, the literature is quite scarce: searching Google Scholar for the terms "*Marketing of technological innovation*" generates hundreds of references but only 03 that come close to the concept sought.

"*Innovation: A Theoretical Review from a Marketing Perspective*" (Jordan Sánchez, 2011), provides an extensive bibliographic survey of the conceptual frameworks of both innovation and marketing, without any application cases or implementation tools. "*Marketing, Innovation and New Businesses*" (Maqueda la Fuente: 2010), explores the contribution these two concepts make to new business creation. It does not establish how marketing applies to technological innovation. "*Marketing Strategies for Technology Innovation Products*" (Zhurylo & Iazvinska: 2007) develops a series of analyses on marketing strategy applied to technological innovation, with a strong conceptual focus, without implementation tools.

Moreover, we found dozens of papers about *technology innovation in marketing* focused in explore how technological innovations (mostly internet or digital tools) facilitate the marketing management of companies, a concept that is far from the approach we are looking for.
An additional detail that is important to highlight: the most recent bibliographic reference for Marketing of technological innovation dates from 2011, 14 years ago.

Is it possible for technological innovation state of art to develop without solid marketing theoretical frameworks, marketing systematized and applicable concepts and tools?, since the very concept of innovation being the successful introduction to the market?.

This initial validation clearly establishes the context in which this document was created: we are dealing with a topic fraught with conceptual and operational gaps, with no major structured references worldwide on the subject. Therefore, the document we are presenting today is a

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pioneer of its kind and fulfills CITEMarketing's mission to develop knowledge for technological innovation Marketing.

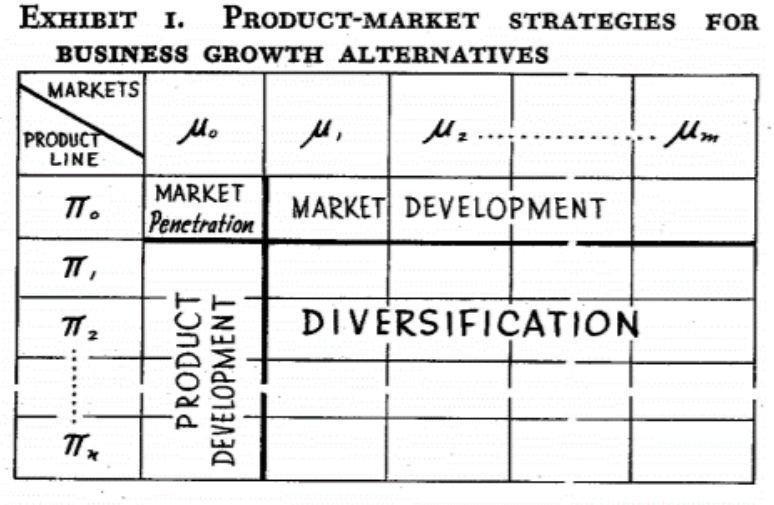
Our working hypotheses were the following:

- The commercial risk of an innovation process can be pre-defined and weighed considering the strategic marketing theory on the enterprise practices
- Most innovation actors are unaware of the existence of commercial risk, its levels and implications for their projects.

2. Theoretical Framework

The Ansoff Matrix was first published in the Harvard Business Review in 1957. It is also known as the Product-Market Matrix and, in some cases, referred to as the Growth Vector Matrix. In the following illustration, we present the original manuscript as it appeared in the magazine:

Figure No 1: Manuscript of Ansoff Matrix



Source: Harvard Business Review (1957)

Ansoff matrix is a tool that synthesizes all existing commercial options for any company or business initiative, using the fundamental variables of any business, products and markets, as the core of its analysis. Working with these two variables, Ansoff indicates that a company can choose to boost the sales of the products it already manages (product "0," as noted in the manuscript), or opt to innovate its product portfolio with new ones (products 1 to *n*). Similarly, it can choose to expand its position within the markets where it already operates (market "0") or seek new markets (markets 1 to *n*).

Crossing these variables, we find that four quadrants are formed, each reflecting a different strategic position:

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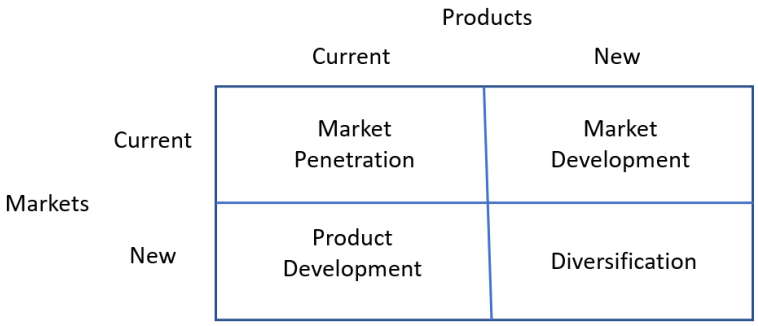
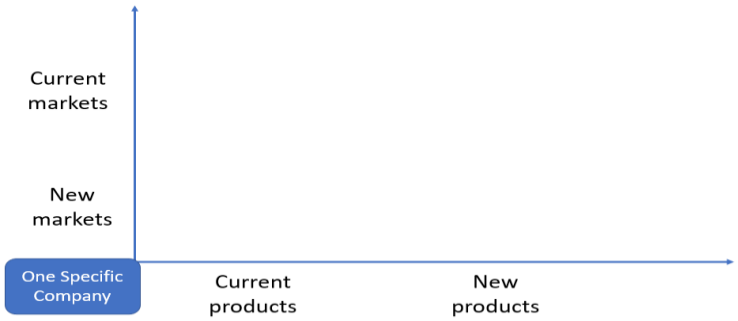
Figure No 2: Ansoff Matrix



Source: Harvard Business Review (1957)

An essential and obvious point—so much it´s not explicitly stated in Ansoff's document—is that at the Cartesian origin of the matrix, companies are positioned, regardless of their type or business sector. Based on this clarification, it is understood that the development of the two variables, product and market, revolves around the individual and concrete reality of a specific company or innovation actor. For that company or actor, the product is either existing or new, and similarly, the markets are either existing or new concerning it.

Figure No 3: Cartesian Origin in Ansoff Matrix



Source: Harvard Business Review (1957)

On the other hand, the Oslo Manual defines innovation as:
"The introduction of a new or significantly improved product, process, or marketing (or organizational) method that differs from the institution's previous practices and has been made available to users (in the case of products) or implemented within the institution (in the case of processes)." (Oslo Manual: 2008)

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From this perspective, the Oslo Manual incorporates the two variables that constitute Ansoff's matrix: any product or service (provided that it is new or novel) and a market, understood as the group of individuals or firms targeted to adopt the product or service.

Clearly, of the entire Ansoff Matrix, only the two quadrants centered on *"new product"* are relevant for technological innovation processes: namely, the *"new product / existing market"* and the *"new product / new market"* combinations.

Thus, by substituting *"new product"* with any technological innovation, Ansoff invites us to reconceptualize the innovation process according to the two variables of his matrix. Innovation may indeed take the form of a *"new product,"* as defined in the Oslo Manual, which necessarily ties us back to the supply side and the supplier. In other words, the innovator develops a product or service that is new or substantially improved relative to their own production heritage, background, and past practices. For example, an innovation actor might create a novel hydraulic-hose pressing technology that departs from all his historically established methods, without implying that technology may has been used by other actors previously. For both the Ansoff and the Structural Commercial Risk matrix, innovation is defined as actor-centric: it´s new for the actor in the Cartesian origin of the matrix, not necessarily for the rest of the world.

However, Ansoff also incorporates a second variable: the market. In other words, innovation must be new or novel to the users—that is, to the market, whether comprised by businesses or consumers. Clearly, in the case of an invention, the degree of novelty for the market is implicitly assumed on a broad or macro level: the market is the entire world; yet there are thousands of invention patents developed in hundreds of countries that remain unknown in other countries / markets, either because their adoption depends on specific conditions met in only a few ones, or because the company chooses to manage these inventions internally, or simply as a matter of commercial strategy. This last consideration underpins the concept of planned obsolescence so common in the electronics industry.

Under this reasoning, it is evident that the Ansoff Matrix fails to capture the inherent nature of technological innovation processes, in which two central commercial positions emerge that open up a new market-driven perspective:

a) A product familiar to the company (or innovation actor in general) but unknown to the specific target market.
b) A product unknown to the company (or innovation actor in general) and, at the same time, unknown to the target market.

By broadening the analysis from the standpoint of businesses as the primary actors in the innovation process—and, by conceptual extension—two additional possible positions emerge:

c) A product familiar to the company and equally familiar to the target market.
d) A product that is new to the company but familiar to the target market.

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This breakdown of scenarios inevitably confronts us with a question—one we will leave momentarily open so as not to lose the thread of this document: must technological innovation necessarily be defined by a company–market binomial in which it is new or substantially different for both parties (scenario "a")? Or might scenarios "b" and "c," in which the qualification of newness or novelty applies to only one of the variables (product or market) but not both, also qualify as innovation scenarios?

Our position is that, within what we will hereafter call the Structural Commercial Risk Matrix, except position "c," the remaining quadrants represent commercial scenarios that may be regarded as technological innovation processes.

We consider that invention processes originate from the supply side, whereas innovation processes stem from demand. Consequently, regardless of the extent of prior knowledge that innovation actors possess about a given new or substantially improved product, it is the market, its existing awareness or lack thereof of the product before its launch, that defines true innovation.

Regarding commercial risk as a variable for analyzing technological innovation process, only one paper was found: *Panama Technological and Business Modernization Fund*, which states: "*Companies do not only face technological risk in the development of their projects. In fact, commercial risk was the one that companies identified as the most important*." (Angelelli P.; Gligo, N.: 2002).

A key point in this conclusion is the authors' "discovery" of the existence of commercial risk in technological innovation processes, which was identified by the innovator's *ex-post* during the project evaluation/systematization process. In other words, the innovators were unaware of this risk *ex-ante* until they faced adverse or unforeseen commercial scenarios during their market access.

Finally, the transaction costs are defined as: "*those characteristics or dimensions of a transaction that make the exchange problematic or extremely costly*" (Salgado: 2003).

3. Methodology:

In this section, we will differentiate 02 parts of the methodology: the one referring to the nature and structure of the Structural Commercial Risk Matrix, its conceptualization and components, and in a second moment, we will develop how it has been used as an instrument to analyze technological innovations.

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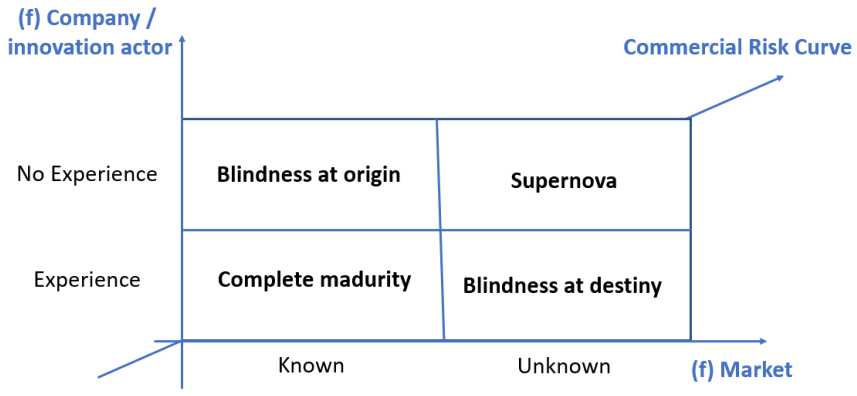
3.1. Methodology of the Structural Commercial Risk Matrix (SCR)

To begin, we adopt Ansoff's principle: at the Cartesian origin of the matrix sits any company—regardless of its business sector—and, accordingly, the entire matrix analysis revolves around that company's specific conditions and circumstances.
On this basis, we define the variables that constitute the axes of analysis:

- **Company Experience:** the extent to which the company has prior technological and productive engagement with the new or substantially improved product, excluding its commercial experience with it. In essence, this axis seeks to assess the degree to which the company possesses the productive know-how to deliver this product to the market at acceptable quality standards.
- **Market Knowledge:** the degree to which the market has familiarity or experience in purchasing/consuming the proposed product, possesses conceptual and/or practical understanding of it, and is aware of any pre-existing similar or comparable offerings that can serve as benchmarks.

Based on these axes, a binary, mutually exclusive measurement system is established—such as "Yes" or "No," "meets" or "does not meet"—which allows for the delineation of the four positions in the matrix: (1) supernova, (2) blindness at origin, (3) blindness at destination, and (4) complete maturity.

Figure No 4: Structural Commercial Risk Matrix (SCR):



Source: Mercadeando S.A.

(1) Supernova: (Unknown by the company / unknown by the market). The closest examples to this concept are disruptive technologies, for which there are no previous references. At one time, many startups emerged in this quadrant.

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(2) Blindness at origin: (Unknown by the company / known by the market There may be much discussion about the degree of prior ignorance on the part of the company, but in simple terms, it illustrates the *ex-centric* (outside the core business) diversification options of many companies.
(3) Blindness at destination: (Known by the company/unknown by the market). In a global market, it´s quite common companies operating in different countries – markets to transfer innovations from one market to another, being known in the first but not in the second.
(4) Complete maturity: (Known by the company / Known by the market). A company entering a market that already knows the product category, and which probably also has a lot of expertise in other markets.

A first visualization of the matrix inevitably reveals that the "supernova" quadrant represents the highest level of risk for any technological innovation, most likely occupied by disruptive technologies that dominate discussions in the startup industry. Conversely, the "complete maturity" quadrant, while valid as a business strategy, falls outside the scope of the market analysis of technological innovation. Meanwhile, the positions of blindness at origin or destination represent intermediate-risk positions that must be carefully weighed.

This matrix allows for the visualization of the risks assumed by companies and/or technological innovation actors when opting for certain product or service innovations. These risks are based on the level of expertise they have regarding the innovations, as well as the level of knowledge/experience the market may have about that category of products or services. The first variable represents business risk, while the second represents market risk.

Based on these variables and their alternatives, companies/institutions will likely recognize, often unconsciously, that they are assuming a greater or lesser degree of structural commercial risk in their proposals. It is advisable not to take this lightly, as it may lead to inconsistencies in their market introduction/access process.

Consistency involves fully visualizing the risks and scenarios that these innovations open up, which must be anticipated to have financed action plans in place.

We will conclude this development by incorporating an analysis of the transaction costs involved in each of the matrix quadrants, which technological innovation actors should consider as guidelines, alerts, or "*Jobs to Do*" once they have become aware of the position of their innovative process within the matrix and the strategic implications of their decision.

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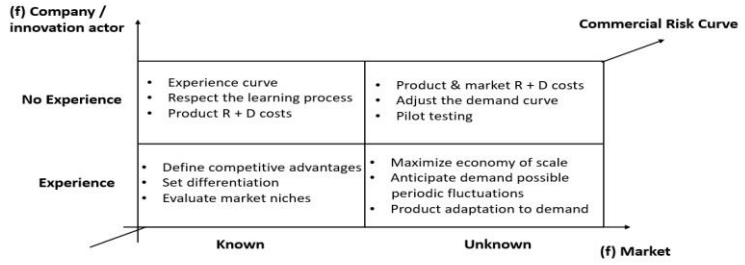
Figure No 5: Transaction Costs in the Structural Commercial Risk Matrix



Source: Mercadeando S.A.

Table No. 1: Conceptualization of Transaction Costs in the Structural Commercial Risk Matrix

	Quadrant		**Transaction Costs**	**Explanation**
1	Complete Maturity	a	Define competitive advantages	Given that the market is already served by other actors, defining some form of competitive advantage is a *sine qua non* condition to ensure market entry.
		b	Set differentiation	An option within the same context is the definition of a differentiating attribute that allows the company to stand out in the market.
		c	Evaluate market niches	Eventually, the product, based on one or both of the previous conditions, may be limited to a market niche, which will require an evaluation of its profitability.
2	Super Nova	d	High product and market innovation + development costs.	Investments in both fronts are crucial, not only to have a competitive and sustainably high-quality offer but also to understand the potential objections from the market.
		e	Adjust the demand curve	The initial sales curves of a product are rarely a true indicator of market acceptance; they are more likely to reflect "trial" behaviors from the market. The real demand curve will be adjusted with subsequent repurchases.
		f	Pilot tests	It is highly recommended to conduct

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				blind pre-tests without exposing the product to 100% of the market, to validate it and start identifying potential objections and ways to address them. At this point, the Market Driven Fit (MDF) methodology can be decisive.
3	Blindness at Origin	g	Experience curve	Capitalize on all the learning from the process to minimize the experience curve as much as possible; review the state of the art and seek paths that have already been traversed.
		h	Respect the learning curve	Research existing products and their positioning, understand common business practices and learn from best practices.
		i	Product Innovation and Development	Focus on identifying a competitive or differentiating advantage, establish a competitive landscape map, and start with *benchmarking*.
4	Blindness at Destination	j	Maximize economies of scale	Leverage general knowledge and prior experience with the product in other markets to amortize fixed development costs.
		k	Anticipate possible periodic fluctuations	Monitor the market adoption conditions, its patterns of use and consumption, and any eventual seasonality that may affect cash flow.
		l	Adapt to demand	Avoid the illusion of previous success; just because it worked in other markets does not guarantee success in the new one. Monitor potential adaptations to reduce the natural resistance of the market.

Source: Mercadeando S.A.

3.2. Methodology of Applying the Structural Commercial Risk Matrix (SCR)

This tool can be used by itself under an academic work scenario, but under our technological innovation consultancy process, we use it as a capacity development approach for innovative actors.

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The expert simply acts as a facilitator of the process when, during the interview with the innovative actor, he or she explains the concept and structure of the matrix, in blank, without mentioning or showing the transaction costs involved. The objective of this first activity is for the innovative actor to identify, *motu proprio*, which of the 04 quadrants of the matrix their project falls into.

At this point, it's important to leave room for reflection and learning by asking participants about their opinions on their project's placement in the matrix and the level of commercial risk that this position represents.

Finally, the facilitator presents the transaction costs involved in the 04 quadrants, with emphasis on the location of the innovative actor's project, and explains them in detail.
In the same spirit of developing participant capabilities, a final space for reflection is opened, guided by the facilitator, with exploratory questions such as:

- Were you aware of the level of commercial risk your innovative initiative entails?
- Were you aware of the transaction costs you face based on your position in the structural commercial risk matrix?
- Do you consider it important to have this knowledge before beginning your technological innovation process?
- Do you think prior knowledge of this topic would have influenced changtes in your innovation process?

4. Results

The innovative actors expressed surprise at the presentation of the results of the matrix applied to the evaluation of their projects. One hundred percent of them were unaware of its existence and, therefore, of the implications for strategy and investment that they should have considered from the outset. Ninety-two percent of them considered that having this prior knowledge would likely have influenced a better outcome for their innovation process.

As has been established throughout the document, the SCR matrix is applicable to any technology in any sector or sub-sector of knowledge and in any market all over the world. Below we present, in a very schematic but graphic way at the same time, the contribution from the results of the SCR in different technologies evaluated *ex – post*.

Next, we schematically present the results of the application of the SCR matrix in a sample of 10 technologies randomly chosen from an institutional sample of 04 technological innovation actors (research institutes and universities); The 10 technologies analyzed are framed in 10 different productive sub-sectors.

The following table allows us to visualize the risk position each actor that each actor unconsciously assumed, and when applying SCR matrix to their technological innovation, 100%

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of the actors were surprised because they hadn't considered the commercial risks their proposals implied. After this application, all decided to adopt it to evaluate any future innovative proposal ex-ante.

Table No. 2: Risk Positions of 10 Technology Innovations in the Structural Commercial Risk Matrix

	Technology	**Sub-sector**	**Complete Madurity**	**Blindness at Origin**	**Blindness at Destiny**	**Supernova**
1	Pomegranate aril separator electric tool	small appliances				
2	Texture improvement process for canned small pelagic fish	Fishery				
3	Improved Gravity Irrigation System for Cocoa	Agroindustry				
4	Fuel efficiency booster device for automobiles	Hidrocarburos				
5	Fish waste composting machine	Fishery				
6	E-commerce Platform for the Articulation of Rural Supply and Urban Demand for Fresh Fish Meat	TICs				
7	Native Microbial Consortia that Favor the Recovery of Mining Landscapes and Prevent the Formation of	Biotechnology				

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	Acidic Waters.					
8	Obtaining Organic Astaxanthin (fish meat coloring) with Supercritical Fluids from Munida	Fishing and aquaculture				
9	Hot Chambers for Rural Homes	Rural housing				
10	COVID Preventive Multi-User Handwashing Station	COVID				

Source: Mercadeando S.A.

5. Discussion

The commercial risk as a variable for analyzing technological innovation process is surprisingly absent from the explicit academic debate on the subject. Only one paper was found that addresses the topic within the framework of the experience of the *Panama Technological and Business Modernization Fund*, which states: "*Companies do not only face technological risk in the development of their projects. In fact, commercial risk was the one that companies identified as the most important*." (Angelelli P.; Gligo, N.: 2002). It is important to note the age of the document; as mentioned above, there seems to be a paralysis in knowledge generation on this topic, which is crucial for technological innovation.

Eventually, and attempting to find explanations for this bibliographic gap found, the profile of the inventor as the main actor of innovation could shed light: specifically, the "*Market Study that Allows to Analyze and Diagnose the Invention and Patents in Peru*" developed by Mercadeando S.A. for the Institute for the Defense of Competition and Intellectual Property (INDECOPI) in 2015, shows 60% of the patents correspond to individual inventors/researchers, 18% to university researchers, 6% to researchers from specialized centers, and 16% to companies or company researchers. (INDECOPI: 2015).
In other words, in Perú, only 16% of the innovation processes are lead by an entrepreneurial actor, in other words, actors without a commercial vocation. In Chile, as a second example, universities generate 46% of the patents, being clearly not an actor with an intrinsic commercial vocation.

Our hypothesis is that to the extent that the majority of innovation actors, and the largest percentage of innovation projects, originate from actors without an intrinsic commercial

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vocation, the issue may be being overlooked, which would need to be validated with further studies.

Regarding the prospecting for continuity of the SCR matrix concepts, it can be enriched/complemented with graduations or risk levels based on the type of innovation (incremental, disruptive, etc.) and the types of market (industrial, consumer), which mark lines of research for the future.

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