Preface

There is global interest in translating the technology arising from university research into economic growth through academic entrepreneurship. Nowadays private, public, and even non-profit organizations are mobilizing their assets, and underutilized discoveries, inventions, and innovations into the market. The commercialization of knowledge and technology creates an ecosystem of research commercialization. This ecosystem is essentially a market that involves universities, research parks, and firms, and includes research joint ventures, strategic alliances, and licensing agreements involving. Therefore, there is an emergence of new organizational forms and purposes that promote research commercialization-this process raises important managerial and policy issues and changes that affects universities, corporations, and governments.

Based on extant literature the book identifies three modes of research and technology commercialization: internal approaches, quasi-internal approaches and externalization approaches (Gideon, Siegel, & Wright, 2008). The book focuses on analysis on the internal activities created by universities. Within this context, research universities are increasingly seen as vehicles for technology transfer and the channels through which knowledge exchange is made more effective. They remain the principal mechanism for knowledge and technology transfer within the research and development centers (Bercovitz & Feldmann, 2006). For universities, the trend towards commercialization reflects pressures to maximize the social return on public investment in research and effort to enhance universities’ self-sustenance. Universities contribute to economic development both by interaction with existing industry and by other types of commercialization of knowledge, like the establishment of new firms. Many universities take this opportunity to secure and expand their activity by demonstrating their utility in society (Gulbrandsen, 1997). The increased focus on commercialization of university research has led to the development of university policies and initiatives to stimulate such activity. Some initiatives are induced ‘top-down’ from the government and its agencies, while the other are emerging ‘bottom-up’ from individuals and entities inside the university (Goldfarb & Henrekson, 2002).

This book sheds light on how universities may respond to this new role by examining specific initiatives and policies aiming to increase commercialization of university research. Further, it will analyze how different universities and other initiatives relate to each other and constitute a system for promoting commercialization of research at a university.

Universities also rely on ‘quasi-internal’ activities to stimulate technology commercialization. The key facilitators of such activity are the business incubators and technology transfer offices (TTOs). Business incubators are the umbrellas for organizations (Allen & McCluskey, 1990). They are defines as “an economic development tool designed to accelerate the growth and success of entrepreneurial companies
through an array of business support resources and services” (The American National Business Incubation Association). According to Sherman and Chappell (1998), business incubators provide assistance in developing business and marketing plans, building management teams, and obtaining capital and access to a range of other more specialized professional services. They also offer flexible space, shared equipment and administrative services. In addition seek to maximize the potential of entrepreneurial agency by providing entrepreneurial actors with services and support that complement their existing abilities and resources, which in turn is meant to enable them to expand their potential (Bøllingtoft & Ulhøi, 2005). Technology transfer offices (TTO’s) play important role in managing the process of knowledge and technology transfer (O’Shea, Chugh, & Allen, 2008). They usually are the first place where invention disclosure occurs and the potential for commercialization is evaluated. In addition, numerous TTO’s provide assistance in business planning, introduction to venture capitalists, assistance in recruiting spin-off teams, and seed money for further work on inventions (Wu, 2007).

The final mode of research and technology commercialization externalization approaches entails: university spin-off companies, university research parks, and regional clusters. In this context, the book will analyze the processes of creation, development and management of research based companies and the necessary environment for active support of technology and knowledge transfer. University spin-off companies are considered to be “one of the most effective ways to contribute to the renewal of the industry while exploiting academia-developed technology” (Powers & McDougall, 2005). These modern business enterprises are initiated by faculty, students, graduates and other staff to benefit society by commercialization of ideas and technologies generated from university research. They accelerate the process of commercialization of research by combining market mechanisms and resources of higher education and the implementation of innovative solutions. Their activity is considered as a consequence of university institutional factors related to technology transfer policies and strategies, technological production and human capital. Awareness of the key importance of modern solutions in the economic development has resulted in strong interest in university high-tech companies, since their ability to create innovations and jobs is an important sign of efficiency. University spin-offs are highly innovative as they rely on new technologies and on knowledge and experience of highly skilled employees who represent very sophisticated competencies. They facilitate the delivery of high value-added products and services (Mavridis, 2004) and play an important part of the new economy, as are the producers of the latest technologies and create new sectors of production. (Benneworth & Charles, 2005). Proposed book aims at be examination policymakers incentives in order to increase the commercialization focus through creating; support, initiatives, programs and regulations. The university not only transfers knowledge but expects to develop knowledge more effectively given the association with the tenants in the research park (Link & Scott, 2006). The university research park is a cluster of technology and research based organizations that locate on or near a university campus in order to benefit from the university’s knowledge base. In addition provides access to critical human and physical capital for innovative companies. Furthermore, the clustering of high-tech firms serves to stimulate technology transfer and the acquisition of key business skills, such as the ability to develop new products (Siegel, Westhead, & Wright, 2003). A cluster is a network of companies, and in addition their customers and suppliers of all the relevant factors, including materials and components, equipment, training and finance. It extends to educational establishments and research institutes that provide a large part of their human and technological capital. They are all stakeholders in the end market, influenced by globalization, commercialization, skills development, inward investment, start-ups, and trade development (Bell, 2005).
UNIQUE CHARACTERISTICS OF PUBLICATION

The book is investigating competitive strategies for academic entrepreneurship as a complex and multi-stage processes designed to transform existing knowledge into an innovative products or services. Their success is determined by correct estimation of: market needs, existing competition, time of launching a product, service, key success factors.

The proposed publication analyzes the processes of: planning, implementing, and integrating the strategic directions to commercialize of research-based products. It will discuss such areas as: marketing, finance, sales, operations, supply chain management and leadership. Included will be methods for managing innovation and strategies regarding the allocation of essential resources to create an environment for the integration into the organizational settings. There will be shown strategies that reinforce the productivity of scientists, attract highly talented employees and develop human capital to the high-tech sector. Furthermore the book will present information regarding how to generate productive solutions that enable academic institutions, research centers, local environment, and university spin-offs to work together. This networking and collaborating facilitate the process of acquisition external competencies in the technological area. It also reduces level of uncertainty and gathers access to strategic information. The proposed publication will analyze how company-level decision making and specific capabilities are significantly important. In addition, it will demonstrate that the performance is determined by the internal capabilities and external networks. Finally, since university spin-off companies are increasingly interconnected and move in the direction of network-based models of competition. The book will present examples of innovation networks among: the university system and spin-off firms, university system and intermediate organizations, intermediate organizations and spin-offs and between spin-offs and their external network. Presented analyses will provide an answer to the questions of how to effectively build and manage institutions within the system of university entrepreneurship and how to build research and technology links that enhance the effectiveness of university spin-off companies.

To sum up: the presented book aims to shed light on commercialization of research-based products and provides theoretical perspectives to the new boundary crossing organizational forms emerging at strong research environments. It explains how organizational forms support research-inspired innovations from basic research. It contributes to conceptual discussions on the entrepreneurial university and academic entrepreneurship, with some particular policy implications for the future innovation and research policy and university organizations. Furthermore, the book will explore the problem of commercialization of research-based products from researchers and practitioners perspective. It will be useful for researchers in the new emerging field, for students, entrepreneurs, venture capitalists and investors, industry partners, representatives of government entities, regulatory agencies- potentially large number of readers.

ORGANIZATION OF THE BOOK

The book is organized into twelve chapters. A brief description of each of the chapters follows:

Chapter 1 will discuss the problem of entrepreneurship education in global business, thus illustrating the theoretical and practical concept of entrepreneurship, the overview of entrepreneurship education, the significance of entrepreneurship education in global business, and the application of entrepreneurship education in global business. The potential of entrepreneurship education is meaningful for modern organizations that seek to provide suppliers and customers, increase business performance, establish
competitiveness, and achieve consistent prosperity in global business. Thus, it is important for modern organizations to investigate their entrepreneurship education applications, create a strategically educational plan to determine their practical accomplishments, and directly respond to entrepreneurship education needs of customers.

Chapter 2 aims to review the academic entrepreneurship literature systematically, to synthesize this research and to provide directions for future research. Extant research has sought to identify the determinants and the consequences of university spin-off activity. There will be outlined configuration studies that seek to explain spin-off activity in terms of the resources of the university; socio-cultural development studies that explain spin-off activity in terms of culture and the rewards within the university; studies that explain spin-offs in terms of external environmental influences; studies that measure the performance of spin-off; and studies that seek to measure the economic impact of spin-off activity.

Chapter 3 will aim to show that entrepreneurship education in universities as a project of Organizational Change can encounter active and passive resistance from different stakeholders. Presented study will effort to form an entrepreneurship minor program in a public university. There will be presented on organizational change and resistance, entrepreneurship and entrepreneurship education process.

Chapter 4 will present the commercialization of university student engineering or design projects including examples of developmental processes and practices in the UK and Malaysia. These highlight the role of universities (staff and resources) in supporting and facilitating entrepreneurship which often necessitates external networking with industry contacts. In this chapter the processes and practices of university design and engineering projects are examined including the potential advantages of these innovation approaches which tend to be more inclusive in nature with design approaches more likely to consider different users given that they are inherently community based with ongoing discussions (Frank et al., 2003). This interactive design approach where designers and developers interact with fellow students and tutors arguably entails a design process that provides some risk reduction.

Chapter 5 will discuss a network to proceed from an idea to a value creating firm. To meet this objective cases of three universities are being evaluated and compared. The comparison of cases from the USA, Denmark and South Korea suggests that the institutional network has a significant impact on the development of the spin-off company. The role of different agents (for example universities) changes with time during different stages of the development of the spin-off. There will be investigated the network required to overcome the initial hurdles of the company creation process in order to gain reliability with potential investors and partners. The value network created around spin-off companies shapes the role that, third parties play in influencing the value captured from commercialization of an innovation.

Chapter 6 will examine the challenges and opportunities confronted in the commercialization of research-based technologies in a university setting. Particular focus will be brought to the identification and creation of a university-based entrepreneurial ecosystem and ways of sustaining it. To provide more detailed context, the authors will cite specific programs and outcomes from these programs, resources and strategies currently utilized and embodied by the Maryland Technology Enterprise Institute, Mtech, at the University of Maryland, College Park (UMD). Particular challenges and obstacles will be discussed including intellectual property issues, conflicts of commitment, and conflicts of interest. Finally, as a way of assisting others in creating a university-based entrepreneurial ecosystem, guidance will be given as to the resources necessary to create and sustain it.

Chapter 7 will provide implications on how to intensify knowledge and technology transfer (KTT) from academia to industry, this chapter will analyze, discuss and develop the definition of the role of university Technology Transfer Offices (TTOs) in an academic entrepreneurship environment. The
focus will be directed at the KTT-related interactions between TTOs and researchers from an internal marketing perspective. In this context, the chapter will cover, discuss and combine theory, empirical results and TTO practice cases. The objective is to derive indicators for a better exploitation of unused KTT support potential on behalf of TTOs, hereby indirectly contributing to an intensification of KTT relations between universities and external practice partners.

Chapter 8 will describe a Lean Startup approach that streamlines academic entrepreneurship, enabling a scalable launchpad to quickly weed out invention disclosures that do not have near-term commercial prospects, and accelerate the commercialization efforts of those that do. The nascent Lean Startup approach, as embodied in the National Science Foundation’s Innovation Corps (NSF I-CorpsTM) program, presents an exciting new platform for universities and their Technology Transfer Offices (TTOs) to build scalable launchpads for research-based startup effort. The Lean Startup for Academic Entrepreneurship approach is about connecting to potential customers first to guide the efforts of academic entrepreneurship, rather than trying to develop a new product or service in isolation from the needs of its future users.

Chapter 9 will describe COTEC’s Technology Commercialization Accelerator (Act®) - a nationwide venture engine that aims at creating social and economic value from the knowledge generated by researchers, by supporting them in the creation of high-tech / high-growth ventures. To contextualize the environment in which Act® was created and operates, a set of statistical data that is relevant to characterize the Portuguese knowledge creation and deployment landscape will provided early in the chapter. Then, the different stages of the unique technology valorisation process employed by Act® will be detailed. The main figures regarding Act’s achievements, since it was created in 2004, will then be provided, together with a short description of some of the start-ups created with Act® support. Finally, the lessons learned throughout Act’s development and overviews of the challenges that will frame its future development will be provided.

Chapter 10 will describe the Maryland Industrial Partnerships (MIPS) program, its genesis, operations, record, and impact. Founded in 1987, MIPS provides funding, matched by participating companies, for university-based research projects that help Maryland companies develop new products. Startup companies find the program attractive in leveraging their scarce resources in a non-dilutive, non-debt manner and effective in enlisting expert faculty and students in developing their company products. The State of Maryland finds the MIPS program attractive because of its significant economic impact and its high-multiple return of tax dollars to the State.

Chapter 11 will present the activities of Professional Service Firms (PSFs) as organizations that may support technology firms and play a role in taking new or emerging technologies through the commercialization process including developing competitive strategies and facilitating the business development activities. Further, PSFs may facilitate knowledge transfer from specialized research centres (either university or commercial centres) or spin-off firms (from established technology companies). The focus here is how PSFs influence the commercialization and adoption of new or emerging technologies which is examined through case studies: Telemedicine; Wearable Technology and Mobile Services. They can either assist vendors through the commercialization activities directly or indirectly by aiding with networking aspects.

Chapter 12 will help to assess the possible use of crowdsourcing in the spin-off environment. A key question guiding the chapter is: Can crowdsourcing be well adopted by university spin-offs? The study will open new paths for research and discussion, and its results will be supportive for decision making in the context of innovation and entrepreneurship. The logic of this paper is to speculate how university spin-offs can create value with groups of customers and users via the web through adopting crowdsourcing in its operation.
REFERENCES


Preface

