

Challenges in Knowledge and Innovation Management for University Spin-off Creation: Evidence from the University of Buenos Aires

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Abstract

University spin-offs are firms created within universities to commercialise scientific knowledge and support knowledge transfer to society and the economy. This study analyses barriers and enabling conditions for spin-off development at the University of Buenos Aires (UBA), Argentina's largest public university. The analysis is structured around three dimensions: regulatory, financial, and institutional. It reviews the UBA University Spin-off Regulation (2024), compares it with frameworks from four leading Latin American universities, and examines the regional venture capital ecosystem (venture capital is investment for early-stage, high-growth firms). It also draws on four semi-structured interviews with researchers and technology transfer staff. The results show that UBA has made important regulatory progress. However, barriers remain, including administrative delays, macroeconomic instability, limited risk capital, weak commercialisation capacity, and cultural resistance to academic entrepreneurship. The study concludes with recommendations to strengthen knowledge valorisation and the university's entrepreneurial ecosystem.

Keywords: university spin-offs; University of Buenos Aires; knowledge management; university entrepreneurship; innovation policies

INTRODUCTION

Over the past three decades, the transformation of universities from knowledge producers to active participants in innovation ecosystems has been one of the defining features of higher education policy (Etzkowitz & Leydesdorff, 2000; Clark, 1998). University spin-offs, companies founded on intellectual property (IP), patents or know-how generated in academic research groups, are a central vehicle of this

transformation. In Latin America, this challenge is exacerbated by structural factors such as limited venture capital (VC) ecosystems, macroeconomic instability, and cultural norms that have historically undervalued applied research (Sutz, 2000; Arocena & Sutz, 2005).

The University of Buenos Aires (UBA), Argentina's largest public university, is one of Latin America's most prolific scientific centres. It has hundreds of dual-affiliation UBA-CONICET (Argentina's National Council for Scientific and Technological Research) research groups spanning thirteen faculties. CONICET is the country's primary research funding and employment body. Despite UBA's strong scientific capacity, the translation of research results into market-oriented ventures has remained limited. Until 2024, UBA lacked an explicit regulatory framework for the creation of university spin-offs. In that year, Its Superior (the university's highest governing bod) unanimously approved the Regulation for the Creation and Promotion of University Spin-offs, establishing the legal foundations for researchers, faculty and graduates to create spin-offs under university auspices.

This paper examines UBA's emerging spin-off ecosystem through three analytical dimensions: (1) a normative dimension comparing UBA's regulations with those of five reference universities in Latin America; (2) a financial dimension analysing the regional VC ecosystem and identifying gaps in UBA's financing architecture; and (3) an institutional capacity dimension based on semi-structured interviews with researchers and transfer managers.

THEORETICAL FRAMEWORK

This study draws on four interrelated bodies of literature. Firstly, it considers the role of innovation as a driver of productive and sustainable development. Schumpeter (1942) identified innovation as the mechanism of 'creative destruction', while Romer (1990) formalised endogenous growth theory, demonstrating that knowledge generates increasing returns and positive externalities. National innovation systems (Freeman, 1987; Lundvall, 1992) show that competitiveness depends on the density and quality of inter-institutional links. Mazzucato (2013) further demonstrates that the state often acts as a first-risk investor in technologies the private sector would not finance, a perspective especially relevant in Argentina, where the public university system accounts for a significant share of the country's research and development (R&D) capacity.

Secondly, the Triple Helix model (Etzkowitz & Leydesdorff, 2000) and the Sábato Triangle (Sábato & Botana, 1968), developed specifically for the Latin American context, conceptualise the evolving relationships between universities, firms and government. Clark (1998) characterised 'entrepreneurial universities' as those that integrate a third academic mission centred on knowledge transfer. Latin American researchers have noted that these frameworks require adaptation to account for weak private-sector demand and the centrality of the state as a funder (Sutz, 2000; Arocena & Sutz, 2005).

Thirdly, knowledge valorisation encompasses the processes by which scientific knowledge creates social and economic value (OECD, 2013), with technology transfer offices (TTOs) identified as critical intermediaries (Siegel et al., 2007; Rothaermel et al., 2007). In Argentina and much of Latin America, TTO institutionalisation has lagged behind North America and Europe (Solleiro & Castañón, 2005). Fourthly, the literature on academic entrepreneurship identifies enabling conditions for spin-off creation: formal institutional support, early-stage financing, academic career incentives, cultural legitimacy for commercialisation, and market knowledge among founders (Shane, 2004; Lockett et al., 2005; O'Shea et al., 2008). Evidence from Latin America suggests that regulatory formalisation is

necessary but insufficient without financing, incentives and cultural change (Molas-Gallart et al., 2002; Barletta et al., 2013).

METHODOLOGY

This study employs a qualitative research design organised around three complementary empirical strategies. Due to the exploratory nature of UBA's spin-off ecosystem (where the regulatory framework was enacted in 2024 and only one spin-off has completed the full institutional procedure) analytical depth is prioritised over breadth. For the normative analysis, a systematic documentary review was conducted of the legal and regulatory frameworks of five universities: UBA, Universidade de São Paulo (USP) and Universidade de Campinas (Unicamp), both in Brazil, Universidad Nacional Autónoma de México (UNAM), in Mexico and Pontificia Universidad Católica de Chile (PUC), in Chile. A comparative matrix was used covering: legal framework, institutional structure, equity participation, development stages, IP ownership and financing instruments. For the financial analysis, secondary sources included regional VC market reports (LAVCA, 2023; KPMG, 2023) and documentation of national innovation funds were used. For the institutional dimension, a ten-question semi-structured interview protocol was applied to four key informants selected by purposive sampling; data were analysed using thematic content analysis (Braun & Clarke, 2006).

NORMATIVE ANALYSIS

UBA's University Spin-off Regulation (2024)

This Regulation, unanimously approved by UBA's Superior Council in 2024, is the first comprehensive regulatory instrument in the university's history dedicated to academic entrepreneurship, managed by the Vice-Rectorate for Science and Technology (SeCyT, Secretaría de Ciencia y Tecnología in Spanish). Key provisions include: Article 2 defines a university spin-off as a legal entity whose main activity applies scientific or technological knowledge developed at UBA. Article 5 requires incorporation under Argentine company law, with researchers, graduates or staff holding the majority of shares. Article 7 specifies that UBA's equity stake must be a minority holding, above the minimum set by the Superior Council. Article 9 details obligations including periodic progress reports and IP licensing compliance. Article 13 establishes a three-stage process: (i) Ideas-Projects, (ii) Spin-off Ventures and (iii) Spin-offs in Development. This approach aligns with international best practices by assigning IP ownership to UBA, creating a licensing model and maintaining SeCyT oversight without imposing management control.

Comparative Analysis

Table 1 presents key dimensions across five Latin American universities. The most developed ecosystems (USP, UNAM and Unicamp) share three features that UBA currently lacks: dedicated relevant financing instruments for university spin-offs; long institutional trajectories since the early 2000s, generating organisational learning; and national legal frameworks imposing binding technology transfer obligations on public universities. As Argentina lacks an equivalent national norm, UBA is driven by institutional initiative rather than legal obligation in its spin-off activities.

Table 1: Comparative analysis of university spin-off frameworks (five Latin American universities)

Dimension	UBA (ARG)	USP (BRA)	UNAM (MEX)	PUC Chile	Unicamp (BRA)
Legal framework	Spin-off Reg. 2024	Lei 10.973/2004; CT&I 2016	PTT Policy 2012	IP & Spin-off Reg. 2015	Lei Inovação + NIT 2003
Institutional unit	SeCyT	AUSPIN/AGEUSP	DGITT	Dir. Transfer & Dev.	Inova Unicamp
University equity	Minority; no control	Variable; FAPESP co-inv.	Minority; royalties+licences	DICTUC S.A. operator	Minority; IP licence+milestones
Stages	3: Ideas → Venture → Development	2: Incubation → Graduation	Venture → Firm → Scaling	Seed → Startup → Scale-up	Pre-incub. → Incub. → Accel.
Financing instruments	Small ones; AGENCIA I+D+i links	PIPE FAPESP; BNDES Garagem	CONACYT Sectoral Funds	CORFO Seed Capital	Inova Unicamp Grant; FAPESP
Active spin-offs	~30, several with links to CONICET	~70 (2023)	>120 in portfolio	~50 via DICTUC/TTD	~90 incubated/graduated

Source: Author's own elaboration based on institutional documents (USP/AUSPIN, 2023; DGITT-UNAM, 2022; PUC Chile, 2023; Inova Unicamp, 2023).

FINANCIAL ANALYSIS

The VC ecosystem in Latin America has grown significantly over the past decade, reaching USD 4.1 billion in 2022, up from USD 500 million in 2015 (LAVCA, 2023). However, growth is highly concentrated: Brazil accounts for around 60% of VC investment, while Argentina's share has fallen below 5%. Early-stage capital (pre-seed and seed) is particularly scarce across the region. The “valley of death” - the gap between publicly funded proof-of-concept programmes and market-oriented Series A rounds- is especially pronounced for university spin-offs, whose technology tends to sit at lower Technology Readiness Levels (TRLs) and whose founding teams generally lack commercial experience (Kantis et al., 2022).

In Argentina, the main public instruments available - FONTAR (Argentine Technological Fund), FONCYT (Fund for Scientific and Technological Research) and FONARSEC (Argentine Sectoral Fund) through AGENCIA I+D+i (the National Agency for the Promotion of Research, Technological Development and Innovation), and CONICET's 'Primeros Laboratorios' and INCUBATEL/NODOS programmes, provide an important baseline.

However, three structural gaps remain: (a) no instrument specifically targets the validation phase between academic proof of concept and commercial prototyping; (b) macroeconomic volatility - exchange rate crises, inflation exceeding 100% annually in 2023 and capital controls - strongly discourages private VC activity; and (c) unlike USP (FEALQ), UNAM (UNAM-Emprende) and Unicamp (Inova Unicamp), UBA does not operate a dedicated innovation fund, pre-incubator or incubation infrastructure with financial support. An additional critical gap is the absence of a royalty reinvestment pipeline: while the regulatory framework for collecting royalties has been established (Art. 9), no operational mechanisms exist yet to redirect these revenues into supporting early-stage spin-offs.

Three priority areas are recommended to strengthen UBA's financing architecture: (a) creation of a UBA Innovation Seed Fund, capitalised through public allocations and partnerships with national development banks such as BICE (Banco de Inversión y Comercio Exterior, Argentina's export and investment bank) and Banco Nación (the state-owned national bank); (b) formalisation of co-investment agreements with CONICET and AGENCIA I+D+i to coordinate FONTAR grants with university equity

participation; and (c) establishment of pre-incubation infrastructure within SeCyT, including mentor networks, legal and IP support services, and market validation assistance.

INSTITUTIONAL PERSPECTIVE

Sample and Protocol

Four semi-structured interviews were conducted with key actors: (E1) a senior researcher in computational chemistry, jointly affiliated with UBA and CONICET, and founder of the first spin-off formally recognised under the new regulation; (E2) an IP, transfer and entrepreneurial development manager from an agricultural sciences faculty, with over twenty years of experience; (E3) the Deputy Office of Linkage and Transfer at a faculty of exact and natural sciences; and (E4) the Director of Linkage and Transfer of UBA's Rectorate office. Anonymity was preserved at the participants request.

Scientific Capacity and Cultural Shift

All interviewees confirmed that UBA has a strong scientific foundation, clearly demonstrated during the COVID-19 pandemic. E4 noted: “Argentine science is very strong and a benchmark throughout the region. Its cycles are driven by public policy, not its own undeniable capacities”. However, a paradigmatic transformation is underway: the basic/applied research dichotomy is increasingly questioned, yet a persistent communication gap hinders progress. E3 observed: “We failed to communicate what we were doing and why it mattered. Taking part in a trade fair is not scientific, and that causes problems in CONICET career evaluations”.

Bureaucracy and Temporal Mismatch

The most frequently cited barrier is the discrepancy between university institutional timelines and the pace of the market. E1 stated: “The response to spin-offs must be fast because technology becomes obsolete within two years. No conditions at all is worse than an imperfect contract”. Their team has waited over two years for a licence agreement and has paid USD 8,000 out of pocket for patent maintenance. E3 proposed a concrete solution: “Drafting a standard licence agreement at the start of the submission process would provide investors with the legal certainty they need before committing funds”. Additional bottlenecks include centralised administrative procedures at the Rectorate and a single shared tax identification number (CUIT - Clave Única de Identificación Tributaria) for the entire university.

Human Resources, Support and Financing Gaps

Three out of four interviewees identified the absence of technology marketing profiles as a significant, under-recognised gap. E3 was direct: “A technology marketing specialist must know how to sell technology. We leave that to researchers, and it collapses”. E4 added that specialised internal capacity is needed in four strategic sectors like agtech, biotech, energy and health, to enable UBA to communicate effectively with companies. The lack of comprehensive support pushes researchers towards private alternatives: “GRIDX, a private innovation services firm which comes and offers the complete pathway, so they go there”. E2 raised a more fundamental concern: “It is very difficult to think about innovation in a faculty that has no running water. Basic infrastructure (water, electricity and internet) must be resolved first.” Regarding financing, E1 proposed a change of approach: “Fund good ideas to test them, not to prove they will be profitable. Asking researchers for business plans puts them off.”

Reception of the Regulation and AI as an Enabling Technology

All interviewees valued the Regulation positively as a necessary normative advance. The first recognised case NrealSound, a company developing digital musical instruments based on computational theoretical chemistry research, serves as a learning case for process improvement. However, E2 introduced an important caveat: “There are patents being maintained with no adopter. We need to map the situation and clarify the purpose of generating spin-offs”. Dual UBA-CONICET affiliation is perceived as one of the most concrete obstacles to licensing, with coordination failures identified on both sides.

All four interviewees spontaneously mentioned the transformative impact of artificial intelligence (AI). E3 stated: “Simply incorporating data science can propel a project into the realm of big tech. It is changing at an astonishing rate, and many researchers have not yet realised this”. E1 introduced a technological sovereignty dimension: “AI is in very few hands. We should develop it ourselves - it should be a matter of sovereignty - not having answers biased by whoever owns the AI”. This points to a strategic opportunity for UBA to position itself as a space for developing applied AI based on public-interest criteria.

DISCUSSION

The analysis reveals a central paradox: although UBA has enacted one of the most structurally coherent spin-off regulatory frameworks in the Argentine public university system, the enabling conditions - financing, incentives, cultural legitimacy and institutional infrastructure- that would allow this regulation to generate entrepreneurial activity remain substantially underdeveloped. This gap between normative formalisation and operational capacity is not unique to UBA; it characterises many Latin American universities that have introduced innovation policies without simultaneously investing in the complementary assets required for implementation (Arocena & Sutz, 2005; Molas-Gallart et al., 2002).

Reference institutions share a pattern of long institutional learning curves, dedicated financing instruments, strong national legal support for technology transfer and progressive alignment of academic career incentives with innovation activities. Replicating these outcomes at UBA will require sustained commitment over several years, a challenge given four-year electoral cycles and recurrent macroeconomic volatility. Without dedicated seed funding or pre-incubation infrastructure¹, the spin-off process risks creating initial enthusiasm followed by disappointment among potential founders (O'Shea et al., 2008). Presenting spin-off creation as a complement, rather than a substitute for basic research may be a more effective strategy for navigating academic culture than framing it as a third mission² in tension with traditional academic values.

CONCLUSIONS

This paper has examined the constraints and opportunities for creating university spin-offs at UBA through three analytical dimensions. Firstly, the University Spin-off Regulation (2024) is a significant institutional development: it provides solid legal foundations, a coherent three-stage process and clear

¹ There's currently a program called PreIncuba dedicated to this

² The Third Mission is the set of activities through which universities interact directly with society, transferring knowledge, technology, and cultural value beyond teaching (first mission) and scientific research (second mission). Some consider technology transfer to be the Fourth Mission, while the third focuses on a social purpose.

governance responsibilities, consistent with recognised international practices. Currently there are about 10 companies that are in the process, working administratively and legally to attain UBA spin-off status.

However, UBA lacks the long institutional trajectory and dedicated support infrastructure of USP, UNAM and Unicamp. Secondly, Argentina's spin-off financing ecosystem is structurally weak. Establishing a dedicated seed fund and pre-incubation infrastructure would have the greatest potential impact on the innovation agenda. Thirdly, the academic community exhibits ambivalence: it values regulatory formalisation but remains sceptical about implementation, concerned about cultural implications, and perceiving tangible obstacles gaps such as bureaucratic misalignment with market timelines and the absence of technology marketing expertise.

It is also observed that the University of Buenos Aires (UBA) has a more scientific than technological focus. This allows it to be better positioned in international rankings, as these reward impactful scientific work. For example, the QS Ranking currently places UBA among the top 80 in the world. However, this is only one aspect of the current work; it is necessary to continue advancing an agenda that values results and innovation in order to minimize the blind transfer of knowledge, as evidenced by Codner (2012)³.

Looking ahead, SeCyT is strategically positioned to leverage the spin-off framework to access international financing, while the local ecosystem matures. Artificial intelligence emerges as a priority opportunity lever, connecting UBA's scientific strengths with technological sovereignty and public interest criteria.

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³ The concept of "blind technology transfer" describes a pattern prevalent in Latin American universities whereby research outputs are transferred to external actors without systematic mechanisms to trace their use, destination, or socioeconomic impact. Codner et al. (2012) argue that this absence of strategic vision in managing research results prevents universities from accumulating institutional learning about their transfer activities and undermines their capacity to build effective knowledge valorization ecosystems.

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