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Towards a Dashboard for Tracking and Monitoring University Spinout Ecosystem Success

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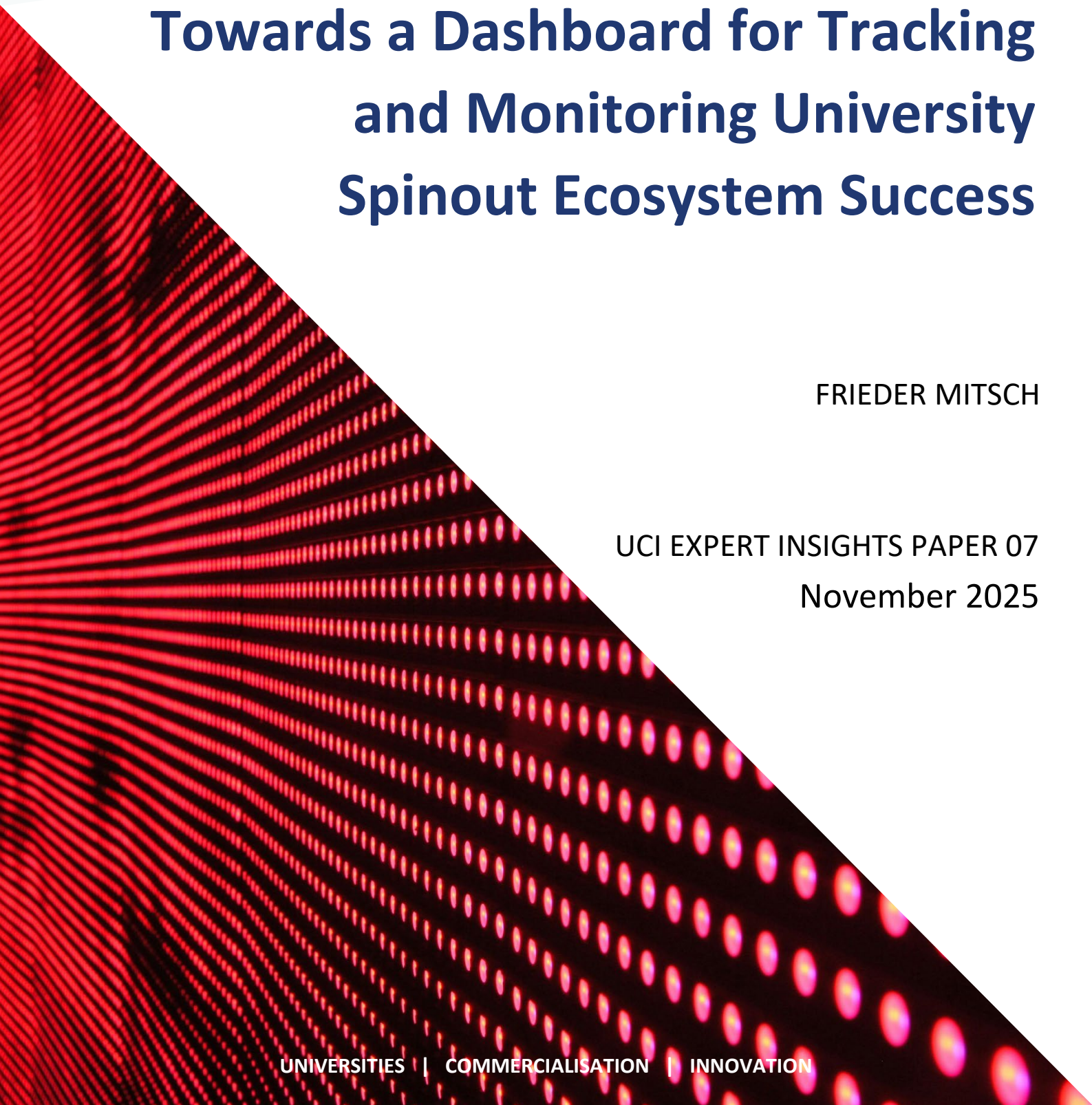

Research England national knowledge exchange metrics programme

This report was developed by the team at UCI, Research England's national knowledge exchange (KE) metrics advisers, to provide expert advice as part of Research England's work programme to develop better data and metrics for KE.

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ABOUT UCI

The Policy Evidence Unit for University Commercialisation and Innovation (UCI) is based at the University of Cambridge and aims to support governments and university leaders in delivering a step change in the contributions universities make to innovation and economic prosperity – nationally and locally – through their commercialisation and other innovation-focused knowledge exchange activities and partnerships.

UCI seeks to improve the evidence base and tools available to key decision makers in public policy and university practice as they develop new approaches for strengthening university research-to-innovation pathways, with a particular focus on commercialisation. To do so it draws on the latest advances and insights from both academic research and policy practice, as well as lessons learned from experiences in the UK and internationally.

The Policy Evidence Unit is funded through a generous grant from Research England to work in close partnership with them to develop next generation data and metrics able to better capture the nature, health and performance of university knowledge exchange.

Find more about our work: UCI Policy Evidence Unit

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Contents

1 INTRODUCTION 4

1.1 OUTLINE 5

2 OVERVIEW OF DASHBOARDS AND FUNCTIONS 6

2.1 WHAT IS A DASHBOARD? 6

2.2 FUNCTIONS OF A UNIVERSITY SPINOUT EVIDENCE DASHBOARD 6

3 ASSESSING THE HEALTH AND PERFORMANCE OF UNIVERSITY SPINOUTS AND ECOSYSTEMS 8

3.1 THE SPINOUT ECOSYSTEM AS A NESTED STRUCTURE 8

3.2 CHARACTERISING THE SPINOUT PROCESS 8

3.3 HOW COULD OUTCOMES AND PERFORMANCE BE MEASURED 9

3.4 FACTORS INFLUENCING SPINOUT SUCCESS 11

3.5 FURTHER DETAILS FROM THE LITERATURE 13

3.6 LITERATURE DISCUSSION 14

4 IMPLICATIONS FOR THE DESIGN OF A UNIVERSITY SPINOUT ECOSYSTEM DASHBOARD 16

4.1 CONCEPTUAL DESIGN 16

4.2 DATA AND METRICS 17

5 OUTLOOK AND NEXT STEPS 19

REFERENCES 21

1 Introduction

This report explores the design and development of a dashboard to monitor and assess the health and performance of university spinout ecosystems. By leveraging data from the University Spinout Register and integrating broader contextual insights, the envisioned dashboard seeks to equip policymakers, universities, and other stakeholders with a dynamic tool for tracking and evaluating the health and performance of spinout ecosystems.

University spinouts play a crucial role in translating academic research into commercial ventures, accelerating knowledge transfer, driving innovation, national competitiveness and economic growth. Unlike traditional startups, university spinouts rely heavily on academic ecosystems, unique knowledge transfer processes, and proximity to research institutions. These distinctions underscore the importance of understanding the specific factors influencing spinout success and the broader role of universities and their ecosystems in shaping these outcomes. However, measuring the health and performance of spinout ecosystems presents unique challenges. These ecosystems operate at the intersection of academic, regional, and global systems as well as technology domains and sectors, relying on a diverse range of resources, networks, and structures. This complexity necessitates a framework for performance measurement that is adaptable, multi-dimensional, and context-sensitive.

The new Spinouts Register represents a transformative initiative to establish a comprehensive and standardized repository of data on university spinouts across the UK. This register will not only provide a publicly accessible and curated list of spinout companies originating from the higher education sector but also has the potential to enable the extraction of richer and more efficient data and evidence about these companies to create data products tailored to specific stakeholders. Overall, the Register aims are to enhance data quality, improve transparency, and support informed decision-making among a diverse group of stakeholders, including policymakers, funding agencies, universities, and researchers. By achieving these goals, the register aims to promote innovation and ensure the effective commercialisation of intellectual property generated within universities.

Given the nature of the data provided by the Spinouts Register, we now have the potential to create powerful new dashboards of metrics to assess the health and performance of university spinout ecosystems. Dashboards are visual tools that consolidate and display key metrics, performance indicators, and data points in a single, intuitive interface.

A well-designed Spinouts Dashboard has the potential to become a valuable tool for monitoring and assessing the health and performance of university spinout ecosystems. By consolidating and visualising key metrics, such a dashboard can provide Research England and others with a mechanism to track the impact and effectiveness of spinout activities across the UK. This capability has the potential to support performance benchmarking, trend analysis, and the identification of areas for improvement within and across ecosystems. Furthermore, the dashboard can facilitate evidence-based decision-making by offering granular insights into the factors driving success or underperformance.

To achieve these aims, this report sets out conceptual underpinnings to help guide the development of a university spinout ecosystem dashboard. It considers the complexities of the spinout process, reflects on measures that could capture the performance of spinouts, and highlights critical factors that should be accounted for in its design. To guide its development, a phased approach is suggested that aligns the dashboard's evolution with emerging insights from ongoing research and data

integration efforts. The first phase should focus on establishing broad performance and outcome trends. The second phase would then involve a deeper investigation into the drivers of performance. This structured methodology will ensure that the dashboard remains responsive to real-world challenges while enabling both high-level trend analysis and more granular diagnostics of ecosystem functionality.

1.1 Outline

This report provides an overview of a possible dashboard and the functions it could provide, as well as considering some of conceptual complexities around the spinout process that should be accounted for in the design of the metrics that will be contained within a dashboard.

The structure of this report is as follows:

Section 2: **Overview of Dashboards and Functions** which provides a concise explanation of dashboards and the specific functions a University Spinout Ecosystem dashboard should perform.

Section 3: **Assessing the Health and Performance of University Spinout Ecosystems**: This section will delve into the challenges of evaluating USO ecosystems, and includes a summary of the literature on the factors influencing spinout outcomes.

Section 4: **Implications for the Design of the Dashboard**: This section explains how insights from the previous section and literature will guide the proposed design of the University Spinout Ecosystem dashboard, integrating the phased approach to its development.

Section 5: **Outlook and Next Steps**: The final section will outline the phased approach in more detail as well as describe next steps to further explore and refine the feasibility of various dashboard design elements.

2 Overview of Dashboards and Functions

2.1 What is a Dashboard?

A dashboard is a visual tool that consolidates and displays key metrics, performance indicators, and data points in a single, easily interpretable interface. It serves as a central hub for monitoring progress, tracking outcomes, and supporting real-time decision-making. Dashboards typically include interactive elements such as charts, graphs, and tables, enabling users to explore data from multiple perspectives and at various levels of granularity.

A dashboard's utility lies in its ability to transform complex datasets into visual and actionable insights. For instance, users could visualize year-over-year growth in the revenue and employment of, and investment raised by, spinouts through dynamic line graphs or assess regional disparities in spinout support using heatmaps. These interactive elements ensure that a range of stakeholders can explore trends efficiently, tailoring the analysis to their specific needs.

2.2 Functions of a University Spinout Evidence dashboard

A well-designed University Spinout Evidence Dashboard should serve multiple purposes. While one of its main functions is to monitor and assess university spinout ecosystem health and performance, it can also play a broader role by helping stakeholders understand the underlying drivers of success and challenges within spinout ecosystems. To be effective, the dashboard should have two core capabilities:

1. Monitor and Track the Performance of University Spinouts and Ecosystems
2. Identify Key Drivers and Emerging Trends

Together, these capabilities ensure that the dashboard serves as both a tracking tool for performance measurement and a deeper analytical tool for understanding the factors shaping spinout ecosystems.

More specifically a well-designed dashboard can fulfil several critical functions:

- **Monitoring and Assessment of Ecosystem Health and Performance:** The dashboard tracks key indicators such as the number of active spinouts, their survival rates, employment trends, and financial performance. It could also track other indicators such as funding or support availability at different stages of an early venture development path. Additionally, the dashboard could help identify potential "value leakage" by tracking indicators such as the acquisition of spinouts by overseas companies, the dominance of foreign investors in later-stage funding rounds, and the relocation of spinouts outside the UK. This provides insights into the overall vitality of the innovation ecosystem and ensure that the domestic innovation ecosystem benefits from university spinouts. This also enables stakeholders to identify best practices and areas needing further intervention. This benchmarking function is critical for fostering healthy competition and sharing effective strategies across institutions
- **Assessing Regional, Institutional, and Sectoral Performance and Impact:** By integrating data on regional economic conditions, investment landscapes, university-specific metrics, and sectoral trends, the dashboard could highlight the performance of university spinout ecosystems and their broader economic and societal impact. Performance indicators might include spinout survival rates, funding secured, and job creation, sector-specific spinout

outcomes and performance, while impact measures could assess how spinouts contribute to regional industrial development, innovation diffusion, and policy effectiveness.

- **Identifying Trends and Patterns:** Dashboards are instrumental in identifying emerging trends within innovation ecosystems, such as shifts in the types of technologies being commercialized or changes in investment patterns. Additionally, the dashboard can track the sectoral distribution of spinouts, helping to identify which industries are driving innovation and which may require additional policy support or funding interventions. These insights can inform strategic decisions at both institutional and policy levels.
- **Customisability and Interactivity:** Users can customise the dashboard to focus on specific aspects of the ecosystem most relevant to their needs. For instance, policymakers might prioritize economic returns and job creation, while university administrators might focus on the efficiency of technology transfer processes and the long-term success of their spinouts.

Given Research England's role as a university-level funder of research and knowledge exchange, a primary function of a Research England-driven dashboard would be the monitoring and assessment of university spinout ecosystem health and performance. However, in taking the time and effort to develop a dashboard, there is significant value in designing a dashboard with a broader set of potential functions meaning it may be able to be used by a wider range of stakeholders.

3 Assessing the Health and Performance of University Spinouts and Ecosystems

Given the multilayered and embedded nature of the spinout process, assessing the health and performance of university spinout ecosystems presents significant challenges. Isolating the influence of various ecosystem components on spinout outcomes is particularly difficult due to the dynamic interactions among local, regional, and national factors.

3.1 The Spinout Ecosystem as a Nested Structure

University spinouts operate within a nested structure of ecosystems, ranging from the university itself to regional, national, and even global levels. Each layer interacts dynamically, contributing unique resources and constraints to spinout development.

Figure 1| Simplified Visualisation of different Levels of the Spinout Ecosystem

For example, a spinout may initially rely on the university ecosystem for access to research expertise and commercialisation support. As it develops, regional factors such as industrial partnerships, labour market conditions, and local policy incentives become increasingly important. National and global ecosystems contribute additional elements, such as regulatory frameworks, venture capital networks, and market access. These nested layers not only interact but also evolve over time, further complicating efforts to isolate their individual contributions to spinout outcomes.

3.2 Characterising the Spinout Process

The university spinout process is inherently complex and can be characterised by a series of key events, unfolding across a series of milestones that include the disclosure of an initial commercialisation idea, the foundation of the business, and specific outcomes such as achieving employment goals, investment thresholds, technology, product and commercial viability, and first sales. In principle, these milestones could be used to track the progress of spinouts and to identify areas where they are struggling. These milestones could also be systematically linked to specific ecosystem components, such as different types of commercialisation support during early stages of

the process, or regional industrial partnerships and access to finance and skills for scaling efforts. For example, in the earlier stages accelerators or incubators might be valuable University or Regional ecosystem assets, whereas later in a spinout's life the focus might turn to labour market characteristics and the availability of industrial partners to support development and market penetration.

Figure 2| Simplified Visualisation of the University Spinout Process

The layered and dynamic nature of these ecosystems demands a holistic approach to performance assessment. For example, the interplay between local policy incentives and access to venture capital can significantly shape spinout outcomes but may vary dramatically between regions. Capturing these nuances requires integrating both qualitative and quantitative data sources into a cohesive framework. The nature of the process and the changing influence of different actors and/or institutions poses a challenge in defining what variables should be captured and how to measure them in order to assess the performance of University Spinout Ecosystems.

3.3 How could outcomes and performance be measured

Assessing the performance of university spinouts and ecosystems requires a structured approach that considers both their viability as commercial ventures and their broader economic impact. University spinouts often commercialize early-stage, high-risk technologies with long development timelines, uncertain market adoption, and sector-specific challenges. As a result, investments in spinouts should be understood as a portfolio approach—some ventures will succeed, while others may fail, pivot, or generate impact in ways beyond traditional commercial success. This portfolio perspective is essential for evaluating university spinout ecosystem performance fairly, rather than focusing solely on individual company outcomes.

A set of preliminary indicators that help describe spinout outcomes have been identified below — acknowledging that this is an ongoing process, and that further refinement is needed. These indicators represent an initial framework for evaluation and will evolve as more data becomes available and methodologies improve. To provide structure, these are grouped these indicators around three key questions:

How Good Are Universities at Producing Viable Spinouts?

Universities play a crucial role in fostering innovation and commercializing academic research. However, measuring success requires moving beyond a simple count of spinouts created. A university's portfolio of spinouts—which may span multiple disciplines, sectors, and business models—provides a more accurate and holistic picture of its impact. Key indicators could include:

- **Portfolio of spinouts created** – Moving beyond aggregate numbers to analyse the diversity of spinouts across disciplines and sectors.

- **Spinouts meeting specific viability criteria** – Assessing how many spinouts progress beyond the early stages, based on milestones such as employment, securing funding, developing viable products or services, hiring employees and building operational capacity, or generating revenue.
- **Investment raised** – Given the increasing complexity of university spinout investment landscapes, it is important to consider not only the volume of funding secured but also the types of investment and investors involved. Traditional venture capital remains a significant player, but emerging sources such as corporate venture funds, pension funds, regional investment bodies, and international investors are becoming increasingly prominent. In addition, non-dilutive funding such as research grants, Innovate UK funding, and government-backed loans, or debt and alternative financing mechanisms are also of interest.
- **Survival rates** – Understanding how long spinouts remain active, recognizing that different sectors have different expected growth and exit timelines.

Additionally, spinouts commercialize knowledge and IP from diverse disciplines, including life sciences, engineering and physical sciences, social sciences, and the arts and humanities, and enter different sectors of the economy, spanning pharmaceuticals and biotechnology, medical technologies, aerospace, software and digital technologies, energy, finance etc. UCI is currently working on a spinout classification project to better categorize spinout activity across different sectors and knowledge domains, which will provide richer context for future assessments.

While high numbers of spinouts could suggest strong innovation output, their quality, funding success, and longevity provide a more accurate picture of how effective universities are in producing commercially viable ventures.

What Is the Effect of Spinouts on Regions, Industries, and the UK Economy?

Beyond individual business success, spinouts contribute significantly to economic development. Measuring their impact on regions, industries, and the UK economy involves tracking:

- **Employment generation and regional stickiness**
- **Turnover and financial performance**
- **Industry contributions** – The sectors in which spinouts operate, highlighting their role in strategic industries such as biotech, AI, clean energy, and advanced manufacturing.
- **Geographic distribution –** Recognizing that some places attract and/or produce more spinouts than others. This includes analysing spinout movement, as well as if there is clustering of spinouts in specific regions, e.g. due to regional sectoral specialisation.

How Good Is the UK at Retaining Spinouts?

Ensuring that university spinouts remain in the UK and continue contributing to the national economy is another key aspect of performance assessment. Factors to consider include:

- **Survival rates in the UK** – Tracking whether spinouts remain active and grow within the UK rather than relocating abroad.

- **Ownership and acquisitions** – Monitoring whether successful spinouts remain UK-owned or are acquired by foreign companies, which can lead to intellectual property and economic value shifting overseas.
- **Location of operations** – Identifying whether spinouts continue to scale within the UK, maintain their headquarters domestically, or move to international markets.

Challenges in Measuring Spinout Performance

While these metrics provide valuable insights, measuring spinout success is inherently complex. Many external factors—such as market conditions, technology- and sector-specific challenges, and broader economic trends—can influence outcomes. Moreover, spinouts take different growth trajectories; some scale rapidly, while others may pursue more revenue-based development models and develop their technologies and grow more gradually, or may remain highly specialised providing niche products and services into strategically important sectors for the UK. Each of these example paths represent viable business models and should be considered when evaluating success.

3.4 Factors Influencing Spinout Success

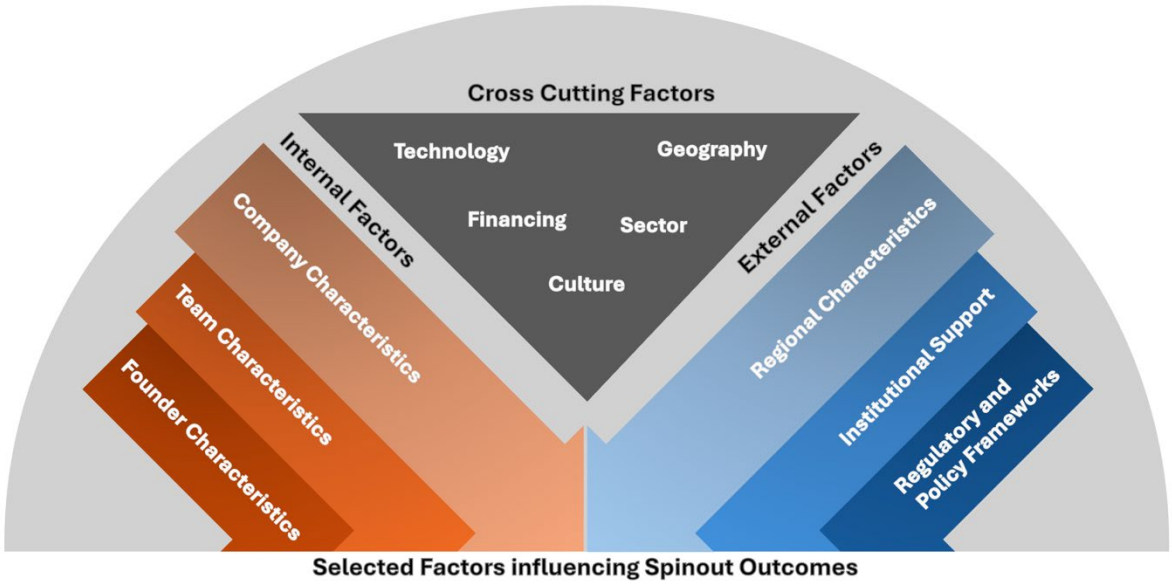

Figure 3| Illustration of selected factors influencing university spinout outcomes

A comprehensive understanding of spinout success requires examining both internal and external factors, recognizing that no two spinouts follow the same trajectory. Each venture is shaped by a distinct combination of influences, akin to a fingerprint, where unique interactions between internal capabilities, external conditions, and cross-cutting factors determine their outcomes.

Internal factors refer to venture-specific characteristics, including:

- **Founder characteristics** (e.g., prior experience, academic background, entrepreneurial mindset).
- **Team characteristics** (e.g., leadership composition, interdisciplinary expertise, cohesion).
- **Company characteristics** (e.g. firm age, technological and commercial readiness, operational structure)

External factors encompass elements of the broader entrepreneurial ecosystem, such as:

- **Regional characteristics** (e.g., industrial clusters, access to skilled labour, proximity to key markets).
- **Institutional support** (e.g., university incubators, government grants, networking initiatives).
- **Regulatory/policy frameworks** (e.g., tax incentives, IP regulations, startup-friendly policies).

Cross-cutting factors that cut across and influence both categories:

- Sectoral orientation
- Technological focus
- Access to financing
- Entrepreneurial culture

These cross-cutting factors influence not only the internal operations of a spinout but also its interaction with the external ecosystem, highlighting their critical role in shaping spinout outcomes.

The literature suggests that university spinouts differ fundamentally from traditional startups due to their dual reliance on academic and commercial systems. These ventures face unique challenges, such as aligning academic ideas and inventions with market demands, transitioning ideas and inventions between parts of the system driven by very different motivations, incentives and cultures, navigating intellectual property agreements, and securing funding tailored to research-intensive business models. Such differences highlight the need for tailored strategies to support spinout success and ensure that university ecosystems provide the necessary incentives, structures, funding, and support to bridge research and commercialization effectively.

Many factors influencing spinout success operate beyond the direct control or influence of the university ecosystem, such as market dynamics, sector-specific challenges, and broader regional or national policies. However, universities and associated innovation ecosystems provide foundational support through access to research, expertise, funding, networks, facilities and equipment, and commercialisation support (Ulrichsen et al. 2022). Understanding this interplay requires synthesizing insights from both university spinout research and broader startup literature to identify best practices and potential areas for targeted intervention.

It is also important to acknowledge the complexity and uncertainty surrounding the factors contributing to spinout performance. The literature highlights a multitude of variables, but causal pathways remain ambiguous, making it challenging to establish definitive proxies for key drivers of success. Some spinouts achieve rapid growth and market impact, while others contribute to technological advancement and knowledge transfer over longer timelines. Recognizing these different trajectories is essential for developing a more nuanced understanding of university spinout ecosystems and their long-term value.

The following is a condensed literature review focusing on the selected key insights from the literature around factors that influence the outcomes of early ventures such as start-ups and university spinouts. For a better overview, the different variables have been divided into factors that are venture specific (internal) and those outside the venture's direct control (external).

3.5 Further details from the literature

3.5.1 Internal influences on venture outcomes

Founder Characteristics

The personal attributes of spinout founders and teams play a critical role in determining outcomes. Personality traits, particularly openness, conscientiousness, and extraversion, persistence, and leadership capabilities, which are pivotal for venture success (Goldberg 1992; Antoncic et al. 2015). For academic founders transitioning into entrepreneurship, the development of an entrepreneurial identity is often influenced by underlying personality traits and the support of academic institutions (Hayter et al. 2022). Graduate students, for instance, must balance technical expertise with the leadership skills required for commercialization (Hayter et al. 2017).

Age also exerts a nuanced influence on entrepreneurial success. Middle-aged founders often achieve greater success by leveraging professional experience and networks, as demonstrated by Azoulay et al. (2020), who found that founders aged 45–50 are most likely to scale high-growth firms. Conversely, younger entrepreneurs may benefit from cognitive flexibility but often lack the resources and social capital necessary for long-term success.

Educational background and prior experience further shape entrepreneurial trajectories. While general education enhances analytical skills, domain-specific entrepreneurial training has a more direct impact on innovation and growth (Dickson et al. 2008; Colombo & Piva 2012). Founders with industry-specific experience or prior entrepreneurial ventures demonstrate superior strategic planning and risk management capabilities, and tend to secure higher levels of financing (Harada 2003; Colombo & Grilli 2005).

Company Characteristics

Spinouts' internal dynamics, such as innovation strategies, and IP management, significantly influence their performance over time. While all spinouts start as young firms, their growth trajectories vary, and the challenges they face evolve as they mature. In their early stages, spinouts are often agile and willing to engage in high-risk innovation but may struggle with resource constraints that hinder sustained R&D investment (García-Quevedo et al., 2014).

As they scale, access to cumulative knowledge, industry networks, and stable financing can enhance their innovation capacity, but they may also encounter structural inertia or bureaucratic challenges (Coad et al., 2016). Effective management of intellectual property is another cornerstone of success, providing spinouts with competitive advantages and enhancing access to venture capital (Helmers & Rogers 2011; Hall & Ziedonis 2001). Mann and Sager (2007) demonstrate that patents play a crucial role in attracting venture capital and improving startup survival. Their study on software startups indicates that patenting is significantly correlated with funding rounds, total investment, and longevity, emphasizing that IP strategy is a key internal determinant of financing success.

Team Characteristics and Network

The strength of professional and social networks is critical for spinouts, facilitating resource acquisition, mentorship, and strategic partnerships (Hansen 1999). Team diversity, particularly the combination of technical and managerial expertise, further enhances resilience and these firms tend to experience better firm growth and investment outcomes (Watson et al. 2003; Eesley et al. 2014).

However, many influential relationships—such as those with industry investors—lie outside university ecosystems, complicating efforts to measure ecosystem contributions to success.

3.5.2 External Influences on Spinout Success

Regional Ecosystems and Proximity to Universities

Regional embeddedness of the venture is another determinant of spinout success. Proximity to parent universities provides access to research facilities and expertise, talent pools, and mentorship opportunities, which are critical during the early stages of venture development (Heblich & Slavtchev 2014; Dahl & Sorenson 2012). Social ties between founders and academic institutions enhance knowledge transfer, fostering innovation and early-stage survival (Crescenzi et al., 2017).

Universities serve as hubs within regional ecosystems, promoting collaboration through academia, industry, and government (Etzkowitz 2002). Infrastructure such as research parks, incubators, and accelerators facilitates the commercialization of academic research (Soetanto & Jack 2016). However, as ventures scale, they increasingly rely on external networks and resources, diluting the influence of their parent institutions (Ulrichsen 2015).

Institutional Support and Policy Frameworks

Incubators and accelerators can play a vital role in addressing early-stage challenges by providing mentorship, funding access, and structured growth environments. University-affiliated incubators, for example, leverage academic resources to support technology transfer, enabling spinouts to establish market footholds (Smilor 1987; Breznitz et al. 2018). Accelerators, with their time-bound programs, focus on scaling startups rapidly by providing targeted mentorship and access to investor networks (Crișan et al. 2021). However, over-reliance on these mechanisms can lead to "support saturation," hindering the development of internal resilience and adaptability (Zhang et al. 2024).

Policy interventions, such as R&D tax credits, further support spinouts by addressing resource constraints and incentivizing innovation. One notable example in the UK is the Enterprise Investment Scheme (EIS), which provides tax breaks to investors backing early-stage, high-risk ventures like spinouts, helping to attract private capital. These fiscal policies have proven effective in stimulating private-sector R&D investment, particularly for resource-constrained ventures (Hall & Van Reenen 2000; Kobayashi 2014). Regional policies that integrate supply-side supports, such as incubators, with demand-side engagement through industry partnerships also enhance spinout performance (Reichert 2019).

3.6 Literature Discussion

The intricate interplay of factors influencing university spinout success underscores the challenge of defining a universally applicable framework for assessing the performance of spinout ecosystems. While various models attempt to quantify spinout outcomes, the interplay between networks, financial resources, and firm-level traits introduces significant variability (Stam, 2015; Isenberg, 2011). Long-term success depends not only on ecosystem-level support but also on industry conditions, national policy, and regulatory regimes, making direct causal relationships difficult to delineate. These complexities highlight the difficulty of applying a standardized framework, as metrics must account for both immediate outputs (such as spinout formation) and broader economic impacts, requiring tailored approaches that account for sectoral and regional differences (Stam, 2018; Lai & Vonortas, 2019).

Spinouts operate at the intersection of academic, regional, and global innovation systems, drawing on a diverse array of resources, networks, and support structures. However, the sheer variety of influences—many of which are outside the control of university ecosystems—makes it difficult to pinpoint a definitive set of variables that directly predict success. This challenge reinforces the need for more flexible, context-sensitive evaluation frameworks that account for regional industrial composition, policy environments, and access to financing as key moderating factors in spinout performance.

Assessing ecosystem performance is complicated by the diversity of spinout success pathways. Different combinations of variables—ranging from market dynamics to founder characteristics and resource availability—may lead to favourable outcomes depending on the unique context of the spinout and the ecosystem in which it operates. While this diversity reflects the richness and adaptability of entrepreneurial ecosystems, it also poses a considerable risk for evaluative efforts. A narrowly designed framework may fail to capture the full spectrum of variables and interactions that contribute to spinout success, leading to incomplete or misleading assessments.

The functional diversity of ecosystem characteristics further complicates this landscape. Ecosystems that look different on paper may play similar roles in fostering spinout success, while seemingly comparable ecosystems may achieve success through entirely different mechanisms. This variability challenges traditional approaches to performance measurement, necessitating a focus on understanding the thresholds and points in time at which specific variables become critical. For instance, the relative importance of funding, mentorship, or physical infrastructure may shift depending on the maturity of the spinout, its sector, or its broader economic and cultural environment.

Assessing the performance of university spinout ecosystems, therefore, might require frameworks that are not only multi-dimensional but also adaptable and context-sensitive. Such frameworks must account for the inherent variability and uncertainty in ecosystem dynamics, prioritizing inclusivity and resilience over rigid metrics. Moreover, the exploration of uncharted dimensions—such as thresholds for ecosystem components—offers a promising avenue for refining our understanding and measurement of ecosystem effectiveness.

4 Implications for the Design of a University Spinout Ecosystem Dashboard

4.1 Conceptual design

Approaching university spinouts from the angle of understanding spinout formation, development and outcomes as a process embedded in multilayered ecosystems has implications for the dashboard design. Spinouts operate within institutional, regional, and national ecosystems, and they also follow diverse growth trajectories—some scale into high-growth ventures, while others may remain specialized providing niche products and services into strategically important sectors. Both paths represent successful outcomes, emphasizing the need for an assessment framework that captures varied measures of success beyond traditional metrics like revenue or investment. Accordingly, a dashboard should reflect the nature of the process and the varied paths that spinouts take, and outcomes realised, by collecting information about different layers of each university ecosystem as well as the different stages of the journey and the different stakeholders involved. It should also be designed to be flexible and adaptable to the changing nature of the ecosystem.

A dashboard should be grounded in a framework that conceptualizes the university spinout ecosystem as a dynamic, interconnected system (see Figure 4). This system spans multiple layers, including the spinouts themselves, the universities from which they originate, the regional environments that support their development, sectoral structures and dynamics, and the broader national and international contexts that influence their success. By adopting this layered and process-oriented approach, a dashboard can assess whether spinouts have access to the necessary resources and support as they progress through different stages of growth.

This framework highlights the interplay of institutional, regional, sectoral and national factors in shaping spinout outcomes. By capturing data across these layers, the dashboard can provide a holistic view of the ecosystem's health and performance. Additionally, its design should allow for the aggregation of information to enable system-wide analyses, offering insights into broader trends and potential areas for intervention.

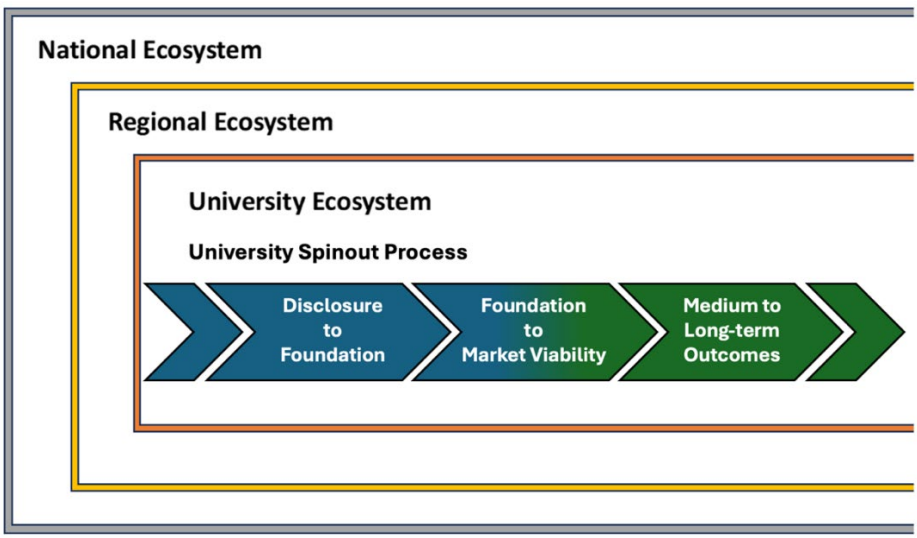

Figure 4| Visualisation of the Spinout Ecosystem Dashboard Framework

Assessing the performance of university spinout ecosystems requires measures that appropriately capture spinout outcomes. The new national university spinout register should enable better outcome measures to be developed. Better USO outcomes are then the main measure to monitor the ecosystem's performance or assess policy interventions. However, as has been shown with the literature review, external factors alone cannot determine USO outcomes, with factors internal to the spinout critically important. Consequently, a more modular dashboard structure could be adopted to reflect these complexities. For example, separate modules might focus on spinout-level data (e.g., survival rates), university-level contributions (e.g., funding initiatives), and regional impacts (e.g., employment trends). Such a design would allow stakeholders to examine data through multiple lenses while maintaining an overarching view of the ecosystem's health.

This more holistic approach will allow stakeholders to monitor the progress of spinouts, evaluate the impact of policies, and identify areas in an ecosystem that might justify intervention. A dashboard should assess the sectoral distribution of spinouts, ensuring alignment with key industrial value chains and key policy priorities. For example, spinouts in biotech, AI, and clean energy require distinct types of support ecosystems, including regulatory guidance, long-term patient capital, and access to specialized infrastructure. With this approach, a dashboard might also allow us to identify patterns of, for example, shortcomings in terms of funding at a specific stage of a venture such as at the proof-of-concept stage. This information could inform decision-making in key stakeholders such as RE around specific funding schemes, or help universities in highlighting a need for strategies to tackle this gap.

As the spinout register becomes operational, it will lay the groundwork for integrating various data sources that provide deeper insights into the broader university innovation ecosystem, and start to explore and capture different drivers of success. Our vision extends beyond merely cataloguing spinouts; it involves the creation of a dynamic, real-time dashboard designed to capture key metrics and trends related to the health and performance of university innovation ecosystems.

While the literature review has shown the multifaceted nature of the process and influences on spinout outcomes and the unclear role that the ecosystem plays in the process, it is not possible to clearly set out the best dashboard design without more investigation and exploration. Still, the university spinout register and the possibilities of linking secondary data sources will allow for new and better insights that should support finding a useful dashboard design to assess university spinout ecosystems in the UK.

4.2 Data and Metrics

The data collection to refine the dashboard design should be as comprehensive as possible, covering multiple levels of analysis in order to allow us to monitor and scrutinise the influence of different factors, journeys, and outcomes. However, while the dashboard will collect company-level data, it does not necessarily have to display individual company-level data publicly for it to be valuable. Instead, this data will be aggregated to create university-, regional-, sectoral- and national-level metrics, ensuring meaningful comparisons while maintaining privacy and data integrity.

In addition to spinout data from the new register, the dashboard will have to incorporate external data sources e.g. employee numbers, turnover, and levels of external investment, regional economic indicators, funding landscapes, and talent pools, to offer a comprehensive view of the spinouts as well as the ecosystem's health. Publicly available datasets from HESA, the ONS, the OECD, and other sources may be useful here, not least in providing critical context, such as regional economic conditions, sectoral alignment, labour market trends, and innovation activity.

Following this framework, we aim to include a wide range of relevant variables and proxies. However, we are aware that gaining access and including all of them is unlikely. It is also important to note that in assembling and collecting data we are not suggesting that all data will or should be individually for each spinout. Rather, the intention would be to provide aggregated insights at different ecosystem levels, such as the university, region or nation, supporting benchmarking and comparative analyses. Below are suggested data points that could be collected and later used to aggregate and generate different metrics:

- **Company-level data:** This includes collecting data on individual spinouts, such as their origin (university, department), proxies for market and commercial viability, company survival, revenue growth, job creation, and external investment levels, and exits. Additional key data points could include the time taken to reach specific milestones (e.g., first funding round, employment thresholds) and the nature of the intellectual property being commercialised.
- **University-level data:** The dashboard could incorporate data on research scale and commercialization activity, including the volume of research funding, the number of research staff, and the intensity of commercialization efforts. Data such as the number of IP disclosures, patents filed, licensing agreements, and the formation of new spinouts can help to measure capture university performance in progressing ideas towards commercialisation opportunities. Additionally, the extent of university support—such as the presence of incubators, proof-of-concept funding, and structured engagement with external partners—will be factored into the analysis. By tracking these indicators, the dashboard will provide insights into how different universities contribute to spinout formation, development, and long-term viability.
- **Regional-level data:** it will be essential to understand how local ecosystems influence spinout success. Data on the economic conditions, investment landscapes, and support infrastructure available in the regions where spinouts operate will be critical. This includes information on regional economic conditions, labour market trends, and the presence of sectoral clusters. Metrics on the availability of venture capital, the presence of incubators and accelerators, regional employment rates, and the talent pool in key industries will be critical factors in determining whether a region is well-positioned to support spinout development and scaling. Additional metrics could track regional disparities in innovation outcomes, the impact of local policies on spinout success, and the regional distribution of public and private funding. A key aspect of this analysis will be the ability to determine the alignment between spinouts and existing industrial strengths, helping to identify regions where spinouts have strong sectoral fit and regions where policy interventions might be needed to bridge gaps in value chains.
- **National Level:** At the national level, the dashboard can incorporate broader economic indicators, public policy impacts, and trends that influence the university innovation ecosystem. This could include metrics on specific national R&D spending, regulatory changes affecting spinouts, and the impact of national innovation policies. National-level data could also track trends in global competitiveness, cross-border investments, and the internationalization of spinouts. This analysis will also consider whether there is sufficient alignment between spinouts and the existing UK economy and support structures. For example if the UK has sufficient industrial capacity to support and scale spinouts or if certain sectors face challenges due to gaps in domestic manufacturing, corporate partnerships, or supply chain integration.

5 Outlook and Next Steps

To ensure that a new national University Spinout Ecosystem dashboard evolves in alignment with emerging insights, a phased approach to understanding spinout performance is proposed. The first phase would focus on descriptive trend analysis, establishing key performance indicators and tracking outcome trends across different ecosystems in the UK. The second phase would build on these insights to explore the drivers of performance, particularly the role of universities and ecosystem factors in shaping spinout trajectories. By structuring the dashboard's evolution in alignment with these research phases, it can remain adaptive and evidence-driven, ensuring it provides both high-level ecosystem insights and more detailed performance diagnostics.

Phase 1: Performance and Outcome Trends

The first phase would focus on establishing a clearer picture of national, regional, and sectoral spinout trends, providing a foundation for further investigation. Descriptive analyses will help identify key patterns in spinout formation, growth, and outcomes across different ecosystems in the UK. By leveraging data from the University Spinout Register and external sources including the ONS, this phase will explore the viability and utility of the types of indicators suggested in section 3.3.

Understanding these trends is critical for assessing whether existing ecosystems provide the necessary conditions for spinout success. Particular attention will be given to regional and sectoral variations, considering differences in access to funding, industrial clusters, and institutional support. Additionally, this phase will examine spinout returns, including investment levels and commercialization success, to identify emerging patterns in how spinouts contribute to the economy. These initial findings will provide baseline evidence for more detailed investigations in the next phase.

Phase 2: Investigating Performance Drivers

Building on the descriptive insights from Phase 1, the second phase would focus on identifying the key drivers of spinout success, particularly in relation to the role of universities and their ecosystems in enabling spinout success. This will involve further statistical analysis and the integration of additional datasets to examine whether specific conditions or ecosystem factor thresholds play a decisive role in supporting spinouts.

A promising direction for research lies in identifying ecosystem factor thresholds. Some ecosystem factors may have critical thresholds whereby reaching these thresholds may be key to creating well-functioning ecosystems capable of consistently supporting spinouts but below which the ecosystem will continue to struggle. For example, in the domain of venture financing, achieving a critical mass of active investors or access to a specific magnitude of funding may prove pivotal. These thresholds might serve as tangible benchmarks for assessing ecosystem performance, offering a clearer path to actionable insights.

Linking the university spinout register to secure ONS data on company turnover and employment, would enable the possibility to explore if there are certain thresholds, by for example applying time-series analyses. Moreover, the analysis in the SRS will be crucial in identifying special combinations of markers and regional variables that contribute to success. These insights could uncover patterns, such as the influence of local ecosystem characteristics or the role of employee growth trajectories, that are essential for spinout development.

Moreover, integrating findings from related ongoing UCI projects - such as the spinout techno-industrial classification project - will refine our understanding of how business specialisation and technological focus affect spinout pathways, resource needs, and timelines. This nuanced view could reveal whether distinct pathways exist based on the type and application of spinout technologies, providing actionable insights for targeted support strategies.

Further involvement of other stakeholders, including universities, and spinouts, is essential to fully understand the drivers of spinout success. Engaging these actors can help uncover hidden dynamics, clarify ecosystem gaps, and align interventions with the specific needs of spinouts and their broader environments.

The findings from both phases will be instrumental in shaping the development of a University Spinout Ecosystem Dashboard, which will serve as a dynamic and modular tool for monitoring spinout performance and ecosystem health. By integrating data from the Spinout Register with additional external datasets, such a dashboard would provide an evolving, evidence-based platform to track trends, benchmark performance, and assess policy interventions.

A key objective of the dashboard would be to enable monitoring of spinout health, while also investigating whether specific ecosystem thresholds can serve as benchmarks for intervention. Additionally, it would provide preliminary insights into the functionality of regional and institutional ecosystems, offering a basis for further refinement as more evidence becomes available. While the development of such a dashboard remains in its conceptual stages, our suggested phased, research-driven approach would ensure that it evolves in a way that reflects both empirical evidence and practical needs.

By adopting this exploratory approach, the work will contribute to laying the groundwork for evidence-informed decision-making. Over time, these efforts should enhance our understanding of university spinout ecosystems and their capacity to support innovation and economic growth.

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