Corporate Enterpreneurship and Triple Helix

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Abstract

Triple Helix (TH) is a concept well known, understood, and applied by many Asian Multinationals (AMNC), and it plays an important role for economic growth and regional development. It seems to be influenced by networks and partnerships and their complexity as well. Corporate entrepreneurship (CE) has been widely acknowledged in international literature and practiced as a vital element of business performance. CE mainly relates to a corporate management style that integrates risk-taking and innovative approaches, as well as reward and motivational techniques that are more traditionally thought of as being the province of entrepreneurship. By encouraging innovation and enriching business performance, CE offers great fundamentals for cooperative development between the government, educational institutes, and businesses. In a constantly demanding environment, the dual forces of technological change and globalisation-heightened competition do have an impact on the way how businesses operate. To cope with this, organizations should fully understand the different meanings of CE, at any level, and try to apply it properly to all decisions made in the framework of TH's cooperation.

1 Introduction

The North of the Netherlands offers an ideal mix of living and working conditions, creating several investment possibilities. Asian business is reforming and its emerging multinationals will change the way we all live, also in this particular

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region. In order to ensure their presence here, a successful cooperation between the government, industry and academia has to be established.

Several companies looking to stake ground in Dutch as well as global markets face several challenges. They must create and sustain brands that have appeal outside their home markets, navigate a range of regulatory and political frameworks, and drive innovation to create differentiated products or services to potentially attract new customers. Additionally, those companies particularly interested and relying on acquisitions must overcome cultural and other differences to successfully integrate new overseas operations; however they are not the scope of this chapter. The most critical challenges are likely to be centered around talent: how to acquire the leadership and knowledge to compete on a global stage. This is crucial for Asian multinationals who act often in the frame of a knowledge-based economy and a knowledge-based society.

The following chapter reports the study on an interconnection between the Triple Helix (TH) and corporate entrepreneurship (CE) and analyzes the investment possibilities for Asian Multinationals (AMNC). TH is a concept well known, understood, and applied by several AMNC, and it plays an important role for the economic growth and region development. It seems to be influenced by networks and partnerships and their complexity as well. Additionally, the study presents the results of researching TH organizations and pinpoints several actions to be undertaken in order to create a potential for those types of companies which are conquering the world. Two Dutch cases are analyzed which show substantial possibilities for transferring knowledge and experience to the Northern Netherlands region.

Corporate entrepreneurship (CE) has been widely acknowledged in international literature and practiced as a vital element of business performance. It develops new ideas, procedures, or products, and thereby stimulates innovation, which is regarded as inherent to effective management practice. CE mainly relates to a corporate management style that integrates risk-taking and innovative approaches, as well as the reward and motivational techniques that are more traditionally thought of as being the province of entrepreneurship. These decisions might directly apply to the level and scope of cooperation. By encouraging innovation and enriching business performance, CE offers great fundamentals for cooperative development between the government, educational institutes, and businesses located in the Northern Netherlands, the region which is the scope of this study.

In a constantly demanding environment, the dual forces of technological change and globalisation-heightened competition impact the way how businesses operate. To cope with this, organizations should fully understand the different meanings of CE, at any level, and try to apply it properly to all of the decisions made in the framework of TH's cooperation.

2 Triple Helix and Corporate Entrepreneurship

Triple Helix (TH) is a concept which underlines the importance of government, industry and academia relations. In line with Leydesdorff, "the TH model enables us to study the network linkages among them, both in the evolutionary terms of the transition to post-industrialism and in terms of communication-theoretical concepts" (Leydesdorff and Heimeriks 2001). The TH model was introduced in 1995 by Etzkowitz and Leydesdorff and illustrates the importance of those interconnections and the value of the abovementioned network linkages. Since then, it has been widely used, particularly in studies of the knowledge-based economy and innovation, both by AMNC as well as companies or organizations in general.

According to Bressers (2012), "governmental agencies increasingly share power with experts from knowledge institutions and businesses and businesses become societally involved through corporate social responsibility (CSR). Knowledge institutions become commercially active and increasingly operate on the verge of science and consultancy. Public policy and science become blurred, yet also remain individually visible. Organizations maintain their primary characteristics, but connections with each other are growing and the organizations assimilate some of each other's roles" (Bressers 2012). In the recent years, this development, in all of the interconnected and abovementioned areas, has been dubbed the rise of the TH concept.

In conclusion, the concept of the Triple Helix System of innovation was recently introduced as an analytical framework that synthesizes key features of the TH interactions into an "innovation system" format, defined according to the systems theory as a set of components, relationships and functions. The relationships between components are synthesized into five main types: technology transfer, collaboration and conflict moderation, collaborative leadership, substitution, and networking (Ranga and Etzkowitz 2013).

The following subchapters discuss core concepts in the TH organization literature, connecting it with knowledge about complexity and cooperation. Ongoing transformation of TH and the importance of networking, in knowledge-based economies are emphasized. TH is also presented as a key for improving conditions for innovation, and increasing investment possibilities for AMNC at the same time.

2.1 Triple Helix Characteristics

TH theory emphasises the development which occurs collaboratively in a mutual three-party process that involve actors (entities) from industry, government, and academia. The TH theory was originally developed to "analyze innovation at the societal level and as a historical outcome. One historical trend that the theory aims to describe is the increasing role of knowledge for innovation, and in particular the role of the university in an increasingly knowledge-based society. Where academia had earlier been seen primarily as an up-stream activity or as part of a knowledge

Table 1 Triple Helix actors and their role in the innovation process (Etzkowitz 2003)

Triple Helix actors	Role in innovation process
Industry	Locus of production
Government	Source of contractual relations that guarantee stable interactions and exchange
University	Source of new knowledge and technology, the generative principle of knowledge-based economies

context to innovation, the TH positioned the university closer to the actual innovation process. Another trend that the theory aims to describe is the increasing role of a collaborative mode of innovation. The three institutional spheres, so called, helices, interact and communicate at different levels in TH processes that not only drive change but also lead to internal transformations of the respective institutional sphere" (Fogelberg and Thorpenberg 2012).

The TH "denotes a transformation in the relationship among industry, government and academia as well as within each of these spheres" (Etzkowitz 2003). In this transformation process all of the actors (entities) engaged need to fulfil several roles. They are briefly presented in Table 1.

The common objective of the TH model is to realize an innovative environment consisting of university spin-off firms, tri-lateral initiatives for knowledge-based economic development, and strategic alliances among firms, government laboratories, and academic research groups (Etzkowitz and Leydesdorff 2000). By providing "a flexible framework to guide efforts, from different starting points, to achieve the common goal of knowledge-based economic and social development" (Etzkowitz and Klofsten 2005), TH enables proper innovation management and a policy model for innovation as well.

The TH model of industry—government—academia relations depictured in Fig. 1 presents an alternative between bilateral and trilateral coordination mechanisms or—in institutional terms—spheres.

The spheres (helices) remain in transition because each of the partner institutes also develops its own, and often differentiating, mission. Thus, "a trade-off can be generated between integration and differentiation, and new systems in terms of possible synergies can be explored and potentially shaped. As the various bilateral translations function, a TH overlay can also be expected to develop as a system of meaning exchanges among differently coded expectations" (Leydesdorff 2012). This dynamic overlay, responding to a demanding environment, is portrayed below (Fig. 2).

Above-presented dynamic overlay has to be well thought out in order to ensure a proper process of innovation. As mentioned previously, TH is under ongoing a transformation process. It occurs through hybridization between spheres where elements from industry, government and academia are recombined into new forms. The result of this transformative process is that "universities increasingly act as entrepreneurs, businesses increasingly act as knowledge developers, and

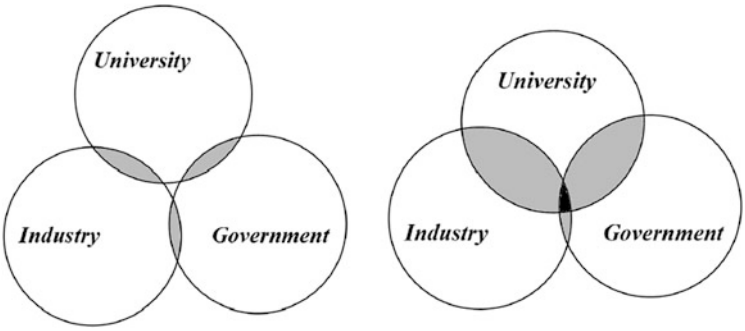

Fig. 1 The origins of the Triple Helix model (Leydesdorff 2012)

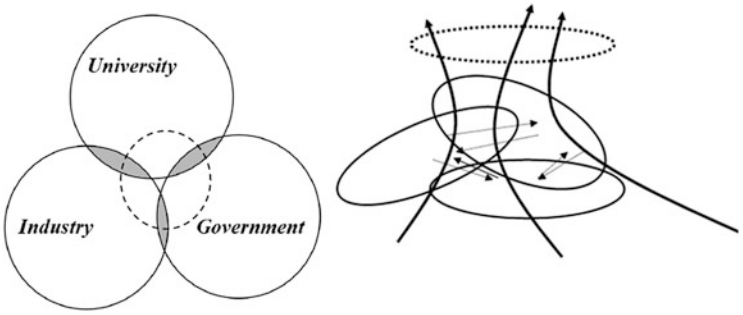

Fig. 2 A differentiated Triple Helix with dynamic overlay (Leydesdorff 2012)

governmental agents maintain their task as the guardian of the rules of the game, but also take available venture capital (VC) to help start new enterprises" (Etzkowitz 2003). The interactivity of the process in which all of the actors (entities) co-evolve towards a notably new structure through communication with each other has to be emphasized at this point.

Bressers (2012) draws our attention to the fact that "by cooperating with many relevant stakeholders actors can attempt to tackle the problem that single actors only have a limited range within which they can steer events. If an actor wishes to influence society in a certain direction it has virtually no chance if it acts alone, only chance and luck will then lead to the desired outcomes. If, however, the actor collaborates with tens, hundreds or thousands of other stakeholders in the same field their combined effort might push the societal change in the envisaged direction. The TH organization, with its internal transformation without reducing the core qualities of the actors, is an important vehicle for such collaborative processes" (Bressers 2012). This collaborative process depends on the way and the intensity with which the aforementioned actors communicate and network. This is discussed in the following subchapter.

2.2 Networking as an Important Triple Helix Component

The connectivity of the government, industry and academia plays a significant role in TH activities. A suitable network among all of the actors (entities) together, representing, respectively, industry, government, and university, presents and creates greater innovation potential and influences the intensity of the connections. The abovementioned actors (entities) might act in different ways as they may possibly understand the communication process differently. The manner in which all of the actors cooperate or acquire new projects or implement new activities undoubtedly depends on their ability to connect with other people, organizations, sectors or ideas. It is notable that the process of engaging all of the actors at the same time becomes more complex. The multitude of these connections increases the complexity of the process from the moment of generating a new idea to successful implementation or commercialization of a particular product or solution. There is really no way to reduce or ignore the complexity of the process, as different situations call for different actions. The complexity of TH should be incorporated into all of the engaged organizations to strengthen and support a better understanding and meaning of all of the available or potential connections. Because of the limited number of pages in this chapter, the complexity is not further discussed, but this does not mean it should be ignored.

According to Etzkowitz (2003), "TH postulates, that this interaction in the tripartite cooperation, is the key to improving conditions for innovation in a knowledge-based society" (Etzkowitz 2003). Thus the interaction between actors is the driving force for change processes, consistent with the discussion of the complexity theory. The networks these actors form are not static: they are in a constant flux (Etzkowitz and Leydesdorff 2000); somehow, these interaction processes between TH participants lead to exchange and alignment (Bressers 2012) and the current technological development facilitates the way these actors communicate.

2.3 Entrepreneurship and Its Importance for Triple Helix Activities

Entrepreneurial activities and a positive attitude toward innovation are a vital part of TH activities. The multidimensionality of the field of entrepreneurship encouraged the development of several forms of entrepreneurship beyond the traditional, neoclassical or Schumpeterian notion of business or economics. In this respect, the new streams in the entrepreneurial concept include several forms and are highlighted in this subchapter. With respect to this, the concept "corporate entrepreneurship" (CE) desires more attention.

The concept of CE is rich with different approaches and assumptions. This phenomenon took different shapes in the history of economic thought (Davidsson 2004; Frederick and Kuratko 2010) and can be expressed in various terms such as intrapreneuring; corporate entrepreneurship (CE); internal corporate

entrepreneurship (ICE); corporate venturing (CV); strategic renewal; and internal entrepreneurship and venturing (Sharma and Chrisman; 1999). Several researchers agree that if entrepreneurship occurs within the setting of an established organization, it is labelled with the term intrapreneurship (Pinchot 1985; Pinchot and Pellman 1999) or other synonyms, such as corporate entrepreneurship (Zahra 1991) or corporate venturing (Covin and Miles 1999), that are used to express the same concept.

CE is recognized as a fundamental element of business performance of large, small and medium sized enterprises, and firms in general, irrespective of their size. CE includes new product improvement and new manufacture methods and procedures (Antoncic and Hisrich 2003), and expansion of innovative services, technologies, or production methods. Correspondingly, innovation is seen here as the main driving force of CE.

As mentioned previously, although CE exists in firms in general irrespective of their size, the majority of the research on corporate entrepreneurial attitude has had a primary focus on large American-based companies. This led many countries to follow and adopt uncritically the American models of CE strategies and in addition, smaller companies imitated intrapreneurial strategies of large organizations without considering their diversities. Consequently, the need for further comparative research on CE in economies other than American and in smaller organizations is particularly critical in order to explore the role of CE and its impact on innovation as a crucial outcome of TH activities.

The basic idea that constitutes the concept of CE is the new venture formation (Pinchot 1985) and refers to intrapreneurship. CE and intrapreneurship are the two terms used interchangeably. However, apart from creation of new business ventures, CE also refers to other innovative activities, such as development of new products, services, technologies, strategies, administrative techniques or competitive postures approach. Research on CE, as mentioned before, has been done largely on "formation of new corporate ventures (CV) and on the entrepreneurial orientation (EO), mainly emphasizing characteristics of entrepreneurial organizations and positively referring it to innovation. CE is seen also as a valuable instrument for rejuvenating and revitalising existing companies or organizations and is recognized as a crucial aspect of organizational development and business performance."

From recent research, CE reflects a broad spectrum of activities related to finding and developing new ideas which mainly are positively related to business performance. Many organizations today "rely on CE to develop and differentiate their products and services" (Hayton et al. 2013). CE occurs when organizations strive to "exploit product-market opportunities through innovative and proactive behaviour" (Dess et al. 1999). As such, CE facilitates a firm's efforts to exploit its current competitive advantages as well, such as recognizing and exploiting new opportunities (Ireland et al. 2009) and the competencies required to successfully pursue them (Covin and Miles 1999). Moreover, CE has evolved into a major strategy consideration for organizations today.

The recognized scope of the CE domain has expanded significantly over the past few decades and may also be related to CV and to strategic entrepreneurship. Corbett et al. (2013) explains that "the label CV is used in reference to the same new business phenomena alluded to in prior typologies, while the strategic entrepreneurship category of CE refers to a wide variety of specific phenomena that include, among others, strategic renewal and the Schumpeterian innovation phenomenon to which Sharma and Chrisman (1999) refer" (Corbett et al. 2013). The author also pays attention to the "new insights from a variety of perspectives on the matter of how established organizations might best respond to the entrepreneurial imperatives they face and opportunities confronting them" (Corbett et al. 2013). The author argues that CE is not all good, all the time, and there must be some limits to its adoption and usefulness. The following areas could be developed further: internal processes of how CE evolves, is adopted, and is successful; explanation and prediction of CE adoption; and prediction of high-performing governance choices.

Three related phenomena have paralleled CE's theoretical development for the last decade. These concepts are corporate venturing (CV), entrepreneurial orientation (EO) and strategic entrepreneurship. They are shortly discussed in the following subchapters. Respective to abovementioned thoughts, a proper understanding of all of these concepts might create some extra space for integrating CE into TH activities.

2.4 Triple Helix System

For the past two decades, there has been an increased interest in the field of entrepreneurial attitude. More attention has been given to a new stream of CE, taking into account the different theories regarding entrepreneurship in economic, psychological, and sociological research. In line with Pirich, CE is a process rather than a static phenomenon or a mechanical economic factor (Pirich 2001). Antoncic and Hisrich provide a more comprehensive view on the concept, emphasizing that CE is "a process that goes on inside an existing firm, regardless of its size, and leads not only to new business ventures but also to other innovative activities and orientations such as development of new products, services, technologies, administrative techniques, strategies, and competitive postures". Correspondingly, CE is also perceived as a process of an organizational renewal, defined as "revitalising a company's business through innovation and changing competitive profile" (Zahra 1991). CE can be also expressed in two other forms: new venture creation within existing organizations or "the process of creating new business and the transformation of organizations through strategic renewal".

Since its introduction at the end of the 1980s, EO has changed its definition several times (Belousova and Gailly 2013). In the works written about EO in the 1980s, it is considered as a posture, whereas the 1990s considered the concept in terms of a new entry. "An EO refers to the processes, practices, and decision-making activities that lead to new entry" whereas new entry is understood as "the act of launching a new venture" (Lumpkin and Dess 1996). It can be accomplished

by entering new or established markets with new or existing goods or services. In conclusion, EO can be also defined as the strategy-making processes and styles of firms that engage in entrepreneurial activities (Lumpkin and Dess 2001) and can be understood as the engine that drives specific CE activities.

Corporate venturing (CV) approaches have as their commonality the adding of new businesses (or portions of new businesses via equity investments) to the corporation. This can be accomplished through three implementation modes: internal corporate venturing, cooperative corporate venturing, and external corporate venturing (Hornsby et al. 2013).

CV can be seen as a specific kind of CE aiming at starting and developing new ventures inside existing organizations. Respectively, CE can be considered as a process related to proactive initiatives from individual employees. In this process, managers are and should be engaged as representatives of the employer. In contrast, one of the CE's dimensions—innovativeness—refers to product and service innovation with emphasis on development and innovation in technology. CE includes new product development, product improvements, and new production methods and procedures. Covin and Slevin (1991) consider one part of the entrepreneurial posture to be reflected in the extensiveness and frequency of product innovation and the related tendency of technological leadership. In addition to this, Zahra included product innovation and technological entrepreneurship (Zahra 1991) as innovative aspects of manufacturing firms.

Strategic entrepreneurship approaches have as their commonality the exhibition of large-scale or otherwise highly consequential innovations that are adopted in the firm's pursuit of competitive advantage. With strategic entrepreneurship, innovation can be in any of five areas: the firm's strategy, product offerings, served markets, internal organization (i.e., structure, processes, and capabilities), or business model. In either case, the organizational environment becomes a critical area of focus when CE activities are to be launched (Hornsby et al. 2013).

In line with Corbett et al, "the strategic entrepreneurship category of CE refers to a wide variety of specific phenomena that include, among others, strategic renewal and the Schumpeterian (disruptive) innovation phenomenon to which Sharma and Chrisman refer. Additionally, strategic entrepreneurship as part of the CE construct recognises not only the disruptive aspect of Schumpeterian innovation, but also the generative, path creating, new business creation aspect that may be inherent in breakthrough innovation, where firms struggle to understand how to execute opportunities in the face of high levels of uncertainty on multiple dimensions" (Corbett et al. 2013).

2.5 Positioning Entrepreneurship to Facilitate Innovation in the Triple Helix System

CE is broadly recognized as an instrument for facilitating innovation and competitiveness of organizations and businesses, and is bounded by a set of internal and external factors, directly or indirectly shaping innovative activities. The internal

factors influencing CE are: the communication process, use of formal control mechanisms, environmental scanning, organizational support, competition-related values, and person-related values. Correspondingly, the external factors influencing CE are: dynamism, technological opportunities, industry growth, demand for new products, favorability of change, and competitive rivalry.

According to Zahra (1991), the other factors influencing CE are environmental factors, such as hostility, dynamism, and heterogeneity (Zahra 1991). Management and the governmental leaders play also a significant role with respect to management style, staffing, and rewarding innovative venture activities or training and trusting individuals within the firm to detect opportunities. All of the activities undertaken should be converted into several visible outcomes. These outcomes can be objective measures, such as profitability, earnings per share, and innovation; and subjective measures, such as employees' satisfaction and commitment to the organization or the organization's learning and memory orientation. Following Hornsby et al. (2013), only by exploring this relationship can "more proficient implementation of CE strategies be enabled." Additionally, management support, work discretion, rewards or reinforcement, time availability, and organizational boundaries need to be deliberated (Hayton et al. 2013).

CE can be studied at the individual, organizational and national level. With regards to TH, the national level might play a significant role in the cooperation between actors (entities), because government might excellently stimulate innovativeness among industry, business and academia, by initiating common projects, for example. Research exploring the antecedents of entrepreneurial-oriented processes and behaviors has been unduly limited (Hornsby et al. 2013). In this context, "the centrality of organizational boundaries as a core dimension of organizational preparedness for corporate entrepreneurship (OPCE), for example, is currently unclear". Although many scholars have theorized the importance of organizational structure as a core aspect of OPCE (Ireland et al. 2009), empirical support for this dimension in practice has been limited and mixed (Hornsby et al. 2002). According to Hornsby et al. (2013), "research into OPCE has been conducted to identify specific organizational antecedents of managers' entrepreneurial behaviour" (Hornsby et al. 2013). In this scholarly vein, several other authors found three factors to be the most important stimulants of managers' entrepreneurial behavior and they are as follows: top management support, organizational structure, and rewards. Hornsby, Kuratko, and Montagno extended this earlier study of OPCE to include work discretion and time availability as two additional factors that serve as determinants of managerial entrepreneurial behavior. This line of research not only made a theoretical contribution but also made a methodological contribution by introducing the instruments that became the precursor of the Corporate Entrepreneurship Assessment Instrument (Hornsby et al. 2013).

Several measurement scales, such as the Corporate Entrepreneurship Assessment Instrument (CEAI) explained by Hornsby et al. (2002) and Kuratko et al. (1990), Entrepreneurial orientation (EO) stressed by Covin and Slevin (1989), and entrepreneurial intensity, are important means of measuring various

aspects of CE strategy. The CEAI is an instrument that was developed to measure the key internal organizational factors that influence a firm's entrepreneurial activities and outcomes. Originally developed by Kuratko et al. (1990) and further refined in more recent studies (Hornsby et al. 2002), the CEAI represents a key instrument available to researchers for measuring a firm's OPCE. A recent study by Hornsby results in "a more parsimonious and psychometrically sound set of items for each factor was derived yielding an 18-item instrument based upon the original 48-item measure, analyzing organizational preparedness for CE" (Hornsby et al. 2013). This provides a necessary and critical tool to advance research in the area of organizational antecedents to CE and provide insight into the important consideration of pro-entrepreneurship organizational architecture (Ireland et al. 2009), ensuring that each factor of the CEAI is represented by a parsimonious set of items that are conceptually distinct from each other before examining the instrument's structural or convergent validity. This examination of the psychometric properties of the CEAI provides the field with a more useful and valid empirical tool for conducting research within an important area of CE.

The CE literature has emphasized the need for favorable environmental conditions (Pinchot 1985) for CE, describing and explaining factors inside and outside organizations which influence and condition CE. Several aspects, such as organizational culture, structure, resources and management style, have been studied from many different angles. This might apply to any actors (entities) engaged in TH activities. Without a supportive organizational climate, CE will not reach its full potential. Also, an open communication system, which allows feedback on new ideas to occur quickly (Pinchot 1985), plays a significant role.

There is a large volume of published studies describing a wide diversity of outcomes associated with CE in the literature. However, three outcomes are believed to be the most salient: new businesses; new products, processes or services; and renewal of the existing organization. Sharma and Chrisman have conceptualized it as three relatively distinct aspects: innovation, corporate venturing (CV) and corporate renewal (CR), where innovation can become a basis for both CR and CV (Belousova and Gailly 2013). In this context, innovation stands for creating and introducing new products, production processes, and organizational systems (Zahra and Covin 1995), as well as services and administrative techniques, often with an emphasis on the development of technology (Antoncic and Hisrich 2003).

CE has recently been the center of management studies and attracts many scholars and managers, irrespective of the size of the organization. It can be beneficial and effect the revitalization and performance of firms. It is noteworthy that the terms "CE" and "intrapreneurship" are often used interchangeably, as entrepreneurial activity is connected to carrying out new combinations by introducing new products or processes, identifying new markets or sources of supply, or creating new types of organizations.

Some firms foster an organizational environment that is more entrepreneurially intense than others. Assessing an organization's entrepreneurial environment has been theorized and demonstrated to represent an important element for successfully

implementing a CE strategy. With respect to Hornsby, research into organizational change efforts, such as the implementation of a CE strategy, requires an analysis of the current organizational environment or state of "organisational preparedness for CE" (Hayton et al. 2013).

The present research implies that future study of the relationships between organizational preparedness for corporate entrepreneurship (OPCE) and other relevant variables is likely to be a fruitful line of scholarly inquiry, whether in terms of the antecedents to, consequences of, or organizational mechanisms through which OPCE is enacted (Hornsby et al. 2013). Also, the strategic vision of a company or organization is significant. It should be developed and communicated by top managers to ensure innovation. Given the strength of convergence between aspects of the OPCE, such as top management support and EO, Hornsby claims, that "future research should examine the influence of entrepreneurial vision as a driving aspect of OPCE at multiple levels within the firm to better understand when, where, and how this vision is adopted, communicated, and enacted by organizational members given that firms often manifest their entrepreneurial beliefs and behaviors in varied and heterogeneous manners" (Wales et al. 2011).

"In terms of future investigations into potential causally adjacent outcomes of OPCE, as discussed, theory suggests that OPCE should be significantly related to an organization's EO with its analysis of the organization's orientation toward risk-taking, innovative, and proactive firm-level behaviors. This study found positive results for the convergent validity of the CEAI factors with EO; in which EO in turn, leads to a more entrepreneurially supportive organizational environment" (Covin and Slevin 1991). Moreover, future research could provide greater insight into the potential complexities in the interrelationship between organizational preparedness and orientation. Research investigating the path of causality between OPCE and firm performance will be preceded by research investigating relationships between preparedness and orientation and outcomes (i.e., Lumpkin and Dess 1996). These outcomes can be objective measures, such as profitability, earnings per share, innovations; and subjective measures, such as employees' satisfaction and commitment to the organization or the organization's learning and memory orientations. According to Hornsby, only by exploring this relationship will a "more proficient implementation of CE strategies be enabled" (Hayton et al. 2013).

2.6 Triple Helix as a Key to Improving Conditions for Innovation

As mentioned previously, the interaction between tripartite parties directly influences the manner in which the economy innovates. It might have a direct impact on societal change and the environment as well. Both how the government interacts and the visible shift in society from its governmental role to governance requires more attention. There is no single source of power which exists without the government. The idea of governance networks or policy networks strengthens this interaction and is closely related to the TH concept. In line with Börzel (1998),

governance networks or policy networks can be defined as "a set of relatively stable relationships which are of non-hierarchical and interdependent nature linking a variety of actors, who share common interests with regard to a policy and who exchange resources to pursue these shared interests acknowledging that co-operation is the best way to achieve common goals" (Börzel 1998). It is notable that any of these actors who belong to any part of the network share common goals or objectives, but they often might have separate interests. A certain degree of trust is needed to cooperate. A reflection on hierarchies is needed also, but it will not be discussed in this chapter.

With respect to Etzkowitz (2013), "innovation is increasingly based upon a 'Triple Helix' of university-industry-government interactions. The increased importance of knowledge and the role of the university in incubation of technology-based firms has given it a more prominent place in the institutional firmament. The entrepreneurial university takes a proactive stance in putting knowledge to use and in broadening the input into the creation of academic knowledge. Thus it operates according to an interactive rather than a linear model of innovation. As firms raise their technological level, they move closer to an academic model, engaging in higher levels of training and in sharing of knowledge. Government acts as a public entrepreneur and venture capitalist in addition to its traditional regulatory role in setting the rules of the game. Moving beyond product development, innovation then becomes an endogenous process of 'taking the role of the other', encouraging hybridization among the institutional spheres" (Ranga and Etzkowitz 2013).

Bressers (2012) points out that "governance networks often include cooperation between government and business, but can also include other parties such as: knowledge actors, citizens, non-governmental organizations and other interest groups. The governance network therefore has the potential to become a Triple Helix organization. Another form of multi-actor cooperation is the public private partnership (PPP). Although quite similar in essence to the idea of the Triple Helix, there are some significant differences" (Bressers 2012). Due to the limited number of pages, they are not discussed here.

2.7 Hanze UAS as a Hub of Theory and Knowledge Integration

Hanze University of Applied Sciences in Groningen (UAS), with its leading strategic themes of energy and healthy ageing and key focus areas on entrepreneurship and excellence, plays an important role in the development of the TH concept. All of the six established Centres of Applied Research and Innovation are engaged currently in several multidisciplinary collaborations between education and business. They are of great value to the innovation capability of the industry in the North of the Netherlands and beyond.

Additionally, more than 30 different professorships in, for example, Allied Health Care and Ageing, Asian Business Strategies, Communication & the Sustainable Society, Demographic Change, Directing entrepreneurial networks,

Energy and many more (Hanze Research Portal 2014), enable a broad spectrum of activities.

By working on innovative and current issues, Hanze UAS is trying to find solutions together with external partners. It underlines a positive attitude of the school towards being engaged in TH activities as well. Both "applied research and innovation are integrated into the various curricula and play an important role in linking education with the working field" (Hanze Research Portal 2014).

It is worthy to mention that "the interaction between the social issues of today and the spatial choices caused by these issues are very much in the focus. Noorderruimte, Centre of Applied Research and Innovation on Area Development, develops and shares expertise about area development in the north of the Netherlands by carrying out applied research based on real-life issues. Some examples of this are integrated solutions for recreation purposes, water storage and nature development, sustainable, energy-efficient renovations in community centres and innovative housing concepts that meet future needs that fit the demands and needs of tomorrow" (Hanze Research Portal 2014).

A close cooperation with Noorderlink, which is a collaboration of several major companies and organizations in the field of HRM (Human Resource Management) and HRD (Human Resource Development), requires more attention as well. "The participating organizations all have their own personnel policy and have a complete P&O department. They also have at least 1000 employees and are located in the North of the Netherlands. Noorderlink strives to maintain a well-balanced mixture between profit and non-profit organizations" (Noorderlink 2014). Its strategic goals are:

- Exchange of knowledge, expertise, and best practices.
- Putting in motion and increasing the employability of staff of the organizations collaborating in Noorderlink.
- Positively profiling the North as an attractive place to work and live.
- To be involved in regional social events (Noorderlink 2014).

Interconnections between academia and industry, through contract research, licensing, start-ups, creating space for companies, government support collaboration (in the form of Research & Development vouchers, academic-industry grants, entrepreneurship programmes, start-up support or building technology-innovation parks), enables the development of talent which is the lifeblood of every organization in Asia. It underlines also the value of talent in the Northern Netherlands. Many AMNC try to acquire highly talented and skilled employees. The latest data written by the Economist Intelligence Unit and published by Heidrick & Struggles, place the Netherlands at the tenth position in The Global Talent Index Report which increases the chance of investment by AMNC in the Netherlands (The Global Talent Index Report: The Outlook to 2015, 2012). With respect to that statement, Noorderlink, together with Hanze UAS, has a great chance to attract potential investors and companies willing to start businesses in this region. It could be seen as a remaining gap to be filled.

In summary, Hanze UAS should start a cooperation with the Asia Triple Helix Society (ATHS) which has been established to initiate and developed research projects that adopt TH and WSI (webometrics, scientometrics, and informetrics) approaches in Asia by engaging researchers, academia, industry, and government. ATHS is an official representative body of the International Triple Helix Association (ITHA) and uses the TH model developed by Etzkowitz and Leydesdorff (2000) which favors the creation and distribution of knowledge through intersector collaboration among universities, industry, and the governmental sector (Asia Triple Helix Society 2014).

3 Triple Helix and East Asia: Understanding and Application

The Triple Helix is a concept well known, understood and applied by several AMNC. Perhaps without finding common objectives of TH model and realizing an innovative environment, AMNC would not have such a good position as they currently possess on the global market. Several forecasts say that Asia will soon be carrying more weight in the world than at any time since 1750. Additionally, it is predicted that by 2030 "Asia will have surpassed North America and Europe combined in terms of global power, based upon GDP, population size, military spending and technological investment" (The Economist 2014b). Respectively, TH should be seen as a core concept, influencing the way how Asian businesses operate, helping them to acquire new markets and gain the leading position, as it might apply to any level of cooperation or an economic growth.

In these terms, Asia is more integrated than ever before. "Some 54 % of the continent's trade is within the region, up from about 25 % in 1990. Japan, Taiwan and South Korea are in a tight embrace with poorer China. Dense supply chains link multinational firms with China's factories. Bits of Thailand, Malaysia and Vietnam, too, are becoming part of this giant industrial cluster known as "Factory Asia". India and Indonesia hope to join in. The rise of the renminbi [the official currency of the People's Republic of China – note by author] as a world currency will also help integrate the continent" (The Economist 2014b). The future is bright for AMNC, including several companies analyzed in this chapter. Undeniably, interactions in the tripartite cooperation occurring in a TH framework improves conditions for innovation and enables those companies to occupy top positions among the biggest companies, including Alibaba, Samsung Electronics, PetroChina, Tata Consultancy and Toyota.

The Economist emphasizes, that "Asia now accounts for 27 % of world market capitalization, up from 20 % a decade ago. The biggest Asian firms easily match their global counterparts for size. Big South Korean conglomerates such as LG, Samsung and Hyundai have global scale, and Samsung's profits are not far off Apple's. Toyota and Volkswagen have almost identical sales. PetroChina invests more than Exxon Mobil does. India has produced a clutch of world-class firms in technology and pharmaceuticals, and its crusty conglomerates have been revived. Asia's technology firms make up about 12 % of the listed sector, double the figure

in 1994. Property firms have faded. Chinese state-backed, private and collectively-owned firms have created a massive wave of listings. Since 2000, Asia has had 11,000 initial public offerings and now boasts 25,000 listed firms" (The Economist 2014b). All of those actions taken are probably the outcome of adequately integrated TH activities among all of the actors (entities) engaged in economic growth and regional development.

3.1 Accelerating Innovation Through Triple Helix Based on Asian Experience

According to the latest report published by The Economist, "Asian firms are adapting to a demanding environment and becoming stronger. In response to rising wages, production (of clothes, for example) is shifting from China to South-East Asia and Africa, led by Japanese firms which are also worried about a war with the Middle Kingdom. Chinese firms such as Haier, which makes fridges, plan to automate factories and get into cleverer products. And as the Chinese push upmarket, the South Koreans are redoubling efforts to stay ahead. Samsung's spending on R&D rose by 24 % in 2013. If they get their act together, India and Indonesia, Asia's bumbling giants, will attract lots of factory jobs. Their best firms are also getting brainier. Once dismissed as "body shops", India's IT-outsourcing firms are now leaders in big data.

Rising consumer aspirations are helping internet firms disrupt traditional industries. Alibaba, a Chinese internet giant, is expanding into banking, telecoms, and logistics. Analysts think it might be worth $150 billion, more than China's steel industry. China's drive to reform its state-owned firms is meant to make them more responsive to customers. Xi Guohua, the boss of China Mobile, plans to give shares to his staff. Across Asia, demand for health care is likely to create a whole new generation of companies; the industry comprises only 4 % of the region's stockmarket, compared with 12 % in the Western world.

In order to challenge foreign rivals, Asian firms are globalizing, following the example of Samsung and Toyota. Lenovo, a thriving Chinese computer firm, has Western-style governance and many foreign staff. Huawei has overtaken Ericsson in telecom equipment. India's Sun Pharma is now one of the world's largest generic-drug firms. Tencent, China's Facebook, has hired the footballer Lionel Messi to advertise its services abroad. Sprawling business houses are evolving into focused multinationals. Tata Sons is now a superb IT firm and luxury-car maker tied to a ragbag of Indian assets" (The Economist 2014a).

According to Ranga and Etkowitz, "recent decades have seen a shift from an earlier focus on innovation sources confined to a single institutional sphere, whether product development in industry, policy-making in government or the creation and dissemination of knowledge in academia, to the interaction among these three spheres as the source of new innovative organizational designs and social interactions. This shift entails not only various mechanisms of institutional restructuring of the sources and development path of innovation, but also a

Table 2 Triple Helix System and its influence on innovation (Ranga and Etzkowitz 2013)

Triple Helix System	Influences on innovation process
Components	Consisting of the institutional spheres of university, industry and government, each with a wide array of actors, among whom a distinction is made between: individual and institutional innovators R&D and non-R&D innovators "single-sphere" and "multi-sphere" (hybrid) institutions
Relationships between components	Technology transfer, collaboration and conflict moderation, collaborative leadership, substitution, and networking
Functions	In the sense of competencies of system components that determine the system's performance. The main function of a THS is seen in a broader sense, that of generation, diffusion, and utilization of knowledge and innovation. This function is realized not only with the techno-economic competencies described in innovation system theory, but also with entrepreneurial, societal, cultural, and policy competencies that are embedded in what we call the "Triple Helix spaces": the knowledge, innovation, and consensus spaces

rethinking of our main models for conceptualizing innovation, including innovation systems (national, regional, sectoral, technological, etc.) and the TH. Authors introduce TH systems as a novel analytical concept that systematizes the key features of university-industry-government interactions, so far loosely address as a 'metaphor' or a 'framework', into an 'innovation system' format that highlights the key new sources of novelty and the dynamics of their interaction" (Ranga and Etzkowitz 2013). Thus, Triple Helix Systems are defined as a set of components, the relationship between them, and their functions. They are briefly explained in Table 2.

The Triple Helix System (THS) provides a fine-grained view of innovation actors and the relationships between them, in a vision of a dynamic, boundary-spanning and diachronic transition of knowledge flows within the system. The THS accommodates both institutional and individual roles in innovation and explains variations in innovative performance in relation to the development of and articulation between the knowledge, innovation, and consensus spaces. Transcending sectoral or technology boundaries, TH systems emphasize boundary permeability among the institutional spheres as an important source of organizational creativity, allowing individuals to move within and between the spheres and engage in recombination of elements to create new types of organizations. Empirical guidelines for policy makers, universities, and business managers can be derived from this analytical framework in order to strengthen collaboration among TH actors and enhance regional development (Ranga and Etzkowitz 2013). Asian experience and involvement, respectively, in that area should be carefully considered, analyzed, and applied.

3.2 Triple Helix and Its Influence on Business Performance in Asia

As mentioned earlier, any activity integrated into the TH system is essential for business performance, which refers to interactions signed between companies, universities, and academia. Through them, actors (entities) share, produce, and disseminate knowledge, technologies, and innovations. In this context, the TH model predicts that the future economic growth is dependent not only on a new innovation cycle, but of a new innovation structure that links basic and applied research in an increasingly closer manner. In a knowledge-based society, university, industry, and government have equal roles and form a TH to stimulate innovation. According to Etzkowitz, "interaction among university, industry and government is the source of the origination and/or the development of incubator movements, interdisciplinary research centres and venture capital, whether private, public or social. These organizational innovations are as important to the flow of innovation as technological advances" (Etzkowitz et al. 2007). The growing popularity of such interactions across the world, including in the Netherlands, can be explained by the fact that they show a new way of consensus-building, which can enable self-development and secure sustainability of a particular region.

From the analysis of several cases of AMNC, which obtain substantial revenues and profits from international markets, and with reference to numerous Asian milestones and highlights (including those presented in the Appendix of this chapter), it can be concluded that the AMNC's imply strategies to support the quest for growth, offer rare insights about the strategies of outbound investment from companies based in Asia and provide an in-depth perspective on decision-making for companies from both mature and rapid-growth markets. The way these strategies are implied has a great impact on predicted trade flows among individual Asian markets and between Asia and the rest of the world, including the Northern Netherlands region.

4 Triple Helix in the Netherlands: Best Practices

The Netherlands, being a part of the European Union, uses "supra-national level of government which provides an additional coordination mechanism and incentive for organising technological innovation and social transformation. Furthermore, the Netherlands has been a centre of trade and knowledge reproduction for centuries" (Park et al. 2005). Its industrial base is relatively weak in comparison to its European partners.

In 2011, the Dutch government identified nine top sectors which they plan to strengthen with the help of Dutch businesses, education, and research. Approximately 1.5 billion € has been made available to support this. Apart from targeted investments, the government is also focused on identifying and solving bottle-necks impeding the growth of these sectors, such as bothersome rules or lack of qualified personnel. The nine top sectors are: High Tech Material & Systems, Agro-Food,

Water, Energy, Horticulture, Chemicals, Creative Industries, Logistics, and Life Sciences (Volkskrant 2011).

Each sector has its own challenges and opportunities. For example, the port of Rotterdam and Schiphol airport are both working hard to stay ahead of other ports and airports competing in the global logistics sector. Businesses in the creative industry excel in designing and producing art, music, buildings, and games. But, there is unexplored potential in marketing these products. The food and horticulture sectors aim to expand their international positions. The energy sector sees opportunities in the development of renewable energy sources (Government of the Netherlands 2014). Knowledge must be converted into new products and services faster. This can be achieved if businesses, the government, and knowledge institutes step up cooperation by bundling specialist research, for example. For this there are plenty of opportunities. Institutes like the NWO (the Netherlands Organisation for Scientific Research), KNAW (the Royal Netherlands Academy of Arts and Sciences), TNO (Netherlands Organisation for Applied Scientific Research) and the large technology institutes are adjusting their programmes to the top sectors. NWO approves research proposals based on scientific criteria and assigns resources to the various plans in collaboration with the top teams (Government of the Netherlands 2014).

Today, "the Netherlands remains a major player in the global Life Sciences Health industries, one of the core sectors listed above. The Netherlands occupies a strong technological position in molecular imaging, medical informatics, biopharmaceuticals, human and veterinary vaccines, regenerative medicine and biomaterials (biomaterial coatings in medical devices), medical technology, and health infrastructure. The Dutch sector owes this position to collaboration, cooperation, and coalition building between businesses, research institutes, and universities, supported by government, linking research to product and business creation (Holland Trade 2014). With approximately 400 innovative life sciences companies within a 120 mile radius, the Netherlands is the most concentrated region in the world when it comes to creating economic and social value in Life Sciences and Health. Approximately 400 companies are active in R&D activities in the life sciences & health branch, employing 25,000 people. Their turnover is 18 billion € a year. In the wider branch, about 3800 organizations are active, comprising hospitals, production facilities, and wholesalers, together employing a further 98,000 people and generating an annual turnover of 54 billion Euro" (Holland Trade 2014).

In line with Leydesdorff, in various countries the Triple Helix concept has also been used as an operational strategy for regional development and to further the knowledge-based economy. It has also become a "movement" for generating incubators in the university context (Leydesdorff 2012).

Noteworthy, benchmarking of a great practice developed by Utrecht University is advised for Hanze UAS as well. In 2012, Utrecht University, together with the Delft University of Technology, AkzoNobel, and MCKinsey & Company, launched the Netherlands-Asia Honors Summer School. This TH program is funded and organized by a unique public-private partnership between all 13 Dutch research

universities, 16 Dutch companies and 4 government ministries. The partners acknowledge Asia's increasing importance and the urgency to introduce the younger Dutch generation to the dynamics of Asia and the opportunities that the continent presents to the Netherlands. The Program offers excellent students from all Dutch research universities the opportunity to attend a summer school in Asia and to experience Asia's society, culture, academia and business (Utrecht University 2014). A profounder look into this experience will allow Hanze UAS to get more connected and strengthen interactivity among actors (entities) engaged. Due to the limited number of pages, this program is not discussed further in this chapter.

In line with abovementioned approaches and definitions, two cases from the Netherlands, which are related both to TH and CE, are presented to demonstrate possible approaches for researching the success of networks of TH organizations. It creates several possibilities for knowledge transfer for some companies, educational institutes, and government in the Northern Netherlands.

4.1 Brainport: An Innovative Global Player

"Brainport Eindhoven Region is a powerful innovative player in a European and global context. It accounts for a third of all Dutch private R&D expenditure, invests 8 % of the GDP on R&D and is one of Europe's top three regions in terms of patent density. The economic success of Brainport Eindhoven Region is the result of a unique cooperation among industry, research, and government. This Triple Helix cooperation generates a very conducive climate for business, for both internationally-renowned companies and innovative small and medium-sized enterprises in the region. These companies cooperate with each other and with knowledge institutes by sharing and multiplying knowledge in an open innovation environment before bringing their products to market.

Brainport Development is the new style development agency of the Brainport foundation. The task of the organization is to drive the region forward and make the economy of the region "future proof". The High Tech Systems & Materials industries are strongly represented in Brainport, with internationally operating top technology companies such as Philips, ASML and FEI Company. The Southeast Netherlands is the third export region of the Netherlands with regard to food production and processing. A large part of the Dutch automotive industry is concentrated in Brainport. It has grown considerably in recent years and now encompasses over 40,000 jobs.

An extensive network of companies in Brainport is active in "lifetec", the collective term for "medical technology and life sciences". The Eindhoven University of Technology invests much research capacity in biomedical and medical technology. This multidisciplinary research is conducted in collaboration with industry and medical institutions in the region.

Design has been in the DNA of the Eindhoven region for decades. Thanks to its industrial and technological background, Eindhoven has developed into a city of

innovation and creativity, a fact that is acknowledged by the numerous innovative products invented, developed, and manufactured in Brainport.

TMC is a proud partner of Brainport Eindhoven and active in many of its initiatives. On top of this there are many links among the constituent companies and institutions. And again: TMC is a stimulator and motivator (TMC 2014). Brainport Eindhoven Region is the axis of a network that extends throughout the Southeast Netherlands and beyond the national borders" (Brainport Monitor 2012).

4.2 Transumo: A Successful Program on Sustainable Mobility

Transumo, a TH organization, was a Dutch program on sustainable mobility, which ran from 2004 until 2010. The program was financed for 30 million € (over 40 million USD at October 2011 exchange rates) by the Dutch national government, with money from natural gas revenues. These revenues were dedicated to the improvement of Dutch infrastructure, both the physical infrastructure and the knowledge infrastructure. The latter was the reason for financing Transumo, as the program aimed to develop knowledge and stimulate innovation on sustainable mobility. Transumo was part of a package of 37 programs for knowledge and innovation development (together accounting for 800 million € in governmental subsidies), each on a separate topic. These topics varied from nanotechnology and biotechnology to less technology-oriented matters, such as the abovementioned sustainable mobility, but also innovative water management or sustainable construction and agriculture. Aside from the 30 million € in subsidized financing, the actors who participated in the program together contributed another 30 million € (through a so-called co-financing structure). This created additional pressure on the importance of the Triple helix, as participation was not without liability. Because the national government financed at least half of the program through the subsidy arrangement, it was the core principal of the program. The core mission of Transumo was to accelerate/encourage the transition to sustainable mobility. This will be achieved by initiating, and establishing for the long term, a transition process that leads to the replacement of the current, supply-driven, mono-disciplinary technology and knowledge infrastructure, with a demand-driven, multidisciplinary and trans-disciplinary, participative knowledge infrastructure (Transumo 2009).

In order to do this, Transumo sent out several calls for project acquisition, resulting ultimately in more than 30 projects. Aside from projects, Transumo undertook several program-wide activities, such as seminars, workshops, and knowledge contribution to education programs. The projects and program-wide activities resulted in the participation of more than 150 organizations as consortium partners, mostly stemming directly from the TH. The Transumo case leads to the conclusion that the TH is highly vulnerable to the degree to which the sector around it is accustomed to change and innovation (Bressers 2012).

5 Conclusions and Recommendations

The Triple Helix concept requires more attention and becomes increasingly important for the regional development and economic growth. The Northern Netherlands region can profit from all of the interactions among actors (entities) engaged in TH activities. The TH postulates that interactions within the tripartite cooperation is the key to improving conditions for innovation in a knowledge-based society, and for the creation of investment possibilities for Asian multinationals in this particular region. The significance of exploring the TH framework underlined in this paper influences directly the decision-making process and might contribute directly to the Northern Netherlands region and its development. An appropriate collaboration between all of the actors engaged in TH activities might lead to added value through the adoption and exploitation of ideas which are incorporated in the mutual partnership, creating an additional support base. It can stimulate innovation and improve results, such as producing more innovative products, processes, or solutions.

Finding the match between all of the different interests of stakeholders requires supplementary effort, and now and then might be risky as well. For instance, once business is interested in making money at high rates of return, government might be bound by laws and procedures to avoid high rates of return and the favoring of particular businesses. This is a problem that TH organizations also face: with diverging interests and objectives tensions may arise between the helices (spheres). Only a smooth cooperation of all of the areas will allow the successful integration of the TH and reach the desired level of innovation; realized in an innovative environment which should be simultaneously supported by the local or national government, consisting of tri-lateral initiatives. There is much more involved in those tri-lateral initiatives, not only university spin-off firms, strategic alliances among firms, government laboratories or academic research groups.

Unquestionably, looking at the successful strategies used and applied by AMNC (partially analyzed in this chapter), TH is a starting point for a knowledge-based economy. The Northern Netherlands region, through a proper implementation of interactions between government, industry, and university, can enhance the investment possibility for AMNC willing to establish their business in this region. The region should place more emphasis on the possibility of accommodating them and present prospective talent available in this part of the Netherlands.

A successful cooperation, in a TH framework, is possible not only in the nine core areas identified by the Dutch government, but also in several other directions, including those on which AMNC are focused. The Northern Netherlands region should undertake action to present the power and breadth of the network among government, industry, and academia, which is perceived as an integrated part of TH activities. Hanze UAS and Noorderlink belong to these activities.

An emphasis on dynamics, learning, and interaction should be made. Thus, an investigation of TH interconnections should include its core characteristics and be applied by the participating actors as well. Only in this case can the complex interplay of diverging actors, with many differing interests, perceptions, and

beliefs, be created. With the increased importance placed on TH, academia should broaden its interactions with industry and government. Successful and effective inter-linkage between those actors will enable the transition of research discoveries and innovation from the laboratories or class rooms to the marketplace. With greater understanding of corporate entrepreneurship (CE), which mainly relates to a corporate management style that integrates risk-taking and innovation approaches as well as the reward and motivational techniques, enhancement of innovation and the creation of a pro-entrepreneurship organizational architecture is possible. Creating favorable environmental conditions, as has been proven in several Dutch cases, and use of the measurement tools of CE, mentioned in this article, might encourage AMNC to invest in the Northern Netherlands region. Without this, recommendations for the Northern Netherlands development as a part of TH concept lose their relevance.

Appendix

Asia Highlights

- Rapid-growth markets from Asia represent the fastest-growing economic region in the world, with an annual growth forecast at more than 6 % a year.
- The IMF expects advanced economies to grow by just 1.4 % in 2012 and 2 % in 2013. The corresponding figure for East and Southeast Asia in 2013 is 7.9 %.
- Since 2000, Asia has been the fastest-growing source of foreign direct investment (FDI). Its businesses currently produce a quarter of the world's exports (US$3.77 trillion in 2010) and form 87 of the Fortune Global 500 largest firms.
- FDI outflows from East and Southeast Asia recorded a compound annual growth rate of 22.9 % in 2005–2011, jumping from US$70 billion to US$242 billion.
- Investors from East and Southeast Asia are major drivers of growth in global foreign direct investment (FDI) outflows, making up 16 % of the world's total FDI (up from just 7 % in 2005) and driven by increased outflows from mainland China, Hong Kong (SAR), Malaysia, South Korea, Singapore and Taiwan.
- Intra-regional trade is expanding rapidly, reflecting the shift towards higher consumption in Asia. China leads the way in terms of outflows and destination, with growth for Indonesia, South Korea, Thailand and Vietnam close behind.
- Trade flows from Asia to the US and Canada, the Middle East, Latin America and Africa are expected to increase by over 10 % a year up to 2020.
- Cross-border M&A purchases are consuming an ever-larger slice of FDI flows, with purchases from Asia reaching a record US$94 billion in 2010.
- The China-US trade route is forecast to see the biggest increase in the world, predicted to rise by almost US$700 billion by 2020.

(Ernst and Young 2012)

Notes

Case studies, presented as best practices of the Triple Helix System in the Netherlands, have been limited only to a brief description. For more details, please contact the engaged institutions directly.

References

Antoncic, B., & Hisrich, R. D. (2003). Clarifying intrapreneurship concept. *Journal of Small Business and Enterprise Development, 10*(1), 7–24.

Asia Triple Helix Society. (2014). *Vitalising research on university-industry-government relations and WSI in Asian countries*. Retrieved June 18, 2014, from http://www.asia-triplehelix.org.

Belousova, O., & Gailly, B. (2013). Corporate entrepreneurship in a dispersed setting: Actors, behaviors, and process. *International Entrepreneurship and Management Journal, 9*(3), 361–377.

Börzel, T. A. (1998). Organizing Babylon – On the different conceptions of policy networks. *Public Administration, 76*(2), 253–273.

Brainport Monitor. (2012). *Summary, Power the smartest*. Retrieved April 12, 2014, from http://www.brainport.nl.

Bressers, N. (2012). The triple helix organisation in practice: Assessment of the triple helix in a Dutch sustainable mobility program. *Science & Public Policy, 39*(5), 669–679.

Corbett, A., Covin, J. G., O'Connor, G. C., & Tucci, C. L. (2013). Corporate entrepreneurship: State-of-the-art research and a future research agenda. *Journal of Product Innovation Management, 30*(5), 812–820.

Covin, J. G., & Miles, M. P. (1999). Corporate entrepreneurship and the pursuit of competitive advantage. *Entrepreneurship Theory and Practice, 23*(3), 47–65.

Covin, J. G., & Slevin, D. P. (1989). Strategic management of small firms in hostile and benign environments. *Strategic Management Journal, 10*(1), 75–87.

Covin, J. G., & Slevin, D. P. (1991). A conceptual model of entrepreneurship as firm behavior. *Entrepreneurship Theory and Practice, 16*, 7–25.

Davidsson, P. (2004). *Researching entrepreneurship*. New York, NY: Springer.

Dess, G., Lumpkin, G. T., & McGee, J. E. (1999). Linking corporate entrepreneurship to strategy, structure, and process. *Entrepreneurship Theory and Practice, 23*, 85–102.

Ernst & Young. (2012). *Beyond Asia: Strategies to support the quest for growth. South Korea Highlights. Facts on Asia', originally published by UNCTAD, IMF, Oxford Economics*. Retrieved June 23, 2014, from http://www.ey.com.

Etzkowitz, H. (2003). Innovation in innovation: The triple helix of university-industry-government relations. *Social Science Information, 42*, 293–337.

Etzkowitz, H., & Klofsten, M. (2005). The innovating region: Toward a theory of knowledge-based regional development. *R&D Management, 35*(3), 243–255.

Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: From national systems and 'Mode 2' to a Triple Helix of university-industry-government relations. *Research Policy, 29*(2), 109–123.

Etzkowitz, H., Ranga, M., Dzisah, J., & Zhou, C. (2007). University-industry-government interaction: the Triple Helix Model of innovation. *Asia Pacific Tech Monitor, 24*(1), 14–23.

Fogelberg, H., & Thorpenberg, S. (2012). Regional innovation policy and public-private partnership: The case of Triple Helix Arenas in Western Sweden. *Science and Public Policy, 39*, 347–356.

Frederick, H., & Kuratko, D. F. (2010). *Entrepreneurship: Theory, process, practice*. South Melbourne, VIC: Cengage Learning Australia.

Government of the Netherlands. (2014). *Investing in top sectors*. Retrieved May 15, 2014, from http://www.government.nl.

Hanze Research Portal. (2014). *Professorships*. Retrieved May 23, 2014, from www.hanze.nl.
Hayton, J., Hornsby, J., & Bloodgood, J. (2013). Part II: The contribution of HRM to corporate entrepreneurship: A review and agenda for future research. *Management, 16*(4), 381–409.
Holland Trade. (2014). *The triple helix in Dutch Life Sciences Health*. Retrieved February 18, 2014, from http://www.hollandtrade.com.
Hornsby, J. S., Kuratko, D. F., Holt, D. T., & Wales, W. Y. (2013). Assessing a measurement of organizational. *Journal of Product Innovation Management, 30*(5), 937–955.
Hornsby, J. S., Kuratko, D. F., & Zahra, S. A. (2002). Middle managers' perception of the internal environment for corporate entrepreneurship: assessing a measurement scale. *Journal of Business Venturing, 17*(3), 253–273.
Ireland, R., Covin, J., & Kuratko, D. (2009). Conceptualizing corporate entrepreneurship strategy. *Entrepreneurship: Theory & Practice, 33*(1), 19–46.
Kuratko, D. F., Montagno, R. V., & Hornsby, J. S. (1990). Developing an entrepreneurial assessment instrument for an effective corporate entrepreneurial environment. *Strategic Management Journal, 11*(Special Issue), 49–58.
Leydesdorff, L. (2012). *The Triple Helix of university-industry-government relations*. Retrieved May 15, 2014, from http://www.leydesdorff.net.
Leydesdorff, L., & Heimeriks, G. (2001). The self-organisation of the European Information Society: The case of 'biotechnology". *Journal of the American Society for Information Science & Technology, 52*(14), 1262–1274.
Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review, 21*(1), 135–172.
Lumpkin, G. T., & Dess, G. G. (2001). Linking two dimensions of entrepreneurial orientation to firm performance: The moderating role of environment and industry life cycle. *Journal of Business Venturing, 16*(5), 429–451.
Noorderlink. (2014). *About Noorderlink*. Retrieved May 10, 2014, from http://www.noorderlink.nl.
Park, H. W., Hong, H. D., & Leydesdorff, L. (2005). A comparison of the knowledge-based innovation systems in the economies of South Korea and The Netherlands. Using Triple Helix Indicators. *Scientometrics, 65*(1), 3–27.
Pinchot, G. (1985). *Intrapreneuring. 'Why you don't have to leave corporation to become an entrepreneur*. New York, NY: Harper & Row Publishers.
Pinchot, G., & Pellman, R. (1999). *Intrapreneuring in action. A handbook for business innovation*. San Francisco, CA: Berret-Köhler Publishers, Inc.
Pirich, A. (2001). *An interface between entrepreneurship and innovation: New Zealand SMEs perspective*. Paper prepared for the 2001 DRUID Conference, Aalborg, Denmark.
Ranga, M., & Etzkowitz, H. (2013). Triple helix systems: An analytical framework for innovation policy and practice in the knowledge society. *Industry and Higher Education, 27*(4), 48 p.
Sharma, P., & Chrisman, J. (1999). Toward a reconciliation of the definitional issues in the field of corporate entrepreneurship. *Entrepreneurship: Theory & Practice, 23*(3), 11–27.
The Economist. (2014a). A world to conquer, May 31st, 2014.
The Economist. (2014b). How to keep roaring? May 31st, 2014.
TMC. (2014). *Brainport Eindhoven Region*. Retrieved June 20, 2014, from http://www.tmcporch.com.
Transumo. (2009). *Transumo 2004–9*. Retrieved December 31, 2014, from http://www.transumo.nl.
Utrecht University. (2014). *Research Asia*. Retrieved June 20, 2014, from http://www.uu.nl.
Volkskrant. (2011). Negen kandidaten voor 1,5 mld subsidie, February 5th, 2011.
Wales, W., Monsen, E., & McKelvie, A. (2011). The organizational pervasiveness of entrepreneurial orientation. *Entrepreneurship Theory & Practice, 35*(5), 895–923.
Zahra, S. (1991). Predictors and financial outcomes of corporate entrepreneurship: An exploratory study. *Journal of Business Venturing, 6*, 259–285.
Zahra, S., & Covin, J. G. (1995). Contextual influences on the corporate entrepreneurship-performance relationship: A longitudinal analysis. *Journal of Business Venturing, 10*(1), 43–58.