

Hochschule Magdeburg---Stendal
Fachbereich Wirtschaft
Institut TBW

**Analysis of Essential Concepts and Application in
connection with Setting up an Enterprise, f.i. a
“spin---off”**

Bachelorarbeit

Eingereicht von: Sara Redondo Sánchez
Matrikelnummer: 20141082

Erstgutachter: Prof. Dr. Regina Brucksch

Zweitgutachter: Prof. Dr. Christian Krause

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Task Description of the Bachelorthesis of Sara Redondo Sánchez (Matr. Nr. 20141082)

„Analysis of essentials concepts and applications in connection with setting up an enterprise, f.i. as a spin off“

Problem description:

The foundation of a new enterprise as a formerly part of a company, university or research institute through employees (as a “spin off”) will get increasingly importance. The motives of the foundation are especially ideas of new products or special results of research, which can used in a new field of business.

Therefore the main functions of management (analysis, planning, organizing, leading and controlling) as a requirement of establishing a new business are to analyse.

Main topics:

- General requirements of establishing a company (process, functions)
- Theoretical foundations of business/market research (analysis tools before establishing a new business)
- An overview of different strategies of a “spin off”
- Analysis of the current situation for university start-ups in Eastern Germany
- Possible Scenarios an recommendations for further projects

Magdeburg, 01.07.2014

Prof. Dr. R. Brucksch
Erstprüfer

Prof. Dr. Krause
Zweitprüfer

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Compendium with Bibliographic Description

“Analysis of Essential Concepts and Application in Connection with Setting up an Enterprise, f.i.a “Spin-off”.”

Redondo Sánchez, Sara

Hochschule Magdeburg---Stendal

Thesis---No.: 20141082

63 pages; 6 figures; 6 tables; 1 appendix.

This thesis is a compilation of the theoretical foundations of establishing a company and its application to the case of an academic “Spin off”. Here, all the concepts regarding strategy and tools to develop it are touched. Also, there is a full analysis on the topic of university startc ups and their problems to grow. Next, a study of the current situation for universities and academic spinc offs in Eastern Germany is developed. Afterwards some good practices and recommendations for the case of Eastern German university spinc offs are listed.

1. Introduction

The foundation of a new enterprise as a formerly part of a company, university or research institute through employees (as a “spin-off”) will get increasingly importance in the near future. The motives of the foundation can be ideas of new products or special results of research, which can be used in a new field of business.

Therefore the main functions of management (analysis, planning, organizing, leading and controlling) as a requirement of establishing a new business are to analyse.

This thesis will focus on the fundamental requirements to create a company. First, in points 2 and 3, the market research will be discussed to move then to a study of the possible strategies that an organization can use and the methods and tools to develop it. Next, in section 4, these concepts will be applied to the analysis of a particular type of companies such as the spin-offs. Finally a summary of all of the above mentioned is applied to university spin-offs in Eastern Germany, this is in sections 5 and 6.

2. General requirements of establishing a company

In this point, the basic steps necessary to successfully develop a new business will be named. First of all, it is necessary to develop a market research regarding the environment of the business we are going to create to clear up if this one is likely to have success. If this research is positive, the development can continue by working out the best strategy possible to penetrate the market. These concepts are expanded in the points that follow.

Also, in Appendix 1 there is a detailed summary of the bureaucratic and legal hurdles faced by entrepreneurs wishing to incorporate and register a new firm in Germany. It examines the procedures, time and cost involved in launching a commercial or industrial firm with up to 50 employees and start-up capital of 10 times the economy's per-capita gross national income.

3. Theoretical foundations of business/market Research

3.1 Market Research

Market research is a business initiative in order to get an idea about the commercial viability of an economic activity. Market research consists of three large important analyses:

1. **Competitive Analysis:** This analysis studies the group of companies with which the company shares the same product's market.

To conduct a Competitive Study is necessary to establish who are the competitors, how many there are and their respective competitive advantages.

This analysis is fully developed in point number 3.3.

2. **Analysis of consumers:** Studying consumer behaviour to detect their consumption needs and how to meet them, find out their buying habits (places, times, preferences, etc.). Its ultimate goal is to provide data to improve marketing techniques to sell a product or a series of products that meet the unmet consumer demand.
3. **Strategy:** Brief but essential concept that sets the direction of the company. Based on the objectives, resources and market and competitive research, the strategy that is most suitable for the new company should be defined.

3.2 The Concept of Strategy

In this point, the notion of strategy and everything related to this topic will be developed.

3.2.1 What is Strategy?

“In the **broadest sense**, strategy is the means by which individuals or organizations achieve their objectives.

Common to definitions of **business strategy** is the notion that strategy is focused on achieving certain goals, that the critical actions that make up a strategy involve allocation of resources; and that strategy implies some consistency, integration, or cohesiveness of decisions and actions.”¹

A business strategy is “1. A method or plan chosen to bring about a desired future, such as achievement of a goal or solution to a problem. 2. The art and science of planning and marshalling resources for their most efficient and effective use. The term is derived from the Greek word for generalship or leading an army.”² It is also “a plan, method or series of actions designed to achieve a specific goal or effect.”³

Nowadays we live in a world of uncertainty and change, so a clear sense of direction is essential to be able to pursue objectives. Michael Porter said that strategy is not about doing things better (that is the concern of operational effectiveness); strategy is about doing things differently. So strategy is about making choices, strategic choices can be distilled to two basic questions:⁴

-- Where to compete?

¹ Grant, Robert M. (2010), p.16

² businessdictionary.com

³ Wordsmyth Dictionary

⁴ Cp. Porter, M. E. (1996)

-- How to compete?

These questions will be discussed later.

3.2.2 The Role of Strategy in Success

The main factors that are conducive to success are going to be named next. Strategies built on these basic four elements are said to almost always play an influential role in the market:

- Goals simple, consistent and long term.
- Profound understanding of the competitive environment.
- Objective appraisal of resources.
- Effective implementation.

3.2.3 The Basic Framework for Strategy Analysis

The basic framework for strategy analysis is divided in two groups and consists on the elements listed in the table showed below:

Table 1: Elements of the basic framework for strategy analysis

1. THE COMPANY	2. THE ENVIRONMENT
▪▪ Goals and Values	▪▪ Competitors
▪▪ Resources and Capabilities	▪▪ Customers
▪▪ Structure and Systems	▪▪ Suppliers

These elements are linked between the strategy.

3.2.4 A Company's Strategy

There are some strategy statements which most companies see value in communicating to employees, customers, investors and business partners. They are:

Mission: It is the meaning behind the actions and the basic statement of organizational purpose, it addresses "Why we exist". Its formulation is crucial for the future of the strategic planning process.

It must contain:

- Organizational structure.
- The criteria for allocation of resources.
- The on-going training.

A statement of principles or values: "What we believe in and how we will behave".

Vision: Aspirations or goals to be achieved by the organization. It has to be shared by all members of the company. "What we want to be".

A strategy statement: "What our competitive plan will be". It should comprise three definitive components of strategy:

- Objectives
- Scope (where we will compete)
- Advantage (how we will compete)

There is also:

Strategic vision: It is the design of business strategy. It is the one that is in the minds of managers and business owners, but it must necessarily pass through a

high---level methodological approach. Strategic vision keeps us apart from corporate improvisation.

Results from this are: Vision, mission, objectives, strategies, goals, critical success factors, analysis of strengths / weaknesses and analysis of the competitive environment.

3.2.5 The Role of Analysis in Strategy Formulation

Without analysis, strategic decisions are susceptible to power battles, and individual whims. Concepts, theories and analytic tools are complements, not substitutes for experience, commitment and creativity. Their role is to provide frameworks for organizing discussion, processing information and opinions and assisting consensus.

The purpose of strategy analysis is not to provide answers but to help in understanding the issues.⁵

3.3 The Tools of Strategic Analysis

In this section follows a discussion of the Analytical Methods that exist to help companies perform their Strategic Analysis.⁶

At the beginning, some definitions are necessary:

Strategic Analysis is “the process of conducting research on the business environment within which an organisation operates and on the organisation itself, in order to formulate strategy.”⁷ And it is also “a theoretically informed understanding of the environment in which an organisation is operating, together with an understanding of the organisation’s interaction with its

⁵ Cp. Grant, Robert M. (2010)

⁶ Cp. Downey, Jim (2007)

⁷ BNET Business Dictionary

environment in order to improve organisational efficiency and effectiveness by increasing the organisation's capacity to deploy and redeploy its resources intelligently.”⁸

Definitions of strategic analysis often differ, but the following attributes are commonly associated with it:

1. Identification and evaluation of data relevant to strategy formulation.
2. Definition of the external and internal environment to be analysed.
3. A range of analytical methods that can be employed in the analysis.

Often used analytical methods in strategic analysis are shown in the table below:

Table 2: Analytical Methods for Strategic Analysis

Method	Explanation
SWOT analysis	3.3.1
PEST analysis	3.3.2
Porter's five forces analysis	3.3.3
Four corner's analysis	3.3.4
Value chain analysis	3.3.5

Application

Analytical methods and tools are essential to ensure consistency and an appropriate level of rigor is applied to the analysis.

There are several important considerations to keep in mind when using analytical tools. They are listed below:⁹

⁸ Worrall, Les. (1998), p.3

1. The tool or method must help to answer the question that the organisation is asking.
2. The expected benefit of using the tool needs to be defined and it must be actionable. The more clearly the tool is defined, the more likely the analysis will be successful.
3. Many tools benefit from input and collaboration with other people, functions or organisations. There should be enough time for collaboration and advance warning given so that people can fit to the analysis.
4. Proper use of analytical tools is time consuming. It is important to ensure that key stakeholders are aware of this. Otherwise they may not be able to provide the necessary commitment to complete the analysis.

The aim of the analytical tools is to sharpen the focus of the analysis and to ensure a methodical, balanced approach.

All analytical tools rely on historical, backward looking data to extrapolate future assumptions. It is important to exercise caution when interpreting strategic analysis results. Otherwise the analysis may be unduly influenced by preconceptions or pressures within the organisation that seek to validate a particular strategic assumption.

3.3.1 SWOT Analysis

SWOT analysis (strengths, weaknesses, opportunities, threats)^{10 11} is a process that seeks to determine in a clear, comprehensive and objective manner, the

⁹ Cp. Downey, Jim (2007)

¹⁰ Cp. Humphrey, Albert (2005)

present and future of the company. It involves an external and an internal analysis that will be explained next.

Market analysis made by SWOT tool consists on the following points:

To analyse our company:

- ❖❖ Defining strengths and weaknesses
- ❖❖ Opportunities and threats

To analyse competition:

- ❖❖ Knowing its nature
- ❖❖ Tactic characteristics
- ❖❖ Business strategies

Social environmental analysis:

- ❖❖ Threats and opportunities of the environment and possible government regulations, political factors, etc.

The external analysis of environment allows us to have access to the items that are outside the organization and are not controllable. This environment can provide positive factors (opportunities) or negative ones (threats).

It is not only the environment or General Macroenvironment (National Context) but also the Microenvironment or Specific Environment (Industry).

The General Macroenvironment consists of factors such as:

¹¹ Cp. Koch, Adam (2000)

- Economic (interest rate, inflation, employment and unemployment rate, exchange rate, monetary and fiscal policies, etc.).
- Demographic (population by age and sex, family structure, migration, population growth, etc.).
- Sociocultural (lifestyle, fashion and habits, social groups, strikes, labour unions)
- Political---legal (political stability, regulation, legislation, elections, etc.).
- Technology (scientific and technological innovations, technological development by economic sectors, etc.).
- Environment (rainfall, drought, weather changes...)

The external analysis allows us to know areas such as:

- Economic aspects of the country.
- Terms of sector growth.
- International and trade relations.
- Demographic and cultural changes that alter the levels of demand.
- Risks of natural, seasonal, accidental factors and contingency plans.
- Legal and tax issues.
- Economic aspects in budgetary terms.

In the case of the **internal analysis**, all the elements are under the control of the organization. From its analysis, we get the strengths and weaknesses we have to improve our actions and satisfy the MISSION.

In this analysis we will see:

- Available technology.
- Communication networks.
- Financial capacity.
- The working environment.

- The human and material resources at our disposal.
- Changes in our organization.
- The compliance with legal and tax obligations

Table 3: SWOT Analysis diagram

<p>Strengths</p> <p>What does your organisation do better than others?</p> <p>What are your unique selling points?</p> <p>What do your competitors and customers in your market perceive as your strengths?</p> <p>What is your organisations competitive edge?</p>	<p>Opportunities</p> <p>What political, economic, social---cultural, or technology changes are taking place that could be favourable to you?</p> <p>Where are there currently gaps in the market or unfulfilled demand?</p> <p>What new innovation could your organisation bring to the market?</p>
<p>Weakness</p> <p>What do other organisations do better than you?</p> <p>What elements of your business add little or no value?</p> <p>What do competitors and customers in your market perceive as your weakness?</p>	<p>Threats</p> <p>What political, economic, social---cultural, or technology changes are taking place that could be unfavourable to you?</p> <p>What restraints to you face?</p> <p>What is your competition doing that could negatively impact you?</p>

Source: Downey, Jim (2007), p.5

3.3.2 PEST analysis

The PEST analysis identifies the general environment factors that will affect businesses. This analysis is performed before conducting the SWOT analysis in the context of strategic planning. The term comes from the acronym for "Political, Economic, Social and Technological." PESTEL or PESTLE the variants are

also used, including the "Legal" and "Green" aspects. It is a useful strategic tool for understanding market cycles, the position of a company, or operational management.¹²

1. Political factors.

These include government regulations such as employment laws, environmental regulations and tax policy. Other political factors are trade restrictions and political stability.

2. Economic factors.

These affect the cost of capital and purchasing power of an organisation. Economic factors include economic growth, interest rates, inflation and currency exchange rates.

3. Social factors.

These impact on the consumer's need and the potential market size for an organisation's goods and services. Social factors include population growth, age demographics and attitudes towards health.

4. Technological factors.

These influence barriers to entry, make or buy decisions and investment in innovation, such as automation, investment incentives and the rate of technological change.

It is also necessary to note that these four paradigms of PEST vary depending on the type of business.

¹² Cp. Downey, Jim (2007)

3.3.3 Porter's five forces

Porter's five forces of competitive position analysis^{13 14} was developed in 1979 by Michael E. Porter as a simple framework for assessing and evaluating the competitive strength and position of a business organisation.

This theory is based on the concept that there are five forces that determine the competitive intensity and attractiveness of a market. Porter's five forces helps identify where the centre of power is in a competitive business situation. This is useful both in understanding the strength of the current competitive position of an organization, and the strength of a position an organization can see as a potential strategic move.

Strategic analysts often use Porter's five forces to find out if new products or services are potentially profitable. By understanding where power lies, the theory can also be used to identify the strongest areas of the organization, to improve their weaknesses and to avoid possible mistakes.

The five forces are:

- **Supplier power.** An assessment of how easy it is for suppliers to drive up prices. This is driven by:
 - Trend of the buyer to replace
 - Evolution of the relative prices of replacement
 - Buyer's switching costs
 - Perceived level of product differentiation
 - Number of substitute products available in the market

¹³ Cp. Downey, Jim (2007)

¹⁴ Cp. Porter, M. E. (1979)

- Cost of switching from one supplier to another. Ease of replacement. (Information-based products are more prone to substitution, as online product can easily replace material product.)
 - Number of suppliers of each essential input
 - Relative size and strength of the supplier
-
- **Buyer power.** An assessment of how easy it is for buyers to drive prices down. This is driven by:
 - Number of buyers in the market
 - Dependence on the distribution channels
 - Chance of negotiation, especially in fixed costs
 - Volume of buyers
 - Costs or customer facilities
 - Availability of information for the buyer
 - Ability to integrate backwards
 - Existence of substitute products
 - Buyer price sensitivity
 - Differential advantages of the product
 - Customer analysis (purchase recently, often leaving income margin)
 - Quality of care (inefficient, very professional)
 - The importance of each individual buyer to the organisation
 - Cost to the buyer of switching from one supplier to another

If a business has just a few powerful buyers, they are often able to dictate terms.

- **Competitive rivalry.** The key factor is the number and ability of competitors in the market. Many competitors, by offering differentiated products and services, will reduce the attractiveness of the market.

Porter identified six entry barriers that could be used to create for the organization a competitive advantage:

- Scale economies.
 - Product differentiation.
 - Capital investments.
 - Cost disadvantage independent of scale.
 - Access to distribution channels.
 - Government policy.
-
- **Threat of substitution.** When there are substitute products that are close in a market, the possibility of change increases the likelihood of customers switching to alternatives in response to possible price increases. This reduces both the power of suppliers and market attractiveness.
 - Buyer propensity to substitute.
 - Relative prices of substitute products.
 - Cost or ease of the buyer.
 - Perceived level of product differentiation or service.
 - Availability of close substitutes.
 - Enough providers.

 - **Threat of new entry.** Profitable markets attract new entrants, thereby profitability diminishes. Unless incumbents have strong and durable barriers to entry, for example, patents, economies of scale, capital requirements or government policies, then profitability will decline to a competitive rate.

This point concerns the barriers to entry of new products / competitors. The easier it is to enter, the greater the threat. So if it comes to riding a small business, it will be very easy the entry of new competitors.

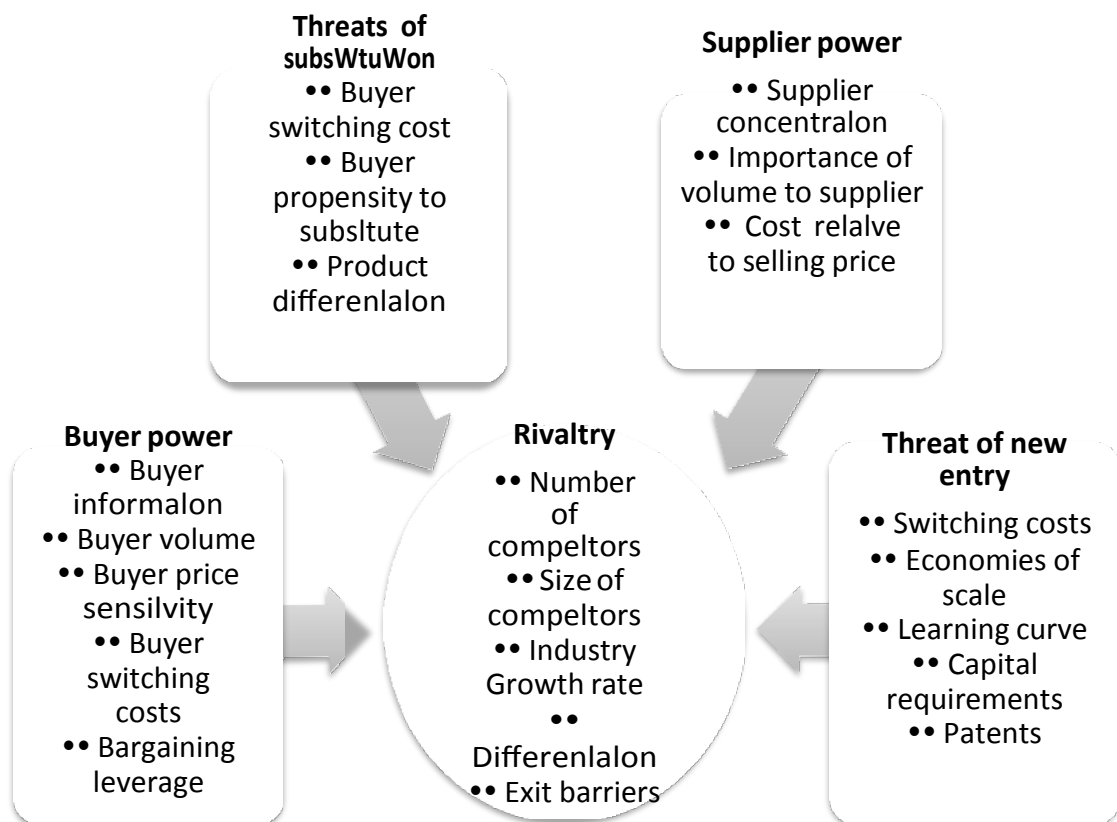


Fig.1: Porter's Five Forces Diagram

Source: Porter, M. E. (1979)

3.3.4 Four corner's analysis

The model of the "Four Corners"¹⁵ is a predictive tool designed by Michael Porter, to help determine the course of action of a competitor. Unlike other forecasting models that are based primarily on the current strategy and skills in a company to determine the future strategy, Porter's model also requires an understanding of what motivates the competitor. This added dimension of understanding the internal culture, system of values, attitudes and assumptions

¹⁵ Cp. Porter, M. E. (1980)

of the competitor, helps in determining much more accurate and realistic possible reactions of a competitor in a given situation interpretation.

The model can be used to:

- Develop a profile of the likely strategy changes a competitor might make and how successful they may be.
- Determine each competitor's probable response to the range of feasible strategic moves other competitors might make.
- Determine each competitor's probable reaction to the range of industry shifts and environmental changes that may occur.

The 'Four Corners' refers to four diagnostic components that are essential to competitor analysis: future goals, current strategy, assumptions and capabilities.

Many organizations conduct basic SWOT analysis and make mistakes in underestimating or overestimating the strategies of their competitors. The motivating factors are often overlooked and they are usually the main drivers of competitive behaviour.

Understanding the following four components can help predict how a competitor may respond to a given situation.

Motivation – drivers.

This corner helps determine the action of competitors by understanding their goals (strategic and tactical) and its current position in relation to their objectives. A big difference between the two could mean that the competitor is likely to react against any external threat that comes in their way, while a small difference is likely to produce a defensive strategy. The question to be answered

is: What is it that drives the competition? These pulses can be on several levels and dimensions and can provide perspectives on future goals.

Motivation – management assumptions.

Perceptions and assumptions that the competitor has about itself and its industry will shape the corner strategy. This corner includes determining the perception of the strengths and weaknesses of the competitors, their organizational culture and their beliefs about the goals of competition. If the competitor thinks highly of your competition and has a fair trial of the industry forces, he is likely to be prepared with plans to counter any threat to his position. Moreover, a competitor who has a mistaken understanding of the forces in the industry is not likely to respond to a potential attack. The question to be answered is: What are the assumptions about the industry, about the competition and about their own abilities competitors have?

Actions – strategy.

The strategy of a competitor determines the way he is competing in the market. However, there may be a difference between the strategy planned by the company (as stated in the annual report and interviews) and its current strategy (as it is evident in their acquisitions, new product development, etc.). So here it is important to determine the current strategy of the competitor and how they really operate. If the strategy in use is working well, it is safe to assume that the competitor may continue to operate the same way. The questions to be answered here are: What the competitor is actually doing and how successful are they implementing its real strategy?

Actions – capabilities.

Capabilities are seen in the inherent ability of the competitors to initiate or respond to external forces. Although they might have the motivation and drive

to start a strategic action, its effectiveness depends on its ability. Its strengths will also determine how the competitor is likely to respond to an external threat. An organization with an extensive distribution network is likely to initiate an attack through its channel, while a company with strong finances is likely to break through lower prices. The questions to be answered here are: What are the strengths and weaknesses of the competitors? In which areas is the competitor stronger?

MOTIVATION

Drivers

- Financial goals
- Corporate culture
- Organisational structure
- Leadership team backgrounds
- External constraints
- Business philosophy

Managements assumptions

- Company's perceptions of its strengths and weaknesses
- Cultural traits
- Organisational value
- Perceived industry forces
- Belief about competitor's goals

ACTIONS

Current strategy

- How the business creates value
- Where the business is choosing to invest
- Relationships and networks the business has developed

Capabilities

- Marketing skills
- Ability to service channels
- Skills and training to work force
- Patents and copyrights
- Financial strength
- Leadership qualities of CEO

Fig. 2: Four Corner's Analysis diagram

Source: Downey, Jim (2007), p.9

3.3.5 Value chain analysis.

Before making a strategic decision for an organisation, it is important to understand how activities within it create value for customers. One way to do this is by conducting a value chain analysis.^{16 17}

The business value chain or value chain is a theoretical model to describe the development of the activities of a business organization delivering value to the final customer, described and popularized by Michael Porter.

Value chain analysis is based on the principle that organizations exist to create value for their customers. In the analysis, the activities of the organization are divided into separate groups of activities that generate value. The organization can more effectively evaluate their internal capabilities by identifying and examining each of these activities separately. Each value adding activity is considered as a source of competitive advantage.

The three steps for conducting a value chain analysis are:

- 1. Separate the organisation's operations into primary and support activities.**

Primary activities are those that physically create a product, as well as its marketing, product delivery and customer support after the sale. Support activities are those that facilitate the life of the primary activities.

Primary activities:

The model of the value chain identifies five primary activities:

¹⁶ Cp. Kaplinsky, Raphael; Morris, Mike (2001)

¹⁷ Cp. Porter, M. E. (1985)

- Bilateral Internal Logistics: includes OS receive operations, manage orders, and monitoring the distribution of OS components. I.e.: receiving, storage, inventory control and internal distribution of raw materials and auxiliary materials until they are incorporated into the production process.
- Operations (production): processing of raw materials processed into the final product. It is at this stage when minimizing cost should be sought.
- Lateral external logistics: receiving and storing products, it also includes consumer product distribution.
- Marketing and Sales: activities that disclose the product.
- Service: aftermarket or maintenance, group of activities to maintain and enhance the value of the product through the application of safeguards, technical and factory support.

Support activities:

- Supply (Procurement): Storage and accumulation of items of merchandise, supplies, materials, etc.
- Infrastructure: organization supporting activities across the enterprise, such as planning, accounting and finance.
- Human resource management: recruiting, hiring and staff motivation.
- Technology development and research: cost drivers and value.

2. **Allocate cost to each activity.**

Activity cost information provides managers with valuable insight into the internal capabilities of an organisation.

3. **Identify the activities that are critical to customer's satisfaction and market success.**

There are three important considerations in evaluating the role of each activity in the value chain.

- Company mission. This influences the choice of activities an organisation undertakes.
- Industry type. The nature of the industry influences the relative importance of activities.
- Value system. This includes the value chains of an organisation's upstream and downstream partners in providing products to end customers.

Value chain analysis is a comprehensive technique for analysing an organisation's source of competitive advantage.

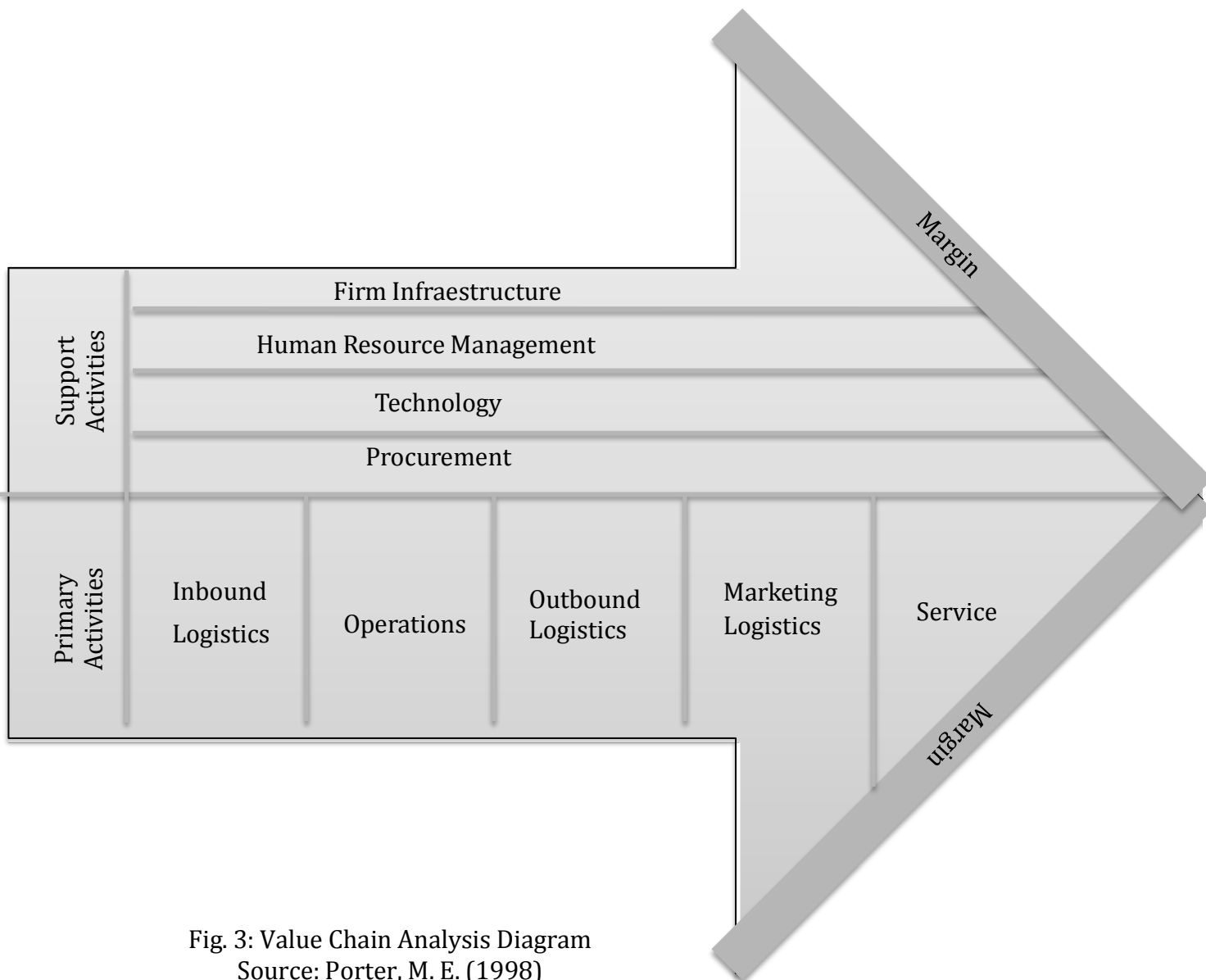


Fig. 3: Value Chain Analysis Diagram
Source: Porter, M. E. (1998)

3.4 The Analysis of Competitive Advantage

A firm can earn superior profitability either by locating in an attractive industry or by establishing a competitive advantage over its rivals. Of these two, competitive advantage is the most important.

External sources of competitive advantage have already been discussed: customer requirements and the nature of competition, these two determine the key success factors within a market. Internal sources of competitive advantage have also been discussed: the potential of the firm's resources and capabilities to establish and sustain competitive advantage.

3.4.1 Sources of Competitive Advantage

First of all, a definition for Competitive Advantage:

“When two or more firms compete within the same market, one firm possesses a competitive advantage over its rivals when it earns (or has the potential to earn) a persistently higher rate or profit.”¹⁸

External Sources: For an external change to create competitive advantage, this change must make a difference on a company regarding their resources and capabilities or improving their strategic position.

The extent to which an external change creates competitive advantage depends on the magnitude of the change and the level of differentiation between companies.

Internal Sources are:

--- Responsiveness to change

--- Innovation

¹⁸ Grant, Robert M. (2010), p.211

These two aspects are the most important ones to achieve advantage using the internal forces of the company.

Michael Porter¹⁹ identified three generic strategies that can be used individually or together, to create long-term defensible position that exceeded the performance of competitors in an industry. These three generic strategies were:

- 1) The overall cost leadership
- 2) Differentiation
- 3) The approach

These generic strategies are tactics to outperform competitors in an industry; in some industrial structures might mean that all companies can obtain high yields, while in others, the success in implementing one of the generic strategies may be what is necessary to achieve acceptable performance in an absolute sense.²⁰

3.4.2 Cost Advantage

The cost leadership is when the company intends to be the lowest cost producer in its industry.²¹ The company has a broad overview and serves many industry segments, and can even operate in related industries. The breadth of the company is often important for cost advantage. Sources of cost advantage are diverse and depend on the industry structure. They may include the pursuit of economies of scale, proprietary technology or preferential access to raw materials.

A successful strategy of cost leadership is spread throughout the company, as evidenced by the high efficiency, low overhead, limited benefits, intolerance to waste, thorough review of the budget requests, wide control of elements,

¹⁹ Cp. Porter, M.E. (1980)

²⁰ Cp. Porter, M.E. (1987)

²¹ Cp. Porter, M.E. (1987)

rewards related to the concentration of costs and extensive employee involvement in attempts to control costs.

Some risks of following cost leadership is that competitors may copy the strategy, reducing the profits of the industry in general; that technological advances in the industry could make the strategy ineffective or that the interest of buyers could be diverted to other differentiating features besides price.

3.4.3 Differentiation Advantage

The differentiation strategy²² is to create for the product or service something that is perceived industry-wide as unique.

It is selected one or more attributes that many buyers in an industry perceive as important, and put exclusively to meet those needs.

Exclusivity is rewarded with a higher price. Differentiation can be based on the product itself, the delivery system by which it is sold, the marketing approach and a range of other factors.

The differentiation strategy should be followed only after careful study of the needs and preferences of buyers, in order to determine the feasibility of incorporating a different characteristic or more to a single product that includes the desired attributes.

A risk taken by following a differentiation strategy is that customers may not value the unique product enough to justify its high price. When this happens, a cost leadership strategy easily overcomes a differentiation strategy. Another risk of using a differentiation strategy is that competitors could develop ways to copy the features of differentiation quickly; thus, companies must find durable sources of uniqueness that rivals cannot imitate or quickly lower cost.

²² Cp. Porter, M.E. (1987)

3.4.4 The Approach

This strategy is very different from the others because it rests on the choice of a narrow view of competition within an industry.²³ The focuser selects a group or segment of the industrial sector and adjusts its strategy to serving them to the exclusion of others. By optimizing its strategy for the target segments, the focuser seeks to achieve an overall competitive advantage.

Focused strategies are most effective when consumers have distinctive preferences or requirements and when rival firms are not intended to specialize in the same market segment.

Risks of pursuing a focus strategy is the possibility that many competitors recognize the successful focus strategy and imitate, or that consumer preferences diverted to product characteristics desired by the market in general.

Each generic strategy is a different approach to create and maintain a competitive edge; combining the kind of competitive advantage a company is looking for and the outlook of its strategic objective approach.

If a company can achieve cost leadership and differentiation simultaneously, the rewards are great because the benefits are additive, differentiation leads to greater prices while cost leadership involves lower costs.

To sum up, it is said that a company should always aggressively pursue all cost reduction opportunities that do not sacrifice differentiation.

3.5 Strategies

3.5.1 SWOT derived Strategies

Next, the different kinds of SWOT derived strategies will be explained.²⁴

²³ Cp. Porter, M.E. (1987)

²⁴ Cp. Bradford et al. (2000)

- **Strategy WT: Strategy to strengthen.**

In general, the goal of this strategy is to minimize both weaknesses and threats. An institution that is only faced with external threats and internal weaknesses could be in a precarious situation.

This strategy involves defensive tactics that aim to reduce internal weaknesses and avoid environmental threats.

- **Strategy WO: Strategy to call up.**

This second strategy seeks to minimize the weaknesses and maximize the opportunities. An institution could identify opportunities in the external environment but have organizational weaknesses that prevent them from taking the advantages that the market offers. It aims to overcome internal weaknesses by taking advantage of external opportunities.

- **Strategy ST: Strategy to defend.**

This strategy builds on the strengths of the company and the threats of the external environment. Its objective is to maximize the first ones while the second ones are minimized. This, however, does not necessarily mean that a strong institution needs to look for external threats to confront them. On the contrary, the strengths of an institution should be used with care and discretion.

In brief, it takes advantage of the company forces to avoid or reduce the impact of external threats.

- **Strategy SO: Strategy to attack.**

Any institution would love to always be in such a position that they could maximize both their opportunities and strengths, that is, always being able to apply this strategy. Such institutions could use their strengths to take

advantage of market opportunities and improve their goods and services. In summary, it is using the internal forces of the company to take advantage of external opportunities.

3.5.2 Business Strategy

A business strategy is a business plan that takes place over the long term to help achieve specific goals or objectives. The aim of a business strategy is to strengthen a particular company to improve its performance and, in return, the business becomes more profitable. Without a business strategy, a company does not have a guide to follow and has a greater risk of not being successful.²⁵

3.5.3 Corporate Strategy

Corporate strategy by definition is the way a company creates value through the configuration and coordination of different business and activities in the market. The objective of corporate strategy is to build corporate advantages to achieve higher than normal profits. There are three questions to determine if a company has corporate benefits:²⁶

1. Does ownership of the company make a profit somewhere in the corporation?
2. Are these benefits greater than overheads?
3. Does the corporation create more value for the business than any other corporation or alternative government structure?

If the answer to these three questions is yes, a competitive advantage is owned. Corporate benefits are obtained through corporate strategy and companies who seek them are posed two major decisions.

²⁵ Cp. Carpenter, Mason A.; Dunung, Sanjyot P. (2012)

²⁶ Cp. Carpenter, Mason A.; Dunung, Sanjyot P. (2012)

First of all: Where to invest? The level of diversification in business and the level of geographic diversification must be defined.

And second: How to create or add value through synergies and coordination?

Although it may be difficult to understand, there is indeed a difference between corporate strategy and business. It is important that managers and strategy designers understand the difference between these two types of strategy to avoid problems in communication and implementation.

Corporate strategy involves making decisions that are made regarding to the direction of the organization as a whole. This strategy relates to matters affecting the company in general, such as deciding the size and composition of the portfolio of businesses.

Business strategy is the way a business competes in a particular sector. Strategic decisions taken at business level have to do with issues such as pricing and efficiency in manufacturing and advertising. The business strategy is based primarily on obtaining a competitive advantage in the market.

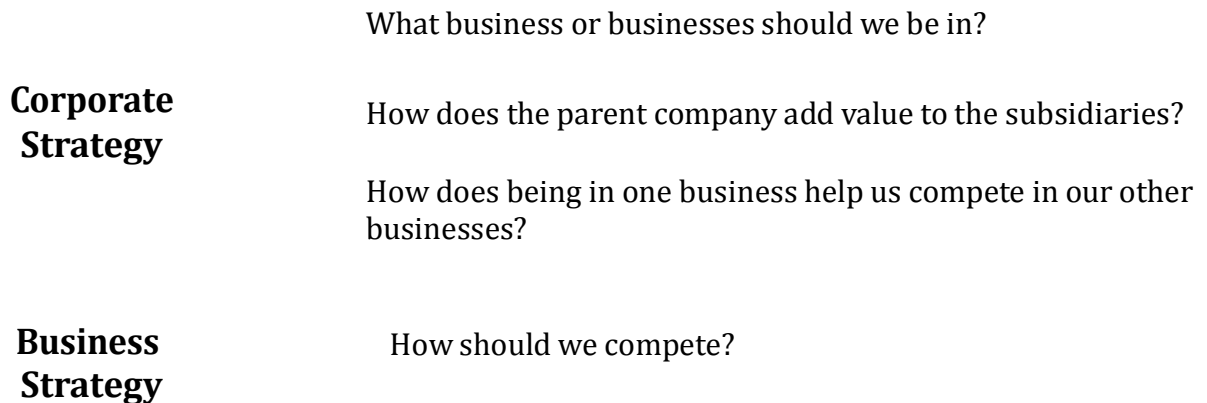


Fig. 4: Corporate Strategy vs. Business Strategy

Source: Carpenter, Mason A.; Dunung, Sanjyot P. (2012)

4. An overview of different strategies of a “Spin-off”

4.1 Introduction

It has been proved that new business coming out from research organisations are one of the most effective ways to start off a business. The spin-offs result from the transfer of people and intellectual property from a parent institution. It is this transfer that makes the difference from technology sale, licensing or joint ventures and alliances.

Spin-off is usually defined as any company creation process that satisfies the three following requirements:²⁷

1. It has its origin in an existing organization called “parent organization”.
2. It involves one or more individuals, regardless of what their status or role in the organization of origin is.
3. These individuals leave the home organization to create a new organization, the spin-off.

For the purpose of this work, spin-off will be defined as a company formed through the **transfer of technology** from an R&D (Research and Development) company or a business company, which is completely independent of the parent company, and involves the **transfer of human capital** too.²⁸ Also, “a spin-off essentially is a separation strategy entailing a tax-free distribution by a corporation (“Parent”) of stock of a subsidiary (“SpinCo”) to Parent’s shareholders, usually as a pro rata dividend or in redemption of Parent’s stock.”²⁹

²⁷ Cp. Pirnay et al. (2003)

²⁸ Davenport, S; Carr, A.; Bibby, D. (2002)

²⁹ Yoder, Lowel (2011)

Depending on the source, they can be distinguished:

- **Business Spin-offs:** The new company comes from another existing prior company (including, as companies, public institutions). Historically these have been the majority, and probably the most relevant and known, supported from the public sector by the European Business and Innovation Centres. They are known as intrapreneurs, generally linked these days to the launching of start-ups.
- **Academic Spin-offs:** When applicable, they are born within universities and research institutes. They are the newest, latest and sparsest, but they have the support of the European Union through different lines and support programs. The reasons are to move the knowledge from the universities, the theoretical research to the companies, creating practical applications.

From a general point of view, certainly, a “spin-off”, is a strategy chosen by the parent company. This last one has chosen to spin over selling or some other possible decision.

Next, some general reasons for a spin-off will be listed:

Retention of talent: It is, in essence, not missing valuable employees, making them partners in new business projects, which will surely bring a plus of commitment.

New business approaches: It is possible that, in the future, the organization finds business opportunities. At first, it can be understood that they are developed within the company, but it is possible that, in some time, the business may find a better framework out of it, its corporate culture, its structure, etc.

Improved management: Some organizations consider it better to manage more closely, breaking the company into smaller units. For example, in some commercial networks, when a distribution arm reaches a size X, undergoes a process of mitosis, generating two smaller pieces.

Development of new technologies arising from Research Centres: the aforementioned academic spin-offs.

Business Survival: When business crisis happens, spin-offs are common. The company is divided trying to save as much as possible, selling these pieces to employees or members of the organization.

Tax, corporate or business planning: For tax purposes, consolidation of accounts, implementation of certain agreements or labour regulations, there are economies that bet for business segregation.

Financial strategy: It is raising funds to develop a specific business unit but not entering the central unit.

Through experience, the key success factors of a Spin-off strategy have been determined:³⁰

1. In most countries, mechanisms to help start-ups have been set up. But added actions from the parent company are always necessary, such as specific measures or/and specific team/structure to follow the projects.
2. To set up schemes to help researchers in creating start-ups is also very important, there can be considered movements such as:
 - Maturation of projects, e.g., to establish an internal review system of projects to choose those that are the most likely to succeed.

³⁰ Cp. European Commission, Joint Research Centre (2011)

- Support for business creation from parent organizations (assistance in project development, financial assistance with support of the salary for a while, possibility of sharing facilities until the spin-off becomes productive, granting personal loans, etc.)
 - Maintaining close relationships between spin-offs and labs.
 - Financing of spin-offs.
3. Develop entrepreneurship by, for instance, promoting awareness actions as regards entrepreneurship toward researchers or simply training for entrepreneurship.

Briefly, these are the most important pros and cons of a Spin-off:³¹

It is said that, by spinning-off, a company potentially gets the ability to unlock value, that is, opening up its strategic direction. On the other hand, the company can lose some synergy when the units separate. For instance, certain functions might need to duplicate.

Also, the reasons for a spin-off are usually aimed at adding value for shareholders, that is, creating two entities that have a value that is greater than the original one. Most companies go for spin-off when the divisions have significant differences and these ones are limiting the growth. Possible disadvantages of a spin-off can include: a reduction in economies of scale (including borrowing capacity), increased risk due to a decrease in diversification, loss of strategic synergies or an increase in cost for other stakeholders.

But, without doubt, the main and bigger risk of spinning-off is that results are not as good as expected and one or both of the resulting companies will not satisfy the expectations.

To finish this introduction, the process of a Spin-off will be detailed: Firstly and obviously, the parent company chooses to adopt a strategy which focuses on its core business and spins-off a certain part of the business. This decision is often based on the advice coming from management consultants, its own

³¹ Cp. Samuelson, Kristin (2011)

shareholders, industry experts, etc. Secondly, it is to decide which assets and which debt obligations should be transferred to the spin-off newly created. Next step for the parent company is to appoint a Paying Agent. The above-mentioned one has to, subsequently, publish a prospectus with the exact details of the operation and to announce this one to the shareholders. Custodians and broker dealers receive next the new shares from the Paying Agent and pass them to the beneficial owners. Finally, the shareholders and the parent company have to deal with the tax consequences coming out from the operation and to amend their investment portfolios and their share value. Last step is for the shareholders to decide the trading strategies for both companies.

4.2 Academic Spin-offs

4.2.1 Notion of University Spin-off

Nowadays, it is considered that, in addition to contributing to innovation by advancing basic science, a University must include among its missions the direct contribution to the economic development of the territory. This new mission is shown in the performance of new functions, between them, there can be found the identification, development and commercialization of the results achieved through the research carried out within it.

As a result of the transformation of a University, the transfer of the results from the research carried out at the university to the firms, takes on critical importance. Technology transfer can be defined as the pace of technology by an individual or organization to another, through a communication channel. Therefore, it is the means through which the results of the research undertaken in universities may have a commercial application.³²

³² Cp. Aceytuno Pérez, María Teresa; de Paz Báñez, Manuela A. (2009)

There are a variety of channels for technology transfer between universities and industry. The most studied may include the following:

- Collaborative agreements and contracts between universities and businesses.
- Licensing of university patents.
- Mobility of human resources between universities and industry.
- Journal publications and contributions to conferences.
- Informal relations.
- Creating companies from the results of the research carried out in universities (University spin-offs).

This work is going to focus on the last one.

In line with the foregoing, a University Spin-off can be defined as a new company created to exploit commercially some knowledge, technology or research results developed at the University.³³ A similar definition could be the one who considers as a university spin-off the companies emerging from universities who aim the commercialization of intellectual property and the transfer of technology developed at academic institutions.³⁴

A very important element in the creation and life of a business is stakeholders, which in the case of a university spin-off, are, as follows:³⁵

- The **organization of origin**, from which the technology transferred is obtained. In the case of university spin-offs, the source organization is the university or other research centre.

³³ Cp. Pirnay et al. (2003)

³⁴ Cp. Djokovic D.; Souitaris, V. (2008)

³⁵ Cp. Roberts, Edward B.; Malonet, Denis E. (1996)

- The **creator of the technology**, which is the person who develops the technology so that it goes from being a result of basic Investigation to an element susceptible to be commercialized.
- The **entrepreneur**, who is the individual whose objective is to create the new company focused on exploiting the technology. It can be noted here that the figure of the entrepreneur and the creator of the technology can be carried out by the same person.
- The **investor**, which provides the necessary funding for the new venture.

4.2.2 Typology of University Spin-offs

It exists a typology of university spin-offs addressing three criteria: the status of the individuals involved, the nature of knowledge transferred from the university and the involvement of the university in the process.³⁶

Considering first the status of the individuals involved in the process, we can distinguish two types of university spin-off:

1. **Academic Spin-offs**: they are created by members of the university scientific community, whether teachers, researchers and PhD students. They are also called Academic Entrepreneurship.
2. **Student Spin-offs**: they are those created by college students.

Depending on the nature of the transferred knowledge, we can distinguish two cases:

1. University Spin-offs whose main activity is based on the commercial exploitation of knowledge encoded for industrial purposes, which are called **product-oriented spin-offs**.

³⁶ Cp. Pirnay et al. (2003)

2. University Spin-offs dedicated to the commercial exploitation of tacit knowledge in order to provide expert advice; in this case, they are called **service-oriented spin-offs**.

Finally, taking into account the attitude of the university towards entrepreneurship, there can be differentiated the spin-offs created with the support of the university and those who have not had this support:

1. **Pull spin-offs**: the individuals go out of college because of the expectations of profit that provides the business opportunity.
2. **Push spin-offs**: those are the cases in which the university has influence on the output of the inventor to the business world through the development of policies to promote the creation of spin-offs and technology transfer mechanism.

Based on the first two criteria, a conceptual framework is developed for the study of university spin-offs, reflected in Table 4:

Table 4: Conceptual framework for the study of university spin-offs

		Status of the individual	
		Researcher	Student
Nature of the transferred knowledge	Encoded	Type I	Type III
	Tacit	Type II	Type IV

Source: Pirnay et al. (2003), p.361

From this table, we determine the characteristics of the different types of university spin-offs, which are set out below, in Table 5.

Table 5: Characteristics of the types of university spin-off companies.

	Type I	Type II	Type III	Type IV
The opportunity				
Kind of knowledge	Encoded and tacit	Tacit	Encoded and tacit	Tacit
Activities	Technological, industrial	Consulting	Technological	Services supply
Entry barrier	Moderate to high	Low to moderate	Moderate	Low to moderate
Potential market	International	Local to national	National to international	Local
Expected growth	High (emerging market)	Low (niche)	Moderate to high	Low (niche)
Export potential	High	Low	Moderate to high	Low
Expenditure on R & D later.	Moderate to high	Low to moderate	Moderate to high	Low
The entrepreneur				
Idea starter	Researcher team	One individual	Individual/ Researcher team	One individual
¿Inventor = entrepreneur?	Sometimes	Most cases	Always	Always
Dependence of the founders	Low	High	High	Very high
Openness to foreign investors	Moderate to high	Low to moderate	Moderate to high	Low
Objective	Growth	Profit	Growth/Profit	Profit
Resource requirements				
Financial	High	Low to moderate	Moderate to high	Low to moderate
Material	Moderate to high	Low	Moderate	Low
Intangible	High	Low to moderate	Moderate to high	Low to moderate

Source: Pirnay et al. (2003), p.363

Although, as indicated by the authors, these characteristics have not been proved through empirical analysis, they are useful for identifying different types of spin-offs existing and designing the most appropriate policy for the development of each type of company.

4.2.3 Formation process of a University Spin-off

Four stages in the formation of university spin-offs can be distinguished:³⁷

1. **Generating business ideas from the research.** At this stage entrepreneurs develop ideas, suggestions or proposals for possible commercialization of research results.
2. **Developing a business plan from the idea conceived before.** At this stage the business idea outlined in the previous stage takes shape in a viable company creation project. The stage ends when the project is finished.
3. **Launching of the spin-off from the project.** This stage involves the creation of a new company, the university spin-off, to exploit the business idea that was generated in the first stage.
4. **Strengthening economic value creation.** The creation of the company translates into value creation within the territory, with both tangible and intangible benefits.

Also, there is an alternative model³⁸ that introduces a different perspective on the process considering that the transition from one stage to another in the evolution of the spin-off is determined by a critical situation (**critical juncture**) that the company must overcome to continue with a higher stage of development. A critical situation is defined as a complex issue that occurs at a point on the path of expansion of a university spin-off, allowing the transition

³⁷ Cp. Nlemvo Ndonzuau et al. (2002)

³⁸ Cp. Vohora et al. (2004)

from one phase of development to the next one³⁹. While overcoming every critical situation, conflicts inherent to the development process of the company are solved, so the company created is completely different to the one that existed in the previous stage, both in resources and capabilities. Four phases of development are identified:

1. **Research phase:** at this stage the research is developed, whose results are protected by intellectual property, generating the marketing opportunity.
2. **Opportunity framing phase:** In this phase the business idea is shaped, so that an opportunity, whose technological value has been demonstrated, is transformed into a business idea. To do this, the researcher---entrepreneur and the technology transfer office are responsible for identifying markets to which the technology can be led to and the ways to get it to potential consumers.
3. **Pre---organization phase:** During this phase, the spin---off managers are dedicated to organize and begin the strategic implementation plans. This involves making decisions about resources and capabilities to be developed and which will be needed in the future. Decisions made at this stage have a great influence on the future development of the company and mistakes made now may impact the future success of the company.
4. **Reorientation phase:** During this stage, the entrepreneurial team has to identify, acquire and integrate resources and continually reconfigure them. The aim of this process will be to generate profits for the company.

As noted above, in this model there are four critical situations in the evolution of the company, whose overcoming is necessary to reach a higher stage of development, and in which increasing complexity is observed:

1. **Opportunity recognition:** it involves the transition from the 'Research phase' to the 'Opportunity framing phase'. Recognizing the opportunity

³⁹ Vohora et al. (2004)

means combining an unmet need in the market with a solution that satisfies this need, and which the rest of the people have overlooked.

2. **Corporate Commitment:** This scenario involves the transition from a business idea, which exists in the mind of the researcher, towards the creation of a business. Thus, the inventor begins to take the necessary steps to become an entrepreneur.
3. **Credibility threshold:** At this point it is necessary that the employer gets hold of the necessary resources to begin with the activity. The achievement of financial resources is the first step, because with them the other resources can be obtained. This situation is called the threshold of credibility because if this is not enough, the ability of the employer to obtain the necessary resources is limited, both financial and human capital resources.
4. **Sustainability threshold:** once the company has obtained the necessary resources and has begun to develop its business, it can be identified one last critical situation, determined by the need for revenue and benefits of the activity that is undertaken and which shows the ability of the company to generate value. Going through this critical situation depends on the ability of the company to continually reconfigure resources and capabilities with the new information and new resources.

If the company fails to overcome each of the various critical situations, it will remain stuck in a development phase, unable to reach the following one. In case some critical situation is not solved in a prolonged period of time, the initial allocation of resources will be depleted, so that it may cause the failure of the company. Furthermore, deficiencies in overcoming one stage will have consequences in the following ones.

4.2.4 Determinants in the creation of a University Spin-off

There are a number of determinants of the emergence of spin-off, so that it feels that it is necessary to design a theoretical framework from which to identify the different categories of determinants and clarify the influence of each one on the generation of spin-off.⁴⁰

The identification of a technological opportunity is considered a prerequisite for the formation of an academic spin-off. Without it, the creation of the firm has no sense. From identifying the opportunity, there can be highlighted several groups of determinants that influence the decision to create the company, the process of forming the same and its subsequent development and performance. A first category of determinants includes the attributes and personality of the entrepreneur; the second, the organizational characteristics of the university; third one, structures and policies of the university that facilitate the marketing, i.e. institutional factors; and, finally, the external or environmental factors. Next, each of these categories will be analysed.

⁴⁰ Cp. O'Shea et al. (2007)

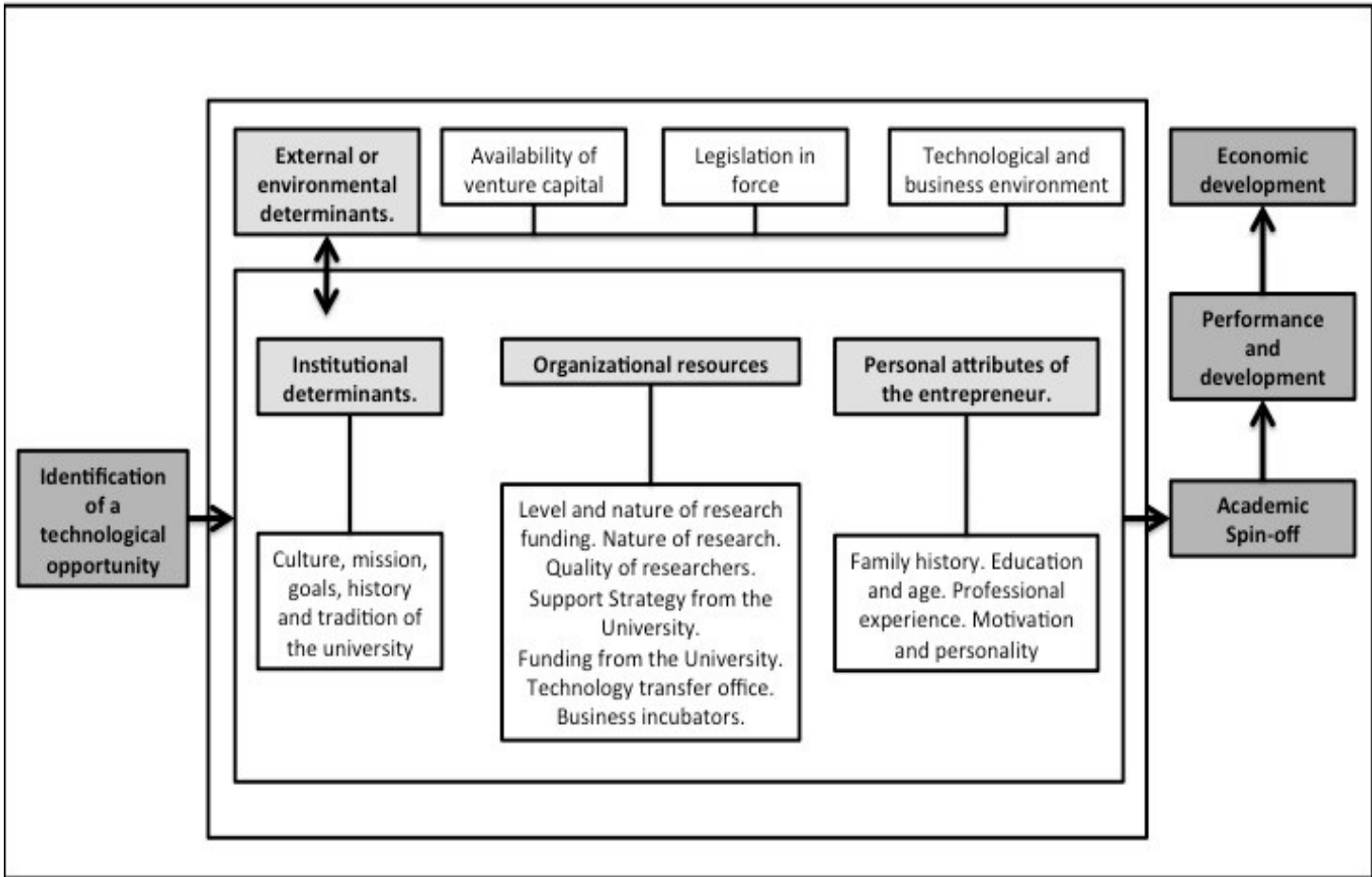


Fig.5: Determinants in the creation of academic spin---offs

Source: Aceytuno Pérez, María Teresa; de Paz Báñez, Manuela A. (2009), p.99

From now on, the determinants shown in Fig.5 will be developed.

Attributes and personality of the entrepreneur

It may be noted that studies of this branch of research share the idea that the creation of spin---offs is a reflection of individual actions, which largely is due to

personal factors of the researcher (or researchers) such as personality, skills, professional experience and willingness to engage in business activities.⁴¹

Four categories of determinants that can be framed within the personal attributes of the entrepreneur or founder of the spin-off company can be identified:⁴²

1. Family history
2. Education, sex and age
3. Professional experience
4. Objectives and motivations

Family history, first, can be a determining factor in the generation of a spin-off because, the presence of a family history business can be a determining factor in the decision to create a technology company.

Education, sex and age represent determining factors on the generation of spin-offs. The educational level, first, seems to be positively correlated with the decision of creating a spin-off. However, a doctor's degree can have negative effects, because its possession reports a higher salary in college, so it increases the opportunity cost of creating the company.

Sex, secondly, has been analysed⁴³ and differences between the spin-off created by men and women have been found. These differences indicate that the functions that have traditionally been awarded to women, such as childcare, pose an obstacle for the investigator women to get involved in the commercialization of the results from the research. However, it has been noted that the influence of these traditional roles is becoming weaker.

⁴¹ Cp. O'Shea et al. (2007)

⁴² Cp. Roberts, Edward B. (1991b)

⁴³ Cp. Murray, Fiona; Graham, Leigh (2007)

In terms of age, finally, the average age of entrepreneurs is 37 years. On the other hand, age has a slightly negative effect on the decision to create a spin-off, which may also be related to the opportunity cost noted above.

Professional experience is the third determinant of generating spin-offs. It is generally considered to have positive effects, although there are some nuances. First one, experience in business management or technology is considered especially positive in the decision to create a spin-off. Secondly, the decision to continue working at the university who created the spin-off may adversely influence by subtracting time devoted to the new company; however, also highlight the positive effects of the permanence of the entrepreneur in the university has on the maintenance of formal and informal relationships with it.

Finally, the goals and motivations of researchers have been identified as a key variable for the decision to create a spin-off. Note the importance of factors such as the need for achievement and recognition. Other objectives and motivations may be the pursuit of innovation and the desire to capture business opportunities.

Organizational resources of the university

It can be considered that the different resource endowments held by each university is a determinant of the rate of spin-off generation of the university, and also allows us to explain the differences that can be observed with regarding the creation of spin-off in other universities.⁴⁴

Among the organizational resources of the university, they can be differentiated the following ones:

1. Level and nature of the funds used to finance research.
2. Nature of the research

⁴⁴ Cp. O'Shea et al. (2005)

3. Quality of the researchers
4. Strategy to support the generation of university spin-offs
5. Availability of technological transfer offices and incubators

Regarding the first factor, it can be noted that the researchers whose activity is funded by resources from industry are more active in the commercial transfer of both results: using patent licenses and through the generation of spin-off.

Secondly, the influence of the nature of the research is based on the idea that both the level of opportunities and the propensity to commercialize research results, vary considerably between different scientific fields and are present in a special way in those sectors in which science and technology are together. Thus, the funding of research in science and engineering is more fruitful in generating spin-offs, with emphasis on research carried out in the fields of health sciences, computer science and chemistry.

Thirdly, it should be noted that a higher quality of researchers could have a positive influence in obtaining important results that can be commercialized by creating a spin-off. In addition, there is a positive relationship between the generation of spin-offs and the prestige of universities, which is based on the idea that exploiting commercial technologies whose outcome is uncertain is easier when the prestige of the university supports the credibility the entrepreneur.⁴⁵

Other factor that has been considered in the literature as determinant of the generation of spin-offs is the building strategy that the university follows. The academic spin-off may provide, in many cases, tools to support the creation and development that are not available to other small businesses that do not come from the university. The strategy to support the generation of spin-off is related

⁴⁵ Cp. Di Gregorio, Dante; Shane, Scott (2003)

to academic culture and the overall goals of the university, which will be analysed later.

There is a classification of strategies to support the creation of spin-offs, in which three models differ.⁴⁶ The first one is the **low selective model**, whose main objective is to generate the largest number of spin-offs possible, by both students and researchers, so that the economic and financial attractiveness of each is less important. The second one is the **supportive model**, in which the generation of spin-offs is considered as a way to commercialize the results of the investigation as an alternative way to patent licensing. As a result, companies created must meet minimum expected benefits. Instead, the support the university offers will be greater. Finally, the third model is the **incubator model**, which aims to find opportunities from scientific research for which the spin-off is the most beneficial form of commercial exploitation, compared to other traditional forms of marketing, such as patent licensing. In this case, it occurs an active research for technological opportunities and a choice between licensing and spin-off is made for each one. As a result, the number of created spin-off is lower, but they have a strong market orientation and growth.

In fifth place, the presence and performance of technology transfer offices can be considered a determinant of the emergence and development of university spin-offs. Technology transfer offices are created by the university to act as intermediaries between university researchers and industry actors.

Among the functions directly related to the generation of spin-offs carried out by the offices of technology transfer, they are included the following:⁴⁷

- To make decisions during the process of assessing the commercial potential of the invention
- To plan the intellectual protection of the invention
- To relate entrepreneurs with venture capital companies

⁴⁶ Cp. Clarysse et al. (2005)

⁴⁷ Cp. Roberts, Edward B.; Malonet, Denis E. (1996)

- To participate in the management system of the company

However, there is no consensus on the effectiveness of the transfer office in the generation of spin-offs. Although, its influence is generally considered positive.⁴⁸ In any case, it can be noted that although the work of the office of technology transfer in the generation of spin-offs is important, it is an element of support and it is influenced by multiple factors, such as the business environment. Therefore, it is important that the activity of the transfer office is integrated into a model of general support, and that it is taken into account the social and institutional context surrounding the university.

Finally, a factor that is often considered crucial for the generation of spin-offs is the presence of university incubators, i.e. areas in which the spin-off took place during their early years. The importance of the incubator is especially noticeable in the early stages of operation of the company.⁴⁹

Institutional determinants

We can identify three main factors⁵⁰: the mission of the university, culture and history and tradition. Thus, we can distinguish some universities where these factors are oriented towards the commercialization of research results and the creation of companies ("business paradigm") and other universities in whose culture still dominates the "scientific paradigm".⁵¹

On the other hand, note several reasons why the structures of the university may have a disincentive effect of business activity, such as the impersonal nature of

⁴⁸ Cp. O'Shea et al. (2007)

⁴⁹ Cp. Clarysse et al. (2005)

⁵⁰ Cp. Mlemvo Ndonzuau et al. (2002)

⁵¹ Cp. O'Shea et al. (2007)

relationships in college, its hierarchical structure, conservatism or lack of methods for appropriate compensation.⁵²

External or environmental determinants

There are three external factors that are determinants in the generation of academic spin-offs:

- The existence of venture capital
- The entry into force of laws that favour the creation of spin-offs
- The university position in a technological and business context

Venture capital firms, first, are dedicated to invest in company creation projects that traditional credit institutions do not fund as they consider them too risky. In general, it is considered that the availability of capital funds positively influences the generation of spin-offs.

Secondly, the current legislation about universities and intellectual property is considered an important factor for the spin-off creation. It is very important that politicians show caution when designing innovation policies, especially when trying to copy the existing patent laws.⁵³

Finally, other external factor that may influence the generation of academic spin-off is the technological and business environment. Some authors emphasize that the emergence of spin-offs in a university that is located in a highly technological and entrepreneurial environment will be greater than at other universities whose location is less flattering.⁵⁴

⁵² Cp. Kirby, David A. (2006)

⁵³ Cp. Bacchiocchi, Emmanuele; Montobbio, Fabio (2007)

⁵⁴ Cp. O'Shea et al. (2007)

To sum up, the design of a policy for the promotion of academic spin-offs should be based on careful analysis of the context and the institutions working in it.

4.2.5 Academic Entrepreneurship Capital

In recent years, the number of studies focused on the analysis of the cause-effect relationship between factors and internal variables in universities and spin-off activity has greatly increased. These factors can be grouped into four specific dimensions: policies and strategies, support measures, production technology and entrepreneurial potential.

These dimensions shape what we call the "academic entrepreneurship capital" of a university, that is, its ability to generate and develop new academic spin-offs.

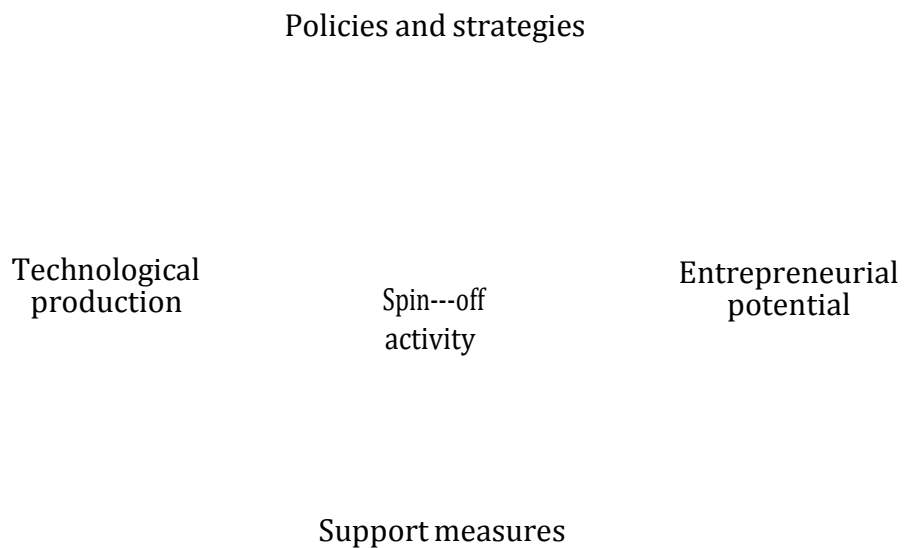


Fig.6: Dimensions of a university's Academic Entrepreneurship Capital

Source: Gómez Gras et al. (2009), p.66

The “academic entrepreneurship capital” of each university is manifested in its spin-off activity, both from the population perspective (creation ratios, surviving time, typology, etc.), such as external and internal impacts generated.

Policies and strategies

Several studies have analysed a number of political and strategic factors associated with the spin-off activity of a college, such as the structure and autonomy of the units involved in the creation of spin-offs; the level of support and selectivity of the spin-off initiatives; the system of incentives for technology transfer; or mechanisms for joint university-spin-off relationship.⁵⁵

Institutional incentives and reward mechanisms operating within a university may preserve and reinforce the existing culture, organizational rules, policies and procedures. A major impediment and often overlooked in the commercialization of university technology is the lack of enough incentives and rewards for academic staff to be involved in spin-off initiatives.

In a general context, examining the policies regarding the level of support and involvement of universities in the stages of emergence of initiatives, analysis and commissioning, four archetypes of these policies that affect the development potential of new spin-offs are identified: lack of proactive policies, minimum support and selectivity, intermediate degree of support and selectivity, and high selectivity and support.

Support actions

Due to the nature of the companies based on new technologies, and in particular to the academic spin-offs, the implementation of support mechanisms by the

⁵⁵ Cp. Gómez Gras et al. (2009)

university acquires a significant importance, with special emphasis on the regions where the presence of external support measures is scarce.

Among the support actions implemented by universities, we can distinguish the economic, non-economic and the infrastructural ones offered to potential entrepreneurs, new entrepreneurs and spin-offs (Table 6).

Table 6: Support actions offered by universities for the spin-off creation

Type of action	Description
<p>Non-economic</p> <p>Promotional activities</p> <p>Information-orientation</p> <p>Counselling-accompanying</p> <p>Access to financial resources</p> <p>Training activities</p> <p>Networking activities</p>	<p>Seminars, conferences, awards, etc. focused on the promotion of positive attitudes and intentions toward technology transfer, entrepreneurship and performing commercially applicable research.</p> <p>Specific and general process aspects of creating an academic spin-off (incompatibilities, procedure, etc.)</p> <p>To carry out the feasibility analysis and drafting the business plan.</p> <p>Search and support in introducing projects to investors, venture capital, subsidies and support, etc.</p> <p>Attending courses in building and administrating companies.</p> <p>Access to a network of interest to the business project (customers, suppliers, etc.)</p>
<p>Economic</p> <p>Help</p> <p>Capital funds</p>	<p>To carry out the activities of the feasibility analysis and the implementation.</p> <p>University participation by capital contributions for the new spin-off.</p>
<p>Infrastructures</p> <p>Physical areas</p> <p>Use of facilities</p> <p>Staff</p>	<p>Incubators, science and business parks, university labs, etc.</p> <p>Rent / cession of R & D equipment.</p> <p>Facilities for the reconciliation of academic and technical work between the university and the spin-off.</p>

Source: Gómez Gras et al. (2009), p.67

Technological production

The relationship between production technology and university spin-off activity has been analysed from different perspectives, specifically focusing on the resources allocated to research, research areas, and protection aspects.

Studies suggest that certain areas of research are more likely to create spin-offs. It has been found evidence of the association between public fundraising and spending on life sciences, chemistry, and computer science and telecommunications, with the spin-off activity. In addition, universities that capture relatively more funding of public programs that encourage R & D collaborative university-industry as well as those with high levels of R & D income from industry, tend to generate more spin-offs.⁵⁶

Overall, there is a positive correlation between the number of granted patents and spin-off activity, although the importance of patents is often not a synonym of higher rates of creation. Interestingly, spending on protection of results of a university is usually correlated with the number of new spin-offs that attract venture capital by providing evidence of the importance for foreign investors of technology protection as an evaluation criterion.

On the other hand, universities with excellence research groups tend to be more intense in spin-off activity, and what is more, they generate companies with higher yields, suggesting that the scientific reputation of a university, and the excellence of its research groups, affects in improving their competitive position to obtain the necessary resources for the implementation of spin-offs.

⁵⁶ Cp. O'Shea et al. (2005)

Entrepreneurial potential

The university community is considered as a reservoir of new entrepreneurs. The conversion of members from the university community to potential new entrepreneurs, as well as their skills and roles in projects and new spin-offs, is a key point in the technology entrepreneurship capital in universities.

They have been identified a number of common features in the more likely researchers to create a spin-off, as, for example, consulting experience, high social capital, access to higher levels of research resources in university, extensive research experience, etc.⁵⁷

Several studies have focused on the analysis of the role of researchers in spin-offs initiatives, recognizing the importance of the involvement of the inventor in the company.⁵⁸ Also, it is important the coordination of the business idea, the level of professional experience of the entrepreneurial team, as well as their vision and knowledge beyond academic boundaries.

Some authors point out the importance of differentiating between the actors involved in the research team and the entrepreneurial team. The first group of actors consists of the individuals involved in the development of the new technology, while the second one is made up by individuals in charge of transforming the technology into a product or service and commercializing it through the creation of an spin-off, they can also be members of the research team or external entrepreneurs, as noted before (4.2.1). Note the crucial importance of the availability of at least one key individual in the entrepreneurial team, coming from the research group that supports the spin-off initiative.

⁵⁷ Cp. Landry et al. (2006)

⁵⁸ Cp. Clarysse, B.; Moray, N. (2004)

5. Analysis of the current situation for university start-ups in Eastern Germany

5.1 Entrepreneurship education in Germany

The current situation regarding the university entrepreneurship in East Germany can be deduced from a study carried out by the OECD (Organisation for Economic Co-operation and Development)⁵⁹ in several institutions of the region. From this study it was extracted that universities identify co-operation with local companies as the most important strategic objective related to entrepreneurship.

Here, the main conclusions from that survey related to university education are listed:

1. Fewer than the 20% of students take entrepreneurship education in the majority of universities despite the wide range of benefits regardless of whether the students will create their own business. Also, it is remarkable that most of the universities offer this kind of education.
2. Teaching entrepreneurship is still focused on business plan writing. But many universities are increasingly starting to incorporate international best practice teaching methods that provide students with real experiences.
3. Extensive start-up services such as business incubators are available but they are mostly focused on the pre-start-up stage. Despite of this, the demand for start-up support is increasing in the majority of universities.
4. Entrepreneurship and alumni could be used more widely in delivering start-up support services.

The strengths found by the case study were:

⁵⁹ Cp. Potter, Jonathan; Halabisky, David (2013a)

1. Entrepreneurship is, in fact, widely supported by the university leaders.
2. Universities are using a variety of approaches to make students engage the entrepreneurship.
3. The use of international good practice teaching methods that provide students with real experiences is growing.
4. Universities are well connected with external entrepreneurship support organisations and networks.

On the other hand, these were the weaknesses:

1. Role models and successful student entrepreneurs have low visibility in universities.
2. Best---practice teaching methods have yet to be widely adopted.
3. There are few incentives and rewards for students, professors and staff to be involved in entrepreneurship activities.
4. Alumni are not used widely in entrepreneurship teaching and business start---up support.
5. Relatively low levels of commercialization and spin---off activities are seen.
6. It exists a reliance of public funding from Federal and state governments and the European Union.

5.2 University Spin---offs in Germany

From a report made for the German Federal Ministry of Research and Education⁶⁰ it was extracted that most of the academic spin---offs created in Germany lack a proper strategy and sometimes they do not even have defined goals. There is too a lack of knowledge about the situation in the markets they are trying to get in.

⁶⁰ Cp. Hemer et al. (2005)

Regarding qualification programmes by parent organisation or public bodies, it was found that all of the founders who used them said that they were very positively about them for the most part.

This analysis showed an important difference between East and West German spin-offs regarding the method of financing the start-ups. West German founders get more often and more private capital for the companies than East German ones. Almost all of these last ones rely on bootstrapping, cash flow and public promotion for financing. This private financing gap in East German spin-offs is not only due to a distinct scepticism on the founders regarding equity capital or on the private investors concerning state aid, founders also have problems with getting private founding because of the market situation.

Banks in Germany have been very diffident lately in debt financing for technology-oriented company spin-offs. Reasons for these are, among others, the high cost of examining the plans and supervising young portfolio companies, also the technical and market risks of a deficient expected return on investment.

6. Possible Scenarios and recommendations for further projects

6.1 Recommendations for Eastern Germany universities

In general, and after analysing the current situation, the “good practices” to be implemented in universities to encourage entrepreneurship can be extracted:⁶¹

First of all, the commercialization of universities’ research knowledge should be improved as well as the financing of business start-up services. It needs to be made a movement along engaging alumni for entrepreneurship education and start-up support. Also, during education, inspiring students to be entrepreneurial is essential as well as strengthening entrepreneurship education.

The study made by the OECD noted above, also, extracted some recommendations for the German universities in the future:⁶²

1. Showcase and celebrate entrepreneurship and success on campus by:
 - Promoting local success stories and successful student entrepreneurs.
 - Showcasing role models at events and incorporating them into teaching, coaching and mentoring.
2. Provide incentives for students, professors and other university members to get involved in entrepreneurship by:
 - Rewarding entrepreneurship activities.
 - Providing universities with appropriate incentives.
3. Improve the quality of entrepreneurship teaching by:
 - Putting less emphasis on business plans in entrepreneurship teaching.
 - Involving alumni in case studies and projects.

⁶¹ Cp. Potter, Jonathan; Halabisky, David (2013b)

⁶² Cp. Potter, Jonathan; Halabisky, David (2013a)

- Providing training for teachers.
4. Develop two---levels of entrepreneurship support by:
- Providing wide---reaching basic entrepreneurship teaching and experiences to a large proportion of students.
 - Providing a second layer of more intensive support to help those students with potential to grow.

6.2 Recommendations for Eastern Germany Spin---off System

From a report made for the German Federal Ministry of Research and Education⁶³, some recommendations for future policy can be noted:

Germany needs improved strategic management and commercial qualifications for the founders. This problem could be solved by means of the creation of an external expert appraisal system for examining the contents of the plans or conducting due diligences or appraisals, namely technology and market expertises or analyses. Also, for inexperienced founders, coaching by experienced professional consultants would be a perfect solution so that enterprise concepts and individual strategies are developed and constantly adapted to the current situation. A certification model could help with the quality control of training schools and subject matter as this market is confused. This way, there would be a qualitative selection of certified training institutions or consultants.

German state exercises indirect influence on business concepts and product characteristics, by examining applications for promotional funds for content or has them vetted by neutral juries. This method can influence the quality of the business and product concepts. A helpful solution for this problem could be to improve the qualification of these people and, for promotional programmes with small number of participants, to obtain external expertises on principle and to partly subsidise the cost for the often---expensive expertises.

⁶³ Cp. Hemer et al. (2005)

From this report was also shown that the scope of support provided by the scientific parent organisation is quantitatively and qualitatively very broad. But, apart from that, the possibilities of stronger links between science and industry should be examined. Research institutions and universities could develop a work and communication modus, language and organisation more similar to industrial reality. This could be made at least at their interfaces to the market, and thus reduce the still existing gulf and the mutual mistrust between science and industry.

Regarding the situation noted above (5.2) about the financing, a necessary subsidiary consequence could be the support for spin-offs via public promotion during the pre-seed, seed, foundation and build-up phase. However, this public promotion should depend on a financing mix meaningful for the company, which is composed from various sources. Thus, companies should be prevented from being satisfied with public promotion alone and they should be encouraged to tap other sources.

To continue, concerning bank financing, the costs for examining the plans and the risks can be reduced by means of a well organised system to draw up or provide favourable priced technology and/or market expertises. These expertises could be taken into account in the rating tools of banks and rating companies and influence in a positive way the rating of the company, so that the credit evaluation for the companies is more favourable for the enterprises.

As it is obvious, an adequate financing is indispensable for success in all enterprise development, but finding the right amount of necessary funding is not easy. Tight financing is, according to the report results, however rather a result of entrepreneurial modesty or managerial deficits than a business model lacking attractiveness. Over tight financing obviously clearly prevents rapid growth, but forces management to adopt commercially cautious strategies and efficient utilisation of resources. On the other hand, rapidly growing companies need

generous financing, which also contains a reserve or cushion for unforeseen risks beyond the funds necessary for solid growth. The speed in the growth of a company is subject to the company goals and enterprise strategies, the potentials of the company, as well as to the market conditions and should not be the result of a financing offer.

6.3 Recommendations for the Hochschule Magdeburg---Stendal

The design and implementation of strategies and measures of support suitable for university scope goes through the analysis of the specific conditions of each university, where the heterogeneity of spin---offs as well as the different needs presented by these business initiatives is necessary to understand throughout the building process, training and development.

It could be said that a young and small university, as is the case of the Hochschule Magdeburg, must first make the effort to enter the research paradigm, providing resources and measures to improve the quality of its researchers, so that when it supports the creation of technology---based companies, their effort is not reduced by the lack of quality of their research. Then, all the measures listed in 6.1 are applicable and relevant for it too.



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Table of Appendices

Appendix 1: “General bureaucratic and legal hurdles faced by entrepreneurs wishing to incorporate and register a new firm in Germany”.

XIII

Appendix 1.

No.	Procedure	Time to Complete	Associated Costs
1	<p>Obtain the company's name at the local chamber of industry and commerce</p> <p>Entrepreneurs need to obtain the company's name at the Berlin Chamber of Industry and Commerce</p>	Less than one day (online procedure)	no charge
2	<p>Notarize the articles of association and memorandum of association</p> <p>The fees depend on value of the share capital, with a basic 10/10 fee calculated as follows:</p> <ul style="list-style-type: none"> • Up to EUR 1,000 of share capital: fee is EUR 10. • From EUR 1,000 to EUR 5,000 of share capital: fee of EUR 8 is added for each EUR 1,000 of share capital. • From EUR 5,000 to EUR 50,000 of share capital: fees of EUR 6 are added for each EUR 3,000 of share capital. • From EUR 50,000 to EUR 5,000,000 of share capital: fees of EUR 15 are added for each EUR 10,000 of share capital. <p>Since the model company has 5 shareholders, these do not have the option of using unified sample articles (as provided for in the attachment to sec. 2 GmbHG).</p> <p>If more than one shareholder is involved, the German Cost Regulation Act provides a double fee (so-called "20/10-fee" / "20/10-Gebühr"), in which the amount for a company with a share capital of 10 times the GNI per capita is EUR 1,104.</p>	1 day	EUR 1104
3	<p>Open a bank account</p> <p>In case of the UG (haftungsbeschränkt) the initial capital has to be paid in full.</p>	1 day	no charge

<p>4</p>	<p>Notary public files the articles of association at the local commercial register</p> <p>Applicants must submit to the Commercial Register by electronic form: (a) the notarized articles of association; (b) the deed of appointment of the directors, if not included in the articles; (c) a list of the company’s shareholders; and (d) the assurance that the statutory minimum paid-in capital has been paid in to the free disposition of the management.</p> <p>Pursuant to the applicable registration laws, the Commercial Register must decide on the company’s registration without undue delay. The Commercial Register publishes the registration on a central electronic platform (www.handelsregister.de) and notifies the local Chamber of Industry and Commerce and the tax office of the new company.</p> <p>Costs to file the articles of association with the local Commercial Register include the following:</p> <ul style="list-style-type: none"> • Notary fees for registration and notarize the articles and foundation agreement. No extra notary fees apply if the notarization and filing of the articles of association (by notary public) are combined. The applicable fees amount to a quarter of the fees set forth under Procedure 2 when the notary used in proc. 2 differs from the one of proc. 4. All amounts are plus 19% VAT. If the application for registration is notarized together with the articles of association, the notarization of the application does not trigger any additional fees. • Registration fees with local court: EUR 150 (if in-kind capital contributions, the statutory registration fee amounts to EUR 240) <p>The Commercial Register notifies the local Chamber of Industry and Commerce and the tax office of the new company.</p>	<p>7 days</p>	<p>EUR 150 (registration fee) + EUR 276 (application for registration)</p>
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5	<p>Notify the local office of business and standards of the establishment of the company</p> <p>Certain businesses (e.g. restaurants, brokers) must apply for a trading permit (Gewerbeerlaubnis). However, the permit does not have to be presented at the time of the registration of the GmbH / UG (haftungsbeschränkt) at the commercial register. If no such permit is required, start-up companies must simply notify the local trade office, which issues a trading license (Gewerbeschein). This notification procedure also covers registration formalities with the central statistical office, the relevant chamber of industry and commerce, the local labour office, the social security and federal health insurance office.</p>	1 day	EUR 31
* 6	<p>Register with the professional association of the relevant trade</p> <p>The professional associations are carriers of occupational accident insurance. Registration must be done within a week of the founding of the business (after the notarization of the articles of association).</p>	1 day (simultaneous with previous procedure)	no charge
* 7	<p>Notify the local labour office of the establishment of the company</p> <p>The notification can be in writing and/or by phone. The Labour Office assigns an eight-digit operating number, which is needed to report social security.</p>	1 day (simultaneous with previous procedure)	no charge
* 8	<p>Register employees for health and social insurance</p> <p>The social security and federal health insurance office notifies the local labour office and the annuity insurance carrier (Deutsche Rentenversicherung Bund). The competent social security and federal health insurance office collects payment for mandatory health, unemployment, and annuity insurance.</p>	1 day (simultaneous with previous procedure)	no charge
* 9	<p>Mail out the documentation to the Tax Office</p>	1 day	no charge



<p>Registration must be done within a month of the opening of the business, and not later than a month after the notarization of the articles of association. After the tax office is notified of the company's business activity by the trade office, the tax office sends the company a questionnaire requesting the company's business data.</p>	<p>(simultaneous with previous procedure)</p>	
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- Takes place simultaneously with another procedure.

Source: International Finance Corporation, The World

Bank. <http://www.doingbusiness.org/data/exploreeconomies/germany/starting---a---business> 18/07/2014

Statement of authorship

I, Sara Redondo Sánchez, confirm that the work presented in this thesis has been performed and interpreted solely by myself except where explicitly identified to the contrary.

Signature: _____

Dated: _____