

Chapter 2

Motivation

2.1 Status Quo of the German and Global Software Industry

Recent studies have shown that there is strong growth in the software industry. The global market for software and software services grew by 7.8 % in 2012 (OECD 2012, p. 55). The industry association BITKOM was expecting a market growth of 3.1 percent for 2013. This means that Germany was predicted to reach a market volume for software and IT services of 53.6 billion euros in 2013 (BITKOM 2013).

The export of software products and services from Germany amounts to 12.1 billion euros, about half of which (6.1 billion euros) is exported to European countries (BITKOM 2011). The two largest German software companies, SAP AG and Software AG, which respectively generate 82.4 and 79.5 % of their revenue abroad (Lünendonk 2011), contributed the highest share.

At the same time, German companies only sporadically take a leading role on the international stage. There are 15 Germany companies among Europe's 100 largest software companies, accounting for 50 % of the top 100 companies' revenue. However, excluding SAP, Germany only accounts for 8 % of the top 100 European companies' revenue (Truffle Capital 2012). The global picture is even more discouraging: while only three of the world's top 100 software companies are from Germany, 63 companies are from the USA (Top 100 Research Foundation 2011). Germany and Europe are also underrepresented when one considers the world's top 50 publicly traded Internet companies. Germany with only 2 companies (corresponding to 4 %) and the rest of Europe with five companies (corresponding to 10 %) have a far lower percentage than the USA, which dominate the ranking with 31 US-American Internet companies (corresponding to 62 %; OECD 2012, p. 44). Therefore, one can conclude that compared to the size of the entire economy, the Germany software industry is underrepresented on a global scale.

There is a large gap between the high number of very small companies and the small number of large (at least for German standards) companies in the software

and IT services industry. This indicates that the weakness of the Germany software industry is not primarily due to the start-up phase, but can rather be found in the later growth phase (cf. Scheer 2001 on this topic). The concentration on a small number of larger companies and on the other hand a lack of medium-sized companies provides evidence that there are impediments in the growth trajectory of software companies (Leimbach 2010, p. 10). This imbalanced structure also impacts exports, as large companies, in particular, are export-oriented, whereas small and young companies exhibit considerable deficits in their export orientation and internationalization (Lünendonk 2011). This can become problematic as the software and IT services market is very international and the quick diffusion of innovative solutions can be seen as a crucial competitive advantage (Leimbach 2010, p. 27).

2.2 Terminology

The project set out to explore how to successfully foster the growth and internationalization of software-based companies. Therefore, we will first provide our understanding of the terms “software-based companies” and “internationalization” and how these terms are used within this study.

2.2.1 *Software-Based Companies*

Software-based companies offer products and services with software at its core. In addition to traditional software companies that develop software either for individual clients or for the mass market, this definition of software-based companies also includes web-centric companies and embedded systems companies. We chose this extended definition as their underlying technological and economic mechanisms are similar or even identical. Our study did not focus on pure IT service providers. Although their business is related to software, they are, as customer-focused service providers, subject to different economic principles. Therefore, their offerings are more similar to traditional service companies than to scalable software development companies (Cusumano 2004, p. 26).

Despite, or rather because their common basis is software, which can be used for a plethora of purposes, software-based companies cover a variety of different products and business models. Their offerings range from apps to standard application software to custom-developed enterprise software. We developed a matrix to identify differences within the different segments. For this purpose, we distinguish between the functional domain (system software, application software, web-centric applications, embedded systems, and other) and the level of the value chain (development and sales of own software, implementation and hosting, as well as consulting and

training). The matrix therefore also includes web-centric applications and embedded systems, which are not part of the software industry in a narrow sense.

We did not focus on companies whose main source of revenue is based on implementing and hosting software or on consulting and training for the purpose of this study. The following “DESC software matrix” (cf. Table 2.1) was used specifically for classifying companies in the quantitative survey.

Certain characteristics apply to the market in which software-based companies operate. These characteristics refer to both the software itself and the market environment (Buxmann et al. 2011). While immateriality and scalability are characteristic of the software itself, software markets are coined to some extent by strong network effects. In addition, technological advances and disruptions play an important role.

Table 2.1 DESC software matrix

Main revenue source of the responding companies ^a :			
	Develop- ment and sales of own soft- ware	Implementa- tion and hosting	Consulting and train- ing
System software:			
Operating systems	o	o	o
Security software	o	o	o
Database	o	o	o
Other system software	o	o	o
Application software:			
Business application software (e.g. ERP)	o	o	o
Technical application software (e.g. CAD)	o	o	o
Games	o	o	o
Other application software	o	o	o
Web-centric applications:			
Internet portals	o	o	o
Knowledge platforms (e.g. rating platforms)	o	o	o
E-commerce / market places of all sorts	o	o	o
Social networks (incl. dating platforms)	o	o	o
Search engines	o	o	o
Mobile applications (e.g. apps, navigation)	o	o	o
Online advertising	o	o	o
Other web-centric applications	o	o	o
Embedded systems	o	o	o
Other	o		

^a The survey was conducted without color coding the different categories

Dark gray software-based companies in a narrow sense

Light gray software-based companies in a broad sense

White not within the main focus of this study

The conversion into binary formats and the resulting immateriality reduce the necessity of an integration into physical value chains and distributional structures (e.g. Picot and Neuburger 2010), thus enabling the replication of perfect copies at variable costs approaching zero (Buxmann et al. 2011). This makes it possible to benefit from economies of scale. Scalability in this context refers to low variable, respectively low marginal, costs for every additional copy of digital products, as well as decreasing unit costs for services, which make it easier to market offerings at flexible prices. Both factors impede the market entrance of competitors and create sustainable profits for dominant companies.

Moreover, software markets are characterized by network effects. In such “winner-takes-it-all” markets (Buxmann et al. 2011), direct network effects (Zerdyck et al. 2000) are created when additional users generate a higher utility for existing users. Typical examples are platforms such as Facebook, eBay, or Twitter. Strong network effects in combination with large scale effects often require a company to engage in international activities at an early stage, in order to reach a critical mass of users and set de-facto standards.

2.2.2 Internationalization

The internationalization of companies can primarily mean two things: either entering a new foreign market to generate revenue abroad, or opening company locations of different kinds (e.g. for distribution or production) in other countries. In a study on the internationalization of European small and medium-sized companies conducted by the European Commission, the authors have an even broader definition of internationalization. They include all meaningful business relationships with foreign partners: exports, imports, foreign direct investments, international outsourcing, and international technological cooperation (European Commission 2010).

To assess the internationalization of young software-based companies, it seems more appropriate to draw on the revenue abroad as a benchmark instead of all relationships with foreign partners. Consistent with many studies on international high-tech companies (Johnson 2004; Knight et al. 2000; McDougall 1989; Oviatt and McDougall 1997; Zahra et al. 2000), this research project employs a distributional definition. The specific share of international revenue above which a company is considered an “*international venture*”, in contrast to a “*domestic venture*”, depends on the author and the study, and varies between 5 and 20 %. Accordingly, a company’s degree of internationalization was measured in this research project as the share of foreign revenue relative to a company’s total revenue.

It was important that our study did not omit business models that have recently emerged, especially freemium- and advertising-based business models, which are based on offerings that initially are free of charge to the customer. Therefore, the case studies that we conducted also included companies that were not yet generating revenue abroad, but had been able to gain customers in other countries. In this

context, foreign markets are all international markets that are outside the domestic market. A higher degree of internationalization thus corresponds to a larger share of foreign revenue respectively a larger share of foreign customers.

2.3 Current State of Research

To our knowledge, there has not been any research in which our research question has been explicitly addressed from a holistic perspective. At the same time, there is a plethora of research and a large number of studies that are highly focused on individual aspects. From the beginning of this study, we built upon these findings while conducting secondary research. As these findings are the starting point for deriving our results and recommendations, we will briefly summarize them in the following section.

2.3.1 Literature Review

There are a large number of theories in the literature on the internationalization of companies (e.g. Calvet 1981; Chetty and Hamilton 1993; Holtbrügge 2003; Kappich 1988; Miesenbock 1988). The theoretical foundations include the product lifecycle theory (Vernon 1966), the internationalization theory with a focus on market entry (Buckley and Casson 1976), the diamond model (Porter 1990), the eclectic paradigm (Dunning 1973, 1988, 2001), the Uppsala model (Johanson and Vahlne 1977, 1990), the network theory (Johanson and Mattsson 1988), and the theory of international new ventures, which is also referred to as “born globals” theory (Oviatt and McDougall 1997). These individual theoretical concepts deal with various forms of internationalization. While most concepts focus on specific aspects of internationalization, only a few claim to be universally valid on an abstract level.

Furthermore, there are a large number of studies on the growth and internationalization of companies. In the section that follows, we provide examples of studies that all highlight different reasons for successful growth and/or internationalization. These reasons can be broadly grouped into the factors strategy, financing, networks, and company size. All of these factors are also addressed, directly or indirectly, by our study.

2.3.1.1 General Internationalization Strategies

Bell et al. (2004) point out that the internationalization strategy of knowledge-intensive companies needs to be analyzed separately. In contrast to traditional companies that react passively and are characterized by opportunistic “*ad-hoc*” internationalization, knowledge-intensive companies internationalize faster and

follow a more structured internationalization strategy. Drivers of the growth of software companies are likely to be found in the strategic areas of innovation management, internal processes, and marketing, as well as in cooperation with other companies and research institutes, more freedom for employees in research and development, a higher investment in marketing, and an increased use of risk capital (Holl et al. 2006). The results by Ojala and Tyrväinen (2006, p. 79) further suggest a connection between a software company's mode of market entry and its product strategy: companies whose product strategy is based on cooperating closely with clients make use of their own sales representatives, while companies that sell standardized mass-market products to end users prefer cooperating with local partners. In addition, Stiehler et al. (2009) identify specialization, a systematic innovation process, and an early and active internationalization as promising business strategies to become internationally successful. On the other hand, especially large corporations benefit from a business strategy that includes outsourcing solutions (Kurbel and Nowakowski 2012).

2.3.1.2 Financing a Company's Internationalization

One study that was limited to an analysis of German companies found that the high cost of entering new markets is the main impediment for the German information and communication technology (ICT) sector to engage in international activities (Bertschek et al. 2011, p. 55). Another study by Metzger et al. (2010) emphasized the negative impact of a lack of debt financing, a lack of access to equity investors, and insufficient funding for young Germany high-tech companies. Jung et al. (2009, p. 28) conclude in their survey among 200 experts that a lack of financing is a "*substantial impediment to found a company*" for entrepreneurs in Germany.

The type of financing also seems to have an impact on the way a young company develops. Companies that are backed by venture capital more quickly and more frequently implement measures to increase the professionalization of the business, such as systematic human resource policies, stock option programs for employees, and even the employment of external managers (Hellmann and Puri 2002). Not implementing such measures of professionalization could increase the time that it takes to internationalize. Egelin and Müller (2012, p. 4) find that particularly those German companies in the ICT industry with the highest potential for growth suffer more often from a lack of shortage of capital. The large majority of companies with only a limited potential for growth, however, are less likely to suffer from a scarcity of capital, as their expansion plans are less ambitious.

2.3.1.3 Networks

Loane et al. (2004) identify a qualified management team with international experience and networks as the most important success factors for internationalization in a competitive environment that is quickly becoming more international.

International contacts and a talent for identifying international business opportunities are both seen as a critical driver of successful internationalization. Johnson (2004) emphasizes in this context the importance of the founders' visionary goals and ambitions.

One factor that Onetti et al. (2008) point out is the role of “*serial entrepreneurs*”. These serial entrepreneurs have already founded—with or without success—a company several times. They can therefore utilize their abilities that they have developed when it comes to internationalizing a company. This also relates to the role of established networks, which can influence the type and selection of a target market (Moen et al. 2004). These networks can be one key factor for small and medium-sized companies to gain an understanding of market selection, to choose the mode of market entry, and to achieve international efficiency (Amal and Freitag Filho 2010, p. 619). Hence, there is a connection between a company's national and international networks and its exports and market diversification. At the same time, Isenberg (2008) finds that it is especially the use of ethnic networks that has a positive impact on internationalization. Gabrielsson and Kirpalani (2004) show that multinational corporations acting as system integrators and distributors can be an option for companies to establish partnerships. Moreover, the Internet facilitates establishing networks as well as conducting marketing activities, which are both important factors for targeting unknown international markets. Sharma und Blomstermo (2003) find that “*born globals*”, which are companies whose strategy focuses on an international expansion early on, require knowledge on the mode of market entry before they actually enter the first market. They therefore make the decision about the mode of market entry based on their own and/or on their network's knowledge. They acquire additional knowledge through drawing on clients' and partners' networks.

2.3.1.4 Speed of Internationalization and Company Size

In a study on the internationalization and the export growth of small companies, Andersson et al. (2004) find that dynamic environments that are changing fast foster the internationalization of companies. Besides, the conditions underlying the speed of internationalization in early phases are different from the ones in later phases. A study on the internationalization of small software companies by Bell (1995) concludes that by following a larger partner organization or client, software companies can possibly overcome a stepwise entry into markets that are psychologically and geographically close. Autio et al. (2000) find that the earlier companies face international competition, the more quickly they grow internationally.

According to Coviello and Munro (1997, p. 379), it is especially young software companies whose internationalization follows a quick and stepwise approach. The speed of internationalization is accelerated or slowed down by the company's network. The analyzed companies had started to operate on an international scale within on average 3 years of their inception. Ruokonen et al. (2008) also find that small high-tech companies internationalize rather early, as long as attention is given

to the following three elements: customer focus, focus on competitors, and coordination of the value creation network. These companies' entry into foreign markets was initiated by the globalization of markets on the one hand and the technological progress in information and communication technologies on the other. In order to make optimal use of these aspects and to internationalize early on, key factors are a company's innovation culture, as well as knowledge and skills regarding the internationalization (Knight and Cavusgil 2004). According to Knight and Cavusgil (2004, p. 137), traditional impediments to internationalization, such as a lack of experience or of resources, are of minor importance, as long as the strategy and culture have been directed at the company's internationalization at an early stage.

2.3.2 Research Gap

Our analysis of the literature shows that a lot of existing research has analyzed some important aspects also found in this research project. However, some relevant questions still remain unanswered. In spite of encompassing theoretical and empirical foundations, the existing approaches are, as we pointed out, fragmented (Kutschker and Schmid 2011, p. 380). Although some efforts have been made to integrate these focused approaches, their explanatory power suffers in part from a weak theoretical foundation, as the topic has often been approached phenomenologically (Jones et al. 2011).

In addition, there is a lack of scientific studies that emphasize the characteristics of small and medium-sized companies in the software-based industry and how their characteristics relate to internationalization approaches. A lot of older internationalization models still concentrate on traditional industrial companies (e.g. Amal and Freitag Filho 2010) or do not take a company's size into consideration (e.g. Johanson and Vahlne 1977). There have been efforts to account for small respectively young high-tech companies (Johnson 2004) and even to analyze the software industry in particular (e.g. Moen et al. 2004). However, many of these studies are based on a small number of case studies (e.g. Coviello and Munro 1997), which makes further research on internationalization strategies of software-based companies necessary.

Moreover, there is a lack of research conducting an international comparison of internationalization strategies (e.g. Coviello and Munro 1997; Ruokonen et al. 2008). Differences in the specific conditions of the home countries are frequently not taken into account. A study may look at one or two, sometimes very particular, countries (e.g. Gabrielson and Kirpalani 2004; Bertschek et al. 2011). This approach reduces the studies' generalizability and comparability. With this in mind, our study puts an emphasis on comparing ecosystems and best practices across seven countries, in order to develop specific recommendations for German software-based companies. The findings can then be potentially applied to other economic regions.

Besides, existing studies mainly deal with either impediments (Metzger et al. 2010) or success factors (e.g. Coviello and Munro 1997; Loane et al. 2004) and analyze the importance of individual factors without considering the context (e.g. Egelin and Müller 2012) and the interdependencies among the factors. This is the reason for the lack of an integrative approach that aggregates macro- and micro-economic perspectives and analyzes the special characteristics of software-based companies' internationalization strategies holistically.

Finally, there is a lack of studies that consider several dimensions and concisely derive actionable recommendations. From a methodological point of view, there are only few studies which combine quantitative research with qualitative observations in order to derive holistic results (e.g. Andersson et al. 2004; Jung et al. 2009).

Based on these considerations, this study focuses on the following research question: what are the critical factors for the growth and internationalization of small and medium-sized software-based companies, and through which managerial measures and through what kind of institutional environment can their growth and internationalization be fostered most efficiently? By addressing this research question, this study sets out to contribute to existing research in this area. The employed methodology draws on an integrative approach that tightly interlocks qualitative and quantitative research. The next chapter will explain in detail how this methodological approach was put into practice.

The Internationalization of German Software-based
Companies

Sustainable Growth Strategies for Small and
Medium-sized Companies

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