A MODEL OF THE PRESCRIPTION-PHARMACEUTICALS SALES PROCESS

Michael Stros[1], Nick Lee[2], David Říha[3]

[1] Michael Stros (Ph.D., Aston University), University of Applied Sciences and Arts of Southern Switzerland (SUPSI), Fernfachhochschule Schweiz, Brig, Switzerland, michael.stros@ffhs.ch
[2] Nick Lee (Ph.D., Aston University), Professor of Sales and Management Science, Warwick Business School, University of Warwick, Coventry CV4 7AL, United Kingdom, nick.lee@wbs.ac.uk
[3] Ing. David Říha, MBA, Ph.D., Vysoká škola ekonomická v Praze, Fakulta podnikohospodářská, david.riha@vse.cz

Abstract: The purpose of this paper is to determine the factors in marketing most relevant to achieving pharmaceutical sales success and their interrelations, as well as providing a prescription-pharmaceuticals sales process model. This will enable scholars to obtain a better understanding of the marketing process for prescription pharmaceuticals, as well as enabling marketers to apply more efficient marketing approaches. The study uses a unique data set, combining primary data and secondary data from the Swiss prescription-pharmaceuticals market. The data is analysed using a multiple-regression based model. A multi-level data structure is found, suggesting that factors concerning the specific brand and also the pharmaceutical substance itself are relevant to sales success. It is revealed that the factors most relevant to sales success are: order of market entry, perceived product-quality, average price, and marketing expenditures, leading to practical recommendations for scholars and marketing professionals. The study focuses only on the Swiss prescription-pharmaceuticals market, investigating five medical drug classes. The assumption is made that these results can be generalised to similar markets and drug classes. The study develops a conceptual prescription-pharmaceuticals sales-process model; offers practical guidelines and a good basis for further scholarly research are provided; and identifies several research gaps by giving proposals for future research.

Keywords: Pharmaceutical marketing efficacy, Product design, Pricing, Promotion, Sales model

JEL Classification: M31

INTRODUCTION

Pharmaceutical companies are increasingly facing pressure to compete. As a result, for many pharmaceutical companies, the revenues have been reduced resulting in smaller profit margins (Bush et al., 2002; Gonzalez et al., 2008). Because the efficacy of marketing spending is being questioned (Morgan et al., 2002; Sheth and Sisodia, 2002), pharmaceutical marketing managers are under increasing pressure to assess, justify and communicate the impact of marketing expenditures on financial outcomes" (Lehmann, 2004, p. 75), and therefore need to improve the efficacy of their marketing activities in order to reduce their marketing spend.

1. MARKETING IN THE PHARMACEUTICAL SECTOR

In pharmaceuticals marketing, marketers are generally considered to work within McCarthy´s (1960) conceptual framework. This refers to the four marketing instrument areas: product (includes product design, packaging), place (distribution channels), promotion (personal selling, advertising, sales promotion) and price (see Frey, 1956; Kotler, 1976). In the pharmaceutical business, it is clear that the sale (prescription decision) is to a greater or lesser extent influenced by the doctor's personal medical-drug preference (prescription habit). Prior work has found that the prescription habit is guided by the order of market entry (OE)

(Coscelli, 2000). Therefore, an early market entry leads to that product gaining a market advantage, as found in a large number of prior studies (Berndt et al., 1997; Coscelli, 2000; Golder and Tellis, 1993; Kalyanaram and Urban, 1992; Bond and Lean, 1977; Urban et al., 1986). Most of the current literature on pharmaceutical marketing presupposes the order of market entry model (OE) as a starting point in the conception of a marketing strategy (see also Castro and Chrisman, 1995; Rodriquez-Pinto et al., 2008). While it can be seen that there is some conflicting research, it can be said in general that the OE plays a crucial role in the development of the marketing strategy (see Castro and Chrisman, 1995; Rodríguez-Pinto et al., 2008). It can therefore be formally stated that ceteris paribus:

H1: The earlier (in regard to other competitors) a market entrant enters the market, the higher the sales will be.

Of course, in a prescription-pharmaceuticals market, the product features of a medical drug play a central role in the physician's prescription decision (sales) (Cooper and Kleinschmidt, 1993; Flechter, 1989; Kotler and Keller, 2006; Sharp and Dawes, 2001; Dogramatzis, 2002). For Cooper and Kleinschmidt (1993), product differentiation can be reached by the design or physical quality of competing products, by the efforts of sellers to distinguish their products through packaging and innovativeness, designed to win the allegiance and loyalty of potential buyers" (Bain 1956, p114; see also Chen and Burgers, 2007 and Kotler, 1998). In the product design area of pharmaceutical products, product innovativeness, efficacy and qualities such as safety (including tolerability) appear to be the key success factors (Smith, 1983; Flechter, 1989; Dogramatzis, 2002). Product quality (efficacy, safety (including tolerability) has also been shown to play an important role in pricing. Consequently, if the approved product has an advantage relative to other products, its market share increases (Berndt et al., 1997). Within this context, several researchers (Smith, 1990; Flechter, 1989; Dogramatzis, 2002) describe the medical-drug interactions (IA), side effects (SE), efficacy and packaging as the most relevant product features.

Taking these product-related factors together, a number of specific hypotheses can be generated:

H2: Medical drugs with fewer IAs are more likely to be prescribed by practitioners.

H3: Medical drugs with fewer SEs are more likely to be prescribed by practitioners.

H4: The better the medical drug's expected efficacy and effectiveness, the more likely it is that the medical drug will be prescribed.

Furthermore, packaging is a part of product design that enables the manufacturers to distinguish themselves from the competition. Evidence suggests that doctors tend to prescribe the product with the most convenient package size, e.g. by choosing the most economical option for their patients. In addition to this it is suggested that producers with a wider range of different packaging have a benefit on market. This is supported by Wansink (1996) who concludes that the package's size influences usage volume. This is support of Elliot (1993) who states that increased competition is forcing brand managers of consumer goods to alter the portfolio of the package sizes they offer. It is therefore hypothesed:

H5: Medical drugs supplied in a packaging more convenient for the user are more likely to be sold.

The influence of pricing in the pharmaceutical sector has been investigated by several researchers. Lexchin (2009, p145) highlighted that doctors are generally ignorant both about the relative and absolute prices of medications". Despite the contradicting evidence provided by the literature, it seems likely that in some manner, the price of a medical drug will be an important variable in any medical pricing policy. Even so, the influence of price on sales still remains quite unclear, and further research is thus required. As a baseline then, and in line with general market theory (see Arnold, 2008), a negative relation between the price level and the prescription decision is suggested:

H6: Medical drugs with a lower price (price of medication) are more likely to be sold.

In order to ensure that a product is known by physicians and, in turn, that prescriptions are made (see Brassington and Pettit, 2007), it is

important to market this product. Previous research has also shown that marketing expenditure (MA) has a significant and positive effect on sales in pharmaceutical markets. 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'. 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". However, Schwartz et al. (1989, p281) revealed that physicians also sometimes prescribed drugs at a rate far greater than that warranted by scientific evidence of their effectiveness". As a result, the following hypothesis is proposed:

H7: More (DTP) promoted medical drugs are more likely to be sold.

The place of distribution (place) in the model is – like DTC advertising – usually dependent on the characteristics of the market itself. It should be noted that place (distribution), as a marketing instrument, does not appear to play an essential role in marketing success, according to some researchers (Cooper and Kleinschmidt, 1993; Ghosh et al., 1983; Smith, 1983). In many markets, pharmaceuticals are tightly controlled by governmental regulations, meaning that no variations are made regarding the distributional marketing activities by pharmaceutical companies. As such, considerations of distribution are removed from the model – while recognising that in a less restricted market, the distribution variable may play a different role.

2. RESEARCH METHODOLOGY AND DATA PREPARATION

This study uses a unique set of primary and secondary data from the Swiss pharmaceutical sector. The applied secondary data were collected by a market-research company, via a network of associated doctors, pharmacists and wholesalers, by gathering data from the medical drugs sales transactions on a monthly basis. The data set covered a total of five prescription-drug classes, containing sales information on 37 substances from 108 products (brands) in Switzerland for the period of 1995 to 2005. As a result, approximately 2.5% of the total Swiss prescription market [total market volume: 4´052 million Swiss Francs (Kaech, 2005, p68)] are investigated. The Swiss market is an appropriate one, because its characteristics of governmentally-fixed pricing, the lack of price awareness of the prescribers and the patients when a drug choice is made, restrictions to certain promotional measures, and the almost non-existent competition from other markets, replicate many other large pharmaceutical markets (e.g. Dogramatzis, 2002). In Table 1, a short description of the market segments and data is given.

Tab. 1: Prescription Pharmaceutical Market Segments Data

Market Segment	Description
Beta Blockers	The dataset of Beta Blockers contains eight pharmaceutical substances and 25 medical products in total.
ACE Inhibitors	The market dataset of ACE inhibitors contains eight pharmaceutical substances and 30 medical products (brands) in total.
ATIIR Antagonists	The data of Angiotensin II Antagonists contain six pharmaceutical substances and 10 medical products (brands).
PDE5 Inhibitors	The market dataset of the therapeutic category phosphodiesterase type 5 inhibitors contains six pharmaceutical substances and 60 medical products in total.
Statins	The dataset of Statins (members of the lipid lowering class) contains five pharmaceutical substances and 20 medical products.

Source: Own procesing, 2017

The variables described in Table 2 covered each of the previously described markets segments shown in Table 1. However, because of the fact that the data did not contain specific product properties, data regarding the defined daily (drug) dose (DDD) were taken from the World Health Organization (WHO) database, while data about drug IAs and SE profiles were taken from a database provided by the Swiss prescription drugs approval authority (Swissmedic). In addition to this, because of the fact that no information regarding physicians' expected efficacy and effectiveness was available, we gathered primary data from Swiss physicians using a questionnaire.

In the first section of this questionnaire, a brief introduction to the research and survey was made. In the second section, 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 and a comment section was included. These questions were then implemented using an online survey tool, in order to enable an email-directed survey approach. For this purpose, an online questionnaire was then distributed via a Swiss market research agency, reaching 6,000 medical doctors (this is approximately a complete census of Swiss GPs). In total, 165 completed questionnaires (response rate 2.5 %) were returned. It needs to be stated, at this point, that a low response rate to surveys among medical doctors is not unusual (Asch et al., 1997; Sloan et al., 1997).

Tab. 2: Description and Statistics of Individual Scales

| Variable	Description	Hypotheses
(OE) Order of Market Entry	This variable indicates the order of market entry of a specific product within a specific medical drug class.	H1
(IA) Drug Interaction	This variable indicates the „interaction between a drug and another substance that prevents the drug from performing as expected" (Day, 2007, p53).	H2
(SE) Drug Side Effects	This variable indicates the „adverse effect that can be termed as a side-effect when judged to be secondary to a therapeutic effect. Adverse effects may cause complications of a disease or procedure and negatively affect its prognosis (Day, 2007, p196).	H3
(EEE) Expected efficacy and effectiveness	This variable indicates the efficacy of a specific medical drug as perceived by prescribers in relation to other medical drugs within a specific drug class.	H4
Packaging Alternatives (PA)	This variable indicates the number of available package sizes.	H5
(AP) Average Price	A price standardisation procedure was conducted to perform a price comparison between the different substances in terms of their efficacy, different dosages and packaging units within a medical drug class was conducted. The standardised price, for one day's therapy is based on the defined daily drug dose (DDD), described as the „assumed average maintenance dose per day for a drug used for its main indication in adults' (www.whocc.no).	H6
(DE) Detailing Expenditures	This variable indicates the monthly personal selling (detailing) expenditures for a specific product (brand).	-
(ME) Mailing Expenditures	This variable indicates the monthly direct mailing expenditures for a specific product (brand).	-
(AE) Advertising Expenditures	This variable indicates the monthly advertising expenditures for a specific product (brand).	-
(MA) Marketing Expenditures	Total monthly marketing expenditures, derived by the addition of detailing expenditures (DE), mailing expenditures (ME) and advertising expenditures (AE).	H7
(AS) Average Sales	This variable indicates the stated real average sales of a specific medical drug per month.	-
(BS) Beta Sales	This variable indicates the slope (beta value) of sales.	-

Source: Own procesing, 2017

Before building our model, we explored the data set for potential multicollinearity, given the likelihood of this occurring amongst key independent variables. In particular, a high correlation was observed between the marketing variables [detailing expenditures (DE), mailing expenditures (ME), advertising expenditures (AE)], indicating a high level of multicollinearity (Kleinbaum et al., 1998), which results in unstable statistical results (Cohen and Cohen, 1975; Kleinbaum et al., 1998). Therefore, these variables were combined by calculating the monthly average, creating a composite marketing expenditures (MA) variable for further use.

As a further descriptive investigation, a sales-time diagram was produced in a next step. For this purpose, data from two medical drug class markets, ATIIR Antagonists and Statins, were analysed. Different slopes between the sales (revenue) curves were observed. Drawing

from this, the variable beta sales (BS), as an indicator for the slope of sales (i.e. beta value), was introduced as a dependent variable to represent the growth (decline) of sales over time (see Table 2). While this seems relatively innovative in a marketing context, in economics, the idea of beta (slope) as a decisive factor is widely used (see Arnold, 2008).

Furthermore, taking into consideration that some of the brands use the same substance (multiple brands can use the same substance, e.g. Paracetamol), a hierarchical two-level data structure is suggested, indicating a brand (first) and a substance (second) level. The substance level includes EEE, IA, and SE variables. The brand level, on the other hand, contains OE, packaging alternatives (PA), average price (AP) and MA as independent variables, whereas average sales (AS) results in a dependent variable (see Figure 1).

Fig. 1: Multi-Level Market Data Structure
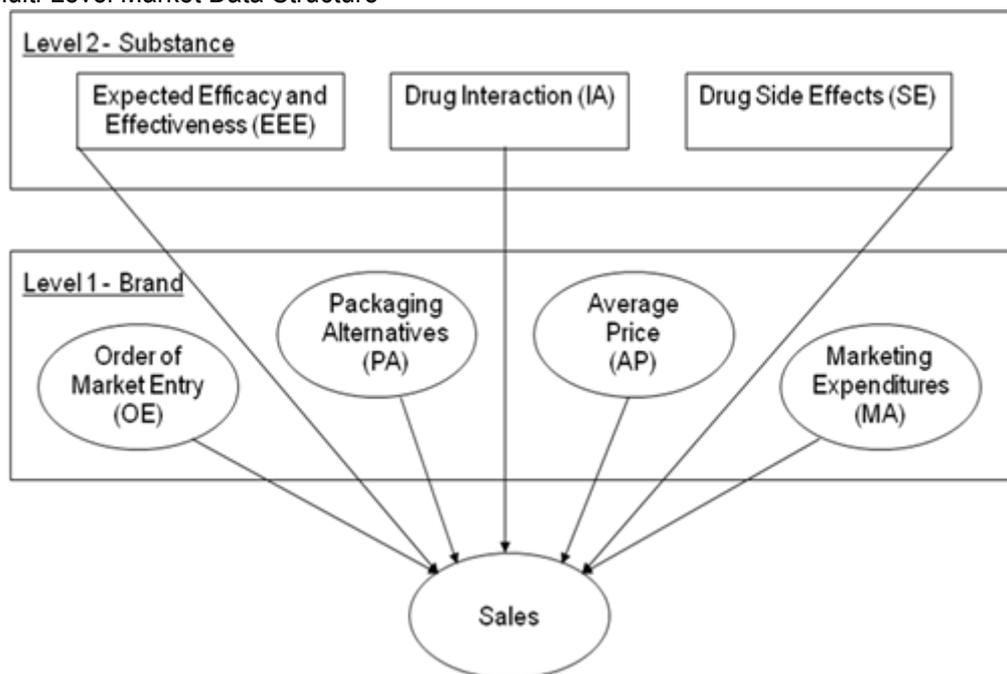
Source: Own, 2017

3. REGRESSION ANALYSIS

Because of the multi-level data structure, a hierarchical linear model (HLM) was considered (see Leeuw and Kreft, 1986; Longford, 1993; Kozlowski and Klein, 2000). However, in order to run a hierarchical linear model, methodological literature suggests

a minimum sample size per level and group of 2 and 30 respectively (Bell et al., 2008; Hox and Maas, 2002; Moineddin et al., 2007; Wieseke et al., 2008). Unfortunately, our data set does not reach this threshold, and because of the secondary nature of the market data set, the sample size cannot be expanded. We therefore used a multiple-regression analysis method

to conduct analysis for each level separately. The application of regression analysis is viewed as the best strategy for testing the given conceptual model. According to Hair et al. (1998, p. 20) a general statistical technique used to analyse the relationship between a single dependent variable and several independent variables". The conducted regressions were based on the sample of 37 substances from 108 brands. Since it is necessary for a separate multiple-regression analysis to be conducted for both levels, the data needed to be aggregated for the second level (Hox, 2010). For this purpose, first level (brand) data were taken and their average value for every single substance was calculated.

For the analysis of the first-level model, the following independent variables were introduced: OE, AP, PA, MA, using AS as a dependent variable. For AP, support could be found (beta = 0.11; sig. = 0.08). For MA, strong support can be afforded by the results (beta = 0.42; sig. = 0.00). This means that an increase in AP and MA will lead to higher sales (revenue). Furthermore, it can be seen that hypotheses H1 and H5 do not find support. In other words, OE and PA do not influence the prescribing decision (see Table 3).

For the second level (substance) multiple-regression model, aggregated data were used. The analysis has shown that SE (beta = 0.42; sig. = 0.03) and EEE (beta = 0.37; sig. = 0.04) are significantly positively related to sales. On the other hand, no significant relationships were found for drug IA (see Table 3).

Tab. 3: Results of the Multiple Regression Model of Average Sales

Dependent Variable: Average Sales (AS)			
First Level (Brand) Regression Analysis Model Data: R^2 = 0.330; F = 4.854; Sig. = 0.000			
Independent Variable	Beta	Sig.	Hypotheses
Order of Market Entry (OE)	-0.08	0.44	H1
Packaging Alternatives (PA)	0.11	0.25	H5
Average Price (AP)	**0.11**	**0.08**	**H6**
Marketing Expenditures (MA)	**0.42**	**0.00**	**H7**
Second Level (Substance) Regression Analysis Model Data: R^2 = 0.341; F = 3.962; Sig. = 0.021			
Independent Variable	Beta	Sig.	Hypotheses
Drug Interaction (IA)	-0.06	0.76	H2
Drug Side Effects (SE)	**0.42**	**0.03**	**H3**
Expected Efficacy and Effectiveness (EEE)	**0.37**	**0.04**	**H4**

Source: Own, 2017

The third model analysed the relationship between marketing factors and BS on the first level (brand). The analysis shows that OE (beta = 0.19; sig. = 0.07), EEE (beta = 0.46; sig. = 0.00) and average MA (beta = 0.22; sig. = 0.03) are significantly positively related to sales (H1, H4, H6). On the other hand, no significant relationships were found for AP and PA (see Table 4).

The fourth model analysed the relationship between marketing factors and the BS on the second level (substance), using aggregated data. The analysis indicates that IA (beta = -0.28; sig. = -2.06), SE (beta = 0.32; sig. = 2.34) and EEE (beta = 0.67; sig. = 0.00) are significant related to the sales slope (see Table 4).

Tab. 4: Results of the Multiple Regression Model of Average Sales

Dependent Variable: Beta Sales (BS)			
First Level (Brand) Regression Analysis Model Data: R^2 = 0.335; F = 5.608; Sig. = 0.000			
Independent Variable	Beta	Sig.	Hypotheses
Order of Market Entry (OE)	**0.19**	**0.07**	**H1**
Packaging Alternatives (PA)	0.08	0.40	H5
Average Price (AP)	0.05	0.65	H6
Marketing Expenditures (MA)	**0.22**	**0.03**	**H7**
Second Level (Substance) Regression Analysis Model Data: R^2 = 0.625; F = 12.771; Sig. = 0.000			
Independent Variable	Beta	Sig.	Hypotheses
Drug Interaction (IA)	**-0.28**	**0.05**	**H2**
Drug Side Effects (SE)	**0.32**	**0.03**	**H3**
Expected Efficacy and Effectiveness (EEE)	**0.67**	**0.00**	**H4**

Source: Own, 2017

The outcome of the multiple-regression analysis, leading to the hypothesised antecedents to AS and their expected direction of influence is shown in Table 5.

Tab. 5: Hypothesised Independent Variables of Average Sales

Hypotheses	Independent Variable	Expected Direction of Relationship (Sales)	Support of Hypotheses
H1	Order of Market Entry (OE)	-	N
H2	Drug Interaction (IA)	-	N
H3	Drug Side Effects (SE)	-	N
H4	Expected Efficacy and Effectiveness (EEE)	+	Y
H5	Packaging Alternatives (PA)	+	N
H6	Average Price (AP)	-	N
H7	Marketing Expenditures (MA)	+	Y

Source: Own, 2017

4. DISCUSSION

The outcome of the analysis suggests a number of novel contributions to literature on pharmaceutical marketing. First, we uncover a multi-level structure, containing a brand (first) level and a substance (second) level. In practical terms, this distinction is highly relevant as companies are only able to actively influence non-substance level-related variables through their marketing activities. This means that marketers can only influence brand-related factors, whereas substance-related factors are mainly attributed when the outcomes of companies' research and development are presented.

Furthermore, our descriptive analysis suggested that during the early stage of market entry, sales appeared to increase immediately, but once a product is established on the market, no effect can be observed. Therefore, an additional variable [BS] was introduced, indicating the slope and capturing the overall sales trend, whereas the mean AS over the whole sales period is indicated by the AS variable. As a result, it can be concluded that promotional efforts in general are of importance during the medical drug introduction phase as an extraordinary sales increase takes place.

The investigation of the OE has not revealed a significant relationship to AS, but a positive significant relation to BS. This means that a later market entrant is more likely to have a higher increase in sales during the market introduction than an earlier entrant. Even more interesting is the fact that AS is not related to OE. At first glance, it appears that OE is not necessarily a decisive factor for long-term market success (sales). This finding is also in contrast to the findings presented in the scientific literature (see Urban et al., 1986; Berndt et al., 1997; Kalyanaram and Urban, 1992; Bond and Lean,

1977; Golder and Tellis, 1993). However, in the present context, additional factors such as governmental bodies are involved in the medicines-launching process. Consequently, an early entry does not necessarily lead to higher sales.

The analysis of the MA has revealed a high level of multicollinearity between the initial DE, ME and AE variables. This result suggests that little distinction in regard to the specific spending on marketing activities appears to be made by the pharmaceutical companies in the studied market.

As an additional theoretical implication, this research has shown a negative significant correlation between the order of market entry (OE) as well as marketing expenditures (MA) (pears.corr = -0,349; sig = 0.001) as well average price (AP) (pears.corr = -0,451; sig = 0.000). According to these data, for a later

market entrant, less marketing expenditures are required but also a lower price is required. Therefore, marketing expenditures and average price are the mediators, whereas the order of market entry is the moderator. This is inline with the scientific literature (Bond and Lean, 1977; Bowman and Gatignon, 1996; Kalyanaram, 2008). Furthermore, as positive significant correlation between the marketing expenditures and average price (pears.corr = 0,549; sig = 0.000) was found. This means that higher marketing expenditures lower the price sensitivity allows therefore a price increase (see also Narayanan et al., 2004; Rizzo, 1999). In this case, marketing expenditures are the moderator whereas the average price is the mediator. Based on the results of the regression analysis, the following conceptual model can be presented (Figure 2):

Fig. 2: Two-Level Conceptual Model of Prescription-Pharmaceuticals Marketing in a State-Controlled Market
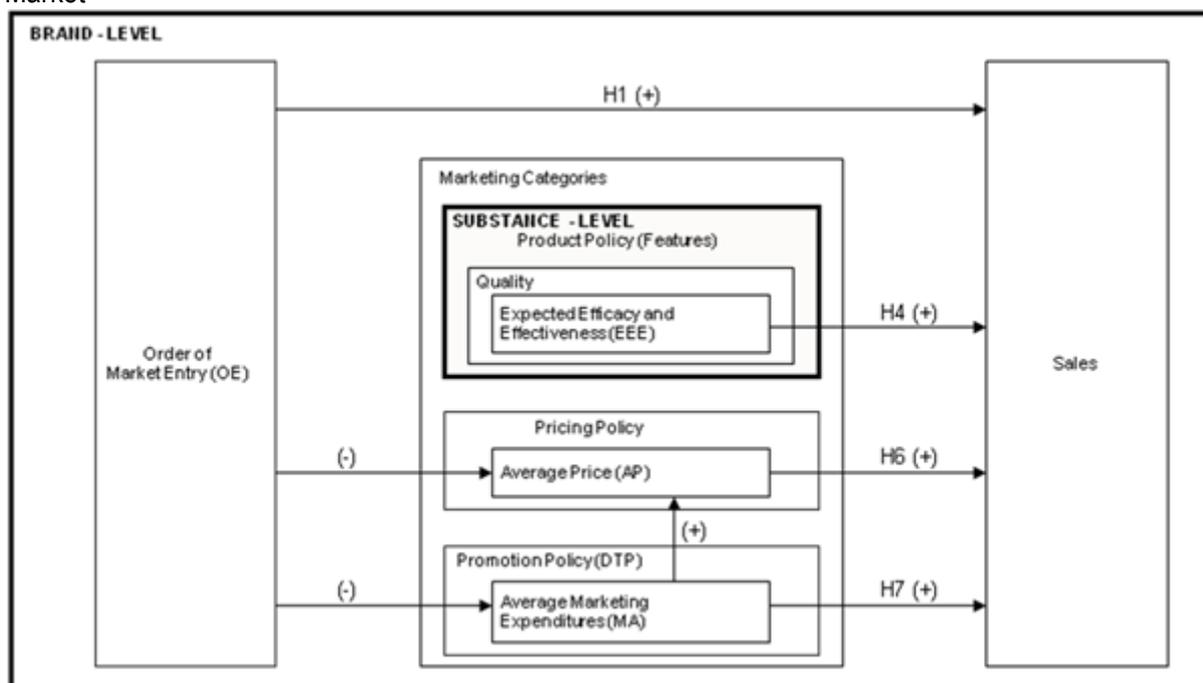
Source: Own, 2017

For drug interaction (IA) the analysis did not reveal a significant relation to average sales (AS) but a negative relation to beta sales (BS). This means that more indicated drug interactions would result in a lower sales (revenue) increase (beta). While somewhat counter-intuitive at first glance, 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. However, this relationship may fluctuate in absolute magnitude across time was well as within and between various product classes. As such, the effect on BS indicates that over time, drugs with more indicated interactions have a generally decreasing sales trend. Yet,

their absolute sales may fluctuate to the extend that a relationship with average sales is not significant in our analysis.

However, in support of previous research (Brassington and Pettit, 2007; Kremer et al., 2008; Bond and Lean, 1977), a highly significant positive relation of MA to AS and BS found, emphasizing the importance of promotional activities for the sales success.

The analysis of the product-related drug IA variable has revealed a negative relation to BS. This means that a higher number of drug IAs result in a lower increase of sales. These findings are in support of the scientific literature, as sales will increase if the approved product has an advantage relative to other products (Berndt et al., 1997).

Of particular interest however is that a positive relationship between medical SE and both AS and BS was found. While this seems contradictory to logic, Denig et al. (1988, p. 82) revealed that 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, p. 83) deduced that mild side effects seem to play a minor role in the assessment of medical drugs". Of course, in the present context it needs to be stated that the data here do not distinguish between serious and mild SE. However, medical drugs that knowingly contain a seriously harmful SE profile are not normally introduced to the market. Consequently, in practical usage, it seems that practitioners do not take (mild) SE into account when prescribing a medical drug. Furthermore, a positive significant relationship between EEE and AS and BS was indicated. These findings are in line with Flechter's (1989) conclusion that product confidence is relevant for the physician's prescription decision (sales).

For PA, no significant relationship with AS was found. These findings for the investigated market are not surprising, as many physicians also sell the prescribed medical drugs directly to their patients (see Kocher and Oggier, 2007). Therefore, economic packaging does not really play a role when a medical prescription is being made.

In the light of the results, it appears that in regard to medical drug quality (product property), drug prescription decisions are made either on a prevailing misconception, such as lack of knowledge, or wrong or biased information, or prescription habit (see Denig et al., 1988). In other words, it is suggested by these results that practitioners are not always well informed and therefore do not prescribe the most suitable medical drug.

Next, a significant relationship between AP and AS was found, revealing that higher medical drug prices result in higher sales. This is in contrast to the price elasticity of demand theory (see Arnold, 2008) that in a market with freely available substitutable products, a higher price will lead to lower sales. However, these results can be explained by the fact that prescribers seem not to be motivated to prescribe cheaper medical drugs. This is in support to other research conducted by Lexchin (2009) as well as Cooper and Kleinschmidt (1993) who concluded that a low-price strategy is generally not effective. Furthermore, self-dispensing doctors, in order to maximise their profit (Kocher and Oggier, 2007; Sutherland et al., 2008), are motivated to prescribe more expensive drugs. On the other hand, patients do not appear to be very cost-sensitive either, as they do not have to cover the costs (see Newhouse and Marquis, 1978). This result is likely to be relatively unique to markets where patients do not contribute significantly to healthcare costs directly (e.g. markets where government subsidies from tax are high) – such as many European contexts.

5. PRACTICAL RECOMMENDATIONS FOR MARKETERS

Based on the research findings, the following important practical recommendations are given, enabling pharmaceutical marketing-managers to improve the efficacy of the applied marketing activities and therefore to justify their marketing spending.

- It is not essential to be first to market: A later market entrant can benefit from the early entrants' market experience.
- Implementing strong marketing activities during the launch phase is crucial: The study has revealed that

a higher increase in sales is usually gained during the product launch phase.

- Enhance the prescriber's expected efficacy and effectiveness: Marketers need to ensure that prescribers think highly of the quality of a specific medical drug, by conducting suitable marketing activities.

- A high-price policy is beneficial in the right market: 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, self-dispensing physicians increase their profits by selling the prescribed medication. Physicians are, therefore, not motivated to prescribe less expensive medical drugs.

Apply the promotional activities more specifically: The promotional efficacy could be improved by implementing more target-oriented promotional activities.

6. LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

Like any study, the present research has some limitations. This study was designed so that individual medications could be compared effectively with each other (same product class and same indication), leading to a limited number of medications available and a resulting small data set. Furthermore, the assumption is made that the presented results could be generalised for prescription-pharmaceuticals markets that are similar to the Swiss market. Of course, this might not necessarily be true (Kremer et al., 2008), especially because only five medical drug classes have been investigated. In addition, due to the fact of unavailable market data, we were unable to include a key aspect of sales success, namely patent protection, was not included in the study. Moreover, for the same reason, we were unable to collect data on some key controls (such as the equality of promotional budgets across brands.) for the investigated categories. Future work should, where possible, remedy these limitations (although in many cases it will be difficult to impossible to derive this data). It is important

to study the effects of pharmaceutical marketing within a regulated prescription-drug market; however, it is often the case that the answers to research questions regarding marketing factors lead to new research questions. Consequently, this work 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 six research gaps are indicated.

- Factors influencing expected efficacy and effectiveness: The prescriber's perceptions of quality are of high relevance. However, the actual factors influencing the EEE still remain unclear. Therefore, additional research regarding the role and the guiding criteria behind EEE should be conducted.

- Price elasticity of prescription-pharmaceutical marketing-demand models: More research regarding the price elasticity that would cover more markets as well as the relevant guiding factors could be performed. This would be in support of Kremer et al. (2008, p. 236), 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. However, according to Kremer et al. (2008, p. 244), the effects of the promotional

instruments vary considerably across disease categories". Therefore, additional research could investigate whether the presented findings relate only to these five investigated medical classes, or if they can be generalised to the entire market.

- 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).
- The aspect of sales- patent protection can be investigated.
- Marketing-mix concept: 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 (product, price and promotion) might be suggested.
- Despite of the fact that in the investigated market direct DTC measures cannot be conducted, the relevance of indirect DTC measures in pharmaceutical marketing could be investigated in a future study.

This paper aims to shed light on the sales process in the pharmaceutical industry and to provide some managerial guidelines. The authors hope that this study provides a point of departure for further scholarly work in this fascinating and important area.

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