



Transnational Social Capital, Business Model Design, and Firm’s Growth in the Context of University Spin-off Companies

Norazlina Mohammed Yasin^{1*}, Farzana Quoquab², Suzilawati Kamarudin³

¹International Business School, Universiti Teknologi Malaysia, Kuala Lumpur, Malaysia, ²International Business School, Universiti Teknologi Malaysia, Kuala Lumpur, Malaysia, ³International Business School, Universiti Teknologi Malaysia, Kuala Lumpur Malaysia. *Email: norazlina.phd@gmail.com

ABSTRACT

The literature on the firm growth among University Spin-off Company has been widely studied in the strategic management literature and the technology transfer practice over the last 15 years. While many studies put emphasis on the firm’s resources, yet how firm growth can be achieved under resource constraint is relatively under-explored. Therefore, through a conceptual model, it is argued that transnational social capital as firm’s internal resources and business model design as firm’s strategy can facilitate firm’s growth under resource constraint. The study attempts to explore the extent to which the transnational social capital and business model design impact firm’s growth under resource constraint. The theoretical framework utilized for this study is the extended form of resource-based view. The study postulates that internal resources that are available in young firms, function as antecedents of firm’s growth. Malaysia is nominated as the context to investigate the accuracy of the proposed model with the focus on the University Spin-Off Companies. This paper provides insight and understanding of transnational social capital, business model design, and firm growth among University Spin-off Company.

Keywords: Transnational Social Capital, Business Model Design, Firm Growth, University Spin-off Company

JEL Classification: L2

1. INTRODUCTION

In the new global economy, the survival and development of university spin-off companies in research commercialization have become an essential issue for the university. Research commercialization mechanisms, where conversion of scientific knowledge leads to economic growth, become the basis for establishment of University Spin-off Companies. Hayter (2013) suggested that the establishment of the firms within university context is the significant vehicle for knowledge sharing, which has the potential to generate jobs and economic growth. However, the diversity in the propensity of the growth of University Spin-off Company depends on certain industries (Davidsson and Handerson, 2002). University Spin-off Companies continuously revise their capabilities and strategies to achieve competitive advantage and growth.

Concurrently, the University Spin-off Company’s growth often denotes the firm that possess resources and supports the exploitation of knowledge nurturing innovation to achieve competitive advantage. In the early years, the firm’s growth should have an average of 66% survival rate (Phillips and Kirchhoff, 1989). Audretsch and Mahmood (1995) in his study concluded that growth and survival rates have a tendency to fluctuate across industries. He also maintained the opinion that the ability of a firm to innovate also helps in improving the firm’s survival rate while undergoing little growth. Later studies revealed that University Spin-off Companies when experienced sluggish growth rate in their early years, they failed due to the insufficient supply of unique resources (Smith and Ho, 2006; Soetanto and Van Geenhuizen, 2011a; Rasmussen et al., 2011). The challenges hinder the opportunity for growth and the company struggles to survive (Jang, 2011; Ismail et al., 2010; Van Geenhuizen and Soetanto, 2009; Zhou et al., 2011).

Van Geehuizen and Soetanto (2013) viewed the challenges experienced by University Spin-off Company during the early research phase that has very minor relationships with consumers, suppliers and industry, which led to the difficulty of managing stakeholders' expectation. The situation is not conducive to the business environment, consequently, not many industries displayed their interest to collaborate with the university which caused difficulties in R&D commercialization (Ismail et al., 2010). As the condition is seen as commercially unviable, Chandran et al. (2014) conclude that this leads to unsuccessful fundraising for the reason that the companies do not see promising potential profits. The essence of the argument is that the turbulence in environmental business is growing along with the need to overcome resource constraints in achieving firm's growth to generate the wealth of country through job creation (Cao et al., 2013; Hirai et al., 2013; Stam et al., 2014; Vohora et al., 2004). Thus, in comparison to increased external resources as a foundation for competitive advantage, this paper highlights the prominence of internal resources available within the firm as strategic resources. Given the impact of resources at a particular stage of firm development, it is vital to acquire different resources for growth (Soetanto and Van Geenhuizen, 2010a; Wright et al., 2012).

The study utilizes the resource-based view (RBV) of the firm as a theoretical foundation for investigating the impact of transnational social capital and business model design on the growth of the firm. RBV has comprehensively being used to assess firms' competitiveness. Firm's resources that are non-substitutable, imperfectly imitable, rare and valuable help in generating sustained competitive advantage (Barney, 1991). The utilization of resources in value creation resulted in firm's growth as dimensions of competitive advantage thus, the diversity of resources vary according to the stage of development of firm's growth (Soetanto and Van Geenhuizen, 2010a). The study investigates interactions of the cross-border network to link other parties including people influenced by researchers on the basis of their professional ties as well as the possible boundary conditions for this connection. Other studies indicate that the limitation is caused by the social pattern which is most probably associated with homogeneous partners in the similar background. In addition, within turbulent environments, the firm's growth can be achieved in various ways e.g. offering similar business model special solutions which can reach diverse customer base outside the area of the parent organization (Clausen and Rasmussen, 2013). As a result, the spin-off companies will turn into collaborations, strategic alliances and new platforms with increased returns for the companies (Trimi and Berbegal-Mirabent, 2012).

The aim of this research is to conduct an investigation through conceptualizing the impact of business model design on firm's performance. The firm needs to look at two aspects to shape strategy for growth, which are their business structure and culture. Their business structure should be aligned with different types of business models to fit with the technological changes. The rest of the paper is planned as follows. First, some relevant literature is reviewed which is related to firm's growth followed by discussing the necessity to have a model focusing on resource constraint. Next, the important element of this model such as transactional

social capital and business model design are briefly explained. Lastly, hypotheses are developed and a conceptual framework is proposed.

2. THE FIRM GROWTH IN ACADEMIC ENTREPRENEURSHIP STUDIES

The revolution on firm's growth has been discussed in three major streams of university spin-off studies. The first stream emphasized on the phenomena of firm's growth in late 1950's until 1980's. These studies frequently adopted from the influential work by Penrose (1959) and was extended to the concept of RBV (Barney, 1991) which was then widely used to evaluate the firms' competitiveness. The majority of studies conducted between 1960's and 1980's emphasized the human factor as a key factor in firm's growth (Penrose, 2009). Experienced and skilled managers are required by firms to capitalize on the opportunities through the available resources to generate profits. It is important that these managers have the technical aptitude to innovational technological products to contribute to the growth of the firm. Previous literature has identified three contexts for selection of relevant strategies. These are internal strengths of the organization (Penrose, 2009), opportunities and threats present in the external environment and resource position of the organization (Wernerfelt, 1984).

A study by Phillips and Kirchhoff (1989) pinpointed another important factor for firm's growth which is its capability to survive and grow. Later studies identified that the first 4 years for a newly established firm and its growth is dependent on the average 66% of survival rate in initial years (Phillips and Kirchhoff, 1989). However, very few studies discussed the growth perspective in detail thus the understanding of the connection between survival and growth and the extent to which survival relates to growth is not much investigated. Almus and Nerlinger (1999) focused on the continuity of growth studies by exploring the factors of firm's growth. Their study evaluated the team foundation, technical orientation and external networks and concluded that these factors are important for firm's growth. The study also discovered that business knowledge is less substantial as compared to technical knowledge (Almus and Nerlinger, 1999). Another study underlined the similar issue by highlighting the importance of technological knowledge understanding by owners on the firm growth and competitive advantage (Dahlstrand, 1997). These studies majorly adopted the theories of RBV, market-based view (Dhewanto and Sohal, 2015; Morgan et al., 2009; Olavarrieta and Friedmann, 2008a; Zhou et al., 2009) and also knowledge based view (Darroch, 2005; Jiménez-Jiménez and Sanz-Valle, 2011; Pérez-López and Alegre, 2011; Sapienza et al., 2004).

In the start of the new millennium, the individual entrepreneurial context was extensively explored. In the European region, studies conducted on the technology intensive firms, including university spin-off companies, highlighted the importance of entrepreneurial characteristics, capabilities, skills and behavior to administer the business operations (Löfsten and Lindelöf, 2002; Davidsson and Henderson, 2002). Over time, new findings on the role of

the network to overcome the market barriers have distracted the scholars (Gübeli and Doloreux, 2005; Soetanto and Geenhuizen, 2006; Soetanto and van Geenhuizen, 2011).

Despite enormous interest in evaluating the effectiveness of technology transfer in firms including the number of spin-off creation and licensing agreements (González-Pernía et al., 2013), the academic advancement on the progress of university spin-off companies is still low. A number of studies have been done to examine the factors which result in spin-off creation (Hayter, 2013) since technology intensive markets are more dependent on technical validity as compared to product market legitimacy (Clarysse et al., 2011). It can be assumed that the increased creation of spin-off companies indicates the effective transfer of technology and also displays the improvement in research quality of new star researchers. However, University Spin-off is facing challenges in two growth stages; sustainable returns and reorientation. The challenges in these phases demonstrate the gap in growth studies (Vohora et al., 2004). Therefore, it is required that attention is given to conducting research studies on the growth direction of the University Spin-off Companies to fill the research gaps as shown in Table 1.

Previous studies, which measured the University Spin-off growth in industrialized countries, were based on the data that resulted from successful spin-offs (Rasmussen et al., 2011) and evolution process (Bathelt et al., 2010; Colombo et al., 2010). Hence, the concluded results from the previous studies are incompletely measured and bearing in mind some factors from the developing countries may give new insights to the body of knowledge. Despite the fact that many researchers used the RBV theory, the assistance provided by the theory on the growth of University Spin-off is still inadequate. Therefore, the aim of this study is also to pay attention to the growth orientation of the University Spin-off Companies in order to fill the research gaps since there are few studies which only discuss the challenges faced by the companies during the growth orientation phase.

3. A MODEL UTILIZING FIRM RESOURCES UNDER RESOURCE CONSTRAINT

The RBV is used in this research to form a theoretical foundation for exploring the impact of transnational social capital on firm

Table 1: University spin-off studies and business lifecycle phase

Lifecycle phase	Studies
Opportunity framing (pre initial phase)	Sherry and Teece (2004), Van Geenhuizen and Soetanto (2009), Hayter (2013)
Pre-organization (initial phase)	Bekkers et al. (2006), Buenstorf (2007), Rasmussen et al. (2011), Morales-Gualdrón et al. (2013), Chandran et al. (2014), Yagüe-Perales and March-Chordà (2012)
Reorientation (growth phase)	Buenstorf and Fornahl (2008), Buenstorf and Geissler (2011), Björnåli and Aspelund (2012), Erdos and Varga (2013), Sullivan and Marvel (2011)

growth. RBV has comprehensively being used to assess firms' competitiveness. Moreover, Soetanto and Van Geenhuizen (2010) observed that network resources have adverse effects on the early growth stages of University Spin-off Companies because newly established firms have limited social connections with the external environment. Consequently, the firm has limited resources for growth. However, this situation can be improved by accessing other resources through social capital. According to Coleman (1988), the social capital offers different services for occupation and job creation as income generation for the firm and is crucial for the sustainable growth of the business. Stam et al. (2014) recommended the firm to utilize the resources of social capital provided by individual professional ties and cross border networks. Utilizing the cross border network within professional ties provides valuable information required by the firm and results in the closeness of social relations to access resources provided by the other firms which will improve firm's competitiveness. Therefore, a better understanding of transnational social capital is crucial as the lack of strategic resources effects the research innovation and the firm then becomes less competitive which directly impacts in the growth of University Spin-off Companies (Bathelt et al., 2010). Despite this, very few studies have investigated the transnational social capital, and there is even less focus on the research of cognitive social categories (Hormiga et al., 2011) and the entrepreneurial area (Hayter, 2013) within various categories of institutions (Urbano and Guerrero, 2013).

Furthermore, in environments presenting rapid change and high uncertainty, the strategy is another essential factor in achieving exponential growth (Bock et al., 2012). In such situation, firms use strategy to exploit new opportunities for firm's value proposition. Moreover, value addition for customers will take place when the firm leverages the potential resources as a competitive tool such as business model (Achtenhagen et al., 2013). This approach then encourages the entrepreneurs to discover a new market, implement their innovation and support new ventures and products. By adapting business model, the firm can focus either on efficiency cost or novelty based approach as market strategy to create value proposition. The business model works as a strategy to fit all the resources within firm at a time (Zott and Amit, 2007). Furthermore, Zott and Amit (2013) revealed that business model and strategy can be complementary and potential sources of competitive advantage and growth. The long duration of innovation process often makes it difficult for the firm to survive due to the increased operational cost before the firm can start earning any profits. Ratajczak-Mrozek (2012) revealed in his study that if an increase in product demand, which is more than the production capability of the firm, is not managed appropriately in the early phase of firm's growth then it has the potential to impact the business performance. The absence of strategy implementation makes the university spin-off companies appear as unattractive for the investors, which results in decreased financial funding (van Geenhuizen and Soetanto, 2009; Jang, 2011; Yagüe-Perales and March-Chordà, 2012). Therefore, firm's growth can be achieved by adopting different business model that has an impact on increased innovation (Clausen and Rasmussen, 2013). The heterogeneity of the business model may be seen as an opportunity to exploit new market and increases the access to the targeted industry.

4. TRANSNATIONAL SOCIAL CAPITAL

The social capital theory holds that social capital is a resource that produces the social nodes or connection within a firm (Bourdieu, 1989). In general, Rutten et al., (2010) have distinguished social capital based on two schools of thoughts: "Structuralists" and "interactionist." In their study, structuralists are regarded as a reflection of individual connections. Similarly, other studies have described it as the access to other resources provided by individual network ties (Liao et al., 2003; Schutjens and Völker, 2010). On the other hand, interactionists emphasize on the interactions that will produce social capital. The alternative concept was based on seminal works by Coleman (1988) that mentions social capital as the norms and relationship of the institutions in the shape of quality and quantity of social interactions.

Firms attach a relatively high priority to local connections as well as transnational connections to the different network relationships across the country to access resources and opportunities (Prashantham and Dhanaraj, 2010). Transnational social capital refers to the interactions of the cross-border network to link other parties including people and organizations. The critical role of binding social capital relies on the weak ties across different connections (Putnam, 1993) as well as its importance to gain information in wider scope. Specifically, by expanding the network border, the firms are able to gain access to information and resources for growth that has been previously acknowledged (Jones and Purves, 2008). Given that network relationships are dynamic, many firms lack structural dimensions on the basis of the quality network which is essential for the development of firm's growth (Katila and Wahlbeck, 2012; Soetanto and van Geehuizen, 2009). Initial social capital within local connections will be depreciated over time when the interaction is substituted by other actors (Prashantham and Dhanaraj, 2010). The network relationships can also depreciate by tie obsolescence due to the contextual changes. Thus, the interaction formed U-shape relations between social capital and firm's growth which explain that moderate social capital will lead to the best effects on the firm's growth (Prashantham and Dhanaraj, 2010).

A key growth factor for firms which desire to expand their transnational social capital is the ability to provide valuable inputs for the firm. The connections between the firms to achieve the common goals is considered as strategic partnering that provides valuable information due to the ability to access capabilities and resources which otherwise is unavailable within the firm (Koka and Prescott, 2002). The inter-firm relationship also represents intangible assets that have an influence on firms (Eklinder-Frick et al., 2014). Social interactions tend to promote social innovation to overcome resource constraints (Bhatt and Altinay, 2013). The study thus, conceptualizes social capital in interactions view (bonding and bridging ties) to examine the firm's growth and reliance on individuals' connections of cross border network. Eklinder-Frick et al. (2014) had suggested bridging and bonding to promote collaboration and creative networks. Moreover, interpersonal relationships leads to diminishing returns with firm's growth and the relationship lacks mutual understanding through cooperation for exchanging information and resources (McFadyen

and Cannella, 2004; Payne et al., 2011). Therefore, bonding and bridging of social capital must be based on trust, where the trust is the essential element to gain mutual understanding (Katila and Wahlbeck, 2011).

While some studies have been carried out on structural networks view in social capital (Soetanto and Van Geehuizen, 2009; Bradley et al., 2012; Schutjens and Völker, 2010), the impact of transnational social capital on firm growth is understudied, particularly the area concerning the university spin-off companies to develop transdisciplinary structure (Festel, 2013). This model adds to the understanding of social capital theory by examining the optimum level of social capital characteristics in connection with growth which results in the non-linear model as suggested by Soetanto and Van Geehuizen (2009). In the model, it is argued that the bridging and bonding of social capital are essential elements for transnational social capital as internal firm resources which then execute the process of expansion of cross-border network and accessing information and resources to facilitate firm's growth.

5. BUSINESS MODEL DESIGN

The business model is essential to transform entrepreneurs' ideas into feasible profits (Palo and Tähtinen, 2013). The business model has a distinct definition (Boons and Lüdeke-Freund, 2013) depending on the context and component (Brettel et al., 2012). The majority of studies refer business model as a mechanism to generate profits through value creation while Saebi and Foss (2015) outlined the differences between organizational structure, revenue source and theoretical components. Boons and Lüdeke-Freund (2013) summarized the business model concept by adopting the whole organizational perspective including value propositions, supply chain, and customer interface. Therefore, in line with the recent literature, the current study defines a business model as organizational strategy tool to generate revenue in the creation of competitive value. These strategies capture the alignment with different levels of business model context, structure and governance (Saebi and Foss, 2015).

In previous literature, the business model is described as an organization's rationality for value creation (Ghaziani and Ventresca, 2005). The terminology of the value chain has been defined by Tongur and Engwall (2014) as organizational focus on market segmentation and customer preference. According to this description, the company makes money and checks its place in the value chain and describes its governance, designs and structures itself to yield value for customers via capitalizing on the business opportunities. It answers several diverse questions about generating income, creating and delivering value to the customer within reasonable cost. For example, Boons and Ludeke-Freund (2013) identified components of the business model, categorized into four building blocks: Financial model, customer interface, supply chain and value proposition. Organization use business model as a strategic management tool to increase the value chain, hence improving overall organizational efficiency (Chesbrough, 2010).

The concept of the business model in previous literature also relates to business strategy (Tongur and Engwall, 2014). Several scholars distinguish the dissimilarity between the business model and strategy. For an example, DaSilva and Trkman (2014) argued that strategy is required during the deployment of resources to achieve firm's goal. The strategy crafts the dynamic capabilities to respond to any possible contingencies. Since business model portrays as the short-term perspective that represents the current organizational goal, thus, the business models crafted by entrepreneurs are prospective, and they envision a future venture and value creation through shaping the strategy. The similar thought was also supported by Zott and Amit (2013) that revealed business model and strategy as complementary and potential sourced for competitive advantage (Zott and Amit, 2011). Similarly, previous findings show business model design has positive relationship with firm's performance (Brettel et al., 2012; Zott and Amit, 2008). Moreover, Saebi and Foss (2015) examined how the open innovation strategy aligned with the business model to increase innovation performance. The study revealed important results that showed different strategies required different business model designs which include efficiency-centric, user-centric, collaborative and open platforms. In the current study, the business model is used to link the firm's strategy to enhance firm's outcome.

6. HYPOTHESES DEVELOPMENT AND CONCEPTUAL FRAMEWORK

An influential theory of firm's growth defined "growth" as an increase in size or amount or enhancement in quality (Penrose, 2009), and quality is one of the important development phenomena for sustaining competitive advantage (Molina-Azorin et al., 2015). RBV framework allows in the identification of how firm's resources have the potential to shape the firm's strategy by creating value for customers. When a firm exploits the first mover advantage for an opportunity through its internal strengths and strategies, it makes it difficult for the competitors to imitate the resources or strategies of the firm for some time. This makes it possible for the firm to attain sustainable competitive advantage. In simpler terms, a firm can achieve sustainable competitive advantage if it has the capability to identify its internal strengths and then use them as strategies to capitalize on the opportunities present in the external environment. On the frontline of firm's growth is the utilization of existing internal resources that meet the needs of a fluctuating marketplace.

6.1. Firm's Growth and Transnational Social Capital

The important role of social capital in the firm's development is shown by Peredo and Chrisman (2006), who discovered that structural networks by an individual are used to identify opportunity. In a similar view, Bhatt and Altinay (2013) pointed out that the opportunity is enhanced through leveraging social capital to substitute or complement other resources. This situation happens when an individual who possesses informal networks can access resources from other organizations through inter-firm connections to overcome resource constraint in developing countries. The information acquired from the social connections helps in product innovation in the form of novelty or differentiation to enhance firm's performance (Bradley et al., 2012; Tsai and Ghoshal,

1998). Thus, social capital is also seen as a source of innovation (Bradley et al., 2012; Yu, 2013). In line with the theory of social capital, which highlights the individual with more network ties is bale to realize the goals through inter-firm connections. Thus, acquiring more network ties results in higher chances of achieving the goals attracting investors for capital investment (Forte et al., 2015). Firms are reaping the benefits of having different network ties that will bring different knowledge. For example, Yu (2013) in his study revealed that the network technology diversity enhances the technological knowledge which increases the firm's innovation performance. However, by having U-shape relationship the level of network technology diversity should be moderate to produce the best condition of firm's performance. Previous studies also discovered that individual that has more network ties possess a higher level of education (Schutjens and Völker, 2010; Dearmon and Grier, 2011). Therefore, the study hypothesize that,

H1: Transnational social capital is significant to firm growth.

6.2. Firm's Growth and Business Model Design

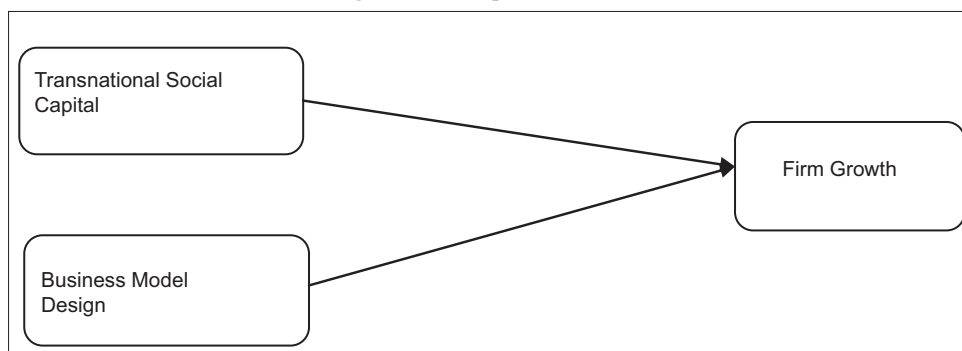
Innovation, as the paramount contributor to knowledge creation, is observed as a valuable resource to the University and Spin-off Company outcomes. Innovation is especially crucial in the event of introduction of new product or service in the market. Here it is also required that the firm is able to ensure the efficient integration of business processes through the creation of a flexible supply chain. In order for the technology based company to grow, it is essential that a working relationship is maintained between the business and all the actors in the supply chain (Ratajczak-Mrozek, 2012). This needs to be adopted as a strategy by the company. However, as the product lifecycle period is short in technology intensive companies, the business model has to be continuously altered and revitalized to be able to capitalize on the technological fluctuations. This conclusion necessitates substantial investments that illustrate a critical gap in industry-academia relationships and research innovation. Therefore, the study hypothesizes that,

H2: Business model design is significant to firm growth.

7. CONCLUSION

The objective of this study was to conceptualize the relationship and impact of internal firm's resources namely transnational social capital and business model design on firm's growth. The understanding of the nature of barriers to firm's growth provides more complete insights into how the two internal resources relate to growth which then helps in overcoming the resource constraints and lower the cost of accessing other resources needed for profit.

Based on the above discussion, it has been observed that transnational social capital which lies under human capital context to facilitate firm's growth under resource constraint. More importantly, this model also places much importance on the knowledge related resources for becoming the firm's strategy in the shape of business model design. This paper provides an academic basis for future research, in line with firm's growth direction, to build model on the basis of business strategy through increased knowledge acquisition or specialization which results in

Figure 1: Conceptual framework

enhancement of productive capabilities and technological changes in innovation (Figure 1).

REFERENCES

- Achtenhagen, L., Melin, L., Naldi, L. (2013), Dynamics of business models – Strategizing, critical capabilities and activities for sustained value creation. *Long Range Planning*, 46(6), 427-442.
- Almus, M., Nerlinger, E.A. (1999), Growth of new technology-based firms: Which factors matter? *Small Business Economics*, 13(2), 141-154.
- Audretsch, D.B., Mahmood, T. (1995), New firm survival: New results using a hazard function. *The Review of Economics and Statistics*, 77(1), 97-103.
- Bekkers, R., Gilsing, V., Van Der Steen, M. (2006), Determining factors of the effectiveness of IP-based spin-offs: Comparing the Netherlands and the US. *The Journal of Technology Transfer*, 31(5), 545-546.
- Barney, J. (1991), Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120.
- Bathelt, H., Kogler, D.F., Munro, A.K. (2010), A knowledge-based typology of university spin-offs in the context of regional economic development. *Technovation*, 30(9), 519-532.
- Bhatt, P., Altinay, L. (2013), How social capital is leveraged in social innovations under resource constraints? *Management Decision*, 51(9), 1772-1792.
- Bjørnåli, E.S., Aspelund, A. (2012), The role of the entrepreneurial team and the board of directors in the internationalization of academic spin-offs. *Journal of International Entrepreneurship*, 10(4), 350-377.
- Bock, A.J., Opsahl, T., George, G., Gann, D.M. (2012), The effects of culture and structure on strategic flexibility during business model innovation. *Journal of Management Studies*, 49(2), 279-305.
- Boons, F., Lüdeke-Freund, F. (2013), Business models for sustainable innovation: State-of-the-art and steps towards a research agenda. *Journal of Cleaner Production*, 45, 9-19.
- Bourdieu, P. (1989), Social space and symbolic power. *Sociological Theory*, 7(1), 14-25.
- Bradley, S.W., McMullen, J.S., Artz, K., Simiyu, E.M. (2012), Capital is not enough: Innovation in developing economies. *Journal of Management Studies*, 49(4), 684-717.
- Brettel, M., Strese, S., Flatten, T.C. (2012), Improving the performance of business models with relationship marketing efforts – An entrepreneurial perspective. *European Management Journal*, 30(2), 85-98.
- Buenstorf, G. (2007), Creation and pursuit of entrepreneurial opportunities: An evolutionary economics perspective. *Small Business Economics*, 28(4), 323-337.
- Buenstorf, G., Fornahl, D. (2009), B2C—bubble to cluster: the dot-com boom, spin-off entrepreneurship, and regional agglomeration. *Journal of Evolutionary Economics*, 19(3), 349-378.
- Buenstorf, G., Geissler, M. (2011), The origins of entrants and the geography of the German laser industry. *Papers in Regional Science*, 90(2), 251-270.
- Cao, C., Appelbaum, R.P., Parker, R. (2013), Research is high, and the market is far away: Commercialization of nanotechnology in China. *Technology in Society*, 35(1), 55-64.
- Chandran, V.G.R., Sundram, V.P.K., Santhidran, S. (2014), Innovation systems in Malaysia: A perspective of university-industry R&D collaboration. *AI and Society*, 29(3), 435-444.
- Chesbrough, H. (2010), Business model innovation: Opportunities and barriers. *Long Range Planning*, 43(2), 354-363.
- Clarysse, B., Wright, M., Van de Velde, E. (2011), Entrepreneurial origin, technological knowledge, and the growth of spin-off companies. *Journal of Management Studies*, 48(6), 1420-1442.
- Clausen, T.H., Rasmussen, E. (2013), Parallel business models and the innovativeness of research-based spin-off ventures. *The Journal of Technology Transfer*, 38(6), 836-849.
- Coleman, J.S. (1988), Social capital in the creation of human capital. *American Journal of Sociology*, 94, S95-S120.
- Colombo, M.G., Luukkonen, T., Mustar, P., Wright, M. (2010), Venture capital and high-tech start-ups. *Venture Capital*, 12(4), 261-266.
- Dahlstrand, Å.L. (1997), Growth and inventiveness in technology-based spin-off firms. *Research Policy*, 26(3), 331-344.
- Darroch, J. (2005), Knowledge management, innovation and firm performance. *Journal of Knowledge Management*, 9(3), 101-115.
- DaSilva, C.M., Trkman, P. (2014), Business model: What it is and what it is not. *Long Range Planning*, 47(6), 379-389.
- Davidsson, P., Henderson, M. (2002), Determinants of the prevalence of start-ups and high-growth firms. *Small Business Economics*, 19(2), 81-100.
- Dearmon, J., Grier, R. (2011), Trust and the accumulation of physical and human capital. *European Journal of Political Economy*, 27(3), 507-519.
- Dhewanto, W., Sohal, A.S. (2015), The relationship between organisational orientation and research and development/technology commercialisation performance. *R&D Management*, 45(4), 339-360.
- Erdős, K., Varga, A. (2013), The role of academic spin-off founders' motivation in the hungarian biotechnology sector. In: *Cooperation, Clusters, and Knowledge Transfer*. Berlin, Heidelberg: Springer. p207-224.
- Eklinder-Frick, J., Eriksson, L.T., Hallén, L. (2014), Multidimensional social capital as a boost or a bar to innovativeness. *Industrial Marketing Management*, 43(3), 460-472.
- Festel, G. (2013), Academic spin-offs, corporate spin-outs and company internal start-ups as technology transfer approach. *The Journal of Technology Transfer*, 38(4), 454-470.
- Forte, A., Peiró-Palomino, J., Tortosa-Ausina, E. (2015), Does social capital matter for European regional growth? *European Economic*

- Review, 77, 47-64.
- Ghaziani, A., Ventresca, M.J. (2005), Keywords and cultural change: Frame analysis of business model public talk, 1975-2000. *Sociological Forum*, 20(4), 523-559.
- González-Pernía, J.L., Kuechle, G., Peña-Legazkue, I. (2013), An assessment of the determinants of university technology transfer. *Economic Development Quarterly*, 27(1), 6-17.
- Gübeli, M.H., Doloreux, D. (2005), An empirical study of university spin-off development. *European Journal of Innovation Management*, 8(3), 269-282.
- Hayter, C.S. (2013), Harnessing university entrepreneurship for economic growth factors of success among university spin-offs. *Economic Development Quarterly*, 27(1), 18-28.
- Hirai, Y., Watanabe, T., Inuzuka, A. (2013), Empirical analysis of the effect of Japanese university spinoffs' social networks on their performance. *Technological Forecasting and Social Change*, 80(6), 1119-1128.
- Hormiga, E., Batista-Canino, R.M., Sánchez-Medina, A. (2011), The impact of relational capital on the success of new business start-ups. *Journal of Small Business Management*, 49(4), 617-638.
- Ismail, K., Mason, C., Cooper, S., Omar, W., Zaidi, W., Abdul Majid, I. (2010), University spin off formations: How decision making process has been made? *International Journal of Business & Social Science*, 1(2), 103-123.
- Jang, S.S. (2011), Growth-focused or profit-focused firms: Transitions toward profitable growth. *Tourism Management*, 32(3), 667-674.
- Jiménez-Jiménez, D., Sanz-Valle, R. (2011), Innovation, organizational learning, and performance. *Journal of Business Research*, 64(4), 408-417.
- Jones, C.B., Purves, R.S. (2008), Geographical information retrieval. *International Journal of Geographical Information Science*, 22(3), 219-228.
- Katila, S., Wahlbeck, Ö. (2012), The role of (transnational) social capital in the start-up processes of immigrant businesses: The case of Chinese and Turkish restaurant businesses in Finland. *International Small Business Journal*, 30(3), 294-309.
- Koka, B.R., Prescott, J.E. (2002), Strategic alliances as social capital: A multidimensional view. *Strategic Management Journal*, 23(9), 795-816.
- Liao, J., Welsch, H., Stoica, M. (2003), Organizational absorptive capacity and responsiveness: An empirical investigation of growth-oriented SMEs. *Entrepreneurship Theory and Practice*, 28(1), 63-85.
- Löfsten, H., Lindelöf, P. (2002), Science parks and the growth of new technology-based firms - Academic-industry links, innovation and markets. *Research Policy*, 31(6), 859-876.
- McFadyen, M.A., Cannella, A.A. (2004), Social capital and knowledge creation: Diminishing returns of the number and strength of exchange relationships. *Academy of Management Journal*, 47(5), 735-746.
- Molina-Azorín, J.F., Tari, J.J., Pereira-Moliner, J., López-Gamero, M.D., Pertusa-Ortega, E.M. (2015), The effects of quality and environmental management on competitive advantage: A mixed methods study in the hotel industry. *Tourism Management*, 50, 41-54.
- Morales-Gualdrón, S.T., Gutiérrez-Gracia, A., Dobón, S.R. (2009), The entrepreneurial motivation in academia: A multidimensional construct. *International Entrepreneurship and Management Journal*, 5(3), 301-317.
- Morgan, N.A., Vorhies, D.W., Mason, C.H. (2009), Market orientation, marketing capabilities, and firm performance. *Strategic Management Journal*, 30(8), 909-920.
- Olavarrieta, S., Friedmann, R. (2008), Market orientation, knowledge-related resources and firm performance. *Journal of Business Research*, 61(6), 623-630.
- Palo, T., Tähtinen, J. (2013), Networked business model development for emerging technology-based services. *Industrial Marketing Management*, 42(5), 773-782.
- Payne, G.T., Moore, C.B., Griffis, S.E., Autry, C.W. (2011), Multilevel challenges and opportunities in social capital research. *Journal of Management*, 37(2), 491-520.
- Penrose, E.T. (1959), *The Theory of the Growth of the Firm*. New York: John Wiley.
- Penrose, E. (2009), *The Theory of the Growth of the Firm/Edith Penrose; with a new introduction by Christos N. Pitelis*. Oxford: Oxford University Press.
- Peredo, A.M., Chrisman, J.J. (2006), Toward a theory of community-based enterprise. *Academy of Management Review*, 31(2), 309-328.
- Pérez-López, S., Alegre, J. (2012), Information technology competency, knowledge processes and firm performance. *Industrial Management & Data Systems*, 112(4), 644-662.
- Phillips, B.D., Kirchoff, B.A. (1989), Formation, growth and survival; small firm dynamics in the US economy. *Small Business Economics*, 1(1), 65-74.
- Prashantham, S., Dhanaraj, C. (2010), The dynamic influence of social capital on the international growth of new ventures. *Journal of Management Studies*, 47(6), 967-994.
- Putnam, R.D. (1993), The prosperous community: Social capital and public life. *The American Prospect*, 4(13), 35-42.
- Rasmussen, E., Mosey, S., Wright, M. (2011), The evolution of entrepreneurial competencies: A longitudinal study of university spin-off venture emergence. *Journal of Management Studies*, 48(6), 1314-1345.
- Ratajczak-Mrozek, M. (2012), Global business networks and cooperation within supply chain as a strategy for high-tech companies' growth. *Journal of Entrepreneurship, Management and Innovation (JEMI)*, 8(1), 35-51.
- Rutten, R., Westlund, H., Boekema, F. (2010), The spatial dimension of social capital. *European Planning Studies*, 18(6), 863-871.
- Saebi, T., Foss, N.J. (2015), Business models for open innovation: Matching heterogeneous open innovation strategies with business model dimensions. *European Management Journal*, 33(3), 201-213.
- Sapienza, H.J., Parhankangas, A., Autio, E. (2004), Knowledge relatedness and post-spin-off growth. *Journal of Business Venturing*, 19(6), 809-829.
- Schutjens, V., Völker, B. (2010), Space and social capital: The degree of locality in entrepreneurs' contacts and its consequences for firm success. *European Planning Studies*, 18(6), 941-963.
- Sherry, E.F., Teece, D.J. (2004), Royalties, evolving patent rights, and the value of innovation. *Research Policy*, 33(2), 179-191.
- Smith, H.L., Ho, K. (2006), Measuring the performance of oxford university, oxford brookes university and the government laboratories spin-off companies. *Research Policy*, 35(10), 1554-1568.
- Soetanto, D.P., Van Geenhuizen, M. (2010), Social capital through networks: The case of university spin-off firms in different stages. *Tijdschrift Voor Economie En Social Geografie*, 101(5), 509-520.
- Soetanto, D.P., van Geenhuizen, M. (2011), Social networks, university spin-off growth and promises of living labs. *Regional Science Policy and Practice*, 3(3), 305-321.
- Soetanto, D.P., van Geenhuizen, M. (2006), Socioeconomic Networks: In Search of Better Support for University Spin-Offs. In: 14th High Technology Small Firms Conference Twente, Netherlands.
- Stam, W., Arzlanian, S., Elfring, T. (2014), Social capital of entrepreneurs and small firm performance: A meta-analysis of contextual and methodological moderators. *Journal of Business Venturing*, 29(1), 152-173.
- Sullivan, D.M., Marvel, M.R. (2011), Knowledge acquisition, network reliance, and early stage technology venture outcomes. *Journal of Management Studies*, 48(6), 1169-1193.
- Tongur, S., Engwall, M. (2014), The business model dilemma of

- technology shifts. *Technovation*, 34(9), 525-535.
- Trimi, S., Berbegal-Mirabent, J. (2012), Business model innovation in entrepreneurship. *International Entrepreneurship and Management Journal*, 8(4), 449-465.
- Tsai, W., Ghoshal, S. (1998), Social capital and value creation: The role of intrafirm networks. *Academy of Management Journal*, 41(4), 464-476.
- Urbano, D., Guerrero, M. (2013), Entrepreneurial universities socioeconomic impacts of academic entrepreneurship in a European region. *Economic Development Quarterly*, 27(1), 40-55.
- Van Geenhuizen, M., Soetanto, D.P. (2009), Academic spin-offs at different ages: A case study in search of key obstacles to growth. *Technovation*, 29(10), 671-681.
- Van Geenhuizen, M., Soetanto, D.P. (2013), Benefitting from learning networks in open innovation: Spin-off firms in contrasting city regions. *European Planning Studies*, 21(5), 666-682.
- Vohora, A., Wright, M., Lockett, A. (2004), Critical junctures in the development of university high-tech spinout companies. *Research Policy*, 33(1), 147-175.
- Wernerfelt, B. (1984), A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171-180.
- Wright, M., Clarysse, B., Mosey, S. (2012), Strategic entrepreneurship, resource orchestration and growing spin-offs from universities. *Technology Analysis & Strategic Management*, 24(9), 911-927.
- Yagüe-Perales, R.M., March-Chordà, I. (2012), Performance analysis of research spin-offs in the Spanish biotechnology industry. *Journal of Business Research*, 65(12), 1782-1789.
- Yu, S.H. (2013), Social capital, absorptive capability, and firm innovation. *Technological Forecasting and Social Change*, 80(7), 1261-1270.
- Zhou, K.Z., Brown, J.R., Dev, C.S. (2009), Market orientation, competitive advantage, and performance: A demand-based perspective. *Journal of Business Research*, 62(11), 1063-1070.
- Zhou, Y., Xu, G., Su, J., Minshall, T. (2011), Barriers to entrepreneurial growth: An empirical study on university spin-offs in China. *Journal of Science and Technology Policy in China*, 2(3), 277-294.
- Zott, C., Amit, R. (2007), Business model design and the performance of entrepreneurial firms. *Organization Science*, 18(2), 181-199.
- Zott, C., Amit, R. (2008), The fit between product market strategy and business model: Implications for firm performance. *Strategic Management Journal*, 29(1), 1-26.
- Zott, C., Amit, R. (2010), Business model design: An activity system perspective. *Long Range Planning*, 43(2), 216-226.
- Zott, C., Amit, R. (2013), The business model: A theoretically anchored robust construct for strategic analysis. *Strategic Organization*, 11(4), 403-411.