

Chapter Seven

The role of the university in industry networking through academic spin-offs

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Abstract

Universities are trying to narrow the gap between science and industry and are urging to create specific units, designing specific programs to assist in breaking the raging of knowledge together with academics, businesses and venture capitalists, seeking to facilitate the transfer of knowledge from academia to the industry while infusing an entrepreneurial culture of innovation. The substantial increase in corporate venture capital spending reflected more fundamental shifts. Along with venture capital, banks, individual angel investors, and corporations are among the other providers of capital for these university- industry linkages. The spinoffs have a vital role in the knowledge and technology transfer process as contributors to the regional economic development and in the promotion of the innovation culture. As knowledge and technologies are transferred to the entrepreneurs, their enterprises can improve their operational processes, services or business models, adapting to compete with the evolving

situations and demands of the market. Although participating in a knowledge and technology transfer provides benefits for university and industry, some barriers hinder this process. This article reviews the relationship between academic spin offs and the role of university to support entrepreneurs collocating it in the network of open innovation intermediaries and proposes a significant model that can be a spinoff support for quick, time bound, and immediate use to any industrial requirement.

Keywords: Technology, knowledge management, Open innovation, Industry agents, Networking, Research, Intermediaries, Deficiency resources.

Introduction

Innovation is inter-disciplinary and embodies a remarkable commonality of purpose among the users to expand the interoperability of connected systems which encourage immediate use and function. Innovation brings a lot of benefits to the economy, diminishes wasteful productivity, reduces obsolescence, increases product reliability and facilitates life with better utilization of resources (Krishnan et al., 2018). Elaborations on innovation includes essentials such as life basics and ecology security; development & modernization in health, safety, environment, waste management, exigencies, and welfare; new technology implementations in computing, mobile, automation, space, imagery, and nano sciences; entertainment areas of cinema, dramatics, sounds, lightings, and laser displays; finally the grey- areas can still have scope for inclusion. The endpoints of innovation are IPR - protecting and patenting; Scaleup incubations - laboratory scaling; and Start-ups requiring a link with venture capitals (Marhaban et al., 2017). Institutions are always embedded in specific contexts; creating regularities and stability, but by doing so, both constrain and enable organizational activities. Firms that adopt product stewardship strategies will evidence inclusion of external stakeholders in the product development and planning processes, prevalent in rapidly changing business and natural environment contexts, demanding continual resource reconfiguration (Paul et al., 2018). Multiplication of stakeholders is leading to new organizational, more hybrid models of governance that help the university cope with the increased complexity of networks and linkages with which it is involved (Jongbloed, 2015).

Interactions among regional stakeholders distinguish clusters from pure agglomerations. These links refer likewise, to horizontal and vertical relations between firms, market-based transactions, and untraded or informal relationships as well as to institutional ties between firms, research organisations and public bodies. Channels of knowledge transfer and interactive learning processes comprise horizontal interactions, vertical relations among competitors, formal and informal cooperation, spin-offs and workforce mobility (Terstriep et al., 2012). Amongst the spatial locations of the geographical proximity between the actors and the firms which they support vary significantly, with a firm's legal counsel being the most proximate, followed by investment bankers, venture capitalists, and independent directors (Donald et al., 2005). Transitioning requires the university spinoffs to focus on the design, convergence, imitation and development, reliability enhancement, cost reduction, weight reduction, higher functionality, improved quality, scale of economies, differentiation & customization, further Scope and combination. The inputs can be enhanced in the students through case studies,

activities, presentations, guest talks, visible exhibits, venture capital and networks (Marhaban et al., 2017).

Universities or Higher Education Institutions (HEIs) develop support mechanisms at all levels of the organisation (Olvera, 2019). Universities increasingly aid innovating firms, particularly in less successful regions lacking other support providers (Benneworth & Dawley, 2005). The difference between Innovation and research are as follows. The research is normally Interdisciplinary, a limited interconnect of disciplines, applied to certain hypotheses, interpreted by the Researcher, experiments, discoveries, finally leads to publications and citations. Whereas the innovation follows an Interdisciplinary approach, expanded interoperable systems, for an immediate use & function, understood and cherished by everyone, evolved through trial-error runs, customizations, for change/ new product/ new service, leading to Patent protection and commercialization (Marhaban et al., 2017). Industries can collaborate with universities to carry out the critical mission of transferring knowledge to society, in a wide range of possibilities such as campus hiring, exchanges of academics/industry professionals, joint institutional research collaborations through contracts, consultations, co-patenting and co-publications, spin-off companies, and laboratories financed by industries and other physical facilities, including informal contacts such as meetings and conferences, as in Figure 1 (Olvera., 2019; Umachandran et al., 2020).

Today's public universities are increasingly becoming like enterprising nonprofits. Partly because of financial reasons, they are turning to the private sector to boost or replace their traditional, predominantly public sources of funding (Jongbloed, 2015). Venture capital has emerged as an important intermediary in financial markets, providing capital to young high-technology firms that might have otherwise gone unfunded (Gompers & Lerner, 2001). Spin-offs are not necessarily the best way to commercialize new technology. The larger part of intellectual capital that is commercialized through universities is actually licensed to established companies. Academic Entrepreneurship is well structured and lives up to create a coherent picture of the spin-off phenomenon (Shane et al., 2004). Many of today's social and economic developments are a result of technological discoveries and developments in fields such as communications, information processing, health sciences and energy supply. These promise smarter, more tailored solutions to the tasks we wish to accomplish. To facilitate innovation the intermediaries perform three primary functions. First, they utilise the opportunity to represent a technological frontier for the firm which due to its inexperience may require external support. Later they involve through engagement with multiple stakeholders, in terms of their origins and logic and the ways they assess and value success and failure. Finally they demand the innovation to move beyond product and process innovation to business model innovation, and as such involves expertise sourced through external and unfamiliar collaboration (Paul et al., 2018). University-Industry alliances in Research and Development are the result of deliberate strategies implemented by national and international governing bodies, as well as the university leadership itself, to promote a more direct involvement of universities in research-based innovation and economic development (Jongbloed, 2015).

Theoretical framework

Constantly, firms need to acquire external-resources, especially innovation and knowledge-based resources through interorganizational networks. The term “Open innovation” was born to underline the networking nature of innovation. Open innovation can be defined as the firm ability to manage the knowledge flows among inter-organizational ties, and the ability to combine internal and external resources based on innovation to create added value. According to Resource Dependence Theory firms are an open system depending on contingencies in an external environment. Firms are not self-sufficient, but their behaviour is influenced by a network of relations with other actors with whom they share and acquire resources and capabilities (Kanter, 1979; Pfeffer, 1981; Ulrich & Barney, 1984). Open innovation processes even happen from outside of the company as well as inside to outside. A company can adopt practises related to each of these processes or combine them. Open innovators benefit in acquiring innovations developed from outside. IPR’s internally developed were sold to outside companies, when the company had insufficient resources to develop them, they established spin-out firms to continue developing some of its technologies. It is difficult for new companies to penetrate the commercial sector, further the industrial response to recent corona and global economic challenges, the government and private businesses have recognized the need to restructure and deregulate parts of the economy, particularly in the financial sector. During the commercialisation stage, the different products in its portfolio developed from the idea to the product stage inside the firm, can collaborate and co-create with external partners at different stages, and also purchase the rights from outside.

University role

Universities play a key role in open innovation networks, they are considered the main creators of innovation transferring their knowledge and innovation to firms (Sharifi, Liu & Ismail, 2014). Actors that play a central role in relational and spatial terms can be considered open innovators (Waguespack, 2007). The actor positioned strategically in the network structure is engaged to bridge and broker connections with other players (Jonsson et al. 2015). Universities are involved in different knowledge transfer activities as collaborative research, contract research, consultancies activities, and commercialization activities such as providing intellectual patents and academic entrepreneurship (Perkmann & Walsh, 2007). Engagement activities do not represent only an income source but an opportunity for universities to test the results of their research and obtain new results for future research through the collaboration with firms (Lee, Lee & Pennings, 2001). On the other hand, through university collaboration firms obtain advantages such as an easy access to new technologies and a more easy access to new knowledge production provided by university, they increase their research capacities, and an easy access to human resources as young students and researchers. Different kinds of links between universities and industries can exist at different levels. According to Parkman and Walsh (2007), the centrality of universities in the network depends on activities through which it is involved in collaboration with other organizations. The highest level of collaboration where university holds a key role is represented by collaborative research and consultancy, while spin-offs and academic entrepreneurship are considered at an intermediate level due to the fact that academics and students are supposed to have relations with their former university.

Finally the lowest level is represented by commercial agreements that provide intellectual property that is considered more profitable in terms of income but not much in terms of networking and collaboration.

Engagement activities as consultancy and research collaborations look to be negatively related with the research quality of department and university, maybe because high quality department and universities could find other finance resources. Universities must develop consultancies support, so as to learn to work with clients (Benneworth & Dawley, 2005). Commercial activities seem to be positively related to the quality of departments and universities. Indeed, universities having a research focused approach have a greater interest for external organizations to transfer their research. Commercial agreements have a relevant influence in relation between universities and firms. From collaborations firms benefit from the exploitation of knowledge and universities benefit from additional funds. Staged capital infusion may be the most potent control mechanism a venture capitalist can employ. Staged capital infusion keeps the university on a tight financial control and reduces potential losses from bad decisions. The venture capitalist can increase the duration of funding and reduce the frequency of re-evaluation as the spinoff company becomes better established and conflicts with the entrepreneur appear more likely (Gompers & Lerner, 2001). Universities can undertake commercial collaboration providing firms with patents or through academic spinouts that represent an important link between firms and universities transferring information and innovation to firms and providing universities with a network of firms, academic entrepreneurs favor bridges between universities and firms.

So universities characterized by different academic entrepreneurs have a dominant role in networking with firms in sharing knowledge and innovation. Networks between universities and firms can be considered not only in terms of ties and collaboration but also in terms of space and proximity. It's estimated that the spatial location of an university organization can represent a relevant determinant for the development of an open innovation network. Indeed universities located in the center of a region where there is a pool of firms focused on research and development favours the strengthening of ties between the actors (Vallance et al., 2018). In Fact, universities of high quality research cannot be considered drivers of technology economy development, but they usually belong to networks where there are existing entities with a high level of technology background and only by networking can the economy of a specific region be improved. Then, regions characterized by a fragmented technological and innovative reality and a lack of innovation drives as public and private entities tend to have low levels of technology economy. Proximity is considered an important parameter to evaluate the university role and the quality of a collaborative network. According to authors such as Fantino et al. (2015) and Lauren at al. (2011), the proximity to high quality research universities favours collaborations between firms and industry while proximity to low quality universities reduces chances of collaboration. In conclusion, a strong university-firm network depends more on the level of quality research than proximity.

The role of entrepreneur and open innovation intermediaries

A mature entrepreneurial ecosystem can be built gradually by the university students, faculty and entrepreneurs through their progressive creation of innovation intermediaries and coordination among the local players involved in the creation of start-ups. Entrepreneurs, either social or commercial entrepreneurs, enact opportunities. Social entrepreneurship is the combination of pursuing a social mission and applying entrepreneurial creativity, is for sure no cure-it-all, but it might help rethinking the current way we do business. Social entrepreneurs follow a social mission and aim to enhance social wealth, clearly distinguishing them from commercial entrepreneurs who aim to create economic value for themselves and their shareholders. Social entrepreneurship has implications on a firm level, on an institutional level, and on a societal level. Illustratively, Social entrepreneurs can apply the thought of social entrepreneurship to alleviate poverty, fight unemployment, provide basic medical care, enhance integration of disabled people, or improve education. An innovation and entrepreneurship framework that focuses on organizational issues from the corporate management perspective develops the framework, suggesting that the innovation process begins with a trigger in the form of environmental change, and ensuing innovation and entrepreneurship activities may be partly overlapping or parallel, where the initial idea is implemented internally, innovation activities prevail, including project management, gatekeeping and sponsoring. The entrepreneurial route thus chosen, triggers organizational implementation alternatives, which include future partnerships or possible ‘spin-ins’ into the original company (Muller, 2012).

The ‘hub’ university plays a leading role in regional and political level, supporting academic entrepreneurship at the operational level based on its evolution from a revenue maximising model to a model that takes account of social and economic regional development (Schaeffer et al., 2016). Entrepreneurship manifests itself throughout the economy in different forms and with different outcomes, such as the creation of wealth; increasing employment; and tackling inequalities and environmental issues. Managers and academics alike had realized that management difficulties led to corporations extracting only a small amount of the value from centralized R&D facilities. Many of the best ideas languished unused or were commercialized in new firms founded by defecting employees (Gompers & Lerner, 2001). Thus by innovating products, services, production processes, organisational forms, and routines, industries generate economic and social value, thus legitimising their role in the economy and society (Paul et al., 2018). Firms commercialize external sources of innovations by obtaining, integrating, and commercializing external innovations is combined with interaction between the firm and its collaborators. Cluster internal interactions need to be complemented with well-developed external cooperation to transfer critical knowledge beyond the cluster boundaries, and thus to reduce the risk of technological lock-ins resulting from ‘cluster blindness’ (Terstriep et al., 2012). Research on obtaining innovations includes searching, enabling, filtering, and acquiring each category with its own specific set of mechanisms and conditions.

Integrating innovations have been mostly studied from an absorptive capacity perspective, with less attention given to the impact of competencies and culture. Commercializing innovations puts the most emphasis on how external innovations create value rather than how firms capture

value from those innovations. Finally, the interaction phase considers both feedback for the linear process and reciprocal innovation processes such as co-creation, network collaboration, and community innovation (Joel et al., 2013). Lack of resources to commercialize leads to dependence on entrepreneurs as intermediary organizations, which function and provide complementary and related services in support of scientific commercialization, commonly available within their local ecosystems. The five intermediaries are university technology transfer and licensing offices; physical space - incubators, accelerators, and co-working spaces; professional services providers; networking, connecting, and assisting organizations; and finance providers - venture capital, angel investors, public financing, and crowdfunding (Clayton et al., 2018). Venture capitalists have developed a variety of mechanisms to overcome the problems that emerge at each stage of the investment process (Gompers & Lerner, 2001). There is a positive relationship between the technological knowledge obtained from universities and the innovation carried out by firms, with the capacity to acquire and assimilate the knowledge provided by universities, mainly due to being academic spin-offs or having long-term relationships with them, and receiving more knowledge from universities (Isabel et al., 2016). Social groups and organizations can merge tacit knowledge into a powerful source of breakthrough innovation.

The ability to form and nurture these groups maybe even more important to the long-term competitive advantage of organizations than just the transitory benefits of even the most commercially successful innovation. According to the Resource Based Theory (Barney, 2001), the competitive advantage of an enterprise derives from tangible and intangible resources in the organizational asset and the Knowledge-Based View (Grant, 1996) considers knowledge the most valuable resource of a firm. It is almost impossible for competitors to copy tacit knowledge as that is the idea that the prime role of the firm, and the essence of organizational capability, is the integration of knowledge. Moreover, organizations leverage knowledge both within themselves and externally to their stakeholders and customers (Azeredo et al., 2006). The growing diffusion of the internet and an understanding of its implications triggered the increasing corporate interest in venture capital to grapple with these new technologies and their implications. Entrepreneurs overcome information asymmetry between themselves and potential investors by keeping the financing function as an important issue for research (Shane et al., 2002). Venture capital organizations finance high-risk, potentially high-reward projects, purchasing equity or equity-linked stakes while the firms are still privately held. The venture capital process is also subject to various pathologies from time to time, which can create problems for investors or entrepreneurs (Gompers & Lerner, 2001). The different types of private equity investing such as Venture Capital, Mezzanine, Buyout and Distress are represented as overlapping circles within private equity, with some overlap with hedge funds (Andrew et al., 2011).

Innovation is commonly understood as the recombination of existing ideas or the generation of new insights into new processes and products is widely viewed as the primary driver of growth in modern capitalistic economies. The open innovation model is effective with the network of R&D collaborative activities in public research organizations (PROs) in comparison with the network linked to R&D collaborative activities in private firms (Belussi et al., 2008).

Innovating firms engage in both technology exploitation and exploration to be effective in the short run and to survive and prosper in the long term. Of the four types of innovation namely the incremental, disruptive, architectural and radical, the radical innovation is the one which leads to commercialisation of an entirely novel idea, and brings huge economic rewards to firms, it is an activity fraught with risk, as it is new to the firm and its markets, and it is the essence of value creation by large firms and entrepreneurial ventures (Paul et al., 2018). Regional development has always stressed the role of key economic actors in less favoured regions, particularly in high-technology sectors, in making those regions more attractive to outside investors. universities can play a lead role in having a broader systemic effect on the regional economic environment, by plugging gaps in the local regional innovation system. The commercialisation to solve the problems involved in exploiting intellectual property in the impoverished regional innovation system (Benneworth, 2007).

Academic spin-offs in open network

University entrepreneurship is supported by two main features of knowledge: an innovative knowledge that provides the base to understand new technologies addressed to be commercialized and entrepreneurial knowledge that allows to understand entrepreneurial processes and network from where to acquire new resources and expertises, among which university students are included (Shah & Pahnke, 2014). Academic spin-offs develop new business opportunities based on new technologies deriving from research activities, they represent an academic entrepreneurship output, the academic capacity efforts to transfer benefits deriving from university. Academic spin-offs are more specialized to develop disruptive and radical innovation than converting and commercializing innovation, while firms can offer important support in the production, manufacturing and marketing process (Piva, 2008).

Although the constant development of academic units as technology transfer offices and university incubators to support academic spin-offs, these units don't provide enough knowledge related to the market and production. Indeed, academic managers do not always have enough knowledge to recognize business and market opportunities. University spin-offs present some deficiency in terms of knowledge conversion capability, Zahara et al. (2007) identify three dimensions that characterize this capability as "conceptualization and visioning capability" addressed to identify the functionality of a new innovation and which market can be addressed, "configuration and design capability" addressed to build a prototype to convert the innovation in a potential product to distribute and commercialize, and finally "embodiment and integration" addressed to integrate different knowledge and technologies in a product require by the market.

Networking can reduce these deficiencies, industry networks involve actors external from academic context as customers and suppliers, venture capital firms, public political entities, business advisors. Actors belonging to the industry sector are closed to the market and needs of consumers, and are more specialize in prototype and product design, and they favor the conversion of radical innovation from academic context into commercialized products. In order

to face this deficiency academic spin-offs need to extend their networking, Sousa et al. (2017) illustrate the impact of industry networking in terms of size and frequency on capability of academic spin-offs to convert knowledge in marketable products. The size of a network consists in the number of direct ties among academic spin-offs and the rest of companies involved and it represents the amount of knowledge resources to which academic spin-offs can have access (Hoang & Antoncic, 2003). In part a large network favors firms to have access to much heterogeneous information.

The frequency of contacts can be considered as the measure of trustiness degree among the actors in the network. It favours knowledge and resource integration and encourages the development of interaction models among the actors and favours the trust within the networks, which increases substantially the quality of the resources, abilities and information shared. The first dimension “Conceptualization and visioning capability” is positively affected by the networking industry. A large number of contacts with industry sectors favours academic spin offs- to acquire complementary knowledge regarding the recognition of new opportunities, identification of new markets and of the user needs, and information regarding the utilization of the innovation.

Regarding the second dimension related to configuration and design capacity, a large amount of contacts and frequent interactions favor academic spin-offs to implement the ability to translate a knowledge in a prototype. Network contacts allow academic spin-offs to acquire new knowledge related to production, distribution and commercialization. In case of tacit knowledge transfer, more interaction with the industry sector is necessary. The different backgrounds and tacit nature of the knowledge require a more frequent interaction to convert an intrinsic knowledge in the academic organization into a stereotype production. Regarding the third components, “embodiment and integration” industry networks are characterized by actors belonging to different backgrounds that facilitate integration activities. A high frequency of contact allows different actors to know each other better and to identify any knowledge overlapping. In the case of these specific competencies related to the integration and embodiment, the size of the network is not so relevant than the variety of actors. Infact, integration capability requires access to different kinds of knowledge sources and a network of large size does not always correspond to having access to a heterogeneous amount of knowledge.

which they managed the innovation process. Established mainline corporations that had relied on central R&D laboratories for new product ideas during most of the century were exploring alternatives, including joint ventures, acquisitions, and university-based collaborations (Gompers & Lerner, 2001). Improved market institutions such as intellectual property rights, venture capital, and technology standards allow for organizations to trade ideas, and new technologies allow for new ways to collaborate across distances. In addition, research and development are now highly multi-disciplinary and in some areas more resource-intensive, requiring more collaboration, in other cases less resource-intensive to the extent that many distributed researchers can make substantial contributions.

Implications

The seed investments always follow unknowable risks, financial supporters make their decisions based upon their intuitive judgments on extraordinary profitable investments. These intuitive judgments are based on the feeling of decision makers about whether entrepreneurial teams are trusted, are committed, and passionate. The effectively charged judgments are the core of intuition and that intuition has both affective and cognitive components embedding in a dynamic emotion-cognition interaction. A process of seed investment decisions of external financial supporters is “truly emotion-cognition interactions”. However the reasons can be generalised as that affect the abilities of an academic entrepreneurial team to obtain early-stage investments.

1. The low probability of financial success and the high failure rate of university spin-offs generate the uncertainty of investment returns discouraging the investment decisions of investors.
2. University spin-off has a limited collateral value and a little salvage value in the event of failure.
3. Information asymmetry exists regarding the worth of the spin-off, with entrepreneurs in a position to decide what details about the potential business they will release to investors, limiting their ability to evaluate the proposition and increasing uncertainty (Huynh, 2018).

Variables and factors

Networking plays a key role in affecting academic spin-off performance. The involvement of business managers influences the entrepreneur approach in terms of innovativeness, risk-taking, autonomy and competitive aggressiveness (Diáñez-González & Camelo-Ordaz, 2016). Venture capital firms are considered the most relevant actors in the industry network that allow ASOs to have easier access to financial resources. In addition to this, they also provide ASO with new know-how, new partnership, causing an increase of their reputation in the market. Access to financial sources allows ASOs to assume risk-taking behaviour, taking part in projects that can be uncertain in terms of results. Transfer technology offices (TTOs) allow ASOs to commercialize innovation more easily and to obtain more revenues. TTOs favor new and strong relationships with industry agents as suppliers, consumers, funders, and other firms that could facilitate access to information regarding prototype tests, production process, market and consumer needs and quality level perceived by consumers. Finally, collaboration with

TTOs favors easier access to government funds since the support of TTOs represents a guarantee for possible funders and a sponsor for the government.

Managerial implications

The involvement of non-academic managers favours ASO to obtain a stock of resources such as human resources, social networks, skills and to meet and to acquire entrepreneurial traits such as recognizing business opportunities from which obtain a competitive advantage. Managers coming from previous entrepreneurship experiences in academic spin-offs provide managerial and commercial knowledge that academic entrepreneurs don't hold. Academic managers have several knowledge related to technological and scientific context rather than entrepreneurial competencies. Managers from non-academic backgrounds can provide a stock of resources to overcome the ASO limits in management and commercialization and improve their entrepreneur behavior. Managers from business backgrounds are supposed to be risk-taking, flexible and proactive, and to have professional ties with industry sectors to share with academic managers.

Social implications

The engagement of external financial supporters in the seed investments of university spin-offs impacts the capabilities and social networks of entrepreneurial teams. In return the capabilities of entrepreneurial teams affect the decisions of financial supporters to engage in seed investments. The social networks of entrepreneurial teams are likely to have both direct and indirect influences on the decisions of financial supporters through their impact on the capabilities of entrepreneurial teams (Huynh, 2018). Social changes, as digital development, climate changes, natural cataclysms, epidemics, immigration flows, environmental issues, poverty alleviation are external factors that drive firms, industries, capital ventures to invest in research and innovation to satisfy the social needs. University plays a key role training future entrepreneurs, developing models of innovation generating new knowledge to be exploited by commercial and social entrepreneurs. Academic staff and students have a key role in this process, academic spin-offs represent the main actors involved to create radical and disruptive innovation to answer social changes. Networking activities are fundamental to create new technologies, relational and knowledge capabilities skills are required.

Conclusion

Innovation represents an important opportunity to create new business opportunities. University is considered one of the most relevant providers of knowledge and contributor to economic development of a region. The creation of knowledge by itself is not enough, one of the main challenges of the university is to share knowledge with industry sectors that are more closed to the market and customers. Engagement and commercial activities represent the main ways through which universities interact with the industry sector. Academic spin offs represent the main conduit between university and industry, they provide disruptive and radical innovation needed to be converted into a technology product addressed to market needs and industry sectors represent a relevant contribution to the production and marketing process. The universities spin-off productivity may be positive or negative depending on the contribution

offered by different investing sources and the amount of capital required for spin-off is substantial during start-up and then increases in the post start-up period, where the entrepreneurship substitution effects with regard to the amount of innovation using capital, for development, incubation, and demonstration expenses for scalability and market positioning. Conversely when university spin-off companies obtain patents and receive support from the Industrial Research Assistance, will have more demand on luring worthy entrepreneurial buy-in.

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