

## 2 Methodology

In this section the author describes the research approach adopted in this thesis. First, the characteristics of the literature review are explained. Thereafter, the research design, methodology and sample selection is argued. Additionally, the processes of data collection and analysis are discussed. The research procedure includes several sequential steps as shown in detail in Figure 1. However, the explanation of the methodology in this chapter is arranged logically and does not follow the exact steps of the actual research procedure.

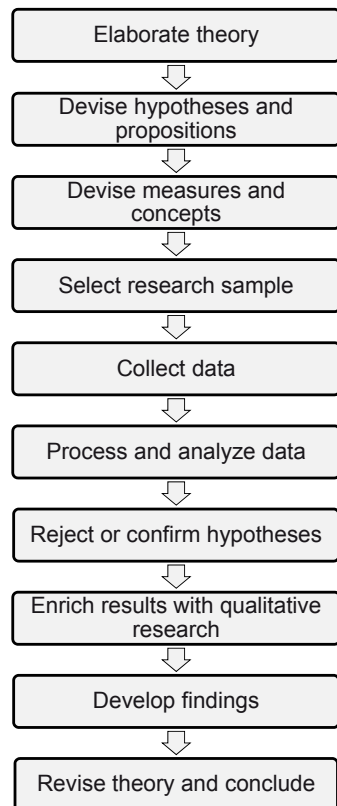
### 2.1 Literature Review

The aim of the study of literature is to compare and summarize the findings of existing work concerning slack, its influence on performance as well as the impact of the external environment on the relationship. Therefore the current state of literature and existing theories and concepts on the topic are analyzed. The findings and problems identified in previous research form the basis for further empirical investigation.

The focus of the literature review lies on articles published in academic journals and magazines, as well as specialized books. While German language results are included, English-language academic articles are emphasized.

The databases used for the literature research are:

- EBSCO Business Source Premier,
- Science Direct College Edition,
- Wiley Online Library,
- ABI/Inform Global Pro Quest, and
- JSTOR.



*Figure 1: Research Procedure adapted from Bryman and Bell (2011, p. 151)*

In addition, a search for supplementary material is performed on scholar.google.com. The keywords primarily used are organizational slack, financial slack, performance, crisis, munificence, and uncertainty. Besides, the author searched for slack in combination with innovation, risk, growth, acquisitions, intervening variables, IPO, M&A, antecedents, measurement, external environment, crisis, threat and economic downturn.

Specific propositions are devised on the basis of the literature review and null hypotheses are formulated. All further steps in the research process are explained in the following sections.

## **2.2 Research design**

In this thesis a longitudinal research design is adopted. Hence, repeated observations on a set of variables for the same sample units are made over time. This type of research design is frequently used to discover relationships between variables. In contrast to a cross sectional design it allows the author to examine changes over a specific period of time. Specifically, in this study the data is collected for several years as the period of investigation runs from 2007 to 2010. An essential benefit of this design is that it facilitates the evaluation of causality between variables since the direction of the influence becomes more apparent over time (cf. Bryman and Bell, 2011, p. 58).

Primarily, a deductive approach to link theory and research is adopted. The author reviews existing literature and deduces hypotheses. Consequently, the process of data collection is based on and guided by existing theory. Subsequently the findings from the research are compared with the literature and the author checks how well the results support the theoretical arguments from previous literature. Through inductive reasoning, existing concepts can be refined or refuted and the findings contribute to the existing theory (cf. Bryman and Bell, 2011, p. 11).

Regarding the research strategy, the approach applied in this thesis can be categorized as a mixed method approach combining quantitative and qualitative research. According to Edmondson and McManus (2007, p. 1165) this hybrid strategy is typically used in intermediate theory, where provisional theoretical relationships are proposed or an established theory is transferred to a new context. As will be discussed in the literature review of the present thesis, the concept of slack is well established in literature, and can therefore be categorized as mature literature. Also the slack-performance

relationship has been studied repeatedly, however partly inconsistent results are reported. Particularly the context of environmental threat has first recently become the focus of various studies. Consequently the author categorizes the relevant theory for the answer of the research question of this study as intermediate.

Overall, when applying a mixed method approach, it is essential that quantitative and qualitative research findings are integrated or linked in order to extract the maximum benefits of the study (cf. Bryman and Bell, 2011, p. 693). Regarding this thesis, the advantage of the hybrid method is that it enables the author to supplement quantitative results on the relationship between certain variables with fuller explanations based on qualitative data (cf. Edmondson and McManus, 2007, p. 1166).

Creswell (2003, p. 211), and Bryman and Bell (2011, p. 632) note several factors that are of importance when selecting a mixed method approach. First, the priority of qualitative or quantitative data and analysis plays an important role. The quantitative research approach is dominant in this thesis, since the main research question is answered through quantitative testing. Qualitative data is subsequently used to give a more detailed insight on a few salient results. Second, the implementation sequence of data collection of qualitative and quantitative data has to be determined. In this thesis the implementation is in phases, as quantitative data is collected first, and qualitative data is collected subsequently.<sup>1</sup> Creswell (2003, p. 211) adds that the stage in the process of the project for integration of the findings from the qualitative and quantitative perspective has to be determined. Since the data collection and analysis are performed individually, the integration of the findings is first conducted in the interpretation phase of this study.

According to Creswell (2003, p. 218) the approach applied in this thesis can be categorized as a sequential explanatory research strategy. Qualitative results are used to provide important contextual information as a supplement to quantitative findings. Thereby the qualitative research supports the explanation and interpretation of the findings on the intervening variables identified in quantitative research (cf. Bryman and Bell, 2011, pp. 636–639).

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<sup>1</sup> More precisely, data collection for the independent and dependent variables is conducted first. Data collection for intervening variables and qualitative analysis is conducted simultaneously but analyzed individually. The process will be explained in detail in chapter 2.4 Data collection.

Specifically, in this thesis salient results of the quantitative research will be analyzed and enriched by qualitative research.

Further details on the method of data analysis, including the quantitative research (correlational analysis) and the qualitative research (content analysis) are explained in the section “Data analysis”.

### **2.3 Sample selection**

The author of this study uses financial data from a sample of publicly traded pharmaceutical firms to determine how financial slack affects performance. Specifically, companies operating in the pharmaceutical industry classified as NACE Rev. 2 primary code 212 (manufacture of pharmaceutical preparations) are chosen. In addition, the sample is limited to the region of Eastern and Western Europe, resulting in an initial sample of 9,697 firms.

The pharmaceutical industry is selected as a research context, for several reasons. While various different industries have been examined previously, the author of this thesis did identify any studies concerning slack and performance that focus on the pharmaceutical industry. Besides, in the years under investigation pharmaceutical companies accumulated high cash holdings (cf. 2008). For instance, Bloomberg reports that the world’s biggest pharmaceutical companies were holding about \$100 billion in cash and marketable securities in 2009 (cf. Kelley, 2009). Since cash holdings are an essential indicator for the presence of financial slack (cf. Bradley *et al.*, 2011a, p. 1081), the pharmaceutical industry seems to be a fitting research context for studying the effect of financial slack on performance. In addition, this industry is one of the most research intensive sectors in the European Union (cf. European Commission, 2011, p. 6). Therefore organizational slack plays a crucial role as it effects innovation, risk taking, acquisition activities and performance.

From the group of pharmaceutical firms located in Europe, those that provide consolidated financial statement for the period of 2007 to 2010 are selected (236 firms). In order to exclude subsidiaries and other affiliates, the parent companies (group ultimate owner or firms with named individuals or families as ultimate owners) are identified. Furthermore only firms, which provide the necessary data for the variables used in the empirical model for all the years between 2007 and 2010, are selected. Finally, from the remaining group of 110 firms the ones with the highest operating revenue (turnover) are chosen, resulting in a final sample of 25 firms.

	Company name	Ctry	Operating rev. in th EUR 2010	No. of employees 2010	Indepen- dency	Legal form	BvD ID number
1.	Actelion LTD	CH	1,534,967	2,441	A+	Public	CH28030030288
2.	Akzo Nobel NV	NL	14,697,000	55,590	A+	Public	NL09007809
3.	Almirall SA	ES	1,002,088	3,012	B+	Public	ESA58869389
4.	AstraZeneca PLC	GB	25,505,303	61,100	A+	Public	GB02723534
5.	Bayer AG	DE	35,704,000	111,400	A+	Public	DE5330000056
6.	Biomerieux SA	FR	1,379,700	6,365	D	Public	FR673620399
7.	Farmacol SA	PL	1,293,083	n.a.	B+	Public	PL273352747
8.	Galenica AG	CH	2,740,460	5,535	B+	Public	CH03530017094
9.	GlaxoSmithKline PLC	GB	33,602,640	98,485	A+	Public	GB03888792
10.	Krka DD Novo Mesto	SI	1,021,909	8,569	A+	Public	SI5043611
11.	Meda AB	SE	1,337,705	2,593	A+	Private	SE5564272812
12.	Merck KGAA	DE	9,363,900	40,562	C	Public	DE6050108507
13.	Novartis AG	CH	39,490,659	119,418	A+	Public	CH27030020612
14.	Novo Nordisk A/S	DK	8,186,689	30,014	B+	Public	DK24256790
15.	Paul Hartmann AG	DE	1,660,304	9,982	B+	Public	DE7370021237
16.	Pelion SA	PL	1,467,543	7,208	A+	Public	PL470929074
17.	Protek OAO	RU	2,453,985	12,370	B+	Public	RU59149045
18.	Richter Gedeon RT	HU	997,871	10,176	B+	Private	HU10484878
19.	Roche Holding AG	CH	39,124,377	80,653	B+	Public	CH27030051590
20.	Sanofi	FR	32,394,000	101,575	A+	Public	FR395030844
21.	Shire PLC	GB	2,597,804	4,183	A+	Public	GB30837EX
22.	Solvay SA	BE	5,993,000	16,785	B+	Private	BE0403091220
23.	Stada Arzneimittel AG	DE	1,657,343	8,024	A+	Public	DE6290015517
24.	Ucb NV/SA	BE	3,218,000	8,898	B+	Private	BE0403053608
25.	Warner Chilcott PLC	IE	2,224,912	2,700	A+	Public	IE471506

Table 1: Sample firms

It is important to mention that for a large number of European firms, especially for small or not publicly listed firms, no consolidated balance sheets or no financial data at all are available. Additionally due to the criterion “high operating revenue” only large firms are included in the sample. The author is aware of the limitation of the sample coverage in terms of firm size, which may cause selection bias. Besides, due to the small sample size of the study, the results cannot simply be generalized.

## **2.4 Data collection**

The data collection in this thesis is based on secondary data. While primary data is often seen as subordinate to secondary data, secondary analysis can have substantial advantages. One major field of application for secondary data is, when historical information is of interest. Specifically, the problems of recall are resolved when past events are investigated through secondary data which has been created during the relevant time period (cf. Harris, 2001, p. 193). The use of archival material delivers large quantities of inexpensive data, and in addition is an unobtrusive strategy as archival material is nonreactive to the presence of investigators (cf. Berg, 2001, p. 191). Since the financial crisis of 2007 to 2010 is in the focus of this study, the benefits of unobtrusive secondary analysis can be exploited in this thesis. However, it has to be noted that due to the use of secondary data the researcher has no control over the quality of the data (cf. Bryman and Bell, 2011, p. 321).

The indicators for financial slack and performance are devised from publicly available data on balance sheets as well as profit and loss statements. The source of the financial data is the OSIRIS database offered by Bureau Van Dijk, which contains financial information on globally listed public companies.

The information about M&A and IPO deals is taken from Zephyr database, also offered by Bureau Van Dijk. Specifically, new acquisitions, acquisitions of increased stakes and the formation of joint ventures which were completed within the years 2007 to 2010 were included as M&A activities. The number of new product introductions, as an intervening variable is identified through an examination of mass media outputs. In addition, for the firm with most M&A activities, as well as for one firm undergoing an IPO, a newspaper research is conducted. The newspaper research for the qualitative as well as quantitative analysis includes the daily newspapers Financial Times (including FT.com) and The Wall Street Journal, as well as news from the

international news agency Reuters Newswires. Particularly, articles published between 2007 and 2010 are in the focus. The newspaper research resulted in 2,693 articles for the quantitative correlational research as well as 1,099 articles for the supplementary qualitative research. To identify and organize the relevant data from the articles, a content analysis is conducted as described in the section "Data analysis".

## 2.5 Measures

For the quantitative analysis measures to operationalize the concepts of financial slack and performance, as well as the three intervening variables are defined in this section.

The *independent variable* in this analysis is financial slack, measured as the current ratio of a firm at the year end. The current ratio is a continuous interval variable and is calculated as follows:

$$\text{current ratio} = \frac{\text{current assets}}{\text{current liabilities}}$$

Current ratio has been chosen, because this measure was widely adopted as a measure of financial, available of unabsorbed slack by previous authors (cf. Daniel *et al.*, 2004). Since this ratio measures a firm's ability to pay its short term obligations it captures the unabsorbed nature of available financial slack.

The *dependent variable* in this study is corporate performance. The author uses an accounting based profitability measure for performance, namely return on assets (ROA) at the year end. This measure can also be categorized as a continuous interval ratio. Various definitions for the measure ROA exist in literature. Although several studies emphasize that ROA is widely used to measure performance in slack literature (cf. Lee, 2011, p. 10; Chiu and Liaw, 2009, p. 328), authors apply different definitions of the metric. The textbook definition of ROA is net income divided by total assets (cf. Losbichler *et al.*, 2012, p. 125). Besides, profit before tax can be used in order to cancel out any taxation differences as well as extraordinary P/L. Others focus on operating profit before interest, taxes, depreciation and amortization, thereby excluding e.g. differences in the capital structure of firms (e.g. Love and Nohria, 2005; Ju and Zhao, 2009). Each of these definitions has its advantages. In this study, three different, but commonly used definitions of ROA are applied in order to demonstrate the implications of differing definitions.

$$ROA_{ni} = \frac{\text{Net Income}}{\text{Total Assets}}$$

$$ROA_{pre-tax} = \frac{\text{P/L before tax}}{\text{Total Assets}}$$

$$ROA_{EBITDA} = \frac{\text{EBITDA}^*}{\text{Total Assets}}$$

\* EBITDA = Earnings before interest, taxes, depreciation and amortization

Some authors argue that a common problem of using ROA as a performance measure is that it varies strongly across industries (cf. Carton and Hofer, 2007, p. 85). This issue is overcome by the focus on a single industry in this study. Furthermore, several previous researchers argue that it is appropriate to consider a time lag when investigating the effect of performance on slack (cf. Su *et al.*, 2009, p. 81). Since especially absorbed forms of slack first have to be recovered it may take a considerable amount of time before slack shows its impact on performance. In this study no time lag is included in the analysis, because available slack is rather readily employable. The fact that a time lag does not have a significant effect on the strength of the relationship between any form of slack and performance is confirmed by Daniel *et al.* (2004, p. 572).

In addition to the two measures described, *three intervening variables* are considered in this study, namely M&A, new products and IPO. The number of M&A deals conducted during the investigation period is used as a measure for expansion. The number of new products introduced is used as a measure for the innovation activities of a firm. In this regard it has to be noted that only products that gained official approval during the sample period were counted. Other innovation activities or products in development which lack formal approval or have been rejected by the U.S. Food and Drug Administration (FDA) or European Medicines Agency (EMA or EMA<sup>2</sup>) are not included in the analysis. Finally the undergoing of IPOs is

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<sup>2</sup> From 1995 to 2004, the European Medicines Agency was known as European Agency for the Evaluation of Medicinal Products, short EMEA (cf. European Medicines Agency, 2009). Since the official launch of a new organizational structure and visual identity in November 2009 the acronym EMA has been commonly used.



included as a measure. All three variables are defined as the number of activities carried out per year, thus they are discrete. However, since the relatively large number of categories they generate, the intervening variables are treated as interval ratios and included in the Pearson's  $r$  correlational analysis. Specifically, they are regarded as moderating variables on the relationship between slack and performance. Thus they are expected to correlate with slack and /or performance and have a strengthening effect on the slack-performance relationship.

## 2.6 Data analysis

As mentioned above, in the first step of analysis the effect of financial slack on performance is investigated through correlational research. Intervening variables, identified through quantitative content analysis, are included in the correlational research. Subsequently three sample firms with salient results concerning the moderators are chosen and further qualitative content analysis of the data is performed.

The *correlational analysis* is concerned with the investigation of the relationship between financial slack and performance. Specifically, the analysis focuses on the question, if an influence of slack on performance is present in the pharmaceutical industry and which intervening variables exist. Descriptive statistics for the collected data for each variable, particularly results from the univariate analysis such as measures of central tendency and measures of dispersion are presented. In order to reject or confirm the null hypotheses a bivariate analysis of the variables for financial slack and performance, as well as the intervening variables is conducted in pairs. For that matter Pearson's product-moment correlation coefficients (Pearson's  $r$ ) are calculated on a year by year basis (cf. Rasch, 2010, pp. 15–21; Bryman and Bell, 2011, pp. 344–349). In addition to the calculation of correlations, a test for statistical significance is performed. This allows the author to assess if the results of the analysis are generalizable to the population (cf. Bryman and Bell, 2011, p. 353). Subsequently, the author prepares a linear regression analysis for the year 2010 to further analyze the relationship between the independent and dependent variable.

The three intervening variables M&A, new products and IPO are included in the analysis in order to examine their moderating effect on the strength of the relationship. The method of *content analysis* is used in this regard to quantify the content of the articles identified in the newspaper research objectively and systematically (cf. Bryman and Bell, 2011, p. 291). The results

of the newspaper research are additionally used in the second step of this thesis, the supplementary qualitative research, in order to enrich the quantitative findings from the correlational research. In this regard, three firms are chosen from the sample and qualitative content analysis is performed on the respective newspaper articles.

It is difficult to give a general definition of content analysis, since the interpretation of the term largely depends on the specific research field and purpose (cf. Mayring, 2010, p. 11). The author of this thesis understands content analysis as to the examination of documents and texts in an attempt to objectively and systematically analyze their content (cf. Harris, 2001, p. 103). This research approach lies at the intersection between qualitative and quantitative research (cf. Duriau *et al.*, 2007, p. 5). One of the main advantages of a content analysis approach is that it is an objective and transparent method, guided by specific rules. Thus the results can be replicated rather easily, and validity and reliability of data collection can be demonstrated (cf. Harris, 2001, p. 193). Besides, it is an unobtrusive and non-reactive research method since previously recorded data is analyzed. This makes it also appropriate for longitudinal analysis. In addition, content analysis provides a high level of flexibility (cf. Bryman and Bell, 2011, p. 305). By using this approach for both, thorough quantitative analysis as well as rich qualitative insight, the author exploits the advantages of content analysis to support the hybrid research strategy (cf. Duriau *et al.*, 2007, p. 23).

Quantitative content analysis emphasizes the identification and quantification of specific characteristics of the content e.g. the counting of textual elements to retrieve data. Qualitative content analysis on the other hand seeks to understand aspects such as the conditions and consequences of the factors under investigation and deals with the meaning in the specific context (cf. Berg, 2001, pp. 241–242; Bryman and Bell, 2011, pp. 289–291). Nevertheless qualitative context analysis demands a systematic, well-structured and controlled analysis, following explicit rules of coding and step by step models (cf. Mayring, 2010, pp. 48–49).

Consequently both, the quantitative and qualitative content analysis follow similar steps, as shown in Figure 2.

Since the results of content analysis depend strongly on the quality of the materials used for analysis (cf. Bryman and Bell, 2011, p. 308), the sources have to be chosen carefully. As mentioned before the material to be examined in this study is newspaper articles from the daily newspapers Financial

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