Disciplinary Differences in Entrepreneurial Transformation

A Case Study of the University of Novi Sad

Norbert Sabic

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Institute for Educational Research
Faculty of Education

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Abstract

Entrepreneurial transformation of universities indicates the emergence of a new institutional model that actively seeks to take advantage of market opportunities. This dissertation aims to contribute to the advancement of the knowledge on the role disciplinary characteristics play in entrepreneurial transformation of higher education institutions. It draws on the argument according to which disciplinary characteristics significantly influence institutional processes and thereby define in what way entrepreneurialism is going to be validated in practice, in structure, and in mission of internal units. Consequently, it maps out the different configurations faculties take to compete on various marketplaces.

A case study has been conducted at the University of Novi Sad in Serbia, in order to map out entrepreneurial transformation at four faculties (Faculty of Philosophy, Faculty of Economics, Faculty of Sciences and Technical Sciences Faculty). The results reveal that significant differences exist among faculties' strategies to exploit market opportunities. Analysing these variations in light of Becher's (2001) typology implies that *hard* sciences compete more actively for research grants and are more willing to engage in knowledge transfer activities, while in *soft* disciplinary fields educational entrepreneurialism predominates. In terms of structural arrangements, *applied* disciplines tend to have stronger steering mechanisms and somewhat more diverse developmental periphery then do *pure* disciplines. Based on these differences, the thesis concludes that the level of inequalities may further undermine the efforts of the University of Novi Sad to pull together its faculties under a common roof.

Keywords: entrepreneurial university, academic capitalism, disciplinary differences

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Abbreviations

ECTS	European Credit Transfer System
EHEA	European Higher Education Area
ERA	European Research Area
EU	European Union
FE	Faculty of Economics
FP	European Framework Programme
FP	Faculty of Philosophy
FS	Faculty of Sciences
FTS	Faculty of Technical Sciences
GDP	Gross Domestic Product
ICT	Information and Communication Technologies
ME	Ministry of Education
MSTD	Ministry of Science and Technological Development
PSSTD	Provincial Secretariat for Science and Technological Development
R&D	Research and Development
SASA	Serbian Academy of Science and Arts
SME	Small and Medium Enterprises
UNS	University of Novi Sad
LHE	Law on Higher Education
LSRA	Law on Scientific and Research Activities

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THE ENTREPRENEURIAL HEFFALUMP

> *"... a rather large and important animal. He has been hunted by many individuals using various trapping devices, but no one so far has succeeded in capturing him. All who claim to have caught sight of him report that he is enormous, but disagree on his particulars."*
>
> *Peter Kilby, 1971*

1. INTRODUCTION

In 1971 economist Peter Kilby compared those who study entrepreneurship to the characters in the Winnie-the-Pooh children's stories. In one story, the characters go hunting for the mysterious creature, the Heffalump. Even though they all claim to know about the Heffalump, none of the characters have ever captured one, and they disagree on its particularities (Kilby, 1971). Reading though several books and articles concerned with entrepreneurship, creates a feeling of ambiguity and confusion in the reader. We found varying and even sometimes contradictory interpretations and descriptions. Therefore, it appears that our tools are insufficient for exact measurement of the concept. However, this does not prevent us to engage in a similar adventure in hope to grasp a deeper understanding of the concept itself and how it relates to higher education.

Despite the fact that entrepreneurship remains a vague concept, its relevancy in terms of economic development has rarely been doubtful. For that reason, it is not surprising that the concept attained such a big popularity in the contemporary economics and management literature. However, we are also witnessing a growing attractiveness of the concept within higher education studies. The majority of scholars in this field would have already constructed a definition of their own regarding “entrepreneurship” and the “entrepreneurial university”. Besides, there is also a growing tendency in the present European political arena, to describe the future of universities as entrepreneurial. The newly established European Institute of Innovation and Technology (EIT) explicitly states in its mission, the importance of promoting a “fresh entrepreneurial culture in Europe”[1]. Indeed, it is believed that the structural coupling between knowledge, innovation, and economic growth can be realised through injecting a bit of entrepreneurial spirit into the daily life of universities. To put it simply, the heightened role of higher education institutions in a knowledge-based economy seems to require from them to take over some features of entrepreneurship and even enterprises.

[1] Obtained from the webpage of the European Institute for Innovation and Technology. Link: http://eit.europa.eu/about-eit/at-a-glance/eit-mission.html

In this paper, we will argue that a new model of organisation, that is the entrepreneurial university, answers the calls for a greater role in economic development. The evolving model can be shortly characterised by increased inter-sector cooperation, professors' engagement in industry related activities, growth of spin-off companies, increased managerial capacity, focusing on application-oriented research, development of attractive programmes and so forth. We also wish to highlight universities aggregative nature through history, whereby earlier transformations still play a crucial role in their present operation (Calhoun 2006a, p. 11), however, we emphasise that the current policy developments encouraged a further evolutionary step in their history. In light of these developments, we will attempt to create a framework for studying entrepreneurialism at universities. Certainly, we acknowledge also, that entrepreneurial transformation goes hand in hand with other major trends, like globalization, internationalization, marketisation and new public management, who challenge the traditional ways universities used to function (Deem, 2001). For that reason, when setting the parameters for analysis, we cannot be hundred percent sure, that what we measure is entrepreneurial change. Furthermore, it is less clear whether entrepreneurialism has a general impact on universities, or only on a minority of disciplines and departments (Tight 2003, p. 173). We know that academic work is rooted in the evolution of disciplines and professions, each possessing its own bodies of ideas, styles of inquiry, and traditions that set directions of efforts (Clark 1983, p. 18). Yet, these differences have been commonly overlooked in research focusing on entrepreneurialism in higher education. Due to the special characteristics of disciplines, we seek to explore different patterns in the way entrepreneurialism manifests itself at the basic unit level. Thus, we attempt to contribute to a better understanding concerning the relationship between disciplinary characteristics and entrepreneurialism.

In order to avoid individualising our findings for every speciality, we are going to use Becher's broad classification of disciplinary differences as the basis for our analysis. In addition, we have adopted a broad definition of entrepreneurialism in order to encompass all related processes in all disciplinary fields, including even those that were so far often left out of entrepreneurship research, such as the humanities and social sciences.

1.1 RATIONALE AND CONTRIBUTION OF THE STUDY

During the industrial age, the economy was established for the purpose of manufacturing. However, in a knowledge society the main objective is not to organise production, but to generate innovations. Therefore, the future of high-wage economies critically depends on their ability and competence to create new markets though product and service innovation and to increase productivity though process innovation (Röpke 1998, p. 1). Consequently, universities that host some of the brightest minds and all the necessary equipment for research, have much to offer to their countries economic development. In other words, there is a strong political pressure to submit university research activities to the needs of the market. Our quest for new knowledge should be guided by utilitarian values and measured by its profitability on the market. However, these developments raised several questions for scholars. It remains controvertible how knowledge should be handled in the future, how and under what conditions should be research activities conducted, how far should universities go concerning knowledge capitalization, what form should their cooperation take with the industry? Therefore, researchers still discuss the applicability of entrepreneurialism in a university setting. Usually, those who argue in favour of entrepreneurship tend to stress the potential of higher education institutions to make significant contributions to wealth creation. Policymakers alike increasingly encourage entrepreneurial transformation of universities by introducing criteria for funding, which rewards entrepreneurial initiatives of universities. On the opposite, there are also scholars who are to some extent more reserved towards entrepreneurialism at universities, and feel that entrepreneurial transformation might endanger the delicate balance between the core activities and lead to the downfall of public confidence in these institutions (Slaughter 1997, p. 29, 241, 71).

Accordingly, we have decided to study entrepreneurialism in higher education because it appears as a current and future style of operation of universities. To put it more symbolic, we could say it appears as a mystical fog spreading over universities, whereby actions and reactions gain a new meaning. However, in most cases the changes it brings to the institutions have rarely been examined across all academic units (Ibid., p. 216). We know that the process of transformation inspired by entrepreneurship is rarely applicable in the same way among different disciplines. We can often see some of the disciplinary units being more progressive in this transformation, while others are facing difficulties to adjust themselves. Therefore, it sounds reasonable to investigate entrepreneurship not on the

institutional level, but to go deeper and look into the processes on the basic unit level, where academics carry out their daily activities. Hence, our findings could validate the argument, that entrepreneurship is not a tailor made concept for all disciplines, and cannot be operationalized in the same way across different disciplines. Moreover, we hope to be able to portray the unique configurations that disciplinary fields take in order to attract additional funds on an increasingly competitive market basis. Such an analysis could provide the first step towards the prognosis of a possible future state of higher education. Additionally, the study can also contribute to a better understanding of disciplines themselves, by exploring the ways in which they exercise entrepreneurial activities, set up support structures for entrepreneurialism and incorporate the concept into their mission.

2. RESEARCH DESIGN AND QUESTIONS

Our research is centred around the issues that come with entrepreneurial transformation. We especially seek to understand the way disciplinary characteristics shape entrepreneurialism in practice and vice a versa. Consequently, the main question addressed in this research is:

How do disciplinary characteristics relate to entrepreneurial transformation of basic units (faculties) at the University of Novi Sad?

To grasp a better understanding of the relationship between the two concepts, we will elaborate on three sub-questions:

1) *What does entrepreneurial transformation encompass?*
2) *How does entrepreneurial transformation manifest itself at the four different faculties?*
3) *How significant is the relationship between disciplinary characteristics and entrepreneurial transformation?*

The first question aims to develop appropriate propositions for the measurement of entrepreneurialism. Therefore, we will elaborate on the existing literature and present a framework that is sufficiently broad to be applicable to all disciplines. Questions two and three, are going to be investigated according to the following features of entrepreneurial transformation:

How does entrepreneurial transformation manifest itself at the four different faculties?

1) What kind of entrepreneurial activities can be identified in the core activities of the faculties and their departments?
2) How do new structural arrangements facilitate entrepreneurialism at the faculties?
3) How much are entrepreneurial values accommodated into the faculties' culture?
4) How does entrepreneurialism appear in the faculties' mission/official documents?

How significant is the relationship between disciplinary characteristics and entrepreneurial transformation?

5) How do the epistemological differences among disciplines influence entrepreneurial transformation of the basic units?

6) How do social differences among disciplines influence entrepreneurial transformation of the basic units?
7) How do organisational differences among disciplines influence entrepreneurial transformation of the basic units?

2.1 METHODOLOGY

Our research strategy was, to conduct a case study, which would according to Yin, allow us to retain the holistic and meaningful characteristics of a real-life event such as entrepreneurship (Yin 2003, p. 2). The intention was to combine a descriptive and an explanatory case study (Yin, 1981a), whereby in the first case, we would use our descriptive framework, around which the case study is organized, to portray entrepreneurial transformation at different disciplinary units, (i.e. faculties). In the second part, we would explore possible casual relationships between the described differences and the theories of disciplinary characteristics. Thus, we will attempt to arrive to explanations, through a kind of pattern-matching process (Yin 1981b, p. 61).

The single case study, which has been carried out at the University of Novi Sad, involved four faculties. These were the Faculty of Sciences (FS), Faculty of Economics (FE), Faculty of Technical Sciences (FTS) and the Faculty of Philosophy (FP). These faculties represent a broad classification of knowledge domains into an enterprise like institution, where several interrelated disciplines operate simultaneously. The faculties were chosen to correspond to Becher's (2001) typology of hard-pure (corresponds to FS), soft-applied (FE), hard-applied (FTS) and soft-pure (FP) disciplines.

2.2 DATA GATHERING AND ANALYSIS

Even though our case study relies on multiply sources of evidence, the primary method for gathering data has been through semi-structured (focused) interviews. This method is perceived to be the most appropriate for data assembling if we have many of open-ended questions (Oppenheim 1992, p. 81). The study sample consisted of 13 academics and PhD fellows from our four faculties. Some of them were regular professors whose main activities were teaching and research, some of them were academics in leading positions, and a

handful of them were academics engaged in some form of entrepreneurial activity at their unit. The interview guide can be found in Appendix 1.

The analysis of the data followed the case studies descriptive and explanatory purpose and involved three activities: describing, classifying, and connecting (Blaikie 2000, p. 240). In the first stage, we have *described* the phenomenon according to the retrieved data. In the next stage, we have *classified* the data by splicing it into categories (i.e. areas of entrepreneurial transformation) and tried to make *connections* between similar categories across faculties.

2.3 LIMITATIONS OF THE STUDY

The quality of the research design is limited by its validity and reliability. According to Yin (2003), four tests are perceived to be the most relevant in terms of case studies. Looking at the studies *construct validity*, we have to analyse whether correct operational measures have been established in order to assess entrepreneurial transformation (Yin 2003, p. 34). A lack of construct validity would likely lead to incorrect conclusions. In this respect, it is worth noticing that measuring entrepreneurship is a very difficult task. The concept has very loose boundaries and therefore it is not exactly clear what should be considered as valid data and as valid method for measurement. Our framework is built upon the experiences of researchers who studied entrepreneurship in the context of higher education (see chapter 3.3.1) and tries to assess those aspects of entrepreneurial transformation, which have been already identified as the most significant ones. Besides, we have to note that multiply sources of evidence (data from interviews, institutional documents and governmental statistics) have been used to underpin the findings in this thesis.

The second test, which is the studies *internal validity* applies only to the explanatory part of this thesis but not to the descriptive one (Ibid.). In this respect, relating the variations in entrepreneurial transformation of internal units exclusively to disciplinary characteristics, especially when we look at the emerging new structures and mission, might underestimate the influence of institutional characteristics. In other words, certain variations might be explained not by disciplinary characteristics but by the faculties' size or location for example. Additionally, rival causal explanations might be established also, depending on whether we emphasize internal (disciplinary) factors or external (political and economical)

ones as key drivers of change. Thus, disciplinarity is only one social and cultural factor amongst many that influences entrepreneurial transformation.

External validity, which is the third aspect we have to consider, refers to the extent to which the findings of this study are generalisable. As we know, the value of a case study is often measured by the degree to which the patterns discovered in it can be generalised to other situations (Schell 1992, p. 5). However, time and space impose some limitations, which weaken the potential of the outcomes to be generalisable (Blaikie 2000, p. 254). We believe that the discovered variations in entrepreneurial transformation and their relationships with disciplinary characteristics are a true description of the present reality of the University of Novi Sad, and that they might have context free relevance also in other highly fragmented higher education systems like the Serbian one. Although, with respect to time boundaries, their relevance is indisputably restricted to the current era in which higher education operates. In order to further enhance the external validity of our finding, we believe that similar studies have to be conducted in a number of research sites using similar methods of data collection and analysis.

Concerning the final test, that is the *reliability* of the study, we wish to outline two possible errors that could prevent other researchers from arriving to the same conclusions when carrying out the same case study. Firstly, the reflective character of qualitative research means that the researcher inevitably injects something of himself into the research process and, hence, into the outcomes (Ibid.). In this case study, we have formulated a normative standpoint according to which we perceive faculties as proactive units who seek to secure accessible benefits on the market. This value judgement, does not lead automatically to misguided conclusions, moreover, we believe that being aware of it, enables the reader to better understand the arguments in this study. Secondly, regarding the method of data gathering, some of the words used in the interviews can have different meanings (Oppenheim 1992, p. 83). The word entrepreneurialism and the related managerial terminologies are often unknown to the interviewees or bear a different meaning than we would expect, and therefore they require explanation. To minimise misunderstandings, an initial interview has been conducted to highlight those areas, which proved to be bias, and to provide clear clarifications for further interviews.

3. EXPLORING THE MAIN CONCEPTS

3.1 ENTREPRENEURSHIP

The present understanding of entrepreneurship owes much to the works of the economist Joseph Schumpeter, who reintroduced the concept into economic theories during the second half of the twenty century. Schumpeter argued that the entrepreneur is a critical factor in a dynamic capitalistic economy, because he/she is responsible for the innovations that replace inferior products, services and procedures (Carayannis 2007, p. 25). Moreover, the innovations introduced by the entrepreneur, disturb the equilibrium in the economic system, which Schumpeter labels as creative destruction. The process results in a new combination of currently available resources and thereby contributes to economic growth (Ibid., p. 27). Hence, it is not surprising that in the era of global competition for wealth creation, the concept of entrepreneurship attained such a big popularity. Today, it is studied in many ways, and not just as an economic concept. Entrepreneurship as a field of inquiry appears in many disciplines and interdisciplinary studies, and consequently, we can find different explanations attached to it. These definitions vary from context to context, in which it is researched, and therefore, we have to acknowledge, that there is no clear definition explaining what the content and what the extent of entrepreneurship is, instead we have to deal with multiply explanations (Landstrom 2005, p. 10). Yet, without a clear definition, each researcher has to make his/her own interpretation of the concept. This certainly creates a barrier to knowledge accumulation, with respect to entrepreneurship (Ibid.).

Following the work of Davidsson (2003) we need to distinguish between “entrepreneurship as a societal phenomenon” and “entrepreneurship as a scholarly domain” (Davidsson 2003, p. 316). In society, only successful entrepreneurship will be recognized. Therefore, the introduction of an outcome criterion is very plausible. In this respect, entrepreneurship is perceived as the introduction of new economic activities that lead to change in the market (Ibid., p. 318). In practice, this would imply the start up of a new organisation or company, or the introduction of new services or products, which by entering the market create a rebalance of resources (creative destruction). Yet not all the innovations lead directly to the establishment of new markets. The fact that entrepreneurs break down barriers stimulates others to follow their lead (Landstrom 2005, p. 34). Likewise, in terms of higher education we often find successful initiatives, like distance education, spreading over from one

institution to the other. Thus, the introduction of a similar programme can be very new to the organisation; however, if there is already a market for such programs, it will not qualify as "pure" entrepreneurial activity. On the other hand, we can mention the expanding franchise of American and Australian Universities, which often are the first to offer English language degrees "offshore" (Altbach 2004, p. 8). Their activities and services are "old"; however, when the institution settles down in a new country, it rearranges the higher education market, by introducing a new market for English language degrees that was not yet present.

Fig. 1: *Entrepreneurship as related to firm and market newness*

	New to the market	Old to the market
New to the firm	1. Introduction of new offers (products) and competitors	2. Imitation of existing practices
Old to the firm	3. Activity expansion	4. Usual business

Adopted from: Davidsson, 2003: 319

As discussed above, there are certain degrees of entrepreneurship based upon a simple outcome criterion (Davidsson 2004, p. 14). Even though it is clear, that initiatives within the first square should count as entrepreneurial, and that of square four as not, it is harder to decide upon *imitative activities*, whereby institutions copy an existing offer on the market, and on market *expansion activities*, whereby institutions export their existing offers to new markets.

Now that we explored the societal aspect of entrepreneurship, we turn to the scholarly perspective. In the scholarly domain, the main question is: *What should be researched in respect to entrepreneurship?* (Landstrom 2005, p. 13). We can distinguish among three scientific areas within the scholarly domain that developed their own approaches to this question. Starting with (i) economics science, within which the concept of entrepreneur was developed, scholars primarily intension is to research entrepreneurship as a function of the market. In other words, it is mostly concerned with the effect the entrepreneur's activities

have on the market. In this respect, we find two widely accepted, yet contradictory beliefs about the nature of such an effect. According to Schumpeter (1934), entrepreneurialism leads to imperfections in the market. In terms of higher education, this could be associated with the introduction of a new study programme at a university, which disturbs the student market, because it seduces potential students from other programs or institutions. On the other hand, Kirzner (1973) saw the entrepreneur as a seeker of imbalances, which he/she aims to remove by his/her entrepreneurial activity (Ibid., p. 14). In this sense, Krizner's entrepreneur does not disturb the equilibrium on the market, but exploits the emerging opportunities. A classical example would be the starting up of a highly demanded study programme, which cannot be found on the market. Thus, analysing entrepreneurialism in higher education from an economic perspective would imply questions like: What happens in the market when a university initiates new organisations (e.g. faculties, centres), engages in new kind of activities or starts up new programs? How do these innovations affect the existing research and teaching market, or any other?

The next scholarly domain has been developed within (ii) behaviour science. From this perspective, the entrepreneurs as individuals or employees of a larger organisation get into the attention of analysis. It is widely believed, that those who initiate economic change, have certain sets of personality traits, which enable us to distinguish them from others. The central question behaviourist put forward is, who is the entrepreneurial, and how can we identify him or her? Consequently, some of the main schools of thoughts describe the entrepreneur as a creative, competent, adaptive, and risk assuming person (Cunningham 1991, p. 47). Alongside behavioralism, the intrapreneurship school argues, that these skills can be useful in complex organisations as well, whereby employees should behave as entrepreneurs, allowing to the firm to develop and diversify its activities (Ibid., p. 53). Grounding entrepreneurship research in higher education on this scholarly domain would encourage us to investigate the characteristics of academics and to analyse to what extent they correspond with those of an entrepreneurial person. Additionally, we could investigate, to what extent are entrepreneurial traits widespread among academics at different universities.

Continuing with the list of approaches to entrepreneurship within the scholarly domain, we will describe how (iii) managerial science is investigating this phenomenon. First of all, management studies move away from the individual and the market being the centre of research, and turn towards institutional processes. In this sense, the concept of

entrepreneurship is explained as "involving all the functions, activities, and actions associated with the perception of opportunities and the creation of organizations to pursue them" (Landsrom 2005, p. 18). However, it remains unclear whether researchers should focus on how opportunities are discovered, or on how new organisations are brought into life to pursue them (Ibid., p. 19). In terms of higher education studies, the first stream of interest makes more sense because it encompasses a wider range of activities which not necessary need to end with the establishment of a new organisation. In light of this, Venkataraman and Shane (2000) argue that the basic questions are why opportunities emerge, how are they discovered, and what actions are used to exploit them (Ibid.)?

3.2 ENTREPRENEURSHIP IN HIGHER EDUCATION

The current changes within the European higher education sector suggest that Schumpeter's model of the entrepreneur has been creatively extended beyond the sphere of business into higher education (Etzkowitz 2000, p. 325). Because entrepreneurship is primarily of importance to private companies, its appearance in public higher education settings raises many questions. For example, how does entrepreneurialism relate to the institutions public mission, how does it change the existing structure of institutions, and how do entrepreneurial activities affect teaching and research practices? However, probably the first and most important question is *why should universities deal at all with entrepreneurship*? The answer to this question depends very much on our understanding of the broader political and economical context within which universities operate today. As well, the question might yield different answers depending on who we target it to, e.g. to policy makers, to private companies or to the universities themselves.

Commonly, changing environmental conditions are in a strong connection with how higher education institutions transformed themselves through history. Marvin Peterson (2007) who investigated organizational models in higher education offers a comprehensive view on such external pressures. The author describes four types of "primary industry" that emerged from 1950 until now[2]. These are the mass higher education industry, the postsecondary education industry, and postsecondary knowledge industry (Peterson 2007, pp. 152-153). Peterson's

[2] An industry is defined as a set of organizations that use or require similar resources or attract similar clients and, which produce similar products and services. (Peterson 2007, p.151)

models are based on the U.S. experience and represent an evolutionary view of their higher education systems as it adopted and changed through history. From 1950 until 1972, the higher education industry has changed from a traditional to a mass industry. The traditional industry, which is characterised by few institutions with small student numbers moved to a mass higher education industry due to increasing demands by customers and new organisational entrants, i.e. universities. An additional challenge in this period was to increase the number of underrepresented groups. From the mass higher education industry, the postsecondary educational industry emerged (1972 – 1995), which could be described in terms of increased competition between various degree granting institutions and by the introduction of standards and regulations mainly for the purpose of quality assurance and equity (Ibid., pp. 151-165).

In the emerging postsecondary knowledge industry (1995 and beyond), which is probably the most relevant in our case, Peterson identifies seven environmental dynamics that reshape higher education institutions. There is a pressure for *diversity*, meaning that universities should increase their services offered for underrepresented groups. Innovations in *information technology* affect the core teaching, learning and research processes. A rising interest in *quality* urges academic assessment and accountability for student learning, faculty productivity and program performance. *New learning markets* are needed to satisfy the needs of older students. The demand for *economic productivity* encourages institutions to contribute more directly to the economic well-being of the region. *Globalisation* fosters international partnerships and shifts focus to global issues. Yet, *resource constraints* remain in form of increasing costs of higher education, and decreasing public funding (Ibid., pp. 165-167). Supposed, these conditions also affect institutions in Europe, it is plausible to question, whether universities conventional way of functioning is still adequate. If not, then we also have to ask whether these external developments affect the universities so substantially, that we could make a distinction between a previous and a future model which fits into our current reality.

The up-and-coming model is drawn into connection with the emergence of broader phenomenon, that is the “knowledge society” or “knowledge based economy”. This term is probably more of a myth, than an actually description of today’s economies or societies, however it is very much at the heart of the universities centrality in the post-industrial world (Meyer, et al. 2007, p. 204). According to Slaughter, the new economy is advanced by

neoliberal policies[3]. These policies tend to favour economic productivity functions over welfare ones and they significantly influence also the public sector (Slaughter 2004, p. 20). Concerning higher education, Slaughter argues that due to the emerges of the new economy a shift has taken place from a public good knowledge/learning regime to an academic capitalist knowledge/learning regime (Ibid., pp. 28-29). In the first case, knowledge is perceived as a public good (available to everyone without diminishing its value to anyone (Geiger 2008, p. 35)), while in the latter case it is a private good, which is valued for its "profitability". Hence, neoliberal policies favour knowledge capitalisation, where university discoveries are quickly converted into intellectual property (patents, copyrights) and become the ownership of individuals, universities, spin-off firms and multinational corporation (Geiger 2008, p. 21). Consequently, in a knowledge society universities are able to engage in markets in order to trade their knowledge resources as any other product. They appear less as producers of public goods and more as distributers of private ones (Calhoun 2006a, p. 8). This description also corresponds closely to Olsen's (2005) fourth vision of the university, namely, the university as a service enterprise embedded in competitive markets. In this respect, universities operate on various regional and global markets, and education and research are commodities to be sold, whereby market competition becomes a key process (Olsen 2005, p. 12).

Furthermore, as Jochan Ropke put it: "New knowledge and ideas, taken for itself, i.e. remaining separated from innovation, are economically worthless" (Röpke 1998, p. 1). Similarly, Schumpeter argues that the relative efficiency of an economic system depends on how well it generates innovations (Carayannis 2007, p. 24). These considerations aim to point out, that beside the fact that knowledge is slowly being transformed into a private good; there are also particular external intentions to affect the way it is being applied. National and supranational governments, e.g. European Union, therefore increasingly seek to adopt policies, which focus on the utilization of university knowledge for the sake of economic advancement.

According to the European Commission, European universities have so far failed to unleash their full potential to stimulate economic growth (van Vught 2006, p. 368). This concern

[3] The terms new economy, knowledge society and knowledge based economy are used interchangeably.

gave rise to several policy recommendations, which propose the redirection of European research efforts towards addressing the major economical and societal issues of the continent (Ibid., p. 372). Numerous initiatives were launched in light of these recommendations to link universities and faculty more closely to industrial innovations. These include the creation of science parks close to research universities, supporting business incubators, providing public "seed capital" for medium size investments and establishing other forms of "bridging institutions" (Mowery 2005, p. 209). However, knowledge production is not the only area where governments see legitimate interest to interfere with universities traditional processes. Fostering entrepreneurial education also represents an increasing tendency. Young graduates who fund their own businesses can enhance economic development as well. Therefore, it became important to create preconditions within universities, that facilitate young people's entrepreneurial ambitions (Schulte 2004, pp. 187-188).

The argument, that "what is good for universities is good for society" does not stand anymore (Musselin 2005, p. 72). Rather, the present policy guidelines actively promote pragmatism over idealistic ideologies when it comes to knowledge production, transmission and exploitation (Gumport 2005, p. 114). In light of these developments, we could argue that the way knowledge is perceived, handled and applied took a new direction within the emerging knowledge societies, whereby universities are encouraged to become tools for economic development (Musselin 2005, p. 70). The concern with the country's economic development definitely has an important part to play in governmental arguments, when it comes to the promotion of entrepreneurialism in higher education.

Additionally, neoliberal policies intend to create markets where none existed before and encourage public institutions to behave in market rational ways (de Boer and Geodegebuure 2003, p. 212 and Currie 2003, p. 19). However, we have to state that there is no single higher education market, rather quite a few of them (Jongbloed 2003, p. 111). When speaking about higher education market, we consider the combination of the student market, labour market, research grant market, and so forth. Traditionally, governments used to control most of these markets, but with the rise of the neoliberal state, deregulatory policies are being increasingly promoted within the public sector (Ibid., p. 113). Theoretically, the encouragement of a "perfect competition" in any of these higher education markets yields the benefits of increased efficiency and quality of the services provided (Dill 1997, p. 168). However, there is an agreement that the total privatisation of higher education would not maximise public

welfare and the positive social benefits justify continued governmental subsidy (Ibid., p. 183). Therefore, the introduction of so-called "quasi-markets" into higher education takes place. These quasi-markets lead to increased competition between public institutions for funding, students and labour. In other words, institutions are encouraged to compete for both teaching and research resources based on their merit and capacity (Currie 2003, p. 20). In such systems, universities success will depend on their ability to compete efficiently on several markets as providers of specific services. Therefore, entrepreneurialism can become a key impetus for market competition as well (Tight 2003, p. 162).

Asking academics, why should universities engage in entrepreneurialism suggests a slightly different reasoning. According to Burton Clark, higher education institutions face a supply-demand imbalance, which is created by the increasing external demands, some of which we outlined above, and the limited institutional capacity to respond to these pressures (Clark 1998, p. xvi). This imbalance can only be restored by making certain structural adjustments within higher education institutions. Thus, incorporating entrepreneurialism into the work and structure of universities might enable them to better conform to social expectations, thus to enhance their ability to contribute to economic development and compete on quasi markets. Moreover, conforming to external expectation about how a particular kind of institution is supposed to look, to be structured, and how it should conduct its business offers credibility and legitimacy (Birnbaum 2000, p. 154). Certainly, this explanation views universities more as reactive entities towards changing circumstances than as proactive ones who also contribute to change. However, it appears, while for some institutions the new environmental conditions represent a threat, others perceive them as opportunities to harvest the advantages offered by the new economy. This view is especially supported by Slaughter, who points to the internal embeddedness of profit-oriented activities as a point of reorganisation, rather than the external demands for adaptation (Slaughter 2004, p. 11). As she says:

> *"We have come to see colleges and universities (and academic managers, professors, and other professionals within them) as actors initiating academic capitalism, not just as players being "corporatized"."*
>
> *Slaughter, 2004: 11*

Thus, we cannot neglect the fact, that besides the obvious external pressures for entrepreneurial transformation, there is also an obvious internal interest of universities to secure the accessible benefits of entrepreneurial activities. For instance, such activities can generate significant third steam income. This income becomes part of the institutions discretionary funds, which in turn is vital to make significant moves without waiting for systemwide enactments (Clark 1998, p. 6). The more money an institution is capable to attract, the more can it invest into its competitive advantage. This argument was also proven by Slaughter, who found out that most of the academics agreed upon, that entrepreneurial activities can enhance university prestige (Slaughter 1997, p. 138). Prestige is vitally important nevertheless because it relates closely to institutions wealth (Geiger 2004, p. 94). Quality and money seem to be in a positive correlation, whereby increase in one-aspect leads to increase in the other. Therefore, being after the money or the prestige does not make any real difference, and those universities, which are successful entrepreneurs, can obtain both.

As we outlined so far, the rationale to adopt entrepreneurialism in higher education might be linked to internal and/or external interests. Even though these justifications might appear as acceptable, some doubts still remain regarding entrepreneurialism at universities. First of all, as Patricia Gumport noted: “responsiveness to compelling economic pressures that dominate contemporary organisational imperatives in an attempt to gain legitimacy in one dimension, may result in loss for the other” (Gumport 2000, p. 67). In other words, there is a fear whether claims for economic productivity will undermine universities traditional functions. Secondly, Slaughter highlights, that engagement in entrepreneurial activities might lead to a serious misuse of universities public position. This is due to the fact that universities might feel encouraged to move discretionary funds around internally to maximize revenues from non-discretionary sources (Slaughter 1997, p. 240). In addition, we often came across the criticism, that faculties’ engagement in entrepreneurial activities might seduce the time devoted to teaching or research in that manner (Ibid., p. 71). Thus, several concerns remain regarding entrepreneurialism at universities, and therefore, we advise to take entrepreneurial transformation with a grain of salt. However, on the other side it would be also unwise to underestimate the challenges higher education institutions face in our time.

3.3 THE ENTREPRENEURIAL UNIVERSITY

The developments described above provide us with useful insights about the encountered challenges higher education institutions have to deal with. As such, they have to compete in "quasi markets" to secure their existence and nonetheless they have to answer calls for economic relevancy. In such a turbulent environment, where the increasing external demands and conditions seriously question the universities future, new ventures and initiatives become critical for higher education institutions. It is here, where the validity of entrepreneurialism in higher education comes through. As Peterson puts it:

> *"It requires them to be much more opportunistic as well as market driven. Institutional redesign and macro or transformational change, not just strategic responses, became necessities for some"*
>
> *Peterson, 2007:175*

The new model, of the 21st century university was developed by Burton Clark, and refers to a variety of structural adjustments within institutions that might be considered as entrepreneurial. The expression "entrepreneurial university" characterises those institutions, which actively address the present environmental pressures and conditions. As described by the author:

> *"This umbrella conception stresses a forward-looking orientation, the willingness to seek out the new frontiers of knowledge. It stresses that the university is engaged in the pursuit of opportunities beyond means that are currently available. It stresses that collegiality need not by limited to defence of the status quo, but the collegial as well as personal forms of authority and leadership can be sources of adaptive behaviour and thereby linked to change."*
>
> *Clark, 2001:23*

Undoubtedly, Burton Clark emphasises that the entrepreneurial model differs from those in the previous decades also based on its changing attitude towards the environment. We mentioned that neoliberal policies have reshaped to a great extent the context within which universities operate today. Universities have to learn to protect, trade, and obtain resources on markets, and they also have to redirect the application and production of resources towards the economic development of their country. In this respect, institutions are perceived mainly as reactive entities. However, the entrepreneurial model emphasises a more interdependent and proactive attitude towards the environment – institutions seek to engage

with or influence the environment to their advantage (Peterson 2007, p. 175). Thus, the entrepreneurial model is not just a response to changing environmental conditions, but it is also a source for further developments. Nevertheless, Clark (2001) reveals a new organisational model that calls for new institutional arrangements in several aspects. Etzkowitz shares this perspective and aligns entrepreneurial transformation to two distinct stages in academic reorganization. The first academic revolution integrated research along with teaching into academic mission. While the second academic revolution, which is seemingly underway, incorporates universities contribution to regional economic development into their primary functions (Etzkowitz 2000, p. 110 and Etzkowitz 2002, p. 12).

This leads us to the following question: *in what way are entrepreneurial universities different from the others?* As outlined by van Vught (2002), university entrepreneurialism occurs in at least three areas: research, teaching and learning, and knowledge transfer. In their research function, universities are encouraged to establish strategic partnerships with the business sector and other knowledge producers and colonise new problem contexts. In their teaching function, they are expected to add entrepreneurial skills to their traditional training processes. In addition, in respect to knowledge transfer they have to put greater emphasis on collaboration and sharing of resources (van Vught 2002, p. 8). Thus, the emerging model calls for a new combination of traditional processes with entrepreneurial ones. As Clark noted, entrepreneurship is not a completely new departure in higher education (Clark, 1998). It builds on existing cultures, organizational forms and practices (Deem 2001, p. 293). Therefore, the consequences, such a bounding may have in terms of higher education, should not be perceived as radical changes, but rather as an improvement in certain functions. Even though this integration can disturb universities traditional functions and structures, yet they often have proven to be able to coexist as well (Slaughter 2004, p. 197). This might be drawn into relationship with universities fragmented and loosely coupled nature, which enables them swift adaptation to environmental conditions, while it also allows some portions of their organisation to persist (Weick 1976, pp. 6-7 and Clark 1983, p. 186).

In this respect, it is argued that entrepreneurialism does not lead to the exclusion of certain functions but it encourages them to be carried out in new ways (Etzkowitz 2000, p. 314). Similarly, Castells notes that universities had always an impressive capability to combine

and pursue simultaneously seemingly contradictory functions (Castells 2001, p. 211). He also adds, that pursuing an economic mission is not new to universities, however, presently it is emphasised more than the other functions (Ibid., pp. 209-210). Therefore, it remains controvertible whether we can draw a sharp line between an old and a new (entrepreneurial) university model.

3.3.1 Three perspectives (Etzkowitz, Slaughter, Clark)

There were many attempts made to map out and isolate the concept of entrepreneurship within higher education. Among the most well known scientists who have undertaken such an initiative, we will focus primarily on the works of Etzkowitz, Slaughter and Clark. We will try to identify the starting point of their analysis, and draw connections between their findings in order to get a broad understanding of the changes that relate to entrepreneurship. However, before that we will look into how they defined entrepreneurship in relation to higher education.

For Etzkowitz, entrepreneurship represents a new role of higher education institutions within a transforming industry-government-university relationship. He argues that a new mission and purpose is slowly taking hold within academic institutions, motivating these institutions to devote their resources to regional economic development. Adding up to their traditional roles of teaching and research, the new entrepreneurial role of universities is based upon creating new knowledge and transforming it into practical uses (Etzkowitz 2002, pp. 9-10). Etzkowitz also developed an analytical framework, through which he approaches entrepreneurialism at universities. The framework, called Triple Helix, elaborates the nature of interconnectedness between the business, governmental and higher education sectors. According to Etzkowitz, there are certain pressures present within the Triple Helix, which urge the emergence of entrepreneurial culture inside the academia (Etzkowitz 2000, p. 315). Thus, the blurring boundaries between the business-government-university sectors lead to a shift in values and practices within higher education. The combination of entrepreneurial activities with the universities traditional roles of education and research has created a hybrid organization in pursuit of multiple goals (Etzkowitz 2002, p. 14). Universities around the globe, increasingly take up entrepreneurial roles with the objective to improve regional or national economic performance as well their financial advantage and that of their faculties (Etzkowitz 2000, p. 313). The new role involves the redefinition and expansion of traditional academic tasks, institutionalization of collaborative arrangements, enhancement of the

capacity for interaction, and capability development to assist the creation of new organizations (Ibid., pp. 315-316). These emerging structures and developmental mechanisms, as outlined by Etzkowitz, play a crucial role in university transformation, which might lead to the second academic revolution.

Slaughter's point of departure is quite different. Starting from the observed changes in academic behaviour, she slowly builds up the notion of academic capitalism. She refers to entrepreneurialism only in reference to activates that are undertaken to capitalize university research or academic expertise. These activities are realized through contracts or grants with business or with governmental agencies, who are seeking solution to a specific public or commercial concern (Slaughter 1997, p. 114). Therefore, she identifies engagement in contract research and/or aligning educational programs to the undergraduate marketplace as the major form of entrepreneurialism within higher education.

In the beginning, Slaughter saw universities as victims of governmental financial restrictions, who were forced to engage in entrepreneurial activities in order to survive (Ibid., p. 69). In her recent work, she points out that the boundaries between market, state and higher education have became blurred, and approaches universities as institutions who are trying to take advantage of the new economy by converting university knowledge to products, processes or services (Slaughter 2004, p. 12,15). Accordingly, academic capitalism describes a process by which universities integrate with the new economy (Ibid., p. 14). This integration involves the creation of new circuits of knowledge that link universities directly to business, the emergence of interstitial and intermediating organizations who facilitate and guide these knowledge circuits, and at last it includes an expanding managerial capacity of universities (Ibid., pp. 307-322).

Our third perspective is based on the work of Burton Clark. Its pragmatic approach, allows us to understand the practical consequences of being an entrepreneurial university. His primary aim was to determine how some of the European universities went about to alter their structures and processes in order to become more responsive to external demands. He associates the terms innovative and responsive very closely with entrepreneurialism, and describes the entrepreneurial university as one, which actively seeks to innovate in how it goes about its business. Consequently, he defines entrepreneurship as both process and outcome, whereby universities respond to the increasing external demands places upon them (Clark 1998, p. 4).

Exploring the nature of entrepreneurial transformation at five universities, Clark manages to circumscribe the prevailing patterns characterising change. He argues, that an entrepreneurial university that is willing to take risks and experiment with changes will need new organizational elements (Ibid., p. 5). Based on his findings, he calls upon universities to strengthened their steering core; expand their developmental periphery; diversify their funding base; stimulate their academic heartland and integrate an entrepreneurial culture within their non-formal structure. Clark's recommendations are very unique in the sense that he goes beyond the visible structural arrangements necessary for entrepreneurial transformation and he highlights also the importance of cultural accommodation of the concept. Addressing both formal and non-formal elements of Universities are the advantages of his study.

Our authors offer three perspectives on entrepreneurialism, which have much in common. Yet in certain areas, they diverge. Before we start our analysis, it is important to bear in mind that the authors have drawn their conclusions according to their studies in different countries, and even continents. Clark explores entrepreneurial changes within the European setting, while Slaughter's focus is first of all on the American higher education sector. Between the two, is the research by Etzkowitz, who reflects on both cases. Thus, variations in their findings and interpretations can also be explained from a contextual point of view. The two higher education systems, the converging European and the American, have slightly different cultural heritage and policy environment. American universities have a longer history to compete for fame through accomplishment, while this practice is a fresh idea to European universities (Ben-David 1971, p. 162). In this respect it is plausible to assume that entrepreneurship will bear a different meaning and relevance. Besides the contextual variations, we can also observe a normative difference between their approaches to entrepreneurialism. Etzkowitz and Clark agree that universities can play a crucial role in today's knowledge society and therefore urge them to follow the pathways of successful entrepreneurial institutions, like MIT in America, or Twente in Europe. However, Slaughter is more reserved towards entrepreneurialism in higher education, and warns us from several dangers related to a neoliberal influence. For instance, she argues that the increased competition for external revenues may seduce resources from instruction and lead to curricular changes driven not so much by educational concerns but by opportunistic deliberations (Slaughter 2004, pp. 181,190). Additionally, she believes that by engaging in knowledge capitalization activities, public support for higher education may get destabilized

(Ibid., p. 29). Thus, while Clark and Etzkowitz are supporting entrepreneurialism at universities, Slaughter opposes such activities on the ground that they may lead to decreased social legitimacy. Without going into more detail, we will continue by converging the findings of the three authors, in order to arrive to a more complete picture of how entrepreneurialism streams into universities.

First, we have to note, that all three authors report about a very basic observation. That is, they recognised that a certain level of change is happening within higher education systems in correspondence with environmental developments. This transformation affects both the institutions and their staff, and inevitably challenges previous practices. As Slaughter says: "Many scholars acknowledge the changes to which we point, whether they refer to them as the commercialization of higher education (Bok 2003, Noble 2001); as entrepreneurial universities (Clark 1998); as a triple helix that weaves together higher education, state and the market (Etzkowitz, Helaley and Webster 1998)..." (Ibid., p. 305). Thus, it appears that we speak about the same thing, yet we call it by different names. This is not surprising considering the wide range of developments that are drawn into connection to define a single concept. Of course, we could also ask the question whether a single concept can embrace all the changes taking place within higher education.

To understand what changes are relevant in respect to entrepreneurship, we have to revisit how each of the authors defined the concept. For Slaughter entrepreneurship appears to be a set of activities, which aim to capitalize university research or expertise. These activities are undertaken in markets in order to generate extra "profit" for the institutions. Clark defines the concept as a set of structural (both formal and non-formal) adjustments inside the university. These adjustments serve to make the institution more adaptive in order to restore the equilibrium within the supply-demand imbalance. Etzkowitz goes further than looking only at entrepreneurial practices or structural adjustments and defines entrepreneurship as a new mission of universities, whereby their ability to enhance economic development comes to the front. In this respect, universities have to enlarge their role as innovative agents.

In sum, we believe that our authors analyse entrepreneurial changes in three areas. Slaughter's primary analytical interest lies within technology transfer activities, patenting and commercialisation of instructions (Ibid., p. 10). She argues that a shift is taking place from activities financed by the government (instruction) to activities designed to generate revenues in competitive markets. (Slaughter 1997, p. 71) Thus, her focus was to explore the

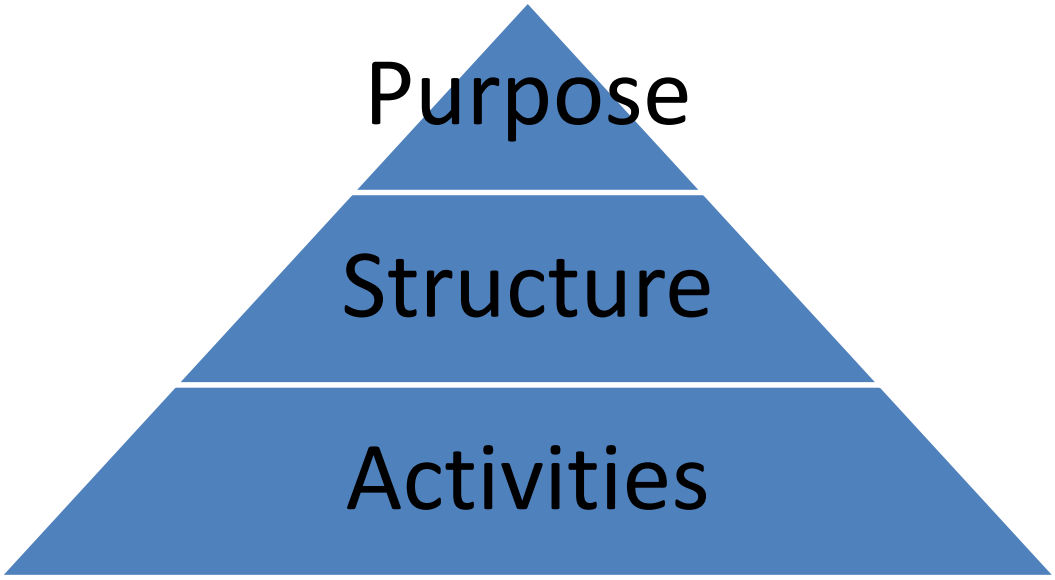
changing character of teaching and research activities in respect to knowledge capitalisation. These adjustments are different from changes in organizational forms and management practices (Deem 2001, p. 293). Within university research activities, Slaughter found little evidence of collective entrepreneurial initiatives. Neither did she identify any systematic push across units to initiate knowledge transfer activities or to generate funds through commercial research markets. However, in terms of educational activities, she remarked that departments were keen to developed strategies to compete more effectively in the undergraduate marketplace (Slaughter 2004, pp. 186-189). In sum, we can say that entrepreneurial efforts in the United States were more dominant in the educational function than inside the research function of universities (Ibid., pp. 186 – 194).

Burton Clark is more concerned with changes taking place in the structural arrangement of organisations. As he put it:

> *"I focused not on small changes in teaching and research programmes...but on changes in structure and culture that added up to a substantially revised, even new, organisational character"*
>
> *Clark, 2001:12*

He is equally emphasizing the importance of formal and non-formal structural rearrangements in light of increasing external pressures. Based on his findings, he comes to argue that a greater *managerial capacity* is needed to foster entrepreneurial processes and culture within the academic heartland (Clark 1998, p. 137). Universities have to *expand their periphery* in order to link up better with external needs and to advance the project orientation of their work (Ibid., p. 6). The periphery is also the main spot through which *third stream funding* can be generated and the surplus of funds used to make innovative steps (Ibid., p. 141). Yet in order for entrepreneurialism to develop, these changes have to be *assisted by the academic heartland*. Therefore, Clark also argues in favour of a shift in the belief system of departments, whereby entrepreneurial processes come to be regarded as positive and beneficiary for the institution. In addition, eventually, these four transformations will converge into a unified *entrepreneurial culture* of the university (Ibid., pp. 7-8). These structural adjustments represent the generalized pathways of identified changes at universities in Europe, which decided to actively pursue entrepreneurialism. Therefore, they are neither exclusive nor complete, and still open for local variations (Ibid., p. 128).

How entrepreneurial processes recondition the purpose of higher education institutions is best explained and mostly discussed by Etzkowitz. As argued by him, a “third mission” is being developed in addition to research and teaching, which will encompass the institutions entrepreneurial processes (Etzkowitz 2000, p. 313 and Etzkowitz 2002, p. 10). This new mission would describe the role played by universities in regional economic development, and would encourage the emergence of new structures that facilitate the new activities. Etzkowitz’s definition of the third mission is build upon the development of scientific research capabilities of universities and the creation of a series of boundary-spanning mechanisms (Etzkowitz 2002, p. 14). Yet he underemphasizes the relevance of, and fails to include, entrepreneurial processes within universities teaching function into the “third mission”. Without neglecting his contribution to our conceptual framework, we propose to extend the concept of a third mission by including also activities and structures concerned with teaching, as equally relevant in terms of regional economic development. In order to further foster the importance of Etzkowitz’s “third mission”, we refer to Clark, when he noted, that entrepreneurial transformation occurs when a number of various individuals come together and agree on a new organizational vision (Gjerding 2006, p. 84). Additionally, Slaughter notices that the service component of universities is being reinterpreted as contributing to national wealth creation (Slaughter 1997, p. 39). Consequently, we can say that all three perspectives underpin the new mission as a necessity for entrepreneurial transformation.



The above outlined arguments point to the fact, that entrepreneurial processes influence a universities character in three aspects. Namely, the way their activities are carried out, the way their formal and non-formal structure is set, and the way institutions define their legitimate purpose for existence. These alterations need each other's support to foster entrepreneurial processes within higher education institutions.

3.4 CHANGE

Schumpeter described the economic system as a closed circular flow, which is in the state of equilibrium. When the entrepreneurial introduces innovations in the form of new products, methods of production, markets, investment goods, or organisations of industrial units and branches, this harmony gets broken (Landstrom 2005, p. 34). However, economists fail to describe how the entrepreneur, considering it either as an individual or as an organization, arrives to the point to innovate. This is where management science is trying stepping in and complementing the theory of entrepreneurship. By establishing certain mechanisms and procedures, it is believed that entrepreneurial processes might be encouraged within institutions. Thus, change is not just the outcome of entrepreneurial processes, but it also appears as a precondition for them.

Because, we greatly rely on a management theory approach, we will be less concerned with the effects of entrepreneurial activities of individual universities that lead to alterations on various markets, and rather we turn to the changes that characterize an entrepreneurial higher education institution. As identified in the previous chapter, we believe that alterations affect three aspects of higher education institutions. Firstly, new activities are introduced and old ones adjusted. These processes do not appear solely within the teaching-research nexus of institutions, but sometimes even as a separate one (e.g. student services). Secondly, new structural arrangements, including both formal and informal, arise to support these entrepreneurial activities. Thirdly, a new mission is slowly being formulated which validates these structural changes. Even though our explanation appears to follow a logical and lineal process, we still believe, that it might also be disconnected. An institution can introduce new structures in the form of new regulations, or even enforce entrepreneurial values among its members before there is a sign of entrepreneurial activities. Additionally, a new entrepreneurial mission might be formulated by the university leaders, with the expectation to promote such activities among their units. Thus, entrepreneurial transformation is not

perceived as a linear process going from one area to the other, but as a detached phenomenon. This is also the case, if we analyze change in terms of organizational levels. As Musselin described it, change is neither linear when examining its movement from the system, to the institutional, to the basic unit and finally down to the individual level (Musselin 2005, p. 66). In a similar manner to management fads, entrepreneurialism might be adopted virtually on institutional level, however might never become part of the daily life of academics. In contrast, several individuals might engage in entrepreneurial activities, even though the concept remains uninstitutionalised in higher, e.g. faculty or university, structures. This is to say, without ignoring the importance of the concepts diffusion, there is little evidence that entrepreneurial transformation occurs in a structured and linear manner, going from one level to the other, or from one area to the other.

In order to address the dilemma of diffusion, we have to turn to the special characteristics of higher educational institutions. We know that universities are in many ways distinct from other business like organizations. Therefore our knowledge about how change and innovation is implemented and disseminated in the business sector, may not apply directly to higher education institutions. As described by Birnbaum (2000), business organizations exercise tight control through hierarchical directives. However, higher education institutions are characterised by fragmentation, with several loosely coupled sub-units that do not depend strictly on each other to carry out their tasks. The degree of institutional fragmentation conditions the extent to which coordinated change is possible or likely (Gornitzka 1999, p. 12). This, basic characteristic of universities makes it almost impossible to implement entrepreneurial transformation simultaneously and in the same form across the many units that constitute the institution. One faculty, department or chair may start up entrepreneurial activities, and extend them, while others might not be even thinking about it. Thus, from a managerial point of view, change becomes unpredictable, as it may or may not appear in the basic units, it can take random forms, and has often little or no effect on other parts of the organization (Birnbaum 2000, p. 150).

However, we cannot disregard the importance of change. It is still a crucial form of sustainability within a constantly transforming environment. Higher education institutions are no exception from this rule and no university can afford to live in the past no matter how much it has achieved. Yet the way they adopt and develop is very much different from how other organisations do. In universities, change is rarely radical, but in most of the cases

incremental (Musselin 2005, p. 65 and Clark, 1983, p. 235). This means, it builds on the existing structural constraints. “What is now in place conditions what will be” (Clark 1983, p. 237). These structures evolved to protect the rightful interests of academics, that is to say, to safeguard the essential stability required by the nature of work. However, entrepreneurs rarely adhere to existing structures, neither formal nor informal, and their innovations are often radical. So how can we expect entrepreneurial processes to develop within higher education, if that is contradictory with what we know about the nature of changes within academia? Even Schumpeter himself noted that large organisations might downgrade their entrepreneurial functions, because these are threatening their existing structures (Carayannis 2007, p. 34).

For that reason, to make entrepreneurial activities sustain within universities, the formal and informal structures of individual units have to be altered in a way, that they welcome such radical developments. As Clark stated: “Entrepreneurial initiatives will fail unless they become a steady part of the structure of work, the web of beliefs, and the division of control” (Clark 1983, p. 237). Such changes however have a unique pattern in university settings. Innovation and adaptation is increasingly demonstrated on the basic unit level, whereas centrally inducted change may never reach the lower parts of the institution. Thus, in a bottom heavy knowledge institution, grass root innovations are a crucial form of change (Ibid., p. 235). This means, that we cannot rely on managerial coordination when entrepreneurial transformation is in question. Instead, it depends on individual initiatives that slowly change the system as they attach to the interests of various groups (Ibid., p. 226). Similarly, Birnbaum says:

> *“Major innovations proposed on higher levels of centralization in colleges and universities may never be implemented, the initiatives of small groups may lead to constant innovation and change”*
>
> *Birnbaum, 2000:151*

Therefore, it is clear, that those who are at the bottom of the organisational hierarchy, namely the individuals, chairs and departments, are one of the most significant drivers of entrepreneurial transformation. However, the bottom structure of universities is very much fragmented and diverse. Individuals are grouped according to their disciplines and they posses very unique perceptions of the reality. Their reaction to entrepreneurial transformation is guided by their definitions of what legitimate activity is and how their own

work, identity, and tradition will be affected (Clark 1983, p. 198). Additionally, there is an important translation process happening before a new idea becomes adopted at universities. Academics attach their own and distinctive meaning to new ideas. Thus, change always begins with the interpretation of the required adjustments (Stensaker 2000, p. 104). This is in a strong relationship with institutional theory, according to which institutions make normatively rational choices that are shaped by the social context of the institution (Oliver 1997, in Gornitzka 1999, p. 9). Therefore, we can assume, that those adjustments, which are in line with the basic units' disciplinary arrangements and values, will be more successful, than those, which are contradictory. To sum up, we could say that entrepreneurial transformation, as a form of change, is resisted on disciplinary grounds, but is also generated by it (Clark 1983, p. 207). We can also assume that entrepreneurial transformation will take different configurations within disciplinary units. It might find relevance in different activities or might be differently accommodated in existing structures. Consequently, it becomes crucial to understand how the distinctive disciplinary characteristics relate to entrepreneurial transformation.

3.5 ACADEMIC ORGANISATION

As we explored in the previous chapter, the dispositions of academic organisation determine how change, precisely entrepreneurial transformation, will occur. Therefore, it is essential for us to grasp a deeper understanding of how work is organised within universities. There are two basic forms of academic organisation. One is the enterprise, i.e. university, and the other is the discipline. Enterprises are easily recognisable because they are usually bound territorially, their operation is defined by governmental policies and because they mostly appear in a concrete physical setting, i.e. buildings. On the contrary, disciplines are vaguer. They are a specialised form of organisation, which clamp together similar professions across large territories (Clark 1983, p. 29). They do not concentrate by locality, but rather by profile, as they draw together academics based on their common interest to teach and research a specific knowledge domain. Thus, it becomes obvious that these two forms of organisation have a differing focus of interest, which determines academic organisation in a special way. Meaning that the complexity and diversity of higher education systems originates from the desire of enterprises to pull together different disciplines, and the disciplines drive to fragment the institution (Ibid., p. 32,13 and Weick 1976).

In terms of our research, the disciplinary aspect of organisation is more relevant, but we also do not want to neglect the enterprise, which represent the primary target of environmental pressures. This is because, public institutions, like universities, are organised to carry out the will of legitimate superiors, but disciplines are not (Clark 1983, p. 31). Thus, the going concerns do not influence the disciplines as significantly as they do the enterprises. Moreover, there is a tendency to discuss the relationship between higher education and society on a macro level and overlook significant internal distinctions (Becher 1994, p. 155). Therefore, we will continue by analysing the relevancy of disciplines in terms of entrepreneurial transformation.

Disciplines exercise a crucial affect on the way work is organised in academic enterprises. Horizontal differentiation within a single university is the primary form of division by fields of knowledge. The broadest groupings are faculties, schools, and colleges that encompass a set of disciplines or an entire profession (Clark 1983, p. 37). The narrower groupings are generally known as chairs, institutes or departments and encompass a speciality within a profession or a discipline. In this sense, we can say that academic systems are increasingly fractured by expertise, rather than unified by it (Ibid., p. 36). Therefore, the university can be considered as the association of several loosely coupled parts who do not depend on each other to carry out their work (Weick 1976, p. 6). The low degree of interdependence between these specialized units is also supported by the fact that disciplines often remain the dominant force in the working life of academics (Clark 1983, p. 30). Teachers and researchers remain loyal first of all to the norms and goals dictated by their respective disciplines, rather by the enterprise, which hosts them. As a result, we regard disciplines as distinct organizational forms that exert varying influence on the structure of higher education as well as on scholarly behaviour.

Because disciplines are ambiguous, it becomes problematic to define which field of study should count as a distinct speciality. According to Tuolmin every discipline has three interrelated elements: 1. the current explanatory goals of the science, 2. its current repertory of concepts and procedures, and 3. the accumulated experience of the scientists working in the particular discipline (Toulmin 1972, p. 175). In this perspective, the clarity of concepts, methods and fundamental aims is the primary criteria to establish a compact discipline. Among the earliest disciplines were theology, medicine, law and philosophy (Clark 1983, p. 37), but as human knowledge increased their number also incrementally grew and is still

growing. Even now, we can find fields that are trying to agree upon the fundamental set of goals and concepts, in order to separate themselves from their original discipline. Besides the obvious epistemological considerations, they have also important social characteristics that define them. As described by Whitley: “scientific fields are a particular work organisation which structure and control the production of intellectual novelty through competition for reputations from national and international audience for contributions to collective goals” (Whitley 1984, p. 81). This reveals that disciplines differ from each other both in an epistemological and social manner (Ylijoki 2000, p. 339). They have their own tradition with heroes, taboos and rituals, as well as their own ways to control, punish and reward their members (Becher 1994, from Ibid., p. 340). However, we cannot and should not separate these two elements from each other when investigating differences among disciplines.

3.5.1 The nature of disciplines

So far, we have offered a basic definition of disciplines and explored in what way they rupture the enterprise into autonomous parts. Continuing, we will elaborate on the similarities and differences among disciplines by drawing on the theories of Becher and Stark. Additionally, we will also explore how some disciplinary characteristics might relate to entrepreneurial transformation.

Several researchers investigated disciplinary differences on the ground of their epistemological characteristics. The intention of these studies was to develop an analytical framework through which we can better understand and describe disciplinary variation (Kolb 1981, from Becher 2001, p. 39). In our research, we will focus primarily on Becher’s work that draws upon the previous studies of Biglan (1972) and Kolb (1981). Biglan’s typology focused on how academics themselves perceive the characteristics of knowledge, while Kolb’s data originated from the students learning strategies. However, their independent findings show a high level of correspondence, which makes Becher suggest the adoption of a two dimensional, four-fold typology of disciplinary differences. The first dimension, hard versus soft, relates to the degree to which a paradigm consensus exists, while the second dimension, pure-applied, relates to the degree of concern with the application. The evolving clusters are: hard-pure (e.g. physics, mathematics), hard-applied (e.g. mechanical engineering, pharmacy), soft-pure (e.g. history, anthropology), and soft-applied (e.g. business administration, law). In each case, these divisions are identified respectively with the natural sciences, the humanities and social sciences, the science-based professions and

the social professions. Based on the outlined categories, Becher notes that we can find reasonably clear distinctions among disciplines in terms several characteristics that highlighted in the following table.

Fig. 2: *Epistemological characteristics of disciplinary fields*

	Hard-Pure	**Hard-Applied**	**Soft-Pure**	**Soft-Applied**
Characteristics in the object of enquiry	cumulative	purposive	reiterative	functional
The nature of knowledge growth	atomistic (tree-like)	pragmatic (know how)	holistic (river like)	utilitarian (know how)
The relationship between the researcher and the knowledge	concerned with universals, quantities, simplification	concerned with mastery of physical environment	concerned with particulars, qualities, complication	concerned with enhancement of professional practice
The enquiry procedures	impersonal, value-free	applied heuristic approaches, uses both qualitative and quantitative approaches	personal, value-laden	uses case studies and case law to a large extent
The extent of truth claims and the criteria for making them	clear criteria for knowledge verification, consensus over significant questions to address, now and in the future	criteria for judgement are purposive, functional	dispute over criteria for knowledge verification, lack of consensus over significant questions to address	
The results of research	results in discovery and explanation	results in products, techniques	results in understanding and interpretation	results in protocols and procedures

Source: Becher, 2001: 36

We find these classifications especially useful, because they encompass the previously outlined important epistemological properties of knowledge fields as well some of the social characteristics of research groups (Becher 2001, p. 35). However, higher education researchers many times question the validity of these groupings. Especially on the basis, that disciplines usually cover several subfields, that might not fit well within the typology. Say for example, applied physics, which is a subdivision of a hard-pure discipline, yet is more concerned with the practical use of discoveries. Besides, the fastest growing areas in recent

years are fields that draw on a number of disciplines, which contributes to the blurring of disciplinary boundaries (Blackmore 2007, p. 227). Therefore, by grouping together more or less homogeneous categories of knowledge, we cannot avoid to neglect some evident differences between and within their constituent subjects (Becher 2001, p. 39). Additionally, because the attributes of disciplines may change over time, it is difficult to claim that any typology of this sort can be permanent and enduring (Ibid., p. 38, 184). Then again, we should not forget that these categories represent broad areas into which disciplines might be classified, and we acknowledge that this framework can serve a useful purpose in investigating further differences among disciplines.

Joan Stark (1998) points out that it is unrealistic to place our classifications purely on the criteria how knowledge is structured and research conducted. As argued by her, in applied fields we should not use the classical distinction between hard/soft, because the concept of paradigm consensus does not explain the differences among them (Stark 1998, pp. 354-359). In addition, we should not neglect the educational dimension of disciplines, which also represents an important source of divergence (Ibid., p. 364). Therefore, Stark proposes an alternative framework to be adopted for professional fields, which encompasses both education and research aspects. Based on the assumption that professional fields are not led primarily by their knowledge base but by their professional role in society creates a solid grounding for distinguishing among them (Ibid., pp. 366-368). The four wings of professional fields identified by Stark are the human client service (nursing, social work, etc), the information service (library science, journalism, etc.), enterprise/production service (business, engineering, etc.), and the artistic service (music, theatre, etc.) (Ibid., p. 368). In addition, each wing differs from the other in terms of the linkages they maintain with their environment, the attention they play to students' socialisation, their inquiry methods, and by their symbolic system, which encompasses the communication patterns of their field. Even though it appears that Starks framework is much more comprehensive than the one developed by Becher, it is also more restricted. Its primary usefulness is limited to professional fields; therefore, it is less applicable in a holistic manner to encompass differences across all the disciplines. However, the new aspects introduced by Stark might still serve as useful aspects when investigating differences in applied fields, which have a strong professional orientation.

Up to now, we were mainly concerned with the cognitive aspect of specialities and mentioned that remarkable differences exist among them. Quoting Paul Blackmore, we could summarise the key epistemological characteristics of the disciplinary fields as the following:

> *"**Hard fields** have a strong and unified theoretical structure, where laws are universal, findings are generalisable, and inquiry is done through quantitative research methods. Contrary, in **soft fields**, knowledge boundaries are less distinct, knowledge is open for interpretation, and research is more likely to be qualitative... in **pure fields**, knowledge exists independently of a social context, while in **applied fields** it is often socially constructed"*
>
> *Blackmore, 2007:228 (Bold added)*

We stated already that cognitive disparity is accompanied by social differences. These are commonly linked to the disciplines cultural attributes, which are constructed by the interaction of academics with each other. They define which work is valued and rewarded, and thereby navigate the individual's behaviour within the discipline. For this aspect of diversity, Becher introduces a new distinction called *urban* (hard fields) and *rural* (soft fields). The two groups tend to have different working patters and they perceive the nature and scope of the problems differently (Becher 2001, p. 106). Urban fields tend to select a narrow area of study with separable problems and they favour to investigate outstanding topics to offer short-range solution. Rural fields typically tend to cover a broader intellectual territory with interlocked problems and they spread across a wide range of themes to engage in long-range issue. In addition, researchers in the urban fields prefer to work in teams, while rural researchers commonly work individually (Ibid., p. 107). These characteristics provide disciplines with recognisable identities and cultural attributes (Ibid., p. 44).

There is also a third aspect of differences, which we did not touch upon much so far. These are the organisational differences, which represent the basic "physical" needs of disciplines to carry out their tasks. Hard fields usually require more financial support in order to purchase very expensive equipment, while soft fields operate on a lower budget because their research is cheaper (Blackmore 2007, p. 230).

In sum, we have revealed important epistemological, social and organisational differences among disciplines. These differences define the form of interaction a discipline will maintain with its environment (Becher 2001, p. 179), therefore they become crucial when investigating entrepreneurialism at the basic unit level.

3.5.2 The relevance of disciplinary differences in terms of entrepreneurial transformation

As we noted before, disciplines extend across enterprises (i.e. institutions) and even borders. We can trace back their fundamental characteristic in every national higher education system. They can take different forms depending on the context, but their basic constructions, which are important to their survival and growth, remain the same (Clark, 1987). For example, in the case of law, the matter of inquiry differs respectively by national policy contexts; however, their methods and goals remain the same. Therefore, it is plausible to assume that investigation into disciplinary differences carried out in one country or at one institution might have transferable relevance in other contexts as well. However, in most cases, disciplinary differences are not included into investigations that focus on entrepreneurship at universities. Even though sometimes it is obvious that certain disciplines have advantages in terms of entrepreneurialism, there was no systematic approach made to analyse entrepreneurial transformation by differentiating among disciplines. In most instances, scholarly explanations focus on the relationship between specialities and *environmental pressures* for change, and on the different *market opportunities* available for them. In light of this, we will provide a short presentation of what we know so far about disciplines in relation to entrepreneurialism.

Several scholars noted that some disciplinary units have a richer array of market opportunities available to them internally and externally than do others (Slaughter 2004, p. 183 and de Boer and Geodegebuure 2003, p. 213). In most cases, these are the hard-applied sciences (e.g. engineering), who apply specific technological knowledge to practical problems of production. Thus, they commonly become entrepreneurial first and most fully (Clark 1998, p. 141). In this respect, other disciplines usually face difficulties to interact with the market, and therefore lag behind. However, this does not mean that entrepreneurialism is a one sided phenomenon, affecting only those disciplines which have something to offer for the market. On the contrary, some evidence is already available about the inter-related processes that reshape current adjustments within the higher education system. For instance, hard-pure fields are investigating the general laws governing the areas of human

understanding. Therefore, their work tends to carry a high prestige, but is also considered to be more expensive. Neoliberal governments and private companies are rarely willing to invest massive amounts of funds into research areas that cannot guarantee to generate economically beneficiary outputs. These political and commercial stipulations may encourage hard-pure disciplines to emphasise work that is considered to be socially applicable (Becher 2001, p. 177). This phenomenon is referred to as an "epistemic drift" during which internal scholarly criteria for relevance are being replaced by criteria imposed without a notion of erudition (Wittrock 1991, p. 78). This is especially relevant in the case of knowledge production, whereby governments can significantly influence the developmental path of knowledge discovery (Gibbons 1994, p. 15). Gibbons makes a distinction between a traditional (Mode 1) and an emerging new approach (Mode 2) to knowledge production. While in mode 1, research was generated within disciplines and in a cognitive context, in mode 2 research is carried out in a transdisciplinary manner and is closely linked to the social and economic context (Ibid., p. 1). It is a perfect example about how the present political circumstances within which the disciplines operate can affect even those fields that traditionally had less interaction with the market. As explained by Becher:

> *"One consequence of academics increasing involvement in chasing the dollar is that the dollars involvement in shaping epistemological forms is becoming increasingly central."*
>
> *Becher, 2001: 38*

We argue that none of the disciplines can escape external claims for economic relevance, but based on their beliefs they independently interpret the meaning of these pressures and decide which responses are appropriate (Clark 1983, p. 99). In this respect Becher notes that there is a fundamental conflict between external pressures on the one hand and academic norms and values on the other. The first one is created by outside demands (originating in government, in industry, etc.) for a wide range of scientific services, while the second set of pressures drives from the internal constitution of science, from its cultural and value system (Becher 2001, p. 160). According to Gibbons, this tension arises because it is not clear whether the knowledge that is generated is being used properly or whether if it would be generated properly, it would be usable (Gibbons in Becher 2001, p. 160). In sum, we can say that neoliberal political pressures for economic relevance affect each discipline, yet differences in their responses might be caused externally by uneven market opportunities or internally by disciplines epistemological, social and organisational characteristics.

3.6 THE EMERGING FRAMEWORK

So far, we outlined that the concept of entrepreneurship got the attention of scientists in several fields. It represents a promising research area both in economics, behaviour and in managerial sciences. Yet, there is a continuous disagreement on its particularities. The only aspect on which most of the scholars seem to agree with is that those who are described as entrepreneurs significantly enhance national economic development through their activities. In our case, these would be organisations rather than individuals. Even Schumpeter himself, who researched entrepreneurship within an economic context, turned away with time from the individualistic perception of entrepreneurship, as he noticed the emergence of a new type of constantly innovative corporate organizations during the 80's (Carayannis 2007, p. 24). These changes let him conclude that entrepreneurship could be the responsibility of a group, a network, or an organization as well (Landstrom 2005, p. 35). This gives validity also to our assumption, that an institution, like a university might be considered as entrepreneurial. We also mentioned that according to management science, the internal processes are the most important factors that define an entrepreneurial institution. Thus, the actions, functions, and activities of universities have to be directed towards the utilization of emerging opportunities. This requires from us to perceive universities as competitors on various markets, and less as providers of public services. Therefore, based on Schumpeter's definition (Schumpeter, 1934) we define university entrepreneurialism as *encompassing a variety of processes within an organisational setting concerned with the pursuit and exploitation of market opportunities.*

Three main elements have to be further clarified. Firstly, entrepreneurialism is a process that starts with the recognition of a "venture idea" and congregates in the emergence of new organisations, new products and services to exploit these opportunities. Secondly, we observe the phenomenon within an institutional setting, and acknowledge that individuals and groups belonging to the institution initiate entrepreneurial processes. Thirdly, we also adopt a subjectivist-creative perspective, whereby an opportunity, i.e. venture idea, is not something existing "out there" but it is created in the entrepreneurs mind. They are specific entities acted upon, and whether these reflect an opportunity or not can only be known afterwards (Davidson 2003, p. 339).

To sum up, we can say that we agree to a proactive perception of university entrepreneurialism, whereby higher education institutions initiate entrepreneurial processes and transformation as means to better connect with their environment to their advantage. Even though, we perceive entrepreneurialism as a set of internally initiated processes, we also acknowledge the fact, which external demands play in the perception of venture ideas. Meaning that, faculties are keener to act upon opportunities where the outcomes are highly regarded both externally and internally. Thus, the interplay of internal and external interests often becomes crucial in terms of entrepreneurial transformation.

We have also discussed that the incorporation of entrepreneurial processes into universities traditional functions, contributed to the emergence of an "upgraded" institutional model. Similarly, to what Craig Calhoun said, we could state that the ideal of a "university of culture" in Europe is being replaced by an ideal of an "entrepreneurial university" (Calhoun 2006b, p. 28). Alternatively, Castells notes: "after centuries of using universities as ideological apparatuses and/or elite selecting devices, there is a rush of policy makers and private firms towards the university as a productive force in the new economy" (Castells 2001, p. 211). Following the works of Clark, Slaughter and Etzkowitz, we believe that entrepreneurial model of universities covers adjustments in three areas. Namely, (i) new and innovative initiatives enrich the traditional activities of institutions, (ii) a structural rearrangement takes place to foster these activities, and (iii) an "entrepreneurial" mission is being incorporated along the existing ones. This framework is going to serve as the basis of our analysis; therefore, we will elaborate on it in more detail.

i. Entrepreneurialism in activities

We know that the past practices do not fit well to the present circumstances. The expansion of the market economy to the public sector requires from the higher education institutions and their personnel to rethink their traditional approaches to their activities. Innovative initiatives have become the core method to secure universities primacy in the sector of knowledge discovery and transmission. Commonly, scholars use to emphasise those activities that are in strong relationship with the new economy, and which have a direct impact on a countries economic performance. Knowledge transfer became the primary way to exploit university knowledge on the market, by allowing private companies to use it for their own benefits. Starting and running business incubators, science parks and spin-off companies, is the dominant form of engagement in knowledge commercialisation.

Therefore, entrepreneurial activities are mainly associated with research and commercialisation of research outcomes. Certainly, the development of high-tech innovations and their export to market places is a very promising area. However, in an increasingly competitive higher education system, universities have to innovate constantly also their teaching practices and programme offers in order to satisfy both external demands put forward by policymakers and students, and their need for competitiveness. Universities demonstrate their entrepreneurial ambitions also by creating new programmes, reaching out to new "costumers", and diversifying their support services (e.g. canteens, student housing, sport centres, etc.). Consequently, the core activities of universities cannot remain the same. They acquire a new meaning and direction within the neoliberal state, and we aim to explore those activities that faculties undertake, in order to better connect with the market.

ii. Structural rearrangement

Entrepreneurial transformation involves remarkable changes also in the structure of institutions. These alterations play a crucial role in the further development of entrepreneurialism in universities core activities (Gjerding 2006, p. 96). In this transformational process, they need to consider "reorganising their academic and administrative structures to coincide their changing mission, external environment and interorganisational relationships. They also may need to reform their academic and faculty roles and create a new culture for doing academic work" (Peterson 2007, p. 169). Thus, the changes have to affect both the formal way an institution is run, and its non-formal, i.e. cultural aspect. The formal structure makes explicit the division of responsibilities, rules and roles, flow of information and resources (Gumport 2002, p. 377). In this respect, most of the scholars identified an increased managerial capacity, expanded developmental periphery, and a diversified funding base, which are in a strong relationship with entrepreneurial processes at universities.

In the first case, it is argued that a strengthened managerial core plays an important role in the adoption of an entrepreneurial direction (Clark 1998, p. 137). It not just increases the capacity of institutions to better interact with the market (Slaughter 2004, p. 307), but it is also aggregates the complex processes (Clark 1998, p. 5), enhances entrepreneurial culture (Schulte 2004, p. 191), stimulates fundraising (Clark 1998, p. 137) and manages cross-subsidising among the many fields and degree levels (Ibid.). Additionally, increased leadership and management is necessary to pull together the fragmented institution and to

redirect its efforts towards new priorities (Olsen 2007, pp. 8-9). In this sense, more and more managers are pulled into the academic system whose contribution is vital for successful entrepreneurial activities. Therefore, we will focus on whether the managerial capacity at the faculties increased and what role the management plays in present entrepreneurial processes.

Secondly, we also know that most of the entrepreneurial activities take place in the periphery (Slaughter 1997, p. 210 and Clark 1998, pp. 6,138-139). The new units, or as Clark calls them, the "project groups" (Clark 1998, p. 138), emerge alongside the traditional departments; and they create bridges to other sectors of society in order to better exploit the emerging opportunities. These centres and institutes are professional outreach offices that work on knowledge transfer, industrial contract, intellectual property development, continuing education, fundraising, and even alumni affairs (Ibid., p. 6). Hence, its expansion is a significant sign of entrepreneurial transformation. In our research, we will try to map out the type of intermediary organisations that emerged alongside faculties and their purpose with regards to entrepreneurialism.

The last aspect of the formal structural transformation refers to the way universities used to secure their funding. Inevitably, entrepreneurial processes contribute to the diversification of resources (Ibid.). With an increased third stream income, higher education institutions enlarge their financial flexibility, which is important to initiate entrepreneurial processes (Schulte 2004, p. 191). In other words, entrepreneurialism contributes to the growth of discretionary funds, which then again can be used to expand the institutions entrepreneurial activities. Consequently, we will elaborate to what extent is the funding base of individual faculties diversified and how are the extra revenues invested.

Continuing with non-formal structural arrangements, several scholars pointed out that entrepreneurial processes may stay on a negligible level, until an entrepreneurial culture is accommodated in every aspect of the institution. The entrepreneurial idea has to spread among many participants, link up with other ideas and be expressed in numerous structures and processes to form a consistent institutional belief (Clark 1998, p. 141). Yet, this new culture often appears to be in contradiction with the traditional ones. This is especially the case when we look at research. The traditional "Mertonian" values which encompass universalism, communalism, disinterestedness, and organized scepticism are increasingly being challenged by entrepreneurialism. For instance, disinterestedness is directly contradicted when a scientist or university has a financial interest in the outcomes of

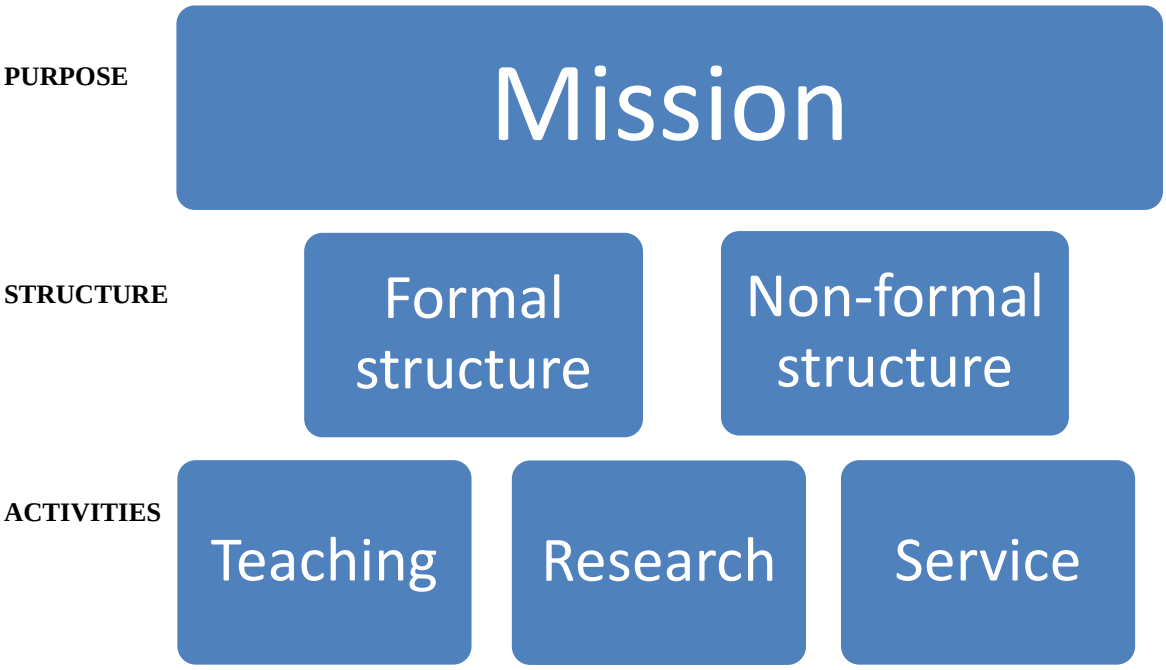
research. Communalism (the sharing of results through publications) can also be compromised when scientists withhold results in order to gain advantage in the marketplace (Geiger 2008, p. 16). Thus, entrepreneurialism challenges the existing culture at universities, which were built up by decades. Therefore, we intend to analyse besides the visible structural measures, also the way academics perceive entrepreneurial activities.

iii. "Entrepreneurial" mission

The entrepreneurial mission, or as Eztkowitz refers to it, the "third mission" embraces an "extrovert" orientation of universities. It rests heavily on the assumption that universities have a role and a responsibility in generating innovations for industry (Geiger 2008, p. 28). Yet, it does not have to be limited to knowledge transfer activities only. It serves the primary purpose to legitimate the new type of activities and structures that seek to strengthen the links between higher education institutions and the market. Thus, the entrepreneurial mission refers to the wider objective of the institution set forth in official policy documents. It is of a symbolic value, yet powerful enough to signal readiness for entrepreneurial activities and institutional restructuring. In this sense, we will explore present policy documents of the institutions and analyse if and how such a mission is adopted.

As show in our framework, we believe that the institutionalisation of entrepreneurship encompasses transformation in several aspects of higher education institutions. It not just leads to modifications in some of the already established activities, structures and missions, but it also brings new elements into the system. However, the system is very much fragmented and diverse, where some fields have advantages, some are more resistant, and some are being untouched by these developments. Therefore, exploring disciplinary variations in entrepreneurial transformation in the context of a highly fragmented higher education sector, like Serbia, could allow us to better understand the nature of relationship between disciplinary characteristics and entrepreneurialism.

Fig. 3: *Entrepreneurial transformation in higher education institutions*



4. BACKGROUND INFORMATION

4.1 DESCRIPTION OF THE SERBIAN HIGHER EEDUCATION SECTOR

Serbia has a binary higher education system with universities and colleges. Generally, universities tend to focus more on broad and theoretical education while colleges (officially called higher professional schools) favour a stronger practical and training orientation (Mantl, et al. 2009, p. 141). There are 14 universities and approximately 68 colleges providing higher education in the country[4]. Looking at universities only, we have to note that seven are public ones and seven are private for profit institutions. Their operation is defined by the Law on Higher Education (LHE) and supplemented by the Law on Scientific Research Activities (LSRA). System level governance is divided between the Ministry of Education (ME), the Ministry of Science and Technological Development (MSTD) and between the two National Councils for education and research. Since 1992, universities enjoy a great degree of autonomy from the State (Stankovic 2005, p. 158) while national quality assurance measures were put in place just recently after the adoption of the new LHE in 2005.

Serbia employs the model of input based funding, where allocations are made according to measures, such as the number of teaching staff, the number of registered students, the number of study programmes and the basic criteria for salaries in public institutions (Vukasovic, et al. 2009, p. 78). These funds are allocated to individual faculties, who later on transfer a certain amount of it to the university, for the provision of collective services. During the past years, there were no radical changes in terms of governmental funding, and higher education institutions have limited power to manage independently public resources, thus the government predetermines their usage (Ibid., p. 77). However, institutions can handle without restrains their personal revenues, which generally consist of tuition fees, administrative surcharges, and incomes from services.

[4] Obtained from the website of the Ministry of Education. Link: http://www.mps.sr.gov.yu/code/navigate.php?Id=113

In the continuation, we will elaborate further on four very important characteristics of the Serbian higher education system: a) the higher education system is in transition, b) the sector is highly fragmented, c) education and research activities are largely separated, and d) there is a weak research and development (R&D) activity in Serbia.

a) Transitional higher education system

In contrast to higher education institutions in developed countries, Serbian universities have to operate in a much more unfavourable environment. They encountered simultaneously the consequences of multiple transition processes and a war (Mantl, et al. 2009, p. 13). The political changes, such as moving away from an authoritarian political regime towards a multi-party democracy and shifting the country's economy from a centrally planned to a market based one, required from higher education institutions to define anew their role and place in society. Thus, after the fall of communism the re-establishment of university autonomy became one of the central issues (Ibid., p. 79). However, this does not mean the absolute liberalization of higher education institutions from political influence, but the creation of a delicate balance between autonomy for self-governance and accountability towards the state and society in general. In this regard, we could witness in the past years an increase of institutional autonomy, while in the mean time, in 2005 a national accreditation system was put in place to ensure that the Serbian higher education institutions and their programs meet the "minimum" requirements.

Besides these changes, there was also an obvious shift towards marketisation. The LHE made private and public institutions equal in terms of their rights and obligations (Report 2007, p. 4), although, private ones are not eligible for governmental support when it comes to education. The fact that Serbia applies a system of "numerous clauses" whereby the number of governmentally subsidized students is pre-determined by the parliament (Mantl, et al. 2009, p. 143), leads to a strong competition for the remaining students who are willing to pay for their education. Consequently, several private for profit institutions were started up, for whom obviously the tuition fees represent the main income. Their share in the student market is still quite small, and covers only 7% of the total student population (Vukasovic, et al. 2009, p. 72); however, this does not discourage them to challenge the monopoly of public institutions. Nonetheless, also the public institutions compete for the fee-paying student in order to make up for the weak governmental funding (Mantl, et al. 2009, p. 143) which presently covers between 56% and 85% of their total budgets (Ibid., p. 97).

In addition to the student market, there is also a market for research and developmental grants. These grants are provided on a project basis, mainly the MSTD and the Provincial Secretariat for Science and Technological Development (PSSTD). Besides the local sources, institutions also seek to compete for international grants, especially those of the European Union (EU). This is underpinned by the data that during the past two years Serbian institutes submitted 499 project proposals for the European Seventh Framework Programme (FP7), which is just one of the many sources for project funding (Focus 2009, p. 21). Competition for grants does not constrain to public and private universities and faculties, but also involves various independent research organisations.

Universities have also the right to set employment policies, manage salary scales and hire skilled personnel independently, leading to a free academic labor market (LHE 2005, p. 36). To be entrepreneurial in such a market, means to attract the best experts by offering more attractive career development opportunities, better salaries and top-class laboratories (Miclea 2006, p. 112). However, due to financial constrains this market remains very much underdeveloped, whereby competition for the best professors and researchers takes place usually within the national system. Certainly, following the communist regime, we can observe the rise of neoliberal policies enforcing marketisation of higher education in several areas leading to an increased competition for students, grants, and partially for skilled labour.

Simultaneously, the Serbian higher education sector was severely hit by the consequences of war, such as the loss of highly qualified personal, decreased mobility and isolation, and underdeveloped infrastructure for teaching and research (Mantl, et al. 2009, p. 13). Therefore, the main objective of the present political and academic leaders became to increase the competitiveness of Serbian higher education by integrating it as soon as possible into the European trends. In this manner, the European developments such as European Higher Education Area (EHEA) and the European Research Area (ERA), turned into the focal driving force behind Serbian reforms. In 2003 the country joined the Bologna process, and simultaneously accepted the Action plan for scientific and technological cooperation with the EU (Komnenovic 2005, p. 10). From this moment on, Serbian higher education was on its way to become an equal partner in the European space for higher education and research. This lead to several major transformations primarily within the educational processes, such as the implementation of the two-cycle system, the European Credit Transfer

System (ECTS), the diploma supplements, and to an increased scientific cooperation with European universities in terms of research.

It seems that, change and transformation have become a daily routine of universities as they are trying to detach from the Humboldtian model of higher education towards a unified European model (Turajlic, et al. 2001, p. 7). Besides Bologna, we also pointed out that Serbian universities have gained on their autonomy and simultaneously have been pulled into marketisation. These developments, fostered competition for resources, and created an arena where entrepreneurial efforts of faculties are crucial.

b) Fragmented higher education sector

We know that most of the higher education institutions are characterised by fragmentation. However, in terms of Serbia, the division among the many units of universities is especially relevant. For a long period, universities were not considered as legal entities, but as umbrella organisations for institutions that conduct teaching and research activities. Thus, the faculties, and not the university as a whole, are still very much the main units of local organisation where the power for internal governance lies (Clark 1983, p. 45 and Mantl, et al. 2009, p. 103). Each faculty is considered as an independent legal entity within a university, thus has the right to receive governmental funding based on detailed budget plans, define its structure, set its tuition fees, create its programs, and so forth, without almost any interference from the university level management. In addition, each faculty has a strong disciplinary focus, which is more similar to the U.S. departments, than to the wider clustering nature of the faculties in Western Europe (Clark 1983, p. 45). The strong institutional fragmentation makes the universities look like voluntary associations of individual faculties. However, this kind of structure (fragmented) has also several weaknesses. First of all, it is inefficient, because it leads to duplication in terms of programmes and administration. Secondly, it is inefficient because it becomes harder to manage and good practices spread unevenly among the many faculties. Thirdly, it is non-transparent which provides space for corruption (Linden and Arnhold 2008, p. 26). In addition, we should also mention that such fragmentation hinders the establishment of a common mission and even identity, which makes an entrepreneurial transformation harder to accomplish.

c) Separated research and education

In terms of Serbian higher education, we have to be careful when we use the term "Humboldtian". Even though most of the academics in Serbia consider that our higher education system is heavily rooted in the German tradition, in reality we can hardly find traces of an integrated research and education culture. Looking more closely on this issue reveals that these two aspects of university activities are fairly separated on both macro and meso levels. On macro level, we find two separate Ministries responsible for education and research. The ME is in charge of the overall management of education processes including also higher education, but excluding issues related to research. The later one is managed by the MSTD. In other words, although universities perform both tasks, they report about, account for, and receive funding for their basic activities separately. In addition, these core activities are also regulated by separate laws making their interrelatedness moderate. Out of this reason, we came to question, whether Etkowitz's first academic revolution ever materialized itself in Serbia. Unfortunately, it is hard to expect that this issue is going to be resolved with a more Europeanized Serbian higher education, due to the fact that we might anticipate similar separateness in the European arena (Olsen 2007, p. 9). In other words, the detached concepts of ERA and the EHEA reflect a similar policy design whereby teaching and research continue to be regarded separately (Mantl, et al. 2009, p. 57). Turning to the meso level, it appears that universities role in terms of research activities is again underemphasized. This is to say, higher education institutions mostly perform teaching related activities, whereas research is centred in institutes and independent research organisations such as the Serbian Academy of Science and Arts (SASA) and "Matica Srpska" (Ibid., p. 118). However, this is not to say that we cannot find research activities going on at university level, but rather that they are expressed in a separate organisational setting.

As we noticed just now, education tends to be the primary function of higher education institutions while research is often the secondary. Research activities are supervised by the MSTD and they are regulated by the LSRA. According to this law, there are three types of institutions eligible to conduct research in Serbia. One of them is the SASA. The academy was founded in the end of the 19th century and represented an open forum of eminent scholars from various disciplines (Ibid., p. 157). Presently it operates 10 research institutes dedicated to both humanities and natural sciences. The second one is a cultural-scientific institute called "Matica Srpska". Besides its purpose to preserve the cultural heritage of the

country, it also conducts research on Serbian history, culture, literacy and in similar fields. These two organisations played and are still playing a major role in the nation building process, and because of that, they are also referred to as institutions of national importance (LSRA 2005, p. 13). Nonetheless, they are also very important in the sense that they represent a "shelter" for the humanities, which are not of any specific economic purpose in the era of utilitarian thinking (Mantl, et al. 2009, p. 181). In other words, they are an important source of knowledge production in the field of social sciences and humanities. However, due to their close involvement into Serbian politics, they are also heavily politicised and dependent on the government both financially and ideologically. Therefore, the countries transformation into a capitalist democracy, challenges these institutions to become modern institutions reflecting excellence and independence in their work (Ibid., p. 176). The third types of organisations eligible to conduct research are the research organisations. Research organisations can be institutes or entire faculties, and they can be either part of universities or independent. In addition, the present law makes a distinction between two kinds of research institutes: a) scientific institutes that conducts basic research, b) research-developmental institutions that conduct applied research and knowledge transfer (LSRA 2005, p. 15).

To sum up, we can say that academies, faculties and institutes carry out most of the publicly financed research activities in Serbia. Yet, in terms of their volume, those that operate outside a university setting seem to predominate, making research frequently disconnected from university teaching. Out of this reason, the Worldbank has recommended for Serbia to rethink the role of these institutions and how many should operate separately from universities (Linden and Arnhold 2008, p. 47).

d) Weak R&D activities

Continuing with research activities in Serbia, we should note that the countries R&D activities have significantly decreased since the beginning of the war in 1991. According to the Statistical Office of The Republic of Serbia, the number of research organizations (including institutes, faculties and research units) during the period of 1990 until 2001, was constantly dropping from 297 to 150[5]. Currently there are 75 faculties and 55 institutes

[5] Obtained from the website of the Statistical Office of the Republic of Serbia. Link: http://webrzs.statserb.sr.gov.yu/axd/en/drugastrana.php?Sifra=0011&izbor=odel&tab=9

registered at the ministry, which is again less than it was the case in 2001. However, the further decrease in their numbers might also be explained with the newly introduced standards that made some of the organizations ineligible to conduct research activities. Besides the decreasing number of research institutes, the number of employed research personnel has also dropped (Ibid., p. 31). However, it is noticeable that the technical assistance staff was hit harder by the cat back than did researchers[6]. Compared to the EU, the number of researchers measured against 10,000 citizens in Serbia is 11,55%. This is nearly half of the 24,8% EU average (Focus 2009, p. 16).

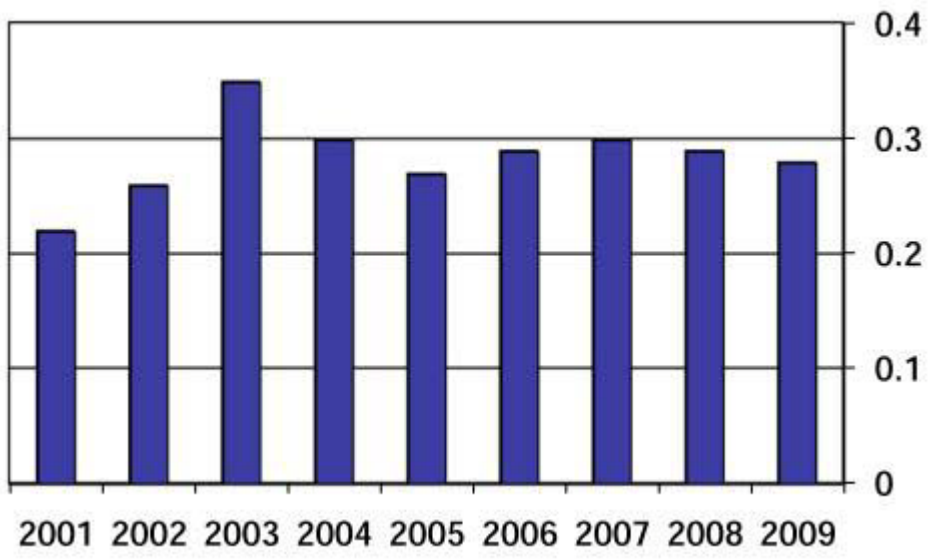
Serbian higher education is also severely underperforming in the number of publications. Even though, there was some evident increase in the past years, Serbia still ranks poorly in Europe (Ibid., p. 11). The weakest disciplines in this sense are the humanities and social sciences who published only 30 articles from a total of 2,047 during 2007 (Ibid.). Patenting activities in the country reflect a similarly declining tendency (Kutlaca, 1998). The most evident decrease took place during the period of war, however, the average number of annual patent applications remained low also afterwards. During the past five years, Serbian faculties and research institutes submitted only 36 patent applications, which is one of the lowest performances, compared to other EU countries (Focus 2009, p. 15).

During the European Council meeting in Barcelona in 2002, the EU set the objective to increase its spending on research and development up to 3% of the GDP[7]. Serbia currently invests only 0,3% of its GDP into research activities (Ibid., p. 7)(Table A), which according to the European Agency for Reconstruction shows a ten times lower capacity for innovation in Serbia, compared to the EU (Zarkovic 2006, p. 1). Of course, this would be only true in the case the EU would have met the 3%, which is still stagnating on a 1,84% level (European Comission 2008, p. 12).

[6] Ibid.

[7] Obtained from website of the European Comission. Link: http://ec.europa.eu/invest-in-research/index_en.htm

Table A: *Investments into science compared to GDP*



Source: Focus, 2009: 8

Concerning all these indicators, the Worldbank's conclusion that R&D activities are still underdeveloped in Serbia seems very plausible (Linden and Arnhold 2008, p. 9). However, it is maybe worth to notice that this is already the third major breakdown in innovative activates in Serbian history. The first one was during and after the Second World War (from 1941-1950) and the second happened during a major financial restructuring between 1966 and 1970 (Kutlaca 1998, pp. 14-18). The third one, which was caused by the Balkan wars and the political and economical reforms of the country, started in 1991 and we are still uncertain whether we can already report about a slight increase or not. Additionally, we have to notice also that a weak innovative potential is not only characterising Serbia, but also the majority of the Balkan countries. As shown by the following table, Serbia actually ranks fairly well regarding its innovative potential compared to its close neighbours (Table B).

Table B: *Ranking of innovative potential of Serbia compared to neighbouring countries*

Global Competitiveness Report 2007—2008 (N=131)

Country	*Overall ranking*	*Higher education and training ranking*	*Innovation ranking*
Albania	109	103	131
Bosnia and Herzegovina	106	98	121
Croatia	57	46	50
Macedonia, FYR	94	75	92
Montenegro	82	79	104
Serbia	91	82	78
Bulgaria	79	66	88
Romania	74	54	76
Slovenia	39	24	30

Source: WEF (2007).

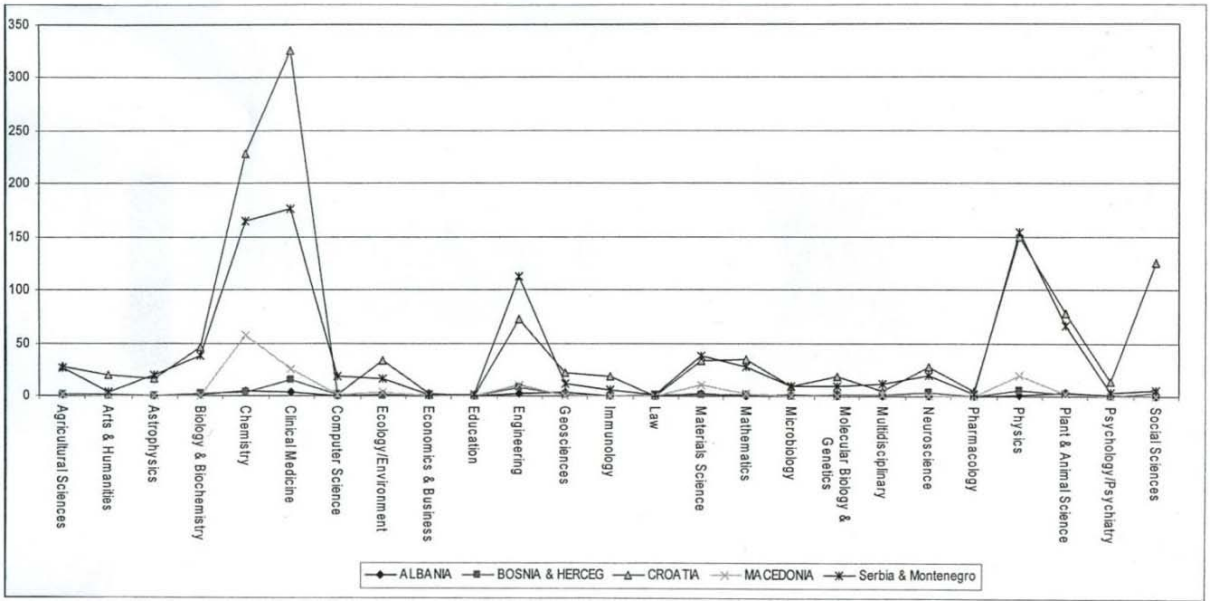
Source: Linden, Arnhold, 2008:14

Besides the apparent financial reasons for a weak performance in R&D, there is also a traditional approach to knowledge production. According to the Wordlbank, investments into R&D should favor applied research over basic ones (Linden and Arnhold 2008, p. 11). Yet in Serbia, basic research is still the dominant form of knowledge production (Focus 2009, p. 8). This is also demonstrated by the countries R&D funds distribution from which 55% goes on basic research and 45% on applied research (Ibid., p. 19). Additionally, most of the research projects are of a smaller size, while big multidisciplinary research is rare (Ibid., p. 9).

Derived from our data on the number of research organizations, the number of employed researchers, the number of registered patents, and about the level of investments into research, it becomes obvious that R&D activities show a constantly declining trend in the time spam between 1991 and 2005. If this tendency continues, Serbia might find itself in a difficult position to catch up with other European countries. Thus, if we accept the argument that knowledge has become the most important factor for economic growth (Linden and Arnhold 2008, p. 14), then Serbia urgently has to devote more resources for R&D activities and prioritise in terms of promising research areas. The economist logic dictates that investments should favour those fields that might be considered as the countries strength in terms of research. According to the publication rates, Serbia is especially doing well in chemistry, medicine, engineering, physics and plant & animal sciences (Table C). Thus, we can find a very strong output in natural sciences whereas social sciences and humanities are

weaker (Mantl, et al. 2009, p. 129). A similar distribution is apparent when examining the orientation of research institutes. The majority of them are dedicated to natural or technical sciences (Ibid., p. 177).

Table C: *Patterns of Scientific Specialisation of Western Balkan Countries*



Source: Mantl et al., 2009: 129

4.1.1 Entrepreneurialism in the Serbian higher education sector

We have to put forward the question of whether the idea of university entrepreneurialism has matured in the Serbian higher education system or not? On a macro level, we can suppose that there is a political awareness about the importance of research activities contribution to the economic development of the country (Focus 2009, p. 2 and LSRA 2005, p. 2). It became an important mission to create a national innovation system, through which companies, universities and research institutes, as well governmental bodies work together to generate, diffuse and apply scientific and technological knowledge (Focus 2009, p. 17). Consequently, the LSRA is soon going to be complemented by a National Research Strategy. Even though this strategy is still a draft document, it offers an outline of the future directions. As such, it outlines that the National Council for Scientific and Technological Development, together with the MSTD aims to foster the link between higher education, research, and economic development (Ibid., p. 14).

In terms of research capacity development, we can expect the stimulation of future PhD and research programmes and the increase of investments into R&D to 1% of national GDP till 2014 (Ibid.). The strategy also aims to establish a clearer focus in terms of national research funding. It wishes to favor applied research over basic one by introducing utilitarian and pragmatic criteria for grant allocation (Ibid., p. 51), and sets national priorities regarding research areas. These priorities have been established according to their potentials, and include biomedicine, new materials and nanotechnology, environmental studies and climate change, energy and energy efficiency, agriculture and food, informatics and telecommunication, and policy development together with the affirmation of national identity (Ibid., pp. 25-26). Additionally, R&D activities have been recognized as major contributors to the development of small and medium enterprises. Consequently, the Ministry of Economy took a pro-active role to encourage cooperation of educational, research and business sectors (Strategy for SME 2005, p. 4). The most obvious example can be found on a political level, where a collaboration between the national Agency for Small and Medium Enterprises (SME), the ME and the MSTD has been established (Strategy for SME 2003, p. 11). As foreseen, the results of this cooperation shall be the establishment of business incubators and science parks across the country, which represent the main form of training future entrepreneurs and creating SME (Programme for Business Incubators 2007, p. 21-26). Universities have been identified as one of the key partners in this process. The introduction of entrepreneurship learning into higher education is also a key element of the strategy for SME (Strategy for SME 2005, p. 18).

Universities are also expected to take a proactive role to stimulate research activities in business incubators, and have to work towards identifying possible business ideas that could be transferred into the incubators. Thus, business incubators would serve as breeding grounds for SME. Science parks on the other hand, aim to serve the research needs of already existing companies and would provide access for them to the research capacities of universities. Therefore, their primary aim is not to stimulate the establishment of future SME, but to work on product advancement and innovations. However, both business incubators and science parks are important mechanisms of university – business cooperation, where the ability of higher education institutions to contribute to economic development of its country gets tested. Furthermore, to boost confidence in national research capacity, the LSRA established the “brand” of centres of excellence, which is going to be presented to research organizations that achieve world-class reputation in their work (LSRA 2005, p. 21).

Attaining this title offers both national recognition and extra financial support for the institutes activities. Hence, it seems that Serbia has finally drafted its exit plan out of almost 20 years of recession in terms of research and development. The new strategies and laws slowly converge into a unified innovation framework, within which entrepreneurial efforts of universities will play a crucial role. Yet, we still find several obstacles that have not been removed when it comes to entrepreneurialism.

The most influential policy instrument, that is the financing mechanism, has been not yet adjusted to the newly established developmental goals. Presently, public funding covers mainly teaching, leaving the institutions little place for other activities (Linden and Arnhold 2008, p. 28). As stated by the LHE, universities and faculties can engage in the commercialization of their research results, however, only under the condition that by this the quality of education does not get decreased (LHE 2005, p. 17). In other words, governmental funding is very much tightened to the educational function of higher education institutions, leaving little space for other types of activities. Moreover, this regulation also provides a valid excuse for institutions concerning their passiveness to cooperate with the industry. Additionally, the existing funding mechanism tends to "punish" faculties who successfully engage in entrepreneurialism. That is to say, the more revenues a faculty is capable to rise through its entrepreneurial activities, the less public resources it is going to receive for maintenance, international cooperation, extracurricular activities, and other costs (Regulation 2005, pp. 8-9). This is because the amount dedicated for non-teaching activities is currently linked to the share of public resources in the institutions total expenditures. Public funding on the other hand is not enough to cover neither education, nor maintenance, nor research entirely. Therefore rising additional resources becomes crucial for universities and their faculties. As we highlighted already, tuition fees are the second biggest source of income (Linden and Arnhold 2008, p. 9), while income from cooperation with the industry or other relevant services might qualify only as the third biggest source (Vukasovic, et al. 2009, p. 128). However, the level of these incomes is very different from faculty to faculty. For some it makes up nearly half of their budget, while others have to operate predominantly on public funds.

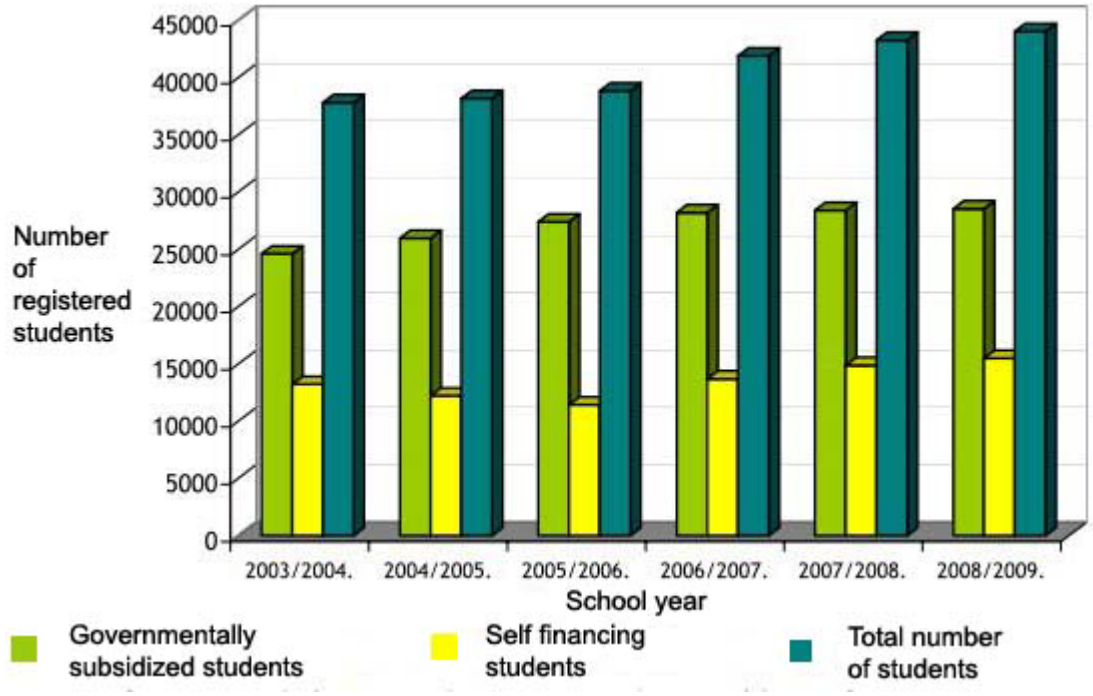
4.2 DESCRIPTION OF THE UNIVERSITY OF NOVI SAD

We could describe the University of Novi Sad (UNS) as one of the most dominant actor in the Serbian higher education system. The university was founded in 1960 and is the second largest university in the country (in terms of student numbers) after the University of Belgrade (Stankovic 2006, p. 118). Furthermore, it is the only public university in the northern province (Vojvodina) covering 20% of the country's total population. UNS has 14 autonomous faculties, most of them located in the main campus in Novi Sad, however, five faculties are in other cities in Vojvodina. The fact that the majority of its faculties are situated on a single campus is the universities greatest advantage compared to other universities, whose faculties are further dispread (Ibid.). Since, 2000 an active university leadership started with the ambition to establish and develop integrated functions at the university level, in contrast to the previous tradition of strong faculties and weak central administration (Ibid., p. 120). In this respect, UNS has managed to establish an office for education, research and public relations (this includes also the newly realised Centre for Career Development and Student Consulting), a central library, an ICT centre, an office for international cooperation, and some more[8]. Through these offices, UNS employs over 30 administrators and managers who provide widespread services for the faculties. Moreover, UNS also acts as a host for the Association for Interdisciplinary and Multidisciplinary Studies and Research, which highlights the universities ambition to provide sanctuary for the emerging new fields of studies. Besides the intention of the university leadership to reinforce central functions, they also adopted a pro-active approach concerning international cooperation. Like all other universities, UNS also experienced from the 90's a deep reaching isolation from international trends in higher education, and lost many of its contacts with European and other universities. After ten years, following the political changes in the country, the priority of the university leadership became to re-establish its international relationships. The strategy of UNS was to "open the windows and let in fresh air" (Ibid., p. 119).

[8] Obtained from the website of the University of Novi Sad. Link: http://www.ns.ac.yu/sr/sluzbe_uns.htm

These internal reforms, led to the fact that today UNS is often described as the most progressive university in Serbia. Consequently, the leadership of UNS has explicitly stated that the university shall become a lead institution in teaching, research, arts and entrepreneurship (The Statute of UNS, p. 1). However, in practice, these functions enjoy various significance. The university defines more or less teaching as its central function (UNS 2009, p. 11), and offers around 300 study programmes on all three levels of upper qualification. In the last five years, there was a 1,74% increase in the student numbers, and approximately 46.000 students are enrolled currently at UNS (Table D). The majority of the students attend social sciences and humanities, then technological sciences, and the least of them are in natural sciences.

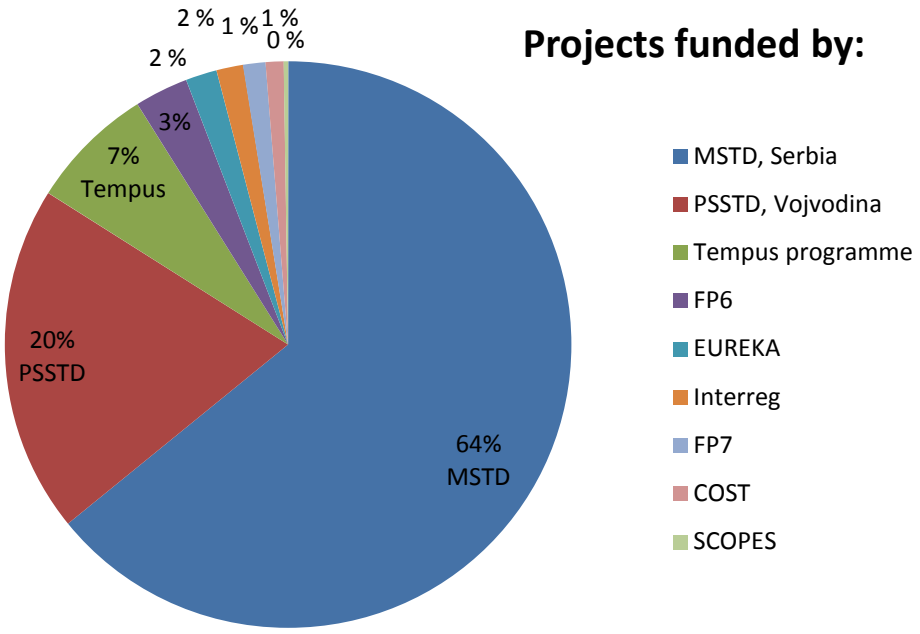
Table D: *Division of self-financing and state subsidized student numbers*



Source: UNS, 2009: 12

The university actively engages also in research and developmental projects. Among the most noticeable programmes are the European Framework Programme (FP)[9], the WUS Austria programme[10], EUREKA[11], and the TEMPUS programme[12]. In the last case, the University of Novi Sad participated in nine projects during 2008. This is more than the half of the total number of approved projects (17) on the territory of Serbia (UNS 2009, p. 33). Moreover, their success to procure so many projects, lead to the establishment of a TEMPUS committee whose task is to coordinate the successful implementation of these projects. Throughout 2008, the UNS had 505 ongoing or new projects[13] (Table E).

Table E: *Source of project funds*



Source: UNS, 2009: 39

[9] The European Framework Programme was initiated by the European Comission with the aim to provide support for research and technological development. Link: http://cordis.europa.eu/fp7/

[10] The WUS Austria programme and provides financial support for the improvement of academic infrastructure, human resources development and academic mobility. Link: http://www.wus-austria.org/

[11] EUREKA is a pan-European network that supports market oriented R&D in order to enhance the competitiveness of European industries. Link: http://www.eureka.be/home.do

[12] The TEMPUS programme of the European Comission supports the development, modernisation and dissemination of new curricula, teaching methods or materials, and the modernisation of the management and governance of higher education institutions. Link: http://eacea.ec.europa.eu/tempus/index_en.php

[13] The annual report of UNS does not make a clear differentiation between research, cooperation, developmental and other types of projects. Therefore, in our description we embrace all of these categories.

As we can see in Table E, the national or the regional government finances the overwhelming number of projects (84%). Even though all faculties compete for project funding, the majority of them is realised at either the Faculty of Sciences (25%), or at the Faculty of Technical Sciences (18%), or at the Faculty of Agriculture (16%), making these faculties the most successful in terms of attracting research grants (Ibid., p. 39).

The central leadership of UNS recognised, that being an entrepreneurial university means much more than the transfer of knowledge or the birthplace of high technology spin-offs. It involves also to be innovative with its programmes, research, projects, institutional development, internationalisation, and being able to generate income to supplement government funding (Stankovic 2006, p. 128). In order to transfer their declarative intentions into practice, the university is aiming to set up a fixed committee for monitoring and advancing entrepreneurial activities. Additionally, since 2007 the University has been enlarged with an UNESCO Chair for Entrepreneurial Studies. It is directly linked to the university and aims to become a centre for excellence in entrepreneurship research and teaching. The chair actively supports the entrepreneurial efforts of students and teachers, promotes entrepreneurial culture, and highlights the universities role in SME development. Therefore, their work is crucial for the universities future development as an entrepreneurial institution. Presently, the chair is working on the introduction of the first master programme on entrepreneurship studies (UNS 2009, p. 56).

5. FINDINGS

In this part of our thesis, we will elaborate on how entrepreneurial transformation plays out in practice at four different faculties without going into the analysis and comparison of the findings. The descriptions will be guided by our framework, which encompasses the changes and innovations in primary processes, the emergence of new structural arrangements and the incorporated entrepreneurial mission and strategy. We will start by quoting one of the professors who we interviewed.

> *"During the crisis (1991-2000), the most successful company [sic] in Novi Sad was the University of Novi Sad. It attracted 36.000 students from all over the country to spend their money in the city"*

5.1 TEACHING

Teaching is perceived as the most important activity of higher education institutions in Serbia. It also represents the principal channel through which faculties attain public and private funds. Therefore, faculties that are capable to attract a big number of students can also develop much faster than those who operate with fewer students. Starting with the question of what has or is changing concerning education, we cannot avoid noticing the important developments brought forth by the Bologna process. The Bologna requirements[14] have been embedded into the new LHE, making certain adjustments obligatory for faculties. The two tier system (undergraduate and graduate education), the ECTS, and the diploma supplement have become mandatory for all higher education institutions. Additionally to these developments, a national quality assurance system has been established. First, the institutions, and now their programmes have to be accredited. Certainly, these developments take up most of the attention of academics and faculty management. However, both of them represent also a source for new undertakings and innovation. To be accredited and to offer accredited programmes became a label for educational marketing, as well as the statement that "Our programmes are organised according to the Bologna requirements". This slogan portrays the intensive competition, which is going on among faculties (both within and across universities), should they be private or public. Besides, due to the entrepreneurial

[14] For more information on the Bologna process visit: http://www.ond.vlaanderen.be/hogeronderwijs/Bologna/

efforts of some faculties, also new markets emerged for adult education, distance education, certification, and so forth. Consequently, in this part, we will be concerned with the initiatives of faculties, which aim to exploit the emerging opportunities within the student market.

Starting with the *Faculty of Economics* (FE), we shall note that it is today the second biggest faculty of UNS, and hosts approximately 6.000 students. In order to differentiate itself from the Faculty of Economics in Belgrade, FE has concentrated its efforts to become a leading school in business administration and informatics, rather than to maintain a strong disciplinary focus on economics. One interviewee noted:

> *"We turn increasingly towards business administration in order to acquire a unique profile."*

Consequently, the FE has established six departments focusing on various aspects of business and management. Based on the student needs and global trends, the faculty has also launched several new programmes and courses in order to increase its attractiveness to future students. Among these initiatives is also the establishment of the youngest department, which organises the programme for European Economics and Business. As explained by our interviewees, this programme turned out to become very popular, and attracts many fee-paying students even nowadays. Besides the new programmes, the faculty actively engages also in certification. Not so long ago, it has obtained the licence to run the training and examination for the ECDL (European Computer Driving Licence). The first level of this prestigious certificate is offered free of charge to students, however, it is also available for non-students who are willing to pay for it. Similarly, since 2005, FE has become a national centre for the implementation of language courses under the ECL (European Consortium for the Certificate of Attainment in Modern Languages) standards, which leads to an internationally recognised language certificate. Additionally, FE also actively seeks out opportunities to engage in commercial teaching activities, mainly in the form of short-term trainings. The faculty has already delivered trainings in various business skills for companies and their employees. One of these trainings was on the topic of successful project proposals writing, and due to its vendibility, it generated substantial extra income for the faculty. Yet, the faculty also demonstrates it entrepreneurial attitude, by opening up a new market for distance education, which is a very underdeveloped segment of higher education in Serbia. Even though their "eLearning" programmes still have to undergo accreditation, there is an

intention to offer a wide range of programmes not just in business administration and management, but also in sociology, philosophy and foreign languages. To sum up, we could state that there is a visible increase in the number of educational programmes and an obvious reach out to new customers, especially if the programme has a high market value and if there is a large interest for it. All of these initiatives have contributed to the fact, that FE is today among the most popular faculties in Vojvodina, with almost two times more enquirers than available study places.

The *Faculty of Philosophy* (FP) gives place to 4.555 students. It has kept its traditional chair system, and currently covers the disciplines of philosophy, history, literature, sociology, pedagogy, psychology, journalism and several language chairs. Because its widespread disciplinary focus, it cannot qualify as a faculty that hosts exclusively soft-pure disciplines, rather a mixture of pure and applied ones. Moreover, there is a strong focus on professional preparation of students for their future careers. As one interviewee explained:

> *"... most of the students will move on to become employed by public institutions, and most probably in the area of teaching and education. Therefore, the obligation of our faculty lies within training students for their teaching profession."*

Hence, aiming for the highest quality in education and modernising teaching practices is central to the faculty's development. Similarly, to the Faculty of Economics, FP also seeks to strengthen its attractiveness by introducing new and more attractive programmes. Journalism, which is the youngest programme and chair, has become just in a few years the fourth most popular programme for students, besides psychology, pedagogy and English language studies. Due to the big number of applicants to the outlined programmes, the faculty has taken measures to harvest some of the financial benefits that come with increased interest. Higher tuition fees have been adopted for the "top" programmes[15], and preparatory classes are being organised to future students for the entry examination. In other words, the "numerous clauses" system in Serbia, which predetermines the number of government subsidized study places, and the excessive student interest for certain programmes, has been creatively exploited by FP. However, this is not the only area where the faculty seeks to take

[15] Even though the Ministry of Education has the right to influence the level of recommended tuition fees, there was not much example of such interventions so far (Vukasovic, et al. 2009, p. 86).

advantage of its possibilities. For example, the pedagogy chair maintains close relationships with local schools, and offers short-term trainings relevant for the profession, and participates in the certification of teachers. Accordingly, an interviewee mentioned the following:

> *"Our main product is education and therefore it is vital for us to sustain the primacy in the advancement of the profession itself."*

On the other side, the psychology chair has undertaken initiatives to connect more closely with the industry, and offer special trainings for companies in HR management skills, or stress relief for employees. However, these activities have stopped due to unknown reasons for us. The psychology chair was also the first to adopt evaluation methods in their practices, even before it has become an accreditation standard. As a result, it has been invited to perform the evaluation of the whole faculty, which has been described as a great success and recognition for the chairs efforts. Besides pedagogy and psychology, the language chairs also engage in organising short-term courses for both students and non-student. They are especially specialised in teaching the languages of minorities in Vojvodina. However, except the above outlined somewhat applied fields, the majority of chairs has little going on with respect to new initiative that would enrich their teaching activities. Because the faculty's close relationship with the ME and generally the public sector, the institution relies very much on governmental initiatives. In this respect, Stark (1998) has already outlined in her study that human client fields tend to maintain close linkages with state legislatures (Stark 1998, p. 371). Therefore, the start up of new programmes at FP is very much in line with governmental recommendations. As explained by one of the vice-deans:

> *"We are obligated to harmonise our programmes with the needs of the labour market. However, so far we have not received any recommendations from the governmental agencies to introduce new study programmes."*

The fastest growing unit of UNS is the *Faculty of Technical Sciences* (FTS). It has a little over 9.500 students and 13 departments, from which some host several chairs. During the last ten years, the faculty has introduced four new departments with corresponding study directions and was among the first to start the implementation of the Bologna requirements. The faculty is especially proud on the fact, that it was the first institution who issued a diploma supplement in Serbia, which was chosen by the Serbian Ministry of Education as a model to be followed by all other faculties in the country. Their success concerning the

implementation of the Bologna requirements, has given the faculty a decent competitive advantage in attracting future students who were seeking a globally recognised diploma. Besides, they were also ahead of other faculties within UNS, regarding the adoption of ICT for educational purposes. The dean of FTS ambitiously notes:

> *"The Faculty of Technical Sciences has become a driving force of reforms at the University of Novi Sad, which is the leader in changes in Serbia"*[16]

The innovative potential of FTS is often explained in the context of their ability to maintain excellent relationships with foreign universities, and successfully import practices related to teaching from the "west".

The *Faculty of Sciences* (FS) hosts 5.665 students. It is organised into five departments covering the disciplinary fields of biology and ecology, physics, geography, chemistry, and mathematics together with informatics. Many of these hard disciplines use expensive equipment for teaching purposes. However, FS is the cheapest faculty to study at from our sample, with an average study fee of 620 Euros per year[17]. The low study fee is the consequence of the faculty's struggle to fill up the available study places. Nevertheless, this faculty can also pride itself on having a "popular" department that attracts many students. The geography department has introduced programmes lately for management in tourism, hunting and hotel services. These programmes obtained grate popularity within a short time and draw a large number of fee-paying students to the faculty. Hence, also other departments decided to move towards more specialised programmes in order to increase their student numbers. An interviewee from the chemistry department noted the following:

> *"Before we used to educate students in general directions. However, we saw what the trends in other courtiers are and now we have expanded our offer with multidisciplinary study programmes, like biochemistry. This was necessary, because in the contrary we would not have enough students only for chemistry."*

[16] Retrieved from the website of FTS. Link: http://www.ftn.uns.ac.rs/index.php?mode=view&action=document&document=17

[17] Retrieved from Infostud. Link: http://prijemni.infostud.com/upisne-kvote-skolarina-07-08-novi-sad.php

Biochemistry and environmental studies are just some of the examples that have been established according to European tendencies. However, even with new programmes, some departments still face a decreasing interest of students, therefore, many of them engages in various promotional activities and school visits as well. Correspondingly, the faculty has set up a new centre for candidates support to aid future applicants.

5.2 RESEARCH AND SERVICE

The following subsection deals with entrepreneurial initiatives that take place within the faculties' research and service functions. The statute of each faculty provides a very detailed description of activities that belong to these functions. Usually it encompasses the conduction of research activities, consulting, publishing, and student services. Accordingly, we will focus on initiatives that are undertaken with the aim to tighten the link between these activities and the market, especially with what we will call the "grant market". The grant market describes the competition for various research, educational and cooperation funds. The agencies or institutions, who manipulate with these sources, have a very clear policy agenda, and complying with their expectations yields additional financial and material benefits for the faculties. In general, after governmental funding, and student fees, the third most important source of income is obtained on the grant market. However, it is not strictly limited to financial benefits, but also enables institutions to purchase modern equipment, engage in international research activities, and to strengthen their capacity by employing assistants. Then again, the competition for grants usually leads to the encouragement of applied research, because both national and international funds are increasingly linked to utilitarian parameters.

The *Faculty of Technical Sciences* is the most highly developed technical institution in Serbia[18], and employs over 600 academics, out of which 60% are assistants. The faculty and its departments are very successful in connecting their research and developmental work with the needs of the market. They are constantly working towards exploiting the abundance of opportunities available for their specialities. For example, the faculty maintains a vivid cooperation with many national and even some international companies like SIEMENS,

[18] Retrieved from the website of FTS. Link: http://www.ftn.uns.ac.rs/english/

TOSHIBA, and FESTO. Through these connections, they constantly engage in knowledge transfer activities and realise R&D projects that address concrete problems. The faculty has contributed also to the establishment of approximately 35 spin-off companies, from which some still operate within the faculty's buildings. These companies perform the commercialisation of technologies that have been created by the faculty and most of them are run by academics, with a few exceptions, where students were the initiators. Furthermore, the departments at FTS also offer various services to public and private companies, such as environmental risk assessment, design of entire factories, energy usage rationalisation, statistical data analysis, introduction of management systems, and so forth. The faculty has also developed a standardised contract sheet for commercial cooperation (services) and made it available for all of its departments. Additionally, the faculty also established a database of companies they worked with, and services they conducted. These processes indicate that FTS has successfully institutionalised collaborative arrangements with the private sector. As described by one of our interviewee, these activities congregate into a "virtual science and technology park" in which the needs of private companies and the potentials of researchers and students meet. Moreover, we could say that the faculty established a healthy symbiosis among its commercial activities and its public mission. Their industrial partners have the privilege to capitalise faculty inventions and have access to the best students, while the faculty receives access to modern laboratories, acquires financial benefits, and incorporates the companies experience into its programmes and curriculum. Besides knowledge transfer and commercial services, the departments at FTS are also very successful in attracting national and international research grants. In this sense, the most progressive units are the Department of Production Engineering and the Department of Power, Electronics and Communications Engineering. They participate in several national and international projects, such as FP6, TEMPUS and WUS Austria.

The *Faculty of Economics* employs 103 academics out of which 28% are assistants. The faculty has developed a very close relationship with the business world, and has carried out many research projects and studies to meet the needs of enterprises for advancing and increasing their productivity. In addition, one interviewee noted:

> *"The increasing domestic and European funds available for Serbian faculties will help to reintegrate research into the daily life of the institutions."*

FE also participates in projects that are concerned with institutional capacity building concerning education. The funds for these projects have been attained on the grant market through national and international (INTERREG[19], TEMPUS) sources. In order to maximise their efficiency in attracting more grants, the faculty has set up a Centre for National and International Projects. This centre is responsible to disseminate information regarding calls for proposals, and to provide assistance in the process of application. Besides their thriving participation on the grant market, the faculty also successfully engages in consulting activities, and delivers advanced knowledge in the fields of management, economics and informatics to their partners, out of which the majority are big public companies. However, due to the recent financial crisis, the number of these contracts has significantly fallen. Furthermore, FE pays much attention on expanding its student services. Not long ago, it has managed to acquire the facilities of a public company, which has gone broke, and transformed it into a modern sport and fitness centre. The sport services there are available both for students and nearby residents, making their centre not just sustainable but also profitable.

The *Faculty of Sciences* operates with 313 staff members, out of which 38% are assistants. They are the most successful faculty in terms of attracting research and cooperation grants. FS is especially doing well in the European FP6 and FP7 programmes, which are perceived as the most prestigious ones, because they also contribute to the faculty's scientific reputation and nevertheless yield a high level of financial support as well. One professor noted:

> *"First of all we apply to national calls. However, we also aim to secure European grants, where the projects are more serious and more money is involved."*

In the beginning, the departments aimed to increase their scientific competence through projects, in order to be able to engage in large-scale research activities, however, as noted by one of the interviewees, many departments still face shortcomings in terms of human capital, which hinders their success in competition with other European institutions. Nevertheless, the faculty shows a high level of responsiveness to the demands of the grant market. For

[19] The overall aim of the INTERREG programme is to improve the effectiveness of regional development policies and instruments through large-scale information exchange and sharing of experience. Link: http://www.interreg3c.net/sixcms/list.php?page=home_en

example, they put great emphasis on developing multidisciplinary approaches to concrete problems and also try to foster their cooperation with the private sector, which is often a requirement for attaining research grants. An interviewee noted in this respect:

> *"With a multidisciplinary approach we not just become more attractive for students, but can obtain also increasing number of European grants."*

Consequently, they have attained participation in several European research projects concentrating on environmental protection, agriculture, and meteorology. FS provides also different services to local companies, and mainly to the big public ones. These services usually involve consulting, different sorts of analysis, and advices regarding environmental protection. However, there is a slight disparity among the departments with regards to the number of projects and cooperation with the industry. The geography department, which has achieved much on the student market, can account for the least number of research projects (close to zero), while the other departments have in average six international projects going on[20]. Also in terms of industrial cooperation, the biology department was described as having the most contacts with the industry, due to their close involvement in agricultural research, which is the dominant industry in Vojvodina. However, in terms of knowledge transfer, most of the ideas and solutions developed by the faculty stay in the drawer. As explained by one of the interviewee:

> *"Due to the harsh status of Serbian economy there is luck of external interests in our research outcomes... even though we have good results in solving problems, these plans have rarely been applied in practice after a project has been finished."*

The *Faculty of Philosophy* employs 376 academics, with 45% being assistants. Their research activities are predominantly financed through national sources, however, chairs like journalism, psychology and history also participate in international projects financed through TEMPUS, INTERREG or FP6. Most of these projects and studies focus on culture, education, and curriculum development. Besides their research activities, the faculty maintains a very close cooperation with its main stakeholders, that is to say, with professionals working in education. Because the faculty's main business is education and

[20] Obtained from the website of the FS. Link: http://www.pmf.uns.ac.rs/view.php?page=6-Istrazivacki-rad-i-saradnja&subpage=41-Medjunarodna-saradnja&lang=srp

culture, which is primarily channelled into society through the public sector, there is not much space for interacting with private companies. However, we can still identify an intense knowledge transfer from the faculty to public schools, mainly through trainings and courses that are generally financed by the ME. Besides, as we have described already with respect to teaching, the faculty has numerous commercial training programmes. Correspondingly, and interviewee noted:

> *"The third aspect (providing services) is important because it signals that we do not have to rely solely on governmental support. It is about sustainability."*

5.3 INCREASED MANAGERIALISM

The Serbian higher education sector is characterised by highly disintegrated universities, where the faculties' deanship is in charge of educational, research and service activities that go on at the departmental or chair level. They manage the operative tasks while the decision making power lies within the faculties' council. The power of the universities rector office is very limited. As described by an interviewee:

> *"The rector's office is like the British monarchy. The queen is there, but has not much power to influence what is going on at faculties".*

Whereas, the dean's office is capable to put forward and implement faculty wide changes. However, their role as advocates of change depends very much from the persons who hold the positions. A professor mentioned the following:

> *"We have the tradition that our professors are elected for the top management positions. Therefore, it is up to them, whether they make use of their new positions as leaders, or just pass by almost unnoticed."*

During our interviews, we encountered both passive and proactive management, with different concerns. The initiatives that come from the dean's office usually have to reach a consensus before they can be applied. The consensus on future developments is achieved through the faculties' collegium, which is an open forum between the deanship and the heads of departments/ chairs. This practice suggests that the faculties have a democratic and collegial internal governance structure. If the deanship is persuasive, it can set the directions of development and because of that, it is a key player when it comes to entrepreneurial

transformation. Therefore, in this part, we will concentrate on the faculty level management rather than the university one. Additionally, we aimed to explore whether there have been changes in the structures and procedures of the deanship, and what the deanship's role was concerning the described developments in the primary activities.

The deanship of the *Faculty of Philosophy* consists of a dean, a vice-dean for education, a vice-dean for finances and a vice-dean for science and international cooperation. They are responsible to manage all aspects of the faculty's activities, and also to provide guidelines regarding future developments and initiatives which affect the whole faculty. Currently, their primary intention is to ensure that all programmes pass the accreditation process and that adequate quality assurance measures are in place within the faculty. The deanship is also very active in encouraging the modernisation of teaching at the faculty. For example, the leadership of the faculty has introduced lately a student web service. Less, but also importantly, the deanship monitors the ongoing national and international projects run by the chairs, and looks out for new opportunities on the grant market. This task is consigned to the vice-dean for science and international cooperation (The Statute of FP, p. 19). However, as we discovered, the initiative for starting up new projects lies primarily within the chairs, while the deanships role is concentrated more on providing administrative assistance and ensuring that the regulations of the faculty are adhered.

The *Faculty of Sciences* has three people in the deanship, which are responsible for teaching, finances, and international cooperation and R&D. The deanship, and especially the vice dean for international cooperation and R&D, is in charge to coordinate international research projects, while the initiatives to start up such activities should come from the departments (The Statute of FS, p. 20). Thus, the deanships role is more of a supportive nature, where they provide information and advice in writing project proposals. In addition, they are also encouraging individual professors to participate more actively on the grant market. However, not all the professors are skilled enough to attract research funds. Most of the projects that have been started up at the faculty are the results of the work of a few individuals.

The *Faculty of Economics* has five persons in the deanship with one manager being responsible for the faculty's branch in Novi Sad. An interviewee mentioned that every new dean brings also new ideas and directions to the faculty's efforts. While the previous deanship paid much attention to strengthen the faculty's networking with other similar institutions and the private sector, the current deanship focuses primarily on accreditation

efforts. However, they still encourage departments to diversify their funding through projects and services. This is also the main reason, why the deanship has created a Centre for National and International Projects, which acts as a strong support structure in the process of attracting research and project grants (The Statute of FE, p. 6). Additionally, the deanship takes a proactive approach also in expanding the periphery of the faculty. Most of the new centres have been initiated by the deanship with the support of the departments. Their central role in initiating change was also remarked by an interviewee:

> *"It is important that the initiative comes from the deanship, but has to be also supported by the individual professors."*

The *Faculty of Technical Sciences* has a five person deanship with a unique vice-dean position for investments and cooperation with the industry. FTS also pulled together the provision of its technical services and appointed a Faculty Manager to be in charge of it. In addition, it is the only faculty from our sample, who also involved the centre directors to participate in the faculty's collegium (The Statute of FTS, p. 17). However, probably the most remarkable innovation in terms of management is the introduction of the ISO 9001 standards[21]. These standards stand for formalised business processes in the area of quality management which enable the deanship to monitor processes, check outputs, and facilitate improvements where needed. In this sense, the deanship is capable to maintain an oversight over the numerous activities and projects of its departments, however, they rarely interfere directly with the work of departments, except in cases when it concerns the educational function of the faculty.

5.4 EXPANDING PERIPHERY

As Burton Clark noted, the expanding periphery is vital to link up with external needs and to advance the project orientation of the work (Clark 1998, p. 6). The periphery encompasses all the centres (or any other type of units), which are different from the traditional departments, and aim to make the university more sensible the needs of the socio-economic environment (Miclea 2006, p. 112). Moreover, because the grant market favours interdisciplinary and problem-oriented research, many emerging centres can be perceived as

[21] For more information on ISO 9001 look at:
http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=46486

a response to these opportunities or are a direct outcome of a concrete project. We can also find centres whose primary task is to commercialize faculty knowledge expertise, or to provide special services to students. In most of the cases, these centres operate on an independent budget and their development depends from their success in attracting funds. Each faculty that participated in our interviews has a number of these centres, whether they focus on teaching, research projects, or commercial services. In the following part, we will elaborate on the number and types of these centres and what role they play in the exploitation of market opportunities.

The *Faculty of Philosophy* has 7 centres, which are formed in order to provide expert services (The Statute of FP, p. 10). The majority of these centres belong to the language chairs, and they organize language courses for students and non-students. There are also centres that focus on teachers training, quality assurance in education and offer preparatory courses for professors who are about to take their teachers examination. Their primary clientele is to be found in the public sector, but some centres, like the Centre for Applied Psychology and the Centre for Sociological Research, have also successfully cooperated with private companies. Besides providing expert services, centres also offer a base for the development of interdisciplinary fields, and contribute to the diversification of available subjects at the faculty.

The *Faculty of Technical Sciences* has all together 17 centres, from which the majority is focused on research activities in specific and often multidisciplinary fields (Enactment 2006, p. 9). Their emergence is closely related to the requirements of the grant market, thus they aim to occupy new knowledge territories, which are highly supported by national and international donors. However, they also provide commercial services and maintain a close relationship with the business world. Therefore, FTS has established an additional office for the regulation of its commercial activities. Besides new research centres, and offices, the faculty is also supplemented by several spin-off companies. Their role as mediators between practice and learning is supported by the fact that some of them provide possibilities for student’s practical placements. On the other hand, the company leaders also hold presentations at the faculty once in a while. Beside the information that these spin-off companies contribute to a more practical education at the faculty, they also have a crucial part to play in obtaining external funding. One professor noted:

> *"One of our spin-off companies has developed a software for NOKIA. The faculty, which owes 5% of the shares in this company, now earns symbolically 1 Euro on every NOKIA mobile phone sold around the globe."*

Due to the benefits that spin-off companies bring to the faculty, they are also highly appreciated by the professors.

> *"I see spin-off companies as our main stakeholders and their expectations should be on the first place. We educate students for their purposes, and we also expect the most help from their side."*

Consequently, the diverse periphery of FTS is directly linked to the faculty's success in other areas, such as teaching and research, and is also the fastest growing one among the faculties we visited, where two to three new units emerge every year.

The *Faculty of Sciences* has a somewhat underdeveloped periphery compared to its size. The centres at the faculty concentrate mostly on research activities for which they obtain funding through the grant market. FS was among the first who has been enriched with centres of excellence, a special state recognition for advanced research activities in a certain field. There are two centres of excellence, one in the field of mathematics and one in chemistry. Besides, these centres, there are also other multidisciplinary centres which run research projects in meteorology, agriculture, and environmental studies. Moreover, the faculty has established a committee for TEMPUS projects, which facilitates and supports the realization of projects within this European programme. However, besides research projects, the centres activities rarely focus on the commercialization of knowledge or on the provision of expert services, even though the faculty's statute foresees the possibility for that (The Statute of FS, p. 6).

The *Faculty of Economics* has five centres, which are defined as profit oriented units (The Statute of FE, p. 9). Their establishment was the outcome of the faculty's need to become more responsive to the grant market and to provide commercial services to the society. While the departments focus mainly on the delivery of educational and research activities, the centres are the ones that generate new ideas, projects, and inevitably also profit. The Centre for National and International Projects deals exclusively with ongoing research, education, and cooperation projects. The Centre for Information and Documentation runs the ECDL programmes. The Education Centre organizes short-term trainings in business skills.

The Centre for Foreign Languages provides education in several languages and also deals with certification. The Sports and Recreation Centre is in charge of sport tournaments and the faculty's fitness programme. Thus, we could state that most of the existing centres at FE focus primarily on service provision. One interviewee mentioned the following:

> *"These centres are small doors towards business and profit, while departments are more concerned with teaching and research."*

5.5 THIRD STREAM INCOME

The Serbian government (through the ME and the MSTD) is still the largest funder of higher education. However, that funding never covers more than 85% of the total costs of higher education (Mantl, et al. 2009, p. 97). This serious shortcoming is the main driving force behind entrepreneurial initiatives at Serbian faculties. Most of the institutions try to collect the remaining funds on the student market. The average student fee amounts to 750 Euros per year (Vukasovic, et al. 2009, p. 92), and with the administrative surcharges that students pay for exams, registration, and so forth, it becomes the most valuable market to exploit[22]. Following private investments of students, the next most important income source is the third stream income. This term covers the funds that have been obtained on the grant market, or through commercial activities and close cooperation with the business sector. Both student fees and third stream income constitute the faculties' personal receipts, and the faculties are not obligated to account for them in detail, neither to the government, nor to the university (Ibid., p. 101). Consequently, it is almost impossible to acquire reliable data on the amount of these incomes and we will deal mainly with approximate percentages. However, we know that there are visible disparities between faculties in terms of their third stream income and no cross subsidizing mechanisms in place to ensure equal development. Therefore, we will attempt to map out the differences in the level of third stream income and explore how these extra sources are invested.

The *Faculty of Philosophy* reported about a very low level of third stream income. Most of the funds come through the centres who offer teaching and consultancy services for the population. Some income is also obtained by engaging in projects and by donations. The

[22] Administrative surcharges in Serbia can reach up to 20% of the total budget of an institution (Vukasovic, et al. 2009, p. 87)

earnings are then usually divided between all levels involved. This means, that the faculty gets a certain percentage because the income was generated by using faculty facilities or equipment, and the chair and centre reserves a certain amount for future developments. These developments usually include the strengthening of human capital by investing into study visits and participation in international conferences. Third stream income is also used for modernizing equipment for educational purposes.

The total income of the *Faculty of Technical Sciences* has increased 10 times in the last five years, and by 28,42% in comparison to the year 2007[23]. This income boost was the result of the multiplying number of fee-paying students and projects with industrial firms. However, the faculty also acquires noticeable income through donations, especially from the spin-off companies that operate alongside the faculty. As one professor mentioned:

> *"It is like an alumni association but with companies."*

All these developments, led to the fact that FTS covers almost 50% of its total expenditures from student fees and third stream income. Departments handle independently their third stream incomes (Enactment 2006, p. 8) and devote the majority of income for research activities. Presently, 50% of all the investments at FTS are targeted towards the strengthening of research capacity (UNS 2009, pp. 46-47). This involves both the purchase of laboratory equipment and human capital development. However, because the public funding is not in harmony with their rapid growth, the faculty and its departments also use some of their third stream income for subsidizing teaching activities. As explained in detail by one of the professors:

> *"We have approximately 30.000 m^2 of space, from which 70% is used for educational purposes, but the government covers only 35% of the maintenance costs of these premises. Therefore, our third stream income is also used to subsidize some aspects of education."*

Regarding the *Faculty of Sciences*, we have little reliable information. We know that the faculty lacks fee-paying students, but we do not know to what extent is that shortage replaced by third stream income. Even though their statute approves the right to attain funding from donations, projects, consultancy work and commercial activities (The Statute

[23] Retrieved from the website of FTS. Link: http://www.ftn.ns.ac.yu/english/about/word.html

of FS, p. 55), there is no evidence to show how frequently these channels are actually used. However, as it was explained to us, the third stream income is increasing, especially due to the participation in several international projects, through which the faculty could also modernize its laboratory equipment.

The *Faculty of Economics* supplements weak governmental funding primarily with student fees. However, due to their wide spread commercial activities, they also obtain up to 15% of their income from other sources. Third stream income is generated primarily on the grant market by participating in projects, and also by various services that the faculty offers. Then again, the income is channelled back to educational activities and spent for modernization of teaching equipment and infrastructure. As one professor ironically noted:

> *"Due to our engagement in projects, we managed to increase the number of computers at the faculty from 50 to 500. Today, only our cleaning ladies have no computers."*

5.6 ENTREPRENEURIAL CULTURE

The concept of entrepreneurialism has not yet reached much attention in the Serbian higher education sector. Academics tend to relate its meaning to the start up of businesses, and according to most of the them, it has more relevance for students than for them individually or for their institution. Thus, most of the professors would describe entrepreneurialism at the faculty in the context of a subject or a programme, through which students are educated about the practices and measures needed to form a company. However, an interviewee mentioned the following:

> *"Professors do not have to know what entrepreneurship is, but they have to accept the philosophy of it."*

This opinion was expressed in connection with the perception of universities as proactive institutions who seek to foster the link between industry and higher education. In this respect, the most valuable contribution comes from the UNESCO Chair for Entrepreneurship, which operates as part of UNS. The chair seeks to establish master studies in entrepreneurship and also actively promotes an entrepreneurial culture inside the faculties. Thus, in the following part, we will be concerned with the values and attitudes faculty members hold regarding the new initiatives their faculties engaged in, and we will also try to map out how widespread entrepreneurial culture is.

An interviewee at the *Faculty of Technical Sciences* noted the following:

> *"It is expected from us to provide education and to advance teaching, but also to give practical results."*

Moreover, he added:

> *"It is not enough to have a brilliant idea and to hope that somebody is going to implement it!"*

Therefore, FTS constantly seeks out ways to transfer its knowledge from theory into practice. The number of spin-off companies has become their main figure to demonstrate their success in knowledge transfer and to underline their prestige. Moreover, there is an internal competition going on among professors concerning who has the best ideas, whose company will have the biggest turnover at the end of the year, who has the most employees, and who can make the most profit. Inevitably, the person who is the most successful will also receive the respect of the other colleagues. Nevertheless, we are far from saying that this is a faculty wide phenomenon. Approximately 10% of the total number of professors is directly engaged in the work or management of a spin-off company. If we would add also those who are engaged in other type of entrepreneurial activities or run centres for example, then the number would slightly increase. The spread of entrepreneurialism among professors is closely related to the fact that those professors who successfully obtained funds, through commercial activities or through projects, could renew their laboratories and therefore encouraged others to follow their lead. However, the willingness to pursue new opportunities is still limited to a few academics, and is especially pronounced among "younger" ones. Consequently, it is maybe worth to notice, that FTS has one of the youngest collective, with the average age being under 40 years[24]. Additionally, FTS has taken steps to promote an entrepreneurial culture among students. In cooperation with MSTD, since 2005 the faculty organises a competition on national level called the Best Technological Innovation[25]. It not just encourages students to come up with innovative ideas, but also places a great emphasis on educating the participants how to exploit their ideas on the market.

[24] Retrieved from the website of FTS. Link: http://www.ftn.uns.ac.rs/english/about/word.html

[25] Retrieved from the website of the project. Link: www.inovacija.org

We can find a slightly different situation at the *Faculty of Economics*. In general, their collective consists of older professors who tend to be more passive when it comes to new initiatives. The academic core devotes most of its time to educational activities, and also prefers individual work. As a result, there is lack of collective undertaking which would be necessary for larger projects. In this respect, a professor has remarked the following:

> *"You cannot organise professors according to projects, because they are strong individuals and they like to work alone."*

However, an entrepreneurial attitude has been strongly demonstrated by the deanship, which also led to the establishment of several new centres, services and programmes that aim to exploit the market opportunities. In addition, FE has also introduced the subject of entrepreneurship to advance the knowledge of their students about business development.

Change in the non-formal structure of the *Faculty of Sciences* is happening very slowly. The faculty lacks young academics that would be motivated and willing to initiate new projects. Moreover, because the executive power is still in the hands of the older professors, there is a low success rate of new ideas. However, the faculty has realised the need for a more dynamic organisation, and therefore has taken steps to include some of the young and talented academics into its management.

The comfort of previous practices predominates also at the *Faculty of Philosophy*. In general terms, the old collective tends to be more resistant to changes that might affect their teaching practices, but welcomes other types of developments. Similarly to FTS, it was noted, that when a chair introduces innovations, which turn out to be successful, that encourages others to follow their footsteps.

5.7 NEW MISSION

The vision of UNS is to become an integrated university with the highest level of international excellence in teaching, research, arts, and entrepreneurship (The Statute of UNS, p. 1). Thus, entrepreneurship is listed as one of the main characteristics that the university should strive for. Additionally, the statute of each faculty describes departments as being entrepreneurial organisational units, except in the case of FP, who does not refer to departments in its documents. On the other hand, an entrepreneurial mission encompasses more than just a declarative statement of orientation. An interview stated:

> *"The idea of entrepreneurship is present, but there is no strategy to enforce it."*

Thus, entrepreneurialism has to acquire a meaning through the faculties' policy documents and be translated into concrete measures that facilitate the new activities and emerging structures. Therefore, we are going to describe whether the official documents of our faculties go beyond the symbolic statement of being entrepreneurial.

The statute of the *Faculty of Technical Sciences* sets forth that its chairs conduct teaching, research and entrepreneurial activities (The Statute of FTS, p. 10), whereby they refer to knowledge transfer between the institution and the industry sector and to services that chairs offer to private or public companies. Moreover, FTS has a so-called innovation function. As described by the statute, this function refers to the creation and implementation of new or advanced products, technologies, processes and services. The statute also clarifies that under implementation, it means the commercialisation of the developments according to the needs of the market (The Statute of FTS, p. 8). In the statute of the *Faulty of Economics*, we have encountered a strong service function. The document states that departments shall provide services to the society in cooperation with the centres (The Statute of FE, p. 6). Additionally, it is stressed, that departments shall engage in research projects, and for the commercialisation of their outcomes the Centre for National and International Projects is responsible (Ibid.). The statute of the *Faculty of Sciences* portrays a clear pathway for entrepreneurialism. It identifies the right of the faculty to establish new units that aim to tighten the link between higher education, science and practice for the sake of providing infrastructural support and linking research and innovation units to private entities (The Statute of FS, p. 6). For that reason, the faculty has enlisted several types of outreach and developmental organisations (innovation centres, business incubators, science parks, etc) which might be established. Moving on to the *Faculty of Philosophy*, we have to state that we could not find in their official documents any indication or reference to entrepreneurship, innovation, or cooperation with the private sector, except the outlined right of the institution to acquire funds through market activities.

6. ANALYSIS OF THE FINDING

In this part, we will compare and analyse the variations in entrepreneurial transformation in light of disciplinary differences. We will separately look at entrepreneurship in primary processes, on new structural arrangements, and on the emergence of a third mission. First, we will outline those elements, which appeared as a common trend among all the faculties.

Probably the most remarkable occurrence regarding teaching activities was that all the faculties have started up at least one new programme during the last ten years. Moreover, these programmes seem to have been initiated with the aim to attract fee-paying students to the faculty. Consequently, they are all multidisciplinary, they would all qualify as applied, and they appear to be also the most attractive programmes for students. In this manner, FE has introduced European Economy and Business Studies, FS introduced Management in Tourism, Hunting and Hotel services, FTS introduced Graphical Engineering and Design, and FP introduced Journalism. These initiatives portray the willingness of disciplinary fields to organise future expansion according to the needs of the student market. However, we should not overemphasize this tendency. The establishment of new programmes at faculties is highly dependent on the available resources individual faculties have. In this manner, one interviewee noted:

> *"We often make programmes according to what kind of professors we have, and not according to the needs of the society."*

Without neglecting this argument, we can still conclude that the majority of new programmes have a multidisciplinary and applied character. This trend is also visible when it comes to research activities. Due to the fact that research grants are allocated according to utilitarian values, the disciplines increasingly seek to establish research teams that focus on a context specific phenomenon and try to offer short-range solutions to problems. Besides, it was also remarkable, that all the faculties reported to be engaged in offering different types of commercial services to the public or private sector. In spite of the financial and human capital limitations of the Serbian higher education sector generally, these common trends nevertheless describe a high level of sensibility towards external needs, whether we speak about students, funding agencies or the industry.

However, we have also spotted several differences in the way, faculties have engaged in entrepreneurial activities. Most of the developments in teaching, besides the Bologna

inspired ones, have been in favour of customer needs. This is very much due to the increasing competition on the student market. Faculties constantly aim to introduce new programmes and courses, modernize their teaching, and engage in promotional activities in order to attract more fee-paying students. However, as we have seen, the students clearly favour soft-applied programmes. Consequently, the most successful institution has been the Faculty of Economics, which has managed to turn itself into a magnet for students. Currently it has a 58/1 student-teacher ratio, which is three times higher than at any other faculty we visited. Besides offering attractive undergraduate studies, it also introduced short-term certification programmes into its regular teaching activities. Moreover, it is also the closest to introduce distance education as new type of activity. Clearly, the faculty is taking steps to exploit the benefits that come with high student interest in their subjects. Similarly, most of the soft applied fields at the Faculty of Philosophy face exaggerated number of student applications to their programmes. Therefore, these fields have introduced preparatory classes, as means by which they not just help to prepare future students for the entry exam, but also acquire additional financial resources. Thus, the increased student interest has encouraged the faculties of philosophy and economics to engage in educational entrepreneurship, not just to further develop their capacity to accept fee-paying students, but also to take financial advantage of their popularity.

In the latter case, hard sciences at the Faculty of Technical sciences and the Faculty of Sciences, have rarely engaged in initiatives other than to increase the attractiveness of their programmes. While in most countries, the enrolment rates in engineering fields are flagging, the FTS has managed not just to maintain their student numbers, but also to increase it noticeably. Partially, this might be explained by the fact that the faculty has placed a large emphasis on increasing the value of its degrees. The FTS was the first faculty to introduce diploma supplements and made their degrees internationally recognised. Even a phrase came to be shared among student, which stated that a degree from the FTS equals a visa. Moreover, the faculty also successfully modernised its teaching practices by employing ICT, and is among the leading institutions in terms of implementing the Bologna requirements. These initiatives have certainly contributed to the huge success of the FTS, and enabled it to increase its student number. Similarly, the FS has also undertaken actions to become more competitive on the student market. Besides introducing more specific programmes and multidisciplinary studies, they also engage in marketing activities and have just recently open up a centre to help future candidates. However, the hard-pure disciplines at the FS still

face difficulties to attract enough students, and especially fee-paying ones. This is also the general tendency at the soft-pure chairs (History and Philosophy) of the FP.

We noticed already, that faculties are very keen to compete for project funding on the grant market. Their interests were oriented primarily to the international funding sources, such as TEMPUS, INTERREG, WUS, and the FP. Besides the argument that international sources offer higher financial benefits than the national ones, the faculties have also emphasized that these programmes enable their departments to foster their networking capacity with other similar departments abroad. In this respect, we have observed that hard fields (FTS and FS) were keener to engage in projects than were soft fields. Moreover, comparing the type of the projects shows that the other faculties that host soft disciplines participate mainly in projects concerned with the advancement of education and teaching, or cooperation. On the other hand, hard disciplines favoured research projects and projects that enabled them to improve their infrastructure. This was especially the case at the FS where the number of FP and WUS Austria projects (research oriented) dominated over TEMPUS and INTERREG ones (cooperation oriented). Out of this reason, we encountered a large number of research teams inside faculties with hard disciplines. These teams were organised in order to conduct research in specific multidisciplinary areas, such as environmental issues, sustainable energy development, and agricultural research. They are not just the primary units that absorb research grants, but are also the main developers of new knowledge, and consequently often the sources of spin-off companies. However, soft fields were often lacking such research teams. Drawing on Becher's work, this difference might be explained by the sociological characteristics of disciplines, whereby scientists in hard fields tend to work in teams, while soft fields prefer individual work (Becher 2001, p. 107). Certainly, this difference has led to the condition, that the faculties, which host hard sciences, were more concerned with the commercialisation of their research outputs, than of education, which was often the case in soft fields. Thus, in terms of research, the hard sciences can account for most of the innovations. However, we could also observe that hard-applied fields were more successful in knowledge transfer, especially in creating spin-off companies, than were hard-pure fields.

This leads us to our third aspect, which involves the analysis of the service function of faculties and their departments. In this respect, all the departments reported to have a history of offering services to external stakeholders, whether are those companies or individuals, public or private. Soft fields, usually offer short-term trainings and consultancy services. In

this respect, the FE reported to have conducted trainings for the business sector, language education, and ICT related consultancy activities. FP also provides language courses and organises trainings for and certification of teachers. These services have a strong educational character, which is generally dominant for soft fields. On the other hand, hard disciplines tend to offer technical services, which range from design to various measurements. FTS was the most advanced in this sense, because their departments have a clearly elaborated list of specific services they are willing to offer for private or public companies. Even though, the service function seems to be less institutionalised at FS, they also regularly engage in providing expertise to companies. Besides the already mentioned difference, that soft fields prefer education related services, while hard fields focus on more technical ones, it is also remarkable that soft fields include individuals as recipients to their services, while hard fields are more likely to work with companies. Moreover, while the majority of faculties have a record of collaboration with companies, the FP identified various public institutions to be the main consumers of their services.

In terms of management, we were concerned with changes to the structure, processes, and orientation of the deanship that might point towards a more entrepreneurial direction of the faculties in the future. Concerning the structure of the deanship, there was little disparity among the faculties. Most of them had a deanship with 3 to 4 persons, which usually included the dean, and three vice-dean, one for teaching, one for finance and one for cooperation. FTS, had an additional vice-dean for investments and cooperation with the industry, which indicates their close involvement in knowledge transfer activities. Moreover, their management board was also supplemented with a faculty manager, which was unique in our case. Besides the slight increase in the size of the management board, FTS was also the most advanced, when it comes to standardised management processes. Just recently, the faculty has introduces the ISO 9001 standards, to ensure the quality of its work. As a result, a clearly elaborated hierarchy with fixed division of tasks at all levels has been established. Certainly, FTS has managed to incorporate some of the best management practices into its work in order to become more efficient. However, this increase might well be explained also by the size and complexity of the faculty. FTS has the highest number of employees and departments, and it conducts a diverse set of activities. Additionally, FTS is very decentralised, which leaves little place for a systematic push for entrepreneurialism from the top to the bottom levels. In contrast, FE is the smallest faculty from our sample, and as our interviewees reported, its deanship is exercising its power to start new activities. Most of the

new initiatives at the FE originated from within the deanship and rarely from the departments, which portrays the faculty leadership as a pulling mechanism towards entrepreneurialism. Thus, only at the FE could we identify a proactive management willing also to initiate and press departments to exploiting new opportunities. As follows, the steering at the two faculties with an applied character had different forms, yet it was strengthened in both cases. This finding is in line with Clark's narrative, that increased managerialism could be relatively centralised or decentralised (Clark 1998, p. 137). We believe that the explanation for this variance lies in the cultural embeddedness of entrepreneurialism within the departments. Hence, the departments at FTS were willing to engage in entrepreneurialism to a greater extent, then the departments of FE. Therefore, the strong faculty leadership at FE supplements the weak potential of its departments to engage in new initiatives. However, we cannot report of similar progress at the faculties with pure disciplines. In general, the deanship at FP and FS had a supportive role, meaning that they were willing to aid the developments that the departments suggested, however, they rarely introduced new mechanisms to strengthen the institutions steering capacity. This is very much in line with the findings of Kekäle (1999) concerning leadership practices across disciplines. As he noted in his research, soft-pure disciplines tend exercise democratic and collegial academic leadership, which he symbolically compares to a jogging exercise (Kekäle 1999, pp. 231-234).

> *"Since there are many interesting paths to follow through the territories, it may be difficult to get the participants to stay on the same track, or reach the same destination – or even to participate in the same competition."*
>
> *Kekäle, 1999:233*

Hence, a weak steering fits better the characters of the involved participants. However, Kekäle also notes that there is more space for managerialism in hard-pure disciplines, because they rely on exact knowledge and a certain liner thinking (Ibid.). Yet, this has been weakly underpinned by our findings. The pragmatic and sometimes even technical approach of FS to leadership has not resulted in any serious measures to strengthen managerial practices and for that reason entrepreneurialism.

The periphery of the faculties is constantly being enriched with new centres, research teams and in some cases even with spin-off companies. However, their emergence and survival is closely related to market opportunities and conditions. During our study, application-oriented faculties revealed a richer periphery with a more diverse activity composition. The FE had several centres for providing services, which ranged from administration and training to sport activities. FTS is also enriched with numerous peripheral units that conduct activities from industrial research to the provision of concrete engineering services. On the other hand, the faculties of philosophy and science (pure disciplines), demonstrated such a variety to a lesser extent and with poorer diversity of activities. Looking as well at the distinction of soft versus hard, we have noted that in the periphery of FE and FP (soft disciplines), monodisiplinary and service oriented units predominate, whose primary intention is to commercialise the fields knowledge or competence. Whereas, at faculties with hard disciplines, multidisciplinary units prevail, who equally focus on knowledge production (trough engaging in research projects) and knowledge transfer activities. Relating to both disciplinary distinctions, we come to notice FTS, that is hard-applied disciplines, to be the most capable to develop a comprehensive periphery, whose expansion is very much in line with the increased number of opportunities available for technical institutions.

A common trend with regards to third stream funding is, that hard sciences tend to have a higher percentage of it, then soft fields. We believe that this difference occurs because hard sciences can offer technical services to both private and public companies, whereas soft fields have less opportunities for cooperation with the industry. The income sources of soft fields are diversified usually though educational services which FP and FE offers for the population. In terms of investments, the emerging pattern suggests, that hard fields use third stream income to invest primarily into their research capacities, which in general requires more funds, than research in soft fields, and which is also more pronounced in the primary activities. Soft fields on the other hand, tend to devote their third stream income for networking and teaching equipment.

Regarding entrepreneurial culture, most of the interviewees linked the willingness to initiate and engage in new type of activities to the age of the academics. Thus, younger professors were described as being those who are predominantly proactive when it comes to linking up with companies, initiating new services, or competing for grants. Whether, we link it to age or not, the number of academics who engages in some sort of entrepreneurial activity in most

of the faculties is concentrated on a few individuals. However, we also got to know, that entrepreneurial culture spreads primarily by means of internal competition. In this respect, FTS, which is the most result-oriented faculty, is also ahead of others. They actively work on the promotion of innovation and knowledge transfer, therefore it seems that entrepreneurial culture is fairly well accommodated within its departments non-formal structure. The academic heartland at FS, FP and FE, showed less commitment to engage in entrepreneurial activities, however, they were proudly referring to those initiatives that have been successful. Meaning that, passiveness of academics represents a bigger barrier then their resistance to entrepreneurialism.

Entrepreneurship is part of the mission of the university, and consequently three out of fours faculties describes departments as entrepreneurial units. After looking through the official documents of all the faculties involved in our study, we have come to conclude that none of them describes what it concretely means by entrepreneurial departments. However, it was often correlated with measure that shall be undertaken to connect the activities of the faculties more closely with the needs of the ndustry. In this sense, the hard fields, thus FS and FTS, have achieved the most to encompass entrepreneurship into their official documents. The statute of FTS describes an innovation function, which is also closely related to knowledge transfer activities. FS has also set forth the possibility to link up better with the industry, through establishing intermediary organisations, like innovation centres, science parks, and so forth. In soft fields, and more precisely at FE, entrepreneurship bears a slightly different meaning. In its statute, they correlate their entrepreneurial mission with an intention to further strengthen and diversify the services, which they offer on the market. Thus, the differences that we observed in the service function of the faculties (see page 108-109) appear also distinctively in their official documents.

7. SUMMARY AND CONCLUSION

In this paper, we have looked at the concept of entrepreneurship, and outlined that it has been studied from three different angles. Every angel, has its own questions and approaches to study entrepreneurship, however, we concluded that the most relevant in terms of our study is the method offered by the management science. Accordingly, we defined entrepreneurship as a process, which is concerned with the exploitation of opportunities that can emerge on various markets. The process starts with the recognition of an opportunity, and ends with the establishment of a new organisation, product or service to pursue that opportunity. Moreover, we also explored the works of the three most outstanding scholars who have conducted research in the area of entrepreneurship in higher education. Even though they all seem to follow a different line of logic, we argued that their theories could converge into a comprehensive framework that portrays well the entrepreneurial transformation of universities. Based on their findings, we came to accept that entrepreneurship leads to changes in the primary activities of universities, that new structural elements are being introduced to supplement the changing processes, and that through the official documents, universities incorporate a third mission which is inspired by entrepreneurship. We believe that our framework provides a far-reaching tool for the investigation of entrepreneurial transformation.

On the other hand, we have also pointed out that change in higher education is a bottom up process, which originates in the smallest units, thus departments and chairs. Their fundamental characteristics, which are shaped by their disciplinary orientation, will mark entrepreneurial transformation, and therefore we believe that it is impossible to portray a common pathway of transformation, which has validity within all disciplinary fields. Rather, entrepreneurial transformation will take distinctive configurations (Clark 1997, p. 292). Therefore, our intention was not to discover disciplinary differences, rather to understand how the existing ones influence entrepreneurial transformation. Following our framework, we have explored variations in entrepreneurial transformation at four faculties of the University of Novi Sad. The fragmented Serbian higher education sector and the highly autonomous disposition of faculties seemed as an adequate place to investigate disciplinary differences in entrepreneurial transformation. As a result, we have come to conclude the following dispositions.

All disciplines showed an interest to engage in entrepreneurial activities in order to harvest the emerging market opportunities. However, we have to bear in mind that the there are several markets, and while a discipline has an advantage on one of them, it can have a disadvantage on others. Therefore, depending on which market offers more opportunities for advancement and growth, disciplines tend to choose different tactics. Concerning *epistemological differences* that exist among disciplines, we have come to conclude that soft fields have an advantage on the student market, and consequently they are more willing to initiate new ventures through which they can take advantage of their preposition. On the other hand, hard fields have more prospects on the grant market, and for that reason, they are eager to follow the flow of research grants. Hard fields have greater opportunities for cooperation with the industry as well. Relating this tendency to the research outcomes of these disciplines, suggest that hard fields, whose work results in products and techniques (Becher, 2001) is more relevant for the industry and consequently they are taking measures to align their services to the needs of private and public companies. On the other hand, the work of soft disciplines results in understanding, interpretation and procedures (Ibid.), which might serve as a plausible explanation why we find as the main "consumers" of their services usually individuals and just rarely companies.

When analysing entrepreneurial transformation through the prism of pure-applied division, we concluded that fields, which are concerned with application, are generally more willing to initiate products, processes, and services that have a value on the market. Moreover, in some cases, the market appears as a legitimate source of measurement of the significance of their research results. We also believe, that this attribute of applied fields is closely related, besides to their general concern with practice, also to the fact that academics in this field have more experience in industry and commerce than do others (Blackmore 2007, p. 231). However, generally the distinction between pure and applied seemed to be less relevant, due to the fact that almost none of the pure fields can escape claims for functionality, especially in Serbia where teaching and research are underfunded. Consequently, the epistemic drift, described by Elzinga (1997), is encouraging pure fields to conduct teaching that is more practical and to generate economically useful research outcomes. Then again, pure fields demonstrated to have less experience in cooperation with the industry.

Social differences among disciplines have also exercised a certain level of influence on entrepreneurial transformation. Most of the new ideas and initiatives are inspired by, and relay heavily on the experience of others (especially foreign examples). They are generally copied, and applied in the context of Serbia. Therefore, the disciplines in which academics tend to maintain a good networking were also more innovative and willing to engage in entrepreneurialism. These characteristics were predominantly demonstrated by the urban fields. However, in this respect, it seems that Stark's framework, and especially its second dimension, which refers to the linkages that professional fields maintain with the society, might be more applicable. Drawing on her framework, we could argue that the faculties of economics and technical sciences, who belong to the business/production services, were capable to foster their entrepreneurial character because the linkages they maintain with their practitioners who predominantly work in private companies (Stark 1998, pp. 357-360). Besides, social differences, also affect the way research is organised. In this respect, urban fields were more willing to encourage teamwork, which resulted in a bigger number of multidisciplinary research teams in these disciplines, and significantly increased their success rate in attracting grants.

Even though it was expected, that in terms of *organisational differences*, "expensive" disciplines would be more devoted to engage in entrepreneurial activities, to fill up their budgets, we have not encountered such a tendency. Setting aside the financial needs of disciplines, every field showed a high level of motivation to take advantage of the opportunities they encountered.

Additionally, we would like to outline, that the intense competition for external resources has positively encouraged entrepreneurial transformation of faculties. However, in a highly fragmented higher education system, like the Serbian one, entrepreneurialism has also created some new problems. van Vught noted that entrepreneurial universities are expected to colonize new problem areas in terms of research (van Vught 2002, p. 8). Nonetheless, the current development in Serbia, suggest that colonization of both research and teaching areas has become the primary method to secure competitive advantage on the student and grant market. Entrepreneurialism has broken down the standard division of knowledge into faculties, whereby attractive study and research fields are being taken over by several institutions. Consequently, this has lead also to duplication. For example, environmental research and studies are being conducted at both the Faculty of Science, and the Faculty of

Technical Science. Agricultural research is present at the Faculty of Science and the Faculty of Agriculture. One can study informatics either at the Faculty of Science, the Faculty of Economics, or the Faculty of Technical Science. Language studies are available at the Faculty of Philosophy and the Faculty of Economics as short-term courses. Certainly, none of these programmes or research teams concentrates exactly on the same aspect of a phenomenon, however, they play their part in the blurring of disciplinary boundaries, as they spread over from one institution to the other.

We want to finish off, by formulating three hypothetical questions that naturally emerge from our conclusion. First of all, the decreasing public funding encourages institutions to rely more heavily on resources, which they acquire on various markets (Clark 1997, p. 292). However, resource division on the market is not fair, but favours those who are more competitive and innovative. In this sense, more and more universities turn to follow an entrepreneurial course, through which they merge new and old practices, and establish an up-to-date organisational structure (Clark 2001, p. 21). Most of the new developments, the way in which they are financed, priced, managed and marketised, reflect the practices of the industry. Therefore, we have to ask ourselves, whether entrepreneurial transformation leads to more company like higher education institutions? Secondly, entrepreneurialism advances certain inequalities among the academic community. The advantages that certain fields or units attain may stimulate others, but it may also foster faculty envy (Geiger 2004, p. 70). A professor noted:

> *"There are big disproportions in the incomes of faculties. A cleaning lady at a "rich" faculty may have a bigger salary than an assistant at a "poor" faculty."*

Therefore, it is important to ask, whether entrepreneurialism helps to hold together an increasingly diversifying institution, or further separates its parts from one another? This question might be especially important in the case of the University of Novi Sad, which currently seeks to unite its autonomous faculties. Thirdly, disciplines are increasingly challenged by the current utilitarian and money-obsessed ethos, however, they are not disappearing, and nor will they do so in the foreseeable future (Blackmore 2007, p. 237 and Becher and Parry 2005, p. 142). Therefore, we have to think about the consequences that certain fields will face due to their lack of ability to compete. Hence, we should ask what will happen with those disciplines that fail to find ways to interact with the market?

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Appendices

Appendix A: Interview guide

Research questions:

(entrepreneurialism in the primary processes)

1. What kind of new ventures did your faculty engage in the last years?

    - Concerning teaching
    - Concerning research
    - Concerning services in general

2. What was the main motivation to start up these initiatives?

    - Why did you initiated them?
    - Who initiated them? (relates to 4.3)

(entrepreneurship in the formal structure)

3. Expanding periphery

    - Was there a visible growth of new units at your faculty? (centers, outreach offices, etc.)
    - What kind of units did emerge?
    - What is their primary task/ activity?

4. Diversifying income

    - Do you acquire funds besides the ministry and the tuition fees? (if yes, where do they come from)
    - How big is the precentage of these third stream incomes in your faculties total budget?
    - How do you spend or invest these incomes?

5. Strenghtened management

    - Whas there any change in the management of the faculty? (if yes, what kind of changes)
    - What role does the faculty management play in the institutions future development?
    - How does the faculty management relate to new initiatives of departments?

(entrepreneurialism in the non-formal structure)

6. To what extent is the concept of entrepreneurship accepted and supported at the faculty?

    - How do most of the professors see the new initiatives?
    - How many professors are actively engaged in some form of entrepreneurial activity at our faculty?
    - Are the professors encouraged to engage in some form of entrepreneurialism?
    - Which are the main barriers for entrepreneurialism?