

DOCTOR OF PHILOSOPHY

The influence of marketing factors and substance characteristics on pharmaceutical sales in a state-controlled prescriptions pharmaceuticals market

Michael Stros

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**THE INFLUENCE OF MARKETNG FACTORS
AND SUBSTANCE CHARACTERISTICS ON
PHARMACEUTICAL SALES IN A
STATE-CONTROLLED PRESCRIPTIONS
PHARMACEUTICALS MARKET**

MICHAEL STROS

Doctor of Philosophy

ASTON UNIVERSITY

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Dedication

To my parents and Lynn!

Acknowledgments

The last seven years of my PhD have been a wonderful, but one of the most intense, phases of my life. It was my pleasure to work on my dissertation at Aston University, and I am sure that my years as a PhD student would not have been so memorable without the support of my colleagues, friends, partner and family.

I started my PhD in 2005, with Prof John Marriott from the Aston School of Life & Health Sciences as my supervisor and Prof Juerg Hari from the Zurich University of Applied Sciences as my co-supervisor. At this point, I would like to thank them both for the support I received from them during this time. In 2007, I had the chance to attend my first academic conference, the EUKO in Salzburg, Austria. The presented conference paper then resulted in a publication.

In 2008, I met Nick Lee, a dedicated Professor in Marketing, at the Academy of Marketing Conference in Aberdeen, where I had presented another paper. However, over time the focus of my research gradually shifted to the “Marketing discipline” and away from “Life science”. Nick agreed at the beginning of 2009 to take over the supervision of my PhD.

On this occasion, I would like to thank Nick for his continuously great and fruitful support, as well as for his patience and for giving me the freedom to develop my own research ideas, and for his critical feedback, forcing me to reconsider my thoughts. It was a true pleasure to be Nick’s PhD student and to cooperate with him on this research project.

In 2009, I had another chance to present my paper at the Academy of Marketing Conference in Leeds. In summer 2009, I had the opportunity to attend the AMS doctoral consortium in Oslo.

Furthermore, I would also like to thank the person at the Swiss market research company (the name cannot be given) that provided this huge market dataset in order to enable this research

and to the study participants from the focus as well as the Delphi groups. These particular qualitative studies also resulted in a publication that was published in 2009 in the “International Journal of Pharmaceutical and Healthcare Marketing”. Therefore, I would also like to thank the reviewers of these organisations (as well those who rejected some of my submitted papers) for their valuable comments – this thesis benefited a great deal from this process. Furthermore, I would like to thank the members of the Marketing Group, and especially the administrators, for their always great support.

I would also like to thank to Dr Lynn Lim, my partner, who has given me so much emotional support over the last couple of years as well as many valuable inputs while reviewing my work.

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Abstract

The present dissertation investigates the influence of brand as well as substance-related marketing attributes on prescription pharmaceutical sales within a state-controlled market. For this purpose, a systematic literature review was conducted in the first instance, during which knowledge about the most relevant research within this field was gathered. Consequently, over 538 publications were reviewed and indicated as being potentially relevant, leading to an eventual count of 98 core publications. However, most of these studies had been conducted in the mainly unrestricted US market. These findings were then summarised and statistically evaluated. In a second step, based on the literature review, a qualitative study, containing focus and Delphi groups, was then performed. The participants in these studies were involved in pharmaceutical marketing within a state-controlled prescriptions pharmaceuticals market. Consequently, the findings were slightly different to those derived by the systematic literature review. Based on this second step, seven hypotheses were proposed. In the third step, these hypotheses were tested, using collected data and a secondary market dataset provided by a market research institute. A statistical analysis was then performed, applying descriptive as well as multiple regression analytical methods. The evaluation of the results resulted in a conceptual model of physician targeting, leading to several theoretical, methodological and managerial implications.

Keywords: Pharmaceutical Prescriptions Marketing, State-Regulated Market, Marketing Mix, Order-of-entry, Systematic literature review, Focus Group Technique, Delphi Group Technique, Secondary Data, Multiple Regression

Executive Summary

The pharmaceutical market is experiencing significantly increased research and development costs, as well as price and other competitive pressures. Consequently, the entire industry has moved into a difficult economic environment. At the same time, marketing expenditure are increasing significantly in comparison to product development costs, meaning that the use of marketing in the pharmaceutical sector is of considerable interest. Furthermore, it has been shown that on the one hand a decline in “product innovation” has taken place, whereas on the other hand an increase in competition is happening within the pharmaceutical marketplace, thus pressurising pharmaceutical companies to increase their marketing expenditure and the effectiveness of their marketing measures. Despite the increased popularity in research into pharmaceutical marketing, there are still many undiscovered areas, particularly as most of the research has been conducted in a non-state-regulated market. Furthermore, there is room for further research in order to derive a “physician-targeting” model and to gain a better insight into product design-related areas. Consequently, scholarly research exploring pharmaceutical marketing is rather piecemeal and has tended to focus on various very specific issues, so research into this area is overdue.

Therefore, in a first step, a systematic review of the literature relevant to pharmaceutical marketing was conducted. Databases of scientific literature were systematically scanned, and in total 538 publications were identified as potentially relevant. After a systematic literature selection process, the results of 98 final core publications were evaluated and analysed using descriptive statistics. It was found that the order-of-entry effect is critical in the sector, indicating that the early entrant has an advantage, as the early entrant defines the market standard, whereas the late entrant can benefit from the experience and promotional activities made by the early entrant in order to prepare the market. This leads to the conclusion that both

strategies are a feasible option. Based on a strategic decision, marketing activities have to be set accordingly, taking regulatory limitations into account. Consequently, according to the literature, the most relevant factors for product design are innovativeness, efficacy and branding, as well as qualities such as safety. In addition, it was revealed that a low price strategy is not necessarily effective. Regarding promotion, it was determined that personal selling, prescriber-directed advertisement (DTP), sampling and word-of-mouth-related activities are of high relevance. Distributional issues were not considered highly in the research. In total, 21 relevant marketing criteria and their sub-criteria were indicated.

Having gathered the actual scientific knowledge and indicated the research gaps, and in order to investigate essential marketing success factors, a qualitative focus study employing five Swiss healthcare professionals in middle and senior management positions was conducted. The focus group study set-up was based on the conclusions of the systematic literature review, and they were asked to express their personal opinions regarding the importance of various factors that might influence the turnover of prescription drugs. This two-hour roundtable interview was tape-recorded, following which a transcript was produced and the content was analysed. As a result, 11 relevant marketing variables and their 24 attributes were derived.

In order to increase the validity of the results from the focus group study, a Delphi group study was additionally conducted, employing a different group of eleven pharmaceutical marketing experts. The Delphi group was designed on the basis of the focus group findings. This study contained three steps. In the first step, a questionnaire containing open questions was sent to the participants. The returned answers were then analysed and a second questionnaire, containing closed, Likert-type scale questions, was created and distributed. In

the final step, the participants were asked to re-evaluate their answers from the previous round where a high level of disagreement was present, in order to reach a consensus within the group. In total, 17 variables were derived and ranked according to their importance within their marketing categories (4Ps). This study concluded that successful marketing has to consider appropriate product properties, including issues such as efficacy, safety and a promotion policy that takes opinion leaders and personal selling into account. In a next step, and based on these results, seven hypotheses were derived and a conceptual model of “physician-targeting” presented.

The aim of this step was to test the proposed hypothesis. For this purpose, a secondary dataset containing five prescription classes, with 37 substances from 108 medical products, for the period 1995 to 2005 from the state-regulated Swiss market were used. However, despite incomplete informational content, additional data had to be gathered from alternative sources, so an online survey of 80 Swiss pharmacists and 6,000 medical doctors (customers) was conducted. In a next step, all data were collated and tested for their quality, by applying descriptive statistical methods, and then they were prepared for further analysis. The analysis indicated different sales (revenue) curve slopes and different sales increases/decreases within the same time period. Consequently, an additional variable as an indicator for the slope (beta value), in addition to the existing dependent “average sales” variable, was implemented. Furthermore, the analysis revealed a two-level data structure, containing a brand and a substance level. As a result, the data had to be aggregated accordingly, in order to perform a multiple regression analysis. A test of the analysis result for reliability showed a positive outcome.

Evaluating the statistical results of the multiple regression analysis revealed that the order-of-entry effect does not have an influence on sales, whereas a positive relation to sales increases (beta) was indicated. This means that it is not essential to be early to the market, and a later market entry is also a feasible alternative. Despite finding a positive relation between the “marketing expenditure” and sales, high multicollinearity between expenses involved in personal selling, mailing and advertising was revealed, leading to the conclusion that no differentiation is made when implementing these marketing instruments. Regarding product design it was shown that “drug interaction” has a negative relation to “beta sales”, leading to the conclusion that higher drug interactions reduce sales, which is supported by the scientific literature. Furthermore, the results showed a positive relation between “perceived quality” on the one hand and a positive relation with “side-effects” on the other. This rather spurious result led to the conclusion that prescribers (costumers) are either not or very badly informed, or they do not care about “side-effects”. Furthermore, a positive relation between “average price” and sales was found, leading to the conclusion that prescribers (costumers) prefer to choose the more expensive medication to suit personal financial benefit.

This dissertation has derived some implications for marketers, policymakers and researchers. Therefore, the following guidance can be given to marketers in state-regulated prescription drugs markets: (1) It is not essential to be first to market; (2) Enhance prescribers (costumers)’ perceived quality; (3) A high price policy is beneficial for sales; (4) Apply specific promotional measures; and (5) Maintain strong marketing activities during the launch phase. On the other hand, policymakers should: (1) Inhibit prescribers (costumers)’ medical drug price-related prescription practice by banning the practice of self-dispensing physicians; (2) Negotiate lower medical prices; (3) Inhibit companies’ promotional activities; and (4) Educational programmes as well as systems on medical drug information for prescribers

(costumers) should be implemented. These opposing interests result in a conflict between marketers and policymakers. However, because of rising costs in healthcare, the role of policymakers will become ever more important. Nevertheless, this dissertation has also revealed new potential research areas. These are:

(1) Factors influencing perceived quality; (2) Price elasticity of prescription pharmaceutical marketing demand models (3) Generalisation of research results; (4) The role of distribution and the order-of-market entry; and (5) Relevant factors for product policy.

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Terminology

Costumer	Physician; Doctor, Prescriber, Practitioner
Consumer	Patient, User
Detailing	Personal Selling
Factors	Criteria; Parameters; Attributes; Items
First entrants	Pioneers
Health insurance	Payer
Health Maintenance Organisation (HMO)	A group of physicians has an agreement with health insurance(s) and provides care for a previously fixed fee
Marketing Instruments	Four marketing instruments defined (4Ps) as: Product (includes product design, package, brand, service); Place (distribution channels); Promotion (personal selling, advertising, sales promotion, publicity) and Price
Marketing mix	Interrelationship between marketing instruments
Medical Drug	Drug; Medicine; Substance; Pharmaceutical
Model	Theory
Order-of-market Entry	Order-of-entry
Personal Selling	Detailing
Physician-targeting	Process that takes place when potential prescribers (customers) are approached in order to reach their personal commitment for prescribing a specific medical drug to their patients (consumers, users)
Product policy	Product design
Sales	Total sales, Revenue
Systematic literature review	Literature review, Review
Graphical overview	Prescription pharmaceutical marketing framework

1. Introduction

1.1. Pharmaceutical Market

‘The importance of the pharmaceutical industry is set to grow further within developed nations as an aging population profile combines with diminishing pension funds to introduce the prospect of not only living longer but having to remain economically active for longer’ (Black and Tagg, 2007, p348).

The pharmaceutical industry has shown enormous and innovative strength because of the sustained demand for novel therapies and in response to intense competitive pressures. In the past this has led repeatedly to new research processes which have culminated in the development of new products. Nevertheless, even though trends in sales of pharmaceuticals in recent years have continuously increased, and despite the demographic growth trend which portends a growing elderly population in need of nursing care, pharmaceutical sales (revenue) will certainly not continue to grow so strongly because of the persistent explosion of costs in the health sector and the resultant pressure that will follow this growth in costs (Blechsmidt, 2003; Schulenburg, Kulp et al., 2003).

Worldwide spending on pharmaceuticals, the largest component of the life sciences industry, was estimated in 2005 to be \$565.9 billion, growing at 5.2% and 7.1% annually in the United States and Europe (EFPIA, 2006). ‘In fact, nine of the largest US pharmaceutical companies spent \$45.4 billion on sales (revenue), marketing and administration in 2001. This is twice the amount that these companies spent on research and development’ (Black and Tagg, 2007, p348; Families USA, 2003). In 2002, the twelve largest pharmaceutical companies between them accounted for approximately about half of the total market volume (see Table 1-1) (Burckhardt, 2003).



Table 1-1: Global sales (revenue) of medications, 2003 (Burckhardt, 2003)

Despite the massive investment in pharmaceutical research, the industry is experiencing significant problems of decreasing productivity relating to new and existing drugs (Datamonitor, 2007; Nichols, 1994; Ruffolo, 2004). Schmid and James (2001) suggested that this declining productivity is due at least partly to the fact that simple disease targets have been addressed, and firms are now left with targets that are much more difficult to address from traditional chemistry perspectives, or where their role in disease is not well understood. This can be underlined by the statement made in Dr Marcia Angell's (2005, p75) controversial book "The Truth About the Drug Companies" that in the 'five years 1998 through 2002, 415 new drugs were approved by the United States Food and Drug Administration (FDA), of which only 14% were classified by the FDA as truly innovative. A further 9% were old drugs that had been changed in some way to appear, in the FDA's view, significantly improved. The remaining 77% were classified as being no better than drugs already on the market, or as treating the same condition as drugs already in existence – termed "me-too" drugs' (see also www.fda.gov). In addition, it has been highlighted by Angell (2005, p80) that 'me-too drugs are made by competing companies, who create their own versions of

blockbuster drugs to cut into a market that has already proved both lucrative and expandable'. For example, in addition to Prilosec and Nexium, there are three other competing proton pump inhibitors on the market. Probably the most popular family of me-too drugs (copies of the original drugs) is the statins¹ (Kritz, 2001; Rowland, 2003). As stated by Angell (2005, p81), 'the original statin, Merck's Mevacor, appeared in 1987, and other companies were quick to produce their own statins. Mevacor was joined by the same company's me-too drug, Zocor, Pfizer's Lipitor, Bristol-Myers' Squibb's Pravachol, Novartis's Lescol and AstraZeneca's Crestor in 2003'.

Jarvis (2001) reported that there is a widening gap between increasing research and development spending and the decreasing number of new products actually reaching the market. The survival probability of therapeutic inventions – only 1 in 5,000 to 10,000 new inventions eventually makes it to market – leads to life sciences development portfolios being uniquely shaped as funnels (Ding and Eliashberg, 2002; Grewal et al., 2008; Jaakkola and Renko, 2007; Schweitzer, 1997). Furthermore, according to the United States Securities and Exchange Commission (SEC) and shareholder reports for 2001, the biggest drug companies spent on average of about 35% of their revenues on "Marketing and Administration" (Henry J. Kaiser, 2004; Public, 2003). In fact, the 'large pharmaceutical companies spent much more on marketing in 2002 than on R&D' (Angell, 2005, p122), which is illustrated by Hollon's (1999) quote that sets out the critical role of marketing and product innovation within the prescription drugs market:

'The winners in the prescription drugs market are not going to be the ones with the patents or products, but those that are the best marketers' (Hollon, 1999, p384).

As a result, the impact of marketing activities on pharmaceutical sales (revenue) is worthy of investigation, and one would expect the vast amount of research on marketing in the past half-

¹ Drugs used to lower blood cholesterol levels.

century would offer significant insights into this area. In fact, in recent years, marketing scholars appear to have become much more interested in pharmaceutical marketing. For Stremersch (2008, p232), ‘the Health and Marketing area is probably one of the richest in unstudied phenomena that the marketing discipline has ever seen in its history’. He sees evidence that ‘Health and Marketing is starting to gain firm ground as a new research field defined by its application area’ (Stremersch, 2008, p229). This is evidenced by the appearance of pharmaceutical marketing research in the discipline’s top journal – The Journal of Marketing (e.g. Narayanan, Desiraju, and Chintagunta, 2004; Stremersch and Van Dyck, 2009) – as well as a recent special issue of The International Journal of Research in Marketing (Stremersch, 2008), another top-level journal. In fact, a dedicated outlet, The International Journal of Pharmaceutical and Healthcare Marketing, appeared in 2007, although this was balanced by the apparent demise of The Journal of Pharmaceutical Marketing and Management in 2008. The relevance of this discipline is also justified by the vast range of specialised professional pharmaceutical marketing conferences such as The Annual Healthcare New Media Marketing Conference; The Annual Multicultural Pharmaceutical and Healthcare Marketing Conference; The Annual Public Relations & Communications Summit; APMRG; CDC’s National Conference on Health Communication, Marketing, and Media; The DigiPharm Europe Conference; The Digital Pharma Conference; The e-Patient Connections Conference; The Eye for Pharma Conference, KOL Europe Conference; The mHealth Conference; The PharmaMarketing Summit; The Social Communications & Healthcare Conference and The Social Media for the Pharmaceutical Industry Conference. Furthermore, increasing expertise on Health and Marketing among faculties, combined with high societal demand, has induced schools such as Columbia University; Deemed University, New Delhi; Fairleigh Dickinson University; Middlesex University; Saint Joseph's University, The George Washington University; University of California; University of Illinois; University of

Mississippi; University of Phoenix and University of Washington to offer healthcare marketing degree programmes.

Furthermore, 'sceptics may argue that there is nothing new to studying promotional effectiveness; however, the health context is unique and may yield unique responsiveness' (Kremer et al., 2008; Stremersch, 2008, p232). According to Singh and Smith (2005), the effectiveness of pharmaceutical promotional expenditure appears to be heterogeneous, depending on a wide range of variables. Existing generalisations of the effectiveness of marketing instruments cannot be generally employed (e.g. Albers et al., 2008; Assmus et al., 1984; Bijmolt et al., 2005; Tellis, 1988; Tellis and Ambler, 2007; Vakratsas and Ambler, 1999) because the pharmaceutical industry differs from markets in at least three important aspects. First, the pharmaceutical industry markets in a provider-patient (consumer) structure, where the physician has a unique gatekeeping function (Stremersch and Van Dyck, 2009). Furthermore, the pharmaceutical industry has to market to both physicians (costumers) and patients (consumers) (Ding and Eliashberg, 2008). Second, in comparison with other industries such as engineering, manufacturing and knowledge-intensive services (BIS, 2007), the pharmaceutical industry spends a large percentage of its revenues on marketing than on research and development (R&D) (Gagnon and Lexchin, 2008). Third, the pharmaceutical industry requires specialised marketing knowledge such as new product development, life cycle management and marketing management (Stremersch and Van Dyck, 2009).

As well as its clear commercial and social importance, scholarly interest in the pharmaceutical sector is presumably driven by the fact that the pharmaceutical market exhibits several peculiarities in comparison to the industrial and consumer markets that marketing research has tended to investigate in the past. Pharmaceutical marketing is not only relevant, but it also raises new questions. In particular, the complex tripartite relationship (3P-triangle) (see figure 1-1) in prescription drug marketing, between a) the party who pays for the drug (in most cases

the health insurer or the state), b) the patient (consumer) who actually uses the drug and c) the prescriber of the drug, is a critical influence.

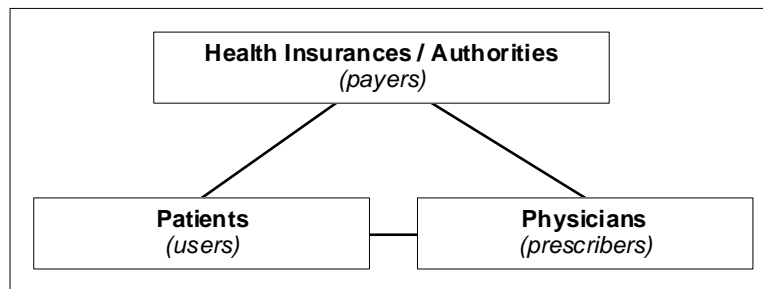


Figure 1-1: Illustration of the tripartite relationship in prescription drug marketing

Thus, this specific business area is faced with the unique situation that the actual purchase decision is not made by the payer or the user (consumer), but by the prescriber, i.e. the physician (costumer) (Ding and Eliashberg, 2008; Gonul and Carter, 2001; Groves et al., 2003; Harms et al., 2002). White et al. (2004, p66) show that ‘doctors (costumers) remain the indispensable arbiter of care in the eyes of the consumer and, in terms of patient (consumer) care, doctor (costumer)-patient (consumer) relationships are substantially unaffected by drug marketers’ investment in consumer promotion’. However, ‘it has also been shown that neither physicians (costumers) nor patients (consumers) are immune to the effects of marketing’ (Hollon, 1999, p384). These conflicting opinions are in need of a systematic attempt at reconciliation. Furthermore, the ‘Health and Marketing field is also an intrinsically unstable environment’ (Stremersch, 2008, p233), characterised by the continuous changes of regulations, new discoveries and new health treatments.

Finally, it can be stated that ‘the practical relevance of research questions in the Health and Marketing field to firms can easily be appreciated if one considers that life sciences firms often spend a large amount of their revenues on promoting their therapies’ (Stremersch, 2008, p233; see also Kremer et al., 2008). Furthermore, ‘rising healthcare costs have become a major public concern in recent years and prescription drugs represent a significant component

of such costs, with shares ranging from 4% in the United States (US) to nearly 18% in France and Italy' (Gonzalez et al., 2008, p247; see also Kyle, 2003).

1.1.1. Marketing in the Pharmaceutical Sector

An analysis of the situation in the pharmaceutical market is a pre-condition to being able to set up a marketing concept. In the following section an overview of the market situation and relevant pharmaceutical marketing strategies is therefore given, in order to be able to deduce the required goals of this research.

Except for the USA, most countries have a strongly regulated market, which is certainly the case with the Swiss health system (Gallay, 2002). As an example, upper limits for prices for medication are mandated by (Federal) legislation.

Since the public in general and health insurance companies in particular are no longer prepared to accept highly or overpriced medicines, or even increases in pricing for minimal therapeutic advances, the price leeway for many pharmaceutical companies has grown smaller and has thus led to lower revenues (see also Gonzalez et al., 2008). This has forced companies to reduce their costs, e.g. by cutting back on their marketing communication budgets or taking other measures to improve their margins. Although this approach is well-known in the industry, there are still some restraints involved in this shift. In particular, losses made in market shares in the mass markets are practically impossible to recover (Kotler and Keller, 2006). Since the possible measures for cost reduction are limited, new ways to increase sales (revenue) have to be found.

In the pharmaceutical sector, two predominant strategic trends have become apparent in recent years (Dogramatzis, 2002). While companies such as Novartis continue to concentrate on the mass market, organisations such as Roche have chosen to follow the path of

specialising in products used in cases with less prevalent indications (market niche segment strategy), primarily in the area of oncology (Fibig and Hutt, 2003). The advantages of the latter approach are obvious: smaller sales teams, as fewer medical specialists are needed, and smaller marketing outlays, since the majority of patients (consumers) with such serious illnesses are already well-informed. In contrast, the manufacturers of products used for the more prevalent conditions suffer from the enormous marketing expenditure needed to differentiate themselves from the competition and attract the attention of doctors (costumers) and patients (consumers) alike.

Furthermore, the decision of the order-of-market entry appears to have a decisive influence upon sales. This phenomenon can be illustrated by sales (revenue) figures taken from the PDE5-inhibitors market. As a first entrant, the Pfizer company launched in March 1998 its blockbuster product Viagra (sildenafil) (see also Angell, 2005) and has generated since then total sales (revenue) of more than over \$8 billion. In late 2002, Levitra (vardenafil), which was jointly developed by Bayer and Glaxo SmithKline, entered the market. In February 2003, as a third entrant, the Icos company and its sales partner Eli Lilly launched Cialis (tadalafil). As clearly shown in Figure 1-2, the sales of the medical drugs that have entered the market later are remarkably lower. At this point it should be noted that the efficacy of all three substances is quite similar (Gresser and Gleiter, 2002; Moore, 2005). This illustrative example shows quite clearly the relevance of the order-of-market entry taking place within a specific prescription pharmaceutical market.



Figure 1-2: PDE5-Inhibitors international sales (revenue) developments

(Source: www.sec.gov, taken from applicable business reports)

In the past, companies realised that the sales of life-saving and life-prolonging medication were related largely in proportion to the respective marketing measures employed. As a consequence, as described by Angell (2005, p126), the pharmaceutical industry in the United States has increased the number of its salespersonnel to 88,000 [one per every five to six physicians (customers)]. At the same time, neither the number of products promoted nor the number of practising doctors (customers) changed in a remotely similar way to the number of salesforce personnel. The absolute rise in research expenses and advances in genetics has not led to the expected volume of more innovative medications. The forecast increase, driven by advances in human genetics, from about 500 to over 30,000 “target points” as leads for product generation is far from becoming reality. This leads to the situation where evermore products with effects that are difficult to differentiate are being offered in the same therapeutic areas (see also Angell, 2005).

This illustrative example demonstrates the relevance of order-of-market entry within this specific market for sales (revenue) success. However, it can also be assumed that this is not the only decisive factor, as indicated by the gradual sales (revenue) increase of a later entrant (Cialis).

1.1.2. The Marketing Mix Concept

Marketing is defined by the American Marketing Association (AMA) as ‘the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large’.² Effectively, marketing is an attempt to modify behaviour and hopefully stimulate demand (see also Smith, 1983).

McCarthy and Perreault (1960) proposed a fundamental conceptual marketing approach termed the ‘4Ps’, which is generally accepted within consumer goods circles. The 4Ps refer to four marketing instrument areas: product (includes product design, package, brand, service), place (distribution channels), promotion (personal selling, advertising, sales (revenue) promotion, publicity) and price (see also Frey, 1956; Kotler, 1976). In addition, Borden (1965, p368) defined ‘the “marketing mix” as the interrelationship among the marketing decision variables (marketing instruments)’. Furthermore, according to Balachandran and Gensch (1974, p160), ‘one of the most challenging questions is how to determine the optimum marketing mix’.

In addition, for Liberman and Rotarius (2001, p23), ‘the nature of the healthcare environment requires the addition of a fifth factor – partners’. This addition recognises that the modern healthcare industry is defined by the unprecedented number of interorganisational collaborations taking place (Rotarius, 1997). Furthermore, Harms et al. (2002, p147) concluded that the ‘future of pharmaceutical marketing depends on the ability to involve

² This definition was approved by the American Marketing Association (AMA) in October 2007 (www.marketingpower.com)

clinicians, patients (consumers), politicians, insurance companies, media, the general public and all healthcare professionals'. They proposed a "4 + 3P" (with the addition of positioning, politics and patients (consumers)) marketing mix approach.

Despite this being a popular field of research in the past, it has been proved not to be so popular in the last twenty years. The application of the marketing mix concept by marketing practitioners (costumers) is common practice and can be found in most of the marketing text books described (see also Kotler, 1998). However, most of the recent research in the pharmaceutical marketing area has focused on specific topics such as product design, promotion, pricing or distribution (see also Chapter 2). There have been isolated studies where researchers have investigated the conceptual marketing mix framework in a general context of multinational corporations, applying a systematic review (Brinik and Bowman, 2007). However, no published empirical study has investigated the marketing mix in a pharmaceutical marketing context. Interestingly, Stremersch and Van Dyck (2009), in the *Journal of Marketing*, published research directions similar to those indicated in this thesis. In fact, they highlighted that there is a need for further research within the area of therapy launch, investigating market entry timing as well as salesforce and communication management within the area of therapy promotion. As will be discussed later, there is a need to reevaluate this concept in today's prescription pharmaceuticals environment, in order to close this gap in pharmaceutical marketing research. Consequently, the optimum marketing mix still remains a critical issue for today's research. There is a further need for research on this subject in pharmaceutical marketing, marketing instruments and "physician-targeting" models especially.

For services marketing, this approach was expanded with an additional three marketing mix variables (people, process and physical evidence, see also Booms and Bitner, 1981; Vandermerwe and Rada, 1988). Similar to other industries, in pharmaceutical marketing it

can be assumed that not all of the decision variables have the same relevance. However, according to Balachandran and Gensch (1974, p160), ‘one of the most challenging questions is how to determine the optimum marketing mix’. The parameters of the marketing mix are given by the marketing concept, which in turn relies upon marketing research to define market segment, its size and to ensure that the objectives of the marketing are satisfied by controllable parameter of the marketing mix. To satisfy these needs, the marketing team makes decisions about many marketing mix parameters (Kotler, 1998).

1.1.3. The Market for Pharmaceuticals

In order to investigate pharmaceutical marketing, it is essential to be aware of the current market environment and to be familiar with the market of prescription drugs. Therefore, in the first stage, the most relevant healthcare systems are presented and their implications for the pharmaceutical business discussed. In a second stage (see Paragraph 1.1.6.), a general market model is presented.

A number of different health systems have emerged worldwide (Reinhardt et al., 2002). Moreover, modes of marketing vary across different health systems. The marketing concept has to consider the actual market environment, which means that appropriate new marketing strategies must be developed for each market (Cooper and Kleinschmidt, 1993; Liberman and Rotarius, 2001). It is therefore essential to be familiar with the several country-specific peculiarities exhibited by pharmaceutical markets. In this section, a number of different health systems (see Table 1-2), along with corresponding advantages and disadvantages peculiar to the state and region, are presented. As an illustration, two different (non-British) health systems, one with a relatively unregulated (financed by private insurances) and one with a highly regulated (financed by social insurance) market structure are discussed.



Table 1-2: Overview of the most important health systems (Gallay, 2002)

The American unregulated pharmaceutical market, by private insurances financed, is one of the few that allows the relatively free setting of prices. In contrast to many other health systems, as shown in Table 1-2, the American system is distinguished by its customer orientation. It is run with a commercial focus and contains many more market elements, and

the high value placed on quality assurance is especially important. A further major difference lies in the fact that in the USA there is no insurance requirement and no central administration. Although the American health system is one of the most expensive in the world, almost 16% of all Americans are uninsured. Of those who are insured, 60% are insured through their employers; 12% through other private insurance; 13% supported by Medicaid (special insurance for the poor) and 15% through Medicare (insurance for the retired and for those over 65 years old). Medicare is financed by a wage tax, and Medicaid is supported by the Federal government and individual states (see Figure 1-3). Unfortunately, medication costs which are not set by the state are not always covered by insurance, a situation that leads to financial problems for many. However, there has recently been a new healthcare reform introduced by the Obama administration in order to improve this situation (see also www.whitehouse.gov).



Figure 1-3: The American health system (partly OECD Secretariat, 2003)

By contrast, the Swiss medication market, for example, is very highly regulated (see also Kocher and Oggier, 2007) (c.f. Figure 1-4). Special rules are established by health insurance law, in order to compensate the provider of services (the rules include costs that will be assumed by the health fund). The list of approved medications created for this purpose determines the composition of a medication and its price. For the purposes of basic insurance, compensation is paid only for those medications found on the approved list. These medications can be obtained by the insured person directly from the pharmacist or from many physicians (consumers)' practices (again, a complicated regulation). Pharmacists are remunerated for their services with a fixed-fee form of compensation (this applies only for prescription drugs) (Apothekenverband, 2003), which is independent of the sales price. There is a lack of incentives for efficiency on the part of patients (consumers) and providers, so the more doctors (consumers) prescribe and examine, the more they earn. Then there is also little incentive for insurance companies to develop much vaunted innovative, lower-cost insurance policies. In addition, there is the strict prohibition of parallel imports of drugs, resulting in punitively high drug prices compared to those in the EU. This has resulted in a mantra in Swiss healthcare politics that healthcare in Switzerland is of good quality but quite expensive. Indeed, according to OECD statistics, Switzerland operates the third most expensive system in the world – behind only the USA and Germany (Civitas, 2002). This creates an attractive pharmaceutical market environment. According to Business Monitor Report (2009), the overall size of the Swiss market and high per-capita spend on drugs continues to be one of the key attractions.



Figure 1-4: The Swiss health system (partly Office federal de la statistique, 2005)

As a result, it can be stated, for state-regulated markets as well as other markets, that the market for healthcare provision and the perfect situation of supply matching demand is almost never reached. This is because the market for healthcare fails to meet some of the basic assumptions necessary for a perfectly competitive market. There are a number of reasons for market failure in relation to healthcare (Elliott and Payne, 2005, p10):

- Imperfect information on the quality and price of the healthcare good (service).
- Moral hazard: some form of insurance cover makes one less careful.
- Agency relationship between patients (consumers) and healthcare providers as a result of an asymmetry of information [typically, the doctor (costumer) knows more than the patient (consumer)].
- Supplier-induced demand: providers with a superior knowledge about health and healthcare interventions are therefore in a position to influence demand for them.

These four examples show why a market failure is a potential problem in relation to healthcare provision and the introduction of drugs. The automatic outcome of a perfect market is efficiency, and the identification of market failures is important because it may lead to inefficiency in the healthcare market.

Most scientific pharmaceutical marketing and related studies focus on the US market. According to Copper and Kleinschmidt (1993, p91), 'it is viewed as a problem, that studies tend to have a one-country (or even one-region) focus (in this case the US market)'. In the present research, only a minority of studies (refer also to Chapter 2) have investigated a non-US market (c.f. Table 1-3). This conclusion is supported by Birnik and Bowman (2007, p317), who note that 'extant research has largely focused on the advanced economies of the US, Japan and Western Europe'. Furthermore, Birnik and Bowman (2007, p317) conclude that 'this literature is thus prone to the same geographic bias found in a great deal of published research'. However, it has to be considered that because of the different market structures, these findings mainly apply to the specific investigated market. In addition, it has to be noted that the US market, as previously discussed, is substantively different to most Western markets, both in the nature of payment and the promotional environment. So far, few published studies which investigate a state-controlled market, such as Belgium, Finland, France, Germany, Japan, Netherlands and Switzerland, financed by combined state and private funding, are available (see Table 1-3). Furthermore, state-controlled markets have different peculiarities regarding governmental management, as well regulations that are implemented. Consequently, the results derived from scientific research performed on the basis of one specific country cannot be fully generalised to other markets. However, as emphasised by Stremersch (2008, p233), the 'primary goal of scholarly research in pharmaceutical marketing should not be to derive theories that can be generalized perfectly to all situations'. In other words, there is a need for specific context-related research.

Markets	Number of Publications found	Main Author
Central America	1	Rojas (2009)
China	1	Chen (2007)
Belgium	1	Parsons (1981)
France	1	Lilien (1990)
Italy	1	Coscelli (2000)
Netherlands	4	Cohen (2007); Leeftang (2008); Stremersch (2009); Venkataraman (2007)
Sweden	1	Jönsson (2001)
non-US	1	Vakratsas (2008)
UK	3	Flechter (1989); Gillis (1998); Greenhalgh (2004)
UK, Finland	1	Jaakkola (2007)
US	56	Aaker (1985); Ambady (2006); Andaleeb (1996); Avorn Chern-Hartley (1982); Azoulay (2002); Berndt (1994); Berndt (2003); Bond (1977); Boulding (1990); Bowman (1996); Brown (1994); Buzzell (1975); Cooley (2009); Chen (2007); Dao (1984); Donohue (2004); Ellison (1997); Goetzinger (2007); Golder (1993); Gonul (2001); Hauser (1990); Huff (1994); Iizuka (2002); Kardes (1992); Kalyanaram (2009); Kalyanaram (2008); Lambkin (1988); Lim (2008); Lurie (1990); Manchanda (2005); Manchanda (2004); Michaels (1985); Mizik (2004); Narayanan (2004); Parsons (1981); Pauwels (2004); Rice (2009); Rizzo (1999); Robinson (1985); Robinson (1988); Rosenthal (2002); Saxe (1982); Shankar (1998); Stern (1998); Tellis (1996); Urban (1986); White (2004)
US, Canada, Europe	9	Bijwaard (2008); Cooper (1993); Han (2005); Lexchin (2009); Lexchin (2006); Mintzes (2003); Mintzes (2002); Wittink (2002); Wong-Rieger (2009)

Table 1-3: Overview of investigated markets

1.1.4. Definition of a general Prescription Drug Market System Model

Taking the previously discussed basis of existing general conceptual marketing knowledge, a universally applicable market model can be set up, which is adapted from Kuehn (2003) (see original in Appendix 1). This takes the marketing concept and the market environment into consideration and represents a pharmaceutical market (see Figure 1-5), in order to understand the potential parameters and their interactions, the market and the current conditions.



Figure 1-5: Prescription drug market system model [Source: based on Kuehn (2003)]

As the market system clearly illustrates (Figure 1-5), costumers (in this case physicians) play a central role within the market, but unlike most markets studied in prior marketing research, they are a completely separate entity to the actual users (consumer) of the product [patients

(consumers)]. This statement is supported by Wright and Lundstrom (2004), who revealed that the primary link between buying and selling firms, sales people, have considerable influence on the buyer's perceptions of the seller's reliability, the value of the seller's services and, consequently, the buyer's interest in continuing the relationship. This leads to the conclusion that the interaction between the physician (customer) and salesperson is of central relevance within pharmaceutical marketing. As there is no standardised definition, the process of approaching and dealing with potential and existent customers is named "physician-targeting" in the present work. Furthermore, Nickum (2007) concludes that because traditional sales models are not the best approach for reaching a more diversified audience, pharmaceutical marketing marketers are rethinking the way they design and deploy their field sales organisations. These converging needs have forced the pharmaceutical industry to re-examine and begin redesigning their sales models in both the primary care and specialty markets. The focus of these efforts has been to better understand the prescribing universe, in order to strengthen physician (customer)-company relationships.

Furthermore, additional factors influencing the market should also be briefly discussed at this point. These are, according to Kuehn's (2003) definition (see also figure 1-5): 'competitors', 'distributors', 'opinion leaders' and 'consumers'. It has to be emphasized, as it has already previously been discussed (see Paragraph 1.1.), that a tripartite relationship (prescribers, users and payers) is in the 'consumer' box present. In addition to this it has to be noted that (as indicated in illustration 1-5), 'internal factors' (please refer to Daft, 2011), 'external factors' (based on the PEST model; please refer to Middleton, 2003) as well as 'external competition forces' (based on the Porter's 5 forces model; Porter, 1979) influence the pharmaceutical market behaviour.

As previously indicated, in prescription drug marketing the interaction between the customer (physician) and salesperson plays a central role because it is essential for sales (revenue) success. Therefore, in the present work, this process will be termed “physician-targeting”.

In the next section of this chapter, a summary of the first few paragraphs will be given and the relevant conclusions will be drawn. This will help to indicate the research gaps as well as research objectives.

1.1.5. Synthesis and Conclusions

In the first part of this chapter a description of the pharmaceutical sector and the role of marketing, as well as the latest and most relevant scholarly research, was made. It was highlighted that there is a need for further research, as indicated by the scientific literature. In a next step, the most fundamental marketing strategies that take place within the prescription pharmaceutical sector and the strategic relevance of order-of-market entry for sales (revenue) were mentioned. The marketing mix concept (interrelationship among the marketing instruments) was then presented and the associated literature discussed. This led to the conclusion that, in order to define an appropriate marketing mix and to perform research within the prescription pharmaceuticals sector, further knowledge about the market, especially its peculiarities, its environment and the sales process, is required. For this purpose, four fundamentally characteristic healthcare systems were presented and an overview of pharmaceutical markets was given. The properties of non-state-regulated as well as of state-regulated markets were then discussed. Based on this overview, a prescription pharmaceuticals market model was presented and the resulting market failures were described. Furthermore, it is also necessary to understand the actual process that takes place when potential prescribers (customers) are approached in order to reach their personal

commitment to prescribing a specific medical drug to their patients (consumers). This process is termed “physician-targeting” (see also Raisch, 1996).

Firstly, there is a widening worldwide gap between increasing research and development spending and the decreasing number of new products actually reaching the market (Jarvis, 2001). In fact, the ‘large pharmaceutical companies spent much more on marketing in 2002 than on research and development’ (Angell, 2005, p122). As a consequence, as described by (Angell, 2005), the pharmaceutical industry in the United States has increased the number of its salespersonnel over the past decade.

Secondly, in most countries, the marketing of medications is strongly regulated and inefficient and leads to a number of markets failures. Elliott and Payne (2005, p10) identified four failures, namely (1) Imperfect information; (2) Moral hazard; (3) The agency relationship between patients (consumers) and healthcare providers (asymmetry of information) and (4) Supplier-induced demand. Moreover, modes of marketing vary across different health systems (Gallay, 2002), which means that, for each market, appropriate new strategies must be developed (Cooper and Kleinschmidt, 1993; Liberman and Rotarius, 2001).

Thirdly, the development of a marketing strategy follows from prevailing market conditions and a clearly laid out general company strategy. In the pharmaceutical sector, there are two predominant strategic directions (Dogramatzis, 2002). While companies such as Novartis continue to concentrate on the mass market, companies such as Roche have chosen to follow the path of specialising in products used in cases with less prevalent indications (market niche segment strategy), primarily in the area of oncology (Fibig and Hutt, 2003). However, there is no generally applicable strategic approach in the pharmaceutical industry, but there are nonetheless factors that should be considered to achieve company success (Harms et al., 2002).

Fourthly, it is concluded that the process of “physician-targeting” plays an essential role in the success of pharmaceutical marketing.

1.2. The Research Gap

Thus, as marketing expenditure for pharmaceutical firms increase, and firms begin to rely on the influence of marketing to influence the performance (revenue) of drugs in an increasingly crowded market space (see also Buckley, 2004; Levy, 1994; Greene, 2007), questions regarding the most efficient marketing instruments are raised. At the same time, from a theoretical perspective, the prescription drugs market is an interesting market to study because of its unique characteristics, such as high regulation and complex relationships between the payer, prescriber and user (consumer). Furthermore, because of its unique health context, investigations of the marketing mix and promotional effectiveness may yield unique responses (see also Kremer et al., 2008). Moreover, as stated by Stremersch (2008, p233), ‘the moderators of such effectiveness may be specific to the health context’ (see also Venkataraman and Stremersch, 2007).

As already stated, Stremersch and Van Dyck (2009) published in the *Journal of Marketing* similar research directions as indicated in this thesis. We see a further need for research about the marketing mix (interrelationship among the four marketing instruments) in pharmaceutical marketing, marketing instruments and especially “physician-targeting” models. The reliability of this preliminary generalisation could be increased through meta-analysis (Stremersch and Van Dyck, 2009, p13), which would enable companies to adapt their current “physician-targeting” concept based on the market and strategic requirements. This would involve considering the most essential marketing instruments and ensuring an appropriate marketing mix is set up. Furthermore, there is a necessity to develop a “physician-targeting” model (Stremersch and Van Dyck, 2009) that considers the mean effect of personal selling on brand

prescriptions, product properties and salespersons. As Stremersch and Van Dyck (2009, p13) concluded, the opportunity lies in developing “physician-targeting” models based on volume, physician (costumer) responsiveness to detailing and competitive detailing patterns (see also Dong et al., 2008). The necessity for more research in this area is also stated by Ryerson (2008), who refers to Churchill et al.’s (1985) meta-analysis of 393 studies and 36 dissertations to determine the level of predictability of sales performance. According to Ryerson (2008, p181), ‘these results were “unimpressive” and have propelled researchers to submit to the challenge of uncovering significant factors, which lead to the determination of sales performance. As a result, 30 years later, new models are still being developed for this same reason’.

As previously stated, the pharmaceutical industry has been forced to re-examine and begin redesigning its sales models (Nickum, 2007). The focus of these efforts is to better understand the prescribing universe, strengthen physician (costumer)-company relationships and, consequently, improve the process that takes place when a physician (costumer) is targeted by a salesperson, in order to gain successful sales (revenue). For this purpose, an appropriate “marketing mix” has to be designed. As previously stated, Borden (1965, p368) defines ‘the “marketing mix” as the interrelationship among the marketing decision variables’. However, according to Balachandran and Gensch (1974, p160), it is ‘one of the most challenging questions how to determine the optimum marketing mix’. Birnik and Bowman (2007, p317) proposed that it ‘would be valuable if future studies used qualitative research methodologies to capture the richness of both marketing mix standardization decisions and implementation’.

Furthermore, most of the available studies have investigated the variation of marketing mix variables in the less regulated US market (Berndt et al., 1997; Berndt et al., 2002; Berndt et al., 2003; Bowman and Gatignon, 1996; Bond and Lean, 1977; Golder and Tellis, 1993; Lieberman and Montgomery, 1988; Lilien and Eunsang, 1990; Moore et al., 1991; Robinson

and Fornell, 1985; Tellis and Golder, 1996; Urban et al., 1986; Vernon, 1971). As already stated, the extant research has largely focused on the advanced economies of the US, Japan and Western Europe (mainly the UK, France, Italy and Belgium but not Switzerland). Consequently, there is a geographically-related bias in some of the published research (Birnik and Bowman, 2007, p317).

In comparison to other industries, the pharmaceutical industry has some unique properties, as discussed, which make it a good example for isolating and studying single success factors. For example, price regulations rule out many rebate tactics and also exclude most of the sales promotion tools available to marketers in other markets. The economic success of the pharmaceutical industry depends on innovative products and successful marketing and sales activities. Furthermore, increased competition and the large variety and complexity of products in the pharmaceutical industry demand the services of a well-educated and professional salesforce in the field (see Paragraph 1.1.). This is generally true for many businesses, but especially for the pharmaceutical industry. In order to gather further knowledge about the “physician-targeting” process, one emphasis of the research should be on specific marketing instrument product design (especially quality) and promotion. At this point it should be emphasised that one aim of scholarly research should be not only to generalise theories but also to develop models with a specific context to their socioeconomic institutional and cultural environment (Steenkamp, 2005).

Finally, in addition to stronger theoretical links, Birnik and Bowman (2007, p316) would also welcome studies that aim to derive managerial prescriptions. It has to be noted that ‘marketing managers are under increasing pressure to assess and communicate the impact of marketing expenditure on financial outcomes’ (Lehmann, 2004, p75). Furthermore, the ‘insights from such studies could improve management decision-making and help to justify the amount and allocation of their marketing budgets’ (Kremer et al., 2008, p236). According

to Rod et al. (2007, p175), ‘drug manufacturers on both sides of the Atlantic are increasingly interested in identifying those marketing investments (i.e. those forms of pharmaceutical promotion) that generate a positive ROI (return on investment)’. In addition, Birnik and Bowman (2007, p316) stated that ‘the current body of literature is vast in richness but full of contradictory findings. As a result, it is not obvious how to distil “best evidence” for use by management practitioners (costumers)’.

The findings of this work will contribute to the domain of pharmaceutical marketing, more specifically to marketing strategy. According to Hooley et al., (2008, p35), the marketing mix proportion is the outcome of the marketing strategy process and can therefore be considered as a key element.

1.3. Research Objectives

The objectives of the present study are threefold, and follow on from the previous discussion. Essentially, the objectives are focused on eliciting theoretical and empirical evidence regarding pharmaceutical marketing instruments and their substantive consequences. More specifically, the three objectives of this study are:

1. To conceptualise and delineate the dimensionality of pharmaceutical marketing mix instruments that are used when physicians (costumers) are targeted.
2. To investigate the influence of product- (especially quality) and promotion-mix related factors on “physician-targeting”, thus leading to an increase in sales (revenue).
3. To develop a valid and reliable model of “physician-targeting” in the sector of prescription pharmaceuticals for marketing managers.

The attainment of these three objectives is important for a number of reasons, which together form the anticipated theoretical contribution of the thesis.

In order to provide a theoretical contribution, in regard to the existing research gaps (see 1.2), the attainment of objective one will contribute to pharmaceutical marketing by conceptualising a number of novel constructs, as well as their factors and interactions which may be of importance to “physician-targeting” models. A key benefit of such a review is the provision of guidance for planning future studies such as measurement items for further standardised studies. Objective one’s achievement is crucial, since, without a robust delineation of the relevant constructs pertaining to pharmaceutical marketing (whether literature- or field-based), it is difficult for researchers to even speculate as to how to develop a “physician-targeting” model. The uniqueness of the Swiss prescription pharmaceutical market in terms of governmentally fixed prescription pharmaceutical pricing, almost non-existent competition from other markets and the lack of price awareness when a drug choice is made by prescribers (costumers), patients (consumers) and insurance companies is another benefit of this study (see 1.1.3).

There are also a number of practical contributions to be gained by the successful undertaking of the present study. Earlier works and reviews have tended to have a limited perspective on a single aspect of marketing or sales (revenue) in the sector. Thus, they do not cover adequately all aspects of the conceptual framework of “physician-targeting”. These findings will also be adaptable to other similar state-regulated markets such as Belgium, Finland, France, Germany, Japan and the Netherlands (see 1.1.3).

Furthermore, as a managerial contribution, theoretical light will be shed on the extent of pharmaceutical market penetration and to develop a qualitative evaluation, which will result in specific recommendations for marketing managers. The resulting conceptual model of the

prescription pharmaceutical marketing process could serve as a decision-making tool for marketing managers when applied to modelling simulation software.

This research will make the following contributions:

- To provide a description of the peculiarities of the state-regulated Swiss prescription pharmaceuticals market.
- Reveal the relevance of the important pharmaceutical marketing factors.
- Develop a “physician-targeting” model.
- To provide support for existing theoretical frameworks.
- To contribute to marketing strategy theory.
- To provide practical recommendations for marketing managers and policy makers.
- To deliver directions for further academic research.

1.4. An Outline of the Thesis’ Structure

In the first stage of this work, a general overview of worldwide valid marketing methodologies will be given. In order to narrow the focus, the study will be limited to one state-regulated market, the Swiss prescription pharmaceutical market, in the second stage.

The thesis is structured into seven chapters, including the present one.

Chapter 2 focuses on assessing the relevant conceptual and empirical literature regarding pharmaceutical marketing, especially “physician-targeting”. In order to carry out this investigation, a systematic literature review will be performed. Here, research in pharmaceutical marketing, psychology and other relevant disciplines is examined in order to gain an insight into pharmaceutical marketing and the key variables of importance. Within each particular stream of research, comment is made on the understanding it can offer to the

task in hand and any particular areas where it may lack explanatory power. In the first instance, the theoretical construct of order-of-market entry will be discussed. In a second step, established pharmaceutical marketing instruments will be discussed.

Chapter 3 describes the qualitative surveys that are performed for this work. Essentially, a qualitative study of “physician-targeting” is described, in order to draw out insights into “physician-targeting”. For this purpose, a focus group study is set up, taking the conclusions derived from the systematic literature review into account. The focus group study provides the outcome of the effort to provide field-based evidence regarding “physician-targeting”.

Chapter 4 conducts the second step of the qualitative surveys, the Delphi group study, which is set up on the basis of the findings derived from the focus group study. Based on the outcome, a conceptual model and formal hypotheses are presented. In conclusion, it is argued that, in order to gain more specific awareness of “physician-targeting”, these literature-based hypotheses need to be examined in light of field data.

Chapter 5 applies a quantitative market data analysis, in order to test the proposed hypotheses. For this purpose, a secondary market dataset containing five state-regulated medical drug classes, provided by a market research company as well as gathered from alternative sources, are prepared for statistical analysis. However, because of missing information, additional data are collected. These data are then collated for their quality tested and for their structure analysed using descriptive statistics. A multiple regression analysis is then applied.

Chapter 6 synthesises the relevant findings outlined in the previous sections. In particular, the significance of the findings to existing theory and methods is examined in depth.

Following this, in Chapter 7, the implications of “physician-targeting” for marketers and policymakers are discussed in detail, and several practical recommendations regarding “physician-targeting” are advanced. Finally, the limitations of the study are outlined, and following on from this a number of recommendations for future research are presented.

2. Success Factors in Pharmaceutical Marketing:

A Systematic Literature Review

2.1. Introduction

In this chapter, the current scientific marketing literature, as well as specific marketing instruments, and their relevance to the pharmaceutical marketing and personal selling context are explored. An overall picture of existing evidence-based strategies and pharmaceutical marketing concepts will be derived and a provision of guidance for planning further studies will be provided.

In the first part, problem statements are discussed and research objectives stated. An overview of the theoretical background of the systematic literature review is given, the applied method justified and the research procedure described. In the second part of this chapter, a brief summary of the research methods applied by the reviewed publications is provided. The findings are then presented in a logical, systematic order. The applied structural framework is based on the order-of-entry and the 4Ps marketing mix model. First of all, the order-of-entry concept regarding the most relevant findings is discussed. It is argued that the effect of order-of-entry is only apparent because of habit formation and the risk that appears for consumers when trying a new brand. Consequently, different marketing strategies have to be applied for both the first entrant and the late entrant. In the second stage, the marketing mix concept and the most relevant findings regarding prescription pharmaceutical marketing and product differentiation criteria such as innovativeness, branding and quality are discussed. In combination with this, an adequate pricing strategy has to be employed. For promotion, it is concluded that word-of-mouth, information, advertising, personal selling and sampling for both direct-to-consumer and direct-to-prescriber promotion are the most essential instruments.

Distribution, as another marketing mix attribute, has not been given very much attention in pharmaceutical marketing research so far, so the topic is not addressed herein. Finally, all marketing factors are listed and ranked according to their relevance, a brief summary is given and the implications for further research are discussed.

2.2. Problem Statement and Objectives

As previously described, “Marketing” is generally defined as the ‘process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services, to create exchanges that satisfy individual and organisational objectives’ (Marketing News, 1985, p1). Furthermore, it can also be described as an attempt to modify behaviour and to stimulate demand (see also Smith, 1983). In order to reach these aims, a “marketing concept” has to be set up, which relies upon marketing research in order to define market segment, their size, and to ensure that the marketing objectives are satisfied by controllable parameters in the marketing mix (Kotler, 2006). These parameters refer, as it has been previously discussed, to four “marketing mix instruments” (4Ps), namely product (includes product design, package, brand and service), place (distribution channels), promotion (personal selling, advertising, sales promotion and publicity) and price (see also Bowman and Gatignon, 1996; Borden, 1965; Berndt et al., 1997; Frey, 1956; Kotler, 2006; Rizzo, 1999; Ghosh et al., 1983; Balachandran and Gensch, 1974).

In the product design area of pharmaceutical products, product innovativeness, efficacy, branding and qualities such as safety and tolerability appear to be the key success factors (Smith, 1983; Fletcher, 1989; Dogramatis, 2002). However, for Cooper and Kleinschmidt (1993, p110), criteria such as ‘product innovativeness and entry order have a modest impact on success’. Nevertheless, according to Hollon (1999, p384), ‘the winners in the prescription

drug market are not going to be those with the best patent protection for their products but those that are the best marketers'. Furthermore, Gonul et al. (2001, p90) find that the 'effectiveness of direct promotional efforts to physicians (costumers) can be enhanced by more specific segmentation, targeting and positioning contingent on the intrinsic brand preferences demonstrated by certain healthcare professionals'. Furthermore, as stated by Azoulay (2002, p555), it is assumed that 'advertising is more effective when combined with a superior bundle of product-quality attributes' (see also Berndt et al., 1997). For personal selling, one can refer to Gonul et al.'s (2001, p89) study, which showed that the 'scope of personal selling should be carefully scheduled in terms of frequency, length of visits, and number of free samples given away to optimise the company's effectiveness of direct promotion efforts and expenses'. Place (distribution), as another marketing instrument, does not appear to play such an essential and important role in marketing success, at least according to some researchers (Cooper and Kleinschmidt, 1993; Ghosh et al., 1983; Smith, 1983).

It has to be emphasised that three parties are involved when purchasing prescription drugs: (1) the prescriber and usually a decision-maker [doctor (costumer)]; (2) the consumer [patient (consumer)] and (3) the payer (e.g. an insurance policy) (Jaakkola and Renko, 2007).

Consequently, 'the ones, who make the decisions are not identical with those, who receive the service and/or pay for it' (Harms et al., 2002, p147). Therefore, a "price" policy might play a less important role within the area of the prescription drug market, and it is even likely that 'payers pay higher prices as a result of the higher advertising that occurs in the industry' (Rizzo, 1999, p89) and/or because of a more innovative product (Dao, 1984).

Since the sales (revenue) of the leading therapeutic categories of the total pharmaceutical market sales predominate, most pharmaceutical companies conduct research in closely related therapeutic areas (Scrip, 2001). These companies often employ similar technological

approaches, which inevitably leads to strong competition in these market segments and results in a race to be first to market. Several researchers (Berndt et al., 1997; Berndt et al., 2002; Berndt et al., 2003; Bowman and Gatignon, 1996; Bond and Lean, 1977; Golder and Tellis, 1993; Lieberman and Montgomery, 1988; Lilien and Eunsang, 1990; Moore et al., 1991; Robinson and Fornell, 1985; Tellis and Golder, 1996; Urban et al., 1986; Vernon, 1971) have shown the relevance of early market entry within the pharmaceutical business. In a landmark study, Bond and Lean (1977) analysed the therapeutic group of diuretics (which promote diuresis) and angina pectoris³. They found that later entrants with higher expenditure on marketing and lower priced drugs were not able to defeat the market leader (see also Ghosh et al., 1983). However, they concluded that promotion (advertising) is essential for sales (revenue) success. Product quality and price were added to the mix later by Berndt et al. (1997). These researchers also showed that later entrants with a much more innovative product (preparation with better therapeutic properties) were able to defeat the market pioneer. It can be concluded that order-of-entry is relevant for market success, but it is not the only strategy that can be employed to become a market leader. Similarly, Tellis and Golder (1996, p73) concluded that ‘market pioneering is neither necessary nor sufficient for long-term success and leadership’.

The objectives of the present chapter follow on from the previous discussion. Essentially, they focus on eliciting theoretical and empirical evidence regarding pharmaceutical marketing instruments and their substantive consequences. More specifically, the two main objectives of the Systematic Literature Review are:

³ Angina pectoris is severe chest pain due to ischemia (a lack of blood and hence oxygen supply) of the heart muscle, generally due to an obstruction or spasm of the coronary arteries (the heart’s blood vessels) (MerckMedicus.com, Dorland’s Medical Dictionary, Retrieved May, 2010).

1. To conceptualise and delineate the dimensionality of pharmaceutical marketing instruments used when physicians (costumers) are targeted. The marketing factors most salient to success in the unique context of the pharmaceutical industry will be identified. More specifically, the most relevant pharmaceutical marketing factors have to be identified. In addition this, another aim is to familiarize with the most important marketing literature.
2. To investigate the influence of pharmaceutical marketing instruments on “physician-targeting”, leading to an increase in sales (revenue). More specifically, the possible interactions between the various previously identified marketing factors and their relevance for sales success according to literature have to be explored.

In order to carry out this investigation, a systematic literature review is performed. In the first section, the methodological approach of this review is described. Following this, the most relevant findings derived from the review are summarised, described and, finally, according to their relevance, evaluated and rated.

2.3. Literature Review Method

‘Systematic reviews have become increasingly common in recent years’, as highlighted by Shojania et al. (2007, p224). In addition, systematic reviews are recommended by researchers as a superior source of evidence regarding the state of current knowledge in a general field, or to substantiate the existence or otherwise of a given relationship (Mulrow et al., 1997; Shojania et al., 2007). According to Petticrew and Roberts (2006, p2), a ‘systematic review is especially useful when a general overall picture of the evidence in a topic area is needed to direct future research efforts, or when an accurate picture of past research and past

methodological approaches is required'. Consequently, as well as being appropriate in this instance, the systematic review is popular in the medical field and is becoming increasingly popular in management. In fact, around 2,500 new systematic reviews are indexed annually on Medline (Moher et al., 2007; Whitlock et al., 2008).

An extended literature search and evaluation process, conducted in a systematic manner, is a key distinction between traditional literature reviews and systematic reviews. Systematic reviews are summaries of the available research evidence. Such methods are aimed at reducing bias and chance effects to provide more reliable information on which to make decisions (Antman et al., 1992; Kleijnen and Knipschild, 1992). Thus, in order to identify all relevant literature within major databases, and also to secure other relevant material, sometimes described as grey literature (Savoie et al., 2003), conventional systematic extended literature review methods as detailed within the next paragraph were used.

However, it has been stated by Moyer et al. (2007, p448) that 'there is no standard definition of a systematic review'. Consequently, different approaches to systematic reviews can be found in the literature (James et al., 2004; Li Pan Wo, 1997; Petticrew and Roberts, 2006) and are normally adapted according to their requirements. In order to perform a systematic review, a journal database and library access, an investigator and an advisory group are required. In this case, the outcome objectives for assessment (i.e. the search terms) were set at the start of the project. Table 2-1 shows the systematic procedure followed. As can be seen, each step feeds into the next and the focus becomes more and more exact, akin to a funnelling process.

Step 1 - General literature search			
<ul style="list-style-type: none"> • <u>Search term:</u> Pharmaceutical Marketing • <u>Databases:</u> EBSCO, Emerald, ABI Inform, NEBIS and Google • <u>Hits:</u> 126 			
Step 2 - Literature review (narrative process)			
<p>Identification of the most important marketing criteria</p> <ul style="list-style-type: none"> • <u>Identified criteria:</u> distribution, promotion, product, price, product diffusion, market system, word-of-mouth and order-of-entry effects 			
Step 3 - Redefined literature search			
<ul style="list-style-type: none"> • <u>Search terms:</u> distribution, promotion, product, price, product diffusion, market system, word of mouth and order-of-entry effects • <u>Databases:</u> BioMed Central; Business Insights; Cambridge Journals Online; Directory of Open Access Journals; EBSCO; Emerald Fulltext; Highwire Press; Ingenta; Oxford Journals; Jstor; Nber; ProQuest; PubMed; Royal Society of Chemistry Journals; ScienceDirect; SpringerLink (MetaPress); Swetwise; Taylor and Francis (informaworld); Wiley InterScience; google; journal catalogues; news articles; text books; grey literature • <u>Hits:</u> 538 			
Step 4 - Ranking of papers according to their relevance (own definition)			
<u>Criteria:</u>	<u>Description:</u>	<u>Ranked:</u>	
5 star	Core paper	4	
4 star	Important Findings and good methodology	57	
3 star	Some interesting findings and figures	100	
2 star	Interesting research methods applied	217	
1 star	Not relevant to subject	286	
Step 5 - Pearl fishing			
<p>Identification of new relevant references (cited more than twice) within the 5 and 4 star papers</p> <ul style="list-style-type: none"> • <u>Hits:</u> 92 papers out of total 1814 citations identified 			
Step 6 - Ranking of “pearl fishing” papers according to their relevance			
<u>Criteria:</u>	<u>Description:</u>	<u>Ranked:</u>	<u>Total:</u>
5 star	Core paper	91	95
4 star	Important Findings and good methodology	1	58
Step 7 - Ranking of papers according to their impact factor			
<ul style="list-style-type: none"> • <u>Criteria:</u> Number of citations • <u>Database:</u> ISI Web of Science citation index • <u>Hits:</u> 103 papers identified 			
Step 8 - Assessing the remaining studies and key factors identification			
<ul style="list-style-type: none"> • <u>Criteria:</u> Study, Year, Intervention, Study population, Study design, Primary reference and secondary reference, Sample size, Response rate, Follow-up rate, Follow-up (months), Validity score, Findings, Conclusion, Key factors • Given the substantial changes in health care and pharmaceutical industries into account, the search was <u>limited to papers published in the last 25 years</u> . Older paper were only considered, if containing substantial statements or being viewed as core paper within their subject area. 			
Step 9 - Examination of content of similar studies			
Step 10 - Evaluating and compiling of selected publications			
<ul style="list-style-type: none"> • 170 citations out of 98 publications indicated 			
Step 11 - Structuring of information			
<ul style="list-style-type: none"> • Coding scheme based on Order-of-Entry Model and 4P-Concept 			
Step 12 - Presentation and evaluation of citations			
<ul style="list-style-type: none"> • Ranking of the criteria within each category according to their number of citations • Calculation of relative importance 			

Table 2-1: The systematic literature review flow chart

Each stage was subject to an analysis according to a set of criteria. In the first stage, the key criterion was to find general preliminary literature in order to set the parameters for more detailed searches in the future. Thus, a broad search of 'pharmaceutical marketing' yielded 126 results, which were the input into the first narrative (second) step. This step involved a review with the aim of identifying the most important criteria for pharmaceutical marketing success. Following this, each criterion was used as a term in a dedicated search, resulting in 528 hits in total. The cut-off point was reached when searches did not add to the tally of included studies (Petticrew and Roberts, 2006). The gathered publications were then subjected to an extensive literature review (third step).

In a fourth step, publications were viewed and ranked according to their relevance to the research task. It should be noted that the procedure of a systematic literature review has to be adapted to the requirements given by the study task (for similar methods see also Biermann et al., 1999; Mullins and Spence, 2003; Wasson et al., 1993). In order to determine the study's appropriateness regarding the research questions, a checklist to assess the derived publications was set up. The following criteria were defined (for further explanations, please refer to Appendix 2): (a) five-star paper (indicated as a core paper within the subject area, shows high relevance regarding to the research question); (b) four-star (study has some important findings and good methodology); (c) three-star (some interesting, but less essential findings and figures can be found); (d) two-star (regarding ongoing research, only interesting research methods applied) and (e) one-star (not relevant to the subject at all).

In total, 4 five-star, 57 four-star, 100 three-star, 91 two-star and 286 one-star publications were rated. For further research, only five- and four-star papers were considered. Next (the fifth step), the previously described procedure was followed for the ranking of papers uncovered by the 'fishing' stage, uncovering a further 92 papers from the 1,814 citations in the four- and five-star ranked papers taken from the fourth step and ranked according to their

relevance (see Appendix 2) (sixth step). In the seventh step, ISI citation impact was taken into account to rank the remaining papers.

The remaining 103 publications were evaluated, and keywords were identified using a Microsoft Excel-based data extraction form. The criteria were: study, year, intervention, study population, study design, primary reference and secondary reference, sample size, response rate, follow-up rate, follow-up (months), validity score, findings, conclusion and key marketing factors. Taking the substantial changes in healthcare and pharmaceutical industries into account, the search was limited to papers published in the last 25 years. Older papers were only considered if they contained substantial statements or were viewed as a core paper (five- and four-star, see Appendix 2) within their subject area. As a result, five papers had to be excluded. The critical information from each paper was then collated and sorted, using a coding scheme as explained below (eighth step).

The remaining top 98 papers were retained for further analysis and review. In order to make sure that no critical information was missed, the aim was to investigate the content of literature review studies containing the same research objectives (similar papers) (for research objectives, see Paragraph 2.2.). However, despite the many existing literature research studies in marketing, usually focusing on specific subject areas, no similar studies were found (ninth step).

In fact, no study was found that has performed an overall literature review of pharmaceutical marketing as presented in this study (please refer also to Paragraph 1.1.2). The most extensive review of pharmaceutical marketing was performed by Kremer et al. (2008), investigating only the effectiveness of pharmaceutical promotional expenditure. Groves et al. (2002) also studied the prescription habits of physicians (costumers). Another literature review performed by Szymanski et al. (1995) analysed order-of-entry and its impact on business performance. Furthermore, the first-mover advantage was investigated by Kerin et al. (1992) and by Golder

and Tellis (1993) in a different study. Marketing mix standardisation in multinational corporations was investigated by Birnik and Bowman (2007), while the role of consumer behaviour in marketing was analysed by Foxall (1999). Churchill et al. (1985) studied the determinants of salesperson performance. This study has included these findings as far as relevant to the research today.

In the tenth step, the selected 98 publications were evaluated and 170 essential citations compiled. The identified citations were then coded using a coding scheme that was based on the order-of-entry model and 4Ps concept. The applied criteria were (see also Kotler, 1998): order-of-entry, early entry, late entry, market share, market leader, market niches, consumer, patient (consumer), physician (costumer), habit formation, sales (revenue), marketing mix, product, product life cycle, innovativeness, product quality, brand, generics, patents, service quality, distribution, promotion, personal selling, perception, SOCO (scale of selling orientation versus customer orientation), advertising, DTP (direct-to-prescriber promotion), DTC (direct-to-consumer promotion, scientific information source, commercial information source, sampling, word-of-mouth, price, costs, market environment, non-product variables, time in market, competitive performance, market growth rate and strategies (eleventh step). The citations were finally sorted according to their defined criteria, presented in a structured text and based on the 4Ps marketing mix concept. After each section, the most important statements were summarised and a conceptual model was derived. In order to gain an overview of the relevance of the marketing factors, these criteria were counted and ranked. In order to ensure that no relevant information had been missed, the analysis was repeated.

In the next section of this chapter, the results of the systematic literature review are presented. At first, a brief overview of the reviewed publications is given, focusing on methodologies used in prior work. Next, the findings are summarised and presented in a systematic order. As a starting point, order-of-entry is discussed, leading to the marketing mix instruments of

product, price and promotional design. Finally, an overview regarding the relevance of marketing instruments, indicated by the number of citations, is given in order to justify further research.

2.4. Methodologies used by Previous Studies

A summary listing of the applied methodologies used in the reviewed literature is provided in Table 2-2. This table classifies the literature into broad methodological categories, and within these categories reports the sample size and data source of each individual study (where it was possible to determine this information). Due to the diversity of samples used in the literature, it was necessary to describe the samples of each individual study rather than categorise them further. It is evident that most of the studies are based on surveys, suggesting that there is significant potential for additional work incorporating qualitative, experimental or modelling approaches to develop additional insights.

Total Articles	Method of Analysis	Main Author, Sample Size and Data Source (if available)
1	Case study	Chen (2007) vitamin market
49	Survey	Aaker (1985) PIMS data; Andaleeb (1996) 400 physicians; Avorn (1982) 2 drug classes, 100 physicians; Azoulay (2002) anti-ulcer market; Berndt (1994) 3'500 physicians (IMS data); Bond (1977) 2 drug markets; Boulding (1990) 3'250 evaluations of 340 business units (PIMS data); Bijwaard (2008) 16 telecom markets; Bowman (1996) 5 categories; Brown (1994) 129 brands in 34 different categories; Chen (2007) 3'000 adult patients; Coscelli (2000) 75'000 observations; Dao (1984) 19 drug classes; Donohue (2004) 25'716 subjects; Ellison (1997) IMS data; Flechter (1989) 187 firms; Gillis (1998) 87 participants; Gonul (2001) 3 large datasets; Hauser (1990) ASSESSOR database; Huff (1994) 95 observations in 34 product categories; Iizuka (2002) NAMCS, CMR, IMS data; Jaakkola (2007) 45 interviews; Kalyanaram (2009) three therapeutic classes; Kalyanaram (2008) three therapeutic classes;

		<p>Kalyanaram (1992) 8 markets, 28 new brand entrants, 220 weeks; Lambkin (1988) 129 start-up companies and 187 businesses (PIMS data); Leeflang (2008) 49 brands 5 products; Lexchin (2009) 73 multiple dosage products; Lilien (1990) 112 observations; Lurie (1990) faculty of 7 universities; Manchanda (2004) 1'000 of 116'218 physicians; Mintzes (2003) 200 physicians; Michaels (1985) 3'216 participants; Mitchell (1989) 5 subfields of medical diagnostic imaging industry, 30 years data entry; Mizik (2004) 74'075 individual physicians; Narayanan (2004) US market; Parsons (1981) 10 ethical drug products 14 sales territories; Pauwels (2004) 1100 Californian car dealers JDE data; Rice (2009) 13 drugs; Rizzo (1999) IMS data; Robinson (1985) 500 observations (PIMS data); Rosenthal (2002) 12'000 physicians (panel data); Rojas (2009) 17 large companies; Saxe (1982) 133 sales people; Schwartz (1989) undefined; Shankar (1998) 13 brands 2 ethical drugs categories; Tellis (1996) PIMS and ASSESSOR database; Urban (1986) A.C. Nielsen market data; Vakratsas (2008) IMS and A.C. Nielsen market data; Venkataraman (2007) 2'774 physicians 39'880 months of observations large firm dataset; White (2004) 21'000 adults (MARS data); Wittink (2002) 392 branded drugs 21'436 observations</p>
2	Qualitative data analysis	Cooley (2009) 14 participants; Cooper (1993) 21 companies;
9	Essay	Cohen (2007); Han (2005); Jönsson (2001); Lexchin (2006); Manchanda (2005); Mintzes (2002); Roth (2004); Stremersch (2009); Wong-Rieger (2009)
3	Experiment	Ambady (2006) 22 video clips; Kardes (1992) 46 and 40 MBA students
13	Literature review	Churchill (1985) 116 articles; Elling (2002) McKinsey Report; Golder (1993) 450 articles and 250 books; Greenhalgh (2004) research areas; Groves (2002) 15 articles; Kalyanaram (1995) undefined; Karakaya (2000) undefined; Kerin (1992) 13 articles; Kremer (2008) meta-analysis of 58 books +781 articles; Lieberman (1988) undefined; Lilien (1981) undefined; Manchanda (2005); Szymanski (1995) 67 articles
5	Modelling	Cohen (1987) model categorisation; Goetzinger (2007) 263 online respondent; Lim (2008) 71 time-series; Shankar (1997) 72 scenarios

10	Review paper	Breuer (2003); Comanor (1979); Comanor (1986); Hill (1999); Hoch (1989); Hollon (1999); Hunt (1998); Jaffe (2000); Schwartz (1990); Trim (2005)
2	Text book	Dogramatis (2002); Bain (1956); Kotler (2006); Smith (1983)

Table 2-2: Profile of analysed publications

2.5. The Importance of Order-of-Entry in Pharmaceutical Marketing as a Theoretical Concept

2.5.1. Order-of-Entry as a Fundamental Concept

Most of the current literature on pharmaceutical marketing presupposes the order-of-entry model as a starting point in the conception of a marketing strategy (see also Castro and Chrisman, 1995; Rodriguez-Pinto et al., 2008). The theoretical order-of-entry concept and first-mover advantage are extensively discussed in the literature and can be applied in both general marketing and pharmaceutical marketing. Bain (1956) initiated the concept, which states that a general tendency of buyers to prefer established over new products may place potential later entrants at a disadvantage as compared to firms already established in the industry. Bain notes that firms entering later might have to accept a lower selling price and/or incur higher selling costs than existing firms, in order to persuade buyers to accept their products. Furthermore, according to Lambkin (1988, p137), 'order-of-entry is systematically related to competitive performance, and this relationship is likely to be moderated by variations in the structures and strategies of the business in different entrant categories'. These findings are supported by Kalyanaram (2008), who investigated the order-of-entry effect in prescription (Rx) drugs markets. However, Kremer et al.'s (2008, p243) results show that the effect of 'order-of-entry on promotional effectiveness is not significant', confirming the findings of Shankar et al. (1998).

Furthermore, it was highlighted by Bijwaard et al. (2008, p246) that the ‘effect of order-of-entry can be partly explained by the predominant importance of switching costs on the demand side’. Consequently, Bijwaard et al. (2008, p247) determined three relevant factors: (1) consumers have to make some initial investment in adapting to a seller’s product or services, (2) contractual costs imposed by the firm and (3) firm-specific learning on how to use the product (habit formation). Because of these switching costs, firms that already exist in the market benefit, as later firms have to convince consumers to switch. Furthermore, according to Coscelli (2000, p367), ‘patients (consumers)’ and physicians (costumers)’ prescribing behaviour exhibits a strong state of dependence, which declines as the number of months between two successive purchases/prescriptions grows larger’. In addition, Coscelli (2000, p351) found ‘significant evidence of doctor (costumer) and patient (consumer) “habits”, which imply that in markets in which brands are not allowed to compete on the basis of price, habit persistence can translate into persistent market shares’.

In summary it can be said that many of the fundamental strategic concepts of pharmaceutical marketing are based on the order-of-entry effect, which is caused by the risks occurring and switching costs on the buyer side when trying a new, previously unknown brand/product. This leads to the formation of a habit towards existing brands/products, once a product/brand is accepted by the consumer. At this point, the brand cognition effect takes place.

2.5.2. The Relation between Order-of-Entry, Market Share and Profitability

The relation between order-of-entry, market share and profitability has been investigated by several researchers. Karakaya (2000, p9) revealed that ‘order-of-entry has an impact on the performance of firms including market share and profitability’. Berndt et al. (1997, p37) concluded that order-of-entry effects are very substantial for sales (revenue). Lilien and Eunsang (1990) linked turnover directly with order-of-entry. For Robinson and Fornell

(1985), order-of-entry is a major determinant of market share, too, which is supported by Szymanski and Troy (1995, p30), who found that ‘on average, order-of-entry exerts a significant and positive effect on market share’. In addition, Tellis and Golder (1996) revealed that an early market entry is relevant for market success, but that it is not the only strategy for becoming a market leader. Furthermore, Kalyanaram et al. (1995, p219) argued that order-of-entry is not related to long-term survival rates, while Cooper and Kleinschmidt (1993, p110) stated that ‘order-of-entry does have a modest impact on success’.

In addition, it has to be noted that it is not always better to have more market share, since changes in market share strongly influence costs (Comanor, 1986, p1207). This statement is supported by Boulding and Staelin (1990, p1160), who concluded that ‘companies with high market shares derive no superior market power except if they operate in environments with little buying power’. As a result, an optimum market share has to be aimed for. Consequently, more market share is not always better, as environmental factors and changes in market share most strongly influence price and costs.

2.5.3. Order-of-Entry Model

Combining the previously described factors – order-of-market entry, marketing efforts and sales (revenue) – an order-of-entry model can be derived. Several researchers have proposed a market share proportion rule (Urban et al., 1986; Berndt et al., 1997; Kalyanaram and Urban, 1992; Lean and Bond, 1977 and Golder and Tellis, 1993), stating that early market leaders have a higher market share and concluding that relative to the n^{th} product, the $(n+1)^{\text{th}}$ entrant can expect about 40% lower sales (revenue). Holding marketing mix elements constant, Table 2-3 shows that the entrant’s forecasted market share divided by the pioneer’s market share roughly equals one divided by the square root of order-of-market entry (Kalyanaram et al., 1995, p216).



Table 2-3: Market share proportion of order-of-entry and market share for consumer packaged goods and prescription anti-ulcer drugs (Kalyanaram et al., 1995, p216)

2.5.4. Early Market Entry as a Strategy

As previously established, the literature strongly suggests that the early market entrant will benefit from the pioneering advantage when introducing a new product. The resulting habit formation will consequently define the product standard within a specific market segment. The pioneer advantage can be explained using a consumer integration perspective. As a result, Kardes and Kalyanaram (1992, p356) concluded that the 'learning advantage conferred to the pioneering brand translates into more extreme and confidently held judgments of the pioneer'. Consequently, 'judgments held with conviction are persistent over time and lead to a long-run pioneering advantage' (Kardes and Kalyanaram, 1992, p356). For Brown and Lattin (1994, p1361), 'pioneering advantage is also related to a brand's length of time in the market: the longer the brand's time in market, the greater its relative share advantage'. This statement is in support of Huff and Robinson's (1994, p1376) findings, whereby 'increasing lead time tends to increase the pioneer's market share reward'.

Early market entrants not only benefit from several advantages, but also they are faced with many potential disadvantages. For Tellis and Golder (1996, p74), market pioneering is a

necessary condition for attaining first-mover advantage and is conducive to achieving a dominant market share and abnormal returns, but ‘being first to the market by itself is neither necessary nor sufficient for enduring market leadership’. Furthermore, Kerin et al.’s. (1992, p48) literature synthesis showed that the ‘belief that entry order automatically endows first-movers with immutable competitive advantages and later entrants with overwhelming disadvantages is naïve in light of conceptual and empirical evidence’. This statement is supported by Brown and Lattin, 1994, p1368), who concluded that ‘over time, some of the share advantage of the early entrant will be competed away’.

In conclusion, we can refer to Lieberman’s and Montgomery’s (1988, p54) statement that ‘pioneering carries both advantages and disadvantages’. A newcomer to the industry will not only be more likely to gain market share, but also to survive if he enters late. This is also supported by Lilien and Eunsang (1990, p580), who stated that ‘first entrants see high return if successful, but bear the risk of a lower overall likelihood of success than later entrants do’. This is supported by Lieberman and Montgomery (1988, p48), who indicated that ‘mechanisms that promote first mover advantages include proprietary learning effects, patents, pre-emption of input factors and locations, and development of buyer switching costs. Conversely, first-mover disadvantages may result from uncertainty, shifts in technology or customer needs, and various types of organisational inertia’. Consequently, the first-mover strategy has its risks (Mitchell, 1989), and research shows that ‘forty-seven percent of market pioneers fail while only eleven percent of pioneers are current market leaders’ (Golder and Tellis, 1993, p169). Furthermore, it should be noted that in the pharmaceutical industry, entry time is not under the complete control of the firm. Additional factors (e.g. the drug approval process, progress in research and development, competitors’ research progress and strategic decisions regarding market entry (see also Subhash, 2009)) also play a role in the timing of drugs entry.

In order to meet the market requirements of an early market entrant, and to ensure a successful product introduction, an innovative product and a specific marketing mix (considering product, price, promotion and place/distributional, see Trim and Hao, 2005) have to be created and pursued. As Tellis and Golder (1996) stated, innovativeness is essential for the early market entrant's success. However, this advantage will be slowly chipped away due to the diffusion of innovativeness that takes place (Greenhalgh et al., 2004). The diffusion patterns of new prescription drugs were characterised by Vakratsas and Kolarici (2008). Regarding promotion, for Cohen and Basu (1987), promotional strategies have a direct impact in the early stages of product perception and are likely to be of considerable importance. However, 'there is a lack of marketing mix effectiveness on early market adoption that suggests that the pharmaceutical market has a pre-defined need for the product and adoption considerations are most likely based on efficacy of the product' (Vakratsas and Kolarici, 2008, p291). Shankar's (1997, p290) results show that the 'shift in the pioneer's equilibrium marketing mix allocation follows changes in its relative marketing mix effectiveness'. Therefore, Vakratsas and Kolarici (2008, p290) suggest that, 'due to persistent and severe symptoms suffered by a class of patients (consumers), an early market for prescription drugs is created. This market may be formed even before the launch of the product, due to well-defined diagnosed needs of patients (consumers) forming this market'. Consequently, an early market entrant should emphasise promotional measures to ensure consumers' habit formation. Therefore, 'managers of pioneering brands should implement promotional and channel-related tactics that facilitate consumer learning' (Kardes and Kalyanaram, 1992, p355). As a result, the main task of promotion lies in building up brand name recall effects. As consumers' knowledge about the features and benefits of pioneer brands increases, the magnitude and duration of the pioneering advantage will also increase (Kardes and Kalyanaram, 1992). Thus, we can make reference to Hoch and Deighton's (1989, p16) conclusions that 'in the design of communication and promotional programs, and in

testing the effectiveness of new product concepts or advertising executions, learning must be accounted for not as something independent of marketing action, but as a process that marketing has the power to leverage in building brand attitudes and consumer loyalty'. Because of the previously described advantages, companies are aiming for an early market entry. In summary, it can be concluded that pharmaceutical promotion serves at least two functions, namely habit formation and the informational function (see also Leffler, 1981).

2.5.5. Late Market Entry as a Strategy

A late market entry strategy is a possible alternative to early market entry, even though later entrants are likely to be at a significant disadvantage in some areas (Brown and Lattin, 1994), but 'the increase of the number of years of competitive rivalry helps later entrants slowly chip away at the pioneer's market share' (Huff and Robinson, 1994, p1370). A late entrant will perform better if he waits while early entrants test the products and markets, and then will benefit from these early entrants' experience (Mitchell, 1989). In addition, late market entrants do not have the marketing costs incurred by early entrants, although they often escape the risk of product failure and gain some little benefit from earlier entrants' advertising (Mitchell, 1989).

For late entrants, there are two strategic options: (1) promoting themselves as variety enhancers and/or (2) gaining the cooperation of retailers in order to encourage side-by-side comparisons of their brands with existing market leaders (Kardes and Kalyanaram, 1992, p356). However, most of the late entrants are on a very small scale and not very innovative. As a result, the typical later market entrant does not represent a serious threat to the leading early market entrant (Robinson, 1988). Furthermore, 'order-of-market-entry tends to decrease the market response to quality' (Bowman and Gatignon, 1996, p238).

Consequently, a late market entrant has to implement an adapted marketing mix according to market requirements. Marketing mix decisions which can compensate for not being first were discussed by Comanor (1986). The disadvantage of being late can be overcome with a differentiated product strategy supported by promotions (see also Vakratsas and Kolaricis, 2008). Consequently, late entrants have to 'shout louder to be heard' (Robinson and Fornell, 1985, p316). However, Bond and Lean (1977) concluded that advertising effectiveness is a decreasing function of order-of-entry into the market. This point is supported by Bowman and Gatignon (1996, p222), who revealed that 'order-of-entry tends to decrease the market response to promotion'.

The pricing policy plays an essential role for the late entrant, too. In particular, 'later entrants are at a disadvantage in competing with price; they need to change price by a larger amount than earlier entrants to attain the same change in market share' (Bowman and Gatignon, 1996, p238). This is especially the case when a me-too strategy is applied. These results are reinforced by Hauser and Wernerfelt (1990), whose findings revealed that the more brands a consumer takes into consideration, the more price-sensitive the consumer will be. There is an apparent relation between order-of-entry, product design, promotion, pricing and sales (revenue).

In conclusion, for Lilien and Eunsang (1990, p580), the 'tactical decision of entry time is a problem of balancing the risks of premature entry with the potential missed opportunity of late entry'. For Mitchell (1989, p99), 'an industry incumbent will perform better if it waits while newcomers test the products and markets'. Therefore, practical guidelines were suggested by Lilien and Eunsang (1990, p580): (1) enter earlier when expected return is higher and (2) enter later when the market is evolving more rapidly. Furthermore, 'pioneers may be businesses with skills and resources attuned to market leadership, whereas late

entrants may be attuned to being market nichers' (Robinson and Fornell, 1985, p316). In sum, it can be stated that:

1. Innovativeness is essential for an early market entrant's success (see also Tellis and Golder, 1996).
2. Managers of pioneering brands should implement promotional and channel-related tactics that facilitate consumer learning (habit formation) (Kardes and Kalyanaram, 1992, p355).
3. Late entrants have to shout louder to be heard (Robinson and Fornell, 1985, p316).
4. Later entrants are at a disadvantage when competing with price; they need to change price by a larger amount than earlier entrants to attain the same change in market share (Bowman and Gatignon, 1996, p238).
5. The disadvantage of being late can be overcome with a differentiated product strategy (see also Vakratsas and Kolsaricis, 2008).

2.6. The Relevance of Product Mix and Pricing in Pharmaceutical Practice

'Product differentiation is an essential discriminator between winning and losing new products' (Cooper and Kleinschmidt, 1993, p108). It is therefore considered key to successful marketing (see also Kotler, 2006 and 1998; Sharp et al., 2001) and may lead to significant buyer preference between established products and the products of new entrant firms (Kotler, 2006).

For Cooper and Kleinschmidt (1993), product differentiation can be reached by branding, by differences in the design or physical quality of competing products, by the efforts of sellers to distinguish their products through packaging and innovativeness and by offering value-added services to buyers, 'designed to win the allegiance and loyalty of potential buyers' (Bain

1956, p114; see also Chen and Burgers, 2007 and Kotler, 1998). Furthermore, as previously discussed, the marketing mix design depends largely on order-of-market entry. In the product design area of pharmaceutical products, product innovativeness, efficacy, branding and qualities such as safety (including tolerability) appear to be the key success factors (Smith, 1983; Flechter, 1989; Dogramatzis, 2002).

2.6.1. The Role of Product Mix Attributes

The three most common product mix elements – innovativeness, quality and branding – applied in prescription drugs marketing, and their implications, are discussed in this paragraph.

Product innovativeness is relevant for the early market entrant's success (Tellis and Golder, 1996) and essential in order to gain unique attributes, thus influencing the price level positively. Consequently, there is an importance attached to continuous innovation within the product category (Tellis and Golder, 1996). Nevertheless, according to Cooper and Kleinschmidt (1993, p110), 'innovativeness has a modest impact on success'.

Market features conducive to pharmaceutical innovation were investigated by Cohen (2007, p214). These are: '(1) more flexibility on the part of private insurers to deviate from the national formulary; (2) speedier reimbursement appraisals, and more (3) specific funding for certain highly innovative pharmaceutical products. On the other hand, other features are detrimental to drug innovation. These include (1) direct price controls, (2) reference pricing, and a (3) centralized nature of decision-making with respect to drug reimbursement'. In this context the impact of the WTO's Trade-Related aspects of Intellectual Property Rights (TRIPs) Agreement, which makes the granting of patents for pharmaceuticals obligatory, has to be mentioned. Since previously many developing countries allowed only for limited patent protection in this area, this represents a significant change in the pharmaceutical sector.

However, as highlighted by Timmermans and Hutadjulu (2000, p1), ‘proponents believe this will lead to an increase in investment and research and development (R&D; innovativeness), yet numerous public health experts, as well as consumer groups, have expressed concern about the impact of the TRIPs Agreement on the availability and prices of drugs’.

Product quality (efficacy, safety (including tolerability) has also been shown to play an important role in pricing. Gonul et al. (2001, p90) found evidence that, in general, ‘physicians (costumers)’ price sensitivity comes second to considerations about drug efficacy and patients (consumers)’ conditions’. Consequently, if the approved product has an advantage relative to other products, its market share increases (Berndt et al., 1997).

Regarding branding, there are two fundamental strategic approaches apparent: (1) generic (usually non-branded products with chemically identical active ingredients (me-too strategy)) and/or (2) branded alternatives produced by different companies (branding strategy). In contrast, branding does influence pricing positively (Rice, 2009). The effectiveness of the me-too strategy has been questioned by Schmalensee (1982). Consequently, as stated by Kremer et al. (2008, p244), ‘the price difference makes generics more attractive than branded products, positively influencing their marketing effectiveness’. In the literature, however, ‘there is little consensus on the price elasticity of demand’ (Kremer et al., 2008, p236). Furthermore, Ellison et al. (1997, p426) also observed ‘fairly high demand elasticity between generic drug substitutes’. In conclusion it can be said that generic (me-too) and new innovative (improved) products tend to lead to price pressure on existing products (Dao, 1984; Kremer et al., 2008).

2.6.2. The Role of Pricing

The influence of pricing in the pharmaceutical sector has been investigated by several researchers. Lexchin (2009, p145) highlighted that ‘doctors (costumers) are generally ignorant

both about the relative and absolute prices of medications'. However, this statement is questioned by Rice (2009, p184), who concluded that 'HMO⁴ physicians (costumers) are more price sensitive in prescribing brand name substitutes than non-HMO physicians (costumers)'.

Furthermore, according to Rojas (2009, p133), 'there are significant differences in the prices of identical drugs across countries'. In prescription drugs markets (please refer also to Table 1), where no regulation regarding the company's pricing practice takes place (such as limitation by profit control, reference pricing regarding a competitor's price, negative lists not paid by statutory health insurance, price freezes, price cuts, general practitioners (costumers)' budgets, pharmaceutical expenditure ceilings, and generic promotion) two different pricing strategies are prevalent – a flat price strategy, where all strengths of the tablet have more or less the same price, and a monotonic price strategy, 'where the price is more or less proportionate to the strength of the tablet', as stated by Joensson (2001, p105). Lexchin (2009, p142) noted that 'when monotonic pricing is used it leads to higher expenditure whereas flat pricing results in lower expenditure and offers public drug plans more predictability in expenditure', since, regardless of the dosage prescribed, spending is the same. However, companies making scored tablets (e.g. to make pill splitting and dosing easier (Solomon, 2007)) may feel that they 'do need to use monotonic pricing since doctors (costumers) will not recognize the cost savings from splitting tablets' (Lexchin, 2009). This supports Cooper and Kleinschmidts' (1993, p109) conclusion that a 'low-price strategy is in general not effective'.

The regularly raised concern that "drugs are too expensive" was debated by Lexchin (2006).

For Lexchin, actual drug prices are justified because new medicines are (1) an effective treatment and (2) cost-effective. On the other hand, for Lexchin (2006, p545), '(1) the claim

⁴ Health Maintenance Organisation – an organisation that provides comprehensive healthcare to voluntarily enrolled individuals and families in a particular geographic area by member physicians with limited referral to outside specialists and which is financed by fixed periodic payments determined in advance (Webster, 2005).

that it costs more than \$800 million (US) to bring a new drug to market is highly debatable; (2) most new drugs do not represent any substantial therapeutic advantage over existing products; (3) the prices companies charge include the \$2.1 billion they spend promoting their medications'. However, as already mentioned by Han (2005, p150), the comments raised by Lexchin give little if any attention to the 'risks and benefits of conducting large-scale research with scarce social and economic resources'. These conclusions are similar to those of Vernon et al. (2004, p2), who predicted that an 'increase of governmental control on drug purchases will dramatically reduce both real drug prices and research and development (R&D) spending'. They estimated that real drug prices will decline by 67.5 per cent. Consequently, according to Vernon et al. (2004, p3), this will 'reduce investment in R&D and lead to a loss of life and life expectancy of a great magnitude'. Furthermore, Vernon et al. (2004, p4) stated that 'informed public policy debate should consider the trade-off between lower drug prices now and future health benefits lost because of lower R&D spending' (see also U.S. Department of Commerce, 2004).

2.7. The Relevance of Promotion in Pharmaceutical Practice

The relevance of promotion in pharmaceutical marketing has been described by Bond and Lean (1977), who found a linear function between sales (revenue) and promotion. These findings are supported by Kremer et al. (2008, p244), who showed that 'promotional expenditure have a significant and positive effect on sales in pharmaceutical markets'. However, this has also been questioned by Kremer et al. (2008, p235), who concluded that the 'main conclusion from studies on the product and disease category levels is that the effectiveness of promotional instruments remains unclear'. The conclusion of the heterogeneity of promotional expenditure effects is also supported by several researchers (Leeflang and Wieringa, 2008; Manchanda et al., 2005; Parsons and Abeele, 1981;

Venkataraman and Stremersch, 2007; Wittink, 2003). Furthermore, Kremer et al. (2008, p244) did not find 'significant promotional elasticity differences between branded and generic products'. Some of these variations might be explained by the fact that personal selling primarily affects product share positively (Kremer et al., 2008, p244), while 'DTC instruments have a positive effect on both product share and disease category sales (revenue)' (Narayanan et al., 2004, p91).

The influence of promotion on pricing has been investigated by several researchers. Rizzo (1999, p112) provided evidence that 'product promotion inhibits price competition in the pharmaceutical industry, lowering price elasticities and leading to higher equilibrium prices'. Narayanan et al. (2004, p104) found 'significant interaction effects between price and promotional expenditure, and quantify the impact of these interactions on personal selling, direct-to-consumer advertising and return on investment'. Rizzo (1999, p89) concluded that 'personal selling efforts systematically lower price sensitivity. As a result, it is likely that consumers pay higher prices as a result of the advertising that occurs in the industry'.

In addition, another aspect to be considered is the informational content of promotion and its role in prescription behaviour. Azoulay (2002, p551) revealed that 'product market competition in the pharmaceutical industry is shaped by both advertising rivalries and scientific rivalries'. A similar conclusion was made by Avorn et al. (1982), who performed a survey of actual prescribing practices. They revealed that physicians (costumers) were more influenced by scientific rather than commercial information sources. Furthermore, Azoulay (2002, p551) found evidence that in 'prescription-drug markets both advertising and scientific information stemming from clinical trials can influence physicians (costumers)' prescription choices'. However, Schwartz et al. (1989, p281) revealed that 'physicians (costumers) also sometimes prescribed drugs at a rate far greater than that warranted by scientific evidence of their effectiveness'. Nevertheless, Roth et al. (2004) raised concerns about the validity of

scientific information as an information source because of apparent cases of data suppression or manipulation.

2.7.1. Promotional Marketing Policies

In pharmaceutical prescription drugs marketing, promotional marketing instruments can be divided into two main groups: (1) direct-to-consumer (DTC) and (2) direct-to-prescriber (DTP) promotion.

Direct-to-consumer (DTC) promotion is the direct appeal to end consumers (users) by the pharmaceutical company. In DTC promotion, drug companies target prescription drugs directly at the public. This approach is based on the idea ‘that mass media marketing motivates patients (consumers) to visit their physicians (costumers) for previously untreated conditions’ (Donohue and Berndt, 2004, p123; see also Findlay, 2002; National Consumers League, 2006; Shaw, 2008). In addition, research also suggests that direct-to-consumer marketing messages serve as discussion starters between doctors (costumers) and patients (consumers) to a greater extent than they stimulate actual patient (consumer) demand for a particular treatment (White et al., 2004). According to Hunt (1998, p2), ‘patients (consumers) often initiate conversations with their physicians (costumers) about promoted medications and even ask for them. In jurisdictions where it is allowed, direct-to-consumer promotion has proved highly successful in stimulating consumer demand for prescription drugs’. In contrast, for Iizuka and Jin (2002, p2), DTC marketing has no effect on physicians (costumers)’ choice of prescription, but ‘may facilitate the communication between patients (consumers) and physicians (costumers)’. These findings are also underlined by Iizukas’ (2002) and Donohue and Berndt’s (2004) results, in that direct-to-consumer promotion leads to a large increase in the number of outpatient (consumer) drug visits (see also Chen, 2007), i.e. ‘a moderate increase in the time spent with physicians (costumers), but no effect on physicians

(costumers)' specific choice among prescription drugs within the therapeutic class' (Iizuka and Jin, 2002, p1). Most studies agree that "disease awareness" or "drug awareness" promotions lead to increases in consultations for targeted conditions. It is argued that 'direct-to-consumer information about pharmaceutical products serves an unmet patient (consumer) need' (Wong-Rieger, 2009, p130), and it is stated that, through promotion, 'drug companies can enable patients (consumers) to make better informed choices about their health and treatment' (Mintzes, 2002, p908). On the other hand, 'critics have argued that healthy patients (consumers) seeking physician (costumer) advice are a waste of healthcare resources; however, there is scant evidence that these consultations are inappropriate' (Wong-Rieger, 2009, p130). Therefore, it is concluded by Wong-Rieger (2009, p130) that 'promotions do not lead to patients (consumers) getting inappropriate medications'.

Nevertheless, in the literature, several researchers have raised their concerns regarding direct-to-consumer promotion. Barbara Mintzes (2002, p908) argued that 'direct-to-consumer (DTC) promotion risks medicalising normal human conditions, with the drug companies raking in increasingly healthy profits'. Mintzes (2002, p909) justified this by citing that 'more than \$2.5bn (£1.8bn; €2.9bn) were spent on direct-to-consumer marketing in the United States in 2001', and concludes that 'the cumulative message may be stronger than any individual campaign'. Furthermore, Mintzes et al.'s (2003) results suggest that more marketing leads to more requests for promoted medicines – and more prescriptions. Consequently, it can be established that 'if direct-to-consumer promotion opens a conversation between patients (consumers) and physicians (costumers), that conversation is highly likely to end with a prescription, often despite physician (costumer) ambivalence about treatment choice' (Mintzes et al., 2003, p405). For Kalyanaram (2009), there is a positive and significant effect attributed to DTC and market share.

In conclusion, Narayanan et al.'s (2004, p104) findings reveal that 'direct-to-consumer marketing has a significant positive effect on both brand share and category sales (revenue)'. The effects of direct-to-consumer communication in the US market were measured by White et al. (2004) in an empirical study. White found that consumers valued physicians (costumers)' opinions most (77%), followed by friends (57%), pharmacists (53%), nurses (48%), brochures (47%), magazine articles (42%), medical journals (38%) and newspaper articles (33%).

Furthermore, it has to be noted that, in healthcare, 'manufacturers are legally prohibited from communicating directly with their end customer [with the exception of New Zealand and the United States]' (Stremersch, 2009, p5), so there is emphasis on other promotional activities (Rod et al., 2007).

The Role of Direct-to-Prescriber (DTP) Promotion – Marketing efforts, typically directed toward physicians (costumers) by pharmaceutical companies, are defined as direct-to-prescriber promotion (Manchanda and Honka, 2005). Kremer et al. (2008, p239) classified 'three DTP subgroups: personal selling, advertising, and other (including physician (costumer) meetings and events, direct mails and sampling)'. Furthermore, Kremer et al. (2008, p244) found that the 'effects of the promotional instruments vary considerably across disease categories. For most disease categories, the average predicted DTP elasticities are substantially higher than the average predicted direct-to-consumer elasticity. However, the effectiveness of DTP instruments depends on the disease category'. A DTP advertising model is proposed by Lim and Kirikoshi (2008).

2.7.2. The Role of Promotional Marketing Instruments

For both promotional marketing policies – direct-to-consumer (DTC) and direct-to-prescriber (DTP) – marketing instruments such as word-of-mouth, information, personal selling, advertising and sampling can be applied.

The Role of Word-of-Mouth – The effectiveness of promotional actions can be improved by an actively supported distribution of positive messages via word-of-mouth. This approach is especially essential in pharmaceutical marketing, as the ‘impact of company marketing is significantly enhanced by the effect that occurs when physicians (costumers) first prescribing the product find it satisfactory and recommend it to their colleagues’ (Lilien et al., 1981, p494). In addition, it has been highlighted by Jaakkola and Renko (2007, p342) that ‘marketers of new pharmaceuticals should also not underestimate the importance of gaining publicity and positive word-of-mouth among patients (consumers). New product acceptability in the pharmaceutical market may be strongly influenced by lay consumers, and that perceived complexity may overrule performance advantages even among professionals’. However, as by Cooley (2009, p46) stated, ‘consumers no longer depend on subjective sources such as word-of-mouth, but also look at objective internet sources’. Goetzinger et al. (2007, p128) also surmised that the ‘search for online health-related information has become increasingly popular’. Consequently, it is evident that the level of influence is influenced by word-of-mouth and information sources.

The Role of Personal Selling – As previously stated, personal selling is a vital marketing instrument for promoting prescription drugs. This statement is supported by Mizik and Jacobson (2004, p1704), who found evidence that ‘personal selling has positive and statistically significant effects on the number of new prescriptions issued by a physician (costumer)’. For Kremer et al. (2008) and Manchanda (2005), personal selling is the most important promotional marketing instrument, too. Lurie et al. (1990, p240) also highlighted

that ‘changes in purchase practices were reported at least once by 25% of faculty and 32% of residents based on salesperson contacts’. The personal selling impact was also empirically explored by Narayanan et al. (2004), who revealed that personal selling can positively affect brand share. Consequently, according to Manchanda and Chintagunta (2004, p131), ‘personal selling has a positive and significant impact on the number of prescriptions written by a doctor (costumer)’, although on the other hand, as further stated by Manchanda and Chintagunta (2004, p143), ‘too much personal selling can dissuade a physician (costumer) from prescribing a drug’. This means that over-promotion (in this case personal selling) can influence sales (revenue) negatively. However, if an over-promotion (personal selling) does not take place, there is strong evidence of correlation between sales (revenue) and numbers of sales representatives, as determined by Rod et al. (2007). Furthermore, Gonul et al. (2001, p90) found evidence that the ‘informative value of personal selling makes physicians (costumers) aware of new drug alternatives and their specifics and prices, as well as supporting the idea that personal selling has a positive effect only up to a point, after which excessive personal selling becomes counteractive’. Consequently, based on a McKinsey report, Elling et al. (2002) questioned in general the effectiveness of the current salesperson system. For Mizik and Jacobson (2004, p1714), the ‘effect of salesforce activity on prescribing behaviour is also modest. Therefore, drug companies’ profits might be enhanced through a reduction in pharmaceutical sales representative numbers, combined with an increase in effectiveness of individual representatives’. This is supported by the fact that several drug companies have – though with only moderate success – attempted to increase their sales (revenue) by increasing the number of sales representatives, in spite of the number of medical practices having remained comparatively constant (Breuer et al., 2003). Consequently, we can ask the following question: Do prescription pharmaceutical sales people really sell anything, or do they just promote pills? According to an American Court of

Appeal ruling, their work is not “sales” in the traditional sense (they do not take orders) (Edwards, 2010).

The Role of Personal Selling in Direct-to-Consumer (DTC) Advertising – According to Kremer et al. (2008, p239), there is ‘evidence that sales are most strongly affected by personal selling, followed by journal pages of advertising, and are least affected by direct-to consumer advertising’. Nevertheless, in addition to the evidence provided by common practice in the industry, earlier studies such as Narayanan et al. (2004) and Rod et al. (2007) suggested that there are synergies between the promotional interactions of DTC and personal selling. Furthermore, Chen (2007) pointed out that patients (consumers) are likely to visit physicians (costumers) in response to DTC. Therefore, it can be argued that it is beneficial to support the marketing activities of personal selling by direct-to-consumer advertising. As a result, for Vakratsas and Kolsarici (2008, p291), ‘less spending on physician (costumer) journal advertising may lead to less information communicated to physicians (costumers) and thus lower awareness of potential treatments. Therefore, underestimating physician (costumer) journal advertising may prompt a decision to underfund this marketing activity, resulting in fewer prescriptions’. Donohue and Berndt (2004) stated that direct-to-consumer advertising appears to affect whether or not someone receives medication of a given therapeutic benefit, whereas personal selling affects which particular medication they receive. This premise is supported by Narayanan et al. (2004), who stated that a feature of direct-to-consumer advertising shows that it is less ‘targeted’ than personal selling, whereas personal selling activity ensures that the target physician (costumer) is appropriately informed. Rosenthal et al. (2002) concluded that direct-to-consumer advertising is an important, but not the primary, driver of immediate growth. However, compared to the effects of DTP (direct-to-prescriber), the direct effect of direct-to-consumer advertising remains relatively small, at least for most disease categories.

Factors of Personal Selling Effectiveness – The results provided by Churchill et al. (1985, p113) indicated that the ‘strength of the relationship between the major determinants of sales effectiveness (as discussed above) and salespeople’s actual performance is influenced by the type of products salespeople sell’. The most important criteria that characterise a successful relationship between a salesperson and a customer were described by Saxe and Weitz (1982) in their 1982 study, in which they developed the 24-item SOCO (Sales Orientation-Customer Orientation) scale. In a later study, Gillis et al. (1998) described the six components that are measured by the SOCO scale. Looking at the individual salesperson in more detail, it is generally considered that there are specific personal attributes that are considered important. Parsons and Abeele (1981) measured the sales response of an established ethical drug to sales visits. They proposed twelve fundamental salesperson variables, in order for a salesperson to be considered “good”. Furthermore, Jaffe (2000) proposed seven (admittedly somewhat self-evident) tactics to add power when dealing with physicians (customers). He also advised building coalitions involving physicians (customers); however, given that personal selling is by far the most expensive element of promotion, Gonul et al. (2001, p89) concluded that the ‘scope of personal selling should be carefully scheduled in terms of frequency, length of visits, and number of free samples given away to optimize the company’s effectiveness of direct promotion efforts and expenses’.

The Role of Personal Selling in Direct-to-Prescriber (DTP) Advertising – It is considered that the individual characteristics of the sales representatives and their relationship with the prescriber are key criteria. This statement is supported by Ambady and Krabbenhoft (2006), who investigated the relevance of a customer’s perception of a salesperson to their sales (revenue) success. This research has clearly shown that there is a strong relation between the customer perception of a salesperson and sales effectiveness. This is also supported by Hill (1999), who stated that the major determinant of the drug chosen by the physician (customer) is the relationship between the salesperson and physician (customer). The interaction between

salesperson and prescriber was also examined by Andaleeb and Tallman (1996, p79), who found that ‘physicians (costumers) viewed the field salesforce as a relevant source of information, but felt that they could also get the necessary information from other sources. Physicians (costumers) also had friendly relations with sales representatives and did not distrust them, but they did not view sales people as a vital part of their practice. Furthermore, the selling approach was not thought to be perceived negatively by the medical community, nor was the field salesforce considered as manipulative’. However, Gillis et al. (1998, p105) found that ‘general practitioners (costumers) perceived salespeople to be preoccupied with their own professional needs’.

The Role of Sampling – The efficiency of personal selling can be enhanced through product sampling. Gonul et al. (2001) found evidence that sampling (provision of drugs at no costs) positively affects prescription probability. Hauser and Wernerfelt (1990) concluded that it has to be taken into account that money-off deals and hand samples make a brand easier to try, and therefore decreases the cost of evaluative search. However, samples and gifts were not viewed as essential for gaining access to physicians (costumers) (Andaleeb and Tallman, 1996). Nevertheless, it can be posited that sales (revenue) are influenced by sampling.

2.8. Summary of the Systematic Literature Review

The relevant criteria and their sub-criteria (please refer to Paragraph 2.3.) were analysed, summarised and categorised according to Bain’s (1956) order-of-entry model and McCarthy’s and Perreault’s (1960) classical “4Ps” concept. For this purpose, a hierarchically structured framework containing three groups – marketing categories variables and attributes – was set up and the five main marketing categories of strategy, product, price, place and promotion were defined, each containing a group of variables. The inherent characteristics of variables are described by attributes. In a second step, the keywords of each statement were then

indicated and categorised according to the five marketing categories. In a third step, the previously indicated keywords were classified according to their categorical property as a variable or attribute. Within the two marketing category and variable classification schemes, the criteria were also ranked according to their importance in the literature. For this purpose, the numbers of criteria were counted within the 170 citations (see Table 2-1, step 10) highlighted as being relevant. These criteria were then ranked within each category (order-of-entry, marketing mix [product, place (distribution)], promotion, price) according to the number of citations (n.) (see also Glitz, 1997). Table 2-4 presents an overview of the results of the systematic literature review.

Marketing Categories	n.	Variables	n.	Attributes
Order of Market Entry	93	Market Share	37	Sales
				Physician
				Patient
				Market Leader
		Early Entry	30	Habit Formation
		Late Entry	26	
Product	16	Innovativeness	14	
		Quality	13	
		Branding	17	
		Packaging	1	
Place (Distribution)	5			
Promotion	97	Personal Selling	34	Perception
				SOCO
		Advertising	26	DTC
				DTP
		Sampling	7	
		Word-of-Mouth	4	
Price	25			

n. shows number of times being mentioned

Table 2-4: Marketing relevance of marketing factors

Marketing theory would suggest that all of the four Ps (Product, Promotion, Place and Price) are essential in marketing (Kotler, 2006). However, based on Table 2-4, the first major finding of the present study is that, in pharmaceutical marketing, promotion as a marketing instrument appears to be considerably more relevant than price, product or place. It was found that promotion policy is considerably more mentioned in literature (times being mentioned:

97), as it is followed by price (times being mentioned: 25), product (times being mentioned: 16) and place (times being mentioned: 5). It should be noted that because of the partly multiple meanings of the initially 170 indicated citations, the total number in Table 6 appears to be higher. So far, an overview of marketing mix elements and instruments has been given. However, because of the apparent differences between the various markets (see Table 1-2), the adequate marketing mix proportion has to be defined.

In total, 21 relevant marketing criteria and their sub-criteria (see Table 2-4) have been indicated by the systematic literature review as being important. In addition, some interesting insights into pharmaceutical marketing were revealed. These findings were structured on the basis of the order-of-market entry model (Bain, 1956) and the fundamental conceptual marketing model (see also Kotler, 2006), thus integrating existing knowledge from the pharmaceutical marketing and psychology genres, amongst others.

2.8.1. Factors guiding Order-of-Entry

As the previous section described (see 2.6.1.), order-of-market entry is a fundamental theoretical concept within pharmaceutical marketing. A company's decision whether to enter a market as a first, early or late entrant is guided by three relevant parameters. First, the status and progress of a medical drug is driven basically by governmental authority approval and is dependent on the company's medical drug research. Second, order-of-market entry is also dependent on competitors' status and progress in research and their own strategic decisions regarding market entry (see also Subhash, 2009). Finally, for early entrants to enjoy success, innovativeness is an essential factor (Tellis and Golder, 1996) but has a 'modest impact on success' (Cooper and Kleinschmidt, 1993, p110).

2.8.2. Order-of-Entry defining Marketing Instruments

‘Product differentiation is an essential discriminator between winning and losing new products’ (Cooper and Kleinschmidt, 1993, p108). This can be reached by adapting product mix attributes adequately (Kotler, 1998). A product policy is guided by the order-of-market entry decision (Vakratsas and Kolsaricis, 2008), as the product market standard is set by the first entrant (Lieberman and Montgomery, 1988). Furthermore, ‘the market response to quality is decreased by order-of-market entry’ (Bowman and Gatignon, 1996, p238).

For Bowman and Gatignon (1996, p238), ‘later entrants are at a disadvantage in competing with price; they need to change price by a larger amount than earlier entrants to attain the same change in market share’. This is also in line with Daos’ (1984) conclusion that innovative new products lead to price pressure on existing products.

Based on Kardes and Kalyanaram’s (1992) and Comanor and Wilson’s (1979) findings, there is a lack of marketing mix effectiveness (Vakratsas and Kolsaricis, 2008) as a decreasing function of order-of-market entry (Bond and Lean, 1979; Bowman and Gatignon, 1996). This results in the need for market formation (Vakratsas and Kolsaricis, 2008). Therefore, it is suggested that companies entering a market late have to employ intense marketing efforts and have to ‘shout louder to be heard’ (Robinson and Fornell, 1985, p316). On the other hand, only later entrants can benefit from the early entrants’ marketing efforts (Mitchell, 1989).

Furthermore, Kardes and Kalyanaram (1992, p355) proposed that ‘promotional and channel-related tactics which facilitate consumer learning (habit formation) should be implemented’.

In summary it can be said that there are two trends apparent in this instance: (1) Early entrants have to invest in promotion in order to prepare the market and (2) late entrants have to invest in promotion ‘in order to be heard’.

2.8.3. Marketing Instruments leading to Sales

As previously described (see Paragraph 2.9.2), product differentiation, as an essential discriminator, is considered key to successful marketing (see also Cooper and Kleinschmidt, 1993; Kotler, 2006 and 1998; Sharp et al., 2001), resulting in higher product sales (revenue). Lexchin (2009, p145) revealed that ‘doctors (costumers) are generally ignorant both about the relative and absolute prices of medications’. However, this statement was questioned by Rice (2009, p184), who concluded that ‘HMO (Health Maintenance Organisation; a group of physicians (costumers) that has an agreement with health insurance(s) and provides care for a previously fixed fee) physicians (costumers) are more price-sensitive in prescribing brand name substitutes than non-HMO physicians (costumers)’. Furthermore, it is posited by several researchers (Bond and Lean, 1977; Kremer et al., 2008, p244) that ‘promotional expenditure have a significant and positive effect on sales (revenue) in pharmaceutical markets’. Furthermore, Gonul et al. (2001) and Hauser and Wernerfelt (1990) find evidence that personal selling and advertising (Kremer et al., 2008) positively affect prescription probability. It should be noted that place (distribution), as a marketing instrument, does not appear to play an essential important role in marketing success, according to some researchers (Cooper and Kleinschmidt, 1993; Ghosh et al., 1983; Smith, 1983).

2.9. Conclusions of the Systematic Literature Review

This chapter has provided an assessment of theory relevant to “physician-targeting” problem situations. A wide range of existing literature sources was tapped in order to develop insights into this issue. In other words, the literature was used to identify the underlying traits or styles of “physician-targeting”. An analysis of the “order-of-market entry” theory demonstrated that a) managers of pioneering brands should implement promotional and channel-related tactics that facilitate consumer learning (habit formation), b) late entrants have to shout louder to be

heard within the market and c) later entrants are at a disadvantage when competing on price, so they need to change the price by a larger amount than earlier entrants to attain the same change in market share.

Many concepts and marketing instruments are described in the literature. Research is usually performed from a narrow perspective focusing on a few interactions and phenomena.

However, not much work has been done so far (see Raisch, 1996, Singh, 2008) to combine all of these research efforts into an overall picture, to investigate the influence of these instruments on sales (revenue) or to provide a generally usable model for marketing managers.

This systematic literature review faced a major obstacle, as most of the available studies investigated the variation of marketing mix variables in the less regulated US market (Berndt et al., 1997; Berndt et al., 2002; Berndt et al., 2003; Bowman and Gatignon, 1996; Bond and Lean, 1977; Golder and Tellis, 1993; Lieberman and Montgomery, 1988; Lilien and Eunsang, 1990; Moore et al., 1991; Robinson and Fornell, 1985; Tellis and Golder, 1996; Urban et al., 1986; Vernon, 1971). So far, no research has been found regarding this particular country. As a result, there is a need for research on “physician-targeting” models in specific market environments, which supports Steenkamp’s (2005) suggestion that targeted research is required within the marketing research area. Therefore, let us ‘move out of the US silo’ (Steenkamp, 2005, p6).

The aim of this chapter was to delineate the dimensionality of pharmaceutical marketing instruments used when physicians (costumers) are targeted. This “physician-targeting” framework was derived from both marketing and psychology literature. Next, it is essential to gain more specific insights into “physician-targeting” and it needs to be examined in light of field data. The following chapter investigates the “physician-targeting” process from a

practical perspective, in order to validate this concept in the focus of the state-controlled market Swiss pharmaceutical market, to identify the most relevant marketing factors and to examine existing theories (please refer also to Paragraph 1.1.5).

3. The Relevance of Marketing Activities in the Swiss Prescription Drugs Market: A Qualitative Focus Group Study

3.1. Situation of Swiss Pharmaceutical Market and its Impact on actual Research

It has been in the first chapter highlighted that the Swiss prescription pharmaceutical market, as a state controlled market, has several peculiarities different to other pharmaceutical markets making it relevant for the present research. These peculiarities are briefly summarised below.

First of all, pharmaceutical companies benefit from a protected market that indicates the presence of a market failure. Prescription medical drugs have to be approved by a governmental body (Swissmedic) in a first place. Furthermore, it can be assumed that not a big differentiation regarding to the product property issues such as quality takes place. Consequently, there is only room for a product differentiation in terms of ‘packaging’ and ‘branding’. The approval of pharmaceutical substances is a long and time consuming process, inhibiting parallel imports of other alternative and/or cheaper medical drugs, reducing the competitive pressure. This is similar to the US market where the medical drug approval is given by the US Food and Drug Administration (FDA). In contrast to the US market, a ban on parallel imports is implemented in Switzerland.

Furthermore, pricing plays an important role as well. In Switzerland, the prices are set by the Swiss Agency for Therapeutic Products (Swissmedic). Despite of this, pharmaceutical companies may actively influence the price level via lobbying by attempting to influence

decisions made by officials in the government. Nevertheless, the market does not appear to be very price sensitive as the patients (consumers) as well as the prescribers (costumers) are not those that have to pay for it (it is normally the health insurances). Furthermore, there is a motivation to prescribe more expensive drugs, as self dispensing physician have a financial benefit and the patients have the perception of receiving a medical drug with higher quality (efficacy and less side effects). This fact leads to the conclusion that the prescribers (costumers) are the final decision makers and consequently the most important 'factor' of the market system. This is different to the US market and indicates a market failure too.

There are also differences regarding to the promotional marketing activities that can be employed in Switzerland in comparison to the US market. There is a ban for direct-to-consumer (DTC) promotional activities in Switzerland. However, some companies have found ways to conduct indirect, legally accepted, direct-to-consumer (DTC) promotion such as 'news articles publication' and/or 'health television programs sponsorship'. On the other hand, the practice of direct-to-physicians (DTP) promotion is legally accepted and conducted by employing 'sales personal', 'mailings' and 'advertising' measures (ads and articles in specific medical doctors directed outlets/publications, brochures, etc.).

Regarding the distributional (place) marketing activities, there is a limitation of distributional channels present and therefore no differentiations in the distributional policy can be made by pharmaceutical companies. The internet as a sales channel (online pharmacies) does not play a role in Switzerland.

In conclusion it can be said that the Swiss prescription pharmaceutical market is a highly interesting market to be investigated from a practical (managerial) as well as theoretical perspective. This is especially the case because of the fact that the relevance and relationship of marketing factors can be separately investigated using marketing factors that are not

applied or altered in the Swiss prescription pharmaceuticals market as control variables. This fact differentiates the present research to the research conducted in US market.

3.2. Introduction

Although the conclusions drawn by the systematic literature review (Chapter 2) have been evidenced and supported by the United States of America's scientific literature, they mainly analyse the free (unregulated) US prescription pharmaceutical market. Most of this research has not addressed the different aspects of regulated markets. For instance, the regulated Swiss prescription pharmaceutical market is unlike the unregulated US prescription pharmaceutical market and some other countries that are operating similarly to the non-US approach.

Therefore, in order to gather additional scientific knowledge that will enable the development of theories applicable to non-US markets, a qualitative research was conducted.

For this purpose, a two-stage empirical qualitative approach was employed. The first stage was a focus group study and the second stage a Delphi group study. In this chapter, the focus group study is presented. The Delphi group study is presented in the next chapter. These two studies aimed to generate some insights into the importance and impact of marketing instruments for the following main reasons. First of all, it was necessary to utilise qualitative fieldwork in order to determine whether or not the constructs suggested by previous research (see Chapter 2) were actually relevant within a regulated prescription pharmaceutical environment. Secondly, qualitative fieldwork (Chapters 3 and 4) was required in order to more fully explicate the constructs which were suggested by the literature, to thus add depth and richness. The analysed data gathered from the qualitative focus and Delphi group studies (see Chapters 3 and 4) and the tentative constructs emerging from the literature-based explication approach described in Chapter 2 were analysed in light of qualitative data (see

Chapter 4) in order to provide a robust delineation of the constructs of interest regarding “physician-targeting”.

Thus, the present chapter begins with a discussion of the overall methodology utilised to collect and analyse the qualitative data. Following that, the methodology of the focus group study is described, the results are presented, a summary is offered, a prescription decision process model is proposed and the most relevant marketing factors are derived.

3.3. Focus Group Study

3.3.1. Introduction

The focus group element of the present study attempts to assess marketing tools in Switzerland, highlighted by a group of participants working in the field of pharmaceuticals. In this paragraph, the previously derived propositions of the systematic literature review are evaluated and advanced. The provided interpretations are based on the focus group results (see Table 3-1) and the systematic literature review findings (see Table 2-4).

In social and behavioural sciences, qualitative research methods deal with understanding things rather than quantitatively measuring them (Gordon and Langmaid, 1988), and they usually involve some type of interview with people (Bortz and Doering, 2006). Furthermore, as emphasised by Glitz (1997, p387), ‘they can offer additional clues about beliefs and attitudes. Quantitative study methods are normally based on retrospective data material (e.g. collected market data) and structured questionnaires’. Quantitative methods are therefore less likely to yield any new findings or different views. On the other hand, these research methods have a larger sample size and are therefore statistically more robust. In addition, study participants are normally not ready to invest more than 10 to 30 minutes of their time for study participation. As a result, the informational content will be limited. In contrast,

qualitative methods in general have longer interview times and therefore gather more in-depth information. This methodology has been described by several authors (see also Lee and Lings, 2008; Morgan, 1988).

In health services research, qualitative research methods, especially focus groups, are becoming increasingly prominent and their value has been more widely acknowledged (for methodology see also Krueger, 1994; Merton et al., 1956; Smith, 1998; Wilkinson, 1998). In addition, Smith (1998, p229) stated that ‘there has been increasing interest in the application of focus groups in pharmacy practice and health services research’. Furthermore, ‘even when the reliability and validity of the data cannot be measured in the same way as for quantitative findings, qualitative data are credible, if careful procedures are applied’ (Glitz, 1997, p387).

3.3.2. Research Procedures and Settings

For the focus group discussion, a set of research questions was developed, ensuring that the stated research objectives in Chapter 1 were covered. For this purpose, a brainstorming session was performed by the focus group facilitator and the monitor team. This brainstorming resulted in a set of questions, which enabled the conceptualisation of the dimensionality of pharmaceutical marketing instruments and clarified the influence of pharmaceutical marketing instruments on “physician-targeting” leading to an increase in sales (revenue). Furthermore, it was ensured that the aspect of order-of-market entry (Bond and Lean, 1977) and all 4Ps were covered (Kotler, 2006). In addition, the clear wording of the questions was ensured and words were selected that avoided biasing the respondents (Schmidt and Hollensen, 2006). As a result, a set of nine open-ended, non-standardised questions was developed. The questions were ordered regarding their topic, starting with general marketing, product, price and promotion, and then they were piloted on a small sample of three marketing academic experts at the Zurich University of Applied Sciences in Winterthur,

Switzerland. Based on the outcome of the pilot study, which did not require any further modifications to the questions for the main focus group study, the following set of questions was agreed to address the research objectives:

- Question [Q₁]: What is the procedure when purchasing prescription drugs?
- Question [Q₂]: What are the most efficient sales methods for prescription drugs?
- Question [Q₃]: What are the criteria when appointments are given to sales reps?
- Question [Q₄]: What methods are applied in prescription drug sales?
- Question [Q₅]: Which criteria are applied when choosing a pharmaceutical product?
- Question [Q₆]: Which product would you choose if you had a choice between two similar products from a well-known and an unknown producer?
- Question [Q₇]: What is the influence of price on the purchase decision?
- Question [Q₈]: What is the salesperson's influence on the physician (customer)'s decision?
- Question [Q₉]: How do you gather product information? What are the most important sources?

In the next step, a requirement profile for the focus group participants was set up. As described in Chapter 2, different interest groups are involved in the prescription drugs market (see also Kocher, 2007). According to Kuehn and Patric's (2003) market system model (see Figure 1-5 and Appendix 1), the relevant interest groups are producers, opinion leaders, pharmacists (sellers), wholesalers, physicians (customers), insurers and patients (consumers). As already shown in Chapter 2, the most important group relevant for physician-targeted sales are producers, physicians (customers) and pharmacists. Because of this, it was envisaged to

set up a focus group with the parties involved on the sales and purchase sides. Furthermore, another criterion was seniority (years of experience, level of involvement, level of position, educational background) in order to ensure the participants' depth of knowledge.

It is the nature of focus group discussions that a small sample size of participants (experts) is employed in order to gather more in-depth information. Consequently, there is a natural upper size limit when doing a group interview. This typically can include 'up to ten experts who have some knowledge of/or experience with the topic under discussion' (Glitz, 1997, p386). In order to limit the total length of the interview time, to ensure that sufficient in-depth information can be gathered and because of the complexity of the topic (e.g. Morgan, 1998), the focus group size was limited to a maximum of five participants.

The facilitator and monitor team indicated via personal contacts the potential candidates fulfilling the requirement profile. These potential candidates were then contacted via mail, providing general information about the study's aim, procedure, location, the assurance of anonymity and required time (two hours) in the first instance, and if no answer was received within a week, via telephone. All approached candidates agreed to participate, but a suitable date and time had to be found. All participants also agreed to the recording of the focus group through email confirmation. No financial compensation was offered. According to the requirement profile, a well-balanced mix of highly experienced individuals could be appointed.

- SA – This candidate, involved on the pharmaceutical sales side, is a former head of marketing and sales for a leading Swiss global pharmaceutical company, management board member and chief executive officer of two Swiss OTC companies in the Basel area today. Based on the long experience in high level positions, SA will provide interesting information from a producer's perspective, as well as marketing and sales approaches.

- BB – This candidate, involved on the pharmaceutical purchase side, holding a PhD, is a specialist for internal medicine FMH based in Zurich. BB will contribute to the focus group regarding his long practical experience in dealing with pharmaceutical sales people and marketing campaigns, and BB can provide information about existing needs and concerns from the prescriber (costumer)’s perspective.
- SC – This candidate, involved in the sales side, holds a position as an independent consultant for a supply chain and commercial service management company, mainly involved in projects for a leading American global pharmaceutical company based in Switzerland. Not being directly involved in the sales process, but in charge of process design and management, SC will contribute to the focus group from a distant and professional perspective.
- BD – This candidate, involved in the purchase side, holding a PhD, is a psychiatrist, a lecturer at Zurich University, author and board member of the Swiss agency for the authorisation and supervision of therapeutic products (Swissmedic). BD will contribute to the focus group regarding their long practical experience in dealing with pharmaceutical sales people and marketing campaigns, and he can provide information about existing needs and concerns from the prescriber (costumer)’s perspective. As a psychiatrist and an academic, it is likely that might have a different view than his colleague BB.
- BE – This candidate, involved on the pharmaceutical purchase side, is a pharmacist and owner of a pharmacy located in Zurich. BE will contribute to the focus group regarding the long practical experience in dealing with pharmaceutical sales people and marketing campaigns, and can provide information about existing needs and concerns from the pharmacist’s perspective.

The focus group discussion took place in a meeting room, centrally located near the Enge train station in Zurich, Switzerland, which was provided without charge by an advocacy firm. These facilities were prepared before hand, and a video projector and tape recorder with a microphone were installed and tested. In order to accommodate the participants' full-time job commitments, the start was set for four o'clock in the afternoon and took place for two hours. The participants were personally welcomed by the facilitator on their arrival and guided to the meeting room. No seating order was given, drinking water was provided and a brief introduction of the participants took place.

The focus group was then briefed by the facilitator, a presentation was made about conducting the research and to explain the research objectives and the procedure of the discussion was given. An agreement on confidentiality, impartiality and that all opinions within the group were welcomed was made. The facilitator led the group through a discussion of the series of nine prepared questions, making sure everyone responded and was probed for detail when necessary, and encouraged group interaction, while keeping discussions focused on the topic. These questions were open in format in order to give the participants as much freedom as possible when answering. Each participant was also asked to engage in individual brainstorming, so as to generate as many ideas as possible for dealing with the issue. These questions were presented to the participants on the video projector. A short break of five minutes was given in the middle of the interview, following the end of the discussion on the third question. The discussion was tape-recorded and the main statements were noted by the study assistant. After the focus group discussion, a small chocolate box was given to the participants and information was given about the further process of this study. The participants were also informed that the results would be submitted to them within a few months' time. In addition, each participant answered a few questions about their professional and personal characteristics.

After the focus group session, all the notes were compiled and the tapes were transcribed verbatim by the facilitator, including the starting time shown on the counter of the tape recorder, on word processing software. Because of the clear differences between the participants' voices, they could be easily distinguished. This manuscript was then proofread for typing mistakes and translated from German into English. However, although the translation was performed as carefully as possible and proofread by a professional in order to minimise possible misinterpretations, it had to be taken into account that the meaning could have been slightly altered. In particular, the translated comments could appear more formal than the meaning of the statements, due to language characteristics. The adequacy of translations in cross-cultural research has been discussed by several authors (Lee and Lings, 2008; Craig and Douglas, 2005). As stated by Lee and Lings (2008), there are at least some common attitudinal or behavioural factors across cultures. In the present study, most of the participants, because of their professional international activities, are familiar with the English cultural background. Nonetheless, the translated statements may appear to a native English speaker to be quite formal (the complete transcript can be viewed in Appendix 3).

3.3.3. Focus Group Findings and Analysis

In the first step, the content of the transcript was coded regarding "pharmaceutical marketing strategy", "product", "price" and "promotion". In a second step, the indicated text fragments were analysed for content regarding frequency, the statement given (content, agreement, and person), transferred and sorted regarding similar content in a meta-matrix (see Appendix 4). Within the matrix, sellers versus buyers and the group opinion were used as units of analysis. Finally, the statements of the focus group members and literatures were compared, analysed and conclusions derived (Glitz, 1997).

3.3.3.1. Pharmaceutical Marketing Strategy

In summary, the order-of-market entry effect guides companies' strategic marketing decisions. This approach considers the physician (costumer)'s prescription habit formation. Furthermore, it is emphasised that the decision-maker (physician (costumer)) plays a central role. Two fundamental strategic marketing communication strategies, the marketing push and the marketing pull, the physician (costumer), and the choice of the marketing communication strategy is guided by the medical drug class. The pharmaceutical company that applies the marketing push strategy will influence the physician (costumer) indirectly through opinion leaders, or directly by employing promotional measures. However, the marketing pull strategy is becoming increasingly important. In order to be able to set up a physician (costumer)-specific marketing strategy, the physicians (costumers)' scientific or economic orientation has to be taken into account. The following criteria were stated by the group members, as shown in Table 3-1.

Seller	Buyer	Group	Literature
Marketing Push (3, +)	Marketing Pull (3, +)	Marketing Pull (4, +)	Dogramatzis, 2002
Opinion Leader (1, +)	Marketing Push (1, +)	Marketing Push (1, +)	Dogramatzis, 2002
Physicians' Preference (2,+)	Opinion Leader (2, +)	Opinion Leader (2, +)	Lilien et al., 1981
Physicians' Orientation (5,+)	Physicians' Preference (4,+)	Physicians' Preference (1,+)	Zhang et al., 2007
		Physicians' Orientation (1,+)	Avorn et al., 1982; Azoulay, 2002
<i>The number within the brackets indicate the number of participant quoting this statement</i>			
<i>The plus or minus symbol indicates if a positive or negative statement was given</i>			

Table 3-1: Marketing strategy factors

It should be added that, regarding marketing strategy, there was an overall high level of agreement within the focus group. However, marketing pull was only raised by participants involved on the buying side. The reason for this behaviour could be that direct promotion to consumers is an illegal practice⁵. On the other hand, physicians (costumers)' orientation was only raised by the participants involved on the seller side. This can be explained by the fact

⁵ It has to be noted, as previously mentioned, that in Switzerland direct-to-consumer (DTC) promotion is an illegal promotion practice (Kocher and Oggier, 2007). However, patients (consumers) can be influenced by employing TV, radio and the internet as indirect promotional channels.

that these participants deal with different physicians (costumers) on a daily basis and therefore have a broader market knowledge. When the participants were prompted to any negative aspects regarding their statements on pharmaceutical marketing, no comments were proffered. Furthermore, despite the confirmation of non-state-regulated, market-related, scientific and general marketing, as well as pharmaceutical marketing literature, some new aspects were mentioned, specifically that it is important to be first into a hospital as physicians (costumers) seldom change prescriptions. Furthermore, the physicians (costumers)' prescription might also be influenced by patients (consumers) who ask for a specific medical drug they have heard of or read about from an alternative source.

General marketing literature (see Brassington and Pettitt, 2005), as well as pharmaceutical marketing literature (Jaakkola and Renko, 2007), describes that decision-makers play a central role when it comes to purchasing decisions. This statement was confirmed by participant SA, who specified that in pharmaceutical marketing, “physicians (costumers) are the decision-makers, when purchasing prescription drugs” (transcription line 103-104).

The classically applied strategy within pharmaceutical marketing, as pointed out by participant SA, is the marketing push, which is discussed in the general marketing literature (Oliver and Farris, 1989). According to participant SA, this “classical sales approach includes the following steps: influencing the physician (costumer) by showing the benefit and making sure that the drug is being distributed at the pharmacy” (transcription line 104-106). As a result, pharmaceutical companies have to ensure their access to physicians (costumers). This was summarised by participant SA, who pointed out that “prescription drugs can only be prescribed by a doctor. Therefore, personal acquaintanceship with a physician (costumer) is a major criterion for success” (transcription line 26-27). Thus, as a non-state-regulated, market-related pharmaceutical marketing study has shown, the marketing strategic consequence is that “product information and sales strategy have to go via the doctor” (participant BE,

transcription line 48). Access to a physician (costumer) in order to derive marketing communication is viewed as a major challenge in pharmaceutical marketing practice (Physicians Weekly, 2010). In order to overcome this hurdle, a practical approach was proposed by the entire focus group whereby pharmaceutical companies should “organise events covering a non-pharmaceutical topic once per year. This enables them to reach doctors (costumers) who normally would not take part” (transcription line 50-52).

In contrast, the non-state-regulated, market-related pharmaceutical marketing scientific literature has shown that there is an apparent trend of more informed patients (consumers) within the field (Findlay, 2002; National Consumers League, 2006; Shaw, 2008). These findings were also confirmed by the entire focus group, which stated “patients (consumers) are increasingly gathering the relevant information and asking doctors (costumers) for a specific medication” (transcription line 54-55). Furthermore, it was stated by the entire focus group that “customers do ask in the pharmacy for additional information about a product they have already heard about” (transcription line 55-56). Consequently, it can be concluded that both physicians (costumers) and pharmacists are faced with this trend. Therefore, it was pointed out by the entire focus group that the marketing strategy of “information pulling” is also applied in Swiss pharmaceutical marketing (transcription line 53). In general marketing, this marketing strategy has been described by Oliver and Farris (1989). The practical implication of this strategy in pharmaceutical marketing is, as stated by participant BB, “the patient (consumer) asks the doctor for a prescription of a drug that has been recommended by the pharmacists” (transcription line 10-11). In general marketing it is evident that different information channels influence the consumer (see Brassington and Pettitt, 2005). For pharmaceutical marketing, the Internet was mentioned, besides the physician (costumer), as another information channel by participant BE: “Consumers often go to the pharmacy and ask for a drug they have encountered on the Internet” (transcription line 24).

The decision as to whether to apply a marketing push or pull strategy is influenced by the medical drug class, as shown by the general marketing literature (see also Dogramatzis, 2002). This conclusion is supported by participant BE's statement that "life style drugs are better advertised via patients (consumers) who ask the doctor for the preparation" (transcription line 48-49). In order to confirm this statement, it was pointed out by the entire focus group that "the market introduction on Viagra would have been very difficult without laymen's involvement and an enormous marketing effort" (transcription line 154-155).

Non-state-regulated, market-related scientific literature clearly establishes that opinion leaders play a central role in pharmaceutical marketing (Lilien et al., 1981). The relevance of opinion leaders in Swiss prescription pharmaceutical marketing was confirmed by participant SA, who stated that "opinion leaders are the main target group" (transcription line 29-30). Consequently, as added by participant SC, "information on opinion leaders" (transcription line 39-41) is essential. In order to employ an opinion leader marketing communication strategy, it is necessary for pharmaceutical companies to gain sufficient market knowledge in the first instance. It was pointed out by participant BB that this could involve, for example, gaining knowledge about "a regional relation network that endorses the medication" (transcription line 32), which will provide positive word-of-mouth communication. This element has not been covered by scientific research, although the importance of word-of-mouth communication in general marketing that is applicable in pharmaceutical marketing has been discussed in the non-state-regulated, market-related scientific literature (Stern and Gould, 1988; Pruden and Vavra, 2004). In the second step, potential individuals have to be identified, approached and convinced. In order to provide a practical example of an opinion leader, the entire focus group proposed that "an opinion leader can be a head doctor or a specialist in a regional hospital providing regular seminars" (transcription line 255), and the opinion leader is usually "a person that has shown exceptional vocational competence" and is already recognised as an opinion leader within the relation network (transcription line 257). In

addition, participant BB recommended that “the relevant opinion leaders have to be convinced one or two years before a new product will be launched” (transcription line 42-43). Furthermore, the personal preference of the decision-maker is another aspect to be considered, as shown by a non-state-regulated, market-related study (Zhang et al., 2007). Regarding this point, participant SA stated that the “doctor’s specialisation is of relevance” (transcription line 63). It was further pointed out by participant SC that it should be kept in mind that “physicians (customers) do have preferences” (transcription line 15) regarding their prescription choice. The physician (customer)’s preference is guided by several criteria. The scientific pharmaceutical marketing literature has shown that there are two groups of physicians (customers): scientifically- and economically-oriented physicians (see also Avorn et al., 1982; Azoulay, 2002). Participant SA pointed out that “scientifically-oriented physicians (customers) decide on the basis of the medical scientific documentation, clinical study results and independent studies” (transcription line 5-6). On the other hand, “economically-oriented doctors (customers) decide on the basis of a price to performance ratio, the best customer service and best margins” (participant SA, transcription line 42-43). In summary, sales success “depends on the product’s features, the application area and target group orientation” (participant SC, transcription line 110). This statement is also supported by the literature (see also Cooper and Kleinschmidt, 1993; Kotler, 2006 and 1998; Sharp et al., 2001). Furthermore, it was emphasised by participant SC that “marketing performed after the market introduction phase has to be extremely target group-oriented” (transcription line 112-113). The entire focus group highlighted the negative example of Serotonin inhibitors as a failed market introduction: “Serotonin inhibitors were unsuccessfully introduced because of poor marketing performance. Consequently, their potential has not been recognised” (transcription line 155-157).

In order to summarise the discussion, the group members derived a specific strategic marketing recommendation. Taking the personal prescription preference into consideration, it was agreed that, as shown by non-state-regulated, market-related pharmaceutical marketing studies, “a prescription habit seldom changes” (transcription line 153) (see also Jaakkola and Renko, 2007; Zhang et al., 2007). It was also pointed out that “general practitioners (costumers) usually have little reason to change their patients (consumers)’ hospital prescriptions” (transcription line 35-36). Consequently, as participant BB stated, it is important for the pharmaceutical company “to be in a hospital first” (transcription line 34-35). Participant BD therefore concluded that it is important that a “medication has been introduced first”, because “good previous experience will cause hesitation in changing the drug” (transcription line 17-18). As a result, it is relevant for the pharmaceutical company that the “substance has been presented at a scientific congress previous to market introduction” (participant BD, transcription line 115-116). In summary, participant SC emphasised that the “marketing strategy and especially pre-launch activities have to be set-up accordingly” (transcription line 110-111). This strategic marketing recommendation provided by the entire focus group is based on the order-of-market entry effect and is strongly supported by non-state-regulated, market-related scientific research conducted on order-of-market entry in the pharmaceutical marketing field (see also Castro and Chrisman, 1995; Rodriquez-Pinto et al., 2008). Consequently, there is a need for further research on order-of-market entry that takes place in the specific environment of a state-regulated prescription pharmaceutical market.

3.3.3.2. Product

In summary, it was stated that the prescribing decision is made on the basis of the physician (costumer)’s personal experience, which is guided by his or her judgment on the product’s features and confidence in the product. The factor ‘product features’ can be defined as a set of

attributes containing indications, effectiveness, safety, side-effect profiles, compliance, drug delivery, product description and packaging. Factor confidence in the product can be defined as a set of attributes containing brand, company size, place of origin (production) and the number of prescriptions. There is an ongoing trend away from branded products and towards generics. The following criteria were stated by the group members, as shown in Table 3-2.

Seller	Buyer	Group	Literature
	Habit Formation (1,+)	Habit Formation (1,+)	Jaakkola and Renko, 2007
Product Properties			
Application Area (1,+)	Effectiveness (1,+) Side Effects (1,+) Compliance (1,+) Drug Delivery (1,+) Medical Documentation (1,+)	Effectiveness (2,+)	Dogramatzis, 2002
Safety (2,+)			Smith, 1990
Side Effects (2,+)			Dogramatzis, 2002
Compliance (1,+)			Dogramatzis, 2002
			Dogramatzis, 2002
Product Presentation (1,+)			Dogramatzis, 2002
Confidence			
Confidence (1,+)	Confidence (3,+)	Place of Production (1,+)	Flechter, 1989
Brand (2,+/-)	Brand (1,+)		Flechter, 1989
Company Size (1,+)	Company Size (1,+)		Flechter, 1989
			Maheswaran, 1994
<i>The number within the brackets indicate the number of participant quoting this statement</i>			
<i>The plus or minus symbol indicates if a positive or negative statement was given</i>			

Table 3-2: Product design-related marketing factors

It should be added that, regarding marketing strategy, there was an overall high level of agreement within the group. When participants were prompted to mention any negative aspects regarding their statements on pharmaceutical marketing, no comments were given. Despite confirmation in the non-state-regulated, market-related, scientific and general marketing literature, as well as the pharmaceutical marketing literature, some new aspects were cited, especially that the effectiveness of a medical drug is normally exaggerated by the pharmaceutical company. Furthermore, one interesting statement is that, according to the focus group, there seems not to be a big difference between the effectiveness of different prescription pharmaceutical brands (products, medical drugs) within the same medical drug class. In other words, prescribers (costumers) do not recognise a difference between brands within the same medical class. For example, this would mean that there is no difference

recognised between Panadol Children, Panadol 500mg, Max Strength, Night-time, etc., containing Paracetamol (pain killer). This statement is in contrast to the literature (Smith, 1983; Flechter, 1989; Dogramatzis, 2002).

In general marketing, consumer behaviour research has shown that a purchase decision is made on the basis of previous product experience, leading to habit formation and resulting in personal preference. This process can be described as a learning process that influences the likelihood that the same choice will be made the next time (Zhang et al., 2007). The process of consumer habit formation is present in pharmaceutical marketing as well (Jaakkola and Renko, 2007). This statement was confirmed by participant BB, who pointed out that “the physician (costumer)’s prescription decision is made on the basis of his or her personal experience” (transcription line 11-12 and 129). This view was also supported by the entire focus group: “the sum of the experience you have of a firm also gives a certain impression about the product” (transcription line 159).

Previous non-state-regulated, market-related pharmaceutical marketing research has indicated that a product’s features represent a major decisive factor when it comes to product choice (Cooper and Kleinschmidt, 1993; Sharp et al., 2001). It was shown by Cooper and Kleinschmidt (1993) that product features can be defined as a set of different attributes. One relevant decisive attribute is “product indication (application area)” (participant SA, transcription line 125-126) as indicated by the general marketing literature. It has to be noted that a medical drug will not be chosen if it is not applicable to a specific need (Dogramatzis, 2002). However, some medical drugs are more suitable for a specific problem than others. Another important attribute of product features is “product effectiveness” (participant BB, transcription line 129). This statement was supported by the group discussion, which concluded that “medication has to show good effectiveness at first and will then be prescribed afterwards” (transcription line 152-153). The relevance of effectiveness as an attribute for

product features has been shown by the general marketing literature (Dogramatzis, 2002; Smith, 1990). Nevertheless, the entire focus group critically stated that “the difference” between the medical drug and its effectiveness “is usually exaggerated by competitors” (transcription line 148). Furthermore, “safety” was viewed by two participants (SA, SC; transcription line 125-126, 131) as being essential. The “side-effect profile” for the prescribing decision was stated by three participants (SA, SC, BB, transcription line 125-126, 131, and 129) as being relevant. The importance of safety and the side-effect profile as attributes for product features has been shown by the general marketing literature (Dogramatzis, 2002; Smith, 1990). In addition, according to the comments of two participants, “compliance” (SA, BE, transcription line 137-138, and 134) as well as “drug delivery” (transcription line 132-133) are relevant to the prescribing decision as shown by the general marketing literature (Dogramatzis, 2002). Furthermore, it was highlighted that “good medical documentation” (participant BD, transcription line 129-130), meaning the product description, and “good product presentation” (participant SC, transcription line 41), meaning packaging, are important, as shown by the general marketing literature (Dogramatzis, 2002).

Another decisive factor in product choice is confidence in the producer and product. This has also been shown by non-state-regulated, market-related scientific pharmaceutical marketing research (Flechter, 1989). One relevant attribute of product confidence is brand. The majority of the participants (two sellers, one buyer) agreed that branding plays a central role for the prescriber (costumer). It was stated that if there are “two similar products, the branded product will be chosen” (transcription line 141). In addition, “I would definitely choose a product from a well-known firm” (transcription line 142). This is also supported by the general marketing literature (Dogramatzis, 2002; Flechter, 1989).

On the other hand, there is an apparent trend towards a switch to generic products (transcription line 176), as stated by participant SA: “pharmacists often give a generic

substitute” (transcription line 3). Despite consumers showing more confidence in branded products (see also Smith, 1983; Flechter, 1989; Dogramatzis, 2002), price sensitivity has increased and has forced consumers (payers) to take into consideration non-branded products (generics) that are usually cheaper and normally contain the same substance. This has also been shown by non-state-regulated, market-related scientific pharmaceutical marketing research (Kremer et al., 2008). Company size is another decisive attribute regarding product confidence, as stated by two participants: “In the case of an unknown producer, the larger one will be chosen” (participant SA, transcription line 138) and “in the case of problems, the larger company will more likely be able to pay” (participant BB, transcription line 139-140). As pointed out by participant SA, “the producer’s reputation is a relevant issue – large companies have an advantage over small companies” (transcription line 126-127). In addition, participant BB stated “I choose the company I [physician (costumer)] and the patients (consumers) have more confidence in” (transcription line 139). This is also supported by non-state-regulated, market-related scientific pharmaceutical marketing research conducted by (Flechter, 1989). In addition, according to the participant BE, “a frequent query is whether the drug has been produced in Switzerland” (transcription line 146). The relevance of the country of origin for the consumer’s purchase decision is shown by non-state-regulated, market-related scientific research (Maheswaran, 1994; Martin and Eroglu, 1993; Ettenson et al., 1988; Han and Terpstra, 1988; Morganosky and Lazarde, 1987). Furthermore, “it is a disadvantage when a drug is seldom prescribed” (participant BD, transcription line 19). The focus group highlighted the relevance of a physician (costumer)’s confidence in a medical drug when it comes to the prescription decision. Furthermore, factors influencing quality perceptions such as safety, especially the side-effect profile, are of relevance. In addition, packaging plays a role, as stated by the participants. However, in order to be able to justify the statements above, further research is required.

3.3.3.3. Promotion

It was concluded that two fundamental promotional approaches are apparent: the marketing push, applying direct-to-physician (costumer) (DTP) promotional measures, and the marketing pull, applying direct-to-consumer (DTC) promotional measures. The most relevant promotional instruments are advertising and personal selling.

The most essential communication channels are discussed in the general marketing pharmaceutical literature (Dogramatzis, 2002). Kremer et al. (2008, p239) classified three of the most relevant promotion channels in pharmaceutical marketing: advertising, personal selling and others [including physician (costumer) meetings and events, direct mailing and sampling]. It was stated earlier by the focus group that two types of promotion strategies are present, namely the push strategy, aiming to target prescribers (costumers) in order to increase their product awareness and predilection, applying direct-to-prescriber (costumer) promotion (DTP), and the pull strategy, targeting the consumer (patients) audience (DTC) directly by employing a set of promotional activities (see also Dogramatzis, 2002).

Personal selling ensures direct personal contact between company representatives and physicians (costumers). In general, physicians (costumers) appreciate the sales representatives as information suppliers, but view them as being biased. However, the willingness to welcome a salesperson depends on the doctor's specialisation and the size and image of the pharmaceutical company. Personal sales contact with physicians (costumers) is important in order to maintain a long-term relationship, which, according to Hill (1999), is essential for sales success. Consequently, the personal attributes of a salesperson are relevant.

Furthermore, the frequency and length of sales visits is important as well. The following criteria were stated by the group members, as shown in Table 3-3.

Seller	Buyer	Group	Literature
Physicians' Acceptance (1,+)	Physicians' Acceptance (4, +)	Physicians' Acceptance (4,+)	Andaleeb et al. 1996
Physician Access (1,+)	Physician Access (1,+)		Kremer et al. 2008
SR Information Provider (2,+)	SR Information Provider (1,+)		Andaleeb et al. 1996
SR Personality (4,+)	SR Personality (1,+)	SR Personality (2,+)	Gillis et al. 1998
	SR Reliability (6, +)	SR Reliability (1, +)	Gillis et al. 1998
SR Relevance (1, +)	SR Relevance (1, +)		Mizik et al. 2004
<i>The number within the brackets indicate the number of participant quoting this statement</i>			
<i>The plus or minus symbol indicates if a positive or negative statement was given</i>			

Table 3-3: Personal sales-related marketing factors

It has to be noted that, in general, there was quite high agreement within the focus group. However, the acceptance of sales visits and the reliability of sales representatives were discussed by the buyer side participants. It can be concluded that there is a critical attitude present when dealing with sales representatives. In other words, in general, physicians (customers) do not fully trust the information that is given to them by a pharmaceutical salesperson. On the other hand, the salesperson's personality was mainly mentioned by the seller side participants. The conclusion could be made that personal influence regarding the sales success of the salesperson is overestimated. Despite confirmation in the non-state-regulated, market-related scientific, general marketing and pharmaceutical marketing literature, some new aspects, not yet covered by scientific research, were mentioned. The relevance of personal sales representatives was questioned. The statements indicate that some doctors (customers) welcome sales representatives and appreciate printing material. Therefore, the assumption might be that the effectiveness of personal sales is dependent on the medical drug class. Consequently, the relative importance of salespeople versus others marketing activities is of interest.

According to Fill (2002, p70), in general marketing 'personal selling is defined as an interpersonal communication tool which involves face to face activities undertaken by individuals, often representing an organisation, in order to inform, persuade or remind an individual or group to take appropriate action, as required by the sponsor's representative'. This definition was supported by participant SA, who stated that "the salesperson has an

influence on the doctor ... as an information supplier” (transcription line 193-194). However, this is not covered by research. In addition, the relevance of personal selling in pharmaceutical marketing has also been examined by Mizik and Jacobson (2004, p1704), who found evidence that ‘personal selling has positive and statistically significant effects on the number of new prescriptions issued by a physician (costumer)’.

Non-state-regulated, market-related research conducted by Kremer et al. (2008, p244) revealed that the ‘effects of the promotional instruments vary considerably across disease categories’. This can be underlined by the entire focus group, which agreed that “certain groups of specialised doctors (costumers) are more likely to welcome sales representatives than others” (transcription line 90-91). Furthermore, it was added by participant SA that “many physicians (costumers) do not accept any sales visits, especially from small firms” (transcription line 27-28). There was agreement with this statement within the entire focus group: “Some doctors (costumers) do not welcome sales reps at all” (transcription line 94). This phenomenon has not been investigated so far. On the other hand, some “doctors (costumers) advise their medical practice assistant only to welcome representatives from certain companies or areas of interest” (entire focus group, transcription line 95-96). In contrast, this is not applicable to everybody, as participant BB stated: “I do not have any preferences when arranging sales appointments. This gives me the chance to get acquainted with a new medicine. There are also chances for meetings at a congress. It works by coincidence” (transcription line 72-74). It was added by participant SA that, in order to make an appointment with certain doctors (costumers), it is “relevant to meet them primarily at a congress” (transcription line 28-29). For participant BD, personal contacts with sales executives are essential in the case of similar products (transcription line 20-21).

In general, physicians (costumers) appreciate personal sales visits. As revealed by the study of Andaleeb and Tallman (1996, p79), ‘physicians (costumers) had friendly relations with sales

representatives and did not distrust them, but they did not view sales people as a vital part of their practice'. Therefore, participant BD stated that "the salesperson is in general quite well informed, also gives information about possible side-effects, but is a little bit biased. If you listen to them on a regular basis, it is an easy way to gain further education" (transcription line 81-84). This statement was supported by participant BE, who stated that "the sales reps only give me some inspiration, but I will seek additional information in cases of interesting information" (transcription line 211-212), and by participant BE, who added "the conversation might give me some initial information. If necessary, I might seek more substantial information" (transcription line 86-88).

Miller and Heinmans (1991) highlighted that personal selling is a crucial element in ensuring customers' post-purchase satisfaction and in building profitable, long-term buyer seller relationships built on trust and understanding. This was underlined by the entire focus group, which emphasised "it should always be the same salesperson you are in charge with" (transcription line 228-229). In addition, participant SC stated that "as more products for a certain treatment are on the market, the sympathy for and/or antipathy of a sales rep become even more important" (transcription line 202-203). This is supported by Hills' (1999) non-state-regulated, market-related research, in which it was suggested that the major determinant of the drug chosen by the physician (costumer) is the relationship between the salesperson and physician (costumer). In contrast, participant SA pointed out that "if the salesperson ... is being tripped up all the time, the physician (costumer) will be influenced, but negatively" (transcription line 194-196).

The interaction between salesperson and prescriber (costumer) was also examined by non-state-regulated, market-related scientific pharmaceutical marketing research conducted by Andaleeb and Tallman (1996, p79), who found that 'physicians (costumers) viewed the field salesforce as a relevant source of information, but felt that they could also get the necessary

information from other sources'. This finding is supported by participant BD, who stated "almost every piece of information provided by sales reps is biased. A sales visit is only useful for me when some helpful information is given. I do not look at the accompanying documents" (transcription line 208-210). This view was supported by the focus group discussion: "It is very difficult to access objective information. Therefore, pharmaceutical representatives still remain an acceptable information source. Information from the relevant specialised literature is usually too critical and deters from trying new medical approaches" (transcription line 97-100). This statement is supported by Gillis et al.'s (1998, p105) non-state-regulated, market-related research, in that 'general practitioners (costumers) perceived salespeople to be preoccupied with their own professional needs'. Furthermore, for participant BD, the pharmaceutical representative cannot provide him with any "new vocational, subject-orientated information" (transcription line 204-205).

Looking at the individual salesperson in more detail, it is generally considered that certain specific personal attributes are important (see also Gillis et al., 1998). Participant BB gave a set of criteria: "I do expect reliable information and a convincing personal appearance" (transcription line 197). For participant SC, "frequent sales visits" are important (participant SC, transcription line 39-41). These statements are supported by Gonul et al.'s (2001, p89) non-state-regulated, market-related research, in that 'the scope of personal selling should be carefully scheduled in terms of frequency and length of visits in order to optimize the company's effectiveness of direct promotion efforts and expenses'.

A pharmaceutical company has to ensure that promotional activities cover all areas used by the physician (costumer) when gathering product information, but it also has to deal with critical concerns raised by the physicians (costumers) regarding the reliability of the information provided. The most important channels are the internet, Compendium⁶, information materials provided by the company, expert opinions and colleagues. On the other

⁶ Compendium is a Swiss medical drug data base (www.compendium.ch).

hand, alternative channels, providing unbiased information such as sales figures, are also consulted. Furthermore, the company has to ensure that information channels used by patients (consumers) are covered by their promotional activities as well. The most relevant channels are the internet and layman’s press. However, the practice of direct-to-consumer (DTC) marketing is illegal in Switzerland. The following criteria were stated by the group members, as shown in Table 3-4.

Seller	Buyer	Group	Literature
Internet (2, +)	Internet (1, +) Medical Documentation (6,+) Independent Information (3, +) Laymen Press (1, +) Over Promotion (1, -)	Laymen Press (1, +)	Goetzinger et al. 2007 Manachanda et al. 2004
<i>The number within the brackets indicate the number of participant quoting this statement The plus or minus symbol indicates if a positive or negative statement was given</i>			

Table 3-4: Advertising-related marketing factors

The issues of medical documentation and independent information were mainly raised by the buyer side participants, which demonstrates the importance of these aspects for prescribers (costumers).

The most relevant direct-to-prescriber (costumer) promotional channels (DTP) were discussed by the focus group. It was pointed out by participant SA that he usually searches for information about a competitor’s product on the internet (transcription line 215). This statement is supported by Goetzinger et al.’s (2007, p128) non-state-regulated, market-related research, which concluded that ‘the search for online health-related information has become increasingly popular’. Participant BE added that he uses “Compendium and the company’s information” as a source (transcription line 226). In addition, participant BB stated that he reads “the critical pharmaceutical information from Etzel Gisling⁷ and also asks colleagues at congresses” (transcription line 219-221). The significant relevance of word-of-mouth was shown by Lilien et al. (1981). For participant BB, the most relevant information sources are

⁷ Etzel Gisling is a Swiss specialist in internal medicine, clinical pharmacology and toxicology based in Wil, Switzerland, regularly writing critical articles covering pharmaceutical issues.

“printing materials and presentations at scientific congresses” (transcription line 108-109); furthermore, “scientific medical documentation is relevant” (participant BD, transcription line 18-19) because it shows the company’s standards (participant BE, transcription line 121-122). It can therefore be summarised that “convincing documentation is essential” (participant BB, transcription line 32). In addition, for participant BD, “a good slogan mentioning the key therapeutic problem is also essential” (transcription line 115).

Furthermore, it was emphasised by participant BD that “layman’s press”, as a direct-to-consumer (DTC) promotional channel, “should be applied” as well. Nevertheless, “despite the circumstance that direct-to-customer advertising is illegal in Switzerland, this is becoming more and more popular” (transcription line 56-57) (Kocher and Oggier, 2007). As such, ethical concerns regarding the influence of advertising on the prescription behaviour of prescribers (costumers) in the Swiss market were raised by Strebel and Michaud (2009).

Concerns regarding the reliability of informational content provided by the producers were also raised (transcription line 218-219). These concerns were also made by Roth et al. (2004).

Alternative information sources have also been mentioned (see also Solomon et al., 2010).

According to participant SC, interesting product and company information can also be found on online stock-trading platforms (transcription line 222). In addition, for participant BD, “sales (revenue) figures for a substance are very important indicators as well” (transcription line 223) and “a rise in share prices is usually related to the product. This is official, unbiased information” (transcription line 223-224). These purchase decision criteria have not been covered by research. In summary, as agreed by the group, “a good salesperson is competent in vocational matters, knows the medicine’s documentation, has a good appearance and demonstrates appropriate communication skills” (transcription line 232-233).

However, it should be kept in mind, as stated by participant BD, that “there can also be too much promotion” (transcription line 46). This statement is confirmed by Manchanda and

Chintagunta's (2004, p143) non-state-regulated, market-related research. They revealed that 'too much personal selling can dissuade a physician (costumer) from prescribing a drug'. Consequently, it should also be taken into account that there can be too much promotion. Therefore, a good promotional balance has to be achieved in order to avoid over- or under-promotion. As a result, there is a need for further research into the role and relevance of promotion measures regarding sales that take place in the specific context of a state-regulated prescription pharmaceutical market which restricts promotional activities (an overview of promotional practice rules can be viewed at www.sgci.ch; Refer to Pharmakodex-Praxis).

3.3.3.4. Price

It was concluded that the buyer's financial incentive is the key criteria for a successful price policy. This is supported by Muehlemann's (2005) ethical concerns regarding the influence of pricing conditions on the prescription behaviour of self-dispensing prescribers (costumers) (see also Paragraph 1.1.3) in the Swiss market. It was stated that a recently implemented governmental regulation introduced incentive schemes for buyers and led to a rise in price sensitivity. However, this statement is not supported by Swiss-related scientific research. As a result, patients (consumers) are increasingly asking their physicians (costumers) and/or pharmacists for the most economical version of a prescribed drug, normally a generic version. There was a high level of agreement within the group. In total, five statements were given by the selling side and seven by the buying side. The focus group statements confirmed non-state-regulated, market-related scientific, general marketing and as pharmaceutical marketing literature, as discussed below.

The implementation of a new governmental regulation has led to an increase in the payer's financial incentive when purchasing a medical drug, and therefore to an increase in price sensitivity. As a result, there is an increasing demand for generic products as a substitute for

the original (branded) medical drug. Regarding pricing, two main drivers come into play: the number of competitors and the perceived product value.

It was shown by Sutherland et al.'s (2008) non-state-regulated, market-related research that financial profit is one of the key drivers when doing business. Consequently, it can be concluded, as corroborated by participant SA, that "financial incentives" (transcription line 104) increase personal benefit and are therefore an important motivator for sellers and buyers. This conclusion is supported by Marteau et al.'s (2009, p983) non-state-regulated, market-related scientific research, in that 'personal financial incentives are increasingly being used to motivate patients (consumers) and general populations to change their behaviour'.

Consequently, the "pricing conditions of a purchase are relevant" (participant BB, transcription line 13-14). This statement is supported by participant BB, who stated that "price plays an important role for me" (transcription line 178).

Regarding patients (consumers)' price sensitivity (see also general marketing literature: Brassington and Pettitt, 2007), it was pointed out by participant SA that "until recently, the price did not have any relevance. However, since the government implemented a new regulation in 2006, whereby 20% of the price of the original (branded) and 10% for the generic medical drug has to be paid directly by the patient (consumer), the price is more relevant" (transcription line 168-170). As a result, this new regulation (Art. 38a KLV, see also www.bag.admin.ch) has resulted in an increase in users (consumer)' financial incentives and therefore price elasticity. Consequently, "the patient (consumer)'s price sensitivity has increased" (transcription line 173), as stated by participant BD. This leads to the situation where "the patient (consumer) considers the price when he has to pay out of his own pocket" (participant BE, transcription line 185-186). As a result, "physicians (costumers) are also confronted more frequently with this issue" (participant BD, transcription line 173-174). This was confirmed by participant BD, who pointed out that he would recommend a generic

product to his patients (consumers) because of the lower price (transcription line 143). It has to be noted that generic drugs are copies of brand name drugs that have exactly the same medical substance, dosage, intended use, effects, side-effects, route of administration, risks, safety, and strength as the original drug (www.fda.org). Consequently, it can be said that the quality is similar between the original (branded) and generic medical drug containing the same substance. Furthermore, participant BE mentioned that “patients (consumers) ... are increasingly asking for generic drugs when purchasing medication” (transcription line 186-187). This statement is supported by sales (revenue) figures, indicating a higher increase in generic drug use versus the original preparation (Swissinfo, 2007). Furthermore, the price level is influenced by competition, as stated by participant BE: “A medical drug without a generic substitute still has a high price” (transcription line 184-185). This is supported by Lambkins’ (1993) non-state-regulated, market-related finding that pricing is influenced by two aspects. The first is the number of competitors and the second is the product’s perceived value. This finding is also supported by non-state-regulated, market-related research conducted by Erickson and Johansson (1985), who concluded that, according to the general marketing literature, the customer may expect a price to reflect the quality of the product. Furthermore, Zeithaml (1988) specified that the customer weights up the promises given by the producer against the price. Consequently, it is likely that ‘consumers pay higher prices as a result of the advertising that occurs in the industry’ (Rizzo, 1999, p89). Regarding pricing, further research is also needed in order to clarify the role of pricing that takes place in a state-regulated market, thus restricting companies’ pricing policies.

3.3.4. Summary of the Focus Group Discussion

The analysis of the focus group discussion has derived five fundamental motivational factors leading to prescribing decisions. The analysis has revealed that early market entry is relevant

in order to form a long-term prescription habit (see also Kardes and Kalyanaram, 1992). Furthermore, - habit formation can also be influenced by a company's product policy (see also Cooper and Kleinschmidt, 1993). It was discussed that the prescriber (costumer)'s financial reward is important when prescribing a drug (see also Sutherland et al., 2008). In addition, the physician (costumer)'s product confidence is decisive. The prescriber (costumer)'s product confidence is influenced by the pharmaceutical company, along with product policy (see also Kardes and Kalyanaram, 1992) and product quality. Another important factor is the product knowledge level. Physicians (costumers) gain knowledge directly through a company's promotional activities or indirectly through independent information sources (see Dogramatzis, 2002). As a result, the following process model can be presented (Figure 3-1).

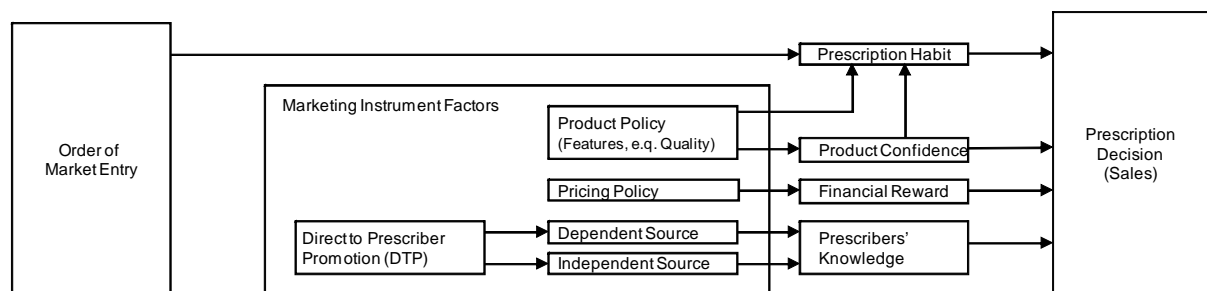


Figure 3-1: Prescription decision process model

In addition, a content analysis of the focus group transcript was performed (see also Krippendorff, 2003, Martin and Bateson, 2007). In a first step, as already described in the systematic literature review chapter, a hierarchical structured framework containing three groups – “marketing categories”, “variables” and “attributes” – was set up, and the five main marketing categories “strategy”, “product”, “price”, “place (distribution)” and “promotion” were defined, each containing the group of variables. The inherent characteristics of variables are described by attributes. In a second step, the keywords of each statement were then indicated and categorised according to the five marketing categories. However, no statements

relating to place (i.e. distribution) were found. In a third step, the previously indicated keywords were classified according to their categorical property as a variable or attribute. In total, the content analysis derived 11 relevant marketing variables and their 24 attributes (see Table 3-5).

Marketing Categories	Variables	Attributes
Product	Properties Safety; Side-effects; Efficacy; Indication (Applicability); Innovativeness	Few prescriptions as a signal of increased risk
	Packaging	Drug delivery
Price	Price Level	No attributes
Promotion	Personal Selling	Number of visits; Experience; Acts as an information provider; Communication of USP's; Competence; Contacts at congresses; Continuity of sales relation; Physician's contact anxiety; Personality of salesperson; Style of selling; Sympathy to salesperson
	Advertising	Informational content of documentation (Objectivity, Scientific, Style of brochures); Physician-oriented advertisement; Experience exchange with colleagues; Providing speciality literature; Health television programs; Further education; Providing of information (via Databases, Internet, Journals); Involvement of layman press; Clinical studies
	Word-of-Mouth (OL)	Head doctors; Specialists and Professors [according to their local or regional relevance]

Table 3-5: Marketing factors

In the next chapter, a three-step Delphi group study is conducted. The Delphi study was set-up based on the findings derived from the systematic literature review (Chapter 2) and the focus group study in the present chapter. The Delphi group study leads to a ranking of the most important variables in pharmaceutical marketing and enables the proposition of hypotheses, as well as a “physician-targeting” conceptual model.

4. The Relevance of Marketing Activities in the Swiss Prescription Drugs Market: A Qualitative Delphi Group Study

4.1. Introduction

This chapter presents the proposed conceptual model, including hypotheses, and additional findings derived from the perspective of Swiss healthcare practitioners (costumers). This chapter also provides advanced discussions on the findings derived in Chapters 2 and 3.

As already explained, a two-stage empirical qualitative approach is employed for this purpose. The first stage is a focus group study (see Chapter 3) and the second stage, as presented in the present chapter, is a Delphi group study. Thus, this chapter begins with a discussion of the methodology used for a Delphi group study. Based on the findings from the focus group study (see Chapter 3), a Delphi group study is set up. In the second part of this chapter, the methodology employed for the Delphi group study is then described, following which the results are presented, summarised, a set of hypotheses is posited and a conceptual model is provided.

4.2. Delphi Group Study

4.2.1. Introduction

The aim of the second qualitative study is to assess the previously derived results from the focus group study and to draw additional outcomes from the Swiss healthcare professionals' experience. Therefore, an adapted three-step Delphi group survey was performed (Haeder and

Haeder, 2000; Linstone and Turoff, 1975). In the Delphi study set-up, the previously derived findings from the focus group were included.

The concept of the Delphi group procedure was developed by the RAND Corporation during the 1950s as a forecasting methodology (Helmer, 1967). For Dalkey and Helmer (1963, p458), ‘the aim of this technique is to obtain the reliable consensus of opinions of experts with a series of questionnaires interspersed with controlled opinion feedback’. This statement is supported by Rowe and Wright (1999, p353), who emphasised that the ‘Delphi technique is intended for use in judgment and forecasting situations in which pure model-based statistical methods are not practical because of the lack of appropriate data’ (see also Wright et al., 1996). However, its relevance is finally defined by the members involved. So far, the Delphi technique has been described and reviewed by several researchers (Haeder and Haeder, 2000; Hill and Fowles, 1975; Linstone and Turoff 1975; Lock, 1987; Parenté and Anderson, 1987; Stewart, 1987; Rowe et al., 1991). In order to reach a consensus within the Delphi group, an adapted three-step interactive questioning procedure was applied, involving senior healthcare marketing professionals, to gather their opinions and professional insights.

4.2.2. Research Procedures and Settings

In the first round, the Delphi group study aimed to identify issues and solicit ideas, in order to determine the most relevant marketing mix criteria and to assess and provide expanded knowledge of the process model derived from the focus group study. In a first step, general questions were developed by the monitor team⁸ to enable the conceptualisation of the Delphi group study, aiming to explore the dimensionality of pharmaceutical marketing and clarifying the influence of pharmaceutical marketing instruments on “physician-targeting” leading to an increase of sales (revenue). For this purpose a brainstorming session was employed to create

⁸ Members of the monitor team were: Michael Stros, Aston University; Prof John Marriott, Aston University; Prof. Juerg Hari, Zurich University of Applied Sciences.

three open-ended, non-standardised general questions, ensuring that clear words were selected (Schmidt and Hollensen, 2006), covering order-of-market entry (Bond and Lean, 1977) and all four marketing mix instruments (Kotler, 2006). Furthermore, it was ensured that the results derived from the focus group were considered as well.

These questions were piloted on a small sample of three marketing academic experts at the Zurich University of Applied Sciences in Winterthur, Switzerland. Based on the outcome of the pilot study, only a few minor changes were required. Consequently, the following three questions were developed:

- Question [Q₁]: What are the most important key factors leading to high product turnover?
- Question [Q₂]: What are the greatest challenges for you in the “product” area?
- Question [Q₃]: Why do many products struggle to reach their financial expectations?

In a next step, a requirement profile for the participants was created. The study aimed to set up a Delphi group with only Swiss healthcare professionals involved in the buying or selling side of pharmaceutical marketing and in a relevant management position. Consequently, the following participant criteria were defined: (1) level of involvement in pharmaceutical marketing processes, (2) position of responsibility, (3) number of years’ experience and (4) educational background.

A Delphi group study consists of a small sample size of participants (experts), usually between ten and twenty (see also Haeder and Haeder, 2000). A nomination process was performed by the monitor team. Potential candidates matching the previously defined participant criteria were directly contacted via telephone call (applying a judgement sampling strategy), during which they were provided with general information about the study’s aims,

the procedure and the assurance of anonymity, in order to gain their readiness for study participation. No financial compensation was offered. As a result, a well-balanced mix of eleven healthcare professionals from academic institutions and different pharmaceutical companies based in Switzerland could be nominated (see Table 4-1).

(1) Level of involvement in pharmaceutical marketing processes	High (directly involved) (8)	Low (not directly involved) (3)	<u>Conclusion:</u> Input from daily managerial practice can be expected	
(2) Position of responsibility	Marketing Director (5)	CEO (4)	Professor (2)	<u>Conclusion:</u> Because of the high level management positions, a broad professional insight will be provided
(3) Number of years of experience	< 20 years (5)	> 20 years (6)	<u>Conclusion:</u> The given statements will be based on long term marketing experience	
(4) Educational background	Graduate (university) (5)	Academic (PhD) (6)	<u>Conclusion:</u> Due to the high educational profile, profound statements will be given	

Table 4-1: Profile of the participating Delphi group experts

It should be noted that the difference between the focus group participants and the Delphi group participants is their expertise in the marketing of the latter group. The focus group was composed of a mix of experts with academic background, In order to gather an overall view, it was the intention to cover the major interest groups within the pharmaceutical market [company, prescriber (costumer and opinion leader), seller (pharmacists) and consultant]. On the other hand, the experts of the Delphi group were prescription pharmaceuticals marketers. Next, a cover letter was created and a questionnaire containing these three questions was devised (see Appendix 5), asking each participant to engage in individual brainstorming, so as to generate as many ideas as possible for dealing with the issue, in order to receive an unbiased and wide set of answers. The postal reply questionnaires were sent out to the experts concerned. The anonymous responses that arrived from ten out of eleven participants within a fortnight were collected and collated. The answers were then elaborated by the coordinator and analysed against those issues they saw as important.

In the second round of the Delphi group study, marketing variables derived from the systematic literature review and the focus group study were further investigated. Consequently, a slightly altered Delphi technique procedure, considered ideal according to the literature (see also Haeder and Haeder, 2000; Hill and Fowles, 1975; Linstone and Turoff 1975; Lock, 1987; Parenté and Anderson, 1987; Stewart, 1987; Rowe et al., 1991), was applied. Criteria such as efficacy, safety and side-effects, tolerability, packaging, pharmacy, internet, wholesalers, hospitals, price level, reimbursement by insurance, results phase of III and IV clinical studies, publications in journals, word-of-mouth, advertisement, personal selling and sampling were employed. These variables were included in the structured round two questionnaire (see Figure 4-1). This questionnaire was then piloted on a small sample of three marketing academic experts at the Zurich University of Applied Sciences in Winterthur, Switzerland. Only a few minor alterations had to be made. The developed second questionnaire was mailed to the participants together with a summary of the answers derived from the first Delphi group round, a cover letter (see Appendix 6) and a reply postal envelope. The Delphi group members were asked to review the presented results and to rank the proposed marketing variables taken from the round one study with regard to their relevance to the sales process. To avoid a non-neutral specification, an eight-point Likert-type scale (Likert, 1993) with extremes from “strongly disagree” to “strongly agree” was applied.

Marketing Categories	Variables	Strong Agree – Strong Disagree
Product	Efficacy	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Safety and Side Effects	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Tolerability	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Packaging	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Results Phase III Study	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Results Phase IV Study	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Place (distribution)	Pharmacy	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Internet	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Wholesalers	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Hospitals	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Price	Price Level	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Reimbursement from Insurance	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Promotion	Publications in Journals	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Word-of-Mouth	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Advertisement	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Personal Selling	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Sampling	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Figure 4-1: Delphi group round two study questionnaire

Participants anonymously recorded their responses and returned them to the coordinator within a fortnight. Ten out of eleven experts replied (91%). The answers were then elaborated and analysed by the coordinator. Responses to questions were grouped and categorised by frequency. This analysis tallied the votes for each of the responses, determined the standard deviation and mean value and finally summarised the responses for the next round.

In the third round of the Delphi group study, the results from the second round were further investigated in order to reach a consensus within the Delphi group. Consequently, the results of the second distribution were summarised and evaluated. High standard deviation associated with certain answers from round two indicated a high level of disagreement within the group. The contradicting questions and answers sets were taken for further investigation. In order to develop the third round questionnaire, a cut-off sampling method was applied for the selection of the questions (Royall, 1970; Bailar et al., 1983). The selection criterion was set at the upper third part of the standard deviation's normal distribution (65th percentile). Furthermore, in order to ensure reliability and validity, similar questions that were answered in a contradictory

manner were considered invalid and thus were discarded (Burton, 2000). Such opposing test statements were therefore scattered throughout the questionnaire. A random selection procedure was applied. This questionnaire was piloted on internal staff at the Zurich University of Applied Sciences in Winterthur, Switzerland. No changes were required.

The questionnaire was sent to the group members for comment and to clarify any points which had been unsatisfactorily answered in the previous round. The Delphi group members were asked to indicate their agreement or disagreement with the statements given by using the provided boxes (see Figure 4-2). The participants of this survey were given a fortnight to respond to this third questionnaire (see Appendix 7). Nine out of the ten remaining participants replied (90%). The answers were then collected, analysed and summarised by the coordinator.

	Statement	Agree	Disagree
1	One of the major decision criteria regarding prescription drugs is their price level	<input type="checkbox"/>	<input type="checkbox"/>
2	The product distribution in the pharmacy does not have a major impact on their sales (revenue) figures	<input type="checkbox"/>	<input type="checkbox"/>
3	Product advertising is a consumer need	<input type="checkbox"/>	<input type="checkbox"/>
4	An actively performed product promotion by the wholesaler is not relevant for the product success	<input type="checkbox"/>	<input type="checkbox"/>
5	The design of the packaging and its ease of use is important when buying the product	<input type="checkbox"/>	<input type="checkbox"/>
6	The salesperson will sell better when incentives are given	<input type="checkbox"/>	<input type="checkbox"/>
7	The personal interaction between the salesperson and the customer has an important effect on the sales success	<input type="checkbox"/>	<input type="checkbox"/>
8	It is not essential whether or not the pharmaceutical product is included in the wholesaler's product range	<input type="checkbox"/>	<input type="checkbox"/>
9	Publications in well-respected journals are essential for the consumers' confidence and therefore for the sales process	<input type="checkbox"/>	<input type="checkbox"/>
10	The price level is an unimportant decision factor when choosing a prescription drug	<input type="checkbox"/>	<input type="checkbox"/>
11	The functionality is the only requirement made to packaging	<input type="checkbox"/>	<input type="checkbox"/>
12	Favorable publications in well-respected journals are generally not noticed by the consumer	<input type="checkbox"/>	<input type="checkbox"/>
13	The consumer (end-user) will only marginally be influenced by a marketing campaign	<input type="checkbox"/>	<input type="checkbox"/>
14	It is essential to ensure a broad product distribution in pharmacies, well displayed locations within the pharmacy and advice given by pharmacist	<input type="checkbox"/>	<input type="checkbox"/>

Figure 4-2: Delphi group round three study questionnaire

4.2.3. Round One Delphi Group Findings and Analysis

In this section, the findings of the first round Delphi group study are presented and a content analysis is performed. The same methodology used for the evaluation of the focus group transcript is applied.

In a first step, the collected answers (see Appendix 8) were coded regarding “pharmaceutical marketing strategy”, “product”, “price” and “promotion” (see also McCarthy and Perreault, 1960). In the second step, the indicated text fragments were analysed for content regarding frequency, the statement given (content, agreement and person), transferred and sorted

regarding similar content in a meta-matrix (see Appendix 9). Finally, the statements of the focus group members and from the literature were compared, analysed and conclusions derived (Glitz, 1997). In order to ensure that no relevant information had been missed out, the analysis was repeated. It has to be noted that the collected answers are anonymous and cannot be assigned to a specific participant.

4.2.3.1. Pharmaceutical Marketing Strategy

In summary it can be concluded that it is important to know the market environment, in order to enable product differentiation against competitors and to gain knowledge about potentially accessible physicians (costumers) in order to set-up a targeting strategy, while questioning the efficacy of me-too preparations. However, producers might be challenged by upcoming new product categories and regulatory issues. Furthermore, it was highlighted that order-of-market entry plays a central role. For long-term sales success, the prescription habit is important. Consequently, it was stated that the first drug on the market with even lower efficacy can create more sales (revenue) than one that enters later. Despite confirmation in the non-state-regulated, market-related scientific, general marketing and pharmaceutical marketing literature, some new aspects, not covered by scientific research, were mentioned. Interestingly, as the focus group had already stated, differences in the effectiveness of different drugs was questioned.

Target orientation is a core success criterion in marketing, as highlighted in the general marketing literature (see also Brassington and Pettitt, 2007; Dogramatzis, 2002) and discussed by the focus group. It was also highlighted by the Delphi group that positioning plays an important role. This was underlined by one of the participants' statement that "the products do not struggle, but they are wrongly positioned" (P9, line 123-124). Furthermore, it was emphasised that it is essential for sales success "to define a clear-cut positioning statement

and market segmentation amongst direct competitors” (P7, line 72-73). As a result, as mentioned by one participant, it is important to “know the competitors well” (P9, line 53). In addition, besides good positioning, a clear differentiation is relevant. Consequently, the product has to “be perceived as different and unique” (P7, line 71) and the “differentiation against competitors has to be based on really relevant parameters” (P5, line 66). It was stated by the focus group, and also concluded in the non-state-regulated, market-related scientific literature, that product differentiation is a key success factor (see also Cooper and Kleinschmidt, 1993; Kotler, 2006 and 1998; Sharp et al., 2001). Furthermore, according to Vakratsas and Kolsaricis (2008), the disadvantage of being late can be overcome with a differentiated product strategy. However, “most pharmaceutical drugs are ‘me-too’ preparations with no advantage over well known, accepted drugs” (P8, line 121) with a “lack of differentiation to competitors” (P4, line 101). This statement cannot be supported by the scientific literature.

The efficacy of a me-too strategy was questioned by Schmalensee’s (1982) non-state-regulated, market-related research. This is in line with the strategic marketing recommendation given by the focus group. Consequently, it was pointed out that it is important that the product has clear and unique selling propositions (USP’s) (P1, line 56).

Furthermore, it was emphasised by a respondent that “the product, marketing and sales have to fit fully to the target market segment” (P1, line 4-5). This is supported by several non-state-regulated, market-related researchers (Cooper and Kleinschmidt, 1993; Kotler, 2006 and 1998; Sharp et al., 2001) and by the focus group. Consequently, it was agreed that a targeting strategy is essential in order to “know who the accessible potential physicians (customers) are” (P4, line 24; P2, line 8). As a result, one answer summarised that awareness of “medical doctors (customers), pharmacies and patients (consumers)” (P1, line 2) is important.

Therefore, the market environment has to be understood (political, economic, legal, etc. constraints) (P9, line 124-125) and continuously monitored. Prescription pharmaceutical drug producers face several challenging factors. On the one hand, “alternative medicine substitutes are increasingly competing with the classical pharmaceutical market (no prescription is required)” (P6, line 114-115, this statement cannot be supported by the scientific literature), while on the other hand, “legal regulations” have to be taken into account when marketing a pharmaceutical drug (P9, line 84-85), and “there is the appearance of new product categories” (P6, line 114) that has to be kept in focus. Consequently, pharmaceutical firms need “continuous management of current and future competitors” (P8, line 81-82).

Early market entry plays a central role regarding a product’s success. It was shown by several non-state-regulated, market-related researchers (Jaakkola and Renko, 2007; Zhang et al., 2007) and agreed by the focus group that prescription habits are a central reason behind a purchase decision. Therefore, habit formation is an important task in marketing. Furthermore, scientific non-state-regulated, market-related research has shown that order-of-market entry plays an important role regarding habit formation (see also Lean and Bond, 1977; Castro and Chrisman, 1995; Kardes and Kalyanaram, 1992; Rodgriuez-Pinot et al., 2008). These findings are supported by the Delphi group as well. One participant stated that “the first drug on the market, even with lower efficacy, can collect more sales (revenue) and is more present in the minds of the customers” (P3, line 15-17). Consequently, as emphasised by one Delphi group respondent, pharmaceutical companies have to “shorten the product development process from the idea-finding stage to the marketable product phase” (P7, line 73-74). This statement is supported by other participants, who concluded that pharmaceutical drugs are less successful because an underestimation of time parameters (P5, line 105) leads to a “late market entry” (P3, line 98), resulting in a “sub-optimal launch” and the inability “to regain momentum” (P7, line 117). As a result, it is essential, as highlighted by one Delphi group respondent, to “focus on the launched product” (P5, line 106) and to “know the customers’

needs” (P9, line 52), as highlighted by non-state-regulated, market-related scientific pharmaceutical marketing research.

As a result, it was stated by the respondents that, in order to ensure market success, a “strategic long-term clinical development plan, a strategic positioning and messaging plan building on a clinical plan, strong pre-launch activities in line with the strategy, a stable and dedicated marketing, sales, medical and regulatory teams, an efficient marketing mix and a good story that is easy to tell are required” (P5, line 28-30; P6, line 111-113; P7, line 44-49). Consequently, it can be concluded that strong pre-launch activities seem to have an impact on sales (revenue) increases during the launch phase. However, the question remains as to which marketing activities (marketing mix and its marketing instruments) should be applied. As a result, more research is required in order to investigate these activities in the context of a state-regulated market.

4.2.3.2. Product

In summary, regarding promotion policy, the applicability of a pharmaceutical drug for a specific need is the most important criterion. In order to gain a differentiated product against competitors, innovativeness is required. Furthermore, it was highlighted that product properties such as therapeutic efficacy, a low or tolerable side-effect profile, packaging and labelling are of relevance. Additionally, because a producer’s reputation is associated with confidence, product brand is of importance. Despite confirmation by the non-state-regulated, market-related scientific, general marketing and pharmaceutical marketing literature, the relevance of packaging, not covered by scientific research, was mentioned.

It was discussed by the focus group, and is shown in the non-state-regulated, market-related scientific pharmaceutical marketing literature (see also Brassington and Pettitt, 2007; Dogramatzis, 2002), that applicability for a specific need is the most important criterion when

a product choice is made. This was also supported by the Delphi group, in that a pharmaceutical drug has to solve a biological problem. This is underlined by the answer of one Delphi group respondent, who stated that “if the drug reduces or heals the issue faster or more comfortably than a comparable drug, then preference is given to the first drug” (P3, line 11-14). Therefore, it is relevant for a pharmaceutical company “to have the ‘right’ drug at the right time” (P4, 61-62), in order to “cover the needs of and to provide clear advantages for patients (consumers) and doctors (costumers)” (P6, line 68; P9, line 52) by “developing a highly innovative and differentiated product” (P7, line 43-44). This is in line with Tellis and Golder’s (1996) non-state-regulated, market-related findings, which determined that product innovativeness is essential to gain unique attributes for a high market share (Berndt et al., 1997) and important for early market entrants. However, according to Cooper and Kleinschmidt’s (1993, p110) non-state-regulated, market-related research, ‘innovativeness has a modest impact on success’.

Consistent with the non-state-regulated, market-related literature (Cooper and Kleinschmidt, 1993; Sharp et al., 2001), as well as the focus group, product properties are of high relevance when a purchase decision is made. This is also supported by the Delphi group. Consequently, it was mentioned by seven participants that a good drug should show high therapeutic efficacy and a low or tolerable side-effect profile (P5, line 28; P8, line 83; P4, line 62-63; P1, line 55; P3, line 95; P2, line 6; P6, line 31-32). This statement was supported by the focus group, as well as by Gonul et al. (2001) in their non-state-regulated, market-related research. They concluded that product properties come first when choosing a product. In addition, good packaging and labelling is important. This is relevant especially because these are the “causes of 30 to 40% of drug recalls” (P4, line 64; P7, line 74). This statement cannot be supported by the scientific literature; however, “over-packaging should be avoided” (P7, line 75).

Regarding branding in general pharmaceutical marketing, there are two fundamental strategic approaches present: branding and the me-too strategy (see also Brassington and Pettitt, 2007; Dogramatzis, 2002). The importance of branding was pointed out by one Delphi group participant. Furthermore, it was stated that “the producing company with its company name and culture is responsible for the product and thus creates general public trust” (P6, line 40-41). This is supported by Flechter’s (1989) non-state-regulated, market-related findings and the statements made by the focus group, who pointed out that a producer’s reputation and the resulting confidence play an important role for the purchaser. Therefore, it is important “to achieve quickly a high product brand awareness and image” (P6, line 41-42). However, the Delphi group respondent stated that a me-too strategy is not effective. This has already been questioned by Schmalensee (1982).

In summary it can be concluded that product confidence that might be gained by quality criteria, as well by product awareness, seems to be of high relevance according to the focus group. This is also partly in support of the Delphi group statements. However, additional research is required in order to provide more clarification in the context of a state-regulated market.

4.2.3.3. Place (Distribution)

It was mentioned by one Delphi group respondent that “product accessibility” is of high importance (P3, line 19-21). It is therefore imperative to ensure a “fast and complete distribution and a good availability and visibility at the sales channels”, leading to a “fast and high penetration among the target audience” (P6, line 38-39). However, according to the non-state-regulated, market-related literature, distribution does not play an essential role in pharmaceutical sales (revenue) success (Cooper and Kleinschmidt, 1993; Ghosh et al., 1983; Smith, 1983) and was not discussed by the focus group, although different distributional mix

strategies are discussed in the general marketing literature (see also Brassington and Pettitt, 2007; Dogramatzis, 2002). The Delphi group statements supported non-state-regulated, market-related, scientific, general marketing and pharmaceutical marketing literature. It has to be added that there is no room for distributional variations in the state-controlled Swiss market. Prescription pharmaceuticals are distributed via wholesalers to pharmacies, hospitals and self-dispensing physicians (costumers), and no alternative channels can be used. Therefore, distribution will not be investigated further in this research.

4.2.3.4. Promotion

Regarding promotion policy, it can be concluded that it is essential to make “as much noise as possible” (P6, line 42) and to have a “simple and logical sales story” (P6, line 68). Three main promotional instruments were mentioned by the Delphi group members: personal selling and advertising such as scientific documentation, patient (consumer) information and public relations. It was highlighted that, for personal selling, the professionalism of the salesforce following a marketing strategy containing an integrated call plan is important. However, it was pointed out that the appointment of sales visits is a challenge. Despite confirmation in the non-state-regulated, market-related, scientific, general marketing and pharmaceutical marketing literature, some new aspects, not covered by scientific research, were mentioned. It was stated that the success of marketing lasts only for a certain period and is therefore time-related.

The importance of promotional activities in pharmaceutical marketing has been shown by non-state-regulated, market-related, pharmaceutical marketing research (Bond and Lean, 1977; Kremer et al., 2008). In support of these findings, it was pointed out by one Delphi group respondent that one of the main aims of pharmaceutical drug promotion is to make as much “noise as possible” in order to become “top of the mind” (P6, line 42; P3, line 17-18)

and to generate more prescriptions (P2, line 93). It was concluded by Robinson and Fornell (1985, p316) that late market entrants especially have to ‘shout louder to be heard’. Therefore, it is essential to have a “simple and logical sales story” (P6, line 68) and “convincing arguments” (P9, line 52).

The relevance of personal selling was discussed by the focus group and in the non-state-regulated, market-related, scientific literature (see also Kremer et al., 2008; Manchanda, 2005; Mizik and Jacobson, 2004). This issue was also raised by one Delphi group respondent, who stated that, regarding personal sales, one important sales (revenue) success factor is the “professionalism of the salesforce, being enthusiastic, highly motivated and having a good level of product knowledge” (P2, line 7-8). This statement is supported by non-state-regulated, market-related, scientific research (Gillis et al., 1998; Saxe and Weitz, 1982; Parsons and Adeele, 1981). Furthermore, according to one Delphi group respondent, it is important that “sales follow a marketing strategy” (P4, line 24-25). Consequently, it is necessary to “implement an integrated call plan considering the number of sales calls, frequency of visits and accompanying supporting activities such as direct mailings, etc.” (P2, line 8-9, P4, line 26-27). This is in line with Gonul et al.’s findings (2001). Nevertheless, it is a challenge for the sales representative, as pointed out by three participants, to get “sales appointments” (P2, line 58-59; P9, line 84; P5, line 66-67). This statement supports the conclusion derived from the focus group, but it is not covered by research.

Another critical aspect to be considered is human resources. According to one participant’s statement, there is a current unsatisfactory situation within the pharmaceutical business regarding the “high turnover of staff (every 1.5 - 2 years), leading to a young, inexperienced team and a non-dedicated salesforce and management” (P5, line 105), thus “having a negative impact on customer interface and knowledge transfer” (P8, line 80-81). This statement cannot be supported by the scientific literature.

Only the Delphi group mentioned direct-to-prescriber (costumer) (DTP) promotional measures. It was highlighted that an appropriate “promotion mix has to be set up containing mailings, journal advertisements and conference activities” (P2, line 9). Pharmaceutical marketing mix strategies are discussed in the general marketing literature (see also Brassington and Pettitt, 2007; Dogramatzis, 2002). Additionally, the relevance of scientific documentation, as shown by a non-state-regulated, market-related, pharmaceutical marketing study, was highlighted by one participant: “The producer has to document the scientific outcomes and proven evidence of seriously conducted medical trials, particularly for the medical environment” (P6, line 32-34). The importance of scientific-oriented documentation has already been pointed out by Avorn et al. (1982) and Azoulays’ (2002) in their non-state-regulated, market-related research, as well as by the focus group. It has to be ensured that “transparent, understandable and complete patient (consumer) information is given” (P6, line 37-38).

In summary we can refer to one participant’s statement that “success by marketing has a short life time” (P8, line 121-122) (see also the general marketing literature: Brassington and Pettitt, 2007). Furthermore, it should be ensured that “no over or under-spending” in marketing takes place (P5, line 65). The relevance of this aspect has already been discussed by the focus group and the non-state-regulated, market-related, scientific pharmaceutical marketing literature (Manchanda and Chintagunta, 2004). As already suggested earlier by the focus and Delphi groups, promotional marketing activities seem to have a high relevance for launch activities and product confidence building. Therefore, additional research will be conducted in this respect.

4.2.3.5. Price

For pricing policy, it can be summarised that a customer's buying power plays a central role. Consequently, the affordability of a medical drug has to be considered. On the other hand, high margins are financial incentives and can motivate doctors (costumers) to prescribe a specific medication. As a result, it can be expected that pricing will become more important. The Delphi group statements are supported by the non-state-regulated, market-related, scientific, general marketing and pharmaceutical marketing literature.

The controversial role of pricing is discussed in the literature. According to Lexchin (2009, p145), 'doctors (costumers) are generally ignorant regarding the price level of pharmaceutical drugs'. However, as pointed out by Muehlemann (2005) and the focus group, the doctor and the patient (consumer)'s (see Brassington and Pettitt, 2007) price awareness will rise when financial incentives are given. Furthermore, the price affordability of a pharmaceutical drug for the payer is an important aspect when the price level is set, as described in the general marketing literature (see Brassington and Pettitt, 2007). This was also highlighted by some of the Delphi group members, who stated that, regarding pricing, the customer's buying power is of relevance: "The customer must be able to pay for the drug (either through healthcare insurance or by personal assets)" (P3, line 14-15). Nevertheless, it was revealed by Copper and Kleinschmidt's (1993) non-state-regulated, market-related, scientific pharmaceutical marketing research that a low-price strategy is generally not effective. In addition, it was emphasised by one Delphi group respondent that it is important to provide a high margin as a financial incentive to sellers. The relevance of financial incentives is shown by Sutherland et al. (2008) in their non-state-regulated, market-related research and was discussed by the focus group. However, these margins are "under pressure due to increased price control from governments, consumer protection organisations, parallel imports and generic (competitive) products" (P7, line 76-79; P2, line 6; P6, 108-109). Consequently, as stated by one

participant, Swiss pharmaceutical drug “prices will become the most important issue in the future” (P1, line 55-56).

In conclusion it can be said that pricing plays a special role in the state-controlled Swiss market. On the one hand, the price level is defined by a governmental body (Swissmedic) but is usually negotiated in the first place by the pharmaceutical companies. Medical drug prices remain fixed and are seldom altered after a review that takes place within three years by the Swiss Federal Office of Public Health (www.bag.adim.ch). This is despite the fact that the medical drug is sometimes sold at a remarkably lower price in other markets. In addition, pharmaceuticals cannot be imported (prohibition of parallel imports). Consequently, as an example, Swiss medical drug prices are on average 50% higher than in Germany (Tagesanzeiger, 2012). Furthermore, self-dispensing physicians (costumers) as well as pharmacists are motivated to prescribe the more expensive drug to bolster their income, which is generated by their own medical drug sales business. As a result, there is a need for further research on the role of pricing in this specific restricted market.

4.2.4. Round One Summary of the Delphi Group Study

The analysis of the Delphi round one study answers revealed seven factors related to prescription decisions. It was highlighted by the Delphi group respondents that early market entry is important for the doctor’s prescription information (see also Lean and Bond, 1977; Castro and Chrisman, 1995; Kardes and Kalyanaram, 1992; Jaakkola and Renko, 2007; Rodgriuez-Pinot et al., 2008). In addition to this it was mentioned that product confidence building (see also Flechter 1989) is of relevance. Furthermore, it was pointed out that the product applicability for a specific need, given by the product’s properties, is an essential criterion (see also Brassington and Pettitt, 2007; Dogramatzis, 2002). Another decisive factor is product knowledge level. It was stated that by employing promotional measures and

making “as much noise as possible”, through channels such as personal selling and advertising, the product would be present in the prescriber (costumer)’s mind. The Delphi group members also emphasised the relevance of affordability for the buyer (see Brassington and Pettitt, 2007), as well as a good margin for maximising the personal financial benefit of making the purchase decision (see also Sutherland et al., 2008). Consequently, the following process model can be presented (Figure 4-3).

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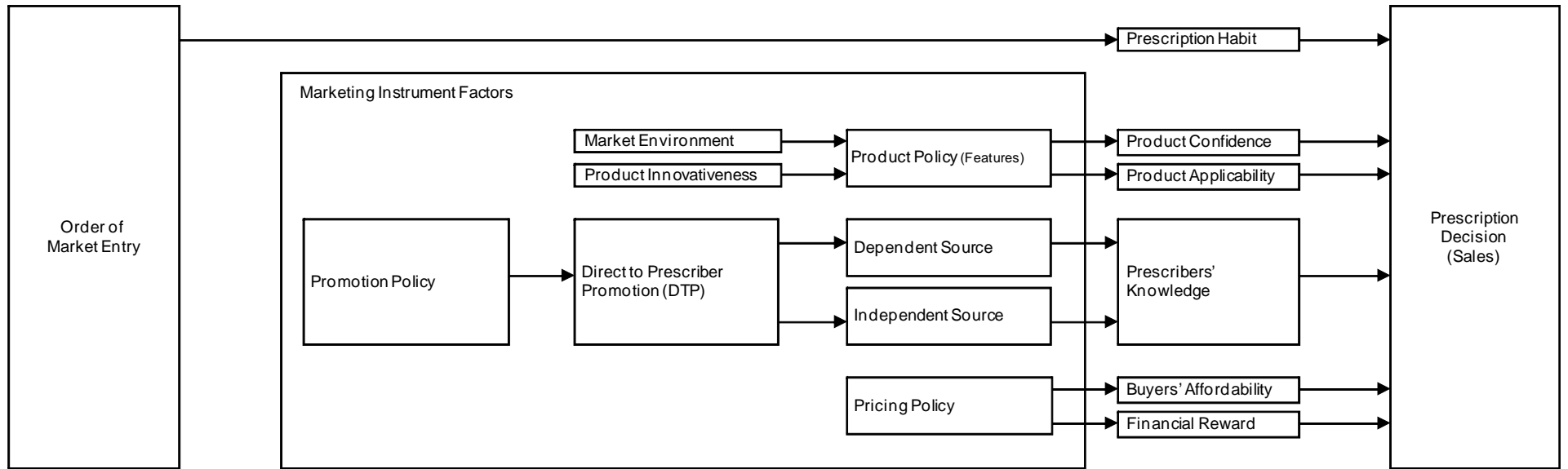


Figure 4-3: Prescription Delphi group round one decision process model

In addition, the Delphi group round one study participants' answers were analysed for content (see also Krippendorff, 2003; Martin and Bateson, 2007) and frequency, then summarised and categorised in line with the marketing mix instruments “product”, “promotion” and “price” [according to McCarthy and Perreault's (1960) 4Ps concept]. An overview of all of the results derived from the Delphi group study is presented in Table 4-2. The number of responses is also provided.

Marketing Categories	Variables	Round 1 Study 11 participants
		number of responses
Product	Safety and Side Effects	5
	Tolerability	1
	Packaging	4
	Clinical Study Results III (Applicability)	1
	Clinical Study Results IV (Applicability)	1
Promotion	Personal Selling	10
	Word-of-Mouth	2
Price	Price Level	2
	Reimbursement from Insurance	1

Table 4-2: Relative importance, response rate and standard deviation of pharmaceutical marketing variables in round one

4.2.5. Rounds Two and Three: Delphi Group Findings and Analysis

In the second round of the Delphi group study, marketing variables derived from the systematic literature review and the focus group study were further investigated. Therefore, a differentiation analysis, comparing the outcomes from the systematic literature review, focus group and Delphi group round one study, was performed. There was generally a quite high similarity between the results derived from the studies. However, the Delphi group round one study finding (see Table 4-2) was expanded by the additional variables derived from the focus group. These are promotion as well as distributional and product policies, as indicated in Table 4-3.

The answers from the completed questionnaires (see Figure 4-1) were collated, and the number of responses (n.), relative importance (r.i.; lowest equals 0, highest equals 1), response rate (r.r.) and standard deviation (s.d.) of every single variable as shown in Table 4-3, were calculated. In general, there was high agreement within the group for most of the variables, as shown by the standard deviation. However, there was also disagreement (applied cut-off criteria: 65th percentile) within the group for some variables. This prompted further investigation in order to clarify this disagreement.

Marketing Categories	Variables	Round 2 Study			Added in Round 2 Study
		10 participants			
		r.i.	r.r.	s.d	
Product	Efficacy (Quality)	0.93	90%	0.88	No
	Packaging	0.50	90%	2.05	No
	Safety and Side Effects (Quality)	0.90	90%	0.83	No
	Tolerability (Quality)	0.79	90%	1.00	No
	Clinical Study Results IV (Innovativeness, Applicability)	0.75	70%	1.48	No
	Clinical Study Results III (Innovativeness, Applicability)	0.72	100%	1.24	No
Place (Distribution)	Hospitals	0.97	90%	0.44	Yes
	Internet	0.24	90%	0.64	Yes
	Pharmacy	0.71	70%	2.00	Yes
	Wholesalers	0.56	70%	1.88	Yes
Promotion	Word-of-Mouth	0.84	100%	1.42	No
	Personal Selling	0.79	70%	1.94	No
	Advertising	0.56	40%	1.73	Yes
	Publications in Journals (Information)	0.73	70%	1.62	Yes
	Sampling	0.71	40%	1.50	Yes
Price	Reimbursement from Insurance	0.93	70%	0.73	No
	Price Level	0.60	80%	2.10	No

n. shows number of responses - r.i. row shows relative importance (lowest 0 - highest 1)
r.r. row shows response rate - s.d. row shows standard deviation

Table 4-3: Relative importance, response rate and standard deviation of pharmaceutical marketing variables in round two

In the third round of the Delphi group study, the results from the second round were further investigated, in order to reach a consensus within the Delphi group. Therefore, the outcome from the second round was reassessed, employing a questionnaire investigating those variables showing a high disagreement. Those variables that were further investigated (8 out of 18) are indicated in Table 4-5 (last column). Again, the number of responses, relative importance, response rate and standard deviation of every single variable were calculated. The importance of pharmaceutical marketing variables is illustrated by means of standardisation

(lowest equals 0, highest equals 1) in Table 4-4. Answer sets showing contradictory opinions were discarded (34 out of 334).

Marketing Categories	Variables	Round 3 Study			Variables further investigated in Round 3
		9 participants			
		r.i.	r.r.	s.d.	
Product	Efficacy (Quality)	0.93	90%	0.88	No
	Safety and Side Effects (Quality)	0.90	90%	0.83	No
	Tolerability (Quality)	0.79	90%	1.00	No
	Clinical Study Results IV (Innovativeness, Applicability)	0.75	70%	1.48	No
	Clinical Study Results III (Innovativeness, Applicability)	0.72	100%	1.24	No
	Packaging	0.49	100%	2.15	Yes
Place (Distribution)	Hospitals	0.97	90%	0.44	No
	Internet	0.24	90%	0.64	No
	Pharmacy	0.73	78%	1.95	Yes
	Wholesalers	0.56	67%	2.17	Yes
Promotion	Word-of-Mouth	0.84	100%	1.42	No
	Sampling	0.71	40%	1.50	No
	Advertising	0.56	44%	1.73	Yes
	Personal Selling	0.80	78%	1.90	Yes
	Publications in Journals (Information)	0.74	89%	1.69	Yes
Price	Reimbursement from Insurance	0.93	70%	0.73	No
	Price Level	0.61	78%	2.19	Yes

n. shows number of responses - r.i. row shows relative importance (lowest 0 - highest 1)
r.r. row shows response rate - s.d. row shows standard deviation

Table 4-4: Relative importance, response rate and standard deviation of pharmaceutical marketing variables in round three

4.2.6. Summary of Rounds Two and Three of the Delphi Group Results

The analysis of the results of the third round of the Delphi group study indicates that a successful marketing strategy for pharmaceuticals has to consider appropriate product properties including issues such as efficacy, safety and side-effects, tolerability and packaging. Furthermore, it is vital that the product is distributed via sales channels such as hospitals, pharmacies, self-dispensing physicians (costumers) and wholesalers. In addition, the promotion policy has to contain word-of-mouth, personal selling, product applicability (indication), information, sampling and advertising. It is also essential that the drug will be reimbursed by health insurance and that a reasonable pricing level is set. A ranking of the marketing variables according to their relative importance within their marketing category is shown in Table 4-5.

Marketing Categories	Variables	Rank	r.i.	s.d.
Product	Efficacy (Quality)	1	0.93	0.88
	Safety and Side Effects (Quality)	2	0.90	0.83
	Tolerability (Quality)	3	0.79	1.00
	Clinical Study Results IV (Innovativeness, Applicability)	4	0.75	1.48
	Clinical Study Results III (Innovativeness, Applicability)	5	0.72	1.24
	Packaging	6	0.49	2.15
Place (Distribution)	Hospitals	1	0.97	0.44
	Pharmacy	2	0.73	1.95
	Wholesalers	3	0.56	2.17
	Internet	4	0.24	0.64
Promotion	Word-of-Mouth	1	0.84	1.42
	Personal Selling	2	0.80	1.90
	Publications in Journals (Information)	3	0.74	1.69
	Sampling	4	0.71	1.50
	Advertising	5	0.56	1.73
Price	Reimbursement from Insurance	1	0.93	0.73
	Price Level	2	0.61	2.19
r.i. row shows relative importance (lowest 0 - highest 1)				
s.d. row shows standard deviation				

Table 4-5: Ranking of the most important variables in pharmaceutical marketing

4.3. Summary of the Qualitative Studies

The analysis of the focus group discussion and Delphi group round one study has revealed a couple of prevalent gaps in scientific pharmaceutical marketing research.

First, the question of the applicability of research performed in a different market environment can be raised. Most pharmaceutical marketing theories and concepts highlighted by the focus and Delphi groups are described in the literature. However, most of this research was conducted in non-state-regulated, market-related markets, usually the US market. Earlier works and reviews have tended to have a limited perspective on a single aspect of marketing or sales in the sector (see also Paragraph 1.3). Thus, they do not cover adequately all aspects of the conceptual framework of “physician-targeting”. There is a need for further research in order to clarify the applicability of this research for a state-regulated (Swiss) market, which would enable the development of a market-specific “physician-targeting” model (see also Stremersch and Van Dyck, 2009).

Second, most of these theories and concepts have been investigated in single, independent studies and under isolated circumstances and different market environments, but they have not been investigated from a broader perspective.

Third, some of the mentioned theories and concepts are only vaguely or not actually described in marketing research. Regarding marketing strategy, there were a couple of new and interesting issues raised. For “product policy”, product features are relevant, but their relative importance is uncertain. Another aspect to be investigated is the fact that there does not seem to be a big difference regarding efficacy between medical drugs, resulting in a lack of differentiation between products. However, the relative importance between these variables is uncertain. Furthermore, the importance of packaging and the risk of over-packaging were emphasised. The influence of packaging on sales (revenue) is another criterion that should be investigated. Moreover, the Delphi group concluded that the applicability of a pharmaceutical drug for a specific need is the most important criterion (see also Cooper and Kleinschmidt, 1993; Sharp et al., 2001). In order to differentiate a product from its competitors’, innovativeness is required. Furthermore, it was concluded that product confidence is of significant importance. Consequently, the variables (1) quality (efficacy, safety and side-effects, tolerability) (2) indication (product applicability) and (3) packaging were regarded as being relevant. These results are supported by several researchers (Smith, 1983; Flechter, 1989; Dogramatzis, 2002).

As stated by the Delphi group members, product accessibility within a particular territory is an important factor. Therefore, product distribution should include sales channels such as (1) hospitals, (2) physicians (costumers) and (3) pharmacies as an important factor. The internet (4), as an additional (unofficial) sales channel for prescription drugs, was of less relevance (see also Brassington and Pettitt, 2007; Dogramatzis, 2002). However, it has to be emphasised that there is no room for distributional variations in the state-controlled Swiss market.

Prescription pharmaceuticals are distributed via wholesalers to pharmacies, hospitals and self-dispensing physicians (costumers), so no alternative channels can be applied. Therefore, distribution policy will not be investigated further in this research.

Regarding “promotion policy”, there were controversial statements regarding the effectiveness and the likelihood that sales representatives are welcomed by physicians (costumers). In addition, additional promotional activities such as direct mailing and advertisements seem to have an effect on personal sales effectiveness. Furthermore, it was stated that promotional activities have a lifespan and over-promotion should be avoided. Additionally, the Delphi group highlighted that, for personal selling, the professionalism of the salesforce following a marketing strategy containing an integrated call plan is important. However, it was pointed out that arranging sales visit appointments is a challenge. It should be understood that the salesperson has a certain level of influence over the doctor in terms of fulfilling their mission as an information supplier. These results are in line with the study from Pitt and Nel (1988), which produced similar results. Pitt and Nel studied factors influencing the prescription behaviour of 210 general practitioners (costumers) in Australia. They suggested that, of the marketing tools available to the pharmaceutical firm, personal selling is the most powerful. Furthermore, the relevance of personal selling is also supported by Black (2005, p119), who states that in ‘order to influence prescription choice by multi-faceted education-based strategies, personal selling is the most effective one’. Consequently, the following additional promotional marketing variables were indicated as being essential: (1) word-of-mouth, (2) personal selling, (3) communication of phase IV/III clinical study results, (4) journal publications, (5) sampling and (6) advertising (see also Brassington and Pettitt, 2007; Dogramatzis, 2002). It has to be added that the expenses for opinion leader directed promotion as well as word-of-mouth directed promotion are not separated and therefore cannot be tested separately. Furthermore, sampling will be viewed as a part of personal selling activity and also will not be separately tested.

For “pricing policy”, it can be summarised that the customer’s buying power plays a central role. Consequently, the affordability of medical drugs has to be considered. However, medical drugs in Switzerland are usually covered by health insurance. Furthermore, high margins are a financial incentive and can motivate doctors (costumers) to prescribe a specific medication. Nevertheless, the price level seems, even when considering continuously rising healthcare costs (Henry, 2004; Kaech, 2004), to be viewed as less important. This phenomenon can also be explained by the fact that ‘the ones who make the decisions are not identical with those who receive the service and/or pay for it’ (Harms et al., 2002, p147).

Furthermore, the influence on the study outcome caused by the participants’ involvement in pharmaceutical marketing process was evaluated (please see also Figure 4-1). The statements contributed by the participants ‘being more directly involved’ were based on their practical experience. In contrast, the statements given by the participants ‘not being directly involved’ and therefore being less biased/influenced by the pharmaceutical industry were more independent/unbiased. In addition to this, the ‘position of responsibility’ as well as the participants ‘educational background’ had an influence on the group members’ contribution too. The participants being involved in more ‘managerial position’ could contribute in terms of strategic issues, whereas those involved in more operational positions could contribute with practical statements. The Delphi group members with practical experience have provided direct from the field insights whereas a more academic perspective was given by the other participants. Furthermore, participants with a higher ‘number of years of experience’ have also given an input that was based on their long term pharmaceutical marketing experience. In summary it can be concluded that the Delphi group was a well-balanced mix of healthcare professionals with different managerial, operational, practical and academic perspectives providing interesting insights to the Swiss prescription pharmaceutical market.

Because this empirical qualitative study has focused on the Swiss pharmaceutical market, it is not surprising that the resulting pharmaceutical marketing mix instruments differ from those derived from the systematic literature review. This discrepancy can be explained by the different market environments, as discussed in Paragraph 1.1.3.

4.4. Deriving Hypotheses

In this paragraph, the conclusions that have been derived from the systematic literature review (see Chapter 2) will be re-examined in the light of the additional qualitative data gathered.

Hypotheses will be proposed and a conceptual model delivered. This will enable the conceptualisation of the dimensionality of pharmaceutical marketing instruments to clarify the influence of pharmaceutical marketing instruments on “physician-targeting”, leading to an increase in sales (revenue), as given by the research objectives.

In general, as well as in the pharmaceutical marketing literature covering mainly the U.S. market, it is described that the prescription decision [sales (revenue)] (dependent variable) is guided by order-of-market entry (independent variable) (Urban et al., 1986; Berndt et al., 1997; Kalyanaram and Urban, 1992; Lean and Bond, 1977; Golder and Tellis, 1993). These authors established a positive relation between these variables. Furthermore, it is shown in the scientific literature (Kardes and Kalyanaram, 1992), and was confirmed by the focus and Delphi groups, that this is caused by habit formation (prescription habit). So far, no research has been published investigating the effect of order-of-market entry in state-regulated pharmaceutical markets. Because of the importance of order-of-market entry, there is a need for research, in order to clarify whether the same effect takes place in this specific market environment. Consequently, the following hypothesis can be derived, hypothesising a similar relation that takes place in non-state-regulated markets:

H1: The earlier a market entrant enters the market, the higher the sales (revenue) will be.

It was stated by the focus and Delphi groups, and is described in the general marketing and pharmaceutical marketing literature, that product features (defined as a set of marketing measures) (see also Cooper and Kleinschmidt, 1993; Kotler, 2006 and 1998; Sharp et al., 2001; Dogramatzis, 2002) play a central role in a physician (costumer)'s prescription decision (dependent variable), thus suggesting a positive relation. Furthermore, it was stated by the focus group that product confidence is relevant for the physician (costumer)'s prescription decision (sales (revenue)) (see also Flechter, 1989). Therefore, it can be hypothesised that:

- H2: Medical drugs with fewer drug interactions with other drugs are more likely to be prescribed by practitioners (costumers).
- H3: Medical drugs with lower side-effects are more likely to be prescribed by practitioners (costumers).
- H4: The better the medical drug's perceived product quality, the more likely the medical drug will be prescribed.
- H5: Medical drugs with more feasible packaging are more likely to be prescribed by practitioners (costumers).

Furthermore, it was stated by the focus and Delphi groups that the patient (consumer)'s price sensitivity is of relevance (see also Brassington and Pettit, 2007; Dogramatzis, 2002). As a result, physicians (costumers) are also confronted with this issue and its influence on their prescription decision (sales (revenue)). Therefore, the "price level" (the affordability of a medical drug) is an important variable in any pricing policy. Furthermore, the focus group concluded that financial reward (seller's margin) is relevant when it comes to the prescription decision. However, Lexchin (2009, p145) noted that 'doctors (costumers) are generally ignorant of both relative and absolute prices of medications'. Based on the existing research and actual findings, the interaction between these variables is quite unclear, so further investigation is required. Nevertheless, a negative relation between the "price level" and the

“prescription decision [sales (revenue)]” variable is suggested, which is in line with market theory suggesting (see also Arnold, 2008) a negative relation between volume and price within a non-regulated (ideal) market.

H6: Medical drugs with a lower price (price level) are more likely to be prescribed by practitioners (costumers).

The general marketing literature (Brassington and Pettit, 2007) and scientific literature (Bond and Lean, 1977; Kremer et al., 2008) describe that promotional expenditure have a significant and positive effect on sales (revenue) in pharmaceutical markets. This was also confirmed by the focus and Delphi groups. It was emphasised that it is important to make a lot of noise in the market, in order to ensure that the product is present and prescriptions are made. It has to be added that sampling is viewed as a part of the personal selling activity and will therefore also not be separately tested. Furthermore, available market data, as discussed in the next chapter, do not distinguish between direct-to-physician (costumer) (DTP) directed expenditure and direct-to-opinion leader- as well as word-of-mouth-directed marketing expenditure. Therefore, the following hypotheses, suggesting a positive relationship between the independent and the dependent variable, are proposed:

H7: Better promoted medical drugs are more likely to be prescribed by physicians (costumers).

H7a: An increase in personal selling activities will positively influence the number of prescriptions.

H7b: An increase in medical drug mailings will positively influence the number of prescriptions.

H7c: More advertising has a positive influence on the number of prescriptions.

It has previously been revealed by the Systematic Literature Review (see Chapter 2.8.3) as well as by the focus (see Chapter 3.2.4) and the Delphi group study (see Chapter 4.2.3.3) that

there is no room for variations in distributional (place) marketing measures in the state-controlled Swiss market. Prescription pharmaceuticals are normally distributed via wholesalers to pharmacies, hospitals and self-dispensing physicians (costumers), and no alternative channels are used. Therefore, the influence of the marketing mix element of distribution (place) on the prescription decision will not be further investigated in this research. Consequently, this instrument has not been included in the conceptual model and no hypotheses have been derived.

Since the sales (revenue) of the leading therapy categories (medical drug class) within the total pharmaceutical market sales (revenue) predominate, most pharmaceutical companies conduct research in closely related therapeutic areas, often employing similar technological approaches, which inevitably leads to strong competition in those market segments and to different peculiarities of the specific drug class.

4.5. Deriving a Conceptual Physician-targeting Model

Taking this into consideration, the following conceptual “physician-targeting” model is presented (Figure 4-4).

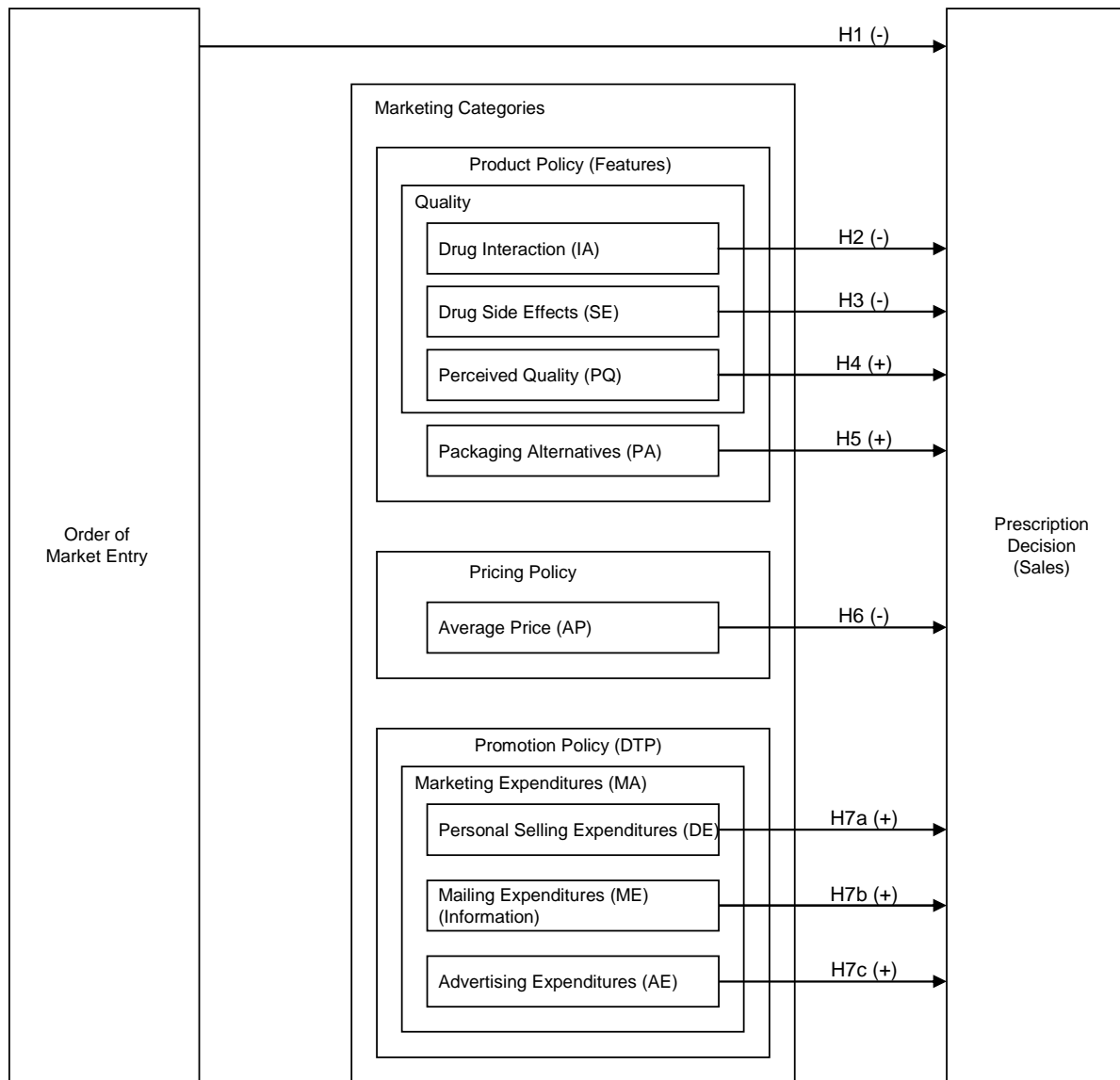


Figure 4-4: Conceptual physician-targeting model

4.6. Limitations

The main limitation of the focus and Delphi group studies lies in the fact that these methods can never guarantee a distortion-free picture. Although the methods used strive to produce consensus among experts, even an expert judgement may not always be objective (see also Haeder and Haeder, 2000; Hill and Fowles, 1975; Linstone and Turoff 1975; Lock, 1987; Parenté and Anderson- Parenté, 1987; Stewart, 1987; Rowe et al., 1991). However, because of their broad professional and academic experience, valid and reliable responses can be assumed from the participants. Furthermore, it is the nature of the Delphi group and focus group techniques that the sample size is relatively small and therefore not broadly representative (focus group n = 5, Delphi group n = 11). As such, the results cannot be interpreted as definitive or as representative of the industry due to the limitations of the size of the panel of acknowledged Swiss experts providing prescriptive advice.

4.7. Conclusions of the Qualitative Study

In this chapter, a conceptual “physician-targeting” model was created, based on the conclusions derived from the systematic literature review and the focus and Delphi group findings. The qualitative data provided evidence of the relevant marketing factors and substantive aspects in the Swiss prescription pharmaceutical market, as previously found in the scientific literature. A serial research study was undertaken, examining essential marketing success factors by means of two qualitative studies and by applying focus group and Delphi survey techniques. Swiss healthcare professionals in middle and senior management positions (focus group n = 5, Delphi group n = 11) were asked to voice their personal opinions regarding the importance of various factors that might influence the turnover of prescription drugs. The fundamental findings garnered from the systematic literature review were used for the Delphi group survey set-up. To reach a consensus within

the Delphi group, a three-step interactive procedure was applied. For the evaluation of the focus group results and Delphi group round one study, a content analysis was performed. The results of the Delphi study were investigated, using descriptive statistics. The present study ultimately yielded a ranking of marketing instruments perceived to be important in the marketing of pharmaceuticals in Switzerland, and then derived hypotheses to provide a robust basis for further research.

In the next chapter, this model will be validated by applying statistical methods employing Swiss prescription pharmaceutical market data and focusing on specific markets.

5. Statistical Market Data Analysis

5.1. Introduction

In this chapter, the secondary market data provided by a Swiss market research company are prepared for analysis, using Excel and statistical analysis software (SPSS). For this purpose, the data delivered on twelve spreadsheets were combined and cleaned. Some of the missing (product property-related) variables were acquired from different sources. In total, a dataset containing thirteen relevant variables was derived. In the next step, the data were tested for their quality. For this purpose they were checked for outliers, missing values, arithmetic mean, variance, standard deviation and normal distribution. The analysis of the data revealed a multi-level structure. As such, appropriate analysis methods were designed and employed.

5.2. Analysis of Secondary Data

In the literature, secondary data analysis is defined as any further analysis of an existing dataset, which presents interpretations, conclusions or knowledge in addition to, or different from, those produced in the first report on the inquiry as a whole and its main results (Hakim, 1982). Moreover, it involves the analysis of someone else's data: a collection of data obtained by another researcher which is available for re-analysis (Sobal, 1981). Furthermore, as stated by Smith (2008, p324), 'this involves using the original, or novel, research questions, statistical approaches and theoretical frameworks and may be undertaken by the original researcher or by someone new'. Despite a number of methodological concerns, as highlighted by Smith (2008), 'a relatively large proportion of numeric papers in the "Sociology" as well as in "Life Science" have applied secondary data analysis' (Smith, 2008, p327). A review of the published output of eight mainstream and well-regarded journals was undertaken by Smith

(2008). This research revealed that about one-quarter of all papers reviewed adopted some form of quantitative method (492 out of 2016), and of these around 41 per cent (202 out of 492) used secondary data analysis (Smith, 2008).

The use of secondary data has outstanding advantages over using primary data. According to Smith (2008, p328), 'it allows researchers to access data on a scale they could not hope to replicate first hand and enables the researcher to access data that is usually of highest quality'. The usage of secondary data for scientific research has also been justified by Booth et al. (2008), especially in the case where these data are not easily available from a primary source. For the present work, it would not have been feasible, because of a lack of access to the required information channels, to collect the sort of information provided by the market data. Therefore, it is suggested that, before undertaking any primary research, study marketers should complete an exhaustive search of secondary data sources (Cross, 2000). In order to support this statement we can refer to Castleberry (2001, p195), who asks 'Why create knowledge using primary data collection, if that knowledge already exists and can be found using secondary data?'

However, as by Young and Ryu (2000, p303) emphasised, 'there are many limitations that have to be managed when a secondary analysis is performed'. Furthermore it was highlighted by Young and Ryu (2000, p303) that researchers must be thoroughly familiar with the dataset, in order to select appropriate proxy measures for their study's concepts and to avoid the temptation to measure concepts not well-represented in the data.

In summary, despite existing methodological concerns regarding the usage of secondary data in scientific research, and because of the need for market data in the present work, this research can only be conducted by using secondary data. This can be justified by the requirement given by the research, in that market data should provide as complete as possible a body of marketing-related information for a certain period (in this case, ten years).

Furthermore, it is not easy to collect market data for a non-market involved institution such as a university. Therefore, these data had to be gathered from a specialised market research institute.

5.3. Data Collection Method

In order to test the previously derived hypotheses (see Chapter 4), secondary and primary data were applied. In this section, the methodology behind the data collection is presented.

5.3.1. Secondary Data Collection

The data were collected by the Swiss market research company via an associated network of associated doctors (costumers), pharmacists and wholesalers. Medical drugs sales (revenue) transactions were gathered on a monthly basis from pharmaceutical companies, wholesalers, hospitals, pharmacies and dispensing physicians (costumers). For this purpose, a questionnaire inquiring about the required market data was mailed on a regular basis to participants, who were compensated financially for their efforts. Several restraints regarding usage, publication and confidentiality had to be made, as will be discussed later. The market research company in Switzerland is a leading market data provider and business consultant in the pharmaceutical and healthcare industry, with over 100 subsidiaries world- wide (for further information, please see also www.imshealth.ch). These data cover five prescription pharmaceutical drug classes, containing sales (revenue) information on 37 substances from 108 medical drug products for the period 1995 to 2005. However, because the provided dataset was incomplete, additional data such as “drug side-effects (SE)”, “drug interaction (IA)” and “defined daily drug dose (DDD)” had to be taken from alternative sources. They are freely available and were gathered from the Swiss agency for the authorisation and

supervision of therapeutic products (www.kompendium.ch) and the WHO Collaborating Centre for Drug Statistics Methodology (www.whocc.no).

5.3.2. Primary Data Collection

No data regarding “perceived drug quality (PQ)” by doctors (costumers) were available. Therefore, primary data for this measure had to be collected. In a first step, a questionnaire was designed (see Appendix 9). In the first section of this questionnaire, a brief introduction to the research and survey was made. Furthermore, a confidentiality statement and the approximate time of participation were given. This questionnaire was previously pre-tested within Aston University. In the second section of the survey, the participants were asked to rank the medical substance on a semantic scale (1-9, not efficient to highly efficient, or no answer) as perceived by the participants. A comment section was also included. Because market data are not restricted to a specific application, no restriction was given. Finally, the opportunity was given to add comments, as well as an email address, to participate in a prize draw to win an Ipod Shuffle and, if interested, to receive the study results.

In a second step, these questions were implemented using the online survey tool “Bristol Online Surveys” (www.survey.bris.ac.uk), in order to enable an email-directed survey approach. As already previously discussed, two parties are involved within the prescription process – the doctor, as the prescribing decision-maker, and the pharmacist, as the involved party that usually provides the medical drug to the patient (consumer), but also might change the prescription (substituting by another brand). Doctors (costumers) were segmented according to their vocational specialisation (general practitioner; internal medicine; cardiology; diabetology; endocrinology).

In the third step, the survey was prepared for distribution among pharmacists and doctors (costumers). For this purpose the Swiss Professional Society of Doctors (costumers)

(www.fmh.ch) and the Swiss Pharmacist Association (www.pharmasuisse.org) were contacted in order to provide support for the distribution. However, the medical association refused participation, but the pharmacist association agreed to distribute the survey (80 potential participants). Consequently, an alternative distribution channel had to be found. The online questionnaire was then distributed via the Swiss market research agency “Pharma Agentur” (www.pharmaagentur.ch), located in Baar (Zug), Switzerland, and reaching 6,000 medical doctors (costumers). The mail that was distributed is shown in Appendix 10. In order to motivate the participants to return the questionnaire, a prize draw was arranged. The data collection was done over a two-week period. This resulted in a total of 165 completed questionnaires (15 pharmacists, response rate 19%; 150 doctors (costumers), response rate 2.5%) and 77 incomplete questionnaires. According to a market researcher from “Pharma Agentur”, a low response rate is quite common among medical doctors (costumers). This can also be supported by the literature (Asch et al., 1997; Amerimedconsulting, 2010). However, the response rate is also highly dependent on institutional reputation, as described by Sloan et al. (1997). Within the sample of participants, 29% were female, 71% male, 45% of the answering doctors (costumers) were general practitioners (costumers) and 44% internal medicine. A total of 22% of the participants were from the Zurich region, 16% from the Berne region and 10% from St. Gallen as well as Aargau. Furthermore, most of the answering participants had lengthy vocational experience (more than 20 years for 41%; 16-20 and 11-15 of 18%). Within one week, 71% of the responses were given.

5.4. Organisation and Development of the Dataset

These market data were delivered in 12 Excel files and presented in different organisational structures, as well as numeric and time formats. An overview of the delivered data files is shown in Appendix 10. This information had to be transformed and merged into a SPSS-

readable format. One challenge was that sales (revenue) data were provided on a weekly basis, whereas marketing expenses were on a quarterly basis. Consequently, marketing expenses had to be recalculated for a weekly basis. For this purpose the weekly average was taken. The merging and transformation of a vast amount of data, organised in rows containing partly incomplete information into columns, had to be performed in a cautious manner to ensure that no information was missed out or mixed up. For this purpose, the data had to be cleaned and checked for missing details and outliers. Specific Excel program routines (macros, small programmable software routines) were created and the finalised dataset was double checked. Missing data were left blank and outliers indicated. However, because the market data only covered sales (revenue), marketing and packaging information, not product features, additional data had to be gathered from alternative sources. Data on product features such as daily drug dosage were acquired from the WHO Centre for Drug Statistic Methodology (www.whocc.no). These data are freely available and can be easily downloaded from the website. In addition, data about drug interactions and the side-effects profile were taken from a database provided by Swiss prescription drugs approval authorities (www.kompendium.ch). For this purpose, the freely available information leaflet for every medical drug was downloaded and the numbers of described drug interactions, as well as side-effects, were counted. As already previously indicated, strict confidentiality was a requirement for the usage of these data provided by IMS. As a result, no actual figures can be published (i.e. as raw spreadsheet data), so substance, product name and medical drug class data have been coded accordingly (please see Appendix 11). However, the actual research is not affected by this restriction, because these data are only used for model testing and therefore do not need to be presented as raw data.

5.5. Descriptive Analysis of Individual Scales

The market dataset contains five medical drug classes in total: (1) Beta Blockers, (2) ACE Inhibitors, (3) Angiotensin II Antagonists, (4) PDE5-Inhibitors and (5) Statins. A short description of these medication classes is now given:

Beta Blockers: The market dataset of Beta Blockers [ATC Code (Anatomical Therapeutic Chemical Classification System): C07A, Beta Blocking Agents] contains eight pharmaceutical substances and 25 medical products in total.

ACE Inhibitors: The market dataset of ACE inhibitors (ATC code: C09A plain; C09B combinations) contains eight pharmaceutical substances and 30 medical products in total.

Angiotensin II Antagonists: The market dataset of Angiotensin II Antagonists (ATC code: C09C, plain) contains six pharmaceutical substances and 10 medical products in total.

PDE5 Inhibitors: The market dataset of the therapeutic category phosphodiesterase type 5 inhibitors (PDE5 inhibitors) (ATC code: GO4B3) contains six pharmaceutical substances and 60 medical products in total.

Statins: The market dataset of Statins (ATC code: C10A, plain) contains five pharmaceutical substances and 20 medical products in total. It has to be noted that the therapeutic category of Statins (members of the lipid lowering class) has been available since the late 1980s.

Therefore, no order-of-entry data are available for this medical drug category.

In order to prepare these data for statistical analysis, it was necessary to perform a test for normality and to examine the characteristics of the variables, in order to determine if these measures were appropriate for further use in hypothesis testing applications. The examination focused on the distributional characteristics of the measures, including a search for significant outliers, and the statistical testing of distributions (including frequency, interval, mean, variance, median, and standard deviation). For this purpose, graphical techniques were used to

gain a basic picture of each measure's distribution. According to Rovezzi (2002), a normal distribution on a 99% confidence level is not present if the z-score is larger than +/- 2.58. For skewness, the z-score is derived from "skewness / SQRT (6/n)", and for kurtosis by "kurtosis / SQRT (24/n)" (see also Fields, 2005).

5.5.1. General Model Variables

5.5.1.1. Order-of-Entry

This measure indicates the order-of-market entry of a specific product within a specific medical drug class. However, the order-of-market entry is not available for Statins because none was introduced between 1995 and 2005, i.e. all drugs were already on the market by 1995. It has to be noted that the ordinal order-of-market entry variable has been treated as an interval variable in the literature (see Kalyanaram et al., 1995, 1992). This is an acceptable practice, as stated by Winship and Mare (1984, p517), and 'one solution to this problem is to assume that the ordered categories constitute a continuous scale' (see also Stevens, 1946; Knapp, 1990). Furthermore, it has been highlighted by Knapp (1990, p121) that there are 'no agreed-upon rules for determining whether a particular scale is ordinal, less than ordinal, or more than ordinal resulting in a controversial discussion taking place in scientific literature, the so-called Stevens controversy' (see also Stevens, 1946). The following statistical characteristics were calculated, despite the controversial views of researchers about their relevance (see also Knapp, 1990): arithmetic mean = 9.663; median = 9.0; mode = 5; standard deviation = 5.982; variance = 35.779; range = 22. Furthermore, no missing values were found. Figure 5-1 (see Appendix 14) shows the frequency distribution. As evident, a skew towards the higher values is present. A skewness (0.521; $z_S = 1.972$) and kurtosis (-.602; $z_K = -1.140$) were calculated, which revealed that normal distribution is, according to this criterion, present. This is in support of Harwell and Gatti (2001, p112), who stated that 'ordinal data are

not continuous and cannot be normally distributed, creating problems for many statistical procedures'. Consequently, as will be discussed later, a transformation procedure will be applied (see Paragraph 5.6.5).

5.5.1.2. Sales from Factory

This measure indicates, in Swiss francs per month, the stated real sales (revenue) for a specific medical drug manufacturer. These data were provided by IMS, showing the following statistical characteristics: arithmetic mean = 354565; median = 51068; mode = 0; standard deviation = 946356 with range = 7815434. Furthermore, no missing values were found.

Figure 5-2 (see Appendix 14) shows the frequency distribution. As seen, a skew towards the higher values is present. A skewness (6.142; $z_S = 23.253$) and kurtosis (46.089; $z_K = 87.245$) were calculated, which revealed that no normal distribution is present. In addition, there also appeared to be some negative values within these data. This can be reasoned by the fact that some goods would have been returned to the producer on the indicated date. Consequently, as we shall discuss later, a transformation procedure in order to deal with the non-normal distributed data will be applied (see Paragraph 5.6.5).

5.5.2. Product Policy Variables

5.5.2.1. Interaction with other Drugs

This variable indicates interactions with other drugs within the same medical drug class. The information was taken from medical information provided by Swissmedic (www.swissmedic.ch), the Swiss agency for the authorisation and supervision of therapeutic products (see www.kompodium.ch). The total numbers of interactions were counted and

listed for each medical drug. The terminology “interaction with other drugs” is described in a medical dictionary as follows:

‘A drug interaction can be defined as an interaction between a drug and another substance that prevents the drug from performing as expected. The interaction may increase or decrease the effectiveness of the drugs’ (Day, 2007, p53).

Consequently, it can be concluded that “fewer interactions” with other drugs are more beneficial for the therapeutic success. The following statistical characteristics were indicated: arithmetic mean = 14.374; median = 14; mode = 14; standard deviation = 5.261 with variance = 27.676; range = 30; skewness = 1.233 ($z_S = 4.668$); kurtosis = 2.875 ($z_K = 5.442$). Figure 5-3 (see Appendix 14) shows the frequency distribution. It has to be concluded that no normal distribution is present. Consequently, as discussed later in Paragraph 5.6.5., a transformation procedure in order to deal with the non-normal distributed data will be applied.

5.5.2.2. Number of Side-effects

This variable indicates the side-effects of the given medical drug in regard to other drugs within the same medical drug class. Again, this information is taken from medical information provided by Swissmedic. The total numbers of side-effects were counted and listed for each medical drug. The terminology “side-effects” is described in a medical dictionary as follows:

‘An adverse effect may be termed a “side-effect“ when judged to be secondary to a main or therapeutic effect. Adverse effects may cause complications of a disease or procedure and negatively affect its prognosis. They may also lead to non-compliance with a treatment regimen’ (Day, 2007, p196).

Consequently, it can be stated that fewer “side-effects” are more beneficial for therapeutic success. The following statistical characteristics were indicated: arithmetic mean = 68.639; median = 553; mode = 107; standard deviation = 34.925 with variance = 1220; skewness = 0.434 ($z_S = 1.643$); kurtosis = -0.961 ($z_K = -1.819$). Figure 5-4 (see Appendix 14) shows frequency distribution. Taking the descriptive analysis into account, it has to be concluded that no normal distribution is present. Consequently, a transformation procedure in order to deal with the non-normal distributed data will be applied (see Paragraph 5.6.5).

5.5.2.3. Perceived Quality

This variable (range 1 to 9) indicates the efficacy of a specific medical drug as perceived by prescribers (costumers) in relation to other medical drugs within a specific drug class. At this point it should emphasised, as stated by Jamieson (2004, p1217), that ‘it has become common practice to assume that Likert-type categories (Likert, 1993) constitute interval-level measurement’ (see also Stevens, 1946 and Knapp, 1990). This information was gathered via a survey that was designed especially for this purpose. All rankings given for each substance by the participants were then added and mean average calculated, leading to the perceived quality figure. The following statistical characteristics were indicated: arithmetic mean = 4.379; median = 4.537; mode = 4.537; standard deviation = 0.544; variance = 0.296; range = 3.596; skewness = -2.429 ($z_S = -4.598$); kurtosis = 9.989 ($z_K = 37.818$). Figure 5-5 (see Appendix 14) shows the frequency of distribution. Taking the descriptive analysis into account, it has to be concluded that no normal distribution is present. As a result, a transformation procedure in order to deal with the non-normal distributed data will be applied (see Paragraph 5.6.5).

5.5.2.4. Packaging Alternatives

The variable package size was derived from the number of available package sizes. This information on the number of portions and dosage was provided by IMS. The following statistical characteristics were indicated: frequency = 109 (number of products); arithmetic mean = 4.12; median = 4.0; mode = 4; standard deviation = 1.418; variance = 2.010; range = 6; skewness = -.058 ($z_S = -0.220$); kurtosis = 0.514 ($z_K = 0.973$). Figure 5-6 (see Appendix 14) shows the frequency distribution. Taking the descriptive analysis into account, it has to be concluded that normal distribution is present.

5.5.3. Pricing Policy Variables

As previously discussed, sales price is not driven by the market, as in other pharmaceutical arenas such as the American market, but is based on a cost calculation taking into account distribution and production costs. The official sales price is set by the governmental authority (Swissmedic) based on the product's efficacy. Furthermore, a comparison with foreign markets is made and therapeutic properties are considered. Consequently, pharmaceutical companies have limited options for implementing their own price policy.

5.5.3.1. Average Price

When analysing price, it is important to perform a price standardisation test in order to enable a comparison between the different substances within a medical drug class. This is because the absolute amount of medication may vary depending on efficacy and the medications are available in different dosages and packaging units, for which price neither decreases nor increases linearly. Consequently it is not obvious which dosing measure should be compared with what. In order to derive a standardised price, the actual price, provided by IMS, for one

day's therapy was calculated by applying the "defined daily drug dose (DDD)" taken from the patient (consumer) information leaflet. The "defined daily dose (DDD)" is described by the "WHO Collaborating Centre for Drug Statistics Methodology (WHOCC)" as follows:

'A common problem when comparing drugs is that different medication can be of different strengths and different potency. DDD aims to solve this by relating all drug use to a standardized unit which is analogous to one day's worth. It is the assumed average maintenance dose per day for a drug used for its main indication in adults' (www.whooc.no/ddd/definition_and_general_considera/).

The formula for calculating DDDs is as follows:

$$Drug_Usage(DDDs) = \left(\frac{Items_issued \times Amount_of_Drug_per_item}{WHO_DDD_Measure} \right)$$

It appeared that price variation over the whole period (1995 to 2005) was low. An average price was calculated, and the following statistical characteristics were indicated: arithmetic mean = 42.756; median = 1.125; mode = 1.63; standard deviation = 254.343; variance = 64690.482; range = 1762.52; skewness = 6.422 ($z_s = 24.313$); kurtosis = 40.487 ($z_k = 76.641$). Figure 5-7 (see Appendix 14) shows frequency distribution. Taking the descriptive analysis into account, it has to be concluded that no normal distribution is present. Consequently, as we shall discuss later, a transformation procedure in order to deal with the non-normal distributed data will be applied (see Paragraph 5.6.5).

5.5.4. Promotion Policy Variables

The dataset contains marketing promotion index (MPI) data (see also www.imshealth.ch), thus enabling the analysis of marketing efficacy. The MPI contains data on three promotional marketing instruments: (1) personal selling expenditure, (2) expenditure for a physician

(costumer)'s targeted direct mailings and (3) professional advertising expenditure for magazines ads. It should be noted that sampling expenses and personal selling expenses are included, and therefore they cannot be tested separately. Furthermore, the market data do not distinguish between direct-to-physician (costumer) (DTP) directed expenditure and direct-to-opinion leaders as well as word-of-mouth directed marketing expenditure. In addition, the MPI enables the evaluation of promotional activities regarding a specific product, as well as the market and the producer, and shows standardised expenses. The data, provided by IMS, cover the sales channels 'pharmacy' and 'self-dispensing physicians (costumers) of prescription medicines' for the period 1995 to 2005.

5.5.4.1. Personal Selling Expenditure

This variable shows monthly personal selling (detailing) expenditure in Swiss francs. The following statistical characteristics were indicated: arithmetic mean = 994954; median = 60231; mode = 0; standard deviation = 2416250; variance = 5.838E12; range = 12276116; skewness = 2.994 ($z_S = 11.335$); kurtosis = 8.887 ($z_K = 16.823$). Figure 5-8 (see Appendix 14) shows the frequency distribution. Taking the descriptive analysis into account, it has to be concluded that no normal distribution is present. As a result, a transformation procedure in order to deal with the non-normal distributed data will be applied (see Paragraph 5.6.5).

5.5.4.2. Mailing Expenditure

This variable shows monthly mailing expenditure in Swiss francs. The following statistical characteristics were indicated: arithmetic mean = 58816; median = 7007; mode = 0; standard deviation = 138984; variance = 1.932E10; range = 665920; skewness = 3.055 ($z_S = 11.566$); kurtosis = 8.930 ($z_K = 16.904$). Figure 5-9 (see Appendix 14) shows the frequency

distribution. Taking the descriptive analysis into account, it has to be concluded that no normal distribution is present.

5.5.4.3. Advertising Expenditure

This variable shows monthly advertising expenditure in Swiss francs. The following statistical characteristics were indicated: arithmetic mean = 289239; median = 9306; mode = 0; standard deviation = 7.93933E5; variance = 6.303E11; range = 4939089; skewness = 4.104 ($z_S = 15.537$); kurtosis = 18.435 ($z_K = 34.897$). Figure 5-10 (see Appendix 14) shows the frequency distribution. Taking the descriptive analysis into account, it has to be concluded that no normal distribution is present. Consequently, a transformation procedure will be applied (see Paragraph 5.6.5).

In summary it can be said that none of the data show a normal distribution that is acceptable according to the requirement set by the skewness and kurtosis test. A non-normal distribution can be a quite critical issue regarding the robustness of statistical results. Consequently, this has to be taken into consideration when analysing the data. Some specific methodological approaches will have to be applied in order to be able to deal with these skewed data. Within the next sections, an in-depth description and justification of the applied methodology will be given.

5.6. Data Analysis

In this section, a descriptive analysis exploring the data will be performed. A structure analysis will then be conducted, leading to actual statistical analysis using multiple regression.

5.6.1. Data Exploration

In the first step, a sales-time diagram of two markets was produced in order to investigate patterns within the given data. This provided a first impression of the data and facilitated the planning of further analysis. As will be shown later, a relevant conclusion was derived that fundamentally guided the design of the analysis. In addition, practical aspects such as data handling could be explored as well. For this purpose, data from two markets (drug classes), ATIIR Antagonists and Statins, were explored further. The selection criteria for choosing these categories were: general practitioner's wide usage of these prescription drugs, a minimum of five drugs within the class and the availability of market share data. Data points containing missing values were removed completely from the dataset. The skewness of the data is irrelevant for the descriptive analysis.

First, a descriptive analysis of the effect of order-of-market entry on sales (revenue) for the ATIIR antagonists market was performed. The data are limited to distribution channels for pharmacies and endocrinologists from 1995 to 2005. The data of the most applied medications within two therapeutic classes were applied. As illustrated in Figure 5-11, the ATIIR antagonists market demonstrated growth up to 2005.

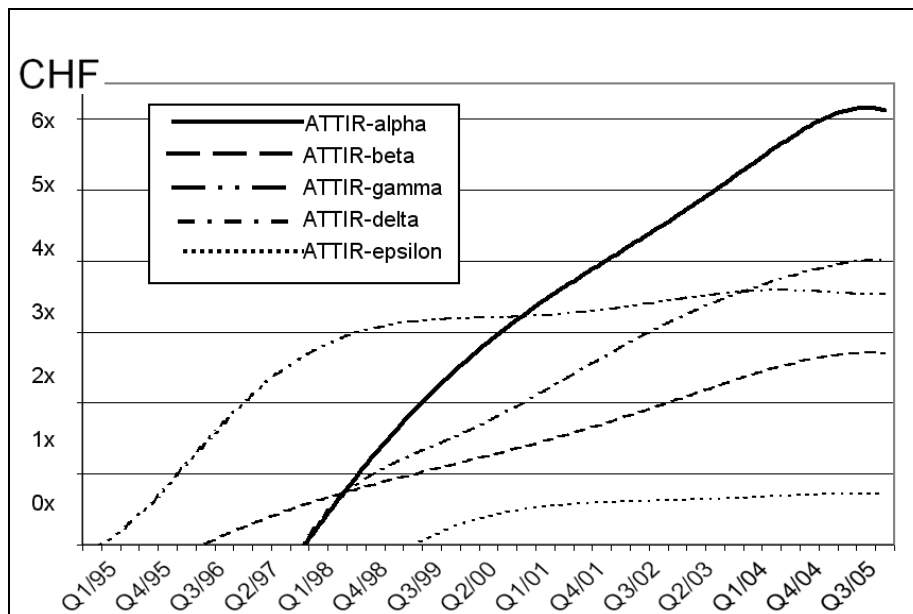


Figure 5-11: Sales of ATIIR-antagonists

For sales (revenue) volume, the curves show that, for each drug, good performance during the launch phase (see Figure 5-11) is decisive. After that, there is, for gamma and epsilon, usually not a very high increase in sales (revenue) volume. However, two medical drugs (ATTIR-alpha, delta) show especially different behaviour. The market pioneer (ATIIR-gamma) was absolutely outperformed by ATIIR-alpha. In 2004, ATIIR-alpha reached a high share and was the clearly market leader. In the same year, ATIIR-delta enjoyed higher sales (revenue) volume than ATIIR-gamma as well. In a second step, the Swiss Statins market for 1995 to 2005 will be explored (see Figure 5-12).

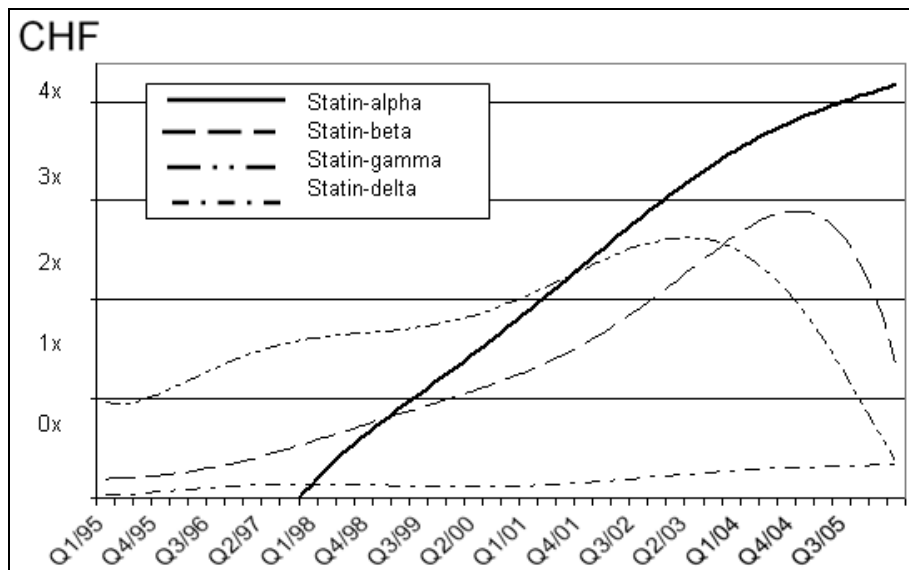


Figure 5-12: Sales of Statins

The Statins market reached its height in 2004 and collapsed for some of the drugs thereafter, which can be linked to the patent expiration of statin-gamma and statin-beta. Statin-gamma continually shows rising sales (revenue) volume and was seen as the absolute (2002) market leader. While statin-gamma had a high market share in 1995, it declined in 2005 (see Figure 5-12).

These descriptive statistics demonstrate that the order-of-market entry effect, as suggested by theory (see also Chapter 2), does not appear here, as illustrated in Figures 5-11; 5-12. In both cases, a later entrant managed to overtake the first entrant, which raises the need to ask what caused this observed behaviour. Furthermore, there are different slopes of sales (revenue) curves and different sales increases/decreases within the same time period. The observation of different slopes is not present in the marketing scientific literature. However, in economics, the idea of beta (slope) as a decisive factor is widely used. The slope is a relevant factor in the theory of price elasticity of demand (see also Arnold, 2008). Elasticity can be defined as the inversion of beta ($Elasticity = 1 / Beta$). Consequently, the implementation of an additional variable as an indicator for the slope (Beta value), in addition to the existing dependent “average sales (AS)” variable, is suggested.

5.6.2. Analysis of the Data Structure

Previously, a conceptual model was developed, a dataset presented and a descriptive analysis performed. In the following section, an analysis strategy will be designed and the formal hypotheses tested.

The data analysis revealed a hierarchical data structure. Within a medical drug class (in our case, five), multiple substances are applied (37). Some of the brands (in total 108) use the same substance (multiple brands can use the same substance, e.g. Paracetamol). Therefore, a two-level structure, containing a brand (first) and a substance (second) level, is suggested. The substance level includes “perceived quality (PQ)”, “drug interaction (IA)”, and “drug side-effects (SE)”. These data only refer to a specific substance, and there is no dependency on a specific brand (multiple brands can use the same substance, e.g. Paracetamol). The brand level, on the other hand, contains the “order-of-market entry (OE)”, “number of package alternatives (PA)”, “average price (AP)” and “marketing expenditure (MA)” as independent variables, whereas “sales” results in a dependent variable, as shown in the following illustration (see Figure 5-13):

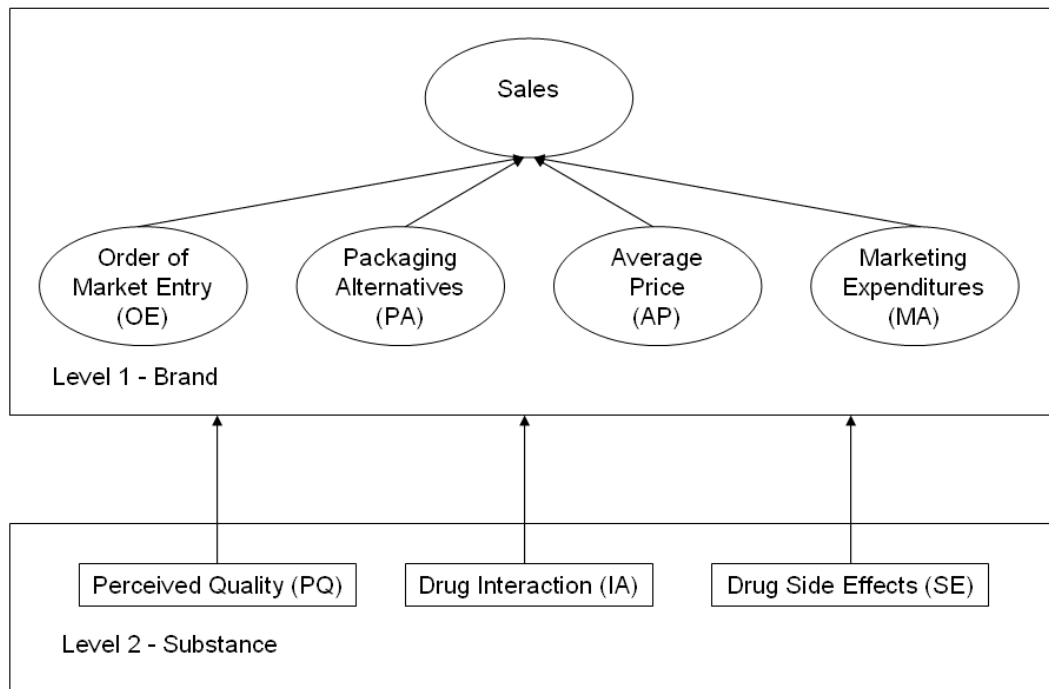


Figure 5-13: Visualisation of the data structure

5.6.3. Preparation of Data

In order to proceed with the analysis, the data were transformed into a specific format. For this purpose, relevant information on every medical product, indicating the “drug class code (DC)”, “substance code (SC)”, “brand name code (BN)”, “perceived quality (PQ)”, “order-of-market entry (OE)”, “number of packaging alternatives (PA)”, “application range (AR)”, “number of drug interactions (IA)”, “number of side-effects (SE)” was collated on an Excel spreadsheet. In addition, the “total detailing expenditure (DE)” in Swiss francs, “total mailing expenditure (ME)”, “total advertising expenditure (AE)”, the “average daily drug dose (DDD) price (AP)”, the “average of product sales (AS)” (total sales (revenue) divided by time period (time)), “beta of sales (BS)” (slope of quarterly sales expenditure (derived with SPSS, using linear regression function)) were calculated. This resulted in a dataset containing 86 data points on the brand level (first level).

5.6.4. The Analysis Strategy

There is no single best way to analyse a multi-level structure. As stated by Harrell (2001), the individual steps that a researcher should take in building a model are based on the investigator's research questions, whether the analysis is explanatory or confirmatory and whether the analytic emphasis is on parameter estimation, model fit or prediction.

In order to test the presented model (see Figure 5-13), a hierarchical linear model (HLM), also called a random coefficient model (see also Leeuw and Kreft, 1986; Longford, 1993), was considered. This methodology seemed especially suitable because, as indicated by Kozlowski and Klein (2000), the nesting of micro- and macro-level phenomena is taken into account, as well as macro-level effects that occur through interactions with micro-level elements (Kozlowski and Klein, 2000). Consequently, according to Goldstein (1995), the major advantage of the HLM is the possibility to link multiple levels simultaneously in a single regression equation. However, according to most researchers (Hox and Maas, 2002; Wieseke et al., 2008), there is a minimum sample size per level and group in order to run an HLM. A rule of thumb recommends a minimum of 30 samples per group (Bell et al., 2008; Hox and Maas, 2002; Moineddin et al., 2007). Unfortunately, the present data do not fulfil this requirement. It also has to be stated that, because of the nature of these data (secondary data for the entire market), the sample size cannot be expanded (additional data added), as there are no additional data available. Furthermore, an HLM test run confirmed the instability of the results when using this dataset. Taking structural reasons into account, these data cannot be altered and they do not fulfil the requirement of a minimum sample size. However, the advantage of using a secondary dataset containing an amount of marketing-relevant information is that it can only be collected by a professional marketer, which outweighs the disadvantages of using a more appropriate method for the analysis of multi-level structures

such as HLM. As a result, an HLM analysis cannot be applied. Consequently, a multiple regression analysis will be conducted.

A multiple regression analysis is defined by Hair et al. (1998, p20) as ‘a general statistical technique used to analyse the relationship between a single dependent variable and several independent variables’. In other words, it can be said that multiple regression is only able to test hypotheses regarding a single dependent variable. This means that the complete conceptual model hypothesised in Chapter 4 cannot be tested all at once, so multiple models must be examined instead. In this case, the application of regression analysis is viewed as the best strategy for testing the given conceptual model. In the next sections, this analysis strategy is developed and then performed.

5.6.4.1. Assumption of Multiple Regression

In order to be able to use multiple regression, a couple of requirements for the data are given. It is especially relevant that the statistical independence of observations, normality and linear relationships between the dependent and independent variables, and the equality of variance (homoscedasticity), is present (see also Hair et al., 1998; Kleinbaum et al., 1998). Several diagnostic statistics and diagrams were produced to identify outliers and to analyse the violation of assumptions, multicollinearity and the power of the test (see also Hair et al., 1998; Kleinbaum et al., 1998; Kaplan, 1995). The assumptions of normality, linearity and homoscedasticity were examined using graphical techniques (see also Hair et al., 1998; Kleinbaum et al., 1998). Nevertheless, for the data collection process, as previously described, the statistical independence of the observations can be assumed.

According to Osborne (2002), a serious violation of the assumption of normality can affect a result. Furthermore, it has to be pointed out that, according to Micceri (1989), it is not unusual that data are not distributed normally within the fields of psychology and education. For this

case, the literature suggests a data transformation procedure (see also Backhaus et al., 2003; Hair et al., 1998; Hartwig and Dearing, 1979; Osborne, 2002). However, Kleinbaum et al. (1998, p117) stated that 'only extreme departures from normality lead to spurious results'. Furthermore, in addition to individual univariate normality, multivariate normality should be assessed. Even when all individual univariate distributions are normal, it is not necessary true that multivariate distribution is going to be normal (Hair et al., 1998; Sharma 1996). However, as stated by Kleinbaum et al. (1998), multiple regression is quite robust against departures from the assumption of homoscedasticity. This statement is also supported by Hair et al. (1998), who concluded that it is not very critical for the reliability of multiple regression analysis results when the assumption of normal distribution does not take place.

Within marketing management, the assumption of a linear relation between dependent and independent variables is commonly made (see also Kotler and Keller, 2006). Consequently, because of lack of contrary evidence, all relationships are hypothesised as being linear.

Finally, because of the way this research is designed, taking into consideration the design of the data collection method, independence can be assumed.

According to Kleinbaum et al. (1998), outliers might have a negative influence on the multiple regression analysis outcome, which can be reasoned by the fact that outliers may negatively influence normal distribution. The deletion of outliers is controversial in the literature (see also Barnett and Lewis, 1994), since it might influence the results of the statistical analysis. However, based on the reason for outliers such as errors in answering questions, as well as data imputation errors, deletion might be justified. Unfortunately, there is no generally applicable strategy on how to deal with outliers (see also West et al., 1995). A range of statistical methods available on SPSS can be applied in order to identify possible outliers. The indicated outliers can be justified. They have not been caused by a measurement

or data handling error. However, the fact that outliers have been removed needs to be considered when statistical results are interpreted.

Another issue that has to be taken into account is multicollinearity. As stated by Kleinbaum et al. (1998), multicollinearity takes place when there is a significant correlation between independent variables in a regression model. Consequently, it is difficult to separate the effects of each independent variable, which results in unstable statistical results (see also Cohen and Cohen, 1975; Kleinbaum et al., 1998). One approach employed to tackle this problem is the deletion of one of the collinear variables or transforming collinear variables (see also Cohen and Cohen, 1975).

5.6.5. Operationalisation of the Multiple Regression Analysis

In this section, an analysis of the multi-level structure will be performed, using multiple linear regression. In order to test the previously presented hypotheses, a set of multiple regression equations is produced. Every equation is then examined for violation of the assumption, as already discussed in Paragraph 5.6.

5.6.5.1. Data Preparation and Assumption Test

A test for multicollinearity was performed, during which tolerance values and their variance inflation factors were examined. According to Kleinbaum et al. (1998), problematic multicollinearity can be indicated by tolerance values below 0.1 and variance inflation factors above 30. Based on the above, multicollinearity between “advertising expenditure (AE)” (tolerance = 0.138; variation inflation = 7.261); “detailing expenditure (DE)” (tolerance = 0.064; variation inflation = 15.591) and “mailing expenditure (ME)”

(tolerance = 0.1; variation inflation = 10.018) was detected. There is also a quite high correlation between these factors, as illustrated in the following table (see Table 5-1).

		DE	ME	AE
DE	Pearson Correlation Sig. (2-tailed)	1.000	.943 .000	.921 .000
ME	Pearson Correlation Sig. (2-tailed)	.943 .000	1.000	.883 .000
AE	Pearson Correlation Sig. (2-tailed)	.921 .000	.883 .000	1.000

Table 5-1: Marketing variable correlations

Therefore, these variables were combined by adding up the values and then calculating the monthly average. This resulted in the single marketing variable “average marketing expenditure (AM)”. Consequently, the hypotheses H7a, H7b and H7c cannot be tested and will therefore be removed from the proposed model. In a next step, the data were checked for outliers and missing data. Five outliers from the “average price (AP)” variable, and one outlier from the “average sales (AS)” (total sales (revenue) divided by time period (time)) and “perceived quality (PQ)” were removed. Furthermore, because the sales (revenue) data of five products had only one data point, “beta sales” (slope of quarterly sales expenditure (derived with SPSS, using the linear regression function) could not be calculated, which led to five missing values (5.8%). The “application range (AR)”, “drug interaction (IA)” and “side-effects (SE)” variables contained three missing values (3.4%). In addition, five missing values (5.8%) for “average marketing expenditure (AM)” were found. The indicated outliers can be justified. They were not caused by a measurement or data handling error; instead, they were missing due to the unavailability of data. These data can therefore be characterised as MAR (missing at random) values. This means that whatever caused the data to be missing does not depend upon the missing data itself (Little and Rubin, 2002). Consequently, there are no restrictions given when replacing these data with an estimated value, as described in the following section.

The handling of missing values is quite challenging. SPSS has single imputation approaches such as mean value and regression substitution. However, several authors such as Graham (2009), Howell (2007) and Schafer (1997) do not recommend the use of these methods because of their weaknesses (altering of the correlation coefficient). Instead, the EM algorithm (multiple imputation) is recommended (Graham, 2009; Little and Rubin, 2002; Schafer, 1997). These researchers highlight that multiple imputations are suitable because it has been shown that they produce unbiased parameter estimates and they are robust to departures from normality assumptions and provide adequate results in the case of a small sample size. For this purpose, the freely available software for multiple imputation NORM (see also Pennsylvania State University homepage: sites.stat.psu.edu) was applied (see also Schafer, 1997). The missing values were replaced by estimates derived from the NORM routine. It has to be added that the low number of missing values (below 5%) can be viewed as statistically insignificant (see also Howell, 2007; Little and Rubin, 2002).

In a second step, a transformation, in order to reach normality, was performed. In the literature (Backhaus et al., 2003; Hair et al., 1998; Hartwig and Dearing, 1979; Osborne, 2002), three different transformation procedures are suggested: (1) square root transformation, (2) logarithmic transformation and (3) inverse transformation. It is suggested that a minimum amount of transformation, beginning with the square root transformation, should be applied, in order to improve normality (Osborne, 2002). In this case, the logarithmic transformation using e as the base was viewed as being appropriate because this function has shown the best results regarding improvement towards normal distribution. It should be added that a higher base tends to pull extreme values more drastically than a lower base (Cleveland, 1984).

Transformation improves normality by reducing the distances between data points. However, Osborne (2002) states that all data points remain in the same relative order as they were prior to transformation, which allows researchers to continue to interpret results in terms of

increasing scores. The transformation resulted in a significant improvement of normality, as illustrated in the following table (see Table 5-2):

Variable	Skewness	z-Score	Kurtosis	z-Score	Comments
PQ	-1.076	-4.074	1.297	2.455	improvement was reached
OE	0.521	1.973	-0.602	-1.139	normally distributed
PA	-0.058	-0.220	-0.644	-1.220	normally distributed
IA	0.363	1.374	1.072	2.029	normally distributed
SE	0.344	1.302	-0.802	-1.518	normally distributed
AM	-0.146	-0.553	-0.659	-1.247	normally distributed
AP	0.493	1.866	2.427	4.594	improvement was reached
AS	0.251	0.950	-0.205	-0.388	normally distributed
BS	-1.536	-5.815	0.893	1.690	improvement was reached

Table 5-2: Normality test results

Since, with a multi-level data structure, an analysis using multiple regression needs to be conducted for every single level separately, the data have to be aggregated for the second level, as suggested by Hox (2010). For the data aggregation of the second level (substance), first-level (brand) data were taken and their average value for every single substance was calculated. This resulted in a reduced dataset (initially 86 data points) containing 26 data points on the second level. The data were then standardised on SPSS, which resulted in an overall average of zero and a standard deviation and variance of one.

Regarding sample size, the market data can be considered as being complete for the previously (see Paragraph 5.5) described five drug classes. Consequently, these five drug classes were defined as the overall population size (100%) in the current research (containing 108 brands and 37 substances). Taking into account that an expected sampling frequency of 50% [for samples providing the required precision levels, if unknown, a value of 50% is taken (Rovezzi, 2002)] could be assumed, a calculation of sample size has revealed that for the brand level (confidence level 95%, confidence interval 5%)⁹, a minimum number of 84 data

⁹ The confidence interval is described by Furlong et al. (2000, p63) as a 'range of values, bounded by the upper and lower confidence limits, that is likely, at a specific level of probability (known as the confidence level), to contain the population parameter. A confidence interval is built around the value of a sample statistic, which serves as our best estimate of the population parameter'.

points is required [The determination of the sample size is described by Armitage et al. (2002); The sample size can also be determined using an online calculation tools: e.g. www.macorr.com/sample-size-calculator.htm]. For the substance level, a minimum 26 data points are required (confidence level 95%, confidence interval 10%) (please refer also to the statistical literature, Backhaus et al., 2003; Lenth, 2001). It can be therefore concluded that, regarding sample size, this dataset provides a robust basis for a statistical analysis.

5.6.5.2. Multiple Regression Model Definition

In this section, a multiple regression model was created by taking the findings from the previously performed data structure analysis, as well as the earlier hypothesised factor relations, into account. Furthermore, Paragraph 5.6.1 concluded that the slope of the sales [“beta sales (BS)”] should be investigated as an additional independent variable. This was also taken into account when creating the multiple regression models, as discussed later. Consequently, for each level [(A) “average sales (AS)” and (B) “beta sales (BS)” as dependent variables], two models were created.

5.6.5.3. Regression Model Selection Method and Power

A number of different model selection methods are described in the literature (see also Kleinbaum et al., 1998). Independent variables are chosen by model selection methods such as forwards, backwards, stepwise and simultaneous entry (see also Hair et al., 1998; Kleinbaum et al., 1998). However, it has been noted that stepwise entries are potentially problematic and should only be used for entirely predictive rather than explanatory models (Hair et al., 1998; Cohen and Cohen, 1975). Consequently, taking into account that the purpose was to test hypotheses and not to predict any dependent variables, simultaneous entry methods were applied.

5.6.5.4. Multiple Regression Analysis of the First Level Model with Average Sales (A1)

In this section, the actual analysis will be performed and their results discussed. The hypothesised antecedents to average sales (revenue) and their expected direction of influence, as well as their hypotheses and its support by the statistical analysis (please see also Chapter 6), are shown in Table 5-3.

Hypotheses	Independent Variable	Expected Direction of Relationship (Sales)	Support of Hypotheses
H ₁	Order-of-market Entry (OE)	-	N
H ₂	Drug Interaction (IA)	-	Y
H ₃	Drug Side-effects (SE)	-	N
H ₄	Perceived Quality (PQ)	+	Y
H ₅	Packaging Alternatives (PA)	+	N
H ₆	Average Price (AP)	-	N
H ₇	Average Marketing Expenditure (AM)	+	Y

Table 5-3: Hypothesised independent variables of average sales

In order to test these variables for multicollinearity¹⁰, tolerance values (all above 0.658 > 0.1) and variance inflation factors (all below 1.519 < 30.0) were calculated by entering them simultaneously into the regression equation (see also Hair et al., 1998; Kleinbaum et al., 1998; Kaplan, 1995). The results did not display any obvious problems. The following first-level model using average sales (revenue) as a dependent variable was then investigated applying the multiple linear regression function on SPSS (see Table 5-4):

$$AS_i = \beta_0 + \beta_1*(OE_i) + \beta_2*(AP_i) + \beta_3*(PA_i) + \beta_4*(AM_i) + \beta_5*(PQ_i) + \beta_6*(IA_i) + \beta_7*(SE_i)$$

Whereas, in the regression equation, “average sales (AS)” is the dependent variable, the independent variables “order-of-market entry (OE)”, “average price (AP)”, “number of

¹⁰ ‘When two predictor variables are highly correlated with each other, the analysis may misleadingly indicate that only one of those predictor variables significantly contributes to the prediction of the criterion variable’ (Furlong et al., 2000, p11).

packaging alternatives (PA)”, “average marketing expenditure (AM)”, “perceived quality (PQ)”, “drug interaction (IA)” and “drug side-effects (SE)” were loaded with factors β_1 to β_7 . Furthermore, the intercept β_0 was introduced.

Multiple R = 0.551 R ² = 0.330 Adjusted R ² = 0.241 F = 4.854 (Sig. 0.000; F _{critical} = 2.129)				
Independent Variable	Beta	t	Sig.	Hyp.
Order-of-market Entry (OE)	-0.083	-0.798	0.427	H ₁
Drug Interaction (IA)	0.092	0.932	0.354	H ₂
Drug Side-effects (SE)	0.103	0.943	0.349	H ₃
Perceived Quality (PQ)	0.075	0.746	0.458	H ₄
Packaging Alternatives (PA)	0.114	1.172	0.245	H ₅
Average Price (AP)	0.210	1.804	0.075	H₆
Average Marketing Expenditure (AM)	0.423	4.147	0.000	H₇

Table 5-4: Results of the first-level multiple regression A1 model

The results derived an adjusted R² of 0.241. This means that 24.1% of the variance can be explained by the elements of the equation and that the independent variables are related by 24.1% to the dependent variable. The rather low number can be justified by the complex nature of the sales process (see also Cohen and Cohen, 1975). It has to be noted at this point that other studies within sociology, having conducted regression analysis, have also derived similar variance values (see also McKee et al., 2001; Wild et al., 2004). The equation is significant (sig = 0.000) and the F-value (4.854; explained variance divided by unexplained variance) is above the calculated critical F-value (2.129). For H6, support for this hypothesis could be found (beta = 0.114; sig = 0.075). For H7, strong support can be afforded by the results (beta = 0.423; sig = 0.000). This means that an increase in “average marketing expenses (AM)” will lead to higher sales (revenue). This is supported by previous research, as discussed in Chapter 2. Moving to product property variables, it can be seen that H2 to H5 do not find support. In other words “side-effects (SE)”, “drug interaction (IA)”, “perceived quality (PQ)” and “packaging alternatives (PA)” do not influence the prescribing decision. This seems to be quite surprising, especially because it is in disagreement with the literature discussed in Paragraph 2.6. Furthermore, H1 also did not find any support. This is not what

one would expect according to the theory discussed in Paragraph 2.5. However, it was revealed by the descriptive data analysis (see Paragraph 5.4) that there is variation between actual sales (revenue) and order-of-market entry. These results and their implications will be discussed in the next chapter.

In a next step, a test for linearity and homoscedasticity¹¹ was performed, using residual plots. No clear patterns could be found, so the assumption of linearity and homoscedasticity is applied. In order to detect the presence of autocorrelation [a relationship between values separated from each other by a given time lag (Bhargava et al., 1983)], a Durbin-Watson test derived a value of 1.979. According to the rule of thumb (see also Gujarati, 2003), the Durbin-Watson value should not be below 1.0. Therefore, it can be assumed that no autocorrelation is present and a valid statistical test can be performed.

5.6.5.5. Multiple Regression Analysis of the Second-Level Model with Average Sales (A2)

For the second-level (substance) multiple regression model (A2), using aggregated data, the variables were tested for multicollinearity. Tolerance values (all above $0.895 > 0.1$) and variance inflation factors (all below $1.117 < 30.0$) were calculated by entering them simultaneously into the regression equation (see also Hair et al. 1998; Kleinbaum et al., 1998; Kaplan, 1995). The results do not display any obvious problems. In a next step, the model, containing only level two (substance)-relevant variables, was investigated by applying the multiple linear regression function on SPSS (see Table 5-5).

¹¹ 'In regression analysis, we see a situation where the amount of variance in Y (the criterion variable) remains constant across different values of X (the predictor variable)' (Furlong et al., 2000, pG8)

Multiple R = 0.584 R ² = 0.341 Adjusted R ² = 0.255 F = 3.962 (Sig. 0.021; F _{critical} =2.544)				
Independent Variable	Beta	t	Sig.	Hyp.
Drug Interaction (IA)	-0.056	-0.316	0.755	H ₂
Drug Side-effects (SE)	0.423	2.364	0.027	H₃
Perceived Quality (PQ)	0.368	2.158	0.042	H₄

Table 5-5: Results of the second-level multiple regression A2 model

The results produced an adjusted R² of 0.255. This means that 25.5% of the variance can be explained by the elements of the equation and that the independent variables are related by 25.5% to the dependent variable. As previously stated, the rather low number can be justified by the rather complex nature of the sales process (see also Cohen and Cohen, 1975). The equation can be considered as being significant (0.021) and the F-value (3.962; explained variance divided by unexplained variance) is above the calculated critical F-value (2.544). The results do not display any obvious statistical problems. Again, the regression statistics above are basically in support of the previously discussed results, as well as the theory (see Chapter 2). The analysis has shown that “drug side-effects (SE)” (beta = 0.423; sig = 0.027) and “perceived quality (PQ)” (beta = 0.368; sig = 0.042) are significantly positively related to the sales (revenue) slope. On the other hand, no significant relations were found for “drug interaction (IA)”. These results and their implications will be discussed in the next chapter.

A test for linearity and homoscedasticity was performed, using residual plots. No clear patterns could be found, so the assumption of linearity and homoscedasticity is applied. In order to detect the presence of autocorrelation, a Durbin-Watson test derived a value of 1.963. Therefore, it can be assumed that no autocorrelation is present and a valid statistical test can be performed.

5.6.5.6. Multiple Regression Analysis of the First-Level Model with Beta Sales (B1)

The third run analysed the relationship between marketing factors and the beta of sales (revenue) on the first level (brand), as suggested in Paragraph 5.6.1. The model was investigated by applying the multiple linear regression function on SPSS (see Table 5-6). The following equation was computed:

$$BS_{ij} = \beta_{0j} + \beta_{1j}*(OE_{ij}) + \beta_{2j}*(AP_{ij}) + \beta_{3j}*(PA_{ij}) + \beta_{4j}*(AM_{ij}) + \beta_{5j}*(PQ_{ij}) + \beta_{6j}*(IA_{ij}) + \beta_{7j}*(SE_{ij})$$

The results produced an adjusted R² of 0.275. This means that 27.5% of the variance can be explained by the elements of the equation and that the independent variables are related by 27.5% to the dependent variable. As already stated, the rather low number can be justified by the rather complex nature of the sales process (see also Cohen and Cohen, 1975).

Multiple R = 0.579 R ² = 0.335 Adjusted R ² = 0.275 F = 5.608 (Sig. 0.000; F _{critical} = 2.129)				
Independent Variable	B	t	Sig.	Hyp.
Order-of-market Entry (OE)	0.188	1.840	0.070	H₁
Drug Interaction (IA)	-0.060	-0.622	0.536	H ₂
Drug Side-effects (SE)	-0.036	-0.335	0.738	H ₃
Perceived Quality (PQ)	0.455	4.611	0.000	H₄
Packaging Alternatives (PA)	0.081	0.853	0.396	H ₅
Average Price (AP)	0.052	0.458	0.648	H ₆
Average Marketing Expenditure (AM)	0.217	2.176	0.033	H₇

Table 5-6: Results of the first-level multiple regression B1 model

A test for multicollinearity was performed. Tolerance values (all above 0.752 > 0.1) and variance inflation factors (all below above 1.519 < 30.0) were calculated by entering them simultaneously into the regression equation (see also Hair et al., 1998; Kleinbaum et al., 1998; Kaplan, 1995). The equation is significant (sig = 0.000) and the F-value (5.608; explained variance divided by unexplained variance) is above the calculated critical F-value (2.129). The results do not display any obvious problems. The analysis shows that “order-of-market entry (OE)” (beta = 0.188; sig = 0.070), “perceived quality (PQ)” (beta = 0.455; sig = 0.000) and “average marketing expenditure (AM)” (beta = 0.217; sig = 0.033) are

significantly positively related to sales (H1, H4, H6). On the other hand, no significant relations were found for “average price (AP)”, “packaging alternatives (PA)”, “drug interaction (IA)” and “drug side-effects (SE)”. These results and their implications will be in discussed the next chapter.

A test for linearity and homoscedasticity was then performed, using residual plots. No clear patterns could be found, so the assumption of linearity and homoscedasticity is applied. In order to detect the presence of autocorrelation, a Durbin-Watson test derived a value of 1.989. According to the rule of thumb (see also Gujarati, 2003), the Durbin-Watson value should not be below 1.0. Therefore, it can be assumed that no autocorrelation is present and a valid statistical test can be performed.

5.6.5.7. Multiple Regression Analysis of the Second-Level Model with Beta Sales (B2)

The fourth run analysed the relationship between marketing factors and the beta of sales (revenue) on the second level (substance), using aggregated data as suggested in Paragraph 5.6.5.1. Therefore, the variables of the aggregated data were tested for multicollinearity. Tolerance values (all above $0.895 > 0.1$) and variance inflation factors (all below $1.117 < 30.0$) were calculated by entering them simultaneously into the regression equation (see also Hair et al., 1998; Kleinbaum et al., 1998; Kaplan, 1995). The results do not display any obvious problems. In a next step, the model containing only level two (substance)-relevant variables was investigated by applying the multiple linear regression function on SPSS (see Table 5-7).

Multiple R = 0.790 R ² = 0.625 Adjusted R ² = 0.576 F = 12.771 (Sig. 0.000; F _{critical} = 2.129)				
Independent Variable	B	t	Sig.	Hyp.
Drug Interaction (IA)	-0.276	-2.056	0.051	H ₂
Drug Side-effects (SE)	0.316	2.341	0.028	H ₃
Perceived Quality (PQ)	0.666	5.172	0.000	H ₄

Table 5-7: Results of the second-level multiple regression B2 model

The results produced an adjusted R² of 0.576. This means that 57.6% of the variance can be explained by the elements of the equation and that the independent variables are related by 57.6% to the dependent variable. As already stated, the rather low number can be justified by the rather complex nature of the sales process (see also Cohen and Cohen, 1975). The equation is significant (sig = 0.000) and the F-value (12.771; explained variance divided by unexplained variance) is above the calculated critical F-value (2.129). The results do not display any obvious statistical problems. The analysis indicates that “drug side-effects (SE)” (beta = 0.316; sig = 2.341), “drug interaction (IA)” (beta = -.276; sig = -2.056), as well as “perceived quality (PQ)” (beta = 0.666; sig = 0.000), are significant related to the sales (revenue) slope. These results and their implications will be discussed in the next chapter.

Finally, a test for linearity and homoscedasticity was performed, using residual plots. No clear patterns could be found, so the assumption of linearity and homoscedasticity is applied. In order to detect the presence of autocorrelation, a Durbin-Watson test derived a value of 2.122. According to the rule of thumb (see also Gujarati, 2003), the Durbin-Watson value should not be below 1.0. Therefore, it can be assumed that no autocorrelation is present and a valid statistical test can be performed.

5.7. Conclusions

In this chapter the previously derived hypotheses were statistically tested. For this purpose secondary market data provided by the Swiss market research company on twelve Excel files containing various different formats were combined. However, product-related data were missing and had to be collected from additional sources. This resulted in a dataset containing ten research-relevant variables. In a next step, the dataset was cleaned. For this purpose, missing values were indicated, a check for outliers was performed and descriptive statistical properties such as arithmetic mean, variance, standard deviation, skewness and kurtosis of the dataset were calculated. Unfortunately, these tests revealed that, in most of the cases, no normal distribution was present.

The data were then further explored, using descriptive statistics. This determined that order-of-entry does not seem to take place. Furthermore, it was recognised that different sales slopes (beta) take place. Interestingly, it seems that this aspect has not been covered so far in marketing-related research, whereas it is widely used in the price-demand theory in economics. Consequently, it was decided to include beta sales (revenue) as dependent variable in the research. An analysis of the data structure revealed a multi-level arrangement, containing a brand (first) and substance (second) level. In order to be able to proceed with further analysis, this data had to be reorganised. For this purpose, the mean averages of the required variables per product (brand) and beta sales (revenue) were calculated, which produced a dataset containing 86 data points.

For the analysis of this multi-level data structure, it was intended to use a hierarchical linear model (HLM). However, the dataset did not fulfil the minimum requirement of 30 samples per group, as noted in the literature (Bell et al., 2008; Hox and Maas, 2002; Moineddin et al., 2007). An HLM test run also highlighted the instability of the results. It was therefore decided to conduct a multiple regression analysis instead.

The data were then prepared for analysis. A test for multicollinearity was performed, revealing a multicollinearity problem between three marketing variables. As a result, these variables were combined (all marketing expenses were added up) into one new marketing variable. A check for outliers and missing values was performed. It appeared that outliers were present and contained extreme values. Although they were justifiable, it appeared that these products are exceptions on the market. Since no generalisation regarding these products could be made, these outliers were removed. The missing values were then replaced by estimates derived from a multiple imputation (EM algorithm). In order to enable statistically robust results, normally distributed data are required. In the present case, a logarithmic transformation had to be conducted in order to reach normal distribution. As data analysis using multiple regression needs to be conducted for every single level separately, the data had to be aggregated (see also Hox, 2010) for the second level (substance), resulting in a dataset of 26 data points. However, for the second level (substance), only the relevant variables were included. A calculation of the sample size indicated that robust results could be derived from the analysis.

Finally, the analysis was performed, calculating both levels (brand and substance) using both depended variables (average and beta sales). All models were tested successfully for their statistical robustness in the first instance. For average sales (revenue), the results showed a strong positive relation with “marketing expenditure (MA)” (beta = 0.752; sig = 0.000) on the first (brand) level and with “side-effects (SE)” (beta = 0.423; sig = 0.027) and “perceived quality (PQ)” (beta = 0.368; sig = 0.042) on the second (substance) level. For beta sales (revenue), the results indicated a strong positive relation with “perceived quality (PQ)” (beta = 0.463; sig = 0.000) as well as the “order-of-market entry (OE)” (beta = 0.218; sig = 0.054) on the first (brand) level and with “side-effects (SE)” (beta = 0.316; sig = 0.028), “perceived quality (PQ)” (beta = 0.666; sig = 0.000) and a negative interaction with “drug interactions (IA)” (beta = -.276; sig = 0.051) on the second (substance) level.

In the next chapter, these results will be critically interpreted and the most important findings and contributions of this research will be established. In addition, the managerial implications and limitations of this work will be presented. Furthermore, some directions for future research will be provided.

6. Evaluation of the Statistical Results

In this chapter, the hypotheses that were presented in the third chapter are investigated on the basis of the statistical results of the multivariate analysis that was performed in Chapter 4, in order to examine the conceptual model explicated in Chapter 3. The conclusions are then discussed and the recent scientific findings that were presented in the second chapter, as well as the results from the qualitative studies (focus and Delphi) shown in Chapter 3, are taken into account. Finally, the implications of these findings in regard to their theoretical implications are analysed, highlighting the study's contribution to research on "physician-targeting". Based on these findings, a final updated conceptual model is presented.

6.1. Evaluation of the Statistical Results

In this section, the previously proposed seven hypotheses will be examined in the light of the statistical results, and then conclusions will be drawn.

In order to be able to interpret the previously presented results, a discussion of the relation between the two variables "beta sales (BS)" and "average sales (AS)" is required at this point. The "beta sales (BS)" variable indicates the slope and captures the overall trend, whereas the "average sales (AV)" variable indicates mean average sales (revenue) over the whole sales (revenue) period. Consequently, this might be thought to imply that a higher "beta sales (BS)" results in higher "average sales (AS)". However, the interpretation of the statistical results showed that this is not necessarily true for every hypothesis, as will be discussed later. This unexpected observation can be explained in a general sense by the "lucas critique" theory (Robert, 1976), suggesting that an effect that occurs by changing an economic policy cannot be entirely predicted on the basis of historical data. In other words, a causal relationship

between an independent and a dependent variable that has been observed on the basis of past data might not necessarily take place in the future.

In Chapter 4 it was shown that a multi-level structure, containing a brand (first) level and a substance (second) level, is present. In a practical sense, this distinction is highly relevant because companies are only able to influence actively non-substance level-related variables through their marketing measures (promotion, pricing and packaging). In other words, this means that the prescription pharmaceutical marketer can only actively influence brand-related factors, whereas substance-related factors are mainly given by companies' outcomes from their research and development (R&D), and therefore they generally are not under the control of marketers. This finding leads to the implication that the overall "marketing concept", containing the four "marketing mix" instruments, has to be reconsidered. Therefore it can be concluded that the classical '4Ps' approach (see Paragraph 1.1.2.) is not necessarily applicable in prescription pharmaceutical marketing, but a '3Ps' approach can be suggested instead, as will be discussed further in the next chapter.

6.1.1. The Importance of Order-of-Entry

For the H1 hypothesis "the earlier a market entrant enters the market, the higher sales will be", the statistical results indicated that there is not a significant relationship between the brand (first level)-related variable "order-of-market entry (OE)" and "average sales (AS)" (beta = -0.083; sig = 0.427), but there is a positive significant relation to "beta sales (BS)" (beta = 0.218; sig = 0.054). This means that a later market entrant is more likely to enjoy a higher increase in sales (revenue) than an earlier entrant. Generally speaking, market entry will increase sales (revenue) immediately, but once a product is established on the market, no effect can be observed. Even more interesting is the fact, as indicated by the results, that "average sales (AS)" is not related to order-of-market entry. These findings are also illustrated

in the following diagrams (see Figures 6-1 and 6-2, the same diagrams (5-11, 5-12) are presented in Chapter 5 as well).

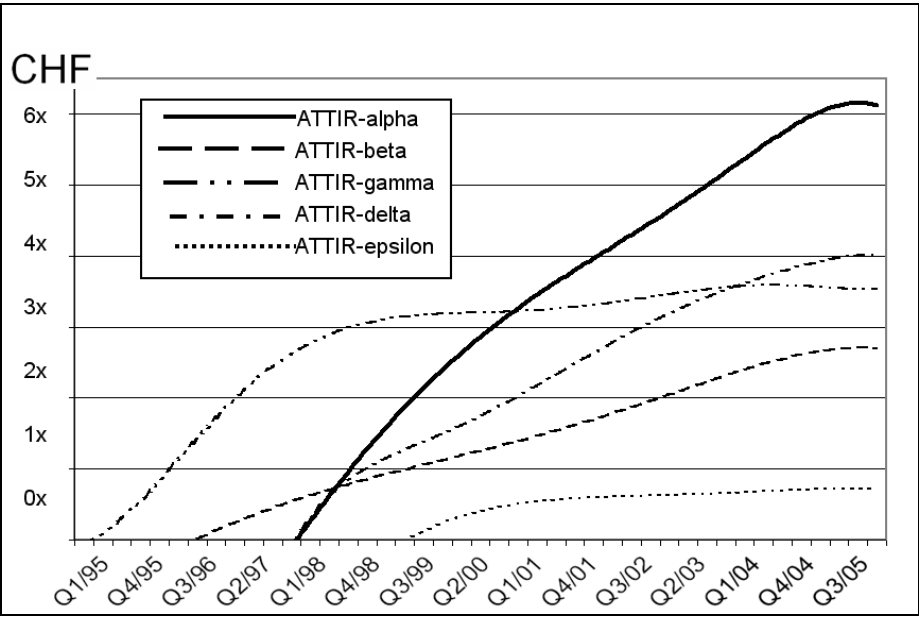


Figure 6-1: Sales of ATTIR-antagonists

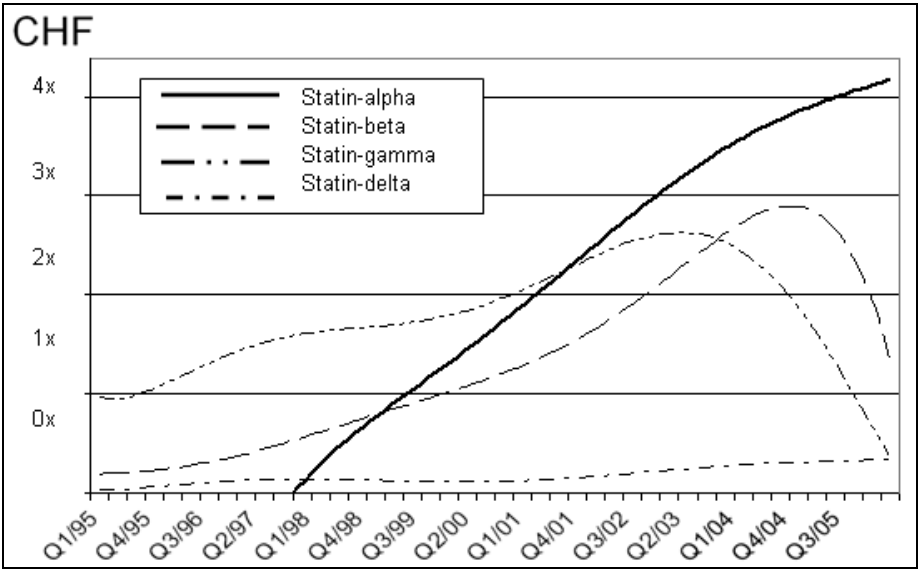


Figure 6-2: Sales of Statins

At first glance, it appears that these results are in contrast to the findings presented in the scientific literature. Berndt et al. (1997, p37) concluded that, as in many markets, the ‘order-of-market entry is very substantial for the sales (revenue) result’. In particular, Berndt et al. (1997, p37) stated that ‘holding price, marketing efforts and product quality constant, relative

to the n^{th} product, the $(n+1)^{\text{th}}$ entrant can expect about 40% lower sales (revenue)'. Similar findings from other authors were also found (see also Urban et al., 1986; Berndt et al., 1997; Kalyanaram and Urban, 1992; Lean and Bond, 1977; Golder and Tellis, 1993). On the other hand, it was highlighted by Brown and Lattin (1994) that late market entry is a possible strategic alternative (see also Paragraph 2.5.5). Consequently, the results show that order-of-market entry is not necessarily a decisive factor for market success (sales). In addition to this point, it has to be stated that such results have primarily been investigated in markets with little regulation (please see Paragraph 1.1.3). However, in the present context, as described in the first chapter, governmental bodies are involved in the medicines launching process by approving negotiated prices with the Swiss Federal Office of Public Health (BAG) – the regulatory Swiss agency for the authorisation and supervision of therapeutic products (Swissmedic) regarding medical drug quality, effectiveness and safety, as well as the Federal Office for Social Insurance (BSV), by placing the medical drug onto the approved list. As a result, medical products cannot be introduced freely into the market by pharmaceutical companies, as will be discussed later. This means that it is difficult to plan the time of market entry.

In summary it is evident that early Swiss prescription pharmaceutical market entrants do not benefit from early mover advantage. This means that, overall, early entry does not necessarily lead to higher sales (revenue), as discussed in Chapter 2. The causes and resulting implications will be discussed later. Thus, no support for hypothesis H1 can be given. Furthermore, the results indicate that during the market introduction phase an extraordinary sales (revenue) increase takes place. This phenomenon will be discussed in the next paragraph.

6.1.2. The Relevance of Promotion

In a next step, the marketing-related H7 hypothesis “more promoted medical drugs are more likely to be prescribed by physicians (costumers)” was investigated. For the “average marketing expenditure (MA)” variable, a highly significant positive relation to “average sales (AS)” (beta = 0.423; sig = 0.000) and “beta sales (BS)” (beta = 0.217; sig = 0.033) was found. These findings are supported by several researchers, who concluded that ‘promotional expenditure have a significant and positive effect on sales (revenue) in pharmaceutical markets’ (Kremer et al., 2008, p244, see also Brassington and Pettit, 2007; Bond and Lean, 1977). This was also confirmed by the focus and Delphi group studies presented herein. The group members indicated the high relevance of promotion in prescription pharmaceutical marketing, in order to ensure that the specific product is present in the prescriber (costumer)’s mind and prescriptions are made. It should be emphasised at this point that promotional activities such as direct-to-consumer (DTC) promotion, as well certain physician (costumer)-directed promotional measures, are heavily restricted in the Swiss state-regulated market. Furthermore, one should also take into account that pharmaceutical companies do not tend to market slow-selling medical drugs. As a result, these products will be removed from the product range in the long term. Consequently, the H7 hypotheses could be supported.

In the previous paragraph the order-of-market entry effect and its implications on sales (revenue) were discussed. In the literature it was highlighted by Vakratsas and Kolsaricis (2008) that companies can overcome the disadvantage of being late with promotional measures. This means that ‘later (new) entrants would have to shout louder in order to be heard on the market’, as stated by (Robinson and Fornell, 1985, p316). These conclusions can also be justified from the marketer’s perspective. Over time, marketers of early entrants gain marketing experience within specific markets (see also Vakratsas and Kolsarici, 2008). On the other hand, the effectiveness of marketing measures will decrease over time (see also Shankar, 1997). As a result, higher marketing efforts are needed when launching a new

product. These conclusions can also be supported by the findings derived from the descriptive analysis, as illustrated in Figures 6-3 and 6-4, indicating the patterns of the actual marketing expenses of two different state-regulated prescription pharmaceutical markets (ATIIR-antagonists and Statins). As clearly interpreted from these illustrations, there is a tendency for a higher proportion of marketing expenditure to be made within the first (product launch) phase and the later stage of a medical drug’s introduction. However, it should be pointed out that marketing activities are restricted as well. It was mentioned earlier that pharmaceutical companies, due to regulatory reasons, can only conduct direct-to-physician (costumer) (DTP) and opinion leaders, as well as word-of-mouth-directed, marketing.

This also leads to the conclusion that the market failure of “imperfect information” (see Arnold, 2008) (in this case a supplier-induced demand that results when a producer with superior product knowledge is in the position to influence demand (see also Elliott and Payne, 2005, p100) is present.

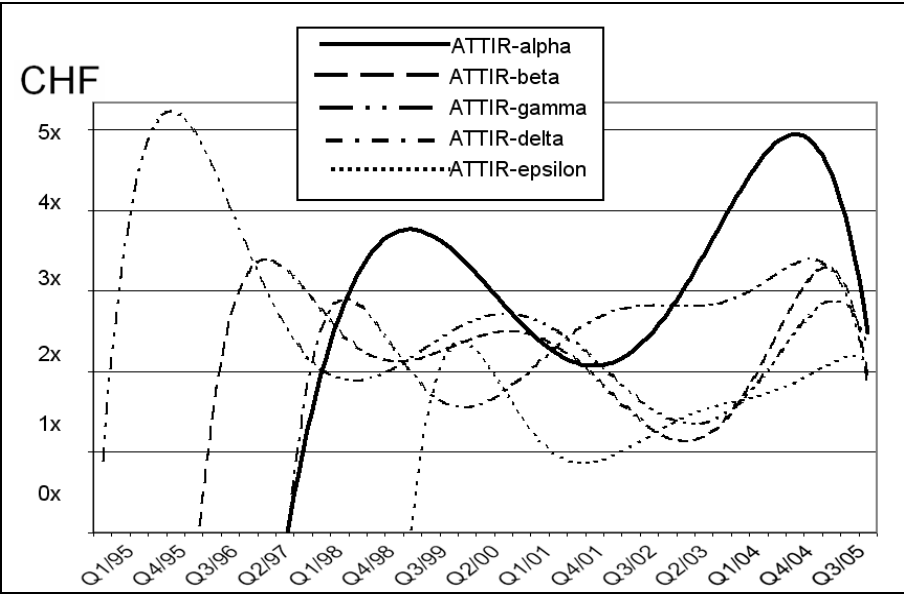


Figure 6-3: Marketing Expenses of ATIIR-antagonists

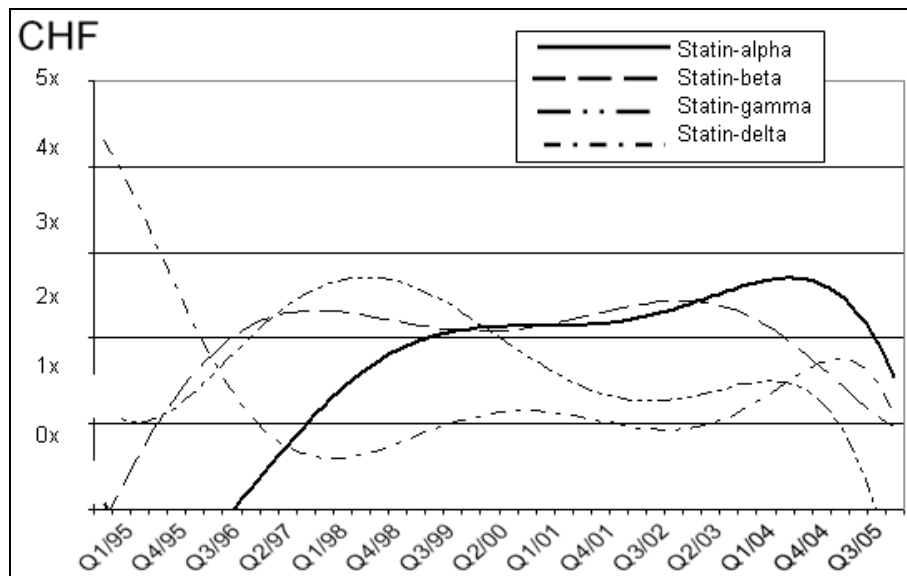


Figure 6-4: Marketing Expenses of Statins

Despite the fact that the order-of-market entry effect does not appear to be relevant, it was revealed that promotional efforts in general are of importance during the medical drug introduction phase. Furthermore, the analysis revealed a high multicollinearity (see Table 5-1) between “detailing expenses (DE)”, “mailing expenses (ME)” and “advertising expenses (AE)” data. This suggests that no distinction in regard to spending on marketing activities appears to be made by the pharmaceutical companies in the studied market. The reasons for these unexpected results are outside the scope of this study and require further research. Therefore, it is also not possible to analyse the individual effect of these promotional marketing measures on sales (revenue).

Based on the presented results, it has to be concluded that sales (revenue) success cannot be fully influenced by pharmaceutical companies employing marketing instruments, but they are influenced by external factors, as already indicated by the marketing model (see Figure 1-4). Nevertheless, the results show that marketing expenditure have a strong influence on “beta sales (BS)” and “average sales (AS)”, indicating that marketing expenditure lead to a sales (revenue) increase and maintain the sales (revenue) level as well.

6.1.3. The Role of Product Mix Attributes

The product mix-related H2 hypothesis “medical drugs with fewer drug interactions (product quality measure) with other drugs are more likely to be prescribed by practitioners (costumers)” was tested. For the substance (second level)-related variable “drug interaction (IA)” the analysis did not reveal a significant relation to “average sales (AS)” (beta = 0.056; sig = 0.755) but a negative relation to “beta sales (BS)” (beta = -0.276; sig = 0.051) for the aggregated substance level. This means that more indicated “drug interactions” would result in a lower sales (revenue) increase. These findings are in support of the scientific literature. According to Berndt et al. (1997), sales (revenue) will increase if the approved product has an advantage relative to other products. The relevance of the product related attributes for sales (revenue) was also emphasised by the focus and Delphi groups. This is also in support of other researchers, who have highlighted that product differentiation is an essential discriminator and key to successful marketing (see also Cooper and Kleinschmidt, 1993; Kotler, 2006 and 1998; Sharp et al., 2001), resulting in higher product sales (revenue). Therefore, support for the H2 hypothesis can be given.

In addition, the H3 hypothesis “medical drugs with lower side-effects (product quality measure) are more likely to be prescribed by practitioners (costumers)” was evaluated. The findings of the multiple regression analysis show a positive relationship between the substance (second level)-related variable “side-effects (SE)” and “average sales (AS)” (beta = 0.423; sig = 0.027) as well as “beta sales (BS)” (beta = 0.316; sig = 0.028) for the aggregated substance level. On first impressions, these unexpected results appear to be quite contradictory. However, a further interpretation reveals that this is not necessarily true. Not very much research has been conducted in this field (please see Paragraph 7.3.). Denig et al. (1988, p82) revealed that ‘serious side-effects are the most important factor when choosing a

drug for a relatively harmless disorder according to the physicians (costumers)'. However, on the other hand, as stated by Denig et al. (1988, p82), 'for the acute disorder, efficacy is valued the most, followed by experience and only then are side-effects taken into account'.

Furthermore, Denig et al. (1988, p83) deduced that 'mild side-effects seem to play a minor role in the assessment of medical drugs'. Nevertheless, it should be added that no distinction between serious and mild side-effects was made in the present research. Furthermore, it has to be emphasised that medical drugs containing a serious harmful side-effect profile are not normally introduced by Swissmedic to the market in the first place. Therefore, it can be assumed that no medical substances with really serious side-effects are being marketed.

However, it should be emphasised that the reliability of the results derived from Denig et al. (1988) can be questioned because of the applied research methodology. The data were collected by using questionnaires directed towards physicians (costumers), but this was indicated as a limitation by Denig et al. (1988, p84). They stated that only general expectancies about treatment outcomes were measured. According to the code of medical ethics (please refer to the American Medical Association, www.ama-assn.org), 'physicians (costumers) should prescribe drugs, devices, and other treatments based solely upon medical considerations and patients (consumers)' need and reasonable expectations of the effectiveness of the drug, device or other treatment for the particular patient (consumer)'. On the other hand, Corrigan (1995, p4) writes in his proposal to the FDA (U.S. Food and Drug Administration, www.fda.gov) that 'physicians (costumers) are not always making informed decisions when determining the medication'. They are either uninformed or do not view side-effects as being a relevant criterion. The interpretations of these results suggest that, in practical usage, practitioners (costumers) do not take side-effects into account when prescribing a medical drug, and therefore there is a case that the correlation uncovered here could be considered spurious. This results in some doubt as to whether or not the H3

hypothesis is supported, despite significant correlation, so further research in this area should be conducted to examine this issue more deeply.

In a next step, the H4 hypothesis “the better the medical drug’s perceived product quality (product quality measure), the more likely the medical drug will be prescribed” was investigated. A positive significant relation between the substance (second level)-related variable “perceived quality (PQ)” and “average sales (AS)” (beta = 0.368; sig = 0.042) as well as “beta sales (BS)” (beta = 0.666; sig = 0.000) was indicated for the aggregated substance level. These findings are in line with Flechter’s (1989) conclusion that product confidence is relevant for the physician (costumer)’s prescription decision (sales). A similar conclusion was drawn by the focus group as well. Consequently, support for the H4 hypothesis can be given.

In addition, the H5 hypothesis “medical drugs with more packaging alternatives are more likely to be prescribed by practitioners (costumers)” was tested. In this case, no significant relationship for the brand (first level) related variable “packaging alternatives (PA)” and “average sales (AS)” (beta = 0.114; sig = 0.245) as well as “beta sales (BS)” (beta = 0.081; sig = 0.396) on the aggregated substance level was found. These finding are not surprising for the Swiss markets. As already discussed, many Swiss physicians (costumers) also sell medical drugs (self-dispensing doctors (costumers); see also Kocher and Oggier, 2007). Therefore, the number of packaging alternatives does not really play a role. As a result, the H5 hypothesis could not be supported.

At this point, a discussion about the results and the implications of the product design-related variables should be made. In Chapter 4 it was shown that a multi-level structure is in place, containing a brand (first) and a substance (second) level. This means, as will be discussed later, that “drug interaction (IA)” and “drug side-effects (SE)” are purely substance-related variables, whereas “perceived quality (PQ)” may partly also be influenced by marketing activities. This might also provide another explanation for these, as they appear to be,

contradictory results. Despite an unfavourable “drug side-effects (SE)” profile, the medical drug’s “perceived quality (PQ)” might increase due to marketing activities conducted by the pharmaceutical company.

Furthermore, in the light of the conclusion that was derived from the third hypothesis, it appears that “drug interaction (IA)” and the number of “packaging alternatives (PA)” are not relevant when a drug prescription is made. This would imply that prescribers (costumers) make decisions based on their knowledge regarding effectiveness, side-effects and interaction profiles with other drugs. However, this does not necessarily mean that their knowledge is correct. So far, studies based on surveys conducted with doctors (costumers) (see also Berndt et al., 1997; Denig et al., 1988), as well as the results derived from the focus and Delphi groups herein, imply that effectiveness, side-effects and the interaction profile are relevant decision-making factors. Consequently, it seems that drug prescription decisions are made on a prevailing misconception (lack of knowledge, wrong or biased information, as well as prescription habit, as might be the case (see also Denig et al., 1988) in regard to medical drug quality). In other words, it appears that practitioners (costumers) are not always well-informed and therefore do not prescribe the most suitable medical drug for the patient (consumer)’s requirements. This might be the case for “side-effects (SE)” and “drug interaction (IA)”. Assuming a spurious relationship, these variables will be removed from the model (please see Figure 5-3 and 5-4). Furthermore, it was revealed that the “perceived quality (PQ)” variable has a positive relation to “beta sales (BS)” (increase of revenue) as well as “average sales (AS)”.

In the first chapter, according to Elliot and Payne (2005, p10), we found that within a healthcare pharmaceutical market, the market failure of “imperfect/asymmetric information” (agency relationship) is typically present. Akerlof (1970) defined the market failure of “imperfect/asymmetric information” as an effect that takes place when sellers have better

information about the product being sold, so they are able to swindle consumers easily. However, it was also stated by DiLorenzo (2011, p252) that in ‘successful capitalist economies, all information about products is asymmetrical because of the division of knowledge’. As a result, the presence of “imperfect/asymmetric information” can be assured in the Swiss prescription pharmaceuticals market. Furthermore, this phenomenon can also be justified through the complex tripartite relationship (3P triangle) that takes place between a) the party who pays for the drug, b) the patient (consumer) who actually uses the drug and c) the prescriber (costumer) of the drug, as discussed in the first chapter.

6.1.4. The Role of Pricing

Next, the H6 hypothesis “medical drugs with a lower price (price level) are more likely to be prescribed by practitioners (costumers)” was tested. As a result, a significant relation between the brand (first level)-related variable of “average price (AP)” and “average sales (AS)” (beta = 0.210; sig = 0.075), but a non-significant relation to “beta sales (BS)” (beta = 0.052; sig = 0.648), was found. This means that a higher price level leads to higher sales (revenue).

Again, at this point a further discussion is required in order to view the wider reasons for these unexpected results. According to the price elasticity of demand theory (see also Arnold, 2008), in a market with freely available substitutable products, a higher price should lead to lower sales (revenue). However, so far it has been revealed that higher “medical drug prices” result in higher sales (revenue). Despite ‘minor consensus on the price elasticity of demand’ (Kremer et al., 2008, p236) that takes place in the literature, the results of the present study revealed a positive price elasticity.

This can be explained by the fact that prescribers (costumers) seem not to be motivated to prescribe cheaper medical drugs. These results are also supported by Lexchin’s (2009, p145) findings, revealing that ‘doctors (costumers) are generally ignorant both about the relative and

absolute prices of medications'. These results are also supported by Cooper and Kleinschmidt (1993, p109), who expounded that a low-price strategy is generally not effective. However, this statement was questioned by Rice (2009, p184), who demonstrated that HMO (Health Maintenance Organisation; a group of physicians (costumers) that has an agreement with health insurance(s) and provides care for a previously fixed fee) physicians (costumers) are more price-sensitive when prescribing brand name substitutes than non-HMO physicians (costumers). In addition, the focus group concluded that financial reward (seller's margin) is relevant when it comes to the medical drug prescription decision. Consequently, in order to maximise a physician (costumer)'s profit, self-dispensing doctors (costumers) (Kocher and Oggier, 2007; Sutherland et al., 2008) are highly motivated to prescribe more expensive medical drugs. This is also supported by the fact that they do not really consider packaging alternatives, e.g. by choosing the most economical option for their patients (consumers).

In addition, it was stated by the focus and Delphi groups that the patient (consumer)'s price sensitivity is of relevance (see also Brassington and Pettit, 2007; Dogramatzis, 2002).

However, this conclusion is questioned by the actual results. Furthermore, it appears that patients (consumers) are usually not very cost-sensitive, as they do not have to cover the costs. As indicated by Newhouse (1978), the insured consumer may be unwilling to search for lower prices because he obtains at best only a fraction of the benefit from finding a lower priced seller. In other words, some form of insurance tends to make the consumers less careful. This phenomenon has been described as the "moral hazard" (Elliot and Payne, 2005, p10). Consequently, market failure is present (see also Arnold, 2008).

The results revealed that average price does not have an effect on "beta sales (BS)", but it does so on "average sales (AS)". This means that a sales (revenue) increase does not take place immediately. As a result, the H6 hypothesis is not supported.

In the next and final chapter of this thesis, managerial implications are examined and limitations are indicated. As a consequence, directions for future research are proffered and the most important findings and contributions are highlighted.

7. Discussion and Conclusions

7.1. Introduction

In this chapter the main findings derived by the Systematic Literature Review (see Chapter 2), the qualitative studies, the focus (see Chapter 3) and Delphi group (see Chapter 4) as well as the quantitative analysis will be interpreted and discussed. For this purpose, reference to the initial three research objectives that are stated in the first chapter (see Paragraph 1.3.) is given. It will within the chapter be shown that this research has fulfilled these objectives (see below).

4. To conceptualise and delineate the dimensionality of pharmaceutical marketing mix instruments that are used when physicians (costumers) are targeted.
5. To investigate the influence of product- (especially quality) and promotion-mix related factors on “physician-targeting”, thus leading to an increase in sales (revenue).
6. To develop a valid and reliable model of “physician-targeting” in the sector of prescription pharmaceuticals for marketing managers.

Based on the findings derived by this research that is based on these initial objectives, a summary of the main study’s results will be given, the theoretical, methodological as well as managerial implications of the research, with particular relevance to prescription pharmaceuticals marketers, are provided. The conceptual “physician-targeting” model is then presented and discussed. Based on this, the outcome of the hypotheses test that was conducted by the qualitative study (see Chapter 5 and 6) is then critically discussed and a number of theoretical, methodological and practical recommendations are proposed. Furthermore, the limitations of the study are discussed and an agenda for future research is provided. Finally, conclusions are drawn, highlighting the major contributions of the present work.

7.2. Deriving the Conceptual Models

Going back to the first chapter of this dissertation, in support of the present scientific literature it was concluded that there is little explicit knowledge regarding actual success factors in pharmaceuticals marketing. The systematic literature review and qualitative studies provided a first insight into this issue and a conceptual model was hypothesised. These methods were then utilised to develop a set of operational measures, in order to test the conceptual model and to enable the development of a “physician-targeting” model. Quantitative secondary data were then used in order to evaluate and validate empirically the conceptual model presented in the following section. Taking the previously discussed statistical results into account, a conceptual model for beta sales (revenue) and average sales (revenue) was derived. The conceptual model containing “beta sales (BS)” as a dependent variable is shown in Figure 7-1.

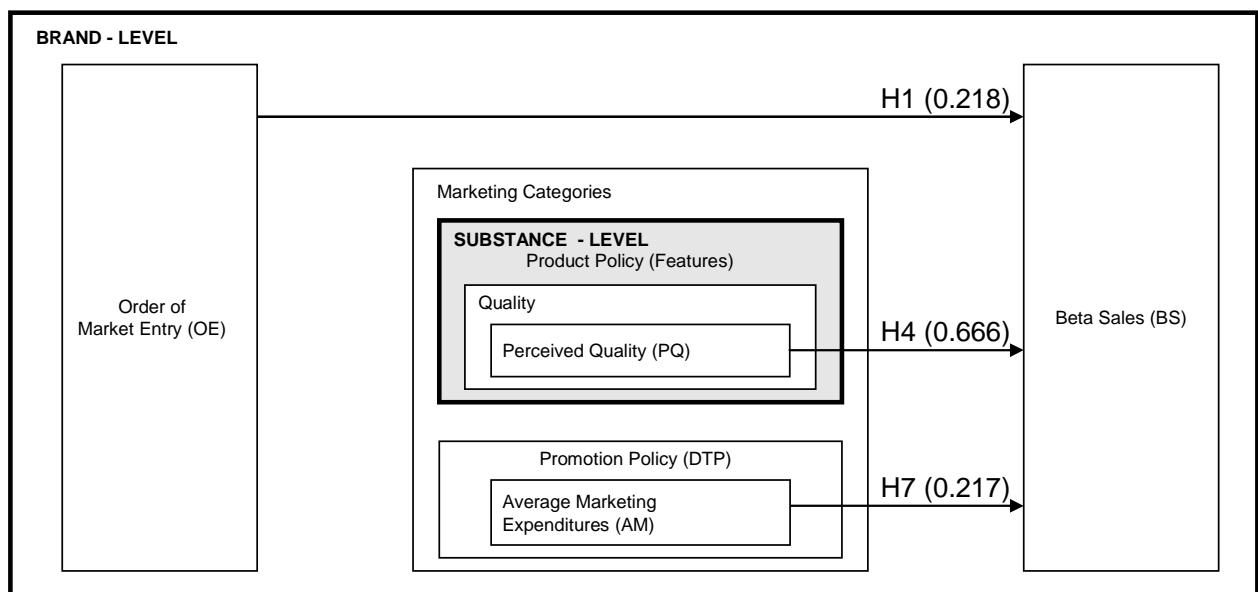


Figure 7-1: Conceptual model containing Beta Sales as a dependent variable

Next, the conceptual model containing “average sales (AS)” as a dependent variable was created, as shown in Figure 7-2.

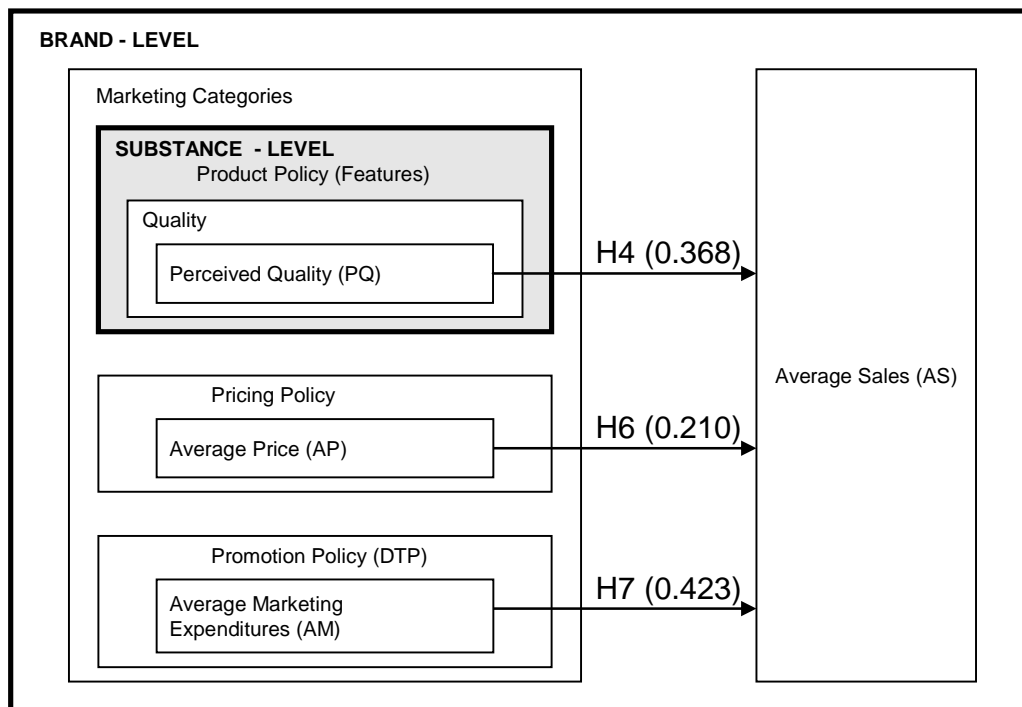


Figure 7-2: Conceptual model containing Average Sales as a dependent variable

As revealed in Chapter 4, a two-level structure distinguishes between the brand (first) level and substance (second) level. From the marketing point of view, this is a very interesting perspective, as it provides a theoretical contribution to other research studies which do not take a two-level structure into account. In practical terms, this means that pharmaceutical companies can only differentiate themselves on the brand level by actively influencing marketing-related measures such as “order-of-market-entry (OE)”, “packaging alternatives (PA)”, “average price (AP)” and “average marketing expenditure (MA)”. On the other hand, the substance-related factor “perceived quality (PQ)” is given by the substance and cannot be influenced by companies’ marketing activities.

In addition, this research revealed two market failures in relation to healthcare (“imperfect/asymmetric information” and “moral hazard”), as described by Elliott and Payne

(2005, p10), in a state-regulated market. Firstly, imperfect information on the quality and price of healthcare goods (service) is in evidence. The patient (consumer) is usually not informed about the quality, price or possible alternatives to the medical drug. Since a certain proportion of the medical drug price is covered by health insurance, this reveals the patient (consumer)'s lack of awareness (see also Jaakkola and Renko, 2007). At this point we should refer to Harm et al.'s (2002, p147) statement that 'the ones who make the decisions are not identical with those who receive the service and/or pay for it'. Secondly, there is an agency relationship (leading to "imperfect information") between patient (consumers) and healthcare providers (physicians (costumers), pharmacists and pharmaceutical companies), which leads to an asymmetry of information [typically, the doctor knows more than the patient (consumer)]. Although DTC (direct-to-consumer advertising) is strictly restricted but DTP [direct-to-physician (costumer) advertising] is allowed in Switzerland (Kocher and Oggier, 2007), there is still "supplier-induced demand", resulting in the fact that providers with superior knowledge about health and healthcare interventions are in a position to influence demand.

The implications of these market failures can be observed by the unusual market behaviour that takes place. As previously discussed, this research revealed that the order-of-market entry effect does not really take place. However, 'later entrants are at a disadvantage in competing with price', as it would be beneficial, at least according to Bowman and Gatignon (1996, p238). This occurs because the medical price has to be agreed with the Swiss Federal Office of Public Health (www.admin.bag.ch). Furthermore, the results show that promotional marketing activities have a positive influence on the medical drug prescription rate. This is despite the fact, as the first chapter highlighted, that pharmaceutical companies distributing their products in the state-regulated Swiss market are faced with certain marketing-related restrictions. As a result, pharmaceutical companies are limited in employing their marketing activities and are not able to vary their channel-related promotional tactics.

By deriving this conceptual (“physician-targeting”) model the 3rd research objective was reached. However, the prerequisite was the 1st as well as the 2nd research objective. This leads to the theoretical, methodological and managerial implications that are proposed in the next section of this chapter.

7.3. Theoretical and Methodological Implications

This dissertation makes a theoretical contribution to the following main areas aiming to improve the quality of scholarly and applied research conducted by marketing researchers.

Firstly, the order-of-market entry effect was evaluated from the perspective of a strongly state-regulated prescription drug market. It was shown that the first mover effect does not take place in such a context. Furthermore, it was revealed that in addition to marketing-related factors that can mainly be influenced by the company, additional external factors play a role, thus leading to unusual market behaviour which contrasts with the models already described in the scientific literature (see also Kalyanaram et al., 1995), as discussed in Chapter 2. As discussed in the first chapter and highlighted by Copper and Kleinschmidt (1993, p91), ‘it is viewed as a problem that studies tend to have a one-country (or even one-region) focus’, usually the non-state-regulated US market.

Secondly, a marketing mix proportion, containing the marketing instruments “product”, “price”, “place” and “promotion” policy, was proposed. Furthermore, it was shown that these marketing instruments have a different relevance and that their use is restricted by governmental authorities, leading to unusual market behaviour. Despite the fact that the present study makes a number of significant contributions to existing research, the work done in this study also contributes to existing theory due to the empirical assessment of numerous

existing constructs. Referring to the research objectives described in the first chapter, this work provides a conceptualisation and delineates the dimensionality of pharmaceutical marketing instruments used for “physician-targeting”. Furthermore, the influence of pharmaceutical marketing instruments leading to sales (revenue) is investigated, and finally a valid and reliable “physician-targeting” model is developed.

It has to be emphasised at this point that different marketing mix concepts have been discussed in the first chapter. Nevertheless, a further discussion is required at this stage of the research.

In addition to McCarthy’s ‘4Ps’ marketing mix concept (McCarthy and Perreault, 1960) that is generally applied for consumer goods, the ‘7Ps’ marketing concept was introduced by Booms and Bitner (1981) for service marketing. According to their definition, the ‘7Ps’ refer to the ‘product’, ‘price’, ‘promotion’, ‘place’, ‘process’, ‘physical evidence’ and ‘people’ that make up the marketing mix. They are an extension of the more basic ‘4Ps’: ‘product’, ‘place’, ‘price’ and ‘promotion’. The structure of the present research is based on the ‘4Ps’ marketing mix model. This can be reasoned by the fact that prescription pharmaceutical are more likely consumer goods than services. This statement can be supported by the fact that most of the recent pharmaceutical marketing literature relates to the idea of the ‘4Ps’ as it has been revealed by the Systematic Literature Review (see Chapter 2.). The focus and Delphi group studies have come to similar conclusions. Despite of this, a few authors (Lieberman and Rotarius, 2001; Harms et al., 2002) have proposed additional ‘Ps’. On the other hand it can be argued that the additional ‘3Ps’ (process, physical evidence and people) are already included within McCarthy’s ‘4Ps’ as it is discussed in the following. Firstly, the ‘process’ attribute is an important factor when it comes to deliver a quality service (in this case the medical drug) and is already included in the product policy that has been investigated in the present research (perceived quality, drug interaction, drug side effects). Secondly, ‘physical evidence’ affects

the customer's satisfaction and refers to the way the product, service, and everything of the company, appears from the outside. In this case, it is included in the product policy by packaging and branding measures as well as by the promotional policy by the sales representative, mailing and advertising measures. Thirdly, 'people', on the other hand, are a crucial factor when it comes to deliver a service (in this case the medical drug) and is already included in the distributional (place) policy. However, as it has been in Chapter 4.4. reasoned, the distributional (place) policy was not investigated in the present research.

Finally it can be summarised that the '4Ps' concept is commonly used in the prescription pharmaceutical marketing field. Furthermore it can be concluded that the additional '3Ps' are already included within the '4Ps' and do therefore not need to be separated.

Furthermore, it was revealed that two market failures are present (see also Elliot and Payne, 2005, p10 and Arnold, 2008). Firstly, it was shown that "imperfect/asymmetric information" (agency relationship) is present, which takes place when sellers (in this case physicians (customers) and pharmacists) are more informed about a product than their patients) (see also Akerlof, 1970). Secondly, the market failure of "moral hazard" (see also Elliot and Payne, 2005, p10 and Arnold, 2008) was observed, as some form of insurances tends to make consumers less careful.

7.4. Managerial Implications

Although it is important to generate a substantive theoretical contribution in a doctoral dissertation, different demands are made by the marketing discipline on scholarly research. According to Hunt (1976 and 1994), marketing can be considered at least in part as an "applied" or "normative" field, as well as a "scientific" one. Consequently, marketing can be

considered as a discipline that provides practical “in the field” advice to marketers. The properties of “managerial-relevant” research were defined by Thomas and Tymon (1982, p348) as the ‘ability of practitioners (costumers) to implement action implications of a theory by manipulating its causal variables’. In addition, managerial relevance has been defined by Jaworski (2011, p211) as the ‘degree to which a specific manager in an organisation perceives academic knowledge to aid his or her job-related thoughts or actions in the pursuit of organisational goals’. Furthermore, it was highlighted in Chapter 1 that, according to Brinik and Bowman (2007, p316), Kremer et al. (2008) and Stremersch (2008), studies aiming to derive managerial descriptions are welcomed. This can also be supported by the fact that ‘managers are increasingly under pressure to justify the impact of their marketing expenditures’ (Lehmann, 2004, p75). According to Varadarajan (2003), marketing research outcomes aimed at marketing managers and policymakers therefore has to satisfy different requirements in regard to their relevance:

- *Marketing managers* - Research that makes a contribution to making better marketing decisions in organisations. The evaluation of the findings derived from this research has lead six practical recommendations for prescription pharmaceutical drug marketers operating in state-regulated markets such as the Swiss context of this study. These recommendations aim to increase the efficacy of marketing measures and sales in an increasingly competitive healthcare market (see also Hollon, 1999) by benefiting two market failures (“imperfect/asymmetric information” and “moral hazard”).
- *Policymakers* - Research that is of value to decision-makers affiliated with governmental institutions. The analysis of the study results has led to four recommendations for policymakers within a state-regulated prescriptions pharmaceuticals market. These measures aim to reduce the ‘rising healthcare costs that have become a major public concern over the last couple of years’ (Gonzalez et

al., 2008, p247) by reducing or eliminating the two market failures (“imperfect/asymmetric information” and “moral hazard”) that take place.

Therefore, a substantial proportion of the contribution of any marketing research should be the direct application of research findings to marketing practice, as presented in the following section. The managerial implications of the present study fall into the strategic marketing area of “order-of-market entry” and the operational marketing area of “marketing instruments”.

As suggested by Stremersch and Van Dyck (2009), the derived model contributes to pharmaceutical marketing research and ‘contributes to the need of managerial prescriptions for medical drugs marketers’ (Birnik and Bowman, 2007, p316), in order to improve management decision-making and the ‘justification of the amount and allocation of companies’ marketing budgets’ (Kremer et al., 2008, p236). Furthermore, these findings will enable pharmaceutical companies to adapt their current “physician-targeting” concept based on market and strategic requirements (Stremersch and Van Dyck, 2009).

7.5. Implications of Physician-targeting Model

The research outcomes as well as the derived conceptual model (see Paragraph 7.1.), indicating the “physician-targeting” process, have already been in the previous paragraphs discussed. In the present paragraph, the four main positively tested hypotheses (please see Figure 7-3) and their theoretical as well as managerial contributions, affecting the decisions of marketing managers, policy maker as well as marketing researchers (scholars), are presented leading to the following practical recommendations.

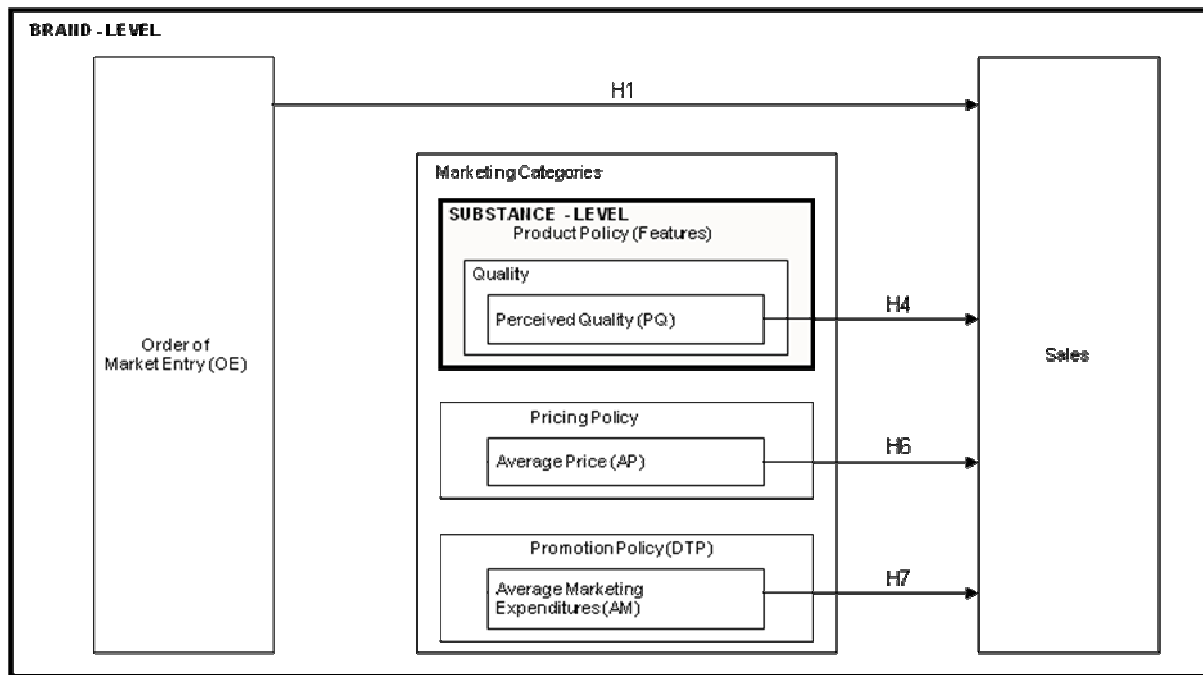


Figure 7-3: Conceptual model of "physician-targeting" in a state-controlled prescription pharmaceuticals market

7.5.1. The Order-of-Entry is not of Importance

In the fourth chapter (see Paragraph 4.4.) the H1 hypothesis "the earlier a market entrant enters the market, the higher the sales (revenue) will be" was proposed and positively supported by the quantitative data analysis. The evaluation of the research findings has led to the following practical recommendation for marketing managers.

1. Marketing managers - It is not essential to be first to market

The results of this dissertation have revealed that, within a state-regulated prescription pharmaceutical market, order-of-market entry is not of high relevance. As discussed in the first chapter, the scientific pharmaceutical marketing literature suggests fundamental marketing strategic concepts based on the order-of-entry effect (see also Castro and Chrisman, 1995; Rodriquez-Pinto et al., 2008), thus enabling companies to follow two strategies: (1) early market entry or (2) late market entry. Despite not

having been covered by this research, the literature provides some practical guidelines for early as well as late market entrants. It has been suggested by Kardes and Kalyanaram (1992) that an early market entrant should emphasise a high level of promotional measures, in order to ensure the formation of a physician (costumer)'s prescription as well the patient (consumer)'s usage habit. Furthermore, to meet the market requirements of an early entrant and to ensure a successful product introduction, a specific marketing mix has to be created and pursued, as by Trim and Hao (2005). On the other hand, a late market entry strategy is a strong alternative. A late market entrant will have to implement a differentiated, adapted marketing mix according to market requirements (see also Comanor, 1986), as discussed in Chapter 2. However, we can refer to Harms et al's (2002) conclusion that there is no generally applicable strategic approach in the pharmaceutical industry, but there are nonetheless factors that should be considered to achieve company success.

7.5.2. The Doctors' Perceived Quality is relevant

In the fourth chapter (see Paragraph 4.4.) the H4 hypothesis "the better the medical drug's perceived product quality, the more likely the medical drug will be prescribed" was proposed and positively supported by the quantitative data analysis. The evaluation of the research findings has lead to the following two practical recommendations.

1. Marketing managers - Enhance the prescriber (costumer)'s perceived quality

This research has shown that, in order to ensure high sales (revenue), marketers should ensure that doctors (costumers) think highly of the quality of a specific medical drug. However, factors leading to an increase in the perceived quality were not investigated by the research. Nevertheless, some practical advice was provided by the focus group and the literature (see also Chapter 2). The focus group participants

suggested that marketers should seek to enhance the product/company brand image (producer's reputation) by communicating quality criteria. This includes good medical documentation as well as a good product presentation. Furthermore, it was pointed out by the focus group (see also Jaakkola and Renko, 2007) that a good drug has to ensure superiority over competitive drugs through high efficacy.

2. Policy makers - Educational programmes and systems providing medical drug information for prescribers (costumers) should be implemented

The results indicate that there is a lack of product knowledge among doctors (costumers) regarding medical drug properties, especially side-effects. Furthermore, there is a chance of a biased medical drug perception because of the pharmaceutical company's marketing activities leading to "imperfect information" market failure. Consequently, an independent medical drug education programme should be set up (see also Angell, 2005). Currently, further educational programmes take place, but they are often not delivered by producers or independent institutions. Again, one should seek to set up an educational programme conducted independently, in order to avoid a conflict of interests.

7.5.3. Higher Price Level leads to Sales Increase

In the fourth chapter (see Paragraph 4.4.) the H6 hypothesis "medical drugs with a lower price (price level) are more likely to be prescribed by practitioners (costumers)" was proposed and significantly negative rejected by the quantitative data analysis. The evaluation of the research findings has therefore lead to the following three practical recommendations.

1. Marketing managers - A high price policy is sales beneficial

This research has revealed that a higher price results in a sales (revenue) increase. This can be explained by "moral hazard" market failure, as well as by "imperfect

information” on offer. The circumstances in which those who receive a service and/or pay for it are not identical with those who make the decision (Harms et al., 2002) justify this effect. Furthermore, because self-dispensing prescribing physicians (costumers) can increase their profits by selling the prescribed medication, they are motivated to prescribe more expensive medical drugs. This phenomenon takes place even in the case of governmentally-fixed prescription drugs pricing due to the negotiability of the price by pharmaceuticals companies.

2. Policy makers - Inhibit prescribers (costumers)’ price-related prescription practice by banning the practice of self-dispensing physicians (costumers)

This research shows that, in order to remove a prescriber’s (costumer) motivation to profit from prescribing more expensive medical drugs, the practice of self-dispensing doctors (costumers) should be banned. This would lead to a reduction in “moral hazard” market failure. In other words policymakers should ensure that prescribers (costumers) (decision-makers) are not involved in any way in medical drugs sales or the distribution process and that they remain independent from pharmaceutical companies, in order to prevent a conflict of interests.

3. Policy makers - Negotiate lower medical prices

The results have indicated that a higher price leads to a sales increase. In order to reduce rising costs within the healthcare sector, one focus of policymakers should be on the costs of medical drugs. As a result, policymakers should try to negotiate a lower price. They can achieve this goal by increasing purchasing power (purchasing in bulks), and competitive pressure could be actively applied where more than one supplier (producer) for a certain medication is present. In addition, it should also be ensured that no conflict of interest (e.g. employers/directors from the authority being involved in a pharmaceutical business) is present.

7.5.4. Promotion plays an important Role

In the fourth chapter (see Paragraph 4.4.) the H7 hypothesis “better promoted medical drugs are more likely to be prescribed by physicians (costumers)” was proposed and positively supported by the quantitative data analysis. The evaluation of the research findings has lead to the following three practical recommendations.

1. Marketing managers - Apply specifically promotional measures

The findings of this dissertation imply that it would be beneficial if promotional measures [e.g. detailing (personal selling), mailing and advertising] were applied more specifically. It was concluded that there is room for an increase in the efficacy of marketing expenditure by implementing more specifically directed marketing measures in the Swiss market. In other words, marketing instruments need to be target-oriented. Regarding personal selling, it is suggested by the literature that, in order to ‘increase the effectiveness of individual representatives’ (Mizik and Jacobson, 2004, p1714), pharmaceutical companies should aim to foster good relationships between the salesperson and prescribers (costumers) (Hill, 1999). The sales-relevant criteria of the sales relationship are characterised by the 24-item SOCO (Sales Orientation-Customer Orientation) scale (Saxe and Weitz, 1982). Some further advice is given by Gonul et al. (2001, p89), who concluded that the ‘scope of personal selling should be carefully scheduled in terms of frequency, length of visits, and number of free samples given away to optimize the company’s effectiveness of direct promotion efforts and expenses’. Regarding mailing and advertising, there is not very much research available within pharmaceutical marketing. However, it has been highlighted by Wong-Rieger (2009) that mailing and advertising should aim to increase “disease awareness” as well as “drug awareness”. Nevertheless, specific

pharmaceutical marketing literature such as Berkowitz (1996), Dogramatzis (2002) and Smith (1983) can be recommended at this point.

2. Marketing managers - Maintain strong marketing activities during the launch phase

This research has revealed that strong marketing activities during the launch phase are beneficial, even in a state-regulated market. Furthermore, it was shown that a higher increase in sales (revenue) is usually gained during the product launch phase. This finding is supported by Jaakkola and Renko (2007, p342), who stated that ‘marketers of new medical drugs should not underestimate the importance of gaining publicity and positive word-of-mouth’. In addition, it was emphasised by Kardes and Kalyanaram (1992, p355) that the ‘habit formation (learning) effect is of importance for long-lasting sales success’. Consequently, it can be concluded that, because the launch phase is of high relevance for the further sales (revenue) success, prescription drugs marketers need to ensure that strong (effective) marketing measures are employed during the product launch phase.

3. Policy makers - Inhibit companies’ promotional activities

Another approach would be a further limitation on companies’ medical drug marketing expenditure by introducing adequate policies, especially for marketing activities that take place during the launch phase. As a result, the market failure “imperfect information” would be reduced. Furthermore, this would also reduce a company’s marketing spending, the widening gap between research and development and marketing expenditure (see also Angell, 2005). The most effective way to achieve this end may be to implement a total ban on any promotional activities and to distribute the required technical medical drug information through a controlled independent channel, in order to avoid a conflict of interests.

7.6. Conflicting Interests between Marketing managers and Policymakers

There is a conflict between pharmaceutical marketers and policymakers. Two main areas are in conflict in this situation, namely “pricing” and “marketing”.

First of all, on the one hand marketers should aim to increase the price level of medical drugs in order to increase sales (revenues), while on the other hand, policymakers should try to reduce the price level, in order to reduce healthcare spending. Together, these two opposing strategies lead to a “pricing policy” conflict. Furthermore, marketers should try to increase marketing expenditure, whereas policymakers should try to inhibit this area, thus resulting in a “marketing policy” conflict.

As already highlighted, healthcare costs are on the rise (Gonzalez et al., 2008) and will lead, if no countermeasures are taken, in the long term to financial problems for society. Taking into account that the current monthly healthcare insurance cost of 365 Swiss francs will rise by an average of 5.4% per year (figures taken from www.bfs.admin.ch) and a low inflation rate is present (it has been almost 0% in Switzerland for the last couple of years, see www.lik.bfs.admin.ch), healthcare insurance costs in 50 years' time will be approximately equal to the average monthly salary of 5,979 Swiss francs (www.bfs.admin.ch). However, at this point it should be mentioned that, according to governmental statistical data (see www.bfs.admin.ch), only 10 per cent of the healthcare costs can be attributed to medication costs. Nevertheless, despite its unpopularity among specific interest groups (pharmaceutical companies, pharmacists, doctors (customers) and even health insurance providers), it can be concluded that, sooner or later, regulatory measures will have to be implemented by policymakers, in order to limit rising healthcare expenditure.

7.7. Study Limitations

The methodology conducted for this dissertation ensures the minimisation of bias caused by reliability¹² and validity¹³. Nevertheless, some limitations are present, as will be discussed in the following.

The systematic literature review discussed in Chapter 2 has several limitations. The method was applied as systematically as possible to ensure the principal limitation of the present study lay in the fact that no literature review could guarantee an absolutely distortion-free picture. Petticrew and Roberts (2006) described six possible biases of systematic reviews. One aim of the study design was to minimise these biases as described below: (1) Studies with statistically significant results are more likely to get published than those with non-significant results. Therefore, unpublished work and alternative sources were considered. (2) The publication could be affected by the source of funding. Therefore, conclusions derived from the systematic literature review were based on 528 publications. (3) Authors may be more likely to report positive findings in international, English language journals, and negative findings in a journal from their own country. Therefore, Swiss and German sources were included as well. (4) Many studies are published in journals that are not indexed in any of the major electronic databases. Therefore, it was ensured that alternative sources gathered via Google and expert recommendations were included. (5) Studies that are supportive of a beneficial effect may be cited more frequently than unsupportive trials. Therefore, the final conclusions' findings were based on 528 publications, in order to minimise this bias. (6) Studies with significant results are more likely to lead to multiple publications. The significance of the results was not a criterion.

¹² The reliability of a measure is its degree of consistency: a perfectly reliable measure gives the same result every time it is applied to the same person or thing, barring changes in the variable being measured' (Whitley, 1995, p100)

¹³ 'The validity of a measure is its degree of accuracy: A perfectly valid measure assesses the trait it is supposed to assess, assesses all aspects of the trait, and assesses only that trait' (Whitley, 1995, p100)

The qualitative focus and Delphi groups described in Chapter 3 had the following limitations. The main limitation lay in the fact that the methods used can never guarantee a distortion-free picture. Although the methods used strive to produce consensus among experts, even an expert judgement may not always be objective (see also Glitz, 1997). However, because of their broad professional and academic experience, valid and reliable responses can be assumed from the participants (see also Glitz, 1997). Furthermore, it is the nature of the Delphi and focus group techniques that the sample size is relatively small and therefore not broadly representative (focus group $n = 5$, Delphi group $n = 11$) (see also Bortz and Doering, 2006). Consequently, the results cannot be interpreted as definitive or as representative of the industry due to the limitations caused by the small number of acknowledged Swiss experts providing prescriptive advice. However, it should be emphasised at this point that quantitative methods can provide new findings or different views, as they might gather more in-depth information, whereas the statistically more robust qualitative methods containing bigger sample sizes are based on retrospective data and structured questionnaires (see also Bortz and Doering, 2006).

The quantitative market data analysis discussed in Chapter 4 has the following limitations. This dissertation was designed so that individual medications could be compared effectively with each other (same product class and same indication). This naturally limits the number of medications. As a result, a total of 37 substances and 108 brands (products) were recorded. Furthermore, this dataset covered five prescription medical markets (Beta Blockers, ACE Inhibitors, Angiotensin II Antagonists, PDE5 Inhibitors, and Statins). The assumption was made that these results could be generalised for the prescription pharmaceuticals market. However, it was stated by the focus group, as well as by Kremer et al. (2008), that this is not necessarily true. Consequently, additional research will be required in order to clarify this uncertainty (see also Paragraph 6.3). In order to investigate the multi-level structure of this dataset, applying hierarchical linear model (HLM) analysis would have been ideal. However,

because of the small sample size, a multiple regression analysis was applied instead. The availability of data in Switzerland was an advantage – marketing data was available from 1995 – but since data records containing all the required information were difficult to find for this period of time, additional data had to be gathered from multiple sources. Some of these data were taken from another secondary data source, while other information (primary data) was collected via an online survey that was especially conducted for this dissertation. Consequently, it can be considered a strength that the dataset contained information gathered from different sources, as this enhanced representativity.

However, this does not mean that these findings can automatically be generalised to markets other than Switzerland, although it is in line with Steenkamp's (2005) suggestion that context-related research should be performed. As stated by Steenkamp (2005, p6), 'theories are usually developed without an explicit reference to their socioeconomic institutional and cultural context. However, a cross-national generalization should in many cases not be assumed'. This can also be reasoned by the fact that, as pointed out by Steenkamp (2005, p6), 'cultural norms and beliefs are powerful forces shaping people's perceptions, dispositions, and behaviours'. Consequently, generalising existing strategies to other markets is one of the most important challenges facing companies today. As a result, 'companies' business models must often be recast', as concluded by Steenkamp (2005, p7). This is in support of Bolton's (2003) editorial note in the *Journal of Marketing* (JM) that international marketing research is underrepresented

7.8. Directions for Future Research

The effects of pharmaceutical marketing within a regulated prescription drug market are interesting and important to study, but often answers to the research questions regarding marketing factors lead to new research questions. Consequently, this dissertation delivers

implications from which academics and marketers can benefit. However, this work has also revealed research gaps that interested scholars can follow in their research. Nevertheless, it should be highlighted at this point that the ‘primary goal of scholarship in pharmaceutical marketing should perhaps not be to derive theories that can be generalised perfectly to all situations’, as suggested by Stremersch (2008, p233). Rather, the goal should be to develop theories and reveal findings with explicit reference to the context (Steenkamp, 2005). In addition, academics should also gain unique overall and independent knowledge about a state-regulated pharmaceutical market and its specific behaviour, in order to be able to deliver recommendations to marketers and policymakers (Steenkamp, 2005). As a result, the following five research gaps are indicated.

- Factors influencing perceived quality

It was revealed that the prescriber (costumer)’s perception of quality is of high relevance. However, the actual factors influencing this factor still remain unclear. Consequently, additional research regarding the role and the guiding criteria behind perceived quality should be conducted.

- Price elasticity of prescription pharmaceutical marketing demand models

This research provided a positive price elasticity for the investigation. However, further research covering more markets and relevant guiding factors could be performed. This in support of Kremer et al. (2008, p236), who concluded that, in the literature, there is ‘little consensus on the price elasticity of demand’.

- Generalisation of the research results

This research is based on data taken from five prescription pharmaceutical medication classes. Further research could investigate if the presented findings relate only to these five investigated medical classes or if they can be generalised to the total market.

However, according to Kremer et al. (2008, p244), the ‘effects of the promotional instruments vary considerably across disease categories’.

- The role of distribution and order-of-market entry

There is room for further research regarding distribution and the relationship between order-of-market entry and distribution in prescription pharmaceutical marketing, as this is widely uncovered by the scientific literature (e.g. to be in hospital first).

- Relevant product policy factors

There is room for research regarding the role of product policy-related factors such as product properties. Furthermore, product differentiation by product alteration using the same substance (such as different types of Paracetamol (pain killer) products: Panadol Children, Panadol 500mg, Max Strength, Night-time, Day & Night, Blackcurrant Flavour, Lemon Sachet, etc.) or by branding (product and company brand) (see also Vakratsas and Kolsaricis, 2008) could be investigated.

In addition to these five suggested research directions, it might be worth reconsidering the validity of the ‘4Ps’ marketing mix concept for prescription pharmaceuticals marketing. Alternatively, concepts such as ‘3Ps’ or ‘2Ps+1’ might be suggested. However, although several marketing mix concepts have been suggested in the scientific literature, as discussed in the first chapter of the present study, the need for an additional marketing mix concept and its contribution to marketing science can be questioned.

7.9. Conclusions

This research has investigated factors leading to higher sales (revenue) of prescription pharmaceutical drugs when physicians (costumers) are targeted in a state-controlled market. The research has also revealed that the vast majority of the literature has investigated specific marketing-related factors within the non-state-regulated U.S. market. In addition, focus and Delphi group studies were conducted with Swiss healthcare professionals (state-regulated market). On the basis of these results, a conceptual model (see Figure 3-5) and seven hypotheses were derived. These hypotheses were then tested in the light of state-controlled (Swiss) prescription pharmaceutical markets data, resulting in the following conceptual model (see Figure 7-3).

The research has revealed several marketing instruments that are not applicable in a state-controlled market. For “order-of-market entry” it was shown that this effect is not of high relevance. For “product policy”, no differences could be found. Furthermore, it was shown that there are restrictions on applicable promotional instruments as a result of initiatives and regulations imposed by governmental authorities, which ultimately lead to a reduction in the amount of marketing that can be employed by pharmaceutical companies. In addition, a distinction has to be made between the “brand-level”-related variable (promotional activities that can be directly influenced by companies) and the “substance-level”-related variable (can only partly be influenced by companies’ promotional activities). Furthermore, there was also a difference in the behaviour of factors related to “average sales (AS)” and “beta sales (BS)”.

In general, it was concluded that prescription drugs “marketers” should place emphasis on their marketing activities through promotional measures during the product introduction phase. Furthermore, it also appears that there is room for a more efficient application of promotional measures. In addition, a higher pricing level should be the goal and measures

should be taken in order to increase the prescriber (costumer)'s perceived quality. However, it is not necessarily relevant to be first to market.

On the other hand, healthcare “policymakers” should aim to reduce prescription drug pricing levels and restrict companies’ promotional activities. In addition, the practice of self-dispensing doctors (costumers) (which takes place in the Swiss market) should be banned and educational product-related measures for doctors (costumers) should be more comprehensive and independently delivered.

The analysis of the effects of pharmaceutical marketing will remain an interesting challenge for researchers worldwide, taking into account the ideas and concepts presented within this dissertation. The author hopes that this dissertation provides a starting point for further work in this fascinating and important area.

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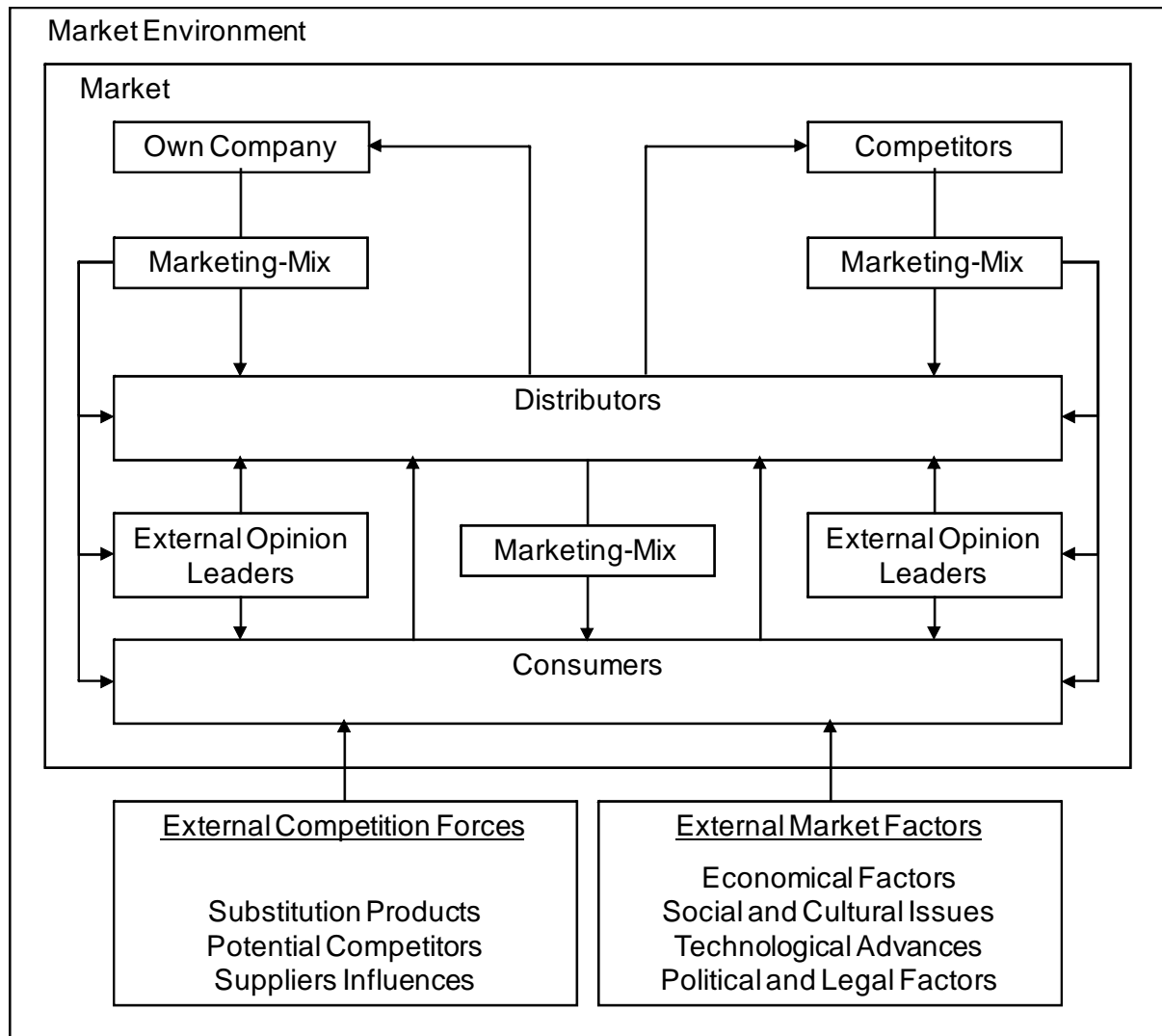
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9. Appendices

Appendix 1 – Kuehn Market Model



Appendix 2 – Literature Rating Criteria

Type	Description	Ranking Criteria
five star	Indicated as a core paper within the subject area, shows high relevance regarding to the research question.	Findings give a relevant contribution regarding to prescription pharmaceutical marketing in general. Methodology meets the requirements of objectivity, reliability and validity.
four star	Paper has some important findings and good methodology.	Findings partly contribute to pharmaceutical marketing, investigate aspects such as order-of-entry, marketing mix, especially product, place, promotion and price and provide in depth findings regarding these instruments. Methodology meets the requirements of objectivity, reliability and validity.
three star	Some interesting, but less essential findings and figures can be found.	Findings partly investigate aspects such as order-of-entry, marketing mix, especially product, place, promotion and price and provide some limited, additional findings. Methodology meets the requirements of objectivity, reliability and validity.
two star	Regarding for the ongoing research, only interesting research methods applied	Provides only interesting methodology that meets the requirements of objectivity, reliability and validity.
one star	Not relevant to subject at all	No contribution at all.

Appendix 3 - Focus Group Transcript

Appendix 4 – Meta Matrix Focus Group

Category		Seller	Buyer	Group
Marketing		<p>SA 3: Pharmacists often give a generic substitute</p> <p>SA 5-6: scientifically oriented physicians decide on the basis of the medical scientific documentation, n, clinical study results, independent studies</p> <p>SA 6-7: economically orientated doctors decide on the basis of a price to performance ratio and the best customer service. best margins</p> <p>SC 15: Physicians do have preferences</p> <p>SA 26-27: prescription drug can only be prescribed by a doctor. Personal acquaintanceship with a</p>	<p>BB 10-11: patient asks the doctor for a prescription of a drug that has been recommended by the pharmacists</p> <p>BB 11-12: physician prescribes a drug usually on the basis of his personal experience, historical data</p> <p>BD 17-18: medication has been introduced first. Good previous experience will cause hesitation in changing the drug.</p> <p>BD 19: disadvantage when a drug is seldom prescribed</p> <p>BE 24: consumers often go to the pharmacy and ask for a drug they have encountered on the</p>	<p>GD 50: Life style drugs, however, are better advertised via patients who ask the doctor for the preparation</p> <p>GD 50-52: organises an event covering a non-pharmaceutical topic once per year. This enables to reach doctors who normally would not take part.</p> <p>GD 53: Information “pushing” is another strategy</p> <p>GD 54-55: , patients are increasingly gathering the relevant information and asking doctors for a specific medication</p> <p>GD 55-56: customers do ask in the pharmacy for additional information about a product they</p>

<p>physician is a major criterion for access</p> <p>SA 29: multiplication effect is also a good approach</p> <p>SA 29-30: Opinion leaders are the main target group</p> <p>SA 63: doctors' specialisation is of relevance</p> <p>SA 103-104: Physicians are the decision makers when purchasing prescription drugs</p> <p>SA 104-106: Classical sales approach: influencing the physician: to show the benefit and make sure that the drug is being distributed at the pharmacy</p>	<p>Internet.</p> <p>BB 32-34: A regional relation network that endorses the medication ... has a positive effect</p> <p>BB 34-35: important ... to be in a hospital first</p> <p>BB 35-36: General practitioners usually have little reason to change the patients' hospital prescription</p> <p>BD 42-43: convince the relevant opinion leaders' one or two years before a new product will be launched</p> <p>BE 48: product information and sales strategy has to go via the doctor</p>	<p>have already heard about</p> <p>GD 153: A prescription habit seldom changes</p> <p>GD 154-155: market introduction of Viagra would have been very difficult without laymans' involvement and an enormous marketing effort</p> <p>GD 155-157: Serotonin inhibitors were unsuccessfully introduced because of their wrong positioning and a poor marketing performance. Their potential has not been realised.</p> <p>GD 255: an opinion leader can be a a head doctor in a regional hospital providing regular seminars or a specialist</p> <p>GD 257: the person that has shown exceptional vocational competence is recognised as an opinion leader</p>
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		<p>SC 110: depends on the product properties, application area and target group</p> <p>SC 110-111: marketing strategy and especially the pre-launch activities have to be set-up accordingly</p> <p>SC 112-113: Marketing performed after the market introduction phase has to be extremely target group orientated</p>	<p>BE 48-49: Life style drugs are better advertised via patients who ask the doctor for the preparation</p> <p>BD 115-116: substance has been presented at a scientific congress previous to the market introduction</p> <p>BE 122-123: market customs. In Europe, advertising is performed via physicians whereas drugs are marketed via patients in America</p>	
Product		<p>SC 41: good product presentation</p> <p>SA 125-126: indication (application area), compliance (once, twice or three times daily) and possible side effects ... safety</p> <p>SA 126-127: producers' reputation are other relevant issues. Large companies have an advantage over small companies</p>	<p>BB 129: effectiveness, side effect profile, 'my own experience'</p> <p>BB 129-130: medication documentation</p> <p>BD 132-133: drug delivery .. imodern image</p>	<p>GD 146: A frequent query is whether the drug has been produced in Switzerland.</p> <p>GD 148: difference (of drugs) is usually exaggerated by the competitors</p> <p>GD 152: medication has to show good effectiveness</p>

		<p>SC 131: Safety and side effects</p> <p>SA 137-138: compliance is relevant</p> <p>SA 138: In case of an unknown producer, the larger one will be chosen</p> <p>SC 141: two similar products, the branded product will be chosen</p> <p>SA 176: There is a switch to generics</p>	<p>BE 134: compliance is relevant</p> <p>BB 139: choose the company me (physician) and the patient has more confidence in</p> <p>BB 139-140: In case of problems, the larger company will be more likely able to pay</p> <p>BD 142: I would definitely choose a product from a well-known firm</p>	<p>GD 159: sum of the experience you have of a firm also gives a certain impression</p>
Price		<p>SC 41: price policies</p> <p>SA 104: Financial incentives are relevant</p> <p>SA 168-170: Until recently, the price did not have any relevance. However, since the government has implemented a new regulation, that 20% of the price has to be paid directly by the patient, the price is more relevant.</p>	<p>BB 13-14: purchase conditions are also relevant</p> <p>BB 32: Reasonable pricing is necessary</p> <p>BD 143: I would recommend a generic product to my patients because of lower price</p>	

		<p>SA 173-174: The new regulation has raised the patients' price sensitivity. Consequently, physicians are also confronted more frequently with this issue.</p> <p>SC 181: There are differences in price sensitivity world wide</p>	<p>BB 178: price plays an important role for me BE 184-185: However, preparation without a generic substitute still has a high price BE 185-186: The patient considers the price when he has to pay out of his own pocket BE 186-187: Patients ... are increasingly asking for them (generic drugs) when purchasing medication</p>	
Place			<p>BD22-23: Consumers purchase prescription drugs via the internet as a grey channel</p>	
Promotion	Advertising	<p>SA 215: I usually search for information about a competitors' product in the internet</p>	<p>BD 18-19: scientific medical documentation is relevant</p>	<p>GD 56-57: Despite the circumstance that direct - to -customer advertising is illegal in Switzerland, this is becoming more</p>

		<p>SC 222: The online trading platforms usually provide information</p>	<p>BB 32: Convincing documentation is essential</p> <p>BD 46: There can also be too much promotion</p> <p>BB 108-109: Sales person, printing material, presentations at scientific congresses</p> <p>BD 114: Good scientific medication documentation is relevant</p> <p>BD 115: A good slogan mentioning the key therapeutic problem is also essential</p> <p>BD 117: lay press should be involved</p> <p>BE 121-122: the quality of medical information shows the company standard</p> <p>BB 218-219: I do have to consult the producers' information. However, I do not know if the complete information has been provided</p>	<p>and more popular. However, there are other ways a drug can be promoted</p>
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			<p>BB 219-221: I read the critical pharmaceutical information from Etzel Gisling, consult the Compendium and also ask colleagues on congresses.</p> <p>BD 223: sales figures of a substance are a very important indicator</p> <p>BD 223-224: A rise in share prices is usually related to the product. This is official, unbiased information.</p> <p>BE 226: information from Compendium, Internet and companys' information</p>	
	Personal Selling	<p>SA 27-28: Many physicians do not accept any sales visits, especially from small firms</p> <p>SA 28-29: relevant to meet the physicians, primarily at a congress</p>	<p>BD 20-21: in case similar products, personal contacts with sales executives are essential</p> <p>BB 72-74: I do not have any preferences when arranging (sales) appointments. This gives me the chance to get acquainted with a new</p>	<p>GD 90-91: Certain groups of specialised doctors more likely welcome sales representatives than others</p> <p>GD 93-94: A reason for cancelling a sales visit might also be the doctor's fear of showing that he is not up to date.</p>

SC 39-41: frequent sales visits ... information of opinion leaders

SC 75-76: Will I like the main matter of the sales visit? Will I benefit from the sales visit? How will I interact with the sales person?

SA 193-194: good product, the sales person has an influence on the doctor ... as an information supplier

medicine. There are also chances for meetings at a congress. It works by coincidence

BD 81-84: They do not take the opportunity to receive information from sales reps. The sales person is in general quite well informed, also gives information about possible side effects, but is a little bit biased. If you listen to them on a regular basis, it is an easy way to gain further education.

BE 86-88: I try to reduce the time of a sales visit. The conversation might give me some first information. If necessary, I might seek better founded information.

BB 197-199: I do expect reliable information and a convincing personal appearance. However, this influences my decision only to a minor extent. I do read clinical studies, attend seminars,

GD 94-95: Some of my doctor' colleagues do not welcome sales reps at all, but are informed by independent resources.

GD 95-96: Others advise their medical practice assistant only to welcome representatives from certain companies or areas of interest

GD 97-100: It is very difficult to access objective information. Therefore, pharmaceutical representatives still remain an acceptable information source.

		<p>SA 194-196: if sales person ... is being tripped up all the time, the physician will be influenced, but negatively.</p> <p>SC 202-203: As more products for a certain treatment are on the market, sympathy for and or antipathy of a sales rep becomes even more important.</p>	<p>and exchange information with colleagues. I do also consider the opinion leader's point of view.</p> <p>BD 204-205: The pharmaceutical representative cannot provide me with any new vocational subject orientated information</p> <p>BD 208-210: Almost every piece of information provided by sales reps is biased. A sales visit is only useful for me when some helpful information is given. I do not look at the accompanying documents.</p> <p>BE 2111-212: The sales reps only give me some inspiration. I will seek additional information in cases involving interesting information</p>	<p>Information from the relevant specialist literature is usually too critical and deters from trying new medical approaches.</p> <p>GD: 228-229: It should always be the same sales person you are in charge with</p> <p>GD 232-233: A good sales person is competent in vocational matters, knows the medicines' documentation, has a good appearance and appropriate communication skills</p>
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Appendix 5 – Delphi Group Round -1-Mailing

Dear Expert

In the course of an ongoing international scientific study of methods for an accelerated market introduction of pharmaceutical products, we are conducting a Delphi-Group survey.

For this current qualitative survey we have defined a small group of chosen healthcare professionals involved on the buy or sell side of pharmaceutical marketing.

- In a first step, you are asked a few general questions.
- In a second step (a few weeks later), you will be asked a couple of additional, more specific questions based on your answers.
- As a last step, the summarised results of this opinion poll will be sent to you and you will be asked whether your assumptions comply with the survey's conclusion.

Thus, we would like to ask you your personal opinion regarding the importance of various factors that might influence the sales of prescription drugs.

1. *What are the most important key factors leading to successful sales?
(Please justify your statement)*

2. *What are the greatest challenges for you in the "product" area? So far we identified issues such as branding, efficacy, sales reps, etc.*

3. *Why do many products struggle to reach their financial expectations?*

Thank you for taking part in this study. Please remember to return the completed questionnaire by means of the return-addressed, pre-paid envelope provided.

Your responses will be treated confidentially and collated with those of other experts. As mentioned above, we will provide you with a summary of the results within the next weeks.

Thank you for your cooperation

Yours Faithfully



Michael Stros

Appendix 6 – Delphi Group Round -2- Covering Letter

Dear Expert

As already mentioned, further questions, as follows, have arisen from your previously handed-in questionnaire.

Instructions:

- Firstly, we would like to learn of your opinion with regard to the relevance of some specific criteria associated with the sales process: Please tick the most appropriate box in column **(A)**.
- Secondly, please rank in columns **(B and C)** (*1 = unimportant, high number = very important*) the above-mentioned criteria according to their importance to the sales process.

Thank you for taking part in this study. Please remember to return the completed questionnaire by means of the return-addressed, pre-paid envelope provided.

Your responses will be treated confidentially and collated with those of other experts and we will provide you with a summary of the results within the next weeks.

Thank you for your cooperation

Yours Faithfully

A handwritten signature in black ink, consisting of the letters 'M' and 'R' written in a cursive, stylized font.

Michael Stros

Appendix 7 – Delphi Group Round -3- Covering Letter

Dear Expert

As already mentioned, further questions, as follows, have arisen from your previously handed-in questionnaire.

Instructions:

- Please tick the most appropriate box in the right column

Thank you for taking part in this study. Please remember to return the completed questionnaire by means of the return-addressed, pre-paid envelope provided.

Your responses will be treated confidentially and collated with those of other experts and we will provide you with a summary of the results within the next weeks.

Thank you for your cooperation

Yours Faithfully

A handwritten signature in black ink, consisting of the letters 'M' and 'R' written in a cursive, stylized font.

Michael Stros

Appendix 8 – Delphi Group Transcript

Appendix 9 – Meta Matrix Delphi Group

Category	Statement	Participant	Line
Marketing	Awareness at a) med. Doc. b) pharmacies, c) patient - generally at the prescriber	1	2
	Product + Marketing + Sales have to fit fully for the given market segment	1	4-5.
	product itself: -high efficacy, less side effects	2	6
	Targeting: see the right doctor (high potential physician);	2	8
	marketing mix: mailings, journal ads, congresses	2	9
	Customer type. Customer perceives the problem as such and is willing to take the drug; Customer buying power. The customer must be able to pay for the drug (either through health care insurance or by personal assets)	3	13-15
	Timing. The first drug on the market even with lower efficacy can collect more sales and is more present in the minds of the customers; Customer mind share	3	15-17
	Product life cycle management. How well the overall product lifecycle is managed. It can shorten the time to market and increase the revenues generated throughout the lifetime of a product.	3	21-23
	Targeting: knowing who are the accessible potential clients;	4	24
	a good story / business logic to sell the drug > business strategy > activities for target; prelaunch activities / launch activities in strong line with the strategy (levers / indicators); dedicated team / sales force incentives	5	28-30
	Establish Customer Relationship Management in an early stage. Establish cooperation concepts with pharmacies, drugstores etc.	6	36-37
	Corporate Culture / Branding: - The producing company stands with its company name and culture responsible for the product and thus creates general public trust. To become "top of mind".	6	40-41 42

Strategic long-term clinical development plan (only promotion if steady flow of clinical results); Strategic positioning & messaging plan building on clinical plan (strategy avoid operational “missing up”); Strong pre-launch activities (accelerates take-up); “Stable” marketing / sales / medical / regulatory team (fluctuation leads to knowledge drain); Efficient marketing mix (sounds like common sense, but isn’t due to high turn-over in marketing management)	7	44-49
Know your customers needs	9	52
Targeting model, 20/80; Know your competitors well	9	53
Handling of real or possible side effects	4	62-63
Packaging and labelling. 30-40% of drug recalls	4	64
no over- or under spending; Marketing excellence: differentiation to competitors basing on really relevant parameters	5	65-66
Simple, logic, story	6	68
easy to tell; emotional branding, different from others; me too products are not even worth to launch - portfolio;	6	68-70
Differentiation: - To be perceivable different and unique: no “me too” product concept; Positioning: - To define a clear-cut positioning statement and market segmentation amongst direct - Competitors; Time to Market: - Shortening the product development process from the idea-finding stage to the marketable - Product phase;	7	71-74
Continuous management of current and future competitors	8	81-82
To be in line with regulatory / legal laws	9	84-85
late market entry	3	98
Lack of differentiation to competitors	4	101
Lack of real customer focus; Lack of creativity and the will to find new innovative ways to sell	4	101-102

	does not fit to target group; young, inexperienced team not dedicated sales force and management	5	104-105
	time parameters are under estimated	5	105
	focus on launch product	5	106
	"critical" volume	6	109
	Insufficient Marketing Strategy and Concepts: - To ambitious objectives, underestimation of time to market, lack of clear positioning, differentiation, segmentation, branding and sales policy	6	111-113
	Often insufficient, profound market and consumer patient insight = important challenge in the future; Appearance of new product categories	6	113-114
	Alternative medicine substitute the classical pharmaceutical market (no prescription by a doctor necessary)	6	114-115
	Sub-optimal (pre-) launch - hard to regain momentum	7	117
	High turnover of national / international business teams (HR!)	7	117-118
	risk for customer interface, strategic consistency, knowledge transfer	7	118-119
	Not the products struggle but ... are based on wrong assumptions, products are often not understood or wrong positioned	9	123-124
	understand the product, the environment (political, economical, legal, etc. constraints), the company	9	124-125
Product	The product itself	1	2-3.
	Drug relevance. The drug has to solve the biological problem; Perceived drug behaviour. If the drug reduces or heals the issue faster or more comfortably than a comparable drug then preference is given to the first;	3	11-14.
	A good drug (efficacy, side effect, medications);	5	28
	Product quality: - Achievement of high therapeutic efficacy for the patients. - The quality performance has to be maintained in the long run on a constantly high level	6	31-32
	Branding:	6	40

	To achieve quickly a high product brand awareness and image	6	41-42
	Develop a highly innovative and differentiated product (unethical Rx e.q. AIDS/Oncology the product and corresponding “disease management” solution are keys);	7	43-44
	products to cover these needs	9	52
	product efficacy must convince	1	55
	Are there USP’s to the product?	1	56
	high efficacy perception of your product is a must	2	58
	Having the ‘right’ drug at the right time	4	61-62
	advantages for patients and doctors in focus	6	68
	Product Convenience: - Work-out consumer-friendly product conception, packaging and strong design. Avoid over-packaging.	7	74-75
	Efficacy, novelty (drugs and targets)	8	83
	product is not so effective	3	95
	product shows undesired side effects	3	96
	not every product is worth to launch	5	105-106
	Product efficacy: - Many products don't meet consumer expectations or create new medical problems in the long term application	6	107-108
	Most are “me too” preparations; No advantage over well known, accepted drugs	8	121
Price	justifiable price (competitive);	2	6
	Price will become the most important issue in future;	1	55-56
	Margins. - To maintain economically defensible margins. Get sufficient profit to generate further research funds and thus assure the company’s economic existence. - Margins under pressure due to increased price control and pressure from governments, consumer protection organisations, parallel imports and generic products.	7	76-79

	Expiring patents lead to low cost imitations and price pressure	6	108-109
Place	Accessibility. How well the drug is accessible i.e. in a respective territory or can the production meet the demand. For a biotech this includes the right partnering with a larger company	3	19-21
	Selling: - Fast and complete distribution, availability and visibility at the sales channels. Fast and high penetration among the target audience;	6	38-39
Promotion	Promotion, if allowed, may support above statements and develop to a broad acceptance	1	3-4.
	Professional sales force: - high/top product knowledge, -enthusiastic, emotional, highly motivated sales rep	2	7-8.
	Frequency: high number of sales force contracts	2	8-9.
	How present the drug is in the customer's mind (doctor or patient) as in classical marketing understanding (through advertisement or sales force etc.);	3	17-18
	Sales Force Excellence: skills of the sales force and implementation of the strategy (call number, frequency);	4	24-25
	Implementation of an integrated call plan: number of calls, frequency, accompanying other activities (mails, e-detailing, etc.)	4	26-27
	Scientific documentation: - The producer has to document the scientific outcomes and proven evidence of seriously conducted medical trials, particularly for the medical "milieus"; Communication: - Public relations aimed at doctors. specialised trade and potential end-users to call early high interest.	6	32-36
	Transparent. understandable and complete patient information;	6	37-38
	Well proven and documented efficacy; Low or tolerable side effects; Superiority over competition drugs (efficacy, side effects, prize, pharmacokinetics)	8	50-51
	Have convincing arguments	9	52
	high number of appointments is another challenge	2	58-59

Getting doctors doors open for the REPs (by offering services besides the product itself, for expl)	5	66-67
Human resources turn-over in marketing (every 1,5 - 2 years) can impact customer interface and knowledge transfer - people business!;	8	80-81
Promotion & sales in 100% compliance with stricter national, international and internal guidelines	8	82-83
To accurate, uncensored data	9	84
To get Dr. appointments for your reps	9	84
less noise - less prescriptions	2	93
lead to image problems and possible withdrawing from the market	3	96-97
Conservative attitude to sales & marketing methodology	4	103
Success by marketing has a short life time, after a few months the truth comes trough	8	121-122

Appendix 10 – Overview of Delivered Secondary Market Data Files

Data File	Indication	Product	Available Data
File_1	Betablockers	17	Sales (pharmacy & practitioners), Cumulated Sales
	ACE Inhibitors	13	Sales (pharmacy & practitioners), Cumulated Sales, Detailing, Non-Detailing, Marketing, Cumulated Detailing, Cumulated Non-Detailing, Cumulated Marketing
	Statins	7	Sales (pharmacy & practitioners), Cumulated Sales, Detailing, Non-Detailing, Marketing, Cumulated Detailing, Cumulated Non-Detailing, Cumulated Marketing
File_2	Betablockers	45	Sales (pharmacy & practitioners)
	Betablockers	22	Sales (pharmacy & practitioners)
	ACE Inhibitors	38	Sales (pharmacy & practitioners)
	ACE Inhibitors	31	Sales (pharmacy & practitioners)
	Statins	45	Sales (pharmacy & practitioners)
	PDE5 Inhibitors	7	Sales (pharmacy & practitioners)
File_3	Betablockers	165	Medical Promotion Index (total promotion costs, detailing costs, mailing costs, advertising costs)
	ACE Inhibitors		
	Statins		
File_4	Statins	618	Launch date
	Ulcustherapeutics		
	Angiotensin II-Antagonists		
	Betablockers		
	ACE Inhibitors		
	PDE5 Inhibitors		
File_5	Angiotensin II-Antagonists	11	Medical Promotion Index (total promotion costs, detailing costs, mailing costs, advertising costs)
File_6	Betablockers		Medical Promotion Index (total promotion costs, detailing costs, mailing costs, advertising costs)
	ACE Inhibitors		
	Statins		
	PDE5 Inhibitors		
File_7	mixed (approved drugs)	6960 + 1584 (generics)	Launch date, Factory price, Sales price, Indication group
File_8	mixed (approved drugs)	Broad range of products	Monthly sales price, Amount per product, Package size
File_9	Betablockers		Medical Promotion Index (total promotion costs, detailing costs, mailing costs, advertising costs)
	ACE Inhibitors		
	Statins		
	PDE5 Inhibitors		
File_10	Betablockers	Broad range of products	Launch date, (Medical Promotion Index) total promotion
	ACE Inhibitors		
	Statins		
	PDE5 Inhibitors		
File_11	Betablockers	Broad range of products	Launch date, Medical Promotion Index (total promotion costs, detailing costs, mailing costs, advertising costs)
	ACE Inhibitors		
	Statins		
	PDE5 Inhibitors		
File_12	PDE5 Inhibitors	7	Sales (pharmacy & practitioners), Cumulated Sales, Detailing, Non-Detailing

Appendix 11 – Coding of Variables for Analysis

VARIABLE NAME	CODE	DESCRIPTION
product_name	1 - 109	none
order_of_entry		<i>number of market entry order, starting with 1</i>
drug_class_code	1 2 3 4 5 6 7 8	ANGIOTENSIN II ANTAGONISTS, PLAIN PDE5 Inhibitors BETA BLOCKING AGENTS BETA BLOCKING AGENTS AND THIAZIDES ACE INHIBITORS, PLAIN ACE INHIBITORS, COMBINATIONS LIPID MODIFYING AGENTS, PLAIN BETA BLOCKING AGENTS AND OTHER DIURETICS
substance_code	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37	Atenolol atorvastatin Bisoprolol Captoprilum carvedilol cerivastatin Enalapril Ezetimibum fenofibrate fluvastatin fosinopril Lisinoprilum Metoprololi moexipril nebivolol nicotinic acid Perindopril Pindolol pravastatin Propranolol quinapril Ramipril simvastatin sotalol Trandolapril Zofenopril candesartan eprosartan Irbesartan losartan olmesartan medoxomil Sildenafil Tadalafil telmisartan valsartan varapamili Vardenafil
daily_drug_dose		<i>in gramm</i>
drug_application_range		<i>total number of approved drug applications</i>
drug_interaction		<i>total number of drug interactions</i>
drug_side_effects		<i>total number of drug side effects</i>
rating_of_drug_properties	1 2 3	bad (equalized 1.0) average (equalized 5.5) good (equalized 10.0)
personal_selling_costs		<i>Producers' monthly product personal selling costs in Swiss Francs</i>
mailing_costs		<i>Producers' monthly product mailing costs in Swiss Francs</i>
advertising_costs		<i>Producers' monthly advertising costs in Swiss Francs</i>
promotion_costs		<i>Cummulated monthly product promotion costs</i>
drug_type_code	1 2 3 4 5 6	tablets filmtablets capsules ampules retard tablets retard capsules

Appendix 12 – Questionnaire for Primary Data Collection

<< INTRODUCTION >>

Dear Expert

I am writing to enlist your assistance in completing an online survey for a doctoral research in Pharmaceutical Marketing at the Aston Business and Life and Health Sciences School, Aston University in the United Kingdom.

Thus, we would like to ask you your personal opinion regarding the efficacy of medical drug substances. This online survey will take you only 5-10 minutes to complete. Furthermore, a price draw will be made for an Ipod Shuffle, from all the completed entries.

I assure you that any information you give will be treated with complete confidentiality. If you would find it useful, I am happy to provide you with a summary of the findings upon completion of the research. Please also note, that the information you provide is not used for any other purpose than testing theories about pharmaceutical marketing strategies.

I look forward to hearing from you. A link of the online survey is given below.

Yours sincerely

Michael Stros

<< PAGE ONE >>

- 1) Sex (male/female)
- 2) Occupation (pharmacist/doctor)
2a) if doctor, what is your specialisation? (general practitioner; inner medicine; cardiology; diebetology; endocrinology)
- 3) Years of experience? (less than 1y; 1-5; 6-10; 11-15; 16-20; more than 20y)
- 4) Where are you located (list of Swiss cantons)

<< PAGE TWO >>

- 5) Please rate the following medical substances for their efficacy

Medical Drug Class	Substance	Valuation <i>Not efficient – highly efficient</i>	No valuation made <i>Tick box</i>	Comments <i>Optional</i>
ACE Inhibitors	Captoprilum	1 2 3 4 5 6 7 8 9 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Enalapril	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Fosinopril	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Lisinoprilum	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Moexipril	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Quinapril	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Trandolapril	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
Angiotensin II Antagonists	Candesartan	1 2 3 4 5 6 7 8 9 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Losartan	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Olmesartan Medoxomil	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Telmisartan	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Valsartan	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
Beta Blockers	Atenolol	1 2 3 4 5 6 7 8 9 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Bisoprolol	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Carvedilol	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Metoprololi	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Nebivolol	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Propranolol	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Sotalol	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
Statins	Atorvastatin	1 2 3 4 5 6 7 8 9 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Cerivastatin	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Fluvastatin	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Pravastatin	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Simvastatin	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
PDE5 Inhibitors	Sildenafil	1 2 3 4 5 6 7 8 9 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Tadalafil	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Vardenafil	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		

<< **PAGE THREE** >>

6) Please leave your email address, in case you are interested to participate on the price draw and would like to receive a summary of the study (optional)

7) Feel free to add additional comments (optional)

<< **PAGE FOUR** >>

Thank you for your participation

If you require further information, you can contact me under
stros@aston.c.uk

Appendix 13 – Mailing

[Falls dieses e-Mail nicht korrekt dargestellt wird, klicken Sie bitte hier](#)



Sehr geehrter Herr Stros

Für meine Dissertation benötige ich Ihre Unterstützung.

Im Rahmen meiner wissenschaftlichen Arbeit an der Aston Business sowie Life & Health Sciences School, Aston Universität in Birmingham, Grossbritannien, untersuche ich Pharma Marketing Modelle.

Für die Umfrage, welche lediglich 5 Minuten Ihrer Zeit in Anspruch nehmen wird, möchte ich Sie bitten, medizinische Substanzen aus fünf Wirkstoffklassen nach ihrer Wirksamkeit zu bewerten.

Falls Sie möchten, können Sie am Ende der Befragung an einer Verlosung teilnehmen und **einen Ipod Shuffle gewinnen**.

Ich kann Ihnen versichern, dass Ihre Informationen vertraulich behandelt und nur zur Überprüfung der Theorie verwendet werden. Falls Sie es wünschen, werde ich Ihnen gerne eine Zusammenfassung der Erkenntnisse zustellen.

Vielen Dank für Ihre Teilnahme.

Bitte beachten Sie, dass Sie während der Umfrage nicht mehr zurück kehren können.

***Zwischen allen TeilnehmerInnen wird ein Ipod Shuffle verlost!**



[Zum Fragebogen ▶](#)

[Zum Fragebogen ▶](#)

Mit freundlichen Grüßen

Handwritten signature of Michael Stros, consisting of the letters 'M' and 'R' in a cursive style.

Michael Stros

Aston Business School

E mail: strosm@aston.ac.uk

***Teilnahmeschluss ist der 22.07.2011. Ihre Angaben werden vertraulich behandelt.**

Ihr Team von just-medical!

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Appendix 14 – Histograms

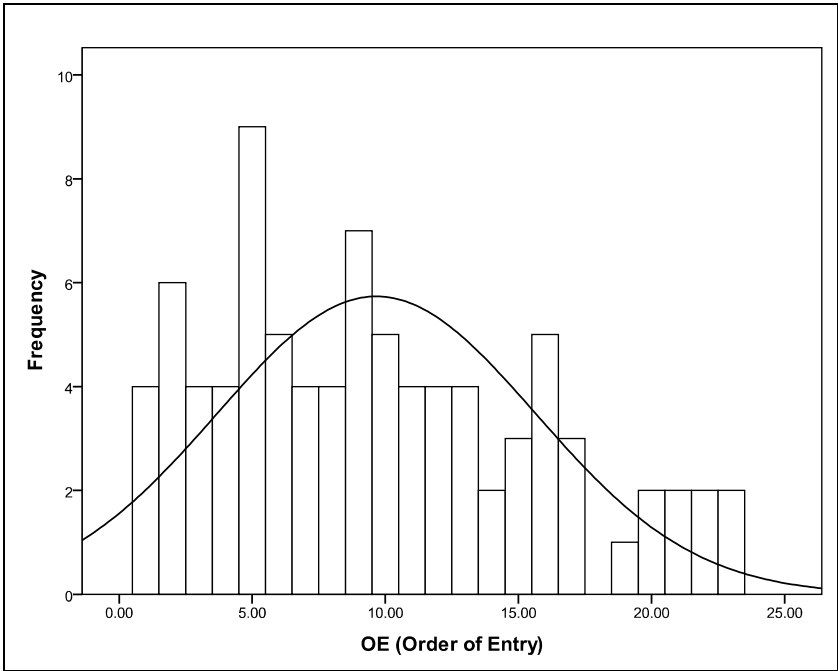


Figure 5-1: Histogram of Order-of-market Entry

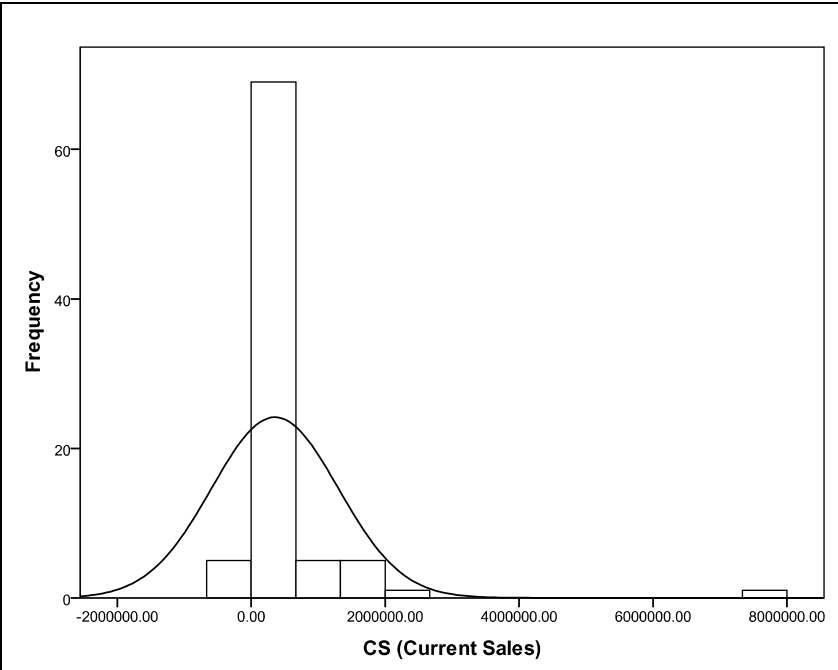


Figure 5-2: Histogram of Sales

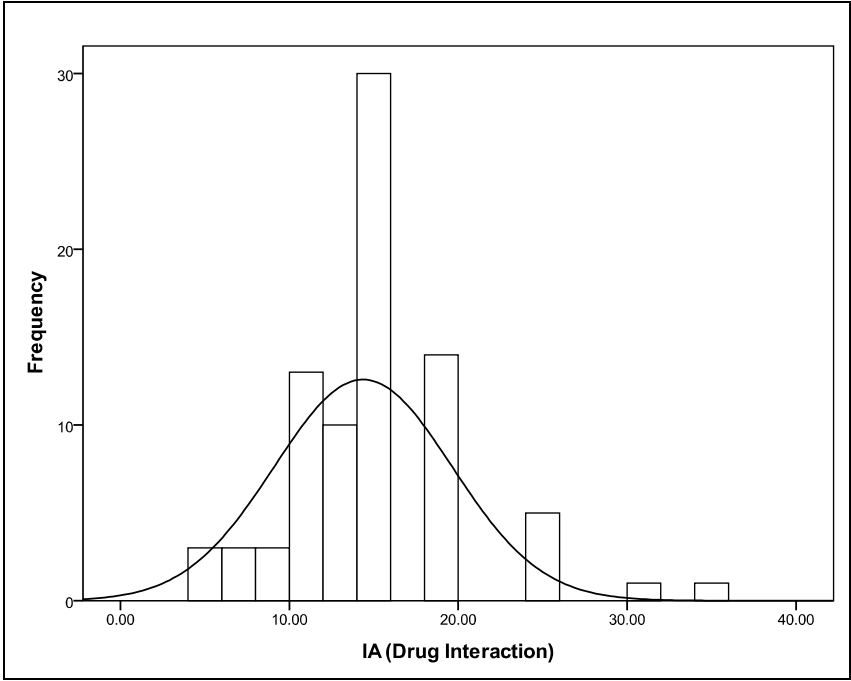


Figure 5-3: Histogram of Interaction with other Drugs

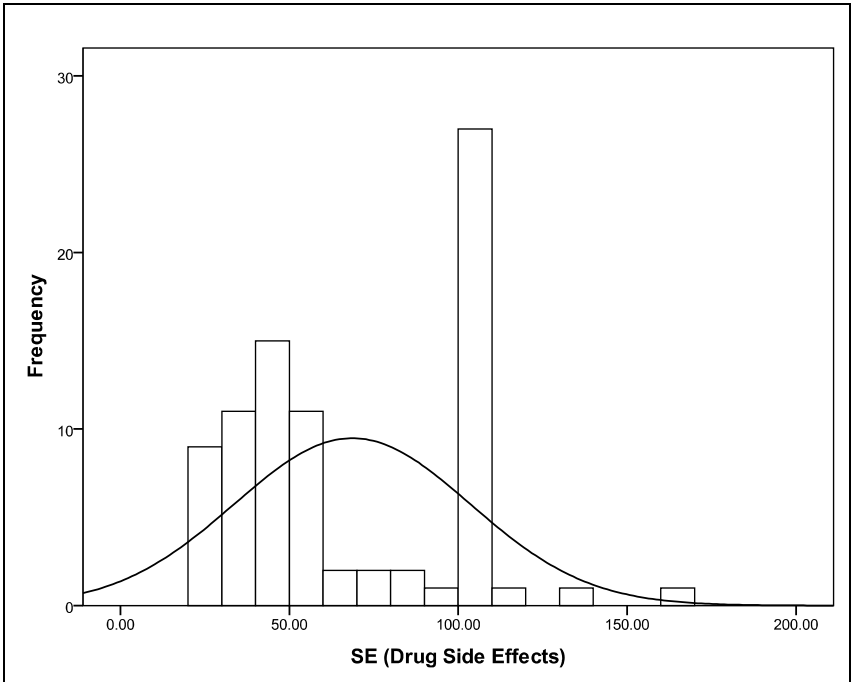


Figure 5-4: Histogram of Side-effects

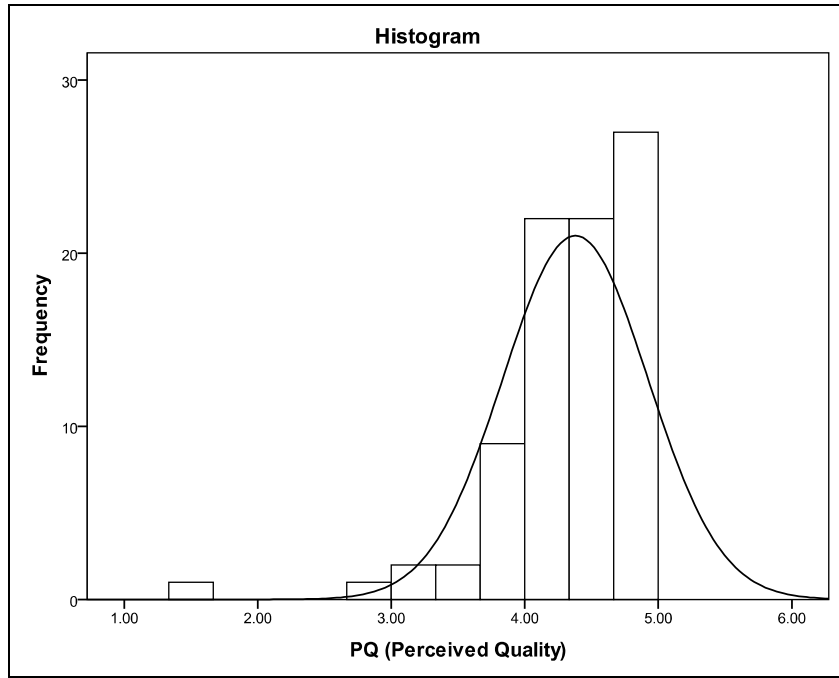


Figure 5-5: Histogram of Perceived Quality

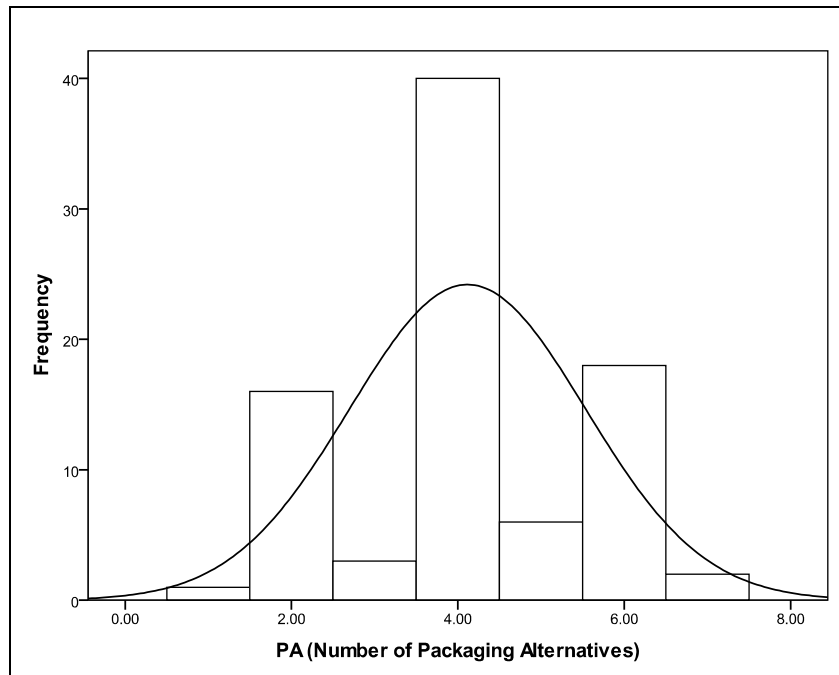


Figure 5-6: Histogram of Packaging Alternatives

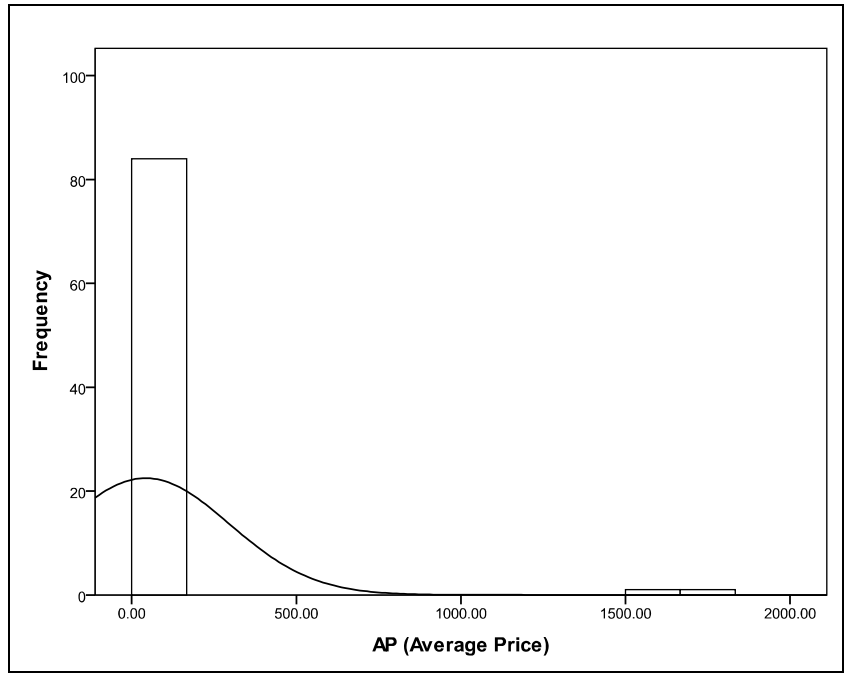


Figure 5-7: Histogram of Average Price

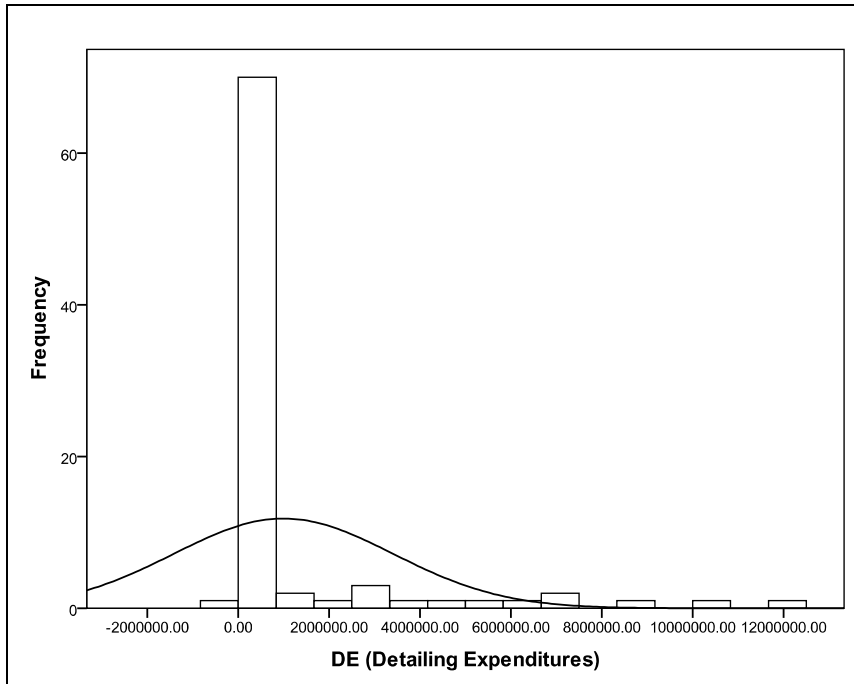


Figure 5-8: Histogram of Detailing Expenditure

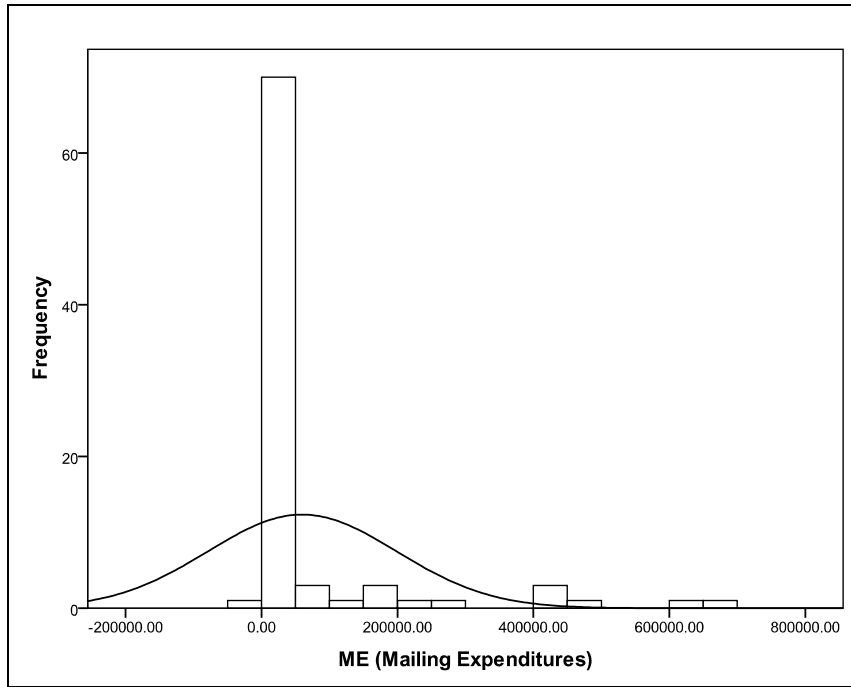


Figure 5-9: Histogram of Mailing Expenditure

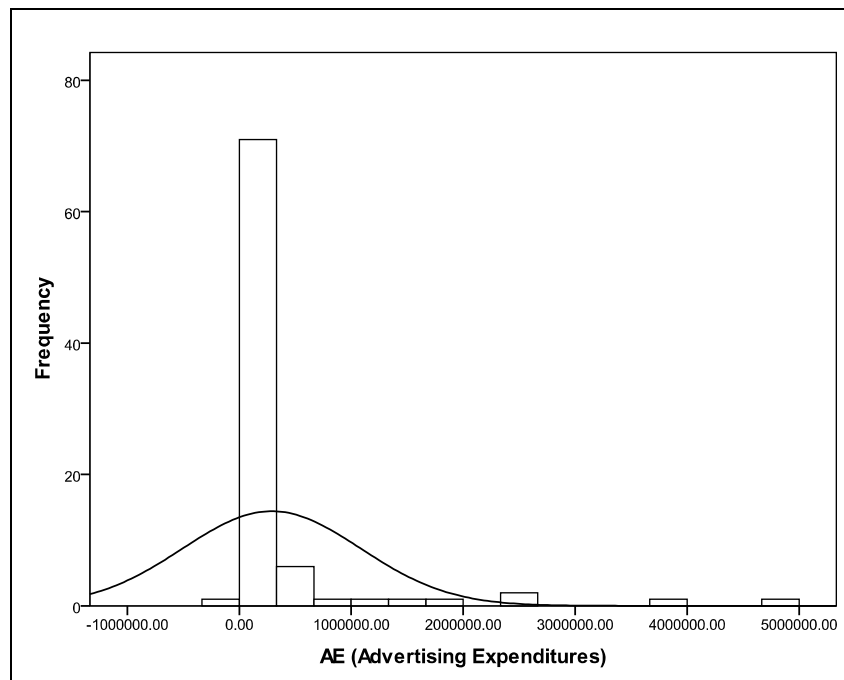


Figure 5-10: Histogram of Advertising Expenditure

