

**Studienreihe der Stiftung Kreditwirtschaft
an der Universität Hohenheim**

Susanna Holzschneider

Valuation and Underpricing of Initial Public Offerings

Evidence from Germany in Different Market Cycles



Verlag Wissenschaft & Praxis



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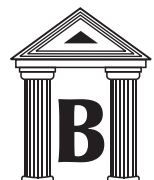
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Vorwort

Die Dissertation „Valuation and Underpricing of Initial Public Offerings – Evidence from Germany in Different Market Cycles“ ist im Rahmen meiner Tätigkeit am Lehrstuhl für Bankwirtschaft und Finanzdienstleistung der Universität Hohenheim und in den zwei Semestern als Visiting PhD an der Stern School of Business der New York University entstanden. Die Dissertation wurde von der Fakultät für Wirtschafts- und Sozialwissenschaften der Universität Hohenheim im November 2010 angenommen.

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München, 22. Dezember 2010

Susanna Holzschneider

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Abbreviations

BVK:	Bundesverband Deutscher Kapitalbeteiligungsgesellschaften - German Private Equity and Venture Capital Association e.V.
CAPEX:	capital expenditure
CDAX:	Composite DAX (Deutscher Aktienindex)
CEO:	chief executives officer
CRSP:	Center for Research in Security Prices
DCF:	discounted cash flow
DDM:	dividend discount model
EBITDA:	earnings before interest, taxes, depreciation and amortization
e.g.:	for example, abbreviation of Latin “ <i>exempli gratia</i> ”
EPS:	earnings per share
et. seq.:	and the following, abbreviation for Latin “ <i>et sequens</i> ”
et. seqq.:	and those that follow, abbreviation for Latin “ <i>et sequentia</i> ”
etc.:	and so forth, abbreviation for Latin “ <i>et cetera</i> ”
EVCA:	European Venture Capital and Private Equity Association
FAZ:	Frankfurter Allgemeine Zeitung
ICB:	Industry Classification Benchmark
IPO:	initial public offering
M&A:	merger and acquisition
MB:	market-to-book
Mio:	million
MLP:	master limited partnership
NASDAQ:	National Association of Securities Dealers Automated Quotations
NEMAX:	performance index of “Neuer Markt”
NVCA:	National Venture Capital Association
OLS:	ordinary least square
PE:	price-earnings

pp.:	Pages
R&D:	research and development
ROE:	return on equity
SEO:	seasoned equity offering
S&P:	Standard and Poor
USA:	United States of America
VC:	venture capital
VCs:	venture capitalists

Introduction

The valuation of firms going public is a very complex topic and one often discussed in corporate finance literature. When firms decide to complete an initial public offering (IPO), to raise new equity by issuing shares on a public stock market, their shares have to be priced to allow potential investors to be found. The valuation of a private firm and its shares is quite difficult, because the stock market value, normally the best indicator of expected firm's growth and profitability in the eyes of investors, is not available. In almost every stock market across several countries the phenomenon of "underpricing" can be seen in the process of going public.¹ Share prices in the secondary market on or after the first day of trading are higher than the initial offering price. These shares are allocated to investors at considerably lower prices than could normally be attained.

This dissertation investigates the puzzle of IPO valuation and underpricing, focusing on the German stock exchange and newly-listed firms, in three chapters. Some explanations of initial returns after the first trading day of stocks have been theoretically explored and related empirical investigations have confirmed some theories and contradicted others. Previous research papers have mainly considered the USA stock market and have investigated several explanations based on the given market environment. The German stock exchange, however, can be described as less developed and less liquid than the USA's. The number of completed IPOs is considerably lower, because German firms rely less on the market for public equity and bank financing is generally very important. There has been a distinct historical development of the institutional environment in both countries. Although interesting differences in stock market and financing systems exist, recent literature about IPO underpricing does not include any direct comparison between offering prices in the USA and in Germany. The impact of institutional factors and the role of investment banks on the phenomenon of IPO underpricing are especially interesting to consider. Therefore, chapter I (Theory and Evidence of IPO Underpricing) of this dissertation focuses on the existing literature, to highlight differences or similarities in IPO underpricing. Overall, the existing theories and empirical findings do not allow consideration of one of these explanations in isolation, and therefore the effects of institutional environments are difficult to determine. Over time, some changes in the explanatory factors have been recognised. However, the empirical results for the German IPO market mainly consider the period of the Neuer Markt, which was the most important stock segment for small-

¹ Underpricing is measured as the difference between the shares' closing price after the first trading day and IPO offer price divided by the offer price.

and medium-sized companies during the dot-com phase of 1997 and 2001. These years were characterised by enormous stock price increases, especially in the technology and internet sectors. IPO volume increased exceptionally during these years and provided a large sample for empirical investigation into this research topic. Some literature suggests that those very high offer prices were even higher than the “true value” of the firms concerned, although prices of newly issued shares increased rapidly after the first day of trading. Germany saw average initial returns of 31% from 1997 to 2001. The market phases of high IPO volume as well as high underpricing, or rather initial returns, are described as “hot” market periods. A “cold” period with oppositional characteristics often follows, with saturated demand for new stocks. Also, in Germany, hardly any firm decided to complete an initial public offering after the bursting of the technology bubble. After 2004, the market started to recover and IPO volume increased again, although the enormous average levels of initial returns seen previously have not since been reached.

These market cycles make drawing a conclusion about the determinants of IPO underpricing even more difficult. The extreme differences in the market characteristics of the German stock exchanges have to be taken into account in investigating the decision to go public and the market value of a firm. Therefore, the empirical studies in this dissertation focus on both market phases, with a sample of IPOs from 1997-2007. This is the longest time period investigated with German data and offers the largest sample of IPOs, compared to previously finished papers related to the Neuer Markt and this research topic. Furthermore, chapter II (How Do Pre-IPO Shareholders Determine Underpricing?) investigates the pre-IPO ownership structure of firms in more detail. This requires the collection, by hand, of information from IPO prospectuses, something which has not previously been completed for an 11-year time period. The firm’s shareholder structure prior to the initial public offering is interesting to analyse, as several theories consider information asymmetries, monitoring requirements and agency conflicts between owners, as well as investment banks and potential investors, to influence the optimal offer price and the amount of “money left on the table” due to underpriced shares. German firms in particular are often held by only few shareholder groups prior to the IPO, compared to the USA, which enables reassessment of previous research results into different firm’s conditions. Furthermore, the analysis includes the implications of ownership structures in different market cycles and their effects on IPO underpricing, which further contributes to the existing research literature. The results confirm that, in the German market, the determinants of initial returns have changed over the time period investigated. Indications of different pre-IPO shareholders’ bargaining interests in terms of offering prices and underpricing are also confirmed, for the divergent market environments.

Although the empirical findings suggest a degree of willingness to leave money on the table, the offering prices of newly issued shares should reflect the firm's value. Investment banks, acting as underwriters in the IPO process, have to value the firm according to their characteristics, accounting information and expected profitability, and so determine approximate share prices. Chapter III, entitled "Do "Herding" Effects on Firm Multiples Determine IPO Valuation?" discusses this issue in more detail. The system of using comparable multiples (e.g. price-earnings ratios or market-to-book ratios) of firms already publicly traded in order to determine the expected market value of the IPO is investigated in particular detail. The German stock market during the period of the Neuer Markt showed severe variability of valuation, especially in particular industry segments. Here, the question of whether changes in IPO valuation can be explained by the corresponding development of public industry-related firms is analyzed. Herding effects on specific information and the neglect of firm characteristics are considered as possible explanations. However, the results indicate that the valuation of industry-related firms or their multiple ratios are minor explanatory factors. Overall stock market performance seems to be a more reasonable value driver for IPOs, especially in hot markets. Overall, the findings of this dissertation make major contributions to the research of IPO underpricing and valuation. Its focus on the German market and the environment of different market cycles in particular give further insights into this topic.