# The Specific Underpricing of IPOs in U.S. Stock Markets

# Market Reputation as a Determinant

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**List of Abbreviations**

ADR - American Deposit Receipt

CAGR - Compounded Annual Growth Rate

CM - Capital Market

CRSP - Center for Research in Security Prices

CSR - Corporate Social Responsibility

ECB - European Central Bank

EDGAR - Electronic Data Gathering, Analysis and Retrieval System

FINRA - Financial Industry Regulatory Authority

GDP - Gross Domestic Product

GIV - Gross Issue Volume

GM - Global Market

GSM - Global Select Market

IFRS - International Financial Reporting Standards

IPO - Initial Public Offering

IRQ - Interquartilerange

NASD - National Association of Securities Dealers

NASDAQ - National Association of Securities Dealers Automated Quotations

NYSE - New York Stock Exchange

OECD - Organization for Economic Cooperation and Development

OTC - Over-the-Counter

SEC - Security and Exchange Commission

U.S. - United States

USD - U.S. Dollars

U.S. GAAP - United States Generally Accepted Accounting Principles

VC - Venture Capital

WTC - World Trade Center

# 1 INTRODUCTION

The economical development is improving and world trade volumes are expected to recover. The recovery process is developing constantly but slowly: Share prices have rebounded within 2009, worldwide trade volumes have recovered slightly and are expected to catch up with values from the end of 2008 during the next year (cf. OECD 2009).

The world is recovering from one of the most severe economic downturns since The Great Depression. Comparing GDP volumes from the previous period at the same time, OECD countries lost up to 2%.

*Illustration 1: Percental Change in GDP for 10 Years (OECD 2010)*

**Gross Domestic Product (Volume)**

*Per cent change previous period - sa*
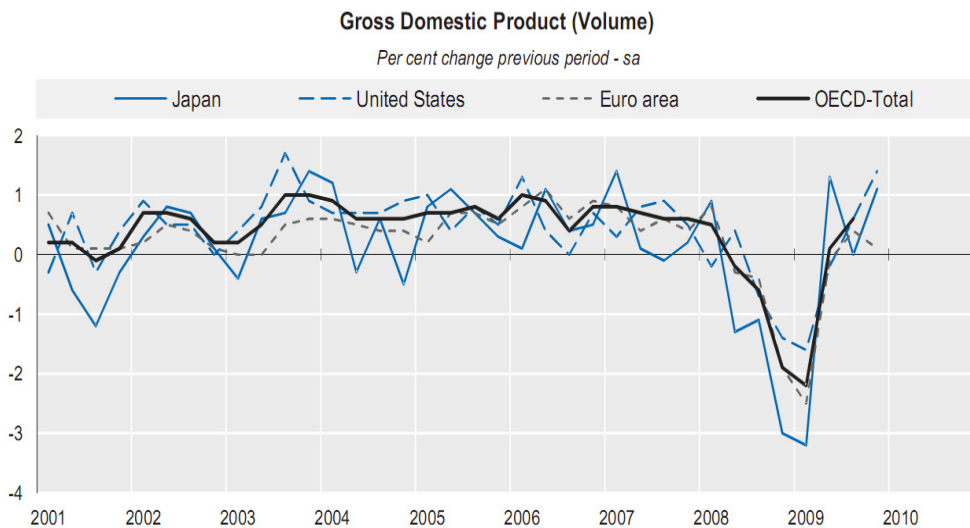
As a logical consequence the U.S. IPO market has been affected by the economic meltdown as well. "IPO activity tends to cluster in certain time periods, thus it appears in waves, so-called hot IPO markets" (Hamer 2007, 9). From 2007 to 2008 the number of IPOs decreased. The U.S. market broke down by more than 85% in one year. In 2007 there were 160 IPOs whereas in 2008 21 securities went public for the first time (cf. Ritter 2010, 2). After the slowest year for IPOs since the 1970s, the market began to show signs of life again in 2009. The number of offerings increased by 21 % although the offering value decreased by almost 15 % (cf. PWC 2010).

"IPO market conditions can change rapidly. Many factors influence the market, political developments, interest rates, inflation, economic forecasts, and sundry other matters that seem unrelated to the quality of a company´s stock. The market is admittedly emotional" (Kleeburg 2005, 53).

To get a deeper understanding of how IPO activity is influenced one has to dispute with further analysis. One of the main drivers that have an impact on the IPO market is the venture capital market. According to Ritter, 35% of the IPOs from 1980 - 2009 were related to venture-capital-backed firms while 57% of all technology IPOs during the same period were VC-backed. The analysis counted for 7,456 IPOs including 2,706 technology IPOs (cf. Ritter 2010, 7). Evidently, the number is highly dependent on the development of venture capital markets, which also started to revive at the end of 2009 (cf. NVCA 2010).

Regarding the IPO procedure itself there are inefficiencies. If going public was fully efficient, an initial public offering should maximize the issuer´s proceeds, the investors who most value the shares should receive them, and in the absence of news or private information there should be little trade after the shares are allocated (cf. Pritsker 2006, 1). But several empirical studies documented the existence of the underpricing-phenomenon for newly listed firms during the early days of trading across many countries and capital markets (cf. Boudriga/Slama 2009, 2). The underpricing is the effect of a significant shift in wealth that is related to an initial public offering. It occurs in the form of an increase of the stock price right after the offering.

By intuition it seems to be highly rational for an issuer to choose the market segment with the highest reputation to maximize his proceeds. But if the issuer does not meet the requirements he will run the risk of losing value. Hunger states that IPO underpricing is attributed to the scarcity of suitable market segments, suitable in terms of the specific issuer risk. In recent literature there are assumptions, proclaiming a connection between the reputation of stock market segments and the level of underpricing. The main implication: The lower the reputation which coheres with listing requirements, the marketing of the stock exchange or presence in the media, the higher the underpricing-effect seems to be (cf. Hunger 2009).

Furthermore, he assumes that it is a necessary consequence of the respective market segment whose reputation is due to qualitative attributions, not to the specific risk an issuer is bringing along (cf. Hunger, 2009).

The empirical investigation Hunger conducted, confirms a specific underpricing in vertical stock market segments in Europe. He constructs the thesis that if rationales, concerning the emergence of corporate reputation, were transmitted to stock market segments, a consistent explanation for underpricing, specific to market segments, could be found. The author´s analysis samples 809 IPOs in Germany, France, Italy, Austria, and Switzerland (cf. 2004, 22).

A differentiated understanding of the terms "vertical market segment" and "underpricing" will be given in the following chapters.

The Market Reputation Thesis delivers a consistent explanation for the empirical results Hunger obtained.

Therefore, this thesis pursues two main objectives:

1) Confirmation for The Market Reputation Thesis should be found.

2) Concerning economic recovery and the expected increase in IPO activity, the understanding of how capital markets gather new issuers should be facilitated.

To achieve these goals this thesis will be structured as follows: First of all an overview and an universal understanding of IPOs and their underpricing should be given. Secondly, in chapter 3, the segmentation of stock markets in the United States will be outlined, followed by the presentation of The Market Reputation Thesis. Likewise the term "reputation" and its adaptability to stock markets will be discussed while a theoretical model of the reputation building process is presented.

In Chapter 4, taking potential reputational effects into account, the only objectively assessable and measurable influence factor for the reputation of a stock market (segment) will be discussed critically - the listing requirements. Based on this assessment and in respect of the underpricing, an assumption-based expectation will be derived.

The empirical analysis, underlying this thesis, encompasses stock market segments of NYSE Euronext *(NYSE, AMEX and ARCA)* and NASDAQ OMX *(The Capital Market, The Global Market, and The Global Select Market).* Therefore, almost sixty parameters, attributable to more than 200 IPOs, were gathered. The fifth part will use this data (i) to compare the deducted expectation with the underpricing of approximately 200 IPOs (ii) to conduct further analysis that confirms The Market Reputation Thesis and (iii) to test different, scientifically discussed, variables that could influence the IPO underpricing.

## 2 INITIAL PUBLIC OFFERINGS AND THEIR UNDERPRICING

### 2.1 THE IPO

"An initial public offering can be defined as the first public offer of shares on the primary market and the introduction of these shares to a security market" (Carls 2007, 359). IPOs are performed in the primary market which is known as the market for the first sale of issuers to investors, even if a bank or a syndicate intermediates (cf. Carls, 2007, 415).

Concerning macroeconomics, IPOs accomplish two very important functions within economies. First of all, they enable the supply of risk capital for companies. This can be seen as a crucial factor to maintain the ability of economies to grow and innovate (Hunger 2004, 17). Secondly, they allocate some of the issuing firm´s risk amongst the wider investing public (cf. Pritsker 2006, 1).

The proceeds of an IPO improve a company´s financial situation remarkably. In terms of accounting the company will improve the debt-to-equity ratio what upgrades the debt financing situation. On the other hand the cash, raised through the offering, could be captured and used for innovation and expansion financing or debt reduction what implicates lower financing costs (cf. Perridon/Steiner 2007, 362) . Furthermore, the shareholder value can be increased, current shareholders will be able to diversify their portfolio, growth can be financed, and the potential for mergers and acquisitions will be greater (cf. Kleeburg 2005, 22/23).

But there are also indirect, less obvious advantages an offering can bring along. "An accompanying offer of a stock-option plan for the management or employees

can have a motivating effect and the public perception of the company can be extended, respectively, improved" (Geddes 2003, 24). However, empirical studies have shown that the main financial reason to go public is to strengthen the equity base with the purpose of financing company growth. In many cases, this is a prerequisite for higher future leverage (cf. Hamer 2007, 3).

Knaus/Jakob argue that managements often only focus on the net proceeds and the IPO-related valuation results. By doing this, companies put themselves insofar in danger as the IPO will shift, from being a mean to an end, the end itself. However, the authors also conclude that the main IPO-related objective is the financing of future growth (cf. 2001, 1).

To gain the benefits outlined above, a company also has to take the costs of an IPO into account. Buermeyer splits them into direct and indirect costs (cf. 2000, 125-129). "Direct costs generally amount to 6-8 % of the issue volume" (Buermeyer 2000, 127), while in the U.S. a general price of 7% of the gross issue volume for issues up to $ 80 million evolved (cf. Carls 2007, 363). Furthermore, Buermeyer mentions the costs of publicity and the underpricing as indirect costs (cf. 2000, 128/129).

"In going public an issuing firm undergoes a rather complex process which must meet the requirements and expectancies of the capital markets, and at the same time maximize the desired benefits for the issuer. However, the listing process is associated with several risk factors, which must be evaluated before the IPO initialization" (Hamer 2007, 2).

In the following, briefly, the milestones of going public in the United States, factors of success, and the role of main participants is described.

## 2.2 GOING PUBLIC IN THE U.S.

### 2.2.1 THE IPO PROCESS - PREPARATION AND FACTORS OF SUCCESS

This thesis examines the IPO underpricing in U.S. stock markets. Explaining the IPO process broadly would not be useful concerning the topic. However, it is meaningful to get a superficial understanding of the complexity, the process inheres, what should be considered before an IPO and what are the main country specific regulation requirements.

Before outlining the process in general, an understanding of the necessary maturity a company should exhibit is given.

"Some rules of thumb for a firm considering an IPO are that the company is growing, that it has a definite need for much larger funding, that it has a "good story", and that it is a good time in the market for this type of company" (Ghosh 2006, 21).

To get a more precisely idea of how minimum requirements could look like, consider the following table:

*Table 1: Recommendations for Companies planning to offer Securities initially (Own illustration based on Petersen 2001, 57/58)*

| | |
|---|---|
| **Quantitative Criteria** | *Company Size:* Sales of $ 15-20 million with near term potential to generate revenues of $ 50-100 million |
| | *Profitability:* Net Income of $ 1 million or more in the current fiscal year |
| | *Growth:* annual growth rates of 30-50%, with the prospect of continuing growth at comparable rates in the upcoming years |
| | *IPO Volume:* market value of publicly traded shares of at least $ 5 million |
| **Qualitative Criteria** | *Management Team:* Investment banks consider the quality of the management team as the most critical factor. The management should be able to deal with the anticipated growth and changes during the IPO process. |
| | *Company´s Business:* The firm´s business field and its products must be promising for the future. |
| | *Organizational Structure:* The organizational structure has to be clear and transparent. Competencies and objectives should be understandable in order to attract potential investors. |

However, these recommendations should be considered as very flexible and highly depending on the individual situation of the firm and actual market conditions. Based on own research, there is empirical evidence for three of four quantitative parameters. Every company, except those that have been incepted right away or were only researching without generating turnover, had revenues of more than $ 100 million in the last fiscal year before the IPO event. Revenues grew within the last three fiscal years before going public at an arithmetic average rate of 63,24 %. Only in one out of 202 cases the gross IPO volume was lower than $ 5 million. Merely in terms of profitability, evidence on the recommendations cannot be

proved. The growth rate´s arithmetic average of the gross operating margin was 7,14 % (Own Research 2010).

"Selling a company´s shares and maintaining the interest of potential investors in the aftermarket is much like a selling product or a service to customers. Both are enhanced by name recognition, advertising and publicity, a product support system, and good distribution channels. The company´s underwriter and the underwriting syndicate constitute the distribution channel, but the company itself will need to create a recognizable corporate image and build the foundation for a strong investor relations program" (Kleeburg 2005, 59).

Klausner highlights several sensitive organizational and preliminary topics concerning the IPO process. The author claims the credibility of the earnings projection that details future growth, the existence of a plan for the usage of the proceeds, a strong management team with sufficient skills, a solid historical financial performance, and the execution of a business plan that facilitates the understanding of the company´s vision (cf. 2008, 16/17).

"After the establishment of the business plan and the undertaking of necessary strategic transactions the fundament for the IPO is to be set up. During the months before an IPO event, successful companies consider questions regarding the operating, personnel, and transactional milestones, the usage of the proceeds and the market´s readiness for the IPO" (Kleeburg 2005, 97/98). "The most important and time-consuming task facing the team is the development of the prospectus, a document that basically serves as a brochure for the company" (Ghosh 2006, 22).

The entire process could be understood as a multidimensional and collateral ongoing procedure throughout several months. It integrates aspects concerning the organizational structure, the registration with SEC and the security market with its pursuant requirements, and the valuation of the company (cf. Petersen 2001, 57-76). The SEC registration will also be presented in the following chapters.

Ghosh states, an analysis of initial public offerings indicates that the IPO process constitutes five distinct phases: (i) the preparation of the IPO prospectus and submission to the SEC approval; (ii) selecting the lead underwriter to form the syndicate and sell the stock to the public; (iii) organizing the "road show" to

present the IPO´s appeals and prospects to the investors, mainly the institutional investors; (iv) setting the offer price and the number of shares to be offered to the public, either through the organized exchanges or through the over-the-counter market; (v) and finally, developing the aftermarket position, after observing the "quiet period" (cf. 2006, 22).

Though, since the underpricing scales differently in various market segments (cf. Hunger 2004, 126), the choice of an adequate segment should be integrated into the IPO process. This decision, depending on when it is made, can influence the downstream stages of the process significantly. Even Carls recognizes the stock exchange application, i.e. the choice of the market segment, as the second step of an IPO process (before iii-v) (cf. Carls 2007, 367).

Generally, depending on the market segment, there are different requirements which force a company to set up appropriate organizational measures to meet those criteria. This, obviously, has an impact on the IPO process.

Concerning the choice of the market segment, a company can also be influenced by the investor´s reaction on the IPO project. If the market is not in a shape to gather the new security in a way, the company and the underwriter is hoping and planning to, it is possible that the stock is going to be under-allotted and will consequently sell at a high discount in the aftermarket. Indirectly this could lead to an adaption of the offer price.

Now, after the introduction of necessary considerations and the IPO process, participants and their roles will be presented.

### 2.2.2 PARTICIPANTS AND THEIR ROLES

There are several institutions and individuals that play a role in the offering process. Beside the issuing company there are investment banks, the SEC, accountants, lawyers, investors, and the exchanges.

The mission of the U.S. Securities and Exchange Commission is to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital information. (cf. SEC 2010) Accountants and lawyers generally consult issuing companies in terms of accounting and legal questions while the security exchange companies set up

listing and transparency requirements that issuers have to meet. "The main task of an investment bank in an IPO transaction is the development and execution of the issuing strategy" (Hamer 2007, 3).

"When a company decides to make a public equity offering using bookbuilding, it first selects one or more investment banks that will be managing underwriters. One or more managers are selected as the lead underwriters" (Hu/Ritter 2007, 3). The initial agreement between the underwriter and the issuing company is called "The Letter of Intent" that prospects the underwriter against any uncovered expenses in the event that the offer is withdrawn (cf. Ghosh 2006, 23).

"In most cases lead underwriters are also bookrunners. They take on most of the responsibilities of the managing underwriters, which might include due diligence, marketing of the issue, pricing, price stabilization, market making, and analyst research coverage of the stock" (Hu/Ritter 2007, 3).

As the crucial institution regarding the offering´s success, the lead underwriter plays a significant intermediary role. He is counterpart for the syndicate, the exchange, advisors, the issuer, selling stockholders, and investors. While he is coordinating the offering process he involves several departments. Concerning the internal bank structure mainly the divisions Equity Capital Markets, Research, and Sales and Trading perform the offering process (cf. Carls 2007, 361).

## 2.3 IPO UNDERPRICING

### 2.3.1 DEFINITION

In literature there are several understandings of the underpricing of IPOs.

Ideally, stock prices should match the per share present value of the discounted future earnings of the company, theoretically paid out as dividends. (cf. Karlis 2000, 82) "Most literature describes underpricing as the difference between the fair value of the company and the offer price, making the price movements on the first trading day the adaption process to the fair valuation. The term "underpricing" originates from U.S. academic literature dating back to the 70s and basically describes the phenomenon of a price movement of newly issued shares after the offering" (Hamer 2007, 8). Usually this price movement manifests itself

in an increase of the stock price right after the sale and thus involves a positive effect for the investor. (Own research) Illustration 3 will clarify this effect.

"Underpricing is estimated as the percentage difference between the price at which the IPO shares were sold to investors (the offer price) and the price at which the shares subsequently trade in the market. Most studies use the first-day closing price when computing initial underpricing returns" (Ljungqvist 2006, 6).

However, Hunger uses the first day opening price:

"The term underpricing implies that the issue price, compared with the (first) secondary price, is too low" (Hunger 2004, 43). "The Underpricing-Phenomenon examines the price difference between primary and secondary market trading. Thus, ideally the first secondary market price is used for the computation, because with its finding the secondary market trading begins. Albeit, because of missing availability, often the first day closing price is used to determine the underpricing" (Hunger 2004, 41).

"Scientific literature distinguishes between the ex-ante and the ex-post underpricing. While the ex-ante underpricing is the difference between the expected price on the secondary market and the issue price, the ex-post UP means the difference between the realized first trading price and the issue price" (Hunger 2010).

For the presentation of own empirical study results, exposed in the following, IPO underpricing is considered ex-post and defined as

*Illustration 2: The Computation of IPO Underpricing (cf. Hunger 2010)*

$$UP_i = \frac{(P_{i,t} - E_i)}{E_i} - \frac{(M_t - M_{t,0})}{M_{t,0}} * 100$$

whereas

$UP_i$ = UP of share i

$P_{it}$ = first day opening price of share i

$E_i$ = issue price of share i

$M_t$ = price of the market portfolio on the first trading day of share i

$M_{t,0}$ = price of the market portfolio at the end of the subscription period of share i

First, a comparable initial return is to be calculated. Therefore, the discreet difference between the first trading price and the issue price is quoted in relation to the issue price. Secondly, to determine if the underpricing is in excess of the market, the calculated relation is reduced by the market´s performance. This computation is also described as ex-post underpricing, because it refers to the (market-adjusted) difference between the issue price and the effectively realized first secondary market price (cf. Hunger 2010).

The consequence of underpricing is a significant shift in wealth. Obviously, there is an issuer´s willingness to "leave money on the table".

"The amount of "money left on the table" is defined as the offer price to closing market price on the first-day of trading, multiplied by the number of shares offered (excluding over-allotment options) on a global basis" (Ritter 2010, 1). Adapting this to the above outlined computation, the first market price would be considered. For clarification of the impact of underpricing on the wealth and ownership of pre-issue shareholders consider the following two issuing strategies:

*Illustration 3: The Impact of Underpricing on the Wealth of Pre-Issue Shareholders (Own illustration based on Ritter 2002)*

**Assumptions:**

| | |
|---|---|
| Pre-issue shares outstanding: | 15,6 million |
| Gross proceeds of IPO: | $ 78 million |
| Post-issue market cap: | $ 280,8 |
| No. of shares sold by pre-issue shareholders: | zero |

| | Strategy I | Strategy II |
|---|---|---|
| **Offer price and number of shares offered:** | 7.8 m shares at $ 10 | 6.0 m shares at $ 13 |
| **Post-issue shares outstanding:** | 23.4 million | 21.6 million |
| **Market price per share:** | $ 12 | $ 13 |
| **Money left on the table:** | $ 15.6 million | Zero |
| **Post-issue wealth of pre-issue shareholder:** | $ 187.2 | $ 202.8 |
| **% of firm owned by pre-issue shareholders:** | 66,7 % | 72,2% |

If a company plans to gain $ 78 million by offering common stock, the effect of an underpriced offering manifests itself in a loss of almost 6 % in ownership. The collected dataset, underlying this thesis, counts 135 underpriced IPOs with $ 3,41 bn "left on the table", representing a nominal issue volume of $ 24,13 bn. This means that on average 14 % of the nominal issue volume is lost due to the underpricing effect.

### 2.3.2 WHO BENEFITS FROM IPO UNDERPRICING?

As substantial amounts of money are "left on the table" when shares are sold too low and the prices for retained shares are diluted, underpricing is costly to firm owners (cf. Hopp/Dreher 2007, 3). But if companies accept these amounts, there also seems to be someone who picks them up. To find out who benefits from IPO underpricing, it has to be figured out which group of investors (institutional / retail) generally receives the highest portion of allocated shares.

"Hanley and Wilhelm (1995) gather distribution data for a sample of 38 IPOs managed and (co-managed) by a single underwriter during the period 1983-1988. The authors find that around 70% of shares in both underpriced and overpriced issues are allocated to institutional investors. In a more recent study, Aggrawal et al. (2002), using a sample of 164 companies going public between May 1997 and June 1998, find that institutions dominate IPO allocations, accounting for a median of about three-quarters of shares offered. The authors document that institutions earn greater profits on their IPO investments than retail investors. Leaving the U.S.

issue market, the authors Ljungqvist and Wilhelm found out that, for 1,031 IPOs in 37 countries and between 1990 and 2000, share allocations to institutional investors are virtually double those received by retail investors" (Pons-Sanz 2005, 11).

By getting the highest portion when new shares are allocated, apparently, institutional investors that initially invest into the offered stocks mainly benefit from the Underpricing-Phenomenon. Generalizing Ljungqvist´s and Wilhelm´s findings, institutional investors participate twice as often than retail investors do.

### 2.3.3 EVIDENCE ON UNDERPRICING

"The first ones who related IPO waves to underpricing were Ibbotson/Jaffe (1975), detecting certain years in the 60s and 70s where IPOs generated very high initial returns. They conclude that underpricing follows a distinct pattern. Based on their discovery, Ritter (1984) advances with this finding and applies it to the year 1980 in his article "The "Hot Issue" Market of 1980", which gives ground-braking insights and is still referenced to in recent works. Ritter points out that underpricing is not solely a function of risk, but it depends on the time frame chosen, in which one industry type strongly participates in the IPO market" (Hamer 2007, 9).

For the U.S. primary market, Loughran/Ritter (2002) examined the underpricing based on a sample of 6.169 firms for different time frames and find average initial returns of 7% between 1980 and 1989, 15% for 1990-1998 and up to 65% (1999) for the following years during The Dot-Com Period. For the U.S. market, they conclude that underpricing has continuously increased over time, contradicting to Ritter (1984) stating that underpricing comes in waves. For 1999, Ljungqvist/Wilhelm (2003), estimate initial returns of 73,3% with a standard deviation of 96,3% and a median of 39,5% (cf. Hamer 2007, 10). The difference might be explainable by the usage of different computation methods.

Furthermore, Loughran/Ritter (2003) state that the change in underpricing refers to three circumstances: (i) the change in the risk composition of companies, (ii) the realignment of incentives, and (iii) a changing in issuers objective function. "The realignment of incentives hypothesis and the change in issuers objective function

hypothesis both assert that the willingness of issuing firms to accept UP has changed over time" (cf. 2003, 1/2).

Using the computation method outlined in Chapter 2.3.1, Hunger finds that it ranges, depending on sample period, sampling method, and capital market, averagely between 2 and 167% (cf. Hunger 2004, 41).

# 3 THE REPUTATION OF MARKET SEGMENTS IN THE CONTEXT OF IPO UNDERPRICING

## 3.1 MARKET SEGMENTATION IN THE UNITED STATES

Hunger´s empirical investigations confirm a specific UP for vertical stock market segments in Europe. (cf. 2004, 143). The author´s analysis samples 809 IPOs in Germany, France, Italy, Austria, and Switzerland (cf. Hunger 2004, 22).

Ghosh intensifies Hunger´s findings for U.S. markets: "In the estimates of Thomson Financial, NASDAQ-listed IPOs had gained an average of 18.5 percent on their first days of trading, and 40.5 percent over their offering during the first three-quarters of 2003. By contrast, new stocks on the New York Stock Exchange had 8.7 percent, and were up 18 percent overall during the same period" (2006, 25/26). Generally, this comparison of initial returns implies a difference in the amount of UP in various stock markets. In chapter 5, as part of the empirical analysis, the UP, referring to specific market segments, will be presented.

"Vertical market segmentation means the existence of several market segments and the possibility of a security being traded in only one of them. In contradiction, there is horizontal segmentation which exists when a security is traded in several market segments simultaneously...However, in respect of IPOs, horizontal segmentation does not play a significant role since initial publicly offered securities are supposed be traded at one exchange" (Hunger 2004, 23).

"American stock exchanges are independent and self-regulative. Although, they are not segmented vertically, they have different admission criteria, which can be transferred to the quality of the offered securities" (Wolff 1994, 164) Concerning those criteria and other requirements, they can be regarded hierarchically. This means that IPOs in different market segments have to fulfill different admission

criteria, i.e. listing requirements, corporate governance standards, and liquidity requirements.

Actually, U.S. stock markets are segmented on a commercial basis by national security exchanges like the empirically investigated NASDAQ OMX Group or NYSE Euronext. By the establishment of particular listing requirements for corresponding markets like Arca, Amex, The Global Select Market or The Capital Market, exchanges try to attract certain issuers.

"Several regulatory functions of exchanges have been delegated and contracted to third party non-governmental regulators (i.e. FINRA), while others, notably in the area of listing, have been retained by exchanges themselves. In Europe, in most cases, it is the capital market regulators, not exchanges, who have an upper hand in issuer regulation according to national and, in many cases, EU legislation" (Christiansen/Koldertsova 2009, 4).

According to Wolff the exchange´s admission criteria can be transferred to the quality of offered securities. Contrarily, Hunger finds that a company listed in a certain market segment is not necessarily worse than a company listed in a segment with higher reputation (2010). This comparison, concerning both Wolff´s and Hunger´s statement, is based on the assumption that admission criteria influence reputation and that there is a link between the terms quality and reputation. Barnett/Jermier/Jafferty deliver it by stating that corporate reputation includes basic components, such as the image and quality (cf. Ljubojevic 2008, 222). This link could possibly be adapted to the reputation of a stock market segment. However, in the following chapter the term "reputation" and its adaptability to market segments will be analyzed more detailed.

A reduction or elimination of UP can only be achieved if there are enough market segments available for companies with different risk profiles. The underpricing of IPOs is a consequence of the market segment´s reputation. The reputation arises due to qualitative factors that do not reflect the issuer´s risk profile. The author, explicitly, names publicity, disclosure, and listing requirements as a determinant of a market segment´s reputation (cf. Hunger 2010).

In the United States, these requirements are manifold and will be presented in chapter four.

## 3.2 THE REPUTATION OF MARKET SEGMENTS

Hunger assumes, summarizing his statement under The Market Reputation Thesis, that each stock exchange and its market segments possess a certain reputation due to the respective listing requirements, the marketing of the stock exchange, its presence in the media, and the historical or jurisdictional arrangement in capital markets. The lower the reputation of a market segment is the higher is the level of underpricing. This could be understood as a compensation for investors that accept minor market liquidity and a higher risk. (2010) Before further analysis can be conducted, the term "reputation" and its adaptability to stock markets and their segments needs to be examined.

"Reputation" originates from the Latin and means "consideration" or "reckoning". Wiedmann finds in his studies that it is optimally defined as "distinction". Furthermore, the American Heritage Dictionary determines reputation as "...the estimation in which one is generally or publicly held"" (Seemann 2008, 37). "Depending on the context in which the term "reputation" is used, there is different emphasis. For marketing experts it is the "corporate analogue to brand equity", economists understand the term as a signal for future behaviour, strategists recognize it as a market entry barrier i.e. a competitive advantage, and accountants might refer to it as a kind of goodwill" (Seemann 2008, 37). There is no common definition for the term. However, in literature, there is agreement on the emergence of corporate reputation (cf. Hunger 2004, 154).

So, who could be the one that perceives the reputation of a stock market segment?

The computation of IPO underpricing refers to the first secondary market price, i.e. the first trading price. This price is determined by (i) the results of the book-building process, i.e. the investor´s bids and (ii) the general receptiveness of the market, i.e. the potential secondary market investors (cf. Ghosh 2006, 25). Consequently, investors are supposed to be the party that perceives the reputation (the cause) of a market segment and impacts the pricing process, i.e. the underpricing (the consequence). Seemann finds the reputation is not a result of

facts but rather of the perception of these facts by the particular group of people (cf. 2008, 39), i.e. investors. Since perception is highly subjective, each investor will establish an individual view of the market segment´s reputation. That makes it very difficult to measure reputation in an objective way.

"Concerning corporate reputation, Fombrun defines it as the overall estimation in which a company is held by its constituents. A corporate reputation represents the "net" affective or emotional reaction - good-bad, weak or strong - of customers, investors, employees, and general public to the company´s name" (2007, 44). It is highly related to experiences that have been made, to communicated experiences of third parties, and to trust in the consistency of the corporation´s behaviour (cf. Hunger 2004, 154). Schwalbach states, citing Wilson (1985), that "...in common usage, reputation is a characteristic or attribute ascribed to one person (firm, industry, etc.) by another..." (Schwalbach 2004, 1). Furthermore, he assumes that reputation is relevant when reality is perceived imperfectly and can only hardly be evaluated, e.g. product sales are impeded due to asymmetric allocation of information in respect of a product´s quality (cf. Schwalbach 2004, 1).

A summary of these definitions implies that (corporate) reputation could be perceived by several groups of people, is not only attributable to a person, and that it is highly related to experience and trust. Hence, the adaptability to market segments is given.

"Another interesting and for the topic highly relevant definition is stated by Nerb: Corporate reputation is firstly shaped by subordinated reputations of particular persons and secondly by superior, especially the country´s and the industry´s reputation" (Hunger 2004, 157). Hunger assumes that this perspective is particularly relevant for the adaption of the term to stock market segments. He concludes that the market segment´s reputation can be assembled by subordinated and superior reputations, i.e. by subordinated listed company´s reputations or superior organizational reputation of the market segment (cf. 2004, 157). On the one hand, if a company has a high reputation, for example in terms of product reliability, this reputation could be transmitted to the compliance with listing requirements that have to be met. Thus, if there are many companies with a high degree of reputation listed in one market segment, the segment could reflect the

company´s reputation. On the other hand, a market segment´s reputation could be shaped by its superior organizational reputation and its ability to control and to sanction. Market segments have different listing and reporting requirements that result in different levels of information asymmetry (cf. Hunger 2004, 159) In chapter four, an approach to examine how differences in listing requirements could influence the reputation of market segments will be performed. It will be based on the above presented understanding of the reputation building process. The following table is supposed to visualize this process:

*Illustration 4: The Reputation Building Process for Stock Market Segments (Own illustration based on Hunger 2004/Fombrun 1996)*



To examine the evolvement of segment specific reputations, the potential determinants need to be reflected. Since Hunger explicitly highlights publicity, disclosure, and listing requirements as a determinant of the market segment´s reputation (cf. Hunger 2010) and this determinant seems to be objectifiable, chapter four focuses on those requirements. Complementary, the author states that the reputation of each market segment refers to the marketing of exchange companies, like NYSE Euronext, the presence in media, and the historical or legal classification within the national and international capital markets (cf. Hunger 2010). On the other hand Fombrun/Shanley isolate four factors that influence corporate reputation positively: profitability, company size, advertising, and charitable contributions (cf. Fombrun 1996, 186).

In fact, there are plenty of hardly quantifiable determinants for the reputation of a market segment. First, the availability of data, secondly, the limited opportunity to quantify determinants, like presence in the media or advertising make it hard to prove a direct link between the presented parameters and the market reputation.

However, it is interesting that Fombrun/Shanley integrate the company size as a determinant for corporate reputation, according to Hunger a possible subordinated reputation for a market segment. Hunger´s empirical analysis illustrates that the company size of the issuing firm, modeled by the nominal capital, the (inverse) issue volume, or the issuing intensity does not exhibit a significant impact on the underpricing (cf. 2004, 144) But these parameters only measure the effective size of an issue or relate it to the nominal/paid-in capital. The examinations in chapter 5 will integrate the parameters total assets and total revenues. Additionally, the research underlying this thesis made it possible to capture data that allows it to compute profitability ratios for a vast majority of the investigated IPOs. Thus, the underpricing will be analyzed, considering the issuing company size and its profitability.

By setting up minimum quantitative admission criteria, the exchanges establish a frame for potential issuers. It could also be possible that the underpricing is lower in those market segments that attract bigger companies. To investigate this hypothesis, below, the listing requirements will be outlined and analyzed. At the end of chapter four, a comparison of initial listing requirements will be performed and possible implications on the underpricing, due to different size groups, will be discussed.

However, it is highly difficult to establish a comprehensive and objective assessment of the evolvement of market reputation. Following the outlined understanding of the reputation building process, the approach in chapter four is also supposed to reflect the possible impact on the reputation of each market segment due to differences in listing requirements. However, it will not end up with the opportunity to establish an ordinal statement that refers to the reputation of market segments.

# 4 LISTING REQUIREMENTS IN THE U.S. AND THEIR POTENTIAL IMPACT ON MARKET REPUTATION

## 4.1 THE SEC AND ITS REQUIREMENTS

"The SEC is the main enforcer of the nation´s security law in the United States. It is also the central institution for registration" (Petersen 2001, 25/26) If a firm wants to be traded publicly it has to meet different requirements set up by the SEC. Beside the initial registration at SEC, described first, there are periodic reporting and publicity requirements, described secondly. These regulations should provide the markets with transparency and help potential investors to substantiate investment decisions.

### 4.1.1 INITIAL REGISTRATION

"National exchanges, brokers, and issuers have to register at SEC and get filed" (Fischer 2008, 45-47). "The Security Act of 1933 mandates that the issuing company and its counsel draft a registration statement for filing with the SEC, the purpose of the registration and disclosure requirements are to underscore the fact that the public has proper and reliable information about the securities that are going to be sold" (Ghosh 2006, 22). "The Act´s by-name "Truth-in-Securities-Law" indicates that its basic objectives are to ensure the disclosure of all material information, and to prohibit misrepresentation" (Fischer 2008, 44) The SEC registration has to be undertaken by every security issuer that wants to get listed at a national exchange.

The initial registration under the Securities Act of 1933 inheres three critical main periods that should be acknowledged:

*Illustration 5: Critical Periods during the SEC Registration (Own illustration based on NYSE 2010)*

**1 Pre-Filing Period**
*No offers to sell and buy*

The term „offer" is very broadly construed to include many activities in connection with the promotion and sale of the securities

**2 Waiting Period (Post-Filing but Pre-Effective)**
*Certain kinds of offers but no sales*

Prospectus used to make offers but must meet requirements of the SEC. The term „prospectus" is very broadly construed to include any promotional writing or broadcast referring to a security for sale.

**3 Post-Effective**
*Sales*

Unlawful to sell a security by means of a prospectus or otherwise unless registration statement is effective.

"At the end of the pre-filing period when the registration statement is filed, it is transformed into the preliminary prospectus or "Red Herring", so-called because of the red band of legal terms running vertically on the left hand side of the cover of the prospectus. It is the most important document used to market the IPO to the prospective investors" (Ghosh 2006, 22). "The waiting period ends, when SEC declares the registration statement as effective. Then the security is allowed to be sold" (Fischer 2008, 44).

The isolated superior reputation effect for commercial market segments like NYSE, Arca, or GSM is the same, because every company has to be registered with SEC. However, the impact on companies seems to be different. For example, if a smaller company that has to put more effort into the establishment of the prospectus and the compliance with other initial requirements, it could gain proportionally more reputation by registering with SEC than a bigger and better known company would. Presumably, the public expectation on the registration process of bigger companies with a certain degree of resonance is stricter.

## 4.1.2 PERIODICAL REQUIREMENTS

"As the Security Act of 1933 only regulates the primary market, the U.S. Congress had to make a second effort to protect market participants from abusive practices in security trading after their initial offering" (Fischer 2008, 45). The Securities Exchange Act of 1934 governs periodical reporting requirements (cf. SEA of 1934,

Section 13). "Since the trade on the secondary market is not a one-time event as trading on the primary market, companies have to provide information periodically using the so-called 10-K/10-Q forms for annual/quarterly reports" (Fischer 2008, 46). For example, domestic issuers must submit annual reports on Form 10-K, quarterly reports on Form 10-Q, and current reports on Form 8-K for a number of specified events and must comply with a variety of other disclosure requirements (cf. SEC 2010).

"The annual report on Form 10-K provides a comprehensive overview of the company's business and financial condition and includes audited financial statements. Although similarly named, the annual report on Form 10-K is distinct from the "annual report to shareholders," which a company must send to its shareholders when it holds an annual meeting to elect directors. If a shareholder requests a company's Form 10-K, the company must provide a copy. In addition, an accelerated filer must disclose on Form 10-K whether the company makes its periodic and current reports available, free of charge, on its website" (SEC 2010). The distinction between the "annual report to shareholders" and Form 10-K lies within the contents. While the "annual report to shareholders" is the principal document used by most public companies to disclose information to their shareholders, the SEC-required document, "Form 10-K", typically contains more detailed information about the company′s financial condition. (cf. SEC 2010)

"The Form 10-Q includes unaudited financial statements and provides a continuing view of the company's financial position during the year. The report must be filed for each of the first three fiscal quarters of the company's fiscal year" (SEC 2010)

"Form 8-K is the "current report" companies must file with the SEC to announce major events that shareholders should know about. The instructions for Form 8-K describe the types of events, such as bankruptcy or receivership, creation of direct financial obligations, unregistered sales of equity securities, or changes in control of the registrant that trigger a public company′s obligation to file a current report" (SEC 2010).

In December 2005, the SEC voted to adopt amendments that create a new category of "large accelerated filers" that includes companies with a public float of $700 million or more. The amendments also redefine "accelerated filers" as companies

that have at least $75 million, but less than $700 million in public float (cf. SEC 2010).

The mentioned forms have to be submitted by every SEC-registered company. Similar to the initial registration, smaller companies seem to enjoy a greater reputation effect than bigger ones. The forms also provide a higher level of transparency. This could lead to a superior impact on the particular segment´s reputation.

However, there are differences in the deadlines for the submission of the forms. For an overview consider the following table:

*Table 2: Deadlines for the Filing of Periodic Reports (SEC 2010)*

| Category of Filer | Revised Deadlines For Filing Periodic Reports | |
| --- | --- | --- |
| | Form 10-K Deadline | Form 10-Q Deadline |
| Large Accelerated Filer ($700MM or more) | 75 days for fiscal years ending before December 15, 2006 and 60 days for fiscal years ending on or after December 15, 2006 | 40 days |
| Accelerated Filer ($75MM or more and less than $700MM) | 75 days | 40 days |
| Non-accelerated Filer (less than $75MM) | 90 days | 45 days |

The regulation authority body obviously sets up an easier frame for smaller companies. It can be stated that the higher the float of the particular company is, the less time is available to file the reporting. This implies that the authority expects more efficiency within the organization of companies that trade on a broader level. These differences in the treatment of companies might lead to a more balanced adjustment of the reputation effect amongst different company size groups.

Actually, in terms of transparency there is no difference between institutions that scale their public tradability wider than others. Solely they do have less time to provide the markets and potential investors with information and thus have to work more efficiently. However, these publicity and disclosure requirements are substantiated and extended in some rules set up by the particular exchange.

In the following the listing requirements, i.e. admission criteria, for common stocks in the empirically considered market segments of NYSE Euronext and NASDAQ OMX will be outlined and discussed. These requirements demonstrate differences that can possibly result in different levels of reputation.

## 4.2 LISTING REQUIREMENTS AT NYSE EURONEXT MARKETS

### 4.2.1 INTRODUCTION TO NYSE EURONEXT

"Founded by 24 brokers and merchants, signing the "Buttonwood Agreement" in 1792, NYSE Group managed to become the first truly global financial marketplace group" (NYSE 2010) After the merger of NYSE Group and Euronext in 2006, NYSE Euronext which acquired the historic American Stock Exchange in 2008, arised (cf. NYSE 2010). "Throughout the years being opposed to difficult incidents, like The Panic of 1857 when Ohio Life Insurance & Trust collapsed, The Great Depression which began with The Black Thursday (October 24, 1929) or The Terrorist Attack on WTC in 2001 which led to the longest closure of the NYSE since 1933, the stock exchange always persecuted a track of strong development regarding trade volumes and resonance" (NYSE 2010). From 2004 until 2008 the stock exchange´s total revenues grew at a CAGR of 35 % (cf. NYSE 2010).

"Today, as a not-for-profit corporation, NYSE Euronext offers a broad and growing array of products and services in cash, equities, futures, options, swaps, exchange-traded products, bonds, market data and commercial technology solutions" (cf. NYSE 2010). "As of Dec. 31, 2008, the exchange had approximately 8,500 listed issues, a total global market capitalization of $ 16.7 trillion/€ 12.3 trillion and its equity exchanges transact an average daily trading volume of approximately $ 153 billion/€ 113 billion" (NYSE 2010).

The exchange´s history and the experiences it made imply a high ability and organizational knowledge about the offering of capital market services. Probably, NYSE Euronext´s market segments are influenced positively by this fact. Considering the understanding of the evolvement of market reputation (cf. Illustration 4), there seems to be a superior impact.

The listing requirements of NYSE, ARCA, and AMEX, outlined in the following, can be differentiated into initial and continued standards which refer to quantitative

reflections. Presumably, both will also have an impact on the reputation of those segments.

However, each segment also requires corporate governance criteria that listing applicants have to fulfill. Analyzing those criteria in detail, would be too extensive considering the topic of this thesis.

### 4.2.2 CORPORATE GOVERNANCE

To reflect possible impacts on market reputation, it is relevant to mention the corporate governance standards of the examined market segments since they are part of the listing requirements and might also impact the reputation of particular market segments. Hypothetically, if those standards are more rigorous and deliver higher transparency, the reputational impact on stock market segments would be higher than for segments whose attributable corporate governance standards are less strict.

Considering this aspect, Hopp/Dreher asserted: "The more effective the investor protection is, the more the costs of information disadvantages will be reduced which results in lower underpricing". Following this hypothesis the authors conducted comprehensive empirical analysis, examining a dataset of more than 500 country-year observations from 29 countries between 1988 and 2005 (cf. Hopp/Dreher 2007, 11), and came to surprising results. They find that underpricing rises significantly with government stability, at the one percent level of significance. More stable governments contribute positively to the premium that investors demand when investing in IPOs in those countries. In this light, the results could suggest that more stable governments might enjoy more private benefits in the economy and that therefore the level of underpricing might be higher (cf. Hopp/Dreher 2007, 23). "However, the results show that none of the procedural legal variables turns out significant" (Hopp/Dreher 2007, 25).

These results, taking specific variables into account, show that there seems to be only slight evidence for an impact of legal infrastructure on the extent of IPO underpricing. However, referring to the presented model (Illustration 4), the impact could be seen as a superior one. To transfer the author´s results to corporate governance requirements, there needs to be a connection between the stability of governments and the configuration of particular governance standards.

Regarding this, Hopp/Dreher assert that corporate governance interacts with the overall constitution of law enforcement and investor protection. For a given level of investor protection the incentives to adopt better governance mechanisms at a company level are an increasing function of the country´s economic and financial development. Better governance mechanisms enable firms to access capital market on better terms (cf. Hopp/Dreher 2007, 10).

So, how is corporate governance regulated at NYSE Euronext market places?

Companies listed on the NYSE, the "Big Board", must comply with certain standards regarding corporate governance (cf. NYSE 2010). Regardless of special exemptions, generally, a company has to fulfill specific disclosure requirements referring to corporate governance. Sections 303A.01-303A-13 of the NYSE Listed Company Manual govern specific standards that consider topics like the independence of directors, independence tests, the relationship between executive and non-executive directors, the corporate governance and the audit committee or, the relationship between the company and its shareholders (cf. NYSE 2010). Consequently, listed companies have to disclose corresponding issues in its proxy statement. "These corporate governance requirements are applicable to all NYSE-listed companies" (Hartofilis 2007).

NYSE Arca listed companies also have to meet specific corporate governance standards. The rules 5.3 (a)-(o) of NYSE Arca Rules prescribe governance issues related to topics like conflicts of interest, the independence of directors and the audit committee, shareholder approval policies, annual meetings, voting rights, immediate public disclosures, or the establishment of corporate governance guidelines (cf. NYSE 2010).

Similar to NYSE and NYSE Arca listings, companies, applying for a listing or listed on NYSE Amex, have to fulfill corporate governance standards. They are written down in Part 8 of the NYSE Amex Rules and also govern the composition of the board of directors, its and the audit committee´s independence, the compensation of executives, and they require the adoption of a code of conduct and ethics (cf. NYSE 2010).

As mentioned in chapter 3.1 there is a link between quality and reputation. The mandatory compliance with corporate governance standards implies a certain quality level of governance. This could influence the public perception of (a) the stock exchange, (b) the particular market segment, and (c) the listed company. It is possible, that the contribution of a market segment´s corporate governance requirements to the reputation of the particular segment has an impact on the amount of IPO underpicing. However, each market segment at NYSE Euronext has its own corporate governance standards. Presumably, the impact of the particular standard is different.

To extract an assertion on the existence of a connection and the significance, an objective approach that quantifies the specific rules is necessary.

### 4.2.3 NEW YORK STOCK EXCHANGE

"The New York Stock Exchange is the premier listing venue for the world´s leading large- and medium-sized companies" (NYSE 2010). Since SEC does not set listing standards and national exchanges set them on their own (cf. SEC 2010), NYSE Euronext prescribes listing standards for its prime segment - NYSE.

There are initial and continued requirements for domestic and non-domestic companies that have to be fulfilled. An introduction to non-domestic standards is not necessary concerning the topic of this paper, because the vast majority of analyzed IPOs were performed by domestic companies. First the initial standards, separated into distribution/size criteria and financial criteria, secondly the continued listing requirements will be depicted.

To get an idea of the distribution and size criteria consider the following table:

Table 3: Distribution and Size Criteria at NYSE (Own illustration based on NYSE 2010)

| Distribution and Size Criteria (must meet all three criteria) | |
|---|---|
| 1) Round-lot Holders[1] | 400 U.S. |
| 2) Public Shares | 1,100,000 outstanding |
| 3) Market Value of Public Shares | |
| IPOs, Spin-offs, Carve-outs, Affiliates | $ 40 million |
| All Other Listings | $ 100 million |

In connection with initial public offerings, spin-offs and carve-outs the NYSE will accept an undertaking from the company's underwriter to ensure that the offering will meet or exceed the NYSE's standards.

Additionally, considering the offer price, it can be noticed that a company must have a closing price or, if listing in connection with an IPO or Initial Firm Commitment Underwritten Public Offering, a price per share of at least $ 4 at the time of initial listing (cf. NYSE 2010).

In cases of IPOs the exchange relies on a written commitment from the underwriter to represent the estimated value of the company´s offering in order to determine a company´s compliance with these listing standards (cf. NYSE 2010). "The underwriter has to certify that the offering will meet share ownership and distribution standards. Conversations with the NYSE listings department suggest that underwriter certification has rarely, if ever, been denied for a firm that met the other quantitative listing requirements" (Harris 2001, 3).

Regarding financial criteria for initial listings, one of the following standards has to be met:

Table 4: Financial Criteria at NYSE (Own Illustration based on NYSE 2010)

| Alternative #1 - Earnings Test | |
|---|---|
| Aggregate pre-tax income for the last 3 years | $ 10 million |
| Minimum in each of the 2 most recent years Third year must be positive | $ 2 million |
| OR | |
| Aggregate pre-tax income for the last 3 years | $ 12 million |
| Minimum in the most recent year | $ 5 million |
| Minimum in the next most recent year | $ 2 million |

(Pre-tax income is adjusted for various items as defined in section 102.01C of the NYSE Listed Company Manual)

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[1] A trading order typically of 100 shares of a stock or some multiple of 100. (Bloomberg.com Financial Glossary, http://www.bloomberg.com/invest/glossary/bfglosr.htm#round_lot, Retrieved 17.05.2010)

| Alternative #2a - Pure Valuation with Cash Flow | |
|---|---|
| Global Market Capitalization | $ 750 million |
| Revenues (most recent 12-month period) Adjusted Cash Flow: | $ 100 million |
| Aggregate for the last 3 years (all 3 years must be positive) | $ 25 million |

| Alternative #2b - Pure Valuation with Revenues | |
|---|---|
| Global Market Capitalization | $ 750 million |
| Revenues (most recent fiscal year) | $ 75 million |

| Alternative #3 - Affiliated Company (For new entities with a parent or affiliated company listed on the NYSE) | |
|---|---|
| Global Market Capitalization | $ 500 million |
| Operational History | 12 months |
| Parent or affiliate is a listed company in good standing. Company´s parents or affiliated company retains control of the entity or is under common control with the entity. | |

| Alternative #4 - Assets and Equity | |
|---|---|
| Global Market Capitalization | $ 150 million |
| Total Assets | $ 75 million |
| Stockholder´s Equity | $ 50 million |

(Global market capitalization for already existing public companies is represented by the most recent three months of trading history in the case of Pure Valuation with Revenues. For all other standards, the measurement is "point in time" for existing public companies.  For IPOs, spin-offs and carve-outs, it is represented by the valuation of the company as represented by, in the case of a spin-off, the distribution ratio as priced, or, in the case of an IPO/carve-out, the as-priced offering in relation to the total company's capitalization.)

"Meeting the quantitative requirements does not guarantee that a firm will be approved for NYSE listing. NYSE weighs factors such as the company´s position and stability in its industry, the composition of its board of directors and audit committee, and the voting rights associated with the securities" (Harris 2001, 3). Obviously, the exchange has broad discretion regarding the listing of a company. Consequently, a firm that fulfills those formal criteria, does not have a right to get listed.

When a company falls below any criterion, outlined in the following, the exchange has the opportunity to review the appropriateness of continued listing (cf. NYSE 2010). NYSE prescribes continuous distribution criteria:

*Table 5: Continued Distribution Criteria at NYSE (Own illustration based on NYSE 2010)*

| Distribution Minimum for Common Stocks |
|:---:|
| No. of total stockholders < 400 |
| OR |
| No. of total stockholders < 1,200 AND |
| Average monthly trading volume < 100,000 shares |
| OR |
| No. of publicly held shares < 600,000 |

Furthermore, there are numerical criteria that have to be met: Companies that get listed, referring to the Earnings Test or the Asset & Equity[2] Standard, must not have an average global market capitalization of less than $ 50 million over a 30 trading-day period while their stockholders equity is less than $ 50 million.

If market capitalization is consecutively less than $ 15 million over a 30 trading-day period, NYSE will review the appropriateness of the listing.

Companies, listed under the Pure Valuation with Cash Flow/Revenues Standard (cf. Table 4) will get reviewed under these circumstances:

*Table 6: Continued Listing Requirements for the Pure Valuation Standard at NYSE (Own illustration based on NYSE 2010)*

| Pure Valuation Standard | | |
|---|---|---|
| Criterion | with Cashflow (# 2a) | with Revenues (#2b) |
| Average global market capitalization over a consecutive 30 trading-day period is less than AND | $ 250 Million | $ 375 Million |
| Total revenues for the most recent 12 months / fiscal year are less than OR | $ 20 Million | $ 15 Million |
| Average global market capitalization over a consecutive trading-day period is less than | $ 75 Million | $ 100 Million |

Companies that are listed under the Affiliated Company Standard will not be subject to numerical criteria unless the parent/affiliated company no longer

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[2] cf. Table 4

controls the entity or such company itself falls below the numerical criteria (cf. NYSE 2010).

The continued listing requirements are less strict than the initial ones are.

Obviously, big companies will be attracted by this segment. Fombrun/Shanley generally define the company size as a factor that impacts corporate reputation positively. (Chapter 3.2) Consequently, the indirect and subordinated influence of these criteria seems to be quite high.

Considering the superior reputation, i.e. the possibility of the exchange to sanction listed companies, probably there is an impact as well. The exchange has the possibility to consider a company as a delisting candidate. Using the example of the Pure Valuation Standard (Tables 4/6), it can review the appropriateness of an alternative-#2a-listing (Valuation with Cash Flow) when market cap is below 1/3 of the initially required market cap while revenues are less than 3/20.

The computation of these ratios should deliver impetus for a simplified approach to establish comparability in respect of the exchange´s opportunity to sanction. However, because of individually configured requirements, a comparison of those opportunities is hardly achievable. The following considerations will make this clearer. Only some criterion is used amongst several standards. Nevertheless, the standards should be compared entirely.

Thus, the comparison of listing requirements, performed in chapter 4.4, will mainly integrate the company size that should be attracted by the particular market segment. Even in doing this, there need to be constraints regarding the selected admission alternatives.

### 4.2.4 ARCA

"NYSE Arca is a fully electronic exchange for growth-oriented enterprises. Listed companies can grow on NYSE Arca and transfer to the NYSE once they meet the requirements" (NYSE 2010). This statement clarifies the kind of company that should be attracted - obviously smaller ones. NYSE Euronext, then NYSE Group, and Archipelago Exchange merged in 2006 (cf. Hartofilis 2007) Today, it is headquartered in Chicago (cf. Bloomberg 2010). With Arca, NYSE Euronext

attempts to attract companies that, previously, would have got listed on NASDAQ (cf. Hartofilis 2007). Presumably, the merger of Archipelago and NYSE made it possible for ARCA to participate from historically grown reputation of NYSE in a positive way.

Similar to "The Big Board", the listing requirements of NYSE Arca can be split into initial and continued. For an overview of the initial listing standards, consider the following table:

*Table 7: Initial Listing Standards at NYSE Arca (NYSE 2010)*

| Initial Listing Standards | |
|---|---|
| **Distribution Minimums** | |
| Public Round-lot Holders | 400 |
| Publicly Held Shares | 1,100,000 |
| Closing Price per Share | $5.00 for 90 consecutive trading days |
| **Financial Minimums (based on US GAAP)** | |
| Market Capitalization | $150 million |
| Market Value of Publicly Held Shares | $45 million |
| Must meet at least two of the following four minimums: | |
| Total Assets | $75 million |
| Revenue (most recent year or 2 of last 3) | $50 million |
| Shareholders' Equity | $50 million |
| Pre-tax earnings in last fiscal year | Positive |

Clearly, these requirements attract smaller companies than NYSE does. At NYSE, two out of four initial listing alternatives require a total market capitalization of $ 750 million (Table 4). Consequently, the possible indirect and subordinated impact on the segment´s reputation, presumably, is smaller than at NYSE.

Two of the last four criteria need to be met. This clarifies the high variability within the listing alternatives. This variability makes it hard to deliver a comprehensive approach to compare the requirements amongst several market segments.

To avoid a delisting, companies also have to fulfill continued listing standards:

*Table 8: Continued Listing Standards at NYSE Arca (NYSE 2010)*

| Continued Listing Standards | |
| --- | --- |
| **Standard 1\*** | |
| Public Round-lot Holders | 400 |
| Publicly Held Shares | 1,100,000 |
| Market Value of Publicly Held Shares | $15 million |
| Shareholders' Equity | $15 million |
| Stock Price | $1.00 |
| **Standard 2\*** | |
| Public Round-lot Holders | 400 |
| Publicly Held Shares | 1,100,000 |
| Market Value of Publicly Held Shares | $15 million |
| Market value of listed securities | $50 million --or-- |
| Total Assets and Total Revenue of $50 million each for the most recently completed fiscal year or two of the last three most recently completed years. | $50 million each |
| Stock Price | $1.00 |

\*Must meet Standard One or Standard Two

One of the two standards has to be met (cf. NYSE 2010).

Standard 1 enables a delisting consideration when the stock price is less than 1/5 of the initial distribution requirement, the market value of publicly held shares is 1/3 of the initially required market value, and shareholders´ equity is less than 3/10 of the initial requirement. Standard 2 provides the same ratio for the shareholders´ equity while the total assets are supposed to be higher than 2/3 and revenues should at least be as high as the initial requirement.

### 4.2.5 AMEX

NYSE Euronext completed the acquisition of the American Stock Exchange (AMEX) on October 1, 2008. NYSE Amex Equities is positioned to be a premier market for listing and trading of small and micro cap companies (cf. NYSE 2010). This statement, again, indicates the commercial segmentation of exchanges in the U.S. NYSE Amex is a commercial market segment, acquired by NYSE Euronext in 2008. Since the smallest companies are attracted, the impact on the segment´s subordinated reputation is expected to be the smallest of the three examined segments of NYSE Euronext.

Quantitative listing standards of NYSE Amex comprise four alternatives to get listed:

*Table 9:Initial Listing Standards NYSE at Amex (NYSE 2010)*

**Quantitative Standards**

| Criteria | Listing Standards | | | |
|---|---|---|---|---|
| | Standard 1 | Standard 2 | Standard 3 | Standard 4 |
| Pre-tax income[1] | $750,000 | N/A | N/A | N/A |
| Market capitalization | N/A | N/A | $50 million | $75 million OR At least $75 million in total assets and $75 million in revenues |
| Market value of public float | $3 million | $15 million | $15 million | $20 million |
| Minimum price | $3 | $3 | $2 | $3 |
| Operating history | N/A | 2 years | N/A | N/A |
| Shareholders' equity | $4 million | $4 million | $4 million | N/A |
| Public shareholders/Public float (shares)[2] | Option 1: 800/500,000 Option 2: 400/1,000,000 Option 3: 400/500,000[3] | | | |

[1] Required in the latest fiscal year, or two of the three most recent fiscal years.

[2] Public shareholders and public float do not include shareholders or shares held directly or indirectly by any officer, director, controlling shareholder or other concentrated (i.e. 10 percent or greater), affiliated or family holdings.

[3] Option 3 requires a daily trading volume of 2,000 shares during the six months prior to listing.

In certain circumstances, concerning IPOs, the NYSE Amex may approve an issue for listing "subject to official notice of issuance" immediately prior to effectiveness of the issuer applicant's initial public offering. While the Exchange has not adopted special criteria for IPOs, added emphasis is placed on the company's financial strength, including an objective evaluation of the anticipated value and offering price, and its demonstrated earnings history and/or outlook (cf. NYSE 2010).

The approval of an application for the listing of securities is a matter solely within the discretion of the exchange. The exchange has established certain minimum numerical standards. The fact that an applicant may meet those standards does not necessarily mean that its application will be approved. Other factors which will also be considered include, but are not limited to, the nature of an issuer´s business, the market for its products, its regulatory history, its past corporate governance activities, or, the reputation of its management (cf. NYSE 2010).

Here, clearly, the exchange´s autonomy from governmental regulation is shown. Even the listing requirements of NYSE Amex consider qualitative aspects, that also reflect the applicant´s corporate governance or the reputation of its management.

An issue, listed on AMEX, will get reviewed as a delisting candidate under the following circumstances:

*Table 10:Continued Distribution Criteria at NYSE Amex (NYSE 2010)*

| Distribution Minimum for Common Stocks |
|---|
| No. of Publicly Held Shares < 1,100,000 |
| OR |
| Total No. of Round-Lot Shareholders < 400 |
| OR |
| Aggregated Market Value of shares publicly held < 15,000,000 |

Furthermore, there are continued requirements for the financial constitution:

*Table 11:Continued Financial Requirements at NYSE Amex (NYSE 2010)*

| Minimum Financial Conditions | |
|---|---|
| Total Market Capitalization of at least | $ 50 million |
| OR | |
| Total Assets and Revenues in the last fiscal year or in two of its three last fiscal years of at least | $ 50 million |

## 4.3 LISTING REQUIREMENTS AT NASDAQ OMX MARKETS

### 4.3.1 INTRODUCTION TO THE NASDAQ OMX GROUP

"Nasdaq was founded in 1971 as a wholly-owned subsidiary of the Financial Industry Regulatory Authority, or FINRA (then known as the National Association of Securities Dealers, Inc.). Beginning in 2000, FINRA restructured and broadened ownership in Nasdaq by selling shares to FINRA members, investment companies and issuers listed on The NASDAQ Stock Market" (Nasdaq 2010).

In connection with this restructuring, Nasdaq applied to the SEC to register The NASDAQ Stock Market as a national securities exchange. FINRA fully divested its ownership of Nasdaq in 2006, and it became fully operational as an independent

registered national securities exchange in 2007. In 2006, Nasdaq also reorganized its operations into a holding company structure (cf. Nasdaq 2010).

"On February 27, 2008, Nasdaq and OMX AB combined their business pursuant to an agreement with Borse Dubai Limited, a Dubai company, or Borse Dubai, and Nasdaq was renamed The NASDAQ OMX Group, Inc. In 2008, Nasdaq performed the acquisition of the Philadelphia Stock Exchange, Inc. and the International Derivatives Clearing Group (IDCG)" (Nasdaq 2010).

"In the U.S., The NASDAQ OMX Group operates The NASDAQ Stock Market. As of December 31, 2008, The NASDAQ Stock Market was home to over 3,000 listed companies with a combined market capitalization of approximately $ 2,6 trillion (Nasdaq 2010). In Europe, The NASDAQ OMX Group operates the exchanges in Stockholm, Copenhagen, Helsinki, and Iceland as NASDAQ OMX Nordic and exchanges in Tallinn, Riga, and Vilnius as NASDAQ OMX Baltic" (Nasdaq 2010).

The operator´s history is not as considerable as NYSE´s is. Respectively, the imaginable superior reputation, due to experience and history, is expected to be less intensive.

Considering the empirical analysis of this thesis, it is interesting to find out if the underpricing at NYSE Euronext is lower than at Nasdaq OMX market segments. Ghosh´s analysis, presented in chapter 3.1, can be seen as an implication for this hypothesis.

In the following, analogously to NYSE Euronext, the listing requirements for common stocks of the examined market segments GSM, GM, and CM will be outlined.

### 4.3.2 CORPORATE GOVERNANCE

Contrarily to corporate governance regulations at NYSE Euronext´s markets, Nasdaq established only one set of standards for all applicants for its segments, The Global Select Market, The Global Market, and The Capital Market.

In addition to meeting quantitative requirements, written down in Rules 5200 (General Procedures), 5300 (The Nasdaq Global Select Market), 5400 (The Nasdaq Global Market), and 5500 (The Nasdaq Capital Market), companies, pursuing a

Nasdaq listing, must meet the qualitative corporate governance requirements of Rule 5600 Series of Nasdaq Equity Rules (cf. Nasdaq 2010).

Similar to NYSE, the requirements include rules relating to the company´s board of directors, including audit committees and independent director oversight of executive compensation and the director nomination process; code of conduct; shareholder meetings, including proxy solicitation and quorum; review of related party transactions; and shareholder approval, including voting rights (cf. Nasdaq 2010).

At first sight, referring to the fact that there is only one set of corporate governance standards for every market segment, the superior reputation could be expected to be the same. But if the size or the particular development stage of the applying companies is taken into account, another aspect arises. For example, if smaller companies, applying for a listing on The Capital Market, have to achieve the same corporate governance standards as bigger companies, applying for a listing on The Global Select Market, need to, the possible impact, related to corporate governance regulation, on the reputation of The Capital Market is presumably higher. Consequently, if underpricing is partially related to the market segment´s reputation, it could be expected to be disproportionately lower at The Capital Market.

### 4.3.3 THE GLOBAL SELECT MARKET

"A company´s compliance with the initial listing criteria will be determined on the basis of the firm´s most recent information filed with the SEC and information provided to Nasdaq OMX. The company shall certify, at or before the time of listing, that all applicable listing criteria have been satisfied" (Nasdaq 2010).

For an initial listing, companies must meet all of the following financial criteria under at least one of the three standards and liquidity requirements below (cf. Nasdaq 2010):

*Table 12: Initial Financial and Qualitative Requirements at Nasdaq GSM (Nasdaq 2010)*

| Requirements | Standard 1 Listing Rules 5315(e) and 5315(f)(3)(A) | Standard 2 Listing Rules 5315(e) and 5315(f)(3)(B) | Standard 3 Listing Rules 5315(e) and 5315(f)(3)(C) | Standard 4 Listing Rules 5315(e) and 5315(f)(3)(D) |
|---|---|---|---|---|
| Pre-tax earnings[2] (income from continuing operations before income taxes) | Aggregate in prior three fiscal years ≥ $11 million and Each of the two most recent fiscal years ≥ $2.2 million and Each of the prior three fiscal years ≥ $0 | N/A | N/A | N/A |
| Cash flows[3] | N/A | Aggregate in prior three fiscal years ≥ $27.5 million and Each of the prior three fiscal years ≥ $0 | N/A | N/A |
| Market capitalization[4] | N/A | Average ≥ $550 million over prior 12 months | Average ≥ $850 million over prior 12 months | $160 million |
| Revenue | N/A | Previous fiscal year ≥ $110 million | Previous fiscal year ≥ $90 million | N/A |
| Total assets | N/A | N/A | N/A | $80 million in the most recently completed fiscal year |
| Stockholders' equity | N/A | N/A | N/A | $55 million |
| Bid price[5] | $4 | $4 | $4 | $4 |
| Market makers[6] | 3 or 4 | 3 or 4 | 3 or 4 | 3 or 4 |
| Corporate governance[7] | Yes | Yes | Yes | Yes |

In the case of a company listing in connection with its initial public offering, compliance with the market capitalization requirements of Rules 5315 (f) (3) (B) and 5315 (f) (3) (C) will be based on the company´s market capitalization at the time of the listing (cf. Nasdaq 2010).

Furthermore, companies planning to list on GSM initially have to meet specific liquidity requirements. All the criteria in their specific category have to be met (Nasdaq 2010). For IPOs the following quantities have to be fulfilled:

*Table 13: Liquidity Requirements for IPOs at Nasdaq GSM (Nasdaq 2010)*

| Requirements | Initial Public Offerings and Spin-Off Companies |
|---|---|
| Round lot shareholders **or** Total shareholders **or** Total shareholders **and** Average monthly trading volume over past twelve months[2] | 450 **or** 2,200 |
| Publicly held shares[3] | 1,250,000 |
| Market value of publicly held shares **or** Market value of publicly held shares **and** Stockholders' equity | $45 million |

"Publicly held shares" is defined as total shares outstanding, less any shares held directly or indirectly by officers, directors or any person who is the beneficial owner of more than 10% of the total shares outstanding of the company (cf. Nasdaq 2010). This definition is also adaptable to the liquidity requirements of other segments (cf. Nasdaq 2010).

Since the requirements are hardly comparable with those of other segments, there is only one criterion that is applicable to every initial evaluation (GSM, GM, and CM) - the stockholders´ equity. With $ 55 million it is the highest for Nasdaq markets. Albeit, the standards should be compared, their individual configuration with different alternatives makes it almost impossible to compare them directly and entirely. Deriving the company size from the criterion "stockholders´ equity", it could be stated that the GSM is supposed to attract the biggest companies and thus could possibly enjoy the highest subordinated reputation of the Nasdaq OMX segments.

To avoid being considered as a delisting candidate, companies constantly have to meet continued listing standards. GSM and GM share the same continued listing standards. The official document which contains them refers, considering the continued listing requirements for GSM, to the Rules 5450 (a) and (b):

*Table 14: Continued Listing Requirements at Nasdaq GSM (Nasdaq 2010)*

| Requirements | Equity Standard Listing Rules 5450(a) and 5450(b)(1) | Market Value Standard Listing Rules 5450(a) and 5450(b)(2) | Total Assets/Total Revenue Standard Listing Rules 5450(a) and 5450(b)(3) |
|---|---|---|---|
| Stockholders' equity | $10 million | N/A | N/A |
| Market value of listed securities[2] | N/A | $50 million | N/A |
| Total assets and Total revenue (in latest fiscal year **or** in two of last three fiscal years) | N/A | N/A | $50 million and $50 million |
| Publicly held shares[3] | 750,000 | 1.1 million | 1.1 million |
| Market value of publicly held shares | $5 million | $15 million | $15 million |
| Bid price | $1 | $1 | $1 |
| Total shareholders[4] | 400 | 400 | 400 |
| Market makers[5] | 2 | 4 | 4 |
| Corporate governance[6] | Yes | Yes | Yes |

[1] Companies must meet the bid price and total shareholders requirements as set forth in Rule 5450(a) and at least one of the Standards in Rule 5450(b).

[2] The term, "listed securities", is defined as "securities listed on NASDAQ or another national securities exchange."

[3] Publicly held shares is defined as total shares outstanding, less any shares held directly or indirectly by officers, directors or any person who is the beneficial owner of more than 10% of the total shares outstanding of the company.

[4] Total shareholders include both holders of beneficial interest and holders of record.

[5] An electronic communications network (ECN) is not considered a market maker for the purpose of these rules.

[6] In addition to the above quantitative requirements, companies must comply with all corporate governance requirements as set forth in the Rule 5600 Series.

As part of the Nasdaq Equity Rules, these rules refer to the GM section. There it is written that each company that has its primary equity security listed on The Global Market must continue to substantially meet all of the requirements set forth in Rule 5450 (a) and at least one of the standards in Rule 5450 (b) (cf. Nasdaq 2010).

The computation of ratios to measure the strictness of sanctioning possibilities, the exchange has, would not make sense at this point, because only one criterion, out of a minimum of six in each standard, could be compared - the stockholders´ equity.

### 4.3.4 THE GLOBAL MARKET

The Nasdaq GM is a market for smaller companies. Similar to the GSM, companies, initially offering shares, have to meet different criteria. While there need to be at least 400 round lot holder (cf. Nasdaq 2010), one of the four standards below has to be met (cf. Nasdaq 2010):

*Table 15: Initial Listing Requirements at Nasdaq GM (Nasdaq 2010)*

| Requirements | Income Standard Listing Rules 5405(a) and 5405(b)(1) | Equity Standard Listing Rules 5405(a) and 5405(b)(2) | Market Value Standard Listing Rules 5405(a) and 5405(b)(3)[2] | Total Assets/Total Revenue Standard Listing Rules 5405(a) and 5405(b)(4) |
|---|---|---|---|---|
| Income from continuing operations before income taxes (in latest fiscal year **or** in two of last three fiscal years) | $1 million | N/A | N/A | N/A |
| Stockholders' equity | $15 million | $30 million | N/A | N/A |
| Market value of listed securities[3] | N/A | N/A | $75 million | N/A |
| Total assets and Total revenue (in latest fiscal year **or** in two of last three fiscal years) | N/A | N/A | N/A | $75 million and $75 million |
| Publicly held shares[4] | 1.1 million | 1.1 million | 1.1 million | 1.1 million |
| Market value of publicly held shares | $8 million | $18 million | $20 million | $20 million |
| Bid price | $4 | $4 | $4[2] | $4 |
| Shareholders (round lot holders)[5] | 400 | 400 | 400 | 400 |
| Market makers[6] | 3 | 3 | 4 | 4 |
| Operating history | N/A | 2 years | N/A | N/A |
| Corporate governance[7] | Yes | Yes | Yes | Yes |

[1] Companies must meet the bid price, publicly held shares, and round lot holders requirements as set forth in Rule 5405(a) and at least one of the Standards in Rule 5405(b).

[2] Seasoned companies (those companies already listed or quoted on another marketplace) qualifying only under the Market Value Standard must meet the market value of listed securities and the bid price requirements for 90 consecutive trading days prior to applying for listing.

[3] The term, "listed securities", is defined as "securities listed on NASDAQ or another national securities exchange."

[4] Publicly held shares is defined as total shares outstanding, less any shares held directly or indirectly by officers, directors or any person who is the beneficial owner of more than 10% of the total shares outstanding of the company.

[5] Round lot holders are shareholders of 100 shares or more. The number of beneficial holders is considered in addition to holders of record.

[6] An electronic communications network (ECN) is not considered a market maker for the purpose of these rules.

[7] In addition to the above quantitative requirements, companies must comply with all corporate governance requirements as set forth in the Rule 5600 Series.

Possibly, this segment is less well reputed than the GSM is. The indirect and subordinated effect of listed companies should be smaller. Is the underpricing higher? As with the other presented listing requirements, the continued ones are less strict than the initial standards:

*Table 16: Continued Listing Requirements at Nasdaq GM (Nasdaq 2010)*

| Requirements | Equity Standard Listing Rules 5450(a) and 5450(b)(1) | Market Value Standard Listing Rules 5450(a) and 5450(b)(2) | Total Assets/Total Revenue Standard Listing Rules 5450(a) and 5450(b)(3) |
|---|---|---|---|
| Stockholders' equity | $10 million | N/A | N/A |
| Market value of listed securities[2] | N/A | $50 million | N/A |
| Total assets and Total revenue (in latest fiscal year **or** in two of last three fiscal years) | N/A | N/A | $50 million and $50 million |
| Publicly held shares[3] | 750,000 | 1.1 million | 1.1 million |
| Market value of publicly held shares | $5 million | $15 million | $15 million |
| Bid price | $1 | $1 | $1 |
| Total shareholders[4] | 400 | 400 | 400 |
| Market makers[5] | 2 | 4 | 4 |
| Corporate governance[6] | Yes | Yes | Yes |

## 4.3.5 THE CAPITAL MARKET

For a listing on The Capital Market, obviously the market for the smallest and less matured companies applying for a listing, there are three standards:

*Table 17: Initial Listing Requirements at Nasdaq CM (Nasdaq 2010)*

| Requirements | Equity Standard Listing Rules 5505(a) and 5505(b)(1) | Market Value of Listed Securities Standard Listing Rules 5505(a) and 5505(b)(2)[2] | Net Income Standard Listing Rules 5505(a) and 5505(b)(3) |
|---|---|---|---|
| Stockholders' equity | $5 million | $4 million | $4 million |
| Market value of publicly held shares | $15 million | $15 million | $5 million |
| Operating history | 2 years | N/A | N/A |
| Market value of listed securities[3] | N/A | $50 million | N/A |
| Net income from continuing operations (in the latest fiscal year or in two of the last three fiscal years) | N/A | N/A | $750,000 |
| Bid price | $4 | $4 | $4 |
| Publicly held shares[4] | 1 million | 1 million | 1 million |
| Shareholders (round lot holders)[5] | 300 | 300 | 300 |
| Market makers[6] | 3 | 3 | 3 |
| Corporate governance[7] | Yes | Yes | Yes |

Here, companies with a comparatively low market value of publicly held shares of $ 5 million are able to apply for a listing. Comparing the required stockholders´ equity, this market also requires the lowest values. Consequently, the underpricing, if it is really connectable to market reputation, which is possibly partially influenced by a subordinated reputation due to listed company sizes, should be the highest at this U.S. market segment of Nasdaq OMX.

The continued listing requirements constitute as follows:

*Table 18: Continued Listing Requirements at Nasdaq CM (Nasdaq 2010)*

| Requirements | Equity Standard Listing Rules 5550(a) and 5550(b)(1) | Market Value of Listed Securities Standard Listing Rules 5550(a) and 5550(b)(2) | Net Income Standard Listing Rules 5550(a) and 5550(b)(3) |
|---|---|---|---|
| Stockholders' equity | $2.5 million | N/A | N/A |
| Market value of listed securities[2] | N/A | $35 million | N/A |
| Net income from continuing operations (in the latest fiscal year or in two of the last three fiscal years) | N/A | N/A | $500,000 |
| Publicly held shares[3] | 500,000 | 500,000 | 500,000 |
| Market value of publicly held securities | $1 million | $1 million | $1 million |
| Bid price | $1 | $1 | $1 |
| Public holders[4] | 300 | 300 | 300 |
| Market makers[5] | 2 | 2 | 2 |
| Corporate governance[6] | Yes | Yes | Yes |

Relating the continuously required market value of listed securities (listing rules 5550 (a) and 5550 (b)(2)) to the initially required market value, the exchange can consider a listed company when the market value falls below 7/10. Considering the Net Income Standard, it is the case when the net income from continuing operations is below 2/3 of the initially required value.

The detailed presentation of the initial and continued listing requirements above has shown that an objective, complete, and useful comparison of those six market segments is almost unachievable. There are too many individual possibilities and standards that differ considerably. Some market segments use other criteria than others. Single criterion is combined with another in one segment, while another segment is applying another combination of criteria subsumed under only one of its several listing alternatives.

## 4.4 COMPARISON AND POSSIBLE IMPLICATIONS ON THE UNDER-PRICING

This paragraph is supposed to establish higher comparability of the listing requirements. First, an approach to compare the entire set of requirements will be provided. Therefore, those standards and single options within the particular market segment have been chosen that are the most comparable. Secondly, the initial size criteria, the only criteria dimension that is evaluable objectively, will be compared and, to derive an expectation on the underpricing, an approach to rank them by the size that they attract will be performed. This possible expectation will

be based on assumptions: (i) the underpricing correlates with the reputation of the particular segment and (ii) this reputation is also based on the company size.

The development of the following table comprised the choice of appropriate listing alternatives within the particular segment. Therefore, some alternatives have not been taken into account.

The choice was based on thorough consideration under the aspect of comparability:

*Table 19: A Comparison of Listing Requirements in the United States (Own illustration based on Chapters 4.1-4.3)*

| EXCHANGE REQUIREMENTS | NYSE | ARCA | AMEX | GSM | GM | CM |
|---|---|---|---|---|---|---|
| **Initial Requirements** | (Pure Valuation with CF) | | (Standard 4) | (Standard 4) | (Assets/Revenue Standard) | (Equity Standard) |
| Round-Lot Holders | 400 | 400 | - | 450 | 400 | 300 |
| Public Shares | 1,100,000 | 1,100,000 | 1,000,000 | 1,250,000 | 1,100,000 | 1,000,000 |
| Market Value of Public Shares | $ 40 million | $ 45 million | $ 20 million | $ 45 million | $ 20 million | $ 15 million |
| Public Shareholders | - | - | 400 | - | - | - |
| Revenues | $ 100 million (most recent 12 months) | $ 50 million (most recent year or 2 of last 3 years) | $ 75 million | - | $ 75 million | - |
| Cashflow | $ 25 million (aggregated for the last 3 years; all positive) | - | - | - | - | - |
| Market Capitalization | $ 750 million | $ 150 million | - | $ 160 million | - | - |
| Total Assets | - | $ 75 million | $ 75 million | $ 80 million (in the most recently fiscal year) | $ 75 million | - |
| Shareholders´ Equity | - | $ 50 million | - | $ 55 million | - | $ 5 million |
| Minimum Price | $ 4 | - | $ 3 | $ 4 | $ 4 | $ 4 |
| Operating History | - | - | - | - | - | 2 years |
| Market Makers | - | - | - | 3 or 4 | 4 | 3 |

| Continued Requirements | | (Standard 1) | | (Equity Standard) | (Equity Standard) | (Equity Standard) |
|---|---|---|---|---|---|---|
| Round-Lot Holders | 400 | 400 | 400 | - | - | 300 |
| Publicly Held Shares | - | 1,100,000 | - | 750,000 | 750,000 | 1,000,000 |
| Market Value of Publicly Held Shares | - | $ 15 million | - | $ 5 million | $ 5 million | $ 15 million |
| Public Shareholders | - | - | 400 | - | 400 | - |
| Revenues | $ 20 million (for the most recent 12 months) | $ 50 million (for the most recent fiscal year or 2 of the last 3 years) | $ 50 million (in the last fiscal year or 2 of the last 3 years) | - | - | - |
| Total Assets | - | $ 50 million (for the most recent fiscal year or 2 of the last 3 years) | $ 50 million (in the last fiscal year or 2 of the last 3 years) | - | - | - |
| Market Capitalization | < $ 250 million (av. over a 30 trading day period) | - | - | - | - | - |
| Shareholders' Equity | - | - | - | $ 10 million | $ 10 million | $ 5 million |
| Minimum Price | - | $ 1 | - | - | - | $ 4 |
| Market Makers | - | - | - | 2 | 2 | 3 |
| Corporate Governance Standards (Exchange) | yes | yes | yes | yes | yes | yes |
| **SEC REQUIREMENTS** | | | | | | |
| SEC Filing | yes | yes | yes | yes | yes | yes |
| Periodic Obligations | 10 K / 10 Q / 8 K | 11 K / 10 Q / 8 K | 12 K / 10 Q / 8 K | 13 K / 10 Q / 8 K | 14 K / 10 Q / 8 K | 15 K / 10 Q / 8 K |
| Prospectus | yes | yes | yes | yes | yes | yes |

Obviously, in terms of distribution criteria, the market segments seem to be quite comparable. For almost every segment, both for initial and continued listing, a minimum number of round-lot holders, public shares and their potential value is set up.

Regarding other criteria, such as asset- or income-related ones, there is heterogeneity amongst the six considered segments. Referring to the initial requirements, for only three of the six segments, the criteria market capitalization, shareholders´ equity, and total assets are applicable. Anyhow, a minimum prospective trading price and the revenues are considered for more than four segments.

For the continued requirements, almost no comparabilty is given. NYSE segments mainly use revenues and total assets as criteria. Since Nasdaq OMX´s segments do not use any of those two, a comparison referring to asset or income factors is not possible.

The reputation of a market segment, mainly, seems to be influenced by non-quantifiable factors - a direct connection can only hardly be verified. Nevertheless, Hunger highlights the disclosure, publicity, and listing requirements as a determinant for the market segments´ reputation. (cf. Chapter 3.2.) Linked to this assumption, in chapters 4.1 - 4.3 they have been presented and discussed, concerning their imaginable impact on the particular segments´ reputation. The only part of them that could be compared in a useful manner are the requirements that refer to the company size.

The next table can be seen as an approach to compare the size groups that are supposed to be attracted by the exchange operators:

*Table 20: Comparison of Initial Size Requirements (Own illustration based on considerations in Chapter 4.1-4.3)*

| Extract from Initial Listing Requirements | | | | | | |
|---|---|---|---|---|---|
| **Investigated Market Segments** | | | | | | |
| | **NYSE Euronext** | | | | **NASDAQ OMX** | |
| | NYSE (Pure Valuation with CF) | ARCA | AMEX (Standard 4) | GSM (Standard 2) | GM (Equity Standard) | CM (Equity Standard) |
| **Distribution and Size Criteria** empty cells: N/A | | | (Option 2) | | | |
| Round-lot Holders | 400 | 400 | | 450 | 400 | 300 |
| Publicly Held Shares | 1100000 | 1100000 | 1000000 | 1250000 | 1100000 | 1000000 |
| Market Value of Public Shares (in million $) | 40 | 45 | 20 | 45 | 18 | 15 |
| Public Shareholders | | | 400 | 2200 | | |
| **Quantitative Criteria** (in million $); empty cells: N/A | | | | | | |
| Global Market Capitalization | 750 | 150 | 75 | 550 | | |
| Revenues | 100 | 50 | 75 | 110 | | |
| Cash Flow | 25 | | | 27.5 | | |
| Total Assets | | 75 | 75 | | | |
| Shareholders´ Equity | | | | 55 (Standard 4) | 30 | 5 |
| **Qualitative Criteria** | | | | | | |
| Corporate Governance | yes | yes | yes | yes | yes | yes |

When analyzing the presented table, it has to be taken into account that only selected standards and criteria of the initial listing requirements, outlined above, have been chosen. Even this selection was made due to aspects of comparability and the necessity to compare standards entirely. To form a conclusion, criteria to evaluate the attracted size groups need to be defined. Those criteria should be the

market capitalization and, supportively, the revenues. If one compares the computed product of those two criteria, the following picture arises:

*Table 21: Ranking of Size Groups defined by Market Segment´s Size Minimums (Based on required Market Capitalization and Revenues/Consideration in Chapter 4.1-4.3)*

| | Market Cap | Revenues | Product | Ranking |
|---|---|---|---|---|
| NYSE | 750 | 100 | 75000 | 1 |
| GSM | 550 | 110 | 60500 | 2 |
| ARCA | 150 | 50 | 7500 | 3 |
| AMEX | 75 | 75 | 5625 | 4 |

Since the listing requirements of The Global Market and The Capital Market do not use the chosen criteria and there is no other criterion that enables a comparison, they cannot be included. Notwithstanding, taking the shareholders´ equity into account, it could be assumed that those two segments are supposed to attract smaller companies than The Global Select Market does. However, this breakpoint forbids a comparison with NYSE Euronext segments.

What could this ranking mean for the underpricing of IPOs in those segments? Since (i) Fombrun/Shanley state that corporate reputation is influenced positively by the size of the company and (ii) Hunger expects the listed company´s size as a subordinated influence factor on the market segment´s reputation, the assumption that the underpricing is expected to be the highest at AMEX and the lowest at "The Big Board" could vaguely be derived. If the underpricing follows the required company size, perhaps, it could be seen as a main determinant. However, beside the required company size, there are plenty of other factors that influence the reputation of market segments. Each one of those factors is expected to have a differently weighted impact on the reputation.

Supportively, it is interesting to find out, how issuing companies follow those required size groups in reality. If companies follow the minimum size requirements of the investigated market segments, those segments that attract and list bigger companies, like NYSE or GSM, possibly display a lower underpricing than segments that attract smaller companies, like AMEX or ARCA.

So, how do the issuing companies behave effectively? Do the biggest firms get listed in those segments that are provided to attract the biggest issuers? For 162 of the 202 investigated IPOs, usable balance sheet data was available. The other

companies were incepted right away or had several predecessors whose balance sheets were presented.

Analyzing this data, considering the size of the issuing firms, results in the following:

Table 22: Effective Size of Issuing Firms based on Total Assets and Revenues (Own Calculations based on captured Balance Sheet Data)

| | A<br>Av. Total Assets last fiscal year before the IPO (in thsd. $) | B<br>Av. Revenues last fiscal year before the IPO (in thsd. $) | = A * B<br>Product | Ranking |
|---|---|---|---|---|
| NYSE | 1,778,155 | 1,131,896 | 2,012,687,430,477 | 1 |
| GSM | 262,653 | 205,522 | 53,981,076,247 | 2 |
| GM | 109,877 | 101,829 | 11,188,672,342 | 3 |
| CM | 164,836 | 48,342 | 7,968,540,010 | 4 |
| Arca | 48,558 | 63,981 | 3,106,773,403 | 5 |
| Amex | 27,434 | 42,187 | 1,157,365,894 | 6 |

Although big companies are able to list in segments that should attract smaller ones, they follow the size requirements of U.S. national exchanges and get listed in those market segments, that are supposed to attract them. Unfortunately, in terms of minimum size requirements, the criterion "total assets" is not applied in a manner that allows the comparison with the effective size of the issuing companies. Vice versa, it was not possible to capture the criterion "(pre-issue-) market capitalization" for issuing firms. However, both the market capitalization and the balanced total assets are assumed as reliable measures for the size of a company. They make it possible to establish a hierarchy of company sizes and therefore comparability is given.

Following the developed understanding of the evolvement of market reputation (cf. Illustration 4/Chapter 3.2) and taking Hunger´s assumption on its correlation with the underpricing into account, now, it is interesting to find out how it developed in particular market segments.

# 5 EMPIRICAL ANALYSIS

## 5.1 DATA BASE AND METHODOLOGY

The research, underlying this thesis, focuses on IPOs in market segments offered by NYSE Euronext and Nasdaq OMX. These two exchange operators were chosen, because they are the largest and most developed in the U.S. To get an understanding of how large NYSE and NASDAQ are, their total market capitalizations could be compared with the Wilshire 5000 Total Market Index which measures the performance of all U.S. equity securities (only U.S. companies). As of January 2008 the index showed a total market cap of approximately $ 14,0 trillion (Wilshire, 2010). One year later, as of Dec. 31, 2008, Nasdaq OMX and NYSE Euronext showed a combined total market capitalization of approximately $ 19,3 trillion, including foreign issuers. (cf. Chapter 4.2.1/4.3.1)

The analyzed IPOs relate to several market segments, offered by these exchange operators. The assessment integrates *Amex*, *Arca*, and *NYSE* of NYSE Euronext, respectively *The Capital Market, The Global Market,* and *The Global Select Market* of NASDAQ OMX.

The scaffold for the data, underlying this thesis, was captured from a data base, provided by Hoovers. The company, in cooperation with MSN Money, provides a service called "IPO Center" that lists all companies that have filed for an IPO of common stock since May, 6 1996 (cf. MSN Money 2010). The data gathered was partially verified by crosschecks with the final prospectus´, filed within the SEC data system, EDGAR. Nevertheless, the final prospectus´ delivered the main part of the data, necessary to conduct the following analysis.

The analysis will be divided into three parts. First, a statistical description of the underlying data, including an analysis of location parameter, will be performed. Secondly, the underpricing within specific market segments will be presented and discussed. In the third place, the methodology of two regression models and their results, integrating a wider range of exogenous variables for the underpricing, will be outlined and discussed.

## 5.2 SAMPLE DESCRIPTION

The entire population counts for 202 IPO observations. 116 were performed at Nasdaq OMX, 86 at NYSE Euronext market segments. The IPOs have been performed between 2004 and 2010. This time frame was chosen, because it offers a certain width that enables the reflection of different economical situations.

The IPOs can be allocated amongst the particular market segments as follows:

*Illustration 6: Number of examined IPOs in Particular Market Segments*
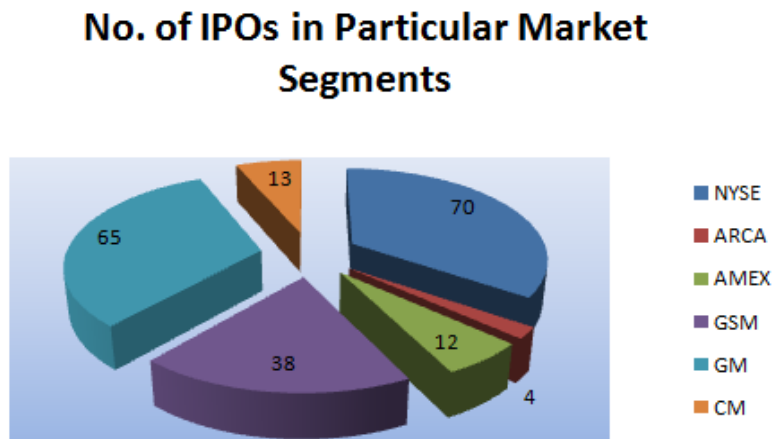


Within the contemplated time frame, only 29 IPOs were performed in smaller market segments. To establish a higher balance amongst the market segments, it would have been necessary to widen the period under review considerably. This would not have been rewarding, because (i) the superiority of the bigger market segments would have been neglected and (ii) the comparison of actual listing requirements would have become way more inessential, since they could have been amended continuously over time.

The number of offerings also varied in the time course:

*Illustration 7: Number of IPOs in the Time Course*
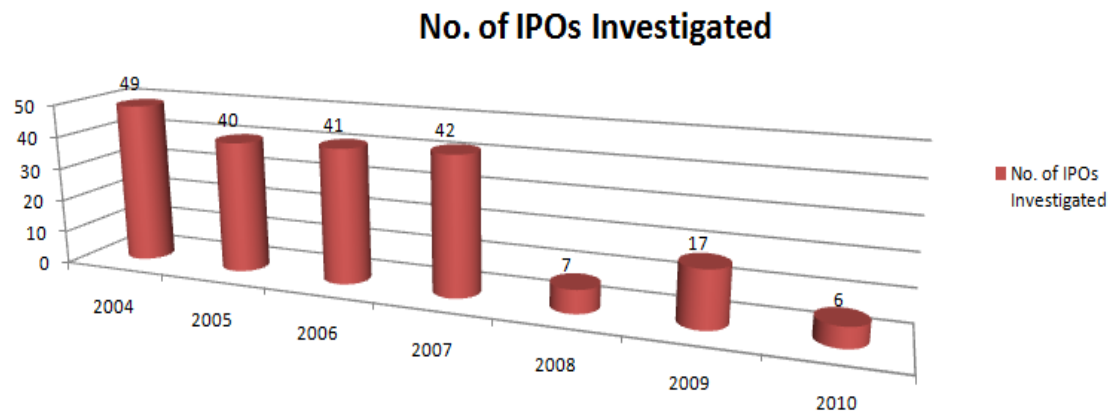


The main portion of examined IPOs is between 2004-2007. The total number of IPOs decreased considerably in 2008. This seems to be the effect of The Financial Crisis that started with the crash of Lehman Brothers in autumn, 2008.

Before a first statistical overview of the sample could be given, the computation of the underpricing, considering the market adjustment, needs to be clarified. The benchmark for the initial return is calculated as the performance of the particular index within the time between the end of the subscription period and the first trading day. This time frame embodies the investment opportunity of the potential investor. It was not possible to gather reliable data for all offerings. Thus, the computation is based on Hunger's findings. The author states, considering his research, that averagely there are 3,88 days between those two moments (cf. 2004, 108). Consequently, the adjustment of the initial return is based on a 4 days adjustment.

## 5.3 THE SPECIFIC UNDERPRICING IN EACH MARKET SEGMENT

Now, the specific UP in the examined market segments will be presented. First, the expectation, derived from the analysis of listing requirements and the effective company sizes will be summarized. Secondly, the ex-post underpricing in those segments will be presented.

Considering table 21 and 22 in the chapter 4.4, the following comparison could be made:

*Table 23: Ranking of Minimum Size Requirements and Effective Company Size of Issuers - An Assumption-Based Expectation*

| | | Ranking of |
|---|---|---|
| No. | Size Requirements | Effective Company Size of Issuing Firms |
| 1 | NYSE | NYSE |
| 2 | GSM | GSM |
| 3 | ARCA | GM |
| 4 | AMEX | CM |
| 5 | * | ARCA |
| 6 | * | AMEX |

*) Due to the missing application of certain criteria and, consequently, the missing comparability with the other size requirements, CM and GM could not be intergrated

This table, again, clarifies the assumption-based expectation stating that the company size could be a subordinated determinant for the segmental reputation. Considering both the required size groups and the effective company size, the underpricing probably is the smallest at NYSE, while it is expected to be the highest at AMEX. Both rankings enable the deduction of similar expectations. Due to the missing application of certain criteria the effective company size is used.

How did the underpricing behave in those market segments effectively?

*Table 24: The Specific Underpricing in the Examined Market Segments*

| | NYSE | GSM | GM | CM | ARCA | AMEX | Total |
|---|---|---|---|---|---|---|---|
| IPOs | 70 | 38 | 65 | 13 | 4 | 12 | 202 |
| Mean | 6.57 | 12.17 | 10.21 | 5.48 | 19.41 | 21.96 | 9.89 |
| Median | 1.00 | 7.71 | 2.82 | 0.82 | 20.60 | 3.56 | 2.82 |
| Maximum | 105.99 | 45.81 | 64.95 | 22.63 | 25.71 | 116.47 | 116.47 |
| Minimum | -12.89 | -2.44 | -10.79 | -4.55 | 10.74 | -0.49 | -12.87 |
| Std. Dev. | 15.87 | 13.24 | 16.55 | 8.75 | 6.92 | 38.08 | 17.53 |
| | | | | | | | |
| Skewness | 3.90 | 0.92 | 1.68 | 0.77 | -0.36 | 1.71 | 2.88 |
| Kurtosis | 23.43 | 2.96 | 5.50 | 2.17 | 1.51 | 4.41 | 14.55 |
| Jarque Bera | 1395.33 | 5.31 | 47.59 | 1.66 | 0.46 | 6.82 | 1401.97 |
| (p-value) | 0.0000 | 0.0703 | 0.0000 | 0.4352 | 0.7966 | 0.0331 | 0.0000 |

The horizontal array is aligned with the assumption-based expected outcome: the smallest UP (NYSE) on the left, the highest (AMEX) on the right.

Contrarily to the expectation, the underpricing for CM issues is the lowest. The second smallest value can be registered at NYSE. With 6,57 % it is below-average. Beside the highest mean of 21,96 %, the highest deviation is also attributable to AMEX. The 12 investigated IPOs deviate averagely at a 38,08 level. This is attributable to two outliers of 116,47% and 81,30%. The mean of the remaining 10

observations is 6,57%. The example of AMEX clarifies the effect of outliers. The results can be warped considerably. Thus, before a conclusion could be made, analogously to Hunger´s approach (2004, 125), the entire population needs to be adjusted in that way that outliers are eliminated. Therefore the outliers that are more than the 1,5-fold of the IRQ distanced from the upper and lower quartile are removed. The next table will show the statistical details, based on the adjusted population:

Table 25: The Specific Underpricing in the Examined Market Segments (outlier adjusted) / Issue Intensity

| | NYSE | GSM | GM | CM | ARCA | AMEX | Total |
|---|---|---|---|---|---|---|---|
| IPOs | 64 | 38 | 61 | 13 | 4 | 10 | 190 |
| Mean | 3.01 | 12.18 | 7.02 | 5.48 | 19.41 | 6.57 | 6.83 |
| Median | 0.38 | 7.71 | 2.27 | 0.82 | 20.60 | 2.97 | 2.00 |
| Maximum | 25.50 | 45.81 | 38.63 | 22.63 | 25.71 | 37.05 | 45.81 |
| Minimum | -12.89 | -2.44 | -10.79 | -4.55 | 10.74 | -0.49 | -12.89 |
| Std. Dev. (1) | 7.17 | 13.24 | 11.09 | 8.75 | 6.92 | 11.20 | 10.79 |
| Skewness | 1.21 | 0.92 | 1.05 | 0.77 | -0.36 | 2.27 | 1.29 |
| Kurtosis | 4.43 | 2.95 | 3.39 | 2.17 | 1.51 | 6.82 | 4.31 |
| Jarque Bera | 21.08 | 5.31 | 11.53 | 1.66 | 0.46 | 14.65 | 66.31 |
| (p-value) | 0.0000 | 0.0703 | 0.0031 | 0.4352 | 0.7966 | 0.0007 | 0.0000 |
| T-Statistic (2) | 3.3553 | 5.6697 | 4.9436 | 2.2566 | 5.6102 | 1.8542 | 8.7321 |
| (p-value) | 0.0013 | 0.0000 | 0.0000 | 0.0435 | 0.0112 | 0.0967 | 0.0000 |
| Wilcoxon Signed Rank (3) | 2.0965 | 4.6262 | 4.1947 | 1.6773 | 1.6432 | 2.4463 | 7.3134 |
| (p-value) | 0.0360 | 0.0000 | 0.0000 | 0.0935 | 0.1003 | 0.0144 | 0.0000 |
| Lilliefors Test | 0.2324 | 0.1486 | 0.2090 | 0.2902 | N/A | 0.3087 | 0.1849 |
| (p-value) | 0.0000 | 0.0337 | 0.0000 | 0.0037 | N/A | 0.0076 | 0.0000 |
| Gross Issue Volume (Mio.USD) | 22530.21 | 5825 | 5662.82 | 748.80 | 402.00 | 163.67 | 35332.50 |
| (%) | 63.77 | 16.49 | 16.03 | 2.12 | 1.14 | 0.46 | 100.00 |
| Average per IPO | 352.03 | 153.29 | 92.83 | 57.60 | 100.50 | 16.37 | 185.96 |
| Paid-In Capital (Mio. USD) | 27736.05 | 3916.60 | 4782.50 | 612.60 | 587.00 | 168.30 | 37803.05 |
| (%) | 73.37 | 10.36 | 12.65 | 1.62 | 1.55 | 0.45 | 100.00 |
| Average per IPO | 433.38 | 103.07 | 78.40 | 47.12 | 146.75 | 16.83 | 198.96 |
| Gross Issue Volume / Paid-In Capital | 0.812308 | 1.487259 | 1.184071 | 1.222329 | 0.684838 | 0.97249 | 0.934647 |

(1) Standard Deviation
(2) H0: Mean = 0
(3) H0: Median = 0

Now, after the adjustment, first conclusions can be made. Considering the column with total values, the average underpricing decreased due to the removal of outliers. It dropped by 306 basis points from 9,89 % to 6,83 %. The null

hypothesis, underlying the mean and median tests, is declinable for almost every subgroup. Thus, the mean and the median is significant in each segment. As expected, the standard deviation decreased as well to a level of 10,79.

To get a graphical overview of the underpricing´s mean amongst the examined market segments, consider the following illustration:

*Illustration 8: Mean Underpricing in Particular Market Segments*
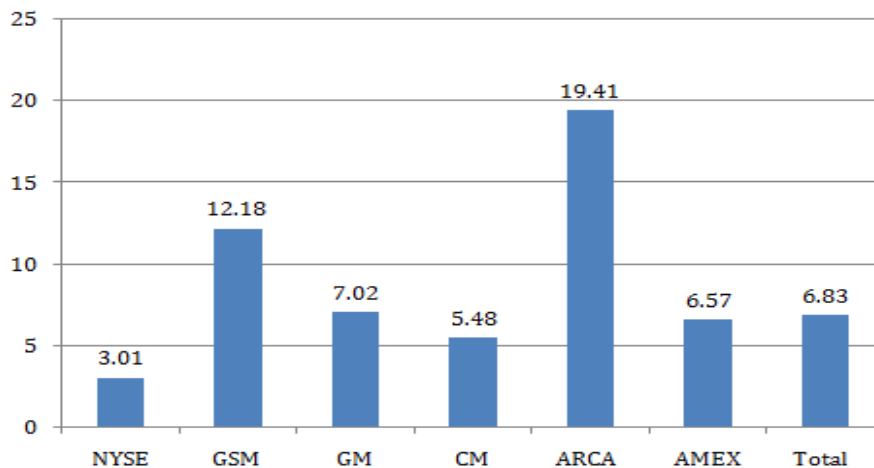


This picture does not reflect the expectation that has been derived, based on the assumption that the company size could possibly be a subordinated influence factor for the reputation of a stock market segment which is assumed to be a determinant for the underpricing itself. If there is statistical significance on the differences, it can be concluded that it did not behave the expected way. To test the equality of medians, the Kruskal-Wallis-Test is applicable since none of the samples is normally distributed:

*Table 26: Tests of Equality*

|  | Test Statistic | P-Value |
|---|---|---|
| 1) F-Test | 5.1098 | 0.0002 |
| 2) Kruskal-Wallis-Test | 21.5562 | 0.0006 |

1) Test of equality of the means
2) Test of equality of the medians

Both the medians and the means of the market segments are significantly different at a level of less than $\alpha = 0,01$. This outcome could have been expected since Hunger´s findings also do not confirm a significant connection between the underpricing and the company size (2004, 137/139).

Analyzing table 25, it can also be stated that the highest recognizable UP is at ARCA while the second highest value is noticeable for issues at GSM. The mean UP is the lowest at NYSE, the market segment with the largest issuers and the highest average GIV per IPO. The second lowest underpricing can be registered at CM, the third lowest exists in the segment with the smallest issuers - AMEX.

Table 25 also implies that, in terms of issue activity, with averagely $ 352.03 million per IPO the "Big Board" is the segment with the largest issues. The examined data includes 64 offerings at NYSE, representing $ 22,530.21 million of gross issue volume. However, with approximately $ 1.49 per dollar paid-in capital, the issue intensity is the highest at The Global Select Market of Nasdaq OMX. Probably, this could be explained by the fact that mainly technological firms issue their stocks at Nasdaq. Assumably, those firms exhibit a higher capital demand.

Since both the kurtosis and the skewness do not exhibit the usual parameters for a normal distribution, none of the subgroups seems to reflect The Gaussian Distribution. However, the Jarque Bera Test only shows significant results for NYSE, GM, and AMEX (p-values < 0,01). Supportively, the Lilliefors-Test on normal distribution was performed and led to more extensive results. In none of the examined market segments and the entire population, the underpricing is distributed normally. Consequently, to test the significance of the medians, the Wilcoxon Rank Sum Test as a non-parametric test is applicable (cf. Crichton 2000, 584). While this test is based on the assumption that the number of ranks above and below the median is the same, it delivers results that are only sinisterly useful since the numbers of observations within the subgroups are quite small. However, it could be stated that the median of the entire population of 190 IPOs is not a coincidental value. Since the p-value is almost zero, the probability of the appropriateness of the computed median is higher than 99 %.

Since the numbers of observations in individual subgroups like CM, ARCA, and AMEX are quite small and not representative, the results of this analysis could be qualified quite easily. To perform a more solid analysis, the next chapter will examine the data on an aggregated basis. Therefore, two subgroups will be formed that summarize the observations for NYSE Euronext and Nasdaq OMX markets. The theoretical model of the reputation building process in chapter 3.2

(Illustration 4) also points at the historical and legal classification of a stock market within capital markets. Since there are conspicuous differences amongst the two exchange operators, an aggregated comparison of the underpricing of NYSE Euronext and Nasdaq OMX issues could deliver support for The Market Reputation Thesis.

## 5.4 THE UNDERPRICING AT NYSE EURONEXT AND NASDAQ OMX MARKET SEGMENTS - AN AGGREGATED COMPARISON

This paragraph is supposed to perform an aggregated comparison of the underpricing in Nasdaq OMX and NYSE Euronext segments. The following table will give an overview of statistical measures in respect of the two exchange operators:

Table 27: Comparison of the Underpricing in NYSE Euronext and Nasdaq OMX Segments

| | NYSE Euronext | Nasdaq OMX | Total |
|---|---|---|---|
| IPOs | 78 | 112 | 190 |
| Mean | 4.31 | 8.59 | 6.83 |
| Median | 1.01 | 3.72 | 2 |
| Maximum | 37.05 | 45.81 | 45.81 |
| Minimum | -12.89 | -10.79 | -12.89 |
| Std. Dev. | 8.52 | 11.84 | 10.79 |
| Skewness | 1.48 | 1.07 | 1.29 |
| Kurtosis | 5.40 | 3.53 | 4.31 |
| Jarque-Bera | 47.36 | 22.65 | 66.31 |
| (p-value) | 0.0000 | 0.0000 | 0.0000 |
| T-Statistic (1) | 4.4649 | 7.6813 | 8.7321 |
| (p-value) | 0.0000 | 0.0000 | 0.0000 |
| Wilcoxon Signed Rank (2) | 3.4616 | 6.4754 | 7.3134 |
| (p-value) | 0.0005 | 0.0000 | 0.0000 |
| Lilliefors Test | 0.2107 | 0.1760 | 0.1849 |
| (p-value) | 0.0000 | 0.0000 | 0.0000 |

(1) H0: Mean = 0
(2) H0: Median = 0

Usually, if Skewness is close to 0 while Kurtosis is close to 3, a normal distribution is signaled (cf. Eckey/Kosfeld/Dreger 2004, 225). Thus, for the two examined groups, both the kurtosis and the skewness point out that the observations are not distributed normally. Supportively, the small p-values of the Lilliefors Test lead to the rejection of the null hypothesis of a normal distribution (cf. E-Views 6 User´s Guide, 2007).

The mean is the highest within market segments of Nasdaq OMX. This result corresponds with Ghosh´s findings, comparing initial returns (Chapter 3.1). With

8.59 % it is 99.30 % higher than the underpricing at NYSE Euronext´s market segments. The total mean is 6.83 %. This average, taking issues with a negative underpricing into account, implies an amount of "money left on the table" of approximately 6.13 Pence per $ nominal issue volume. Considering the medians, a similar picture arises. Half of the observations at NYSE Euronext segments exhibit an underpricing of less than 1.01 % while the other half features more than 1.01 %. With 3.72 %,  the median at Nasdaq OMX is higher as well. NYSE Euronext-IPOs averagely deviate from their arithmetic mean at a level of 8.52 while Nasdaq IPOs exhibit a standard deviation of 11.84. Thus, the evolvement differs considerably amongst the two exchange operators. Supportive to this statement consider the following table:

*Table 28: Tests of Equality 2*

|  | Test Statistic | P-Value |
|---|---|---|
| F-Test | 7.5106 | 0.0067 |
| Kruskal-Wallis-Test | 6.3007 | 0.0121 |

Both the F-Test and the Kruskal-Wallis-Test for not normally distributed populations show that both the mean and the median differ significantly amongst the two observation groups.

What could this mean in respect of The Market Reputation Thesis? As mentioned in chapter 4, the history of both exchange operators differs significantly. NYSE was founded in 1792 and grew naturally throughout the centuries, facing difficult incidents like The Panic of 1857 when Ohio Life Insurance & Trust collapsed or The Great Depression of 1929. On the other hand, Nasdaq, founded in 1971 (almost 200 years later) as a subsidiary of FINRA (at that time known as NASD), boasts a history that is significantly shorter than it is the case for NYSE. This difference in history could deliver an explanation for the trust and the reputation that has been build up throughout the years. The effect, that could be classified as a superior reputational impact on NYSE Euronext markets (cf. Illustration 4), could lead to the difference in underpricing amongst the two exchange operators. This would imply a main impact on reputation due to historical classification within capital markets and support The Market Reputation Thesis which assumes a relationship between the reputation of stock markets and the underpricing.

Additionally to the analysis conducted above, the following chapter is supposed to reassess different scientific explanations for the existence of IPO underpricing. The empirical analysis will follow the approach performed by Hunger (cf. 2004, 137-139).

## 5.5 REGRESSION ANALYSIS

The regression models, outlined in the following, are supposed to test different, scientifically discussed influencing variables for the IPO underpricing. The analysis is conducted as a linear multiple regression based on the method of ordinary least squares. There are two samples that will be examined and discussed:

First the influence of different potential exogenous variables will be tested based on a sample of 190 observations, in the following named as Panel A. This sample represents the original data base of 202 IPOs, reduced by particular outliers. (cf. chapter 5.3)

Since balance sheet and income data was only available for a specific amount of IPOs, a second sample will be tested. This sample, called Panel B, reduces the outlier-adjusted Panel A, counting for 190 IPOs, by observations for those balance sheet and income data was not available and counts for 151 observations. Thereby, it is possible to test the underpricing with balance sheet and income data based exogenous variables.

### 5.4.1 THE REGRESSION MODELS

The first model is supposed to widen the statistical tests that Hunger conducted. The author´s model included the following exogenous variables: market trend, new economy, underwriter, the gross issue volume per € of paid-in capital, and the free float (cf. 2004, 109-111). The gross issue volume/paid-in capital ratio, the author used, is not included since too many companies have been incepted right away and only exhibit a low amount of paid-in capital what leads to high variations within the computed ratios. These four variables that are left, described in the following, will be used for the analysis of both Panel A and B.

Formally, the applied cross-sectional regression model could be described as follows:

$$UP_i = \beta_0 + (market\ trend)\ \beta_1 + (industry)\ \beta_2 + (underwriter)\ \beta_3 + (freefloat)\ \beta4 + \varepsilon_i$$

The following table defines the used variables and points out the expectation that refers to the particular variable:

*Table 29: Explanations on Exogenous Variables for the Regression Model (Panel A)*

| Variable | Explanation | Value | Expectation (1) |
|---|---|---|---|
| Market Trend | Bull- or Bear Market | 1 = increasing benchmark index<br>0 = others | (+) |
| Industry (New Economy) | Issuers that refer to the industries: financial services, media, biopharma, software, technology or telecommunications | 1 = yes<br>0 = others | (+) |
| Underwriter (Reputation) | Underwriters with the highest product of the term: issue volume x no. of issues | 1=Morgan Stanley, Goldman, Merrill Lynch, J.P. Morgan, Credit Suisse, Citigroup, Lehman, Bank of Am., Piper Jaffray, Deutsche Bank, UBS<br>0 = others | (-) |
| Freefloat | Post-Issue publicly floating securities | | (-) |

(1) Expected algebraic sign of the particular exogenous variable´s coefficient

Afterwards, relying on Hunger´s illustrations, those variables will be explained (cf. 2004, 109-112).

Since Ritter states that hot and cold issue periods are relevant for the underpricing, the variable "market trend" is supposed to test this assumption. Whereas in hot issue periods a higher underpricing is expectable, for the regression coefficient a positive algebraic sign is also expectable.

To test the potential influence of the industry, for issuers, coming from "New Economy" industries, a dummy variable is formed. Based on the potentially higher entrepreneurial risk that companies in "New Economy" industries are exposed to, the coefficient is expected to be positive.

The variable "underwriter" contains an approach to test the influence of the reputation, the underwriter reflects. Assuming that the reputation of an investment bank is the higher, the more often it performed the lead underwriter role and the higher the amount of issued volume was, the computational product of the number of accompanied issues and the total issue volume within the

observed IPOs reflects the measure for this thesis. If the "market leaders" indeed have a higher reputation a negative algebraic sign is to be expected.

The free float is supposed to test the Signaling, specified by Grinblatt/Hwang. The authors state that a high portion of existing shareholders reflect a "good signal" in terms of the Signaling considerations (cf. Hunger 2004, 48). Thus, it could be examined if there is a general connection between the free float and the underpricing.

The second regression model will also include the variables, outlined above. The analysis of Panel B will be extended by balance sheet- and income-related variables.

The variables that are going to be added to the regression model outlined above, are designed to deliver a proxy for the particular company size and its profitability. While potential investors usually try to figure out the development potential of an issuing company, they try to evaluate the company and its possible growth potential. Since the research, underlying this thesis, made it possible to ascertain balance sheet and income data of the three pre-issue years, the variables that are going to be integrated mainly exist of growth rates.

First, the compounded annual growth rates of the total assets and the total revenues will be taken into account. Since the growth of revenues and assets could reflect a healthy growth in general, it could be possible that potential investors tend to accept lower levels of underpricing.

Secondly, the profitability should be taken into account. If an issuer´s profitability increases steadily, this could also be a sign for a good and healthy development. Therefore, on a percentage basis, the difference of the gross operating income and the income between the third last and the last year before the IPO is used as a exogenous variable.

For an overview of the added variables for Panel B consider the following table:

*Table 30: Explanations on Added Exogenous Variables for the Regression Model (Panel B)*

| Variable | Explanation | Value | Expectation (1) |
|---|---|---|---|
| CAGR Assets | Compounded Annual Growth Rate of Total Assets (Last 3 Pre-IPO Years) | Percentage | (-) |
| CAGR Revenues | Compounded Annual Growth Rate of Total Revenues (Last 3 Pre-IPO Years) | Percentage | (-) |
| Growth Income | Percental Growth of Operating Income (Percental Change between IPO - 3 years and - 1 year) | Percentage | (-) |
| Growth GOM | Percental Growth Gross Operating Margin (Percental Change between IPO - 3 years and - 1 year) | Percentage | (-) |

(1) Expected algebraic sign of the particular exogenous variable´s coefficient

If the underpricing is understood as a risk premium that investors demand, the algebraic sign of each variable is expected to be negative, i.e. it will lower with each increase of the particular exogenous variable. Since those variables point out a positive development of the company, it could be expected that, by tendency, potential investors abandon parts of the underpricing.

## 5.4.2 RESULTS AND DISCUSSION

In the following the results of both the Panel A and B analysis will be presented and discussed. The regression results of Panel A deliver the following picture:

*Table 31: Regression Results Panel A*

| Panel A (190 IPOs) | |
|---|---|
| Endogenous Variable | Underpricing (in %) |
| Observations | 190 |
| R-Squared | 0.1083 |
| Adjusted R-Squared | 0.0890 |
| F-Test (p-value) | 5.6170 (0,0003) |
| White-Test (p-value) | 2.2741 (0,0128) |
| Durbin-Watson-Test | 2.0089 |

| Exogenous Variable | Coefficient | Standard Error | T-Statistic | (p-value) |
|---|---|---|---|---|
| Trend | 2.9470 | 1.5658 | 1.8822 | 0.0614 |
| Industry ("New Eco.") | -0.3097 | 1.5301 | -0.2024 | 0.8398 |
| Underwriter | 0.3619 | 1.6830 | 0.2150 | 0.8300 |
| Free Float | -0.1465 | 0.0359 | -4.0689 | 0.0001 |

With a R-squared at a 0.1083 level the model explains almost 11% of the evolvement of the underpricing. Two of four expectations referring to the coefficient´s algebraic sign have been fulfilled. By tendency, the underpricing rises when there is a bull market and it also rises when there is less free float. For the other two variables, the "New Economy" proxy and the underwriter, the expectations have not been fulfilled. The contrary trend for the New Economy Variable could be explained by the fact that today, presumably, there is less entrepreneurial risk for those companies as it was when Hunger conducted his examinations. However, both variables are not significant.

Since all of the exogenous variables exhibit a comparably low standard error, and thus there is a low square root of the variance, the particular estimations are quite exact, especially for the variable "free float". Dominantly, this variable seems to affect the underpricing what could support the thesis provided by Grinblatt/Hwang. With a coefficient of -0.1465 and a p-value of almost zero it is highly significant. The trend also plays a key role within this model. With a coefficient of 2.9470 and a p-value of sharply more than 0.05 it is also almost significant.

At a significance level of less than 0.01 the F-Test shows that the coefficients are not the same and thus exert different influences on the endogenous variable.

Since the White-Test implies homoskedasticity at a significance level of $\alpha = 0,01$ (cf. Hunger 2004, 137), the test implies the homogeneity of the variances of the residuals.

The next table shows the results of the second panel. As explained in chapter 5.4.1, for this model, the pool of exogenous variables has been extended by variables that are based on historical income and balance sheet data.

*Table 32: Regression Results Panel B*

| Panel B (151 IPOs) | | | | |
|---|---|---|---|---|
| Endogenous Variable | Underpricing (in %) | | | |
| Observations | 151 | | | |
| R-Squared | 0.1936 | | | |
| Adjusted R-Squared | 0.1482 | | | |
| F-Test (p-value) | 4.2625 (0,0001) | | | |
| White-Test (p-value) | 1.8897 (0,0048) | | | |
| Durbin-Watson-Test | 1.9628 | | | |

| Exogenous Variable | Coefficient | Standard Error | T-Statistic | (p-value) |
|---|---|---|---|---|
| Trend | 3.8978 | 1.7983 | 2.1674 | 0.0319 |
| Industry ("New Eco.") | -0.2283 | 1.7732 | -0.1287 | 0.8977 |
| Underwriter | -1.5282 | 2.0121 | -0.7595 | 0.4488 |
| Free Float | -0.1305 | 0.0468 | -2.7895 | 0.0060 |
| CAGR Assets | -0.0131 | 0.0080 | -1.6363 | 0.1040 |
| CAGR Revenues | 0.0324 | 0.0087 | 3.7279 | 0.0003 |
| Growth Income | 0.0006 | 0.0012 | 0.4853 | 0.6282 |
| Growth GOM | -0.0013 | 0.0057 | -0.2366 | 0.8133 |

Considering the goodness of this model, the R-squared rose up to a level of 0.1936, explaining almost 20% of the underpricing. This might be explainable with the increase in exogenous variables. Remarkably, the adjusted R-squared, which is immunized against a rise due to the extension of exogenous variables (cf. Eckey/ Kosfeld/Dreger 2004, 53-55) increased to a level of 0.1482. Since the F-Test is highly significant, here, it can also be stated that the coefficients exert different influence on the UP while the White-Test implies homoskedasticity. Thus, the variances of the residuals are not different.

Considering the expected algebraic signs of the added variables, it could be said that in two of four cases there is a compliant outcome. Notably, the added variable "CAGR Revenues", which obviously influences the underpricing positively, delivers a highly significant contribution to the endogenous variable. With a very low standard error of 0.0087 and a p-value of less than 0.01, the positive influence on the underpricing of 0.0324 is highly significant. None of the other added variables is significant since their p-value is higher than 0,05. Supporting the explications in chapter 5.3 a link between the company size, reflected by the CAGR of the total assets within the last three years before the IPO, cannot be proved. However, considering The Market Reputation Thesis, this result has no restrictive effect. Since the model of the reputation building process (Illustration 4) uses only one scientific interpretation of the emergence of corporate reputation (a subordinated influence factor for the reputation of stock markets), it is possible that other factors than the company size influence corporate reputation. Beyond that the model shows that there are plenty of other factors, influencing the reputation of a

stock market segment. Even if the company size has an impact on corporate reputation, it could be outweighed by other influencing factors that dominate the reputation building.

Coming back to the regression results another question prompts: What could the highly significant variable "CAGR Revenues" imply? This variable necessarily not needs to reflect the company size. The genesis of revenues is also a question of productivity. Companies with little assets, i.e. resources, could generate the same turnover than companies with more assets do. The coefficient of this variable points at a positive and small impact on the underpricing. It can be said that it rises by 0.0324 due to a one-unit change in this variable. Albeit, the impact seems to be quite small, it is highly significant. Testing the CAGR of the total revenues on its own leads to a R-squared of 0.0997, a coefficient of 0.0311, a standard error of 0.0077, and a p-value of 0.0001, which is a remarkable result considering the fact that this is a basic regression model with only one variable. For a visualization of the bivariate regression model consider the following illustration:

*Illustration 9: Regression Model Underpricing/CAGR Revenues*
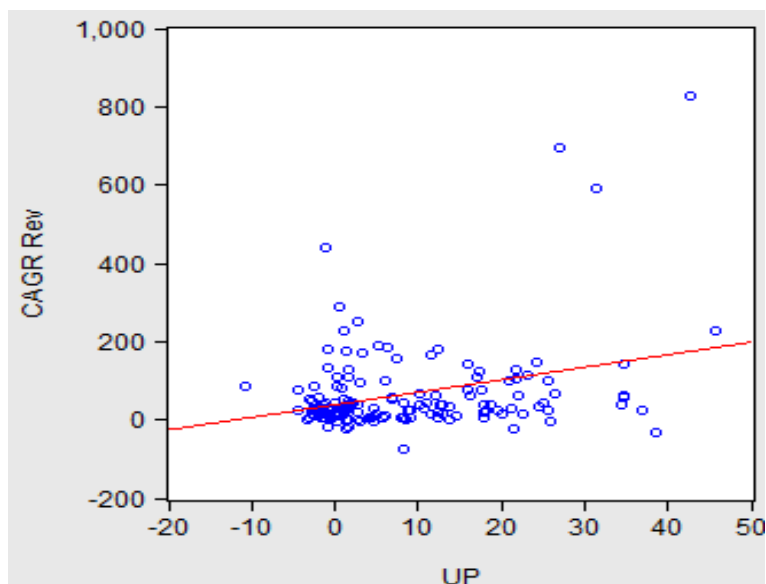


Obviously, the CAGR of the total revenues of the last 3 years before the offering delivers a significant partial explanation for the evolvement of the IPO under-pricing. But why is this impact positive? Why does the underpricing increase if revenues grew constantly within the last three years before the IPO? Perhaps a too strong growth irritates investors. Adapting this result to The Market Reputation

Thesis, another question prompts: Does the pre-IPO-growth of revenues influence the reputation of a company and consequently of a market segment?

However, the other added variables (CAGR Assets, Growth Income, Growth, GOM) not seem to have a significant impact on the underpricing. This could be seen as a densification of those indications that support the assumption of a cohesion between the UP and the reputation of particular stock market segments. It seems to be that these factors are not relevant for the "fine" companies have to pay when they are not able to meet specific criteria before offering common stocks publicly for the first time.

## 5.6 SUMMARY OF THE EMPIRICAL ANALYSIS

The analysis above has shown that in none of the examined subgroups the underpricing is distributed normally and that the entire population, underlying this thesis, is big enough to enable empirical evidence. Considering the comparison of the underpricing at U.S. segments of NYSE Euronext and those of Nasdaq OMX, it can be stated that it is lower at segments of NYSE Euronext. Connecting this finding with The Market Reputation Thesis, NYSE Euronext´s segments seem to enjoy higher reputation than those of Nasdaq OMX. Possibly, this is attributable to the longer history of the exchange company and the experiences it gained over time. These results support The Market Reputation Thesis.

The comparison of the assumption-based expectation, worked out by comparing and categorizing the six market segments referring to attracted and effective company size groups, was not fulfilled. The underpricing behaved differently. If The Market Reputation Thesis reflects reality, this result (i) clarifies the difficulty to measure the reputation of market segments and derive corresponding expectations on the underpricing of IPOs and (ii) is not a restriction to The Market Reputation Thesis since there are plenty of other factors that influence the reputation of a stock market segment.

The regression results of Panel A point out that the free float significantly influences the underpricing in that way, that it lowers when the ratio of publicly traded share and outstanding shares rises. After adding variables that are based on income and balance sheet data, the Panel B analysis showed higher goodness.

Considering this regression model, one variable seems to deliver a highly significant explanation - the CAGR of total revenues.

# 6 CONCLUSION

The Market Reputation Thesis relates the underpricing to the reputation of the particular market segment, the security will be listed in. Accordingly, the reputation of the market segment is correlated that way that underpricing is the higher, the lower the reputation of the market segment is (cf. Hunger 2010).

The examination regarding the term "reputation" made clear that reputation is highly subjective and hardly to quantify, i.e. to measure. Even there is no common definition of the term. Business Science is only examining the term in respect of corporations. Hunger assumes a link between the reputation of a stock market segment and its listing requirements.

This thesis has shown that listing requirements in the United States are hardly comparable since there is a variety of alternative standards for each stock markets segment. The only meaningful way to compare them, especially regarding their possible impact on reputation, was to deliver an approach that highlighted the criterion "company size" which, at first sight, seemed to be relevant for the reputation building. The result was an assumption-based expectation on how the underpricing is expected to behave. Foreseeably, the mean in each segment behaved in another way. This could be explained by the variety of determinants, most of them non-quantifiable and highly subjective, that seem to have an impact on the reputation of a stock market segment and, consequently, on the underpricing.

The empirical analysis in chapter 5 tests The Market Reputation Thesis on a twofold basis: (i) the company size as a potential influence factor on the reputation of a stock market segment and (ii) the difference in UP between NYSE Euronext and Nasdaq OMX issues, presumably explainable by the conspicuous difference in the operator´s history. The results of the first examination do not necessarily lead to the rejection of The Market Reputation Thesis while the results of the second examination even support the thesis. Beyond that, the empirical analysis underlines the differing emergence of UP amongst various stock market segments.

Furthermore, another finding, in literature almost not discussed, needs to be mentioned. The CAGR of total revenues seems to have a small but highly significant impact on the underpricing.

Summarizing, the "Underpricing Puzzle" is highly complex and still needs to be examined. The Market Reputation Thesis delivers a logical and meaningful explanation, but direct evidence could only hardly be proved. However, there are indications that point at the validity of this thesis and do not lead to a rejection.

One Hundred Thirty Five underpriced IPOs with a combined issue volume of $ 24.131 million, performed in a time frame of six years, led to an amount of "money left on the table" of  $ 3.414 million. These figures underline the economical impact on the wealth of existing and prospective shareholders and also clarify the importance of academic research in this field.

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