State of the Art Review

Spinout Mobility: Why University Spinouts Move and How Regions Can Retain and Attract Them

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This review explores the spatial behaviour of university spinouts, with a particular focus on why they remain close to their origin or relocate over time. While prior studies have concentrated on their formation and performance, their geographical trajectories remain largely underexamined.

The literature suggests that location choices are shaped by a balance between continued access to university-linked resources and the need to tap into external assets such as investment, skills, and markets. Available evidence points to three recurring patterns: strong initial localisation, selective relocation as firms mature, and uneven regional outcomes, where regions with high retention are not necessarily those with high attraction.

Despite these insights, the empirical base is still limited. There is little longitudinal evidence, weak understanding of individual and firm-level motivations, and insufficient differentiation between types of spinouts. Moreover, the role of regional conditions in supporting both retention and inward mobility remains unclear.

The review highlights the need for a shift in policy emphasis towards supporting later-stage business development, strengthening regional ecosystems, and improving data and classification frameworks to better capture spinout dynamics.

Background

University spinouts (USOs) are typically defined as new ventures created to commercialise intellectual property (IP) generated within universities, with the IP belonging to either the university or an academic and, in some cases, university equity participation (Rossi et al., 2023). This distinguishes them from broader categories such as academic start-ups or technology-based firms, which may involve university-affiliated individuals (researchers and students) but are not necessarily based on university-linked IP. UK evidence highlights that spinouts represent a specific pathway of formal knowledge commercialisation, and should be analytically separated from wider entrepreneurial activity emerging from universities (Ulrichsen, 2019).

Spinouts have attracted sustained policy interest as vehicles of knowledge exchange, translating research into commercially viable innovations. They are expected to contribute to regional economic development through job creation, productivity growth and knowledge spillovers into local firms and networks (Egeln et al., 2004; Tracey and Williamson, 2023), although empirical evidence of these benefits remains limited and often anecdotal (Benneworth and Charles, 2005; Harrison and Leitch, 2010). USOs occupy a central role in innovation policy, particularly in the UK, where university commercialisation is seen as a mechanism for strengthening regional innovation systems.

A substantial body of research has therefore focused on the creation and performance of USOs, examining the role of university capabilities, incubation models and founder resources (Clarysse et al., 2005; Shane and Stuart, 2002). This literature shows that spinout activity is highly concentrated in research-intensive universities and regions, reflecting the geography of research capacity and entrepreneurial ecosystems (Ulrichsen, 2019).

At the same time, innovative start-ups, including spinouts, are inherently mobile. While initially anchored to their parent institutions through knowledge ties and social capital, they may relocate to access finance, talent and markets. Regions differ not only in their ability to generate spinouts, but also to retain and attract them, with important implications for regional development (Rossi et al., 2023).

Despite this, the literature has paid limited attention to the post-formation spatial dynamics of spinouts. This raises a key question: *Why and when do university spinouts move, and what regional conditions enable their retention and attraction?*

Research Evidence

Theoretical concepts explaining spinout location and relocation

The location and mobility of university spinouts can be understood through a set of complementary theoretical perspectives drawn from economic geography, innovation studies, and entrepreneurship research (Boschma, 2005; Stam, 2015; Spigel, 2017).

While these literatures have largely developed in parallel, they converge on a common insight: spinout location decisions reflect a trade-off between proximity-based advantages and access to external resources and opportunities (Audretsch and Feldman, 1996; Bathelt et al., 2004).

Rather than being driven by a single mechanism, spinout location decisions reflect the interaction between firm-level characteristics (e.g. type, capabilities, founder incentives) and regional conditions (e.g. availability of finance, networks, and agglomeration economies) (Clarysse et al., 2005; Wright et al., 2007; Stam, 2015). Existing literature points to a set of recurring mechanisms that shape these decisions, including academic embeddedness, social capital, absorptive capacity, and ecosystem quality, as well as stage-dependent resource needs associated with firm growth (Shane, 2004; Shane and Stuart, 2002; Cohen and Levinthal, 1990; Spigel, 2017). Importantly, these mechanisms operate differently across the firm lifecycle, helping to explain both early-stage spatial stickiness and later-stage mobility (Vohora et al., 2004).

At the point of formation, spinouts are typically strongly anchored to their parent institutions, reflecting dependence on tacit knowledge, research infrastructure, and academic networks. This is consistent with theories of academic embeddedness and knowledge spillovers, which emphasise the importance of both geographic and relational proximity in enabling access to university-based resources (Shane, 2004; Rasmussen et al., 2011; Boschma, 2005).

Over time, as firms evolve, location decisions become increasingly shaped by changing resource requirements and growth ambitions. The literature highlights several mechanisms through which this transition occurs. First, spinout typologies suggest that high-growth, technology-oriented ventures are more likely to seek external finance, managerial expertise, and specialised markets, increasing their propensity to relocate (Clarysse et al., 2005; Wright et al., 2007). Second, critical development thresholds imply that firms may need to access new forms of legitimacy, funding, and capabilities at key stages of development, which are not always available in their home region (Vohora et al., 2004). Third, theories of agglomeration economies and entrepreneurial ecosystems emphasise the role of regional environments in providing access to specialised labour, investors, and networks, which can act as powerful pull factors for relocation (Audretsch and Feldman, 1996; Bathelt et al., 2004; Stam, 2015; Spigel, 2017).

Table 1 synthesises the main theoretical concepts and mechanisms identified in the literature. It brings together insights on firm heterogeneity, resource constraints, network embeddedness, and regional conditions, and shows how these jointly influence both location and relocation decisions.

Table 1. Theoretical mechanisms explaining spin-out location and relocation

Theoretical concept	Key idea	Mechanism influencing location choice	Expected spatial behaviour	Key references
Academic embeddedness	Spin-outs initially rely on university knowledge, infrastructure and personnel	Continued collaboration with the parent university and access to tacit knowledge encourage spatial proximity	Strong local anchoring in early stages	Shane (2004); Rasmussen et al. (2011)
Founder career incentives	Academic founders balance research careers with entrepreneurial activity	Maintaining academic roles and career considerations encourages proximity to the university	Early-stage firms more likely to remain near the parent institution	Kolympiris et al. (2015)
Spin-out typologies	Different types of spin-outs have distinct growth ambitions and resource needs	High-growth, technology-based spin-outs require venture capital, specialised management and markets not always available locally	High-growth spin-outs more likely to relocate to strong innovation hubs; lifestyle or consultancy spin-outs remain local	Clarysse et al. (2005); Wright et al. (2007)
Critical development thresholds	Spin-outs face stages requiring new resources, legitimacy and capabilities	Access to finance, managerial expertise and credibility may require entry into stronger ecosystems	Relocation more likely when firms cross key development thresholds (e.g. scaling)	Vohora et al. (2004)
Absorptive capacity and resource gaps	Firms' ability to benefit from external knowledge depends on internal capabilities	Limited absorptive capacity and capability gaps constrain use of external knowledge, reinforcing local embeddedness; relocation occurs as capabilities develop	Early-stage anchoring; later mobility as firms seek complementary assets	Cohen and Levinthal (1990); Fritsch and Slavtchev (2007); Adams et al. (2017)
Social capital and networks	Informal and formal networks shape access to information, advice and opportunities	Trust-based relationships with mentors, collaborators and peers influence learning and opportunity recognition; networks are geographically uneven	Firms may remain where trusted networks exist, or relocate to access stronger entrepreneurial communities	Shane and Stuart (2002); Nicolaou and Birley (2003); Stam (2015)
Access to finance and investors	Availability of financial capital is critical for venture growth	Venture capital, business angels and other investors are geographically concentrated and require proximity for interaction and monitoring	Firms may relocate to regions with deeper capital markets and investor presence	Florida and Kenney (1988); Sorenson and Stuart (2001); Colombo and Grilli (2010)
Agglomeration economies	Innovative firms benefit from spatial concentration of related activities	Access to specialised labour, suppliers, customers and knowledge spillovers encourages clustering	Movement toward dense innovation clusters and major economic centres	Audretsch and Feldman (1996); Bathelt et al. (2004)

Entrepreneurial ecosystems	Successful ventures depend on the quality of regional ecosystems	Availability and coordination of finance, talent, institutions and support services varies across regions	Spin-outs may relocate to ecosystems with stronger capital markets and support structures	Stam (2015); Spigel (2017)
Location advantages (FDI logic)	Firms choose locations based on relative advantages across regions	Trade-off between home-region ties and access to strategic assets (markets, finance, knowledge)	Relocation toward regions offering superior growth and strategic opportunities	Dunning (2009)

Direct empirical evidence on locational choices

There is limited direct empirical evidence on the mobility of university spinouts, with most studies focusing instead on their creation, performance, or local embedding. The available evidence, however, points to a consistent pattern: high early-stage spatial stickiness combined with selective and often delayed relocation. Importantly, recent work suggests that mobility should not be understood solely in terms of administrative regions, but also in terms of spatial distance from the parent institution, which captures the intensity of ongoing knowledge and network linkages.

Evidence from semi-peripheral regions in the Netherlands provides some of the most detailed longitudinal insights. A comprehensive study of spin-offs from the research-intensive University of Twente shows high overall regional retention, with approximately 86–89% of firms remaining in the region of origin. **Retention is particularly strong among spinouts compared to non-IP-based spinoffs**, reflecting their continued dependence on university-generated knowledge, infrastructure and networks (Bazen, 2018). At the same time, while some inward mobility is observed, attraction rates – percentage of spinouts established outside Twente region which moved to the region – remain comparatively modest (albeit higher for spinouts compared to non-IP-based spinoffs), indicating that such regions struggle to draw in spinouts from elsewhere. Complementary evidence from Saxion University of Applied Sciences confirms similarly high short-term retention rates (around 85–96% within the first five years), but also highlights a negative migration balance, with more firms leaving than entering the region (Bazen, 2020).

Much of this literature conceptualises mobility at the level of regional boundaries, implicitly treating location as a binary choice (stay vs leave). Complementary evidence from Germany by Egeln et al. (2004) enriches this view by introducing **distance** as a continuous dimension of spinout location and conceptualises location decisions in terms of distance thresholds (e.g. 25, 50, 75 km), reflecting the limits of face-to-face interaction and tacit knowledge exchange. Within such thresholds, firms can maintain regular interaction with their parent institution; beyond them, relocation implies a qualitative shift in the nature of linkages. Using a large representative dataset, the authors show that while proximity to the parent institution remains important, a substantial share of spin-offs locate at non-trivial distances: only around 55% are within 25 km, while more than 25% are located at distances exceeding 75 km. This challenges the view of spinouts as purely local phenomena and highlights that spatial embeddedness is graduated rather than binary. Their findings suggest that spinout location reflects a trade-off between proximity-based knowledge access and human capital (localisation economies) and market- and demand-oriented considerations (urbanisation economies). While strong ties to the parent institution (e.g. use of infrastructure, contract research, hiring students) anchor firms locally, demand conditions, access to customers, and broader economic opportunities can pull firms away—even relatively early in their lifecycle.

This distance-based perspective also complements insights on the **timing of mobility**. While early-stage relocation appears limited in Dutch evidence, longer-term analysis from the Twente case indicates that mobility often occurs later, around 9–10 years after foundation, suggesting that relocation is associated with the scaling phase rather than initial establishment. Taken together, this indicates that mobility is not only a question of *whether* firms move, but also *how far* and *when*, with different mechanisms operating at different spatial and temporal scales.

Findings from the UK provide further insights into how **regional entrepreneurial system characteristics shape these dynamics**. Harrison and Leitch (2010) show that, in peripheral regions such as Northern Ireland, spinouts tend to remain small, resource-constrained and locally embedded, often operating as "technology lifestyle" businesses rather than high-growth ventures. This reflects not only firm-level characteristics but also structural constraints in access to venture capital, expertise, and networks. Access to private venture capital and business angel finance is particularly constrained, with firms reporting significant difficulties in raising external funding, often receiving less capital than required and, in some cases, adjusting or scaling back their growth strategies as a result. These constraints are compounded by weak linkages to external commercial expertise, including limited access to mentoring and industry networks beyond the university. Such conditions limit growth opportunities, potentially increasing incentives for relocation at later stages, particularly when firms seek to scale.

Recent UK evidence by Rossi et al. (2023) provides one of the most direct and comprehensive analyses of spinout mobility, explicitly distinguishing between **retention and attraction dynamics across regions**. The study investigates the early-stage mobility of USOs founded between 2005 and 2012, restricting the sample to firms active within the first seven years after establishment. The analysis is conducted at the NUTS-2 regional level. The findings show that the majority of university spinouts remain locally embedded, with around 70% of firms staying in their university's home region, confirming a strong degree of spatial stickiness. However, this aggregate pattern masks substantial heterogeneity. Mobility varies across sectors, with manufacturing and chemical–pharmaceutical spinouts being more mobile, while trade and other service-oriented firms exhibit lower mobility. Firm-level events also matter: acquired spinouts are significantly less likely to remain in their region of origin, often relocating closer to new owners.

At the regional level, Rossi et al. (2023) highlight a clear asymmetry between retention and attraction. **Regions with high retention are not necessarily those with high attraction**, and vice versa. For example, London and the South East exhibit low retention but high attraction, whereas many regions in the North of England, the South West and the devolved nations show high retention but low attraction. Some regions perform weakly on both dimensions, exhibiting both low retention and low attraction (notably the West Midlands and parts of the East Midlands).

Crucially, Rossi et al (2023) shows that different regional mechanisms underpin retention and attraction. **Regions with high retention rates tend to be characterised by lower urbanisation economies and lower input costs**, suggesting that spinouts remain where they can exploit cost advantages alongside continued access to university-based knowledge resources. Indeed, locally embedded spinouts appear less dependent on regional innovation ecosystems, as their links to the parent university provide access to skilled labour, laboratories and networks. In contrast, **regions that attract spinouts exhibit stronger localisation economies and richer innovation environments**, including higher concentrations of knowledge-intensive firms, greater availability of science parks, and more developed advisory and support infrastructures. Migrating spinouts therefore appear to trade off proximity to the parent university for access to stronger innovation ecosystems, sectoral clustering, and market opportunities elsewhere.

As an example, evidence from a London-focused study by Lawton Smith et al. (2014) suggests that even strong metropolitan ecosystems do not guarantee retention. Despite London's significant agglomeration advantages, over one-third of university-related spin-offs had left the region, pointing to substantial outward mobility even in core regions. This reinforces Rossi et al. (2023)'s distinction by showing that high attraction potential does not necessarily translate into high retention, and that firm-level dynamics and evolving resource needs may outweigh location-specific advantages.

The role of specific resources further refines this picture. **Access to finance emerges as a key factor for both retention and attraction**, while other forms of support have more differentiated effects: manufacturing spinouts are more likely to remain where local financing is available, whereas service-based spinouts respond more strongly to the availability of business advice and support services. Overall, Rossi et al. (2023) demonstrate that spinout mobility reflects a balance between cost-based anchoring forces and opportunity-driven relocation, and that retention and attraction are shaped by distinct but complementary regional conditions.

More generally, evidence on the location decisions of academic start-ups indicates that they tend to locate close to their parent institutions, driven by access to tacit knowledge, infrastructure and skilled labour; however, such **proximity is not purely geographic**. Recent work shows that **social ties** to the parent university are critical, and that proximity alone does not guarantee access to knowledge resources (Heblich & Slavtchev, 2024). In a similar vein, Adams et al. (2017) emphasise that location choice of spinouts at entry reflects the interaction between inherited knowledge resources and the need to access complementary capabilities, with firms often remaining in familiar environments when these resource gaps —and their limited **absorptive capacity**— limit their ability to benefit from external knowledge spillovers. This reinforces the idea that early-stage retention reflects both spatial and relational embeddedness. Evidence from the US biotechnology sector shows that location choices reflect both regional factors (e.g. access to venture capital and knowledge assets) and **founder characteristics**, with more experienced entrepreneurs more likely to locate away from their academic base (Kolympiris et al., 2015).

Overview and Evidence Gaps

Taken together, the limited but growing body of evidence suggests three key stylised facts. First, spinouts exhibit high early-stage stickiness, reflecting dependence on university-related resources and networks. Second, mobility is selective, distance-sensitive, and often occurs later in the lifecycle, particularly as firms scale and seek access to finance, markets, and specialised capabilities. Third, there is a clear asymmetry between retention and attraction, with peripheral regions often able to generate and initially retain spinouts but struggling to sustain their growth or attract external firms. However, despite these emerging patterns, the evidence remains fragmented and largely descriptive, with limited systematic analysis of the drivers and mechanisms underpinning spinout mobility across different spatial scales.

A first key gap concerns the lack of longitudinal and lifecycle-based analyses. Much of the existing evidence captures spinout location at a single point in time or focuses on early-stage outcomes, providing only a partial view of mobility dynamics. As a result, the timing, sequencing and triggers of relocation remain poorly understood, particularly beyond the initial years following firm formation. This limits our ability to distinguish between temporary adjustments, staged relocation, and permanent migration, as well as to link mobility decisions to firm growth trajectories.

Second, **there is limited understanding of the micro-level mechanisms driving mobility**, particularly the interaction between firm capabilities, founder characteristics, and resource constraints. While theoretical frameworks highlight the role of absorptive capacity, social capital and development thresholds, these mechanisms are rarely tested empirically in an integrated way. In particular, there is a lack of evidence on how capability gaps evolve over time, and how they shape firms' ability to benefit from external ecosystems, or conversely, reinforce local embeddedness. Closely related, there is a notable **lack of qualitative evidence on the motivations underpinning relocation decisions**, with even the most comprehensive quantitative studies acknowledging that the reasons why spinouts move—or choose to stay—remain insufficiently understood (Rossi et al., 2023).

Third, the literature remains underdeveloped in capturing **heterogeneity across spinouts**. Existing studies point to differences by sector, technology intensity, and ownership structure (e.g. acquired firms), but there is little systematic analysis of how **different types of spinouts follow distinct mobility trajectories**. This issue is compounded by definitional ambiguity, as many studies use the term “spin-offs” broadly, often conflating formal university spinouts, academic start-ups, and research-based firms founded by academics. Such aggregation risks obscuring important differences in resource needs, growth ambitions, and mobility behaviour across these categories.

A fourth gap relates to the **spatial dimension of mobility**. Much of the literature conceptualises location at the level of administrative regions, with **limited attention to distance, multi-location strategies, or partial relocation**. This constrains our understanding of how firms balance proximity to the parent university with access to external resources, and whether mobility should be understood as a binary outcome or a continuum of spatial configurations.

Finally, while recent work highlights the distinction between retention and attraction, there is limited evidence on the policy and ecosystem conditions that support each of these outcomes. In particular, it remains unclear how different components of regional systems—such as finance, networks, and support infrastructures—interact to influence firms' decisions to stay or move. More broadly, there is **little systematic evidence on which combinations of regional ecosystem factors are most effective in supporting both retention and attraction**, and whether these configurations differ across stages of firm development or types of spinouts. This limits the ability to design targeted and coordinated policy interventions, especially in peripheral regions seeking not only to retain but also to attract and scale spinouts.

Policy Implications

From a policy perspective, the evidence points to the need for a **shift from supporting spinout creation to enabling retention, scale-up, and value capture**. While existing interventions—such as proof-of-concept funding, incubators, and commercialisation support—are effective in fostering early-stage activity, they do not address the key constraints that emerge as firms grow (Lockett et al., 2003; Wright et al., 2007).

First, policies need to address the **scale-up gap**, particularly in access to growth finance, experienced management, and global networks. Relocation is frequently driven by the search for these complementary assets. Strengthening **regional investment ecosystems**, including later-stage finance and investor networks, is therefore critical to improving retention. Recent UK evidence highlights that, despite strong performance in spinout creation, the UK continues to face challenges in retaining value as firms scale, with increasing reliance on external investors and international markets.

Second, the distinction between retention and attraction implies that different policy levers are required. Retention is often supported by cost advantages and continued university linkages, whereas attraction depends on strong agglomeration economies and ecosystem depth. Earlier policy-oriented research highlights that weaker regions face structural disadvantages in building such ecosystems and require more tailored, context-sensitive interventions (Benneworth and Charles, 2005; Pugh, 2017). This reinforces the need to **move beyond "one-size-fits-all" models** of innovation policy.

Third, policy design should better reflect **firm heterogeneity and classification challenges**. Spinouts differ significantly in their technological orientation, growth trajectories, and strategic importance, yet existing policy frameworks and datasets often treat them as a homogeneous group. Recent work highlights the need for more nuanced classification systems that capture technological domains, application areas, and strategic relevance, enabling more targeted and effective policy design (Roupakia and Ulrichsen, 2025).

Fourth, **improving the evidence base is essential**. Current limitations in tracking spinouts over time and across locations constrain both research and policy evaluation. Recent initiatives to link administrative and firm-level datasets highlight both the potential and the current gaps in understanding spinout performance, trajectories, and geographic mobility. Strengthening longitudinal and linked data infrastructures is therefore critical for understanding not only *where* spinouts move, but *why and* informing more evidence-based interventions.

Finally, the findings point to the importance of adopting a systemic, lifecycle-oriented approach. Supporting spinouts requires **coordinated interventions across stages—from early commercialisation to scaling—and across domains, including finance, skills, infrastructure, and networks.** As highlighted in both academic and policy-oriented work, successful outcomes depend not on isolated policy instruments, but on the strength and alignment of the broader innovation ecosystem.

Overall, policy should move beyond a focus on the number of spinouts created and instead prioritise the conditions that enable spinouts to remain, grow, and generate long-term economic value locally.

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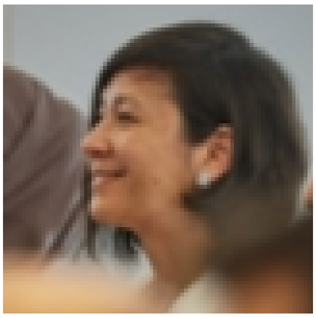

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