LONG-RUN PERFORMANCE OF INITIAL PUBLIC OFFERINGS IN THE GERMAN STOCK MARKET: THE FAMILY BUSINESS EXPERIENCE 1977 TO 1998

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Abstract

This paper investigates the long-run performance of initial public offerings of 174 family firms floated in Germany between 1977 and 1998. Family businesses typically come closest to the ideal of non-separation of ownership from control. The fundamental change in ownership structure induced by the flotation represents a change in the governance of the firm as for the first time dispersed outsiders buy equity capital. An examination of the stock price performance allows drawing conclusions to explain the impact of governance changes on firm value. A prediction of stock price performance spans two theories: Advantages of modern corporations where management and ownership are separated are cut short by the so-called principal-agent problem. Managers – the agents – could take actions against the interest of shareholders – the principals. Agency problems in closely-held family firms should be less predominant. On the other hand, the rent-protection theory predicts that family owners have incentives to skim private benefits at the expense of firm performance. Depending on the extent of these two effects, family-owned firms should out-, respectively underperform the market. The empirical evidence seems to support the private benefit hypothesis: 3 years after the listing the market-adjusted return was on average −25.31% compared to a broad index. The underperformance increased to −53.50% after 60 months. Even when excluding potential new economy and *Neuer Markt* biases, the underperformance is a statistically significant −10.50% and −50.13%, respectively.

Keywords: ownership structure, family firms, agency problems, private benefits, long-run performance, buy-and-hold abnormal returns

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1 Introduction

This paper analyzes the stock price performance of initial public offerings (IPOs) of family-owned firms in Germany floated between 1977 and 1998. The decision to go public and the timing are an important event in the life cycle of any company. During recent decades an increasing number of companies chose this instrument to raise new equity capital. As 395 German companies went public during the period of 1977 to 1998, the majority of these IPOs took place during the last 8 years, i.e. 1991 to 1998. The majority of IPO firms that went public during the period analyzed in this paper can be characterized as family-owned. In addition, e.g. Schuermann and Koerfgen (1997) expect a number of some 5,000 German family-owned companies suitable for a stock market listing. Despite the recent decline at international stock markets an increasing number of IPOs of family-owned firms can be anticipated in the future.

Numerous papers examine the performance of IPOs. Academic research is mostly driven by the persistent existence of two ostensible anomalies: underpricing and underperformance.

As there is strong empirical evidence that, on average, IPOs are underpriced in almost any capital market, the evidence for an abnormal long-run performance is less definite. In the past a majority of studies documented a long-run underperformance compared to some type of benchmark. Questions concerning the adequacy of methodical issues have been raised more recently.

The motivation to analyze the performance of family-owned firms is twofold: (i) Family-owned firms are a peripheral issue in the academic literature, especially in the field of financial economics. This is contrary to their economic and social importance, especially in the German economy.[6] A very few

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[6] Family firms make up 40% of the Fortune 500 companies in the United States, generate some 66% of the German gross domestic product and employ about 50% of the labor force in the United Kingdom; see Chami (2001), p. 1. For a similar argumentation see e.g. Davis (1983), p. 47, James (1999a), p. 42, McConaughy, Walker, Henderson and Mishra (1998), p. 2, or Schulze, Lubatkin, Dino and Buchholtz (2001), p. 99. In a comparison of 27 countries La Porta, Lopez-de-Silanes and Shleifer (1999), p. 496, find that by far the dominant form of controlling ownership is by families. Faccio and Lang's (2002) data sample contains 5,232 (704) firms in 13 Western

studies, e.g. Aussenegg (1997), examining the performance of IPOs identify and separate family-owned firms in a subsection. This paper focuses explicitly on family-owned firms. (ii) Family-owned firms are a very interesting object to examine due to their specific governance structures *per se*: Privately-held family businesses and public corporations represent two opposite extremes of the relation between ownership and control as family-owned firms come closest to the ideal of non-separation of ownership and control. The IPO of a family-owned firm can be interpreted as a first and crucial step in its evolution into a public corporation where ownership and control are separated. Thus, the fundamental change in ownership structure induced by the IPO represents a change in the governance of the family firm, as for the first time dispersed outsiders invest in the company's equity capital. The analysis of family firm post-IPO performance allows drawing conclusions, which influence changes in the governance structure of family-owned firms have on firm value.

The German economy can be characterized by a predominant family ownership as a form of business organization. Ownership is often concentrated in a small and closely related group of individuals. Starting with Berle and Means (1932) a new form of business organization emerged in the academic literature also referred to as the contractual view of the firm: Ownership and active management are separated. These corporations are owned by dispersed outside shareholders. These firms face several advantages, e.g. on capital and labour markets. It seems conceivable to hypothesize that modern corporations should perform better than traditional closely held companies. But this hypothesis is moderated by a phenomenon called the principal-agent conflict: Professional managers – the agents – could take actions against the best interest of the shareholders – the principals. The conclusion is that agents have to be monitored, which is cost intensive. On the other hand, family firms face a different problem: Family owners have incentives to skim private benefits at the expense of firm performance. Minority shareholders are likely to be expropriated. Deviations from the market-based investment decision rule do not only weaken, but may use up the benefits illustrated in view of the agency theory. As a consequence, investors should undervalue family firms. The analysis of the above mentioned two stylized facts – underpricing and underperformance – is an important part in the research area of event studies. In general, event studies test how stock prices respond to information in order to derive testimony with regard to the efficient market hypothesis. Fama (1970) defines an efficient financial market as one in which security prices always fully reflect all available information. In regard of IPOs Dawson (1987) states:

European countries (Germany). 44.29% (64.62%) are family-controlled.

If there are enough astute traders in the market, then it will quickly price new shares to reflect the available set of information. Significant long-run abnormal returns could be interpreted as inconsistent with market efficiency. If the efficient market hypothesis proves true, neutral performance relative to an appropriate benchmark should be observed. A serious objection can be formulated: Tests in regard of market efficiency require a normative model as a benchmark. If a positive, i.e. empirically based, 'model is used, one is not testing market efficiency' but compares one empirical pattern to another empirical pattern, as formulated by Loughran and Ritter (2002). Due to the specific character of IPOs – as there is no trading history, data cannot properly be adjusted for risk – empirical results have to be interpreted with caution.

The remainder of this paper is organized as follows: Chapter 2 describes the market for IPOs in Germany. The key findings of how ownership structure affects firm value and specifics of family-owned firms are discussed in Chapter 3. Chapter 4 describes the sample data and discusses the methodology. Chapter 5 comprehensively surveys the empirical literature on the long-run performance of IPO firms and presents and discusses the empirical findings. Several theoretical explanations are introduced and tested regression analyses. Chapter 6 concludes.

2   The Market for Initial Public Offerings
2.1   Reasons for Going Public

As motives for family businesses to go public may differ from other groups of IPO firms, e.g. spin offs or privatizations, this section focuses on the first group. According to Rydqvist and Hoegholm (1995), motives can be classified as financial or productivity related. Both groups can be further divided into firm and owner-based motives, respectively incentive and publicity-based motives. Table 1 describes the classification.

Financial aspects seem to be important in almost every IPO: Companies go public to raise new equity capital to finance their growth and to invest in new projects. In an empirical study of 127 family firm IPOs in Sweden, Rydqvist and Hoegholm (1995) find out that financial reasons are stated by 97% of the firms. Financial reasons seem to be crucial in Germany, too, as predominantly companies associated with the German *Mittelstand* show decreasing equity ratios during the last decades.[7]

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[7] See e.g. Claussen (1991), p. 183-184, or Zacharias (2000), p. 50-52, describing the equity gap. The results of an examination of all IPOs in 1985 in Germany show that the equity ratio increased from 27% before the IPO to 40% after the IPO; see Ladwig and Motte (1996), p. 801. Especially in the case of family-owned firms it could be assumed that the most important benefit from going public is to overcome borrowing constraints instead of financing growth.

Table 1. Classification of motives for going public

Financial Motives	*Productivity Motives*
Firm Financing	**Incentives**
- Raising of new equity capital, financing growth and new investment projects - Enable trading in shares in liquid and transparent secondary markets - Facilitate future reissuance of equity and debt titles - Lower the cost of equity finance and increase its availability - Lower the cost of debt finance and decrease dependence from debt finance - Improve credit rating, reduce debt/equity ratio - Facilitate external growth through acquisitions, own shares as 'transaction currency'	- Share options-based salary programs - Stakeholder stock ownership - Performance evaluation, management is subjected to external control, outside monitoring
Portfolio Rebalancing	**Publicity**
- Ability for the founder and other initial investors, e.g. private equity investors, to realize parts of their investment to finance consumption or to diversify private portfolios - Facilitate succession of control	- Products are better known, increased visibility - Raising the firm's attractiveness as an employer - Increase employee status - Increase bargaining power versus suppliers - Expanded and reinforced social network

Sources: based on Rydqvist and Hoegholm (1995), p. 292, Ehrhardt (1997), p. 7-8, Pagano, Panetta and Zingales (1998), Schuermann and Koerfgen (1997), p. 83-124, and Zacharias (2000), p. 49-57.

Other financial motives, in general, include the availability of financing takeovers with shares and the overall improvement of financing conditions. Pagano *et al.* (1998) argue that, due to the improved publicity, financing conditions in general improve. Companies face a reduction in the cost of bank credits after the IPO. Firms borrow from a larger number of banks and increase their independence. The second group, portfolio rebalancing motives, refers to the financial situation of the initial investors. Depending on the ratio of selling old shares and new shares from a capital increase, the IPO provides liquidity for the firm's incumbent owners. With regard to family-owned firms the motive 'succession of control' is prominent. A large number of family companies face a problem of succession, i.e. the transition from the post-war generation that founded or professionalized the firms to the generation of heirs, the so-called *Erbengeneration.*[8] Via an IPO a company can be sold to outside investors. A second possibility is the valuation aspect of a stock market quotation. Although German jurisdiction denies this motive, a stock quotation can help to sell shares held within the complex structures of large families on the basis of a more or less 'objective' market price.

In Rydqvist and Hoegholm's study productivity motives are stated with a frequency of about 73%. Some companies link their bonus salaries to stock price performance or introduce stock option programs after the IPO. More important seems to be the aspect

of an increasing publicity on the markets for output and input factors, e.g. the market for human resources. Managers assume that the company's attractiveness increases. Employing several case studies and an empirical study, Ravasi and Marchisio (2001) find out that IPOs of family-owned firms have a much greater impact on the firm's strategic decisions than just the financial benefits: IPO firms also increase their social and reputational capital.

Contrary to the above mentioned benefits of a stock market quotation, several disadvantages are associated with the IPO of a family-owned firm mostly due to the dilution of the shareholder structure: Family owners fear to lose their dominant positions within the firm. Many mature family-owned companies do not want to go public. Many families are not pleased with the idea that the firm's objective is reduced to maximizing the annual profit. Some family firms do not agree with the short-sighted perspective of capital markets and its effects on the company's strategic decisions and its development. Klein (2000) states that these family firms do not view the IPO as a form of financing but as the notional end as a family business. There seems to be a ubiquitous opinion that family owners view external financing as a sign of weakness.[9] Other, more common disadvantages include increasing management efforts, higher tax burdens, more restrictive publicity requirements and possibly

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[8] Klein (2000), p. 92-99, comprehensively describes the process of succession in family businesses.

[9] See e.g. Gerke *et al.* (1995), p. 25, Klein (2000), p. 187-192, Schuermann and Koerfgen (1997), p. 19, and Zacharias (2000), p. 56.

consequences from the co-determination by employees.[10]

2.2 Theoretical Aspects of Going Public

From the family's perspective the IPO is an even more attractive way of raising new capital in case of an ownership structure that allows them to secure their controlling position within the company. Empirical studies examining IPOs in Germany confirm that family owners wish to keep their dominant position after the IPO, unless the primary motive for going public was to sell all their shares and retreat from the company. Ehrhardt and Nowak (2002a) find out that in their sample of 105 IPOs of family-owned firms even 5 years after the IPO more than 50% of the voting rights are owned by family investors. Several theoretical models analyze changes in the ownership structure after going public:

Pagano (1993) examines how the decisions of entrepreneurs affect the economy. In his trade-off model the entrepreneur only goes public if the benefits of going public, e.g. the initial owner can diversify his own portfolio, outweigh the costs of going public, i.e. if the company faces a situation of financial distress. As a result some economies with smaller stock markets compared to the United States, e.g. Germany or Italy, have an inefficiently small number of companies listed on the stock exchanges in comparison to the stage of their economic development. Consequently, these markets can get trapped in such a low-level 'bad equilibrium'. Entrepreneurs do not go public in such an economy due to the failure to internalize the positive externality arising from the increase in the diversification opportunities that are available to outside investors due to the entrepreneurs' decisions to go public.[11]

In Zingales (1995) the decision (i) whether to go public and (ii) about what equity fraction initial investors will retain is the result of a value maximizing decision made by the initial owner who wants to eventually sell his company. The model assumes perfect information, but requires that the seller has better bargaining power against passive investors than against an investor who seeks control. By going public, the initial owner can change the proportion of cash flow rights and control rights which he will retain when he bargains with a potential buyer. To the extent that the market for corporate control is not perfectly competitive, but the market for shares is, the proportion of cash flow and control rights will affect the total amount of surplus he can extract from a potential buyer of the company. In

order to maximize his total proceeds and to optimize the ownership structure, the initial owner must balance out two factors:

- By selling to dispersed shareholders, he maximizes his proceeds from the sale of cash flow rights.
- By directly bargaining with a potential buyer, he maximizes his proceeds from the sale of control rights.

A similar decision is modeled by Chemmanur and Fulghieri (1999). The authors analyze at what stage in its life cycle a firm should go public. The entrepreneur raising equity capital has to choose between placing shares privately with a small number of (institutional) investors or by selling shares to a dispersed public via an IPO. Chemmanur and Fulghieri focus on asymmetric information between the entrepreneur and outside investors. Their model predicts that younger firms seek financing by venture capitalists and older firms raise equity capital via an IPO.

Both, the question whether a company undertakes an IPO or stays private and the question of inside ownership fraction held by initial owners, depend on the optimal combination of majority control and dispersed ownership. Due to their different characteristics – cash flow rights are enjoyed by all shareholders, control rights are enjoyed only by the controlling shareholder – the initial owner should sell his company by two separate mechanisms: Cash flow rights should be auctioned to dispersed shareholders. Control rights should be sold in a direct negotiation. Legal restrictions can occur if the law restricts the stripping of cash flow rights from voting rights. The initial owner uses the IPO only as one step to achieve the ownership structure that will maximize his total proceeds from the sale. Mello and Parsons (1998) develop a model for the optimal IPO strategy: They view the IPO as a part of a staged process of financing that begins with an IPO for small, passive and dispersed investors, then the sale of a controlling block and, finally, the contingent sale of additional shares. In addition, they confirm that an immediate exit strategy for initial owners is not optimal. Pagano, Panetta and Zingales (1998) expect a high incidence of control transfers after the listing. Their hypothesis is confirmed by some empirical studies: In Rydqvist and Hoegholm (1995) the average ownership retention of family members is reduced to only 36% within 5 years, while family members still hold 48% of voting rights. In Pagano *et al.* the controlling group still holds 64.4% of voting rights 3 years after the IPO. In addition, Pagano *et al.* compare control turnover after an IPO with the normal turnover of control among privately held firms and find out that the former is twice as large as the latter. Contrary to that, the fraction retained by the controlling shareholder in the United States and in the United

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[10] See Schuermann and Koerfgen (1997), p. 103-124. The authors provide a very detailed overview on the positive and negative effects on (i) the company and (ii) the family when going public.

[11] See Chemmanur and Fulghieri (1999), p. 253, assuming that entrepreneurs fear investors' reactions reducing the price at which shares can be sold.

Kingdom is much smaller.[12] In Germany the average ownership retention of family shareholders stays remarkably high. For a sample of 105 family firm IPOs floated between 1970 and 1991 Ehrhardt and Nowak (2002a) find out that family shareholders hold 98.2% of the voting rights before the IPO, 77.1% immediately after the IPO, 67.9% after 3 years, 57.9% after 5 years and still 40.4% after 10 years. Even more notable, when using dual class share structures family shareholders still hold 51.8% of the voting rights 10 years after the IPO, whereas in non-dual class share structures family shareholders sell a high fraction of voting rights via the IPO and hold only 31.7% after 10 years.

Another hypothesis analyzing the portfolio diversifaction motive is: 'If diversification is an important motive in the decision to go public […] we should expect riskier companies to be more likely to go public, and controlling shareholders to sell a large portion of their shares at the time of the IPO or soon afterwards.'[13] Contrary to the hypothesis, the above described empirical findings provide evidence that the diversification motive is less important in the decision to go public. Family owners sell a substantial stake at the IPO, but retain more than a majority stake. These findings are in line with Mello and Parson's (1998) hypothesis that an IPO 'is not a good method for selling control'. Accordant with Zingales (1995), Mello and Parsons (1998) argue that the IPO is the first stage in the eventual sale of a company. Stoughton and Zechner (1998) also focus on favoring large investors. As they abstract from asymmetric information, their optimal IPO method is the opposite. Their model suggests a block trade to a large investor first and after that selling shares to small investors at the same price. The empirical evidence, especially in Germany, does not seem to support this sequence.

3 Family Firms, Ownership and Performance
3.1 Separation of Ownership and Control

A main subject in the principal-agent literature is the separation of ownership from control rights. Berle and Means (1932) were among the first to document that the interest of directors and managers can diverge from those of the owners of a firm. Whereas the first try to maximize their own utility and pursue their own interest, the latter wish to maximize shareholder wealth. Wealth losses occur as a consequence. Berle and Means state that those who control the firm 'can serve their own pockets better by profiting at the expense of the company than by making profits for it'. Referred to as agency costs, the separation of ownership and control should have a negative impact on firm value. Jensen and Meckling (1976) focus on another aspect: if the size of a firm increases most

likely agency costs will be larger, because it will be more difficult for owners to control the management and therefore monitoring expenditures will be higher. Agency costs can be reduced if the principal provides appropriate incentives for the agent. One possibility to align managers' interests with those of shareholders is to give managers shares in the firm. Thus, the performance of a firm should be positively related to the fraction of managerial ownership: the higher it is, the higher firm value should be. According to Fama (1980) agency conflicts between owners and managers due to the separation of ownership and control can be solved in another way: managers face both the discipline and opportunities provided by the markets for their services. This explanation requires efficient labour markets. Fama argues that the divorce of ownership from control can be viewed as an efficient form of economic organization. On the one hand, agency conflicts due to the separation can have an impact on firm value and on the other hand, agency costs can be reduced and even be interpreted as an efficient form of organization. This argumentation is widely disputed in the literature:

A contrary view has been developed by Demsetz (1983) and Demsetz and Lehn (1985). Demsetz conceives the ownership structure of a firm as an endogenous outcome of a maximizing process, i.e. owners determine the structure in a systematically value-maximizing manner. Nevertheless, agency costs due to the separation of ownership and control can occur: 'In a world in which self-interest plays a significant role in economic behaviour, it is foolish to believe that owners of valuable resources systematically relinquish control to managers who are not guided to serve their interest.' Demsetz' rationale is that product market competition forces firms to adopt cost-minimizing governance structures. Thus, the ownership structure cannot have any impact on the performance of a firm since *ex ante* it is optimally chosen. In an empirical test using accounting data Demsetz and Lehn show that there is no significant correlation and especially no significant positive relationship between level of ownership concentration and profit rate. The implication for IPOs of family firms is that the separation of ownership and control after the IPO should not reduce firm value. Under simplifying assumptions the family shareholders' decision to alter the ownership structure of the firm from concentrated to diffuse should not have a significant impact on the stock price performance. The hypothesis is that the stock price performance of an unseasoned firm should follow the predictions of market efficiency. No abnormal performance should be observed. In case Demsetz and Lehn's assumptions are not accepted, it can be assumed that ownership concentration and performance are correlated.

3.2 Ownership Structure

Based on Jensen and Meckling's (1976) agency model Leland and Pyle (1977) develop a univariate

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[12] See Brennan and Franks (1997) and Mikkelson, Partch and Shah (1997)

[13] See Pagano *et al.* (1998), p. 40.

signalling model in which the value of the firm, immediately subsequent to the issue of new shares, is positively related to the percentage ownership retained by the entrepreneur. In case of an IPO, old investors usually have a substantial informational advantage over new investors. Leland and Pyle's signalling argument implies that pre-offering investors retaining a high share of equity in an IPO firm hold a less diversified private portfolio. Thus, they will only be willing to take this unique risk – a risk that potentially could be eliminated by diversification – if they are convinced about the firm's future growth prospectus. Consequently, the higher the fraction of equity retained, the higher the entrepreneur's expectations and *vice versa*. Investors in an IPO will realize this mechanism and will be willing to pay more for shares in a high quality firm, where the entrepreneur retains a large equity fraction. How and Low (1993) argue that the fractional ownership retained by the issuers is a key determinant of firm value. Thus, there should be a positive linear relation between the entrepreneurial ownership and the market value of the firm. In case of family-owned firms the entrepreneurial control is often exerted by family members, thus this linear relation could be assumed for most of the firms in the sample. The empirical evidence for this linearity hypothesis is dichotomous. Boehmer (1993) shows that, inconsistent with Leland and Pyle's model, firm size is an important determinant of the relation between percentage ownership and firm value.[14] Nevertheless, both the signalling and the agency hypothesis imply a positive correlation between ownership retention and the market value of a firm.

Contrary to Demsetz and Lehn's hypothesis, Stulz (1988), too, argues that ownership structure is a determinant of corporate value, but focuses on another aspect: in his model the market for corporate control is a way to discipline managers. He uses the relation between inside holdings and the probability of a takeover as a function of the premium a bidder has to pay. On the one side, the takeover premium increases the higher inside holdings by the management are. On the other side, the probability of a hostile takeover decreases with the inside fraction. Contrary to Leland and Pyle's linear model, Stulz argues that the value of a firm is positively related to the fraction of voting rights controlled by the management for low fractions and negatively related as the fraction becomes larger. Thus, there is an optimal level of inside holdings which maximizes firm value. The optimal fraction of inside ownership should be 50%. In a long-run event study on the aftermarket performance of German family-firm IPOs, Ehrhardt (1999) confirms Stulz' results showing that post-IPO performance is higher

when a fraction of 25% to 50% is retained by family shareholders. Using Tobin's *q* as a proxy for firm performance[15] Morck, Shleifer and Vishny (1988) as well as McConnell and Servaes (1990) confirm Stulz' prediction of a significant, non-linear relation. Where the first find a *N*-shaped relation, i.e. positive relation for fractions smaller than 5% and larger than 25% and a negative relation betwixt, the latter, using different methods, find out, that the relation is positive for equity holdings smaller than some 40% to 50% and negative for larger fractions, which is consistent with Stulz' argument. For a sample of 1,128 IPOs in the US between 1980 and 1984, Boehmer (1993) documents a significant *N*-shaped relation between inside holdings and firm value. The relation is positive for fractions smaller than 33% and larger than 58%. It is negative for fractions between 33% and 58%. Comparing the market reactions to the announcement of IPOs and private sales of equity, Wruck (1989) also finds a strong correlation between ownership concentration and firm value. Changes of ownership concentration are associated with changes in firm value. Wruck confirms Morck *et al.*'s *N*-shaped relation.

The importance of large shareholders, e.g. family ownership, is also analyzed in another strand of literature. Public firms in different economies are organized and governed in different ways.[16] Whereas corporate governance in the United States and the United Kingdom can be characterized by dispersed shareholdings and liquid security markets – the so-called market-based system – the governance system in Germany traditionally is defined by concentrated shareholding structures by families and banks. German banks and insurance companies hold significant shares in public corporations and play a dominant role in board representation and proxy voting.[17] Franks and Mayer (2001) present a more detailed overview on ownership and control mechanisms in German corporations. Lehmann and Weigand (2000) analyze the operational performance of 361 German public and private firms and document that ownership concentration affects firm performance in a somehow puzzling matter.

The question is if family investors can discipline poorly performing management and thus, if family ownership – as a large shareholder willing and able to monitor the management – has a positive impact on the value of a firm? The basic assumption is that for an individual shareholder the cost of obtaining

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[14] Chemmanur and Fulghieri (1999) highlight that the adverse selection cost as postulated by Leland and Pyle (1977) is a more serious obstacle to the listing of young and small companies, e.g. in the United States, than for older and larger companies, e.g. in Europe.

[15] Tobin's *q* is equal to the ratio of the firm's market value to the replacement cost of its physical assets; see e.g. Morck, Shleifer and Vishny (1988), p. 296. *q* can be interpreted as a proxy for the firm's valuable intangible assets, e.g. management quality.

[16] For a detailed description of corporate control mechanisms and their effectiveness in the United States, the United Kingdom, Japan and Germany see e.g. Prowse (1995).

[17] See e.g. Edwards and Nibler (2000) or Gorton and Schmid (2000).

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information could outweigh his benefit of gaining that information.[18] Zeckhauser and Pound (1990) develop a theoretical model and argue 'that large outside investors could play an important role by monitoring management actions and influencing management decisions to favour shareholders, thereby improving the performance of a corporation and raising the price of its stock'.

3.3 Definition of Family Firms

So far, neither academics, professionals nor jurisprudence were able to develop a precise definition of family firms,[19] mostly because a broad range of company types, especially in Germany, can be considered as family-owned, varying from a founder's start-up company to mature and large family-owned conglomerates. In addition, family firms can be organized in any possible legal form. Due to the scope of this paper as an empirical study it is important to employ a pursuable definition instead of qualitative and individual assessments.

Sociological literature delivers a spectrum of definitions with regard to the term 'family' and how its role changed over time. Based on the German *Grundgesetz*, Article 6, the core family can be defined as a married couple including their children. Due to the fact that German family-owned firms are comparatively old when going public, the family is defined as a group of people in a kinsman like relationship descended from one marriage as well as their spouses.

In a next step the family has to be linked to a company. The basic idea is that the founder, his family and his descendants have shaped the company with their standards and ideals at some time. The main criterion to define a company as family-owned or as a family firm (*Familienunternehmen*) seems to be the percentage of family ownership. Influencing a company seems to be possible if a family holds the majority of voting rights. Parts of the literature mention a threshold of 50% plus one vote held by family members.[20] The percentage of equity ownership seems to be a reasonable criterion for the purpose of an empirical study. But practitioners raise objections and argue that other factors are more important for the characterization as a family-owned company, e.g. family members define the long term strategy, the founder's authority and power or the company's mentality. A remarkable example is the *Bayerische Motorenwerke AG (BMW)* in Munich, one of the world's largest car manufacturer in the prime segment. Even if the *Quandt* family held more than 50% of all shares[21], *BMW* presumably could not be considered as family-owned because of the way the company is organized and managed. Not only because of this argument but due to problems obtaining precise information about ownership structures before and immediately after the IPO, the fractional equity ownership as a sole criterion appears insufficient for describing and defining a family-owned firm.[22]

The definition used in this paper is based on Klein (2000), employing two additional criteria: the fraction of family members in the managing-committee and in the supervisory board.[23] A universal guideline for the classification as a family firm according to Davis (1983) can be summarized as follows: A family business is an organization in which 'policy and direction are subject to significant influence by one ore more family units through ownership and sometimes through the participation of family members in management'. With the exception of the ownership criterion, where a minimum of 25% held by family members is required, the percentage can – theoretically – vary between 0% and 100%, resulting in almost 'pure' company types: family-owned, family-managed and family-controlled firms. The formal definition is:

$$FC \cong \left(\frac{E_{fam(\min 25\%)}}{E_{total}} \right) + \left(\frac{Mgt_{fam}}{Mgt_{total}} \right) + \left(\frac{SB_{fam}}{SB_{total}} \right) \geq 1$$

where:

FC ≡ family company

E_{fam} ≡ equity held by family members (minimum 25%),

E_{total} ≡ total equity,

Mgt ≡ number of members in the management board and

SB ≡ number of members in the supervisory board.

Both, the chairman of the management board and the chairman of the supervisory board have more power than other members of the two boards. Thus, if one of these two positions is occupied by a family

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[18] E.g. Shleifer and Vishny (1986) develop a model in which the presence of a large minority shareholder provides a partial solution to that free-rider problem.

[19] Ehrhardt and Nowak (2002a), p. 17, mention the only legal definition of family-controlled stock corporations provided by the German *Betriebsverfassungsgesetz* (§ 76 Abs. 6 (2) BetrVG as of 1952): 'The stock corporation law defines family companies as those stock companies whose shareholder is either one natural being or whose shareholders are relatives by birth or marriage.'

[20] See e.g. Klein (2000), p. 107, or Leach (1990). Ehrhardt and Nowak (2002a), p. 17, classify a firm as *family-owned*, if one or more individual members of one or two families (together) own a fraction of the equity of at least 75 percent. Cronqvist and Nilsson (2002), p. 15, consider a company as family-controlled if the family controls at least 25% of the voting rights.

[21] As of March 2004 three family members hold some 46.6% of ordinary shares.

[22] See e.g. Anderson and Reeb (2003) or Anderson, Mansi and Reeb (2003), who have similar problems with the identification of family firms in the S&P 500 for the purpose of an empirical examination.

[23] See Klein (2000), p. 20. This rationale can be found in other parts of the family firm literature. See e.g. Casson (1999), p. 10, or Romano, Tanewski and Smyrnios (2000).

member, the fraction of family members in the management respectively supervisory board is multiplied by the factor 1.5 to take into account the importance of the position. Contrary to the above mentioned intention of developing a pursuable definition, in 28 out of 174 cases parts of the required information were not available in order to employ the formal definition. Due to the relative high age of German family firms one specific problem has to be considered: Several generations after the founder, his family often expands and includes distant relatives or in-law relatives with different family names. In these cases individual tests regarding age and character of the company were performed. Another obstacle is the participation of employees on German supervisory boards due to the German co-determination which dilutes the control rights associated with equity ownership. Nevertheless, companies are included if there was a direct link to one ore more families at the time of the IPO. The underlying rationale is the delimitation of closely-held family firms versus anonymous public corporations. Thus, young founder's companies with a direct link to one or more founders who shape the business with their personality are included, as an exception of a family firm.[24]

3.4 Family Firms and Private Benefits

On the one hand, the family owner's decisions of how to go public and about the future ownership structure will be driven by the notion of maximizing the long-run return derived from the equity fraction held. On the other hand, it has to be taken into account that pre-IPO investors could have substantial private benefits of keeping control over the company. These private benefits could outweigh the above mentioned disadvantages regarding the level of IPO proceeds.[25] Private benefits seem to be comparatively high in Germany.

3.4.1 Definition and Empirical Evidence of Private Benefits

Underdeveloped capital markets with comparatively low investor protection, e.g. Germany, seem to enable controlling owners to derive high rents from their ownership stake. But what are these private benefits in detail? In their analysis of the agency costs derived from the separation of ownership and control, Jensen and Meckling (1976) describe an example of private benefits that enunciates their non-pecuniary character. Maximizing utility does not only involve 'the benefits he [the manager] derives from pecuniary returns but also the utility generated by various non-pecuniary aspects of his entrepreneurial activities such as the

physical appointments of the office, the attractiveness of the secretarial staff, the level of employee discipline, the kind and amount of charitable contributions, personal relations ('love', 'respect', etc.) with employees, a larger than optimal computer to play with, purchase of production inputs from friends, etc.'[26] Coffee (2001) provides a more recent and more general definition of private benefits of control which stands 'for all the ways in which those in control of a corporation can siphon off benefits to themselves that are not shared with the other shareholders [...]'. Coffee focuses on how private benefits of control differ depending on the legal system in different countries. In line with other research, Coffee shows that common law countries seem to outperform civil law countries in terms of capital market quality.[27] Empirical backing is presented by Nenova (2003) who analyzes valuation differences between higher-voting share types over lower-voting share classes in 661 dual class share firms in 30 different countries and explains the difference as to represent the value of control. Average private benefits of control measured as the percentage of the firm's market capitalization differ systematically: In Scandinavian civil law countries they sum up to 0.5%, in common law countries 4.5%, in German civil law countries 16.2% and in French civil law countries 25.4%.

Ehrhardt and Nowak (2002a) formulate a typology of private benefits of control emphasizing two dimensions as shown in Table 2: pecuniary versus non-pecuniary reasons and the transferability of private benefits of control. Obviously, family-owned firms are associated with the existence of (large) private benefits. Family ownership is often interpreted as a proxy for private benefits in the empirical literature.[28] Benefits associated with control rights seem more valuable for private than for institutional owners. Especially the reputational class of private benefits plays an important role in case of family firms. Family owners receive a high social prestige by owning a firm with a good reputation. Often family members and relatives are promoted into positions of senior management although being less qualified than outside professional managers. Some founder's companies can be described as autocratic. These types of private benefits cannot easily be transferred to another owner. They are exclusive to the current owners, as their existence requires e.g. a large family, a root in a certain geographical region and – more important – a long time to build.

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[24] Faccio and Lang (2002), p. 373, employ a similar rationale for their definition of family ownership.

[25] See e.g. Goergen and Renneboog (2001), p. 27, or Jenkinson and Ljungqvist (2001b) for a more detailed discussion.

[26] See Jensen and Meckling (1976), p. 312. Demsetz (1983), p. 381, refers to the phenomenon as 'on-the-job consumption'.

[27] See e.g. La Porta, Lopez-de-Silvanes and Shleifer (1999) and La Porta, Lopez-de-Silvanes, Shleifer and Vishny (2000a), (2000b) or (2002).

[28] See e.g. Amoako-Adu and Smith (2001), p. 1090-1096, Franks and Mayer (2001), p. 970, Goergen and Renneboog (2001) as well as Holmen and Hoegfeldt (2002).

Table 2. Classification of private benefits of control

		Pecuniary ('Tunneling')	Non-Pecuniary
Transferability	*high*	**Self-Dealing** - Excessive (above market) compensation - Diversion of resources - Asset transfers at arbitrary prices - Cheap loans and guarantees	**Amenities** - Winning the world series - Influencing public opinion - Owning a luxury brand - Physical appointments
	low	**Dilution** - Insider trading - Creeping acquisitions - Freeze-out and squeeze-out	**Reputation** - Social prestige - Family tradition - Promotion of relatives - Personal relations

These aspects illustrate a major peculiarity of the German corporate governance system in comparison to the system in the United States, where agency conflicts are often analyzed from the view of the hostile takeover literature instead of private benefit research. E.g. Grossman and Hart (1988) focus on takeover bids as a mechanism for allocating control with two types of (mostly pecuniary) control benefits: (i) Benefits to security holders and (ii) private benefits to the controlling owner. In comparison, the German market for corporate control can be characterized by hostility much less. Instead negotiated sales of blocks and acquisitions of shares in the open stock market have been the most important mechanisms for corporate control transactions.[29] Nevertheless, for the purpose of an empirical study it is difficult (i) to determine adequate proxies for private benefits of control and (ii) to quantify them.

On the other hand, in regard of reputational private benefits one could argue that their existence does not alter the wealth of ouside investors. This argument can be contrasted with Jensen's (2001) achievements in regard of the dimensions of value maximizing. 'The existence of *any* private benefit – whether pecuniary or non-pecuniary – which is not shared with the minority shareholders gives the controlling owner an incentive to deviate from the maximization of total firm value.'[30]

3.4.2 Private Benefits and the Decision to Go Public

Bebchuk (1999) describes the entrepreneur's decision whether to maintain control over the company when going public by choosing a concentrated or dispersed ownership structure. This decision is influenced by the magnitude of private benefits of control. The entrepreneur faces two possibilities:

- If private benefits of control are *small* the entrepreneur will choose a dispersed ownership structure by issuing common stock (ordinary shares). He has no need to protect his control rights.
- If the value of private benefits is *high* the entrepreneur will more likely maintain control. 'Maintaining a lock on control would enable the company's initial shareholders to capture a larger fraction of the surplus from value-producing transfers of control' caused by the IPO.

A most common way to keep control over a company is to separate cash flow rights from voting rights by introducing a dual class share structure of ordinary shares and non-voting preference shares. Other instruments to separate control and cash flow rights include stock pyramids and cross-ownership structures. All three means enable a shareholder to exercise control while holding only a small equity fraction.[31] While initial owners keep the ordinary voting stock, non-voting preference shares are sold to the public. Thus, the separation of cash flow rights and voting rights will be most likely used in conjunction with a controlling shareholder, e.g. family ownership, but not with a dispersed ownership structure.[32] Summarized by Mello and Parsons (1998): 'When private benefits of control are significant and voting rights can be isolated from cash flow rights it may be best for the seller to deviate from one vote per share, but not otherwise.'

Bebchuk and Zingales (2000) show that the ownership structure chosen by a value-maximizing entrepreneur at the IPO might deviate from the socially optimal solution, because of the external effect that the choice of ownership structure has on

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[29] See e.g. Franks and Mayer (2001), Gorton and Schmid (2000) or Prowse (1995). Jenkinson and Ljungqvist (2001b) indicate that hostile transactions increased in recent years.

[30] See Ehrhardt and Nowak (2001), p. 6.

[31] See e.g. Bebchuk, Kraakman and Triantis (2000) providing an overview on these mechanisms. Faccio and Lang (2002), p. 388, find that pyramids and cross-holdings are more common in Germany than in other European countries.

[32] See e.g. DeAngelo and DeAngelo (1985) as well as Grossmann and Hart (1988).

potential future buyers of control.[33] Rational entrepreneurs will fully internalize the effects of ownership structure on their future wealth and they will internalize the effects of ownership structure on dispersed shareholders as these effects are reflected in the IPO price. But the entrepreneur does not internalize the effects of ownership structure on the surplus captured by future blockholders. As ownership structure influences (i) the terms when a control transfer might occur and (ii) the surplus captured by potential controlling buyers only in perfectly competitive markets for corporate control, the optimal choice of ownership structure from the entrepreneur's point of view coincides with the socially efficient capital structure. Consistent with Pagano (1993) it can be assumed that in underdeveloped capital markets the privately optimal choice of ownership structure should differ from the socially efficient structure. Where the impact of post-IPO transfers of control on minority shareholders will be negative, e.g. in countries with relatively low investor protection, only a small number of companies will be publicly listed. Combining Bebchuck's (1999) and Bebchuk and Zingales' (2000) analyses, listed firms tend to have an ownership structure, in which the initial owner retains control but sells some of the cash-flow rights to outside investors, if private benefits of control are large, and entrepreneurs will chose this type of structure even if a structure with dispersed ownership is more efficient from a social point of view.

Although the models mentioned above predict different outcomes, they can be summarized as follows: Private benefits can have a strong impact on the ownership structure chosen when going public and determine control structures, i.e. their existence can lead to dual class share structures – if allowed.

3.5 Family Firms and Dual Class Shares
3.5.1 Dual Class Share Structures, Private Benefits and Empirical Evidence

The simultaneous issuance of ordinary stock and non-voting preferred stock enables family owners to diversify cash flow rights while keeping control over the company. Investors in preferred stock face one disadvantage: Preference shares usually trade with a discount to ordinary shares. According to Ehrhardt and Nowak (2000a) the price difference has a long term mean of 17.9%.[34] On the other hand, preference

shares usually earn a higher and/or guaranteed dividend. Contrary to the empirical findings, the neoclassical theory argues that due to the higher dividend preference shares should trade at a higher price and therefore should have a higher market value. On the other hand, it is argued that voting rights bear an economic value, which increases the valuation of ordinary shares. Another argument is that preference shares are less known to investors and therefore less traded. Controlling shareholders, such as families, can use these dual class share structures in order to protect their private benefits. According to Rydqvist (1992) in some countries, e.g. Switzerland, dual class share structures are even used as a protection mechanism to keep foreign investors from taking control of domestic firms.

In their analysis of Swedish seasoned equity offerings, Cronqvist and Nilsson (2002) show that family owners use an offering method that is least likely to dilute their controlling stake and increases monitoring by a new blockholder. Even more, family owners will not issue at all, if the resulting ownership structure is one where they face an 'unacceptable' dilution of control. Rydqvist and Hoegholm (1995) find out that in a sample of 166 Swedish IPOs of family-owned firms between 1970 and 1991 more than 90% of the firms use dual class share structures. They argue that the risk of losing control is a cost of public ownership and thus takeover defenses – i.e. dual class shares, limitation of voting rights, pyramidal structures, etc. – are used to reduce this risk. For a sample of 105 German IPOs of family-owned firms Ehrhardt and Nowak (2002a) confirm Bebchuck's (1999) hypothesis that non-voting shares are used where family owners retain the majority of voting rights. Family shareholders still hold 51.8% (72.9%) in 44 dual class firms 10 (5) years after the IPO, whereas family owners in single class firms lose the majority of voting rights at some time between 3 to 5 years after the IPO.

Holmen and Hoegfeldt's (2002) analysis supports the view that the issuance of ordinary and preferred stock, resulting in a dual class share structure, is directly correlated with the existence of private benefits of control. They show that controlling shareholders in dual class firms never sell their stakes piece by piece but only in a block trade associated with a control premium that reflects the value of control rights. In summary: It can be argued that dual

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[33] The basic idea that the entrepreneur's choice might deviate from the socially efficient choice was introduced by Grossman and Hart (1980). In contrast to Grossman and Hart, where the choice of ownership structure was exogenous, Bebchuk and Zingales (2000) endogenize the choice of ownership structure and analyze the difference between private and social efficiency at the IPO stage.

[34] For a sample of 28 German corporations Kruse, Berg and Weber (1993) calculate a median price difference of some 29%. The authors cite studies for the United States (5.44% in 1940-1978), Italy (23.4% in 1985) and the United Kingdom (13.3% in 1955-1982). For a sample of

101 German companies between 1956 and 1998 Daske and Ehrhardt (2000) calculate a statistically significant price difference of 17.2% between ordinary shares and non-voting preference shares. Hoffmann-Burchardi (1999) confirms Kruse's *et al.* results. For her sample of firms between 1988 and 1997 she calculates an average voting premium of 26.34%. This is in line with Barclay and Holderness' (1989) results for the United States stating that control premiums in block trades average 20%. Rydqvist (1992), p. 53, summarizes empirical research for several countries and finds out that the percentage price difference is generally positive.

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class share structures are most typical with concentrated ownership structures driven by entrepreneurs or families who try to keep their private benefits of control.

Accordant with Zingales (1995), Gomes (2000) views the IPO as the first step in the eventual sale of a company. Using a multiperiod model, Gomes shows that an IPO does not need to be in disfavor of minority shareholders and that controlling shareholder structures might even be beneficial. Sheehan (2000) states: 'If the controlling shareholder cares about his *reputation* because of possible future sales of stock, dual class and pyramidal structures allow more of those future sales without losing control of the firm.' Family reputation and interaction can provide an important constraint on managerial self-dealing.[35] Thus, owners of family firms seem to be able to realize private benefits from control of their corporation without sacrificing firm performance.

3.5.2 Family Owners as a Unique Class of Shareholders

Family shareholders represent a unique class of shareholders, mostly because they hold poorly diversified private portfolios, they are long term investors and they regularly control senior management positions. Thus, this section presents a summarizing overview on various hypothetical advantages and disadvantages of family ownership.

Advantages of family ownership include:

- Families have *longer investment horizons* and stronger incentives to invest, resulting in greater investment efficiency and faster growth. Thus, families do not monitor only effectively and efficiently, but optimize decisions within the family and future family members in mind.[36] Moreover, these monitoring activities can be associated with learning curve effects.

- In line with Jensen and Meckling's (1976) agency view on the firm, Fama and Jensen (1983) suggest that family relationships among owner-managers should *reduce agency costs* and as a consequence firm value should increase.

- Concentrated ownership can reduce agency conflicts resulting in higher firm value – mostly because in family firms the family's wealth is directly linked to firm performance and firm value as argued by Demsetz and Lehn (1985).

- DeAngelo and DeAngelo (1985) suggest that family involvement serves to monitor and discipline managers because of long term relationships between family members and with the firm. This connection reduces the probability that a short-sighted management omits good investment projects to raise current earnings.

- The existence of owner-managers in family firms, characterized by high family commitment and strong family ties, forges a straightforward decision-making and an entrepreneurial spirit offering family firms competitive advantages over non-family firms.

- Family ownership ensures a continuous leadership with lower management turnover. The longevity especially of German family firms often spans several generations.

- Because of the longevity of family firms and related reputational aspects, other stakeholders, e.g. suppliers or banks, are more likely to deal with family firms rather than with comparable non-family firms with relatively high management turnover.

- Anderson, Mansi and Reeb (2003) argue that family firms will face a lower cost of debt financing in comparison to non-family firms because their specific incentive structures result in fewer agency conflicts. Bond holders seem to view family ownership as an organizational structure that better protects their interests.

- As family owners tend to be risk-averse family firms try to reduce the level of debt. Higher levels of debt increase the probability of bankruptcy and of loss of control of the firm as argued by Mishra and McConaughy (1999).

- Family firms are associated with a clear and strong corporate identity, high loyalty of employees, a family tradition and strong geographical ties in one region.

- Davis (1983) points out what distinguishes successful family firms from other non-family businesses is the level of trust and altruism, commitment, concern for the long run and love for the firm. According to Davis, Schoorman and Donaldson (1997) stewardship theory can be used to explain situations of separated ownership and control in which managers – if family members or not – are not motivated by their own interest, but rather act as stewards ('agents') whose motives are aligned with their principals' objectives.

On the other side, disadvantages of family ownership include:

- Outsiders, as reported in anecdotal accounts in the popular press, view family firms as associated with very high levels of *in-transparency*. A most popular argument for undervaluing family businesses is a 'hankey-pankey' behavior of acts of grafting.

- Families have incentives and the power to skim private benefits at the expense of firm performance. Minority shareholders will be expropriated. E.g. family owners are able to expropriate wealth from the firm by overpaying themselves. Often related-party transactions can be observed.

- Families pursuing their own interest, i.e. individualistic, opportunistic and self-serving behaviour, can adversely affect employee effort and productivity.[37]

- It is often argued that there is no corporate governance in German family firms due to a lacking

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[35] See Denis and Denis (1994), p. 115.
[36] See e.g. James (1999a), p. 52, James (1999b), p. 65, or Holmen and Hoegfeldt (2002), p. 8.

[37] See Burkart, Gromb and Panunzi (1997), p. 702.

market of corporate control. Instead, some family firms can be characterized by an autocratic style of management.

- Family owners, especially the founder's generation, often cannot diversify their private portfolios against the specific risks afforded by the commercial operations of the firm. Lack of success and failure of the firm may financially ruins the whole family.[38]

- Family owners often view their firms as an asset to bequeath to the next generation.[39] The preceding generation values firm survival over wealth maximization. If separated, family owners prefer to maximize firm value rather than shareholder value.

- Family owners may derive greater benefits from purposes such as longevity, social and ecological responsibility, technical innovations, growth or firm survival rather than from increasing shareholder value. As a consequence outside investors will undervalue the firm resulting in higher capital costs.

- Because family owners fear to lose control of the firm they can restrict the company's growth by themselves, e.g. if a capital increase would dilute family ownership. Family owners tend to be less willing to take risk.[40]

- Controlling ownership stakes reduce the probability of hostile bids, reducing the value of the firm.[41]

- Conflicts may arise between family members who are actively working in the firm versus those who are solely shareholders.[42] As there is no separation between family and business relationships and families get larger, especially over time, family members' interests tend to diverge, leading to and resulting in conflicts and struggles.

- The twofold financial needs of the firm and the family can be a serious difficulty for family owners and can lead to conflicts over strategic decisions within the firm and different investment decision rules can be employed.[43]

- Often family members and relatives are promoted into positions of senior management although being less qualified than outside professional managers. This behaviour reduces the firm's attractiveness on human resource markets.

- Severe problems are associated with family succession. Often founders or family managers remain active even if they are no longer competent or qualified to run the business.

- Often family owners are embedded in communities and in networks.[44] Social and political reputation or regional importance may prevent family

owners to take grievously steps, e.g. reducing staff, closing plants, etc., even if these actions are operationally necessary.

Despite theoretical models, argumentations and empirical findings, ownership structure seems to affect firm performance and firm value. If family ownership provides competitive advantages (disadvantages) to the firm, a better (inferior) firm performance should be observed in family firms versus non-family firms. Summarizing the above mentioned sources, a puzzling picture is left. On the one hand, controlling family shareholders are associated with better monitoring functions as larger ownership fractions allow them to obtain larger stakes of the firm value. Thus, concentrated ownership could be seen as beneficial.[45] On the other hand, research focusing on family firms indicates that families do not primarily maximize shareholder value. Investors in family firms have difficulties in valuing properly. Thus, family firms should be undervalued relative to the market investment rule. This effect may be limited by family firm specific matters: 'Family ties, loyalty, insurance and stability are expected to be effective in lengthening the horizons of managers and in providing the incentives for family managers to make efficient investments in the family business.'[46]

Finally, this Chapter does not conclude with a clear and definite hypothesis publicizing either under- out- or neutral performance of family-owned firms.

4   Data and Methodology

4.1   Sample Data and Descriptive Statistics

The initial data sample is comprised of 395 IPOs between 1977 and 1998. Using the definition developed in the previous Chapter, in a first step 208 IPOs were identified as flotations of family firms. Not only because of data requirements and comparability with former studies the event window of 1977 to 1998 was chosen for the following reasons: on the one hand, only very little IPO activity took place before 1977. For example Ehrhardt and Nowak (2000a) identify only one family-owned firm that went public between 1970 and 1976. The corporate tax reform in 1977 (*Koerperschaftssteuer-Reform*) eliminated the double taxation on dividend payments making a flotation in the German stock market more attractive. Figure 1 shows that it needed another 6 years up to 1983 though, before a larger number of firms went public. It seems reasonable to mention that 8 out of 10 firms in 1983 were not included due to data unavailability or the flotation on the *Ungeregelter Freiverkehr*. On the other side, restricting the sample to the end of 1998 facilitates the analysis of the long-run performance for at least up to 36 months over an event window of 25 years, i.e.

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[38] See Casson (1999), p. 13.
[39] See e.g. Burkart, Panunzi and Shleifer (2003), Casson (1999), p. 17, or Chami (1999), p. 19.
[40] See McConaughy, Matthews and Fialko (2001), p. 36.
[41] See Barclay and Holderness (1989), p. 384.
[42] See Cadbury (2000), p. 2.
[43] See Fama and Jensen (1985), p. 106.
[44] See Casson (1999), p. 15.

[45] See Ehrhardt and Nowak (2000b), p. 5.
[46] See James (1999a), p. 41.

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from 1977 to 2001. As a result, the data sample is as recent as possible. Another conclusion presented by Figure 1 is that, apparently, there is no specific 'hot issue' or 'cold issue' period in the subsample period of 1983 to 1998.
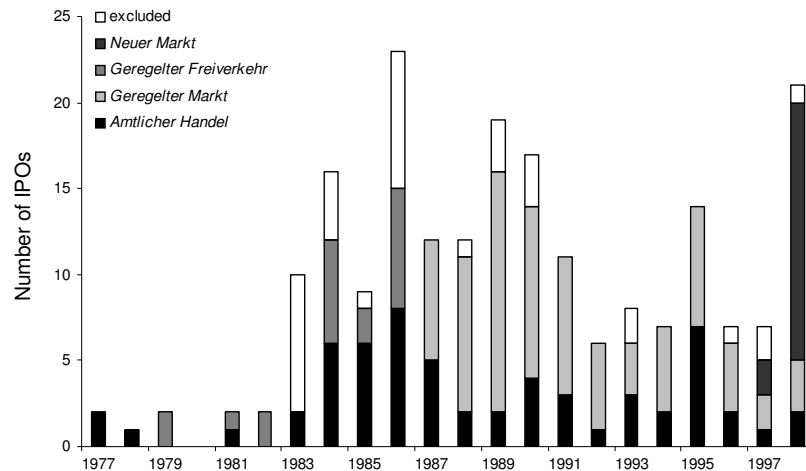

Figure 1. Number of IPOs of family-owned firms by year of flotation and market segment

To achieve a homogenous data basis the initial sample had to meet the following criteria, partially suggested by Ritter (1991): (i) gross proceeds of 1 million *Deutsche Mark* or more, measured in terms of December 2001 purchasing power, to guarantee a minimum offering size, (ii) daily stock prices available from *Karlsruher Kapitalmarktdatenbank* (KKMDB), (iii) companies being taken public by an investment bank, (iv) no other outstanding shares of the firm being traded before the IPO and (v) the company being listed at the *Geregelter Freiverkehr* (until May 1988), *Geregelter Markt* (since May 1988), *Amtlicher Handel* or *Neuer Markt* (since 1997). Flotations at the *Ungeregelter Freiverkehr* (until May 1988), *Freiverkehr* (since 1988) and other OTC segments were excluded. This study does not employ a criterion with regard to the company's age. Although, in comparison to other capital markets, German companies are comparatively old with a mean (median) age of 55.89 (40) years when going public.[47]

The final number of companies in the sample totals 174, representing 83.7% of the number of companies and 94.2% of aggregate gross proceeds by market value. 117 firms issued common stock, 53 issued non-voting preferred stock, while only 4 companies preferred the parallel issuance of common and preferred stock. The analysis of both classes of shares for the latter 4 firms does not show any economically significant differences. Thus, these companies were included only with the performance of their ordinary shares.

The mean size of the 174 IPOs is 16.3 million in nominal value and 144.3 million *Deutsche Mark* in market value, respectively. Values range from 1.1 million (1.7) to 246.4 million *Deutsche Mark* (4,803.7). As these figures seem very low, they are negatively biased by the smaller IPOs before 1983 and the flotations on the *Neuer Markt* in 1997 and 1998. Further interesting characteristics include (i) that the number of family firm IPOs remained high after the stock market crash in October 1987 and (ii) that a majority of the issuing family companies preferred the market segment *Geregelter Markt* after its introduction in May 1987.

4.2   Long-Run Abnormal Return Construction

Numerous studies document that the results of long-run event studies highly depend on the research design, addressing two major issues: the calculation of returns and the choice of benchmark.[48]

The first decision determines the event window length. While earlier studies on German IPOs examined long-run performance for only 1 year,[49]

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[47] Gompers (1996), p. 140, reports an average age of some 6 years for venture capital-backed IPOs in the United States, whereas Field and Karpoff (2002), p. 1859, report an average age of 18.1 years. In a comprehensive overview Rydqvist and Hoegholm (1995), p. 310, report an average age of some 40 years for European IPOs, ranging from 29 years in Spain to 57 years in Germany. In addition, Rydqvist and Hoegholm report an average age of 38 years for the sample of Swedish family-owned firms. Pagano *et al.* (1998) highlight that the typical Italian IPO is 8 times as large and 6 times as old as the typical IPO in the United States.

[48] See e.g. Barber and Lyon (1997), Brav, Geczy and Gompers (2000), Gompers and Lerner (2003) or Loughran and Ritter (1995).

[49] Schmidt *et al.* (1988) use an event window of 1 year, Wittleder (1989) 53 weeks, Uhlir (1989) 15 months, Hannson and Ljungqvist (1993) 20 months. According to

there is international evidence by Loughran and Ritter (1995) that IPOs underperform for some 5 years. To facilitate comparisons with former studies long-run results are presented primarily for periods of 12, 36 and 60 months.

The second choice refers to the weighting scheme of returns over a number of observations. Fama (1998) and Brav *et al.* (2000) point out that the usage of equally weighted or value-weighted returns highly depends on the researcher´s aim: While equally weighted returns are the preferred method when examining potential stock market mispricings, the authors recommend value-weighted returns when measuring the average investors´ wealth change attributable to an event. In their study on tests of market efficiency Loughran and Ritter (2000) strongly prefer equally weighted returns.[50] Thus, equally weighted returns are used in this paper.[51]

Analyzing long-run performance for up to 5 years requires stock prices for each company for this period of time. The data sample used in this study contains 3 companies whose return series are shorter than that.[52] Hence, the third decision is how to treat these companies. Excluding these firms leads to a so-called survivorship bias.[53] In place of only full series of returns, truncated return series are used, i.e. all firms in the data sample are included regardless of the length of their return series. While this paper includes IPOs floated in 1997 and 1998 stock price data is not available for the fourth and fifth year of the listing. Unlike other studies, these 25 firms will be included in the 36-month analysis but excluded in the 60-month analysis.

A fourth choice refers to the question either to include or to exclude the first month following the IPO. While some studies[54] exclude the first month and start computing returns with the first trading day of the month following the IPO, it is argued that this procedure could cause a bias. Consequently return series start immediately on the first day of trading with the first available spot quotation available from KKMDB. Initial returns are not included for the following reason: as equity offerings are usually oversubscribed 'most investors simply do not have the opportunity to acquire all new issues at the offering price'.[55] Including initial returns, although correct in theory, would lead to a trading strategy that only a small number of investors could retrace.

The fifth decision determines over which period of time returns are measured, i.e. daily, weekly or monthly returns. Brown and Warner (1985) state that potential biases increase, the shorter the return measure period is. Not surprisingly, empirical literature established the monthly return measurement.[56] Raw returns are calculated as follows:

$$R_{IPO\,i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} \ ,$$

where $P_{i,t}$ denotes the last available price for stock i in month t. This study follows Ritter´s (1991) suggestion and defines a month as a 21-trading-day period relative to the IPO date. This proceeding has two major benefits: (i) Turn-of-the-month effects as a potential seasonal anomaly are excluded and (ii) the return series start with a full month in comparison to the conventional proceeding where a truncated month is compared to a full calendar month of benchmark performance.

Besides the choice of benchmark most important, the researcher has to select an appropriate return measure. Two common measures are (i) cumulative abnormal returns (CARs) and (ii) buy-and-hold abnormal returns (BHAR).[57] Unfortunately: '[T]here is no consensus on how to measure long-term

Ehrhardt (1997) p. 173, Ljungqvist (1993) is the first one employing a 36-month holding period for a German data sample.

[50] See Loughran and Ritter (2000), p. 363: 'But if one is trying to measure the abnormal returns on the average firm undergoing some event, then each firm should be weighted equally.' The idea behind this refers to the observation that most abnormal patterns are stronger for smaller firms. Because of extremely large size differences apparent anomalies could shrink or even disappear when using value-weighted instead of equally weighted return series.

[51] For the German capital market Ehrhardt (1997), p. 165, recommends a strategy where identical amounts are invested in every IPO without changing the portfolio weights afterwards. Additionally, Cowan and Sergeant (2001) state that event study means and test statistics conventionally are equally weighted.

[52] Stock prices for *Massa AG* (1986) were available up to month 41, for *MVG AG* (1988) up to month 52 and for *Interglas AG* (1989) up to month 42.

[53] Nevertheless some studies exclude companies with shorter return series than the event window. Kim *et al.* (1995), p. 437, discuss the possibility that the avoidance of a survivorship bias could lead to a 'high casualty bias' when using truncated series instead of full series. This phenomenon especially affects data samples in the United States and in the United Kingdom, where a relatively high percentage of new issued firms is delisted within the common event window lengths. The data sample used in this study should not be affected.

[54] E.g. Brav *et al.* (2000), Figure 2, only require the availability of CRSP data 'at some point after the offering date'.

[55] See Reilly (1973), p. 89. Reilly and Hatfield (1969) mention the extreme interest in IPOs and call it 'new issue fever'.

[56] See Brown and Warner (1980), p. 211, in particular Brown and Warner (1985) and for a more recent description Canina, Michaely, Thaler and Womack (1998), p. 408.

[57] Barber and Lyon (1997) present a detailed description on both methods. In general, CARs are calculated by summarizing monthly abnormal returns whereas BHARs are the difference of the return on a buy-and-hold investment in the sample firm less the return on a buy-and-hold investment in an appropriate benchmark/portfolio. Thus, CARs ignore compounding whereas BHARs include the compounding effect.

abnormal performance.'[58] From an investor's point of view, BHARs should be used as they minimize transaction costs because an equally weighted CAR strategy implies costly monthly rebalancing. In addition, CARs 'are a biased predictor of long-run buy-and-hold abnormal returns'.[59] CARs tend to be positively biased. Kothari and Warner (1997) and Lyon *et al.* (1999) find out that, in comparison to CARs, BHARs 'accurately represent investor experience' but are 'more sensitive to the problem of cross-sectional dependence among sample firms [...]'.[60]

As beginning with Ritter's (1991) article most of the recent literature uses BHARs. This paper also computes BHARs as this measure represents the most common measurement method. Positive BHAR measures can be interpreted as IPOs outperforming the benchmark, while negative BHARs indicate an underperformance relative to the benchmark portfolio.

A second widely employed measure of secondary market performance is the wealth relative, denoted as WR, which was initially used in this context by Ritter (1991). According to Loughran and Ritter (1995) the rationale is to define a measure that indicates the investment in IPOs that is required in order to have the same wealth at the end of the holding period as would be produced by an investment in the benchmark portfolio. A wealth relative greater than 1 indicates outperformance relative to the benchmark, whereas underperformance is expressed by a wealth relative smaller than 1. Ritter (1991) defines the wealth relative WR as follows:

$$WR = \frac{\frac{1}{n}\left[\prod_{t=1}^{T}(1+R_{IPOi,t})\right]}{\frac{1}{n}\left[\prod_{t=1}^{T}(1+R_{RPFm,t})\right]} = \frac{BHR^{IPO}+1}{BHR^{RPF}+1} \ ,$$

where T denotes the length of the holding period. An example explains the meaning of the wealth relative: Assume a simple case where BHR^{IPO} is 0.20 and BHR^{RPF} is 0.60. Using formula, the wealth relative is 0.75. Investing 100 units in the reference portfolio, the investor would achieve 160 units at the end of the event window. Instead of 100 units an investors had to invest 133.33 units in issuing firms to achieve the same wealth.[61]

Significance tests are employed to test whether the average abnormal return is significant different from zero. Presuming that abnormal returns are normally distributed, a simple *t*-statistic is the researcher's preferred choice.

Most of the more recent empirical studies state that the distribution of abnormal returns cannot be approximated with the normal distribution due to a strong positive skewness leading to misspecifications

of any parametric test, especially the parametric *t*-test.[62] While older studies only describe this phenomenon, a broad range of statistics-based literature presents improved test-specifications. In their seminal article on the specifications of long-run event studies, Barber and Lyon (1997) document that the (positive) skewness bias implies negatively biased *t*-statistics. According to Lyon, Barber and Tsai (1999) reported *p*-values will be smaller than they should be. These authors suggest the use of a transformed *t*-statistic which was originally documented by Johnson (1978) and which reduces the effect of skewness. The skewness-adjusted *t*-statistic is defined as:

$$t_{sa} = \sqrt{n} * \left(S + \tfrac{1}{3}\hat{\gamma}S^2 + \frac{1}{6n}\hat{\gamma} \right),$$

with:

$$S = \frac{\overline{IR}}{\sigma(IR)} \text{ and } \qquad \hat{\gamma} = \frac{\sum_{i=1}^{n}\left(IR_i - \overline{IR}\right)^3}{n*[\sigma(IR)]^3} \ ,$$

where $\hat{\gamma}$ is an estimate of the coefficient of skewness. Assume $\hat{\gamma}=0$, the skewness-adjusted *t*-test equals the conventional *t*-test. As *p*-values for t_{sa} cannot be found in statistical tables some studies simply use *p*-values for the conventional Student's *t*-statistic. This procedure will also be employed in this paper.

While Sutton (1993) recommends a bootstrapped application, Lyon *et al.* (1999) argue that *only* a bootstrapped application of the skewness-adjusted test statistic yields well-specified test statistics.[63]

As bootstrapped skewness-adjusted *t*-statistics are not undisputable in the empirical and theoretical literature it seems appropriate to report the results of a non-parametric sign test which tests the median of the distribution of abnormal returns.[64] The sign test does not require the assumption that the population is normally distributed. It tests whether the probability that the difference between the number of positive and negative initial returns is positive is greater than the probability that the difference is negative. The null hypothesis is that the median is equal to zero, i.e. that both probabilities are equal.

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[58] See Loughran and Ritter (2000), p. 362.
[59] See Barber and Lyon (1997), p. 346.
[60] See Lyon, Barber and Tsai (1999), p. 198.
[61] See Aussenegg (1997), p. 425, for this interpretation.

[62] Fama, Fisher, Jensen and Roll (1969), p. 6, were among the first to report right skewness in stock specific performance measures. For empirical examples see Aussenegg (1997), p. 416-417, Drobetz and Kammermann (2002), p. 6, Stehle and Ehrhardt (1999), p. 1399, and others. Ehrhardt (1997, p. 71) provides an overview on some empirical studies all reporting positive skewness.
[63] Ikenberry, Lakonishok and Vermaelen (1995) as well as Cowan and Sergeant (1997) and (2001) were among the first to use the bootstrapping procedure in long-run event studies.
[64] See e.g. Brown (1999), p. 17, Ehrhardt and Koerstein (2001), p. 7, or Sutton (1993), p. 803.

4.3   Benchmark Formation

Neither academics nor professionals were able to develop an approved model to precisely forecast expected returns of shares. The market-adjusted-return approach, as required by the capital asset pricing model (CAPM), is commonly used in long-run event studies.[65] Because of complexity the market portfolio cannot be determined empirically. Thus, a proxy variable has to be employed, often referred to as *benchmark*.

Results of long-run studies are highly sensitive to the choice of an appropriate benchmark for the calculation of abnormal returns. Numerous empirical as well as simulation studies discuss this issue. Among others, Brav, Geczy and Gompers (2000) use the most common stock indices in the United States as well as size and book-to-market portfolios and show that the results differ. Levis (1993) employs, both, value- and equally weighted all-share indices as well as a small cap index for his sample of IPO firms in the United Kingdom. Sapusek (2000) is among the first who uses a broad set of benchmarks to measure post-IPO performance on the German capital market. She detects under-, neutral and outperformance depending on the choice of benchmark.

Some 30 years ago the question was raised: 'Is it appropriate to compare the performance of an *individual* stock with the performance of a *portfolio* of stocks?'[66] Not surprisingly, the majority of IPO long-run performance studies uses at least one of the three basic approaches: (i) A stock index as a benchmark, (ii) assigning every IPO in the sample to a non-issuing matching firm and (iii) size-matched portfolios.

Employing an index as a proxy for the expected return of a stock is probably the least time-consuming approach which, in addition, reflects a naïve investor's point of view of comparing the performance of his IPO firm portfolio to any index certificate. Nevertheless, a major disadvantage refers to the fact that the index most likely includes the subject to be examined. Barber and Lyon (1997) refer to this phenomenon as the new listing bias. Another potential argument against an index benchmark is provided by the results of a simulation study on the benchmark effect in long-run event studies presented by Ehrhardt and Koerstein (2001). The authors conclude, that in comparison to the matching firm and size portfolio approach, a value- and equally weighted stock index, e.g. the DAX, biases the results the most. Thus, they reject the idea that any index could be an appropriate benchmark in long-run event studies.

The second approach matches every IPO firm to a non-issuing firm based on size and/or industry. Especially Barber and Lyon (1997) strongly advocate the control firm approach as it eliminates the new listing bias, a rebalancing bias[67] and a skewness bias[68]. This approach should be appropriate in large capital markets, e.g. in the United States and in the United Kingdom. It seems reasonable that non-issuing companies matched by industry and size should, in general, have similar characteristics. In this case risk seems to be better taken into account in comparison to market-adjustments. However, a major concern against the employment of the control firm approach to the German capital market is the latter's small size. The main argument is that only a very small number of listed firms exist within one industry. The first consequence is that percental differences in size between a pair of IPO and non-issuing firm could be relatively high. The second shortcoming is that most likely certain firms are used more than once as a control firm. Thus, this study does not employ the control firm approach as results, using German stock price data, tend to be arbitrary.

A third possibility is to compare a sample of IPO firms to reference portfolios instead of individual firms. A very common method is to construct 10 size-based portfolios of all available non-issuing firms and rebalance them every year. In their simulations Barber and Lyon (1997) show that reference portfolios yield misspecified test statistics. Thus, the authors do not recommend this approach for a data sample in the United States. On the other hand, Stehle, Ehrhardt and Przyborowsky (2000) show that size portfolios are more accurate than index benchmarks. As similar problems occur as described within the matching firm approach this paper does not employ the size portfolio method.

Especially the discussion on the choice of benchmark shows that there is no 'best' method to measure abnormal stock price performance. Due to the size and scope of this paper and its plausible character abnormal performance will be measured against the DAFOX provided by KKMDB. The DAFOX is a value-weighted all share index covering the whole population of the *Amtlicher Handel*, the prime segment of the Frankfurt stock exchange. Contrary to the DAX, the DAFOX is a total-return index. Most important the DAFOX includes dividend payments. It can be concluded that the combination of BHARs and an index cannot be considered as *the* 'best' method. More detailed research for international capital markets provides a manifold picture. The proceeding used in this study tries to take into account the relatively small size of the German

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[65] Usually market-adjusted returns are stated as: $AR_{i,t} = R_{i,t} - E(R_{i,t})$, where $AR_{i,t}$ is the abnormal return on stock i in period t, $R_{i,t}$ the observed return and $E(R_{i,t})$ its expected value.

[66] See Reilly (1973), p. 84.

[67] In comparison to the matching firm approach, size portfolios and indices have to be rebalanced periodically while the returns of the sample are compounded without rebalancing.

[68] The skewness bias is eliminated when using the matching firm approach because the probability that sample and control firms face positive returns is the same.

stock market. It seems that potential biases could increase when using the matching firm or reference portfolio approach.

5 Empirical Results on Long-Run Performance

5.1 Empirical Literature on Long-Run Performance

Long-run returns of IPO firms are a less widely documented characteristic than the evidence of positive short-run returns. Panel A of Table 3 summarizes the results for the stock market in the United States. Early long-run post-IPO studies performed by Stigler (1964), Simon (1989), Reilly (1973) as well as McDonald and Fisher (1972), using small data samples, document an underperformance by IPO firms. However, Ritter (1991) started a wave of long-run studies. Being the first to use a large data sample of 1,526 firms going public between 1975 and 1984 Ritter finds a 3-year return of 34.47%, whereas a control sample of industry- and size-matched firms returned 61.86%. Using CARs Ritter calculates an underperformance of –29.13%. Given this result, Jenkinson and Ljungqvist (2001a) cite Wall Street brokers who translated the term IPO into 'It´s Probably Overpriced'.[69]

Ritter's results are confirmed by Aggarwal and Rivoli (1990) who find a highly significant underperformance of –13.73% after 250 trading days using the NASDAQ index as a benchmark. Loughran and Ritter (1995) use a sample of 4,753 companies going public either on the NASDAQ, AMEX or NYSE between 1970 and 1990. Using BHARs and size-matched firms as a benchmark, they calculate an abnormal underperformance of –26.0% after 3 years and –50.7% after 5 years. Nevertheless the IPO firm portfolio yields absolute positive returns of 8.4% and 15.7%, respectively. Loughran and Ritter (1995) show that their results are highly sensitive to the benchmark employed.

Even more recent studies document a long-run underperformance when employing the classical method of BHARs in combination with an index. Using 4 different indices, Brav, Geczy and Gompers (2000) compute abnormal returns ranging from –28.4% to –44.2% when employing equally weighted BHARs and a range of –8.8% to –25.7% when using value-weighted measures. Only size and book-to-market matched firms used as a benchmark yield positive results emphasizing the importance of the model misspecification problem as discussed in Chapter 4. Gompers and Lerner (2003) confirm these results using a pre-NASDAQ sample of firms that went public between 1935 and 1972. Underperformance increases between the end of the 3rd year and the end of the 5th year after the IPO. Contrary to Brav and Gompers' (1997) results,

underperformance is not eliminated when firms are matched to portfolios based on size and book-to-market ratio. Ritter and Welch (2002) analyzing over 6,000 IPOs document that results not only depend on the methodology, but also on the choice of sample period. Using BHARs and an index, they show that results vary for different subperiods. Overall, IPO firms underperform by –23.4%. Results change significantly when IPO firms are compared to non-IPO firms matched by size and book-to-market ratio. Ritter and Welch (2002) compute a so-called '*style-adjusted*' underperformance of only –5.10%.

Panel B shows that underperformance is not limited to the United States. First IPO event studies for European capital markets are performaned by Levis (1993) for the United Kingdom and Keloharju (1993) for Finland. Levis reports a long-run underperformance of –8.31% for 712 IPOs in the period of 1980 to 1988 compared to a small-capitalization index and abnormal returns of –22.96% compared to an all-share index. Keloharju computes that an investment strategy of buying 79 IPOs in Finland 'on the first trading day and holding them for 36 months from the IPO would have left the investor with only 79 cents for each dollar invested' in a broad value-weighted index. Comparing more recent studies, the underperformance of European IPOs ranges from –6.10% in Switzerland to –73.95% in Austria with an exception in the case of Poland.[70]

Panel C lists the results for other developed capital markets. Underperformance can also be found in Australia, Canada, Japan and New Zealand. Lee, Taylor and Walter (1996a) examine 169 Australian IPOs between 1976 and 1989. They find that a strategy of buying these IPO firms at the first trading day and holding them for 36 months earned a statistically significant underperformance of –51.26% compared to a broad market index. Firth (1997) finds a significant underperformance of –17.91% in New Zealand for a comparable period of time. In a more recent article by Hamao, Packer and Ritter (2000), Japanese IPO firms underperform by –10.70% compared to an industry- and size-matched non-IPO portfolio. In their sample of 211 Australian IPOs floated between 1991 and 1994, Lamba and Otchere (2001) find out that CARs 36 months after the IPO are only moderately statistically different from zero with a positive value of 5.41%.

Panel D extends the empirical findings to several

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[69] See Jenkinson and Ljungqvist (2001a), p. 54.

[70] Aussenegg (1999) analyzes the performance of privatizations and private sector IPOs at the Warsaw stock exchange. Splitting the sample, private sector IPOs tend to underperform whereas privatization IPOs insignificantly outperform. Due to extreme skewness, mean aftermarket performance equals 20.09% whereas the median is –45.42%. In addition Aussenegg uses the Warsaw Stock Exchange Index as a benchmark, consisting only of IPO firms due to a 50 year break of share trading during the period of communism in Poland. Barber and Lyon (1997) refer to this phenomenon as the new listing bias.

emerging markets yielding a more manifold picture: Aggarwal, Leal and Hernandez (1993) examine the performance of IPOs in Brazil, Chile and Mexico. Long-run market-adjusted returns are –47.00% in Brazil and –23.70% in Chile after a 3-year period. Mexican IPOs underperform by –19.60% after one year. Long-run underperformance is also documented in South Africa by Page and Reyneke (1997), in Hong Kong by McGuinness (1993) and in Hungary by Jelic and Briston (1999). Dawson (1987) analyzes the return patterns of IPO firms in Hong Kong, Malaysia and Singapore. None of his findings documented in Panel D are statistically significant at 5%-levels indicating that sample sizes are very small. Other studies document a neutral aftermarket performance which seems to be consistent with efficient market expectations. Lee, Taylor and Walter (1996b) find a slightly positive performance of 0.80% for 132 IPOs in Singapore after 3 years. Sullivan and Unite (2001) investigate the IPO market in the Philippines and document a slightly negative performance of –5.44% after 36 months using a sample of 65 offerings compared to a portfolio of matched non-IPO firms.

Remarkable results can be found in India, Korea and Turkey. Realizing the benchmark problem and using CARs Shah (1995) analyzes 2,056 IPOs in India between 1991 and 1995. After 400 trading days IPO firms are 13.7% ahead of the benchmark. Kim, Krinsky and Lee (1995) examine 99 Korean companies that went public between 1985 and 1988. For 24 (36) months the mean value of matching firm-adjusted returns amounts to a statistically significant 59.01% (91.59%). Highly significant results are also presented by Kiymaz (1999) for a Turkish data sample of 138 IPOs. Long-run average abnormal returns are found to be 44.1% at the end of 36 months.

In Germany research on the long-run after-IPO performance started very lately in the 1980's, mostly due to the very few IPOs before 1983. Both Schmidt *et al.* (1988), Uhlir (1989) and Wittleder (1989) document an underperformance. According to Ljungqvist (1997) a sample of 180 IPOs that went public between 1970 and 1993 loses a significant –12.11% (*t*-value: –2.61) over 36 months. Very detailed research was presented by Ehrhardt (1997). A sample of 160 firms underperforms by –5.20% after 3 years compared to an equally weighted market portfolio and overperforms by 5.45% when compared to a value-weighted market portfolio. In a next step, Ehrhardt compares IPO firms to 10 size portfolios. Both values turn negative (–0.63% and –3.81%, respectively) but still are statistically not significant. Ehrhardt's (1997) results are confirmed by Stehle and Ehrhardt (1999) as well as Stehle, Ehrhardt and Przyborowsky (2000). In a more recent dissertation Mager (2001) uses CARs and a market index as a benchmark and finds an economically and statistically significant underperformance of –41.25% using a sample of 85 IPOs floated between 1987 and 1998. BHARs confirm the underperformance.

Finally, Panel F presents the scarce evidence on family-firm long-run performance: Using a sample of 31 Austrian family-owned companies going public between 1984 and 1991, Aussenegg (1997) finds a statistically significant underperformance of –118.60% after 5 years. Methods are based on BHARs and size-matched portfolios. In comparison to that, 20 non-family firms underperform by only –4.75%. However, these results are not statistically significant. Only a sample of 7 privatizations outperforms by an astounding 49.85%. Examining the larger capital market in Germany, Lowinski and Schiereck (2003) calculate a strongly significant underperformance of –59.20% after 3 years for a sample of 64 family-owned firms between 1991 and 1998. In contrast to Ehrhardt and Nowak (2002a), Lowinski and Schiereck use the DAFOX as a benchmark whereas the first use 10 size portfolios of all stocks traded on the *Amtlicher Handel* of the Frankfurt stock exchange. Analyzing a sample of 105 firms issuing shares between 1970 and 1991 Ehrhardt and Nowak compute a non-significant underperformance of –8.10% after 36 months. This result can be attributed primarily to the underperformance of issues employing dual-class share structures, i.e. common stock and non-voting preferred stock. Whereas the performance of non-dual-class share IPOs is neutral and not significantly different from zero, the underperformance of dual-class share issues is higher with –19.60% and statistically significant at the 5 percent level.

In summary: evidence of negative long-run returns for IPO firms is less widely documented than the evidence of underpricing. The few countries with positive long-run results using the standard methodology – BHARs and an index as benchmark – can be interpreted as the result of different institutional settings in different countries. Nevertheless, up to 1997 most studies documented a long-run underperformance. Cai and Wei (1997) even state that this phenomenon is 'almost universal and has been confirmed in many countries'. More recent studies emphasizing model specification problems show that IPOs do not perform statistically significant different from seasoned firms. The most recent strand of IPO research holds misspecification of models responsible for the widely documented long-run underperformance of IPOs. The most common excuse formulated by the efficient market hypothesis is the failure to properly adjust for risk. Nevertheless, although evidence on family-firm long-run stock performance is very scarce other types of empirical research, e.g. using accounting data, seem to confirm the long-run underperformance of family firms. Morck, Strangeland and Yeung (1998) find out that firms controlled by heirs have lower returns on sales and assets and their growth is less than or equal to the development observed in other comparable firms. Lauterbach and Vaninsky (1999) state that family-owned and family-managed firms appear least efficient in generating profits.

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Table 3.   Comparative evidence of IPO long-run performance

Country	Source	Sample Period	Sample Size	Months	Abnormal Return (%)
Panel A:	**United States**				
United States	Stigler (1964)	1923-1928	84	60	-42,50%
United States	Simon (1989)	1926-1933	53	60	-35,14%
United States	Simon (1989)	1934-1940	20	60	6,24%
United States	Stigler (1964)	1949-1955	47	60	-30,40%
United States	Reilly (1973)	1963-1965	115	36	-20,67%
United States	McDonald and Fisher (1972)	1969	142	12	-18,10%
United States	Gompers and Lerner (2003)	1935-1972	3.661	60	-34,80%
United States	Ritter (1991)	1975-1984	1.526	36	-29,13%
United States	Aggarwal and Rivoli (1990)	1977-1987	1.598	12	-13,73%
United States	Loughran and Ritter (1995)	1970-1990	4.753	60	-50,70%
United States	Brav, Geczy and Gompers (2000)	1975-1992	4.622	60	-38,60%
United States	Ritter and Welch (2002)	1980-2000	6.169	36	-23,40%
Panel B:	**Europe**				
Austria	Aussenegg (1997)	1984-1996	51	60	-73,95%
Denmark	Jakobsen and Sorensen (2001)	1984-1992	76	60	-30,40%
Finland	Keloharju (1993)	1984-1989	79	36	-20,80%
France	Leleux and Muzyka (1997)	1987-1991	56	36	-30,30%
France	Derrien and Womack (2003)	1992-1998	264	24	-6,27%
Poland	Aussenegg (1999)	1991-1996	57	36	20,09%
Portugal	Almeida and Duque (2000)	1992-1998	21	12	-13,75%
Spain	Alvarez and Gonzalez (2000)	1987-1997	56	60	-23,07%
Switzerland	Kunz and Aggarwal (1994)	1983-1989	34	36	-6,10%
Switzerland	Drobetz and Kammermann (2002)	1983-2000	120	14	-6,80%
United Kingdom	Levis (1993)	1980-1988	712	36	-8,31%
United Kingdom	Leleux and Muzyka (1997)	1987-1991	220	36	-19,20%
United Kingdom	Espenlaub, Gregory and Tonks (2000)	1985-1992	561	60	-21,32%
United Kingdom	Brown (1999)	1990-1995	232	36	-20,05%
United Kingdom	Khurshed, Mudambi and Goergen (1999)	1991-1995	240	36	-17,81%
Panel C:	**Other Developed Markets**				
Australia	Finn and Higham (1988)	1966-1978	93	12	-6,52%
Australia	Lee, Taylor and Walter (1996a)	1976-1989	169	36	-51,26%
Australia	Lamba and Otchere (2001)	1991-1994	211	36	5,41%
Canada	Shaw (1971)	1956-1963	105	60	-32,30%
Japan	Cai and Wei (1997)	1971-1992	180	60	-39,30%
Japan	Hamao, Packer and Ritter (2000)	1989-1994	355	36	-10,70%
New Zealand	Firth (1997)	1979-1987	143	60	-17,91%
Country	Source	Sample Period	Sample Size	Months	Abnormal Return (%)
Panel D:	**Emerging Markets**				
Brazil	Aggarwal, Leal and Hernandez (1993)	1980-1990	48	36	-47,00%
Chile	Aggarwal, Leal and Hernandez (1993)	1982-1990	18	36	-23,70%
Hong Kong	Dawson (1987)	1978-1983	21	12	-9,30%
Hong Kong	McGuinness (1993b)	1980-1990	92	24	-18,26%
Hungary	Jelic and Briston (1999)	1990-1998	14	36	-55,67%
India	Shah (1995)	1991-1995	2.056	19	13,70%
Korea	Kim, Krinski and Lee (1995)	1985-1988	99	36	91,59%
Malaysia	Dawson (1987)	1978-1983	21	12	18,20%
Malaysia	Paudyal, Saadouni and Briston (1998)	1984-1995	95	36	8,96%
Mexico	Aggarwal, Leal and Hernandez (1993)	1987-1990	38	12	-19,60%
Philippines	Sullivan and Unite (1998) and (2001)	1987-1997	65	36	-5,44%
Singapore	Dawson (1987)	1978-1983	39	12	-2,70%
Singapore	Lee, Taylor and Walter (1996b)	1973-1992	132	36	0,80%
South Africa	Page and Reyneke (1997)	1980-1991	118	48	-63,45%
Turkey	Kiymaz (1999)	1990-1995	138	36	44,10%
Panel E:	**Germany**				
Germany	Schlag and Wodrich (2000)	1884-1914	163	60	-0,13%
Germany	Schmidt *et al.* (1988)	1984-1985	32	12	-10,22%
Germany	Uhlir (1989a)	1977-1986	70	15	-11,88%
Germany	Wittleder (1989)	1961-1987	67	12	-3,95%
Germany	Ehrhardt (1997)	1960-1990	160	36	-5,20%
Germany	Hannson and Ljungqvist (1992)	1978-1991	162	20	-1,94%
Germany	Stehle and Ehrhardt (1999); Stehle, Ehrhardt and Przyborowsky (2000)	1960-1992	187	36	-5,04%
Germany	Ljungqvist (1997)	1970-1993	180	36	-12,11%
Germany	Sapusek (2000)	1983-1993	n/a	60	-8,31%
Germany	Mager (2001)	1987-1993	85	60	-41,25%
Germany	Steib and Mohan (1997)	1988-1994	90	24	-9,50%
Panel F:	**Family Firms**				
Austria	Aussenegg (1997)	1984-1996	31	60	-118,60%
Germany	Ehrhardt and Nowak (2002)	1970-1991	105	36	-8,10%
Germany	Lowinski and Schiereck (2003)	1991-1998	64	36	-59,20%
Germany	Kuklinski, Lowinski and Schiereck (2003)	1977-1998	146	60	-43,39%

Sources:
See references. Where more than one author or one study is listed as a source of information, combined samples have been constructed by calculating arithmetic means. 'Months' describes the event window, i.e. the number of months over which after-market returns are recorded. Returns are calculated over the event window and are not annualized. Initial returns are excluded. Returns are generally market-adjusted. Where more than one benchmark and one method of computation are used, a representative result is shown.

5.2 Empirical Evidence on Long-Run Performance
5.2.1   Unadjusted Returns and Tests for Normality
Excluding initial returns, an investment strategy that invested the same amount of money in every IPO regardless of its size earned 8.46% after 12 months, 11.79% after 3 years and 19.29% after 5 years.

The distribution of unadjusted monthly returns for a 36-month holding period does not follow a normal distribution. The assumption of normality can be rejected. (i) Values for standardized skewness (–5.2846) and kurtosis (5.1377) are outside the ±2-range

of normality, (ii) the median (0.5033%) is higher than the value for the mean (0.1953%) and (iii) the result of a Kolmogorov-Smirnov test indicates that the normality hypothesis has to be rejected with 99% confidence. The rejection of the normality hypothesis is confirmed when using 12- as well as full and truncated 60-month monthly returns. Thus, subsequent statistical testing has to be interpreted with caution.

5.2.2   Adjusted Returns

This section summarizes the results of benchmark adjusted long-run returns. Abnormal returns are used to verify or falsify the predictions of market efficiency, i.e. the abnormal performance of shares after an IPO should be neutral. Investing in IPO firms should not yield abnormal profits nor excess losses. Table 4 provides an overview on BHARs.

Table 4. Overview on secondary market performance (1977-1998)

Event window length	6 days	11 days	1 month	3 months	6 months	12 months	36 months	60 months
Mean BHR (IPO firms)	-0,27%	-0,04%	0,67%	2,42%	3,81%	8,46%	11,79%	19,29%
Mean BHR (Benchmark)	0,27%	0,47%	1,04%	2,15%	3,48%	9,69%	37,10%	72,79%
Wealth Relative	1,0004	1,0215	1,0032	0,9946	0,9949	0,9888	0,8154	0,6904
Mean BHAR	-0,54%	-0,51%	-0,36%	0,27%	0,33%	-1,23%	-25,31%	-53,50%
t-statistic	-0,6228	-0,5381	-0,2576	0,1433	0,1484	-0,3527	-4,3378	-5,3482
p-value	*0,5343*	*0,5912*	*0,7970*	*0,8862*	*0,8822*	*0,7248*	*0,0000*	*0,0000*
Median BHAR	-1,14%	-1,48%	-2,43%	-1,19%	-2,42%	-8,06%	-28,69%	-43,29%
sign test	-2,7292	-2,2743	-3,4873	-1,2130	-1,6678	-2,5775	-3,7905	-5,1612
p-value	*0,0000*	*0,0000*	*0,0000*	*0,0000*	*0,0000*	*0,0000*	*0,0000*	*0,0002*
Standard deviation BHAR	11,39%	12,46%	18,55%	24,56%	29,39%	46,08%	76,96%	122,11%
Minimum BHAR	-40,77%	-39,58%	-58,31%	-66,44%	-74,78%	-101,84%	-252,18%	-343,34%
Maximum BHAR	102,86%	80,91%	92,78%	141,62%	134,12%	342,18%	242,80%	377,06%
Number positive BHAR	69	72	64	79	76	70	62	43
Number negative BHAR	105	102	110	95	98	104	112	106
Number	174	174	174	174	174	174	174	149

The evidence presented in Table 4 confirms that the price adjustment due to the flotation is completed during the first week of trading as mean BHRs during the first week are very small. The mean BHAR amounts to an underperformance of –0.54% at the end of the first week of trading. A simple *t*-test indicates insignificance, whereas a sign test testing the median BHAR of –1.14% indicates significance. The mean BHAR remains negative until the end of the 60-month period with an exception of the 3- and 6-month periods. The null hypothesis for the mean BHAR to equal null cannot be rejected until month 12. Mean BHAR turn significantly negative for the 36- and 60-month periods. Contrary to the mean BHAR, the median BHAR remains negative and statistically significant different from zero independently from the event window length. 1 month after the flotation both the mean and the median BHAR are negative with –0.36% and –2.43%, respectively. After 3 (6) months the mean BHAR turns insignificantly positive with 0.27% (0.33%) while the median BHAR stays negative with –1.19% (–2.42%). After one year the extent of the negative median BHAR increases to –8.06%, while the mean BHAR stays insignificantly small with –1.23%. The results for the long term performance are more explicit: Both the –25.31% mean BHAR and the –28.69% median BHAR after 36

months are statistically significant different from zero at the 99.9% confidence level. The results aggravate after 60 months: The mean BHAR equals –53.5%, the median BHAR is –43.29%. A wealth relative of 0.8154 after 36 months and 0.6904 after 60 months confirms the underperformance of family firms in comparison to the market. Surprisingly, the extent of underperformance of family-owned IPO firms in Germany floated between 1977 and 1998 is much more pronounced in comparison to the other examinations on the German capital market as shown in Panel E in Table 3. Analyzing a much longer period of time than Lowinski and Schiereck (2003), who calculate a significant underperformance of 59.20% after 3 years for a sample of 64 family-owned firms between 1991 and 1998, the mean BHAR of –25.31% presented in this study is much smaller, providing evidence for the hypothesis that the level of underperformance varies over time. For a more comparable sample, Ehrhardt and Nowak (2002a) calculate an underperformance of –8.10% after 36 months. This first overview on secondary market performance indicates the necessity of more detailed research to explain the observed patterns.

Figure 2 exhibits the development of mean BHRs and mean BHARs for the entire sample of 174 IPOs.

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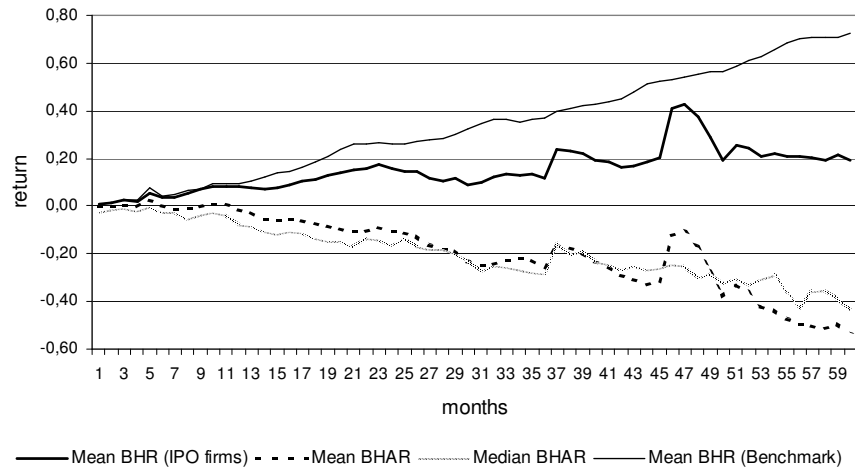
Figure 2. Development of BHRs and BHARs over time

During the first year the development of IPO firms and the benchmark does not differ significantly. Afterwards the mean BHAR drops below the market performance measured by the DAFOX. The DAFOX increases continuously whereas mean and median BHARs continuously decrease. [71]

The instability of the results presented above requires a more detailed view at various subsamples. Results are presented for the entire 1977 to 1998 period as well as for 3 different subperiods. The first subperiod from 1977 to 1995 does not include IPOs on the *Neuer Markt* as the segment was introduced in 1997. The second and third subperiod divide the event window into two subperiods: (i) The first 11 years from 1977 to 1987 and (ii) the subsequent 11 years from 1988 to 1998.

Table 5 presents 12-month returns. BHRs for all periods differ only slightly with values ranging from 7.99% to 9.40%, indicating that earlier IPOs performed slightly better. BHARs confirm this finding. Whereas more recent IPOs underperform the benchmark by –2.65%, earlier IPOs overperform by 1.59%. A simple *t*-test as well as a skewness-adjusted *t*-test and its bootstrapped application indicate insignificance. Analyses of medians produce a reverse picture. Median BHARs are negative for all periods with values ranging from an insignificant –0.72% (1977 to 1987) to a significant –10.23% for the subsequent 11 years.

Table 5. Long-run abnormal returns after 12 months

12 months	1977-1998	1977-1995	1977-1987	1988-1998
Mean BHR (IPO firms)	8,46%	8,68%	9,40%	7,99%
Standard deviation BHR	49,81%	35,79%	37,51%	55,08%
Median BHR	1,87%	2,86%	5,08%	1,49%
Mean BHR (Benchmark)	9,69%	7,14%	7,80%	10,63%
Wealth Relative	0,9888	1,0144	1,0148	0,9761
Mean BHAR	-1,23%	1,54%	1,59%	-2,65%
Standard deviation BHAR	46,08%	32,98%	33,91%	51,17%
t-statistic	-0,3527	0,5594	0,3582	-0,5568
p-value	0,7248	0,5768	0,7215	0,5788
skewness-adjusted t-statistic	-0,3109	0,5969	0,4053	-0,4903
p-value	0,7563	0,5515	0,6868	0,6249
bootstrapped skew.-adj. t-statistic	-0,2353	0,4826	0,2519	-0,3772
bootstrapped skew.-adj. p-value	0,8151	0,6319	0,8023	0,7079
Median BHAR	-8,06%	-3,72%	-0,72%	-10,13%
sign test	-2,5775	-1,7561	-0,2626	-2,9711
p-value	0,0000	0,0000	0,8396	0,0000
Minimum BHAR	-101,84%	-67,09%	-67,09%	-101,84%
Maximum BHAR	342,18%	150,82%	150,82%	342,18%
Number positive BHAR	70	61	28	42
Number negative BHAR	104	82	30	74
Number	174	143	58	116

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[71] The peak in means during the 46th month stems from a dramatic stock price increase of the stock trading company Ballmaier & Schultz that was acquired by Baader Wertpapier GmbH. Its stock price was raised by the factor 6.5.

Table 6 presents long-run returns for a 36-month holding period. BHRs strongly vary over time. Earlier IPOs earn almost 40% after 3 years. Later IPOs lose –2%. The second subperiod from 1977 to 1995 clearly indicates that the results simply reflect the losses associated with the new economy bubble of 1997 to 2002. Mean and median BHARs show that the first 58 flotations of family firms between 1977 and 1987 even outperform the DAFOX by 7.74% and 6.33%, respectively, although the null hypothesis cannot be rejected at conventional levels. BHARs for the entire period are strongly biased by more recent IPOs. 116 IPOs between 1988 and 1998 underperform significantly with a –41.83% mean BHAR and a –53.49% median BHAR. Remarkably, the range between the minimum and maximum BHAR is close to 500%.

Table 7 and Figure 3 present long-run returns for a 60-month holding period. As described in Chapter 4.3, a number of 25 IPOs in 1997 and 1998 is excluded because of the inavailability of stock price data. The results confirm the 36-month analysis. Earlier IPOs earn a 52.18% whereas more recent IPOs lose –1.67% (BHR). Figure 3 shows that the results are driven by some positive outliers during the first subperiod and numerous negative outliers during the later subperiod. Mean and median BHARs of earlier IPOs show that family firms insignificantly underperform the benchmark by –2.32% and –12.70%, respectively. These results are approximately in line with previous research as shown in Table 3. Flotations between 1988 and 1996 underperform by a statistically significant mean –86.12% BHAR and a median –81.42% BHAR. In comparison to the 36-month period, the range between the minimum and maximum BHAR increases to 720%.

Table 6. Long-run abnormal returns after 36 months

36 months	1977-1998	1977-1995	1977-1987	1988-1998
Mean BHR (IPO firms)	11,79%	25,45%	39,38%	-2,00%
Standard deviation BHR	74,41%	70,20%	69,10%	73,40%
Median BHR	-3,02%	10,92%	22,39%	-19,82%
Mean BHR (Benchmark)	37,10%	35,96%	31,63%	39,83%
Wealth Relative	0,8154	0,9228	1,0588	0,7008
Mean BHAR	-25,31%	-10,50%	7,74%	-41,83%
Standard deviation BHAR	76,96%	72,03%	71,62%	74,44%
t-statistic	-4,3378	-1,7435	0,8234	-6,0531
p-value	*0,0000*	*0,0834*	*0,4137*	*0,0000*
skewness-adjusted t-statistic	-4,1523	-1,6466	0,8908	-5,9981
p-value	*0,0001*	*0,1018*	*0,3768*	*0,0000*
bootstrapped skew.-adj. t-statistic	-3,1931	-1,2851	0,5924	-2,6905
bootstrapped skew.-adj. p-value	*0,0027*	*0,2058*	*0,5567*	*0,0102*
Median BHAR	-28,69%	-11,95%	6,33%	-53,49%
sign test	-3,7905	-1,9234	1,3131	-5,5709
p-value	*0,0000*	*0,0229*	*0,1258*	*0,0000*
Minimum BHAR	-252,18%	-252,18%	-252,18%	-199,86%
Maximum BHAR	242,80%	242,80%	225,09%	242,80%
Number positive BHAR	62	60	34	28
Number negative BHAR	112	83	24	88
Number	174	143	58	116

Table 7. Long-run abnormal returns after 60 months

| 60 months	1977-1996	1977-1995	1977-1987	1988-1996
Mean BHR (IPO firms)	19,29%	21,63%	52,18%	-1,67%
Standard deviation BHR	101,23%	102,43%	102,47%	95,18%
Median BHR	-7,68%	-4,86%	34,28%	-22,86%
Mean BHR (Benchmark)	72,79%	71,77%	54,50%	84,45%
Wealth Relative	0,6904	0,7081	0,9850	0,5331
Mean BHAR	-53,50%	-50,13%	-2,32%	-86,12%
Standard deviation BHAR	122,11%	123,18%	100,79%	123,78%
t-statistic	-5,3482	-4,8671	-0,1750	-6,6372
p-value	*0,0000*	*0,0000*	*0,8617*	*0,0000*
skewness-adjusted t-statistic	-4,8438	-1,7446	0,1478	-6,1955
p-value	*0,0000*	*0,0832*	*0,8830*	*0,0000*
bootstrapped skew.-adj. t-statistic	-2,5197	-1,0033	0,0919	-2,0301
bootstrapped skew.-adj. p-value	*0,0156*	*0,3215*	*0,9272*	*0,0487*
Median BHAR	-43,29%	-39,16%	-12,70%	-81,42%
sign test	-5,1612	-4,7666	-0,5252	-6,1849
p-value	*0,0002*	*0,0008*	*0,3496*	*0,0000*
Minimum BHAR	-343,34%	-343,34%	-195,97%	-343,34%
Maximum BHAR	377,06%	377,06%	377,06%	363,30%
Number positive BHAR	43	43	27	16
Number negative BHAR	106	100	31	75
Number	149	143	58	91
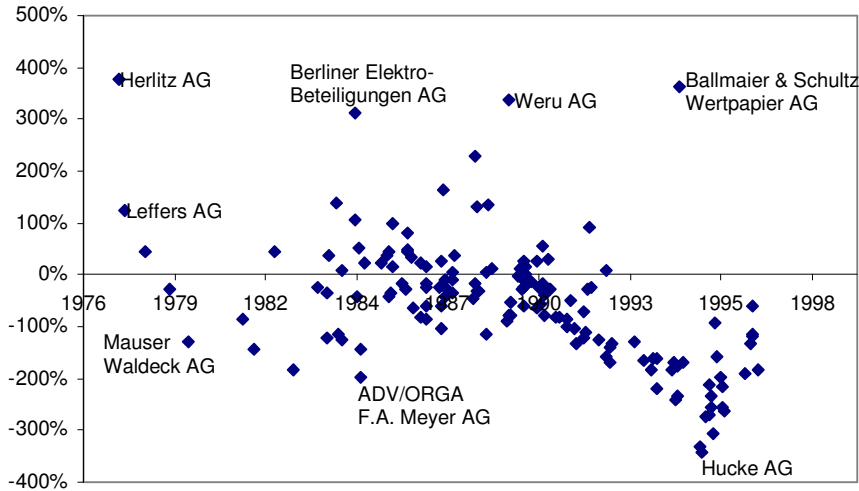
Figure 3. Firm-specific BHARs after 60 months (1977-1996)

Especially in case of the 60-month period analysis the effect of the bootstrapped application of the skewness-adjusted *t*-test can be observed. Whereas regular tests indicate significant at least at the 90% confidence level, the bootstrapped skewness-adjusted test reports much higher *p*-values, especially for the 1977 to 1995 period. The results are in line with Sutton's (1993) theoretical explanations that the *p*-values of non-bootstrapped tests in case of severe skewness are smaller than they should be. Consequently, conventional tests tend to inflate the significance levels. The empirical findings support the methodical objections with regard to the specifications of parametric tests. On the other hand, the differences between non-adjusted *t*-tests and skewness-adjusted *t*-tests are comparatively small. In almost all of the examinations they do not change the predictions of significance versus non-significance. Differences between the parametric measures and non-parametric (rank) measures seem notable. Again: since the literature has not established a universal test technique, all statistical tests have to be treated with caution.

5.2.3 Long-Run Performance by Market Segment

Another aspect is the level of abnormal performance at different market segments. Table 8 splits the analysis for long-run returns into four market segments and applicable time periods.

Table 8. Long-run abnormal returns by market segment

Market segment/ time period	Mean BHR (IPO firms)	Mean BHR (DAFOX)	Wealth Relative	Mean BHAR	Standard deviation BHAR	t-statistic	p-value	Median BHAR	sign test	p-value	Number	Neg.
Panel A: 12 months												
all observations												
1977-1998	8,46%	9,69%	0,9888	-1,23%	46,08%	-0,3527	0,7248	-8,06%	-2,5775	0,0000	174	104
1977-1995	8,68%	7,14%	1,0144	1,54%	32,98%	0,5594	0,5768	-3,72%	-1,7561	0,0000	143	82
1977-1987	9,40%	7,80%	1,0148	1,59%	33,91%	0,3582	0,7215	-0,72%	-0,2626	0,8396	58	30
1988-1998	7,99%	10,63%	0,9761	-2,65%	51,17%	-0,5568	0,5788	-10,13%	-2,9711	0,0000	116	74
Amtlicher Handel												
1977-1998	13,23%	11,38%	1,0166	1,85%	41,16%	0,3487	0,7286	-8,13%	-0,5164	0,4165	60	32
1977-1995	15,89%	9,45%	1,0588	6,44%	38,05%	1,2544	0,2151	-1,97%	-0,1348	0,9143	55	28
1977-1987	15,74%	10,62%	1,0463	5,12%	39,25%	0,7267	0,4730	-7,79%	-0,1796	0,8550	31	16
1988-1998	10,55%	12,19%	0,9854	-1,64%	43,52%	-0,2033	0,8404	-9,21%	-0,5571	0,4238	29	16
Geregelter Markt												
1987-1998	1,54%	7,24%	0,9469	-5,70%	33,20%	-1,5057	0,1363	-9,53%	-3,0769	0,0000	77	52
1987-1995	3,24%	4,00%	0,9927	-0,76%	29,30%	-0,2133	0,8318	-4,51%	-2,4254	0,0000	68	44
Geregelter Freiverkehr												
1977-1987	7,37%	11,46%	0,9633	-4,09%	29,46%	-0,6207	0,5422	-0,18%	0,0000	1,3414	20	10
Neuer Markt												
1997-1998	24,19%	12,72%	1,1017	11,47%	100,65%	0,4697	0,6449	-37,67%	-0,7276	0,2793	17	10
Panel A: 36 months												
all observations												
1977-1998	11,79%	37,10%	0,8154	-25,31%	76,96%	-4,3378	0,0000	-28,69%	-3,7905	0,0000	174	112
1977-1995	25,45%	35,96%	0,9228	-10,50%	72,03%	-1,7435	0,0834	-11,95%	-1,9234	0,0229	143	83
1977-1987	39,38%	31,63%	1,0588	7,74%	71,62%	0,8234	0,4137	6,33%	1,3131	0,1258	58	24
1988-1998	-2,00%	39,83%	0,7008	-41,83%	74,44%	-6,0531	0,0000	-53,49%	-5,5709	0,0000	116	88
Amtlicher Handel												
1977-1998	15,18%	42,98%	0,8056	-27,80%	71,25%	-3,0225	0,0037	-17,84%	-1,0328	0,3195	60	34
1977-1995	22,47%	40,73%	0,8703	-18,26%	66,08%	-2,0492	0,0453	-13,21%	-0,4045	0,5706	55	29
1977-1987	32,16%	28,53%	1,0283	3,63%	50,60%	0,3995	0,6923	6,56%	1,6164	0,0060	31	11
1988-1998	-2,98%	58,43%	0,6124	-61,40%	75,43%	-4,3836	0,0001	-61,29%	-3,1568	0,0018	29	23
Geregelter Markt												
1987-1998	13,42%	36,01%	0,8339	-22,59%	74,92%	-2,6454	0,0099	-36,03%	-3,5328	0,0000	77	54
1987-1995	22,16%	31,62%	0,9281	-9,46%	68,30%	-1,1419	0,2576	-20,83%	-2,6679	0,0005	68	45
Geregelter Freiverkehr												
1977-1987	44,86%	37,58%	1,0529	7,28%	96,97%	0,3357	0,7408	7,02%	0,4472	0,3819	20	9
Neuer Markt												
1997-1998	-46,45%	20,73%	0,4436	-67,18%	65,18%	-4,2498	0,0006	-90,33%	-3,1530	0,0004	17	15

Market segment/ time period	Mean BHR (IPO firms)	Mean BHR (DAFOX)	Wealth Relative	Mean BHAR	Standard deviation BHAR	t-statistic	*p-value*	Median BHAR	sign test	*p-value*	Number	Neg.
Panel A: 60 months												
all observations												
1977-1996	19,29%	72,79%	0,6904	-53,50%	122,11%	-5,3482	*0,0000*	-43,29%	-5,1612	*0,0002*	149	106
1977-1995	21,63%	71,77%	0,7081	-50,13%	123,18%	-4,8671	*0,0000*	-39,16%	-4,7666	*0,0008*	143	100
1977-1987	52,18%	54,50%	0,9850	-2,32%	100,79%	-0,1750	*0,8617*	-12,70%	-0,5252	*0,3496*	58	31
1988-1996	-1,67%	84,45%	0,5331	-86,12%	123,78%	-6,6372	*0,0000*	-81,42%	-6,1849	*0,0000*	91	75
Amtlicher Handel												
1977-1996	20,10%	77,13%	0,6780	-58,71%	126,62%	-3,5010	*0,0009*	-47,65%	-2,7815	*0,0702*	57	39
1977-1995	22,30%	75,76%	0,6959	-55,30%	127,41%	-3,2187	*0,0022*	-43,29%	-2,5620	*0,0903*	55	37
1977-1987	54,66%	49,53%	1,0343	2,72%	104,84%	0,1444	*0,8861*	5,81%	0,1796	*0,3765*	31	15
1988-1996	-21,10%	110,05%	0,3757	-131,96%	111,63%	-6,0276	*0,0000*	-142,54%	-4,3146	*0,0098*	26	24
Geregelter Markt												
1987-1996	6,32%	68,54%	0,6308	-62,22%	119,76%	-4,4085	*0,0000*	-60,45%	-4,7140	*0,0010*	72	56
1987-1995	8,72%	67,30%	0,6499	-58,57%	121,81%	-3,9654	*0,0002*	-56,49%	-4,3656	*0,0027*	68	52
Geregelter Freiverkehr												
1977-1987	63,68%	70,92%	0,9576	-7,24%	112,57%	-0,2876	*0,7768*	-21,07%	-0,4472	*0,3353*	20	11
Neuer Markt												
1997-1998	n/a	n/a	n/a	n/a	n/a	n/a	*n/a*	n/a	n/a	*n/a*	n/a	n/a

Starting with the analysis of 12-month BHARs, the relatively small range of BHRs (7.99% to 9.40%) and BHARs (-2.65% to 1.59%) for the examination of the entire sample of 174 family firms broadens when splitting the data sample into market segments. IPOs at the *Amtlicher Handel* earned on average higher BHRs ranging from 10.55% to 15.89%. Mean adjusted returns insignificantly outperformed the market by 6.44% for the subperiod of 1977 to 1995. The stock market decline during the late 1990's affected BHARs for the most recent period: Family firms floated between 1988 and 1998 underperformed with a mean of –1.64% and a median of –9.21%. Returns at the second segment, the *Geregelter Markt*, were on average smaller. Since its introduction in 1987 family firms only earned 1.54% in absolute measures and significantly underperformed the DAFOX by –5.70%. IPOs at the *Geregelter Freiverkehr* between 1977 and its discontinuance in 1987 performed worse in comparison to more restrictive market segments. Not surprisingly, 12-month returns at the *Neuer Markt* outperformed all other family-owned firms as their return series until the end of 1999 were not affected by the subsequent decline. On the other hand, the median 12-month BHAR at the *Neuer Markt* moderates the outperformance. Excluding the *Neuer Markt*, the prediction holds true that market segments with more restrictive listing requirements attract companies with – assumably – a higher quality and, as a consequence, superior long-run returns.

The results at the *Neuer Markt* are even worse when analyzing 36-month returns. 17 flotations of family firms lost some 46% and significantly underperformed the market by –67.18% at the 99% confidence level. IPOs at the *Geregelter Freiverkehr* between 1977 and 1987 earned the highest raw (44.86%) and market-adjusted returns (7.28%). BHARs do not differ significantly from zero and show the highest standard deviation. Family firms floated at its successor, the *Geregelter Markt*, did not continue those positive results. Mean (median) BHARs were –9.46% (-20.83%) during the first 9 years and –22.59% (-36.03%) for the period of 1987 to 1998. Examinations for IPOs at the prime segment

reveal that their performance is biased by significantly underperforming flotations in the 1995 to 1998 period. Whereas IPOs between 1977 and 1987 earned the highest unadjusted returns and positive market-adjusted returns, both expressed as mean and median, the second group of family businesses that floated their shares at the *Amtlicher Handel* between 1988 and 1998 faced a statistically significant underperformance of more than –60%. In comparison to 12-month returns the picture for the 36-month holding period is less clear. The correlation between the quality of the market segment and the amount of adjusted performance cannot be transferred to the 36-month analysis. The correlation does not hold true for the 60-month analysis aswell: Earlier IPOs, i.e. between 1977 and 1987, earned higher unadjusted returns at the *Geregelter Freiverkehr* in comparison to the *Amtlicher Handel*. The sign changes when examining BHARs. Flotations at the *Geregelter Freiverkehr* insignificantly underperformed by a mean –7.24% and a median –21.07%. Contrary, IPOs at the *Amtlicher Handel* insignificantly overperformed by 2.72% and 5.81%, respectively. The puzzle also remains during the second half of the sample period: IPOs at the prime segment earned negative returns after 60 months and significantly underperformed both in terms of means (–131.96%) and medians (–142.54%). Although the performance of family firms floated in 1997 and 1998 is excluded in the 60-month analysis, the remaining sample is affected both by the *bullish* stock markets until 2000 and the decline since 2000. Probably, these effects are amplified by the compounding calculation method of BHARs. Finally, comparisons of the 3 Panels in Table 8 indicate that the standard deviations of BHARs increased over time, independently of the market segment.

5.2.4 Long-Run Performance by Industry Sector

This section analyzes long-run returns by industry sectors. Industry classifications are based on 11 industry segmentations provided by KKMDB. Table 9 represents the results.

Table 9. Long-run abnormal returns by industry sector (1977-1998)

Industry segment	Mean BHR (IPO firms)	Mean BHR (DAFOX)	Wealth Relative	Mean BHAR	Standard deviation BHAR	t-statistic	p-value	Median BHAR	sign test	p-value	Number	Neg.
Panel A: 12 months												
Consumer Goods, Food, Paper, Leisure	4,83%	10,19%	0,9513	-5,37%	34,75%	-1,0247	0,3112	-12,96%	-2,4121	0,0000	44	30
Automobile & Machinery	-2,00%	6,67%	0,9187	-8,67%	23,38%	-2,1936	0,0352	-11,43%	-1,5213	0,0000	35	22
Electrical Engineering & Electronics	19,43%	12,01%	1,0663	7,42%	77,98%	0,5383	0,5942	-4,90%	-0,7071	0,3097	32	18
Construction	1,36%	6,60%	0,9509	-5,24%	40,79%	-0,6291	0,5355	-2,29%	-1,2247	0,0157	24	15
Chemicals & Pharmaceuticals	17,54%	15,16%	1,0207	2,39%	48,83%	0,1693	0,8687	-1,67%	0,0000	0,8160	12	6
Miscellaneous	3,41%	1,63%	1,0175	1,78%	40,38%	n/a	n/a	-0,52%	n/a	n/a	8	4
Department Stores	31,64%	12,97%	1,1653	18,67%	33,40%	n/a	n/a	10,51%	n/a	n/a	6	1
Holdings	37,20%	6,69%	1,2860	30,51%	33,36%	n/a	n/a	26,28%	n/a	n/a	5	1
Banks & Insurances	-11,16%	22,30%	0,7264	-33,46%	25,04%	n/a	n/a	-26,42%	n/a	n/a	4	4
Utilities	43,42%	20,29%	1,1923	23,14%	44,51%	n/a	n/a	23,14%	n/a	n/a	2	1
Transportation & Logistics	9,51%	12,66%	0,9720	-3,15%	0,80%	n/a	n/a	-3,15%	n/a	n/a	2	2
Panel B: 36 months												
Consumer Goods, Food, Paper, Leisure	17,01%	39,02%	0,8417	-22,00%	68,62%	-2,1268	0,0392	-17,31%	-1,8091	0,0398	44	28
Automobile & Machinery	-6,37%	36,30%	0,6869	-42,67%	51,51%	-4,9009	0,0000	-40,18%	-2,8735	0,0000	35	26
Electrical Engineering & Electronics	4,83%	28,04%	0,8187	-23,22%	83,50%	-1,5728	0,1259	-49,49%	-1,7678	0,0881	32	21
Construction	-4,60%	41,76%	0,6730	-46,35%	99,42%	-2,2842	0,0319	-41,38%	-2,0412	0,1139	24	17
Chemicals & Pharmaceuticals	19,69%	52,22%	0,7863	-32,53%	76,45%	-1,4742	0,1685	-6,49%	0,0000	0,4767	12	6
Miscellaneous	-2,73%	27,81%	0,7610	-30,54%	45,67%	n/a	n/a	-34,16%	n/a	n/a	8	7
Department Stores	50,64%	17,12%	1,2862	33,52%	61,49%	n/a	n/a	43,86%	n/a	n/a	6	1
Holdings	114,84%	28,22%	1,6755	86,62%	102,35%	n/a	n/a	91,33%	n/a	n/a	5	1
Banks & Insurances	26,18%	66,58%	0,7575	-40,40%	77,01%	n/a	n/a	-54,50%	n/a	n/a	4	3
Utilities	110,69%	68,31%	1,2518	42,39%	89,65%	n/a	n/a	42,39%	n/a	n/a	2	1
Transportation & Logistics	31,68%	36,29%	0,9662	-4,61%	77,19%	n/a	n/a	-4,61%	n/a	n/a	2	1
Panel C: 60 months[1]												
Consumer Goods, Food, Paper, Leisure	10,74%	71,68%	0,6450	-60,94%	124,89%	-3,2000	0,0026	-34,01%	-2,2875	0,1295	43	29
Automobile & Machinery	-2,91%	65,16%	0,5878	-68,07%	74,57%	-5,0825	0,0000	-60,43%	-4,1309	0,0000	31	27
Electrical Engineering & Electronics	26,96%	62,15%	0,7830	-35,19%	102,49%	-1,5355	0,1412	-46,30%	-1,7889	0,1457	20	14
Construction	-2,04%	75,58%	0,5579	-77,62%	128,45%	-2,7693	0,0118	-86,13%	-3,2733	0,0469	21	18
Chemicals & Pharmaceuticals	28,66%	87,84%	0,6850	-59,18%	102,26%	-1,8301	0,1005	-23,47%	-0,6325	0,3898	10	6
Miscellaneous	1,29%	89,66%	0,5341	-88,37%	103,77%	n/a	n/a	-78,81%	n/a	n/a	7	5
Department Stores	99,18%	62,18%	1,2282	37,01%	112,57%	n/a	n/a	43,72%	n/a	n/a	6	1
Holdings	66,12%	61,44%	1,0290	4,69%	187,54%	n/a	n/a	-25,76%	n/a	n/a	5	3
Banks & Insurances	276,45%	98,75%	1,8941	177,70%	216,04%	n/a	n/a	229,24%	n/a	n/a	3	1
Utilities	-74,79%	257,32%	0,0705	-332,11%	n/a	n/a	n/a	-332,11%	n/a	n/a	1	1
Transportation & Logistics	15,46%	86,91%	0,6177	-71,45%	240,26%	n/a	n/a	-71,45%	n/a	n/a	2	1

[1] IPOs in 1997 and 1998 are excluded.

The analysis of Table 9 does not provide a clear outcome: The 6 industries displayed first, i.e. consumer goods to miscellaneous, all show a decreasing long-run performance in terms of market-adjusted returns. E.g. the automobile and machinery industries underperform by a significant –8.67% after 12 months, decline to –42.67% after 36 and to –68.07% after 60 months. None of these 6 industries overperforms after 3 and 5 years, respectively. The performance of the remaining 5 industries is ambiguously and has to be treated with extreme caution due to the very small numbers of observations: Whereas the level and direction of their abnormal performance is more distinctive after 12 months in comparison to other industries, this effect even increases after 36 and 60 months. One firm in the utilities sector (*Sero Entsorgung AG*) underperforms by an extreme –332.11% whereas 3 financial firms outperform by 177.70%. Surprisingly, a sample of 5 industry holdings seems to follow the market performance. An diversification discount cannot be observed.

Comparisons by pairs regarding the 6 largest industry sectors for 12-, 36- and 60-month holding periods do not produce any statistically significant differences at the 90% confidence level. Thus, a buy-and-hold investment strategy based on industry sectors did not achieve any persistent advantages.

5.2.5 Long-Run Performance by Ownership Structure

This section investigates the long-run performance of family firm IPOs differentiated by the extent of family involvement in the firm. The segmentation presented in Table 10 is guided by Morck, Shleifer and Vishny (1988), McConnell and Servaes (1990) as well as Ehrhardt and Nowak (2000a). Ownership concentration, i.e. the percental fraction of equity held by family members, is employed as an indicator for the degree of power exerted by the family. In case the findings do not present clear evidence that firms with a specific degree of family involvement under- or outperform in comparison to firms with different ownership structures, one could argue that Demsetz and Lehn's (1985) hypothesis and findings are supported. Ownership could be considered as an endogenous outcome which does have no impact on firm value in an efficient capital market.

Table 10. Long-run abnormal returns by family equity ownership fraction (1977-1998)

Equity Fraction	Mean BHR (IPO firms)	Mean BHR (DAFOX)	Wealth Relative	Mean BHAR	Standard deviation BHAR	t-statistic	p-value	Median BHAR	sign test	p-value	Number	Neg.
Panel A: 12 months												
0% - 50%	10,88%	11,58%	0,9937	-0,70%	38,39%	-0,0576	0,9554	-13,27%	-0,6325	0,2757	10	6
50% - 60%	5,21%	9,61%	0,9599	-4,40%	42,33%	-0,5691	0,5737	-9,48%	-0,7303	0,2532	30	17
60% - 70%	3,66%	9,01%	0,9509	-5,35%	73,35%	-0,4059	0,6877	-8,34%	-1,9757	0,0175	31	21
70% - 80%	14,21%	10,90%	1,0298	3,30%	40,84%	0,5242	0,6030	-2,80%	-0,3086	0,6884	42	22
80% - 90%	3,94%	13,50%	0,9157	-9,56%	32,79%	-0,8749	0,4071	-5,26%	-1,6667	0,0000	9	7
90% - 100%	8,86%	8,14%	1,0067	0,72%	34,63%	0,1508	0,8807	-6,49%	-1,3868	0,0003	52	31
Panel B: 36 months												
0% - 50%	15,14%	44,73%	0,7956	-29,59%	95,85%	-0,9762	0,3545	-32,03%	-0,6325	0,3913	10	6
50% - 60%	9,17%	33,32%	0,8188	-24,15%	94,39%	-1,4015	0,1717	-54,07%	-1,4606	0,1836	30	19
60% - 70%	-4,15%	31,31%	0,7300	-35,46%	67,88%	-2,9084	0,0068	-49,02%	-2,6941	0,0015	31	23
70% - 80%	-6,34%	43,44%	0,6529	-49,78%	77,55%	-4,1603	0,0002	-58,38%	-2,7775	0,0068	42	30
80% - 90%	72,60%	66,20%	1,0385	6,40%	62,99%	0,3048	0,7683	-21,01%	-1,0000	0,1521	9	6
90% - 100%	26,28%	31,10%	0,9632	-4,82%	63,80%	-0,5447	0,5883	-1,35%	-0,5547	0,4563	52	28
Panel C: 60 months[1]												
0% - 50%	51,92%	86,80%	0,8133	-34,88%	115,06%	-0,8021	0,4531	30,46%	0,3780	0,2840	7	3
50% - 60%	9,74%	69,78%	0,6463	-60,05%	135,39%	-2,3046	0,0294	-47,13%	-2,5019	0,1099	27	20
60% - 70%	19,23%	79,57%	0,6640	-60,33%	131,01%	-2,1104	0,0476	-78,81%	-2,8368	0,0712	21	17
70% - 80%	1,20%	76,04%	0,5749	-74,84%	127,76%	-3,4155	0,0017	-78,89%	-3,0870	0,0585	34	26
80% - 90%	51,85%	129,62%	0,6613	-77,77%	141,55%	-1,5540	0,1641	-85,00%	-0,7071	0,2815	8	5
90% - 100%	26,70%	58,87%	0,7975	-32,16%	106,65%	-2,1746	0,0343	-24,46%	-2,4962	0,0468	52	35

[1] IPOs in 1997 and 1998 are excluded.

Table 11. Correlation between fractional family ownership and BHARs (1977-1998)

Coefficients of correlations	12 months	36 months	60 months[1]
Pearson	-0,0279	0,2115	0,0765
p-value	0,7148	0,0050***	0,3540
Spearman	-0,0133	0,1899	0,0921
p-value	0,8615	0,0125**	0,2626
Kendall's Tau	-0,0055	0,1286	0,0659
p-value	0,9140	0,0120**	0,2651

[1] IPOs in 1997 and 1998 are excluded.

$p \leq 0.1$ indicates significance at the 10% level, respectively ** $p \leq 0.05$, *** $p \leq 0.01$.

As noted before, long-run performance one year after the IPO does not produce any significant results. The results presented in Panel A, both BHRs and BHARs, offer no clear evidence in favor of one direction. E.g. firms with 90% to 100% family ownership, the largest group, faced an average mean close to zero abnormal return whereas the group with lowest family ownership fractions seems to have similar characteristics. The coefficients of correlation in Table 11 indicate a slightly negative, but non-significant correlation. Comparisons by pairs do not produce statistically significant differences.

36-month results, displayed in Panel B, can be interpreted as follows: IPO firms with highest family ownership produce close to zero BHARs as indicated by the mean (–4.82%) and the median (–1.35%). The returns of these 52 firms have one of the lowest standard deviations. Firms with smaller equity stakes held by family members perform worse in terms of BHRs and BHARs. The 80% to 90% group biases the

findings because of some outliers. Nevertheless, the coefficients of correlation show a highly significant positive correlation between 36-month BHARs and fractional family ownership. The higher the stake held by family members the better the market-adjusted long-run performance.

A similar relation, although weaker and not significant, can be observed for the 60-month analysis. Firms with very small family ownership stakes perform the best in terms of BHRs. Because of the small number the BHAR of –34.88% is less meaningful, whereas the median is positive with 30.46%. Firms characterized by family ownership between 50% and 90% underperform by some –60% to –75% and have higher standard deviations. The last group where family members hold 90% to 100% earns unadjusted returns of 26.70% but underperforms the market by a significant –32.16%. These findings are opposite to the results presented by Ehrhardt and Nowak (2000a) who detect positive excess returns for

voting right concentrations between 25% and 75%. Linear relations, expressed in Table 11, are weak for the entire sample of 174 family firm IPOs between 1977 and 1998. Clustering with regard to equity ownership fractions does not support the models presented in Chapter 3.2.

A similar analysis performed by level of family involvement as measured with regard to the definition developed in Chapter 3.3 is presented in Table 12. There seems to be clear evidence that 5 firms with the highest family involvement (quotient greater than 250%) underperform the worst after one year, but

outperform after 36 and 60 months. Notably, the number is very small and the standard deviations are very high – some twice as high as in other groups. The evidence for the 4 other groups is less definite after 1 year and 3 years. Panel C shows that the higher the level of family influence, the higher the abnormal performance in terms of BHARs. BHARs range from –93.71% to –9.25%. Contrary to the analysis by fractional clusters, the coefficients of correlation presented in Table 13 confirm the findings of this section.

Table 12. Long-run abnormal returns by family involvement (1977-1998)

Family Firm Definition	Mean BHR (IPO firms)	Mean BHR (DAFOX)	Wealth Relative	Mean BHAR	Standard deviation BHAR	t-statistic	p-value	Median BHAR	sign test	p-value	Number	Neg.
Panel A: 12 months												
0% - 100%	11,06%	15,98%	0,9575	-4,92%	30,93%	-0,9006	0,3748	-8,77%	-1,4142	0,0001	32	20
100% - 150%	12,21%	8,61%	1,0332	3,61%	55,65%	0,5306	0,5975	-4,32%	-0,6108	0,3648	67	36
150% - 200%	4,03%	8,27%	0,9608	-4,24%	38,41%	-0,6805	0,5004	-5,01%	-1,2978	0,0050	38	23
200% - 250%	4,42%	5,14%	0,9931	-0,72%	47,74%	-0,0856	0,9323	-8,95%	-2,1213	0,0000	32	22
250% - 300%	0,97%	23,83%	0,8155	-22,85%	28,78%	-1,7754	0,1505	-18,71%	-0,4472	1,0385	5	3
Panel B: 36 months												
0% - 100%	11,40%	54,83%	0,7195	-43,43%	72,79%	-3,3750	0,0020	-56,62%	-2,4749	0,0108	32	23
100% - 150%	-1,09%	31,40%	0,7528	-32,49%	71,46%	-3,7214	0,0004	-38,89%	-3,0542	0,0004	67	46
150% - 200%	26,25%	41,85%	0,8900	-15,60%	86,26%	-1,1151	0,2720	-7,34%	-0,6489	0,3928	38	21
200% - 250%	7,67%	22,42%	0,8795	-14,75%	67,41%	-1,2377	0,2251	-28,19%	-1,7678	0,0329	32	21
250% - 300%	103,32%	57,78%	1,2886	45,54%	123,50%	0,8245	0,4560	24,85%	1,3416	0,2497	5	1
Panel C: 60 months[1]												
0% - 100%	-0,06%	93,66%	0,5161	-93,71%	101,72%	-4,7872	0,0001	-81,42%	-3,6566	0,0110	27	23
100% - 150%	7,00%	69,19%	0,6325	-62,18%	109,35%	-4,2172	0,0001	-60,43%	-3,9104	0,0040	55	42
150% - 200%	27,23%	80,28%	0,7058	-53,04%	132,27%	-2,3726	0,0235	-34,01%	-2,5355	0,0956	35	25
200% - 250%	36,55%	45,80%	0,9365	-9,25%	125,89%	-0,3820	0,7056	-15,82%	-0,5774	0,2942	27	15
250% - 300%	110,18%	93,17%	1,0881	17,02%	199,75%	0,1905	0,8582	7,89%	1,3416	0,1682	5	1

[1] IPOs in 1997 and 1998 are excluded.

Table 13. Correlation between fractional family involvement and BHARs (1977-1998)

Coefficients of correlations	12 months	36 months	60 months[1]
Pearson	-0,0279	0,2118	0,2635
p-value	*0,7148*	*0,0050*****	*0,0012****
Spearman	-0,0133	0,1899	0,2411
p-value	*0,8615*	*0,0125***	*0,0034****
Kendall's Tau	-0,0055	0,1286	0,1591
p-value	*0,9140*	*0,0120'**	*0,0041****

[1] IPOs in 1997 and 1998 are excluded.

$p \leq 0.1$ indicates significance at the 10% level, respectively ** $p \leq 0.05$, *** $p \leq 0.01$.

As argued in Chapter 3.3 family influence should be higher in family-owned businesses where the positions of the chairman of the management board and/or supervisory board are occupied by family members. In line with McConaughy *et al.* (1998) offering evidence that managerial ownership holds

little relation for firm value, it can be hypothesized that it is more important *who* runs or controls the business. The authors, analyzing operational performance, find empirical support for Fama and Jensen's (1983) suggestions in a sample of 219 founding family controlled firms in the United States

that family relationships improve monitoring while providing incentives that are associated with better firm performance. On the other hand, Morck *et al.* (1988) find out that for older firms Tobin's *q* is lower when a founding family holds one of the top management positions than when the firm is run by a professional manager. For a sample of Israeli firms Lauterbach and Vaninsky (1999) point out that family

firms run by their owners perform relatively worse in comparison to family firms managed by professionals. Thus, the subsequent Table splits the data sample into a group of firms where a family member occupied one of the top management positions at the time of the IPO and into a second group where professional managers ran and controlled the firm.

Table 14. Long-run abnormal returns by type of family involvement (1977-1998)

Panel A: **Long-Run Performance** **1977-1998**	**12 months**		**36 months**		**60 months**[1]	
	CEO/Chairman: Family Members	CEO/Chairman: Non-Family	CEO/Chairman: Family Members	CEO/Chairman: Non-Family	CEO/Chairman: Family Members	CEO/Chairman: Non-Family
Mean BHR (IPO firms)	8,01%	10,98%	11,30%	14,60%	21,05%	9,65%
Standard deviation BHR	50,58%	46,04%	73,49%	80,95%	101,92%	99,01%
Median BHR	1,01%	3,03%	-4,16%	8,75%	-6,85%	-12,12%
Mean BHR (Benchmark)	8,63%	15,73%	34,76%	50,39%	69,70%	89,76%
Wealth Relative	0,9943	0,9590	0,8259	0,7620	0,7133	0,5779
Mean BHAR	-0,61%	-4,75%	-23,47%	-35,80%	-48,64%	-80,10%
Standard deviation BHAR	46,71%	43,00%	77,18%	76,30%	116,61%	148,89%
t-statistic	-0,1600	-0,5629	-3,6986	-2,3920	-4,6825	-2,5801
p-value	*0,8731*	*0,5785*	*0,0003*	*0,0246*	*0,0000*	*0,0171*
skewness-adjusted t-statistic	-0,1183	-0,5293	-3,6287	-1,7703	-4,1607	-2,3823
p-value	*0,9060*	*0,6013*	*0,0004*	*0,0889*	*0,0001*	*0,0263*
Median BHAR	-8,35%	-6,63%	-27,51%	-44,60%	-40,78%	-70,41%
sign test	-2,1372	-1,5689	-3,1236	-2,3534	-4,4544	-2,7107
p-value	*0,0000*	*0,0018*	*0,0005*	*0,0171*	*0,0010*	*0,1177*
Minimum BHAR	-101,84%	-95,64%	-252,18%	-158,31%	-305,25%	-343,34%
Maximum BHAR	342,18%	120,48%	225,09%	242,80%	377,06%	337,46%
Number positive BHAR	61	9	55	7	38	5
Number negative BHAR	87	17	93	19	88	18
Number	148	26	148	26	126	23

Panel B: Test Statistics	**12 months**	**36 months**	**60 months**
two sample t-statistic	0,4207	0,7525	1,1373
p-value	*0,6745*	*0,4528*	*0,2573*
Mann-Whitney U-test	1849,0000	1693,0000	1282,0000
p-value	*0,7531*	*0,3305*	*0,3817*
Kolmogorov-Smirnov test	0,5353	0,9948	0,7838
p-value	*0,9368*	*0,2767*	*0,5708*

[1] IPOs in 1997 and 1998 are excluded.

The 12-month analysis in Panel A does not show significant differences between the two groups. Mean BHARs for family-managed firms are –0.61%. The other group of firms which are not managed or controlled by family members underperforms by –4.75%, although these firms earn slightly higher unadjusted returns of some 11%. BHARs for both groups do not significantly differ from zero as indicated by 3 tests. More interestingly is the number of firms in both groups: The vast majority of 148 firms is managed and/or controlled by family members. Statistical tests in Panel B do not produce any statistically significant differences between the means, medians and distributions of the two groups of firms.

Differences between the two groups remain insignificant for the 36- and 60-month analysis, although both mean and median BHARs indicate that the group of family-managed firms underperforms

less than the smaller, second group. 3 years after the flotations the first group underperforms by a mean –23.47% and a median –27.51%, whereas the second group underperforms by –35.80% and –44.60%, respectively. Again, absolute measures are higher for the second group of family firms. This relations reverses after 60 months: Family-managed or –controlled firms earned a BHR of 21.05% whereas the other group only earned some 10%. Corresponding medians are both negative with –6.85% and –12.12%, respectively. Market-adjusted returns provide better evidence: The first group underperforms the DAFOX by –48.64%. The second group underperforms by an astounding and also significant –80.10%. Remarkably are the standard deviations of both measures. Ranges amount to some 700%. Although the differences are not statistically significant, their economical extent is.

The empirical findings seem to support Fama and

Jensen's (1983) suggestion: It is an important issue *who* runs and controls the firm. Family members seem to have a positive impact on firm performance supporting the agency view of the firm, predicting that agency conflicts are reduced in those firms. Furthermore, they reject the rent-protection view of the firm, predicting that families try to expropriate minority shareholders. On the other hand, these findings should not be taken as stylized facts as the classification into one of the two groups is based on incomplete information. As noted before, especially in older firms data inavailability problems arise due to the fact that family members could have changed their family names. Other thinkable obstacles are situations where a family acquired another firm which was founded by another family and kept its traditional name.

5.2.6 Long-Run Performance by Type of Shares

Most of the literature argues that dual class share structures are most typical with concentrated ownership driven by families who try to keep their private benefits of control. As a consequence, rational investors should value firms issuing shares using dual class structures and solely non-voting preference stock, respectively, with a discount in comparison to other IPO firms. E.g. Ehrhardt and Nowak (2000a) examining a sample of 105 German family firms point out that the underperformance can only be attributed to the significant underperformance of firms issuing non-voting shares. These 41 firms underperformed

significantly by –18.74% whereas the other group of 65 firms issuing ordinary shares overperformed the market by an insignificant 0.71%. Ehrhardt and Nowak argue that although differences in means between these two samples are not statistically significant the economic insight is definite.

Table 15 splits the entire sample of 174 firms into two groups: (i) Family firms issuing solely ordinary shares and (ii) firms floating non-voting preference shares or preference shares in conjunction with common stock. As no preference shares were issued in 1997 and 1998 all IPOs in these two years were excluded reducing the sample to 149 firms.

The findings presented in Table 15 are not in line with Nowak and Ehrhardt's (2000a) results. The theoretical argumentation quoted before has to be rejected: 5 years after the issuance ordinary shares perform worse in comparison to the control group of preference shares. Whereas the first group has mean and median BHARs of some –60%, significantly different from zero, the second group underperforms by 'only' –39.67% and –25.24%, respectively. Interestingly, mean BHRs equal, but standard deviations of BHARs do not. Tests regarding differences in means, medians and distributions do not provide statistically significant differences between the two groups. The direction of the results does not change when analyzing 36-month returns. Again, family firms issuing ordinary shares perform worse than family-owned firms that issued preference shares or both types of shares.

Table 15. Long-run abnormal returns by type of shares (1977-1996)

Panel A: Long-Run Performance 1977-1996	12 months		36 months		60 months	
	Ordinary Shares	Preference Shares	Ordinary Shares	Preference Shares	Ordinary Shares	Preference Shares
Mean BHR (IPO firms)	11,06%	7,26%	26,76%	18,11%	19,06%	19,67%
Standard deviation BHR	36,40%	34,87%	73,22%	64,75%	106,57%	92,87%
Median BHR	6,69%	-3,27%	11,58%	7,57%	-15,68%	0,76%
Mean BHR (Benchmark)	9,31%	7,87%	43,46%	31,48%	81,12%	59,34%
Wealth Relative	1,0161	0,9943	0,8836	0,8983	0,6573	0,7510
Mean BHAR	1,76%	-0,62%	-16,70%	-13,37%	-62,07%	-39,67%
Standard deviation BHAR	32,26%	34,17%	78,30%	70,49%	131,11%	105,63%
t-statistic	0,5219	-0,1366	-2,0462	-1,4319	-4,5408	-2,8355
p-value	*0,6030*	*0,8918*	*0,0436*	*0,1577*	*0,0000*	*0,0064*
skewness-adjusted t-statistic	0,5592	-0,0965	-1,8920	-1,4370	-3,9892	-2,6641
p-value	*0,5774*	*0,9235*	*0,0617*	*0,1563*	*0,0001*	*0,0101*
Median BHAR	-2,28%	-8,46%	-20,83%	-13,21%	-59,94%	-25,24%
sign test	-0,8341	-1,9868	-1,8766	-1,4570	-4,1703	-3,0464
p-value	*0,0380*	*0,0000*	*0,0470*	*0,0972*	*0,0078*	*0,0162*
Minimum BHAR	-62,77%	-67,09%	-199,86%	-252,18%	-343,34%	-274,22%
Maximum BHAR	120,48%	150,82%	242,80%	225,09%	377,06%	310,34%
Number positive BHAR	42	21	37	23	26	17
Number negative BHAR	50	36	55	34	66	40
Number	92	57	92	57	92	57
Panel B: Test Statistics	**12 months**		**36 months**		**60 months**	
two sample t-statistic	0,4267		-0,2623		-1,0887	
p-value	*0,6702*		*0,7934*		*0,2781*	
Mann-Whitney U-test	2484,0000		2781,0000		2986,0000	
p-value	*0,5912*		*0,5359*		*0,1557*	
Kolmogorov-Smirnov test	0,6222		0,7252		1,1924	
p-value	*0,8336*		*0,6690*		*0,1116*	

5.2.7 Correlation of Initial Returns and Long-Run Performance

Aggarwal and Rivoli (1990) argue that there are 'fads' in the IPO market. They define fads as 'a temporary overvaluation caused by over-optimism on the part of investors'. As they find two explanations for the underpricing phenomenon – (i) underwriters systematically and deliberately underprice IPOs and (ii) IPOs are subject to an overvaluation or fads in early aftermarket trading – it seems reasonable to set initial returns and long-run performance into correlation. In case the fads hypothesis proves true, a negative correlation between initial returns and long term performance should be observed. Table 16 displays coefficients of correlations as introduced before.

Table 16. Correlation between unadjusted initial returns and BHARs (1977-1998)

Coefficients of correlations	1 month	3 months	6 months	12 months	36 months	60 months[1]
Pearson	-0,0261	-0,0671	-0,0299	0,0010	-0,1069	0,1102
p-value	*0,7323*	*0,3788*	*0,6952*	*0,9893*	*0,1605*	*0,1810*
Spearman	0,2093	0,2879	0,2245	0,1007	0,0017	0,1368
p-value	*0,0059****	*0,0002****	*0,0031****	*0,1855*	*0,9825*	*0,0961**
Kendall's Tau	0,1617	0,2197	0,1629	0,0770	-0,0032	0,0939
p-value	*0,0017****	*0,0000****	*0,0016****	*0,1351*	*0,9502*	*0,0938**

[1] IPOs in 1997 and 1998 are excluded.

Contrary to Ehrhardt (1997) who finds a non-significant but slightly negative correlation, the results displayed in Table 16 are less definite: The Pearson coefficient documents lightly negative relations during the first 6 months. It turns meaningsless after one year, again negative after 36 months and positive after 60 months. Contrary to that, both rank measures find a statistically significant and positive correlation between initial returns and BHARs during the first 6 months after the flotations. Both measures remain positive but lose their significance. The correlations become significant again after 60 months. In line with Ehrhardt's argumentation the documented patterns do not seem to support the fad hypothesis. Probably, there is no direct or causal relation between the levels of underpricing and long-run abnormal performance. These findings are consistent with those for the capital market in the United States as presented by Ritter and Welch (2002).

5.2.8 Control Sample of Non-Family Initial Public Offerings

The long-run performance of family firm IPOs is compared to a sample of flotations of non-family firms. The control-firm portfolio originally comprises 176 companies. 45 firms are excluded because stock price data was not available. KKMDB provided stock prices for the majority of 112 companies. For the remaining 19 companies stock data was obtained from the Bloomberg Database. As Bloomberg data does not consider dividend payments potential biases could occur. These effects are expected to be minimal as 14 out of the 19 firms went public during the last two years, i.e. in 1997 and 1998. Finally, the long-run control sample of non-family firms contains 131 firms. The distribution of IPO events over time significantly differs between the two samples. Almost half of these firms, i.e. a number of 67 companies, went public during the most recent three years. Consequently, Table 17 compares the long-run performance of family firms versus the returns of non-family firms for the 1977 to 1995 period and for 12-, 36- and 60-month holding periods.

The 12-month analysis in Panel A reveals that there are almost no differences between the two groups. All measures, e.g. BHR, wealth relative, mean and median BHAR, fall into a very small range. Both groups perform insignificantly compared to the DAFOX. As noted before, the group of family firms is more than twice as large as the control group of non-family firms. Values for minimum and maximum are slighty larger for the group of firms mentioned first. However, this does not alter the test statistics in Panel A. Besides, Panel B provides strong evidence that there are no statistically significant differences between the two groups.

All tests regarding differences between market-adjusted long-run returns of family firms and non-family firms remain insignificant when examining returns for the 36-month holding period. Corresponding results presented in Panel A support these findings. Although both mean and median non-family BHRs are about 10% higher in comparison to unadjusted figures for family firm returns, measures for wealth relatives as well as mean BHARs indicate that family firm perform worse. The mean BHAR amounts to –10.50%. Non-family firms underperform by 'only' –4.65%. *t*-tests as well as the sign test indicate that the underperformance of family firms is weakly significant. Two other facts have to be highlighted: (i) Standard deviations are almost equal with some 72% and (ii) the worst family firm underperforms by –252.18% whereas the worst non-family firm obtained a BHAR of

only –150.09%. Unfortunately, the evidence with regard to underperforming family firms is weakened by the figures for medians. The median BHAR is

11.95% for the group of family firms whereas non-family firms have a median BHAR of –17.81% after 36 months.

Table 17. Comparison of long-run returns of family firms versus non-family firms (1977-1995)

Panel A: Long-Run Performance 1977-1995	12 months		36 months		60 months	
	Family Firms	Control Sample: Non-Family	Family Firms	Control Sample: Non-Family	Family Firms	Control Sample: Non-Family
Mean BHR (IPO firms)	8,68%	9,07%	25,45%	34,70%	21,63%	37,45%
Standard deviation BHR	35,79%	35,21%	70,20%	71,68%	102,43%	81,99%
Median BHR	2,86%	5,07%	10,92%	20,60%	-4,86%	17,31%
Mean BHR (Benchmark)	7,14%	7,49%	35,96%	39,34%	71,77%	74,43%
Wealth Relative	1,0144	1,0146	0,9228	0,9667	0,7081	0,7880
Mean BHAR	1,54%	1,57%	-10,50%	-4,65%	-50,13%	-36,98%
Standard deviation BHAR	32,98%	31,90%	72,03%	71,65%	123,18%	109,31%
t-statistic	0,5594	0,3948	-1,7435	-0,5188	-4,8671	-2,7065
p-value	*0,5768*	*0,6943*	*0,0834*	*0,6057*	*0,0000*	*0,0087*
skewness-adjusted t-statistic	0,5969	0,3297	-1,6466	-0,5777	-4,3374	-2,6483
p-value	*0,5515*	*0,7427*	*0,1018*	*0,5655*	*0,0000*	*0,0102*
Median BHAR	-3,72%	-1,67%	-11,95%	-17,81%	-39,16%	-32,90%
sign test	-1,7561	-0,2500	-1,9234	-1,5000	-4,7666	-3,2500
p-value	*0,0000*	*0,8839*	*0,0229*	*0,0711*	*0,0008*	*0,0113*
Minimum BHAR	-67,09%	-58,35%	-252,18%	-150,09%	-343,34%	-314,96%
Maximum BHAR	150,82%	134,54%	242,80%	266,51%	377,06%	227,60%
Number positive BHAR	61	31	60	26	43	19
Number negative BHAR	82	33	83	38	100	45
Number	143	64	143	64	143	64
Panel B: Test Statistics	**12 months**		**36 months**		**60 months**	
two sample t-statistic	-0,0064		-0,5414		-0,7344	
p-value	*0,9949*		*0,5888*		*0,4636*	
Mann-Whitney U-test	4708,0000		4699,0000		4935,0000	
p-value	*0,7413*		*0,7584*		*0,3681*	
Kolmogorov-Smirnov test	0,7098		0,7803		0,9169	
p-value	*0,6948*		*0,5765*		*0,3734*	

The underperformance of family-owned firm in comparison to the non-family control sample – at least from an economically point of view – crystallizes when investigating the long-run performance for a holding period of 60 months. Family firms earn a mean 21.63% and a median –4.86% BHR. Contrary to that, the control sample yields 37.45% and 17.31%, respectively. Adjustments by the market unfold the following results of which all differ statistically significant from zero: 143 family firms underperform the DAFOX by –50.13% in terms of means in contrast to –36.98% of the control sample. The standard deviation is higher in case of family firms (123.18% versus 109.31%). The results are confirmed by medians and by wealth relatives. The median family firm BHAR amounts to –39.16% whereas the non-family firm BHAR attained –32.90%. The wealth relative suggests that an investor had to invest 141 units in the IPO firm instead of investing 100 units in the market portfolio to achieve the same wealth after 60 months in case of the average family firm. In case of non-family flotations the investors had to invest some 127 units in the IPO firm instead of 100 units in the benchmark. Values for minimum and maximum confirm the above mentioned findings with regard to the standard deviation. Interestingly, the percentage of firms obtaining negative BHARs equals in both groups and amounts to 70%. To put in a nutshell:

Only 30% of the IPOs in both groups beat the market.

Panel C confirms the above mentioned assumption that it takes 5 years – at least 36 months seem to be insufficient – to reveal the total extent of negative abnormal performance. The results presented in Table 17 provide empirical evidence that family-owned firms do not only underperform the market but, in addition, underperform a portfolio of other companies that went public during the same period. From a statistical point of view the differences between the two groups of issuing firms are not significant, i.e. the null hypothesis cannot be rejected that the differences between the two means and medians, respectively, equal zero.

The long-run performance comparison of family-owned firms versus non-family businesses allows drawing conclusion with regard to at least one former empirical study: Aussenegg (1997) splits a sample of 71 flotations in Austria between 1984 and 1996 into 4 groups. Family firms, non-family firms, privatizations and other IPOs. In line with the results presented in this paper, a subsample of 31 family firms underperforms the market statistically significant by –118.60%. The median BHAR is –51.56%. The vast majority of some 87% of the firms underperforms the benchmark. Even when measured with unadjusted returns, family firms lose –19.69%. The second group, non-family firm IPOs, yields 110.64%, but still

underperforms the market by –4.75% (mean) and –17.75% (median), respectively. Most important, Aussenegg's (1997) results confirm the underperformance of family firms, both in comparison to the market and to a control sample of non-family firms.

Unfortunately, Ehrhardt and Nowak analyzing IPOs of German family-owned firms during a comparable period of time do not use a control sample of non-family firms to contrast their results with. Nevertheless, other types of research confirm the negative abnormal returns family firms have yielded at the stock market. For a sample of 280 Israeli firms Lauterbach and Vaninsky (1999) confirm the comparatively low performance of family firms by employing a so-called data envelopment analysis and state that 'partnerships of individuals and family-owned controlled firms are found to be least efficient in generating net income'.

5.3 Explanations for Long-Run Performance

Explanations for the long-run underperformance anomaly can be classified into 3 groups:[72] (i) The first group of literature analyzes long-run performance in the light of underpricing models. (ii) The second group provides expectations-based and behavioral explanations. (iii) The third group focuses on the bad model and mismeasurement problem. The following sections test potential explanations with regard to the underperformance phenomenon as documented in Chapter 5.2. OLS regressions are used to examine the explanatory power of different hypotheses. 60-month BHARs are used as the dependent variable. Thus, the data sample comprises 149 family firms that went public between 1977 and 1996. IPOs in 1997 and 1998 are excluded. In comparison to the entire sample of 174 firms documented biases should decrease and results should be more reliable.

6.3.1 Size Hypothesis

Khurshed, Mudambi and Goergen (1999) posit a positive relationship between the size of a firm and its long-run performance. VOL is used as a proxy for size and denotes the natural logarithm of inflation-adjusted nominal issuing volume. An additional variable REV is introduced which measures the logarithm of the inflation-adjusted gross revenues of an IPO firm in the year prior to its flotation. Signs of both coefficients are expected to be positive.

Contrary to the assumption, the univariate regressions R 1.1 and R 1.2 provide evidence against the size hypothesis. Both regression coefficients are negative and significant. The combination of both proxies in R 1.4 eliminates explanatory power. REV

turns positive and both variables turn insignificant. The negative coefficient of NR could be interpreted as a decrease of underperformance over time, i.e. later IPO firms underperform less than earlier IPOs. The inclusion of NR in R 1.5 and R 1.6 slightly changes the coefficients for VOL and REV. REV loses its significance. Values for R^2's have to be attributed to the variable NR. The size hypothesis has to be rejected. The larger firms are, the worse is their performance. These results could be interpreted with the existence of private benefits in family firms. As Barclay and Holderness (1989) state 'private benefits should increase with firm size because larger firms offer potentially larger pecuniary and nonpecuniary benefits.'

6.3.2 Age Hypothesis

The age hypothesis states: The older the IPO firms, the better the long-run performance. Age is used as a proxy for uncertainty. In general, older firms could be associated with less uncertainty due to a longer operating history. Another factor seems to be important when analyzing family firms. The older a family firm is, the larger the family or families get. In most firms, some members hold management positions within the firm whereas a larger group of family members holds equity stakes and longs for annual dividend payments. Managing family members could have incentives to expropriate the other group by skimming private benefits at the expense of firm value. Consequently, outside family members are expected to control their relatives. A positive sign for AGE should be observed.

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[72] See e.g. Jenkinson and Ljungqvist (2001a), p. 139-166, for a comprehensive overview on long-run theories and models.

Table 18. Long-run performance and firm size

	α	VOL	REV	NR	R^2 adj. R^2	F-Ratio p-value
R 1.1 *C*	0,0448	-0,2490			3,8193%	6,33
	0,8660	*0,0130*			n/a	*0,0129*
R 1.2	0,3076		-0,1512		2,3615%	3,53
	0,5152		*0,0622*		1,6928%	*0,0622*
R 1.3 *C*	0,5821			-0,0150	27,7109%	42,05
	0,0040			*0,0000*	n/a	*0,0000*
R 1.4	-0,0490	-0,2528	0,0137		3,7380%	2,82
	0,9267	*0,1520*	*0,9218*		2,4102%	*0,0632*
R 1.5 *C*	0,9665	-0,1788		-0,0145	29,6586%	26,29
	0,0010	*0,0630*		*0,0000*	n/a	*0,0000*
R 1.6 *C*	1,2889		-0,1358	-0,0142	28,7900%	25,74
	0,0150		*0,1180*	*0,0000*	n/a	*0,0000*
R 1.7 *C*	1,1344	-0,1007	-0,0702	-0,0140	29,0042%	17,28
	0,0550	*0,4450*	*0,5900*	*0,0000*	n/a	*0,0000*

Note: p-values (in italics) correspond to tests of the hypothesis that the coefficients are equal to 0. E.g. p-values less than 0.05 indicate statistically significant nonzero coefficients. The R^2 statistic measures the proportion of the variability in the dependent variable. The adjusted R^2 statistic adjusts the standard R^2 value based on the number of coefficients in the model. The F-Ratio is a ratio of the variance explained by a factor to the unexplained variance. In case there is no effect, the associated p-value is close to 1. C denotes regressions where regressions coefficients are corrected by the Huber-White covariance matrix estimator.

Table 19. Long-run performance and firm age

	α	AGE	CEO	NR	R^2 adj. R^2	F-Ratio p-value
R 2.1	-0,4700	-0,0011			0,2226%	0,32
	0,0042	*0,5744*			-0,4801%	*0,5744*
R 2.2 *C*	0,6369	-0,0007		-0,0151	28,3420%	21,51
	0,0060	*0,7360*		*0,0000*	n/a	*0,0000*
R 2.3	-0,8010		0,3146		0,8722%	1,29
	0,0020		*0,2573*		0,1979%	*0,2573*
R 2.4 *C*	0,4049		0,1998	-0,0148	28,0612%	21,03
	0,1800		*0,4510*	*0,0000*	n/a	*0,0000*
R 2.5	-0,7341	-0,0009	0,2958		0,9960%	0,71
	0,0153	*0,6641*	*0,2957*		-0,4100%	*0,4938*
R 2.6 *C*	0,4628	-0,0005	0,1869	-0,0150	28,6498%	14,42
	0,1320	*0,7920*	*0,4780*	*0,0000*	n/a	*0,0000*

Table 19 provides evidence against the age hypothesis. The coefficient for AGE is slightly negative and remains insignificant in all regressions. The second variable, CEO, is positive indicating a superior performance in firms where the top management positions are held by family members. In line with Table 14, all regression coefficients for CEO remain insignificant.

5.3.3 Underwriter Reputation Hypothesis

The underwriter reputation hypothesis states that IPOs underwritten by prestigious underwriters have a better long-run performance. REP measures the aggregate issuing volume of all other IPOs that were lead-underwritten by the specific investment bank, measured as the natural logarithm of the inflation-adjusted nominal issuing volume. The variable IPOBNK considers IPO activities as part of the consortium of issuing banks. IPOBNK counts the number of previous IPOs where the lead underwriter under consideration has been part of the syndicate. Positive signs are expected both for REP and IPOBNK.

The univariate regressions R 3.1 and R 3.2 show that the regression coefficients for both REP and IPOBNK are negative and statistically significant. When NR is introduced in regressions R 3.4 and R 3.5, both REP and IPOBNK lose their significance. Thus, the quality of an underwriter cannot be viewed as an indicator for post-IPO performance.

5.3.4 Dilution Hypothesis

Consistent with the ownership retention models discussed in Chapter 3.2, the dilution hypothesis posits that the higher the dilution of the initial owner's shareholding, i.e. the higher the percentage of equity sold, the worse the long-run performance should be. Consequenly, all variables, e.g. FFLOAT, SHRNOM and SHREFF, should have a negative sign. FFLOAT is used as a proxy to measure the percentage of equity issued in the IPO. To control for potential data errors in FFLOAT, SHRNOM and SHREFF are employed as additional variables, denoting the quotient of nominal (effective) issuing volume and the company's share capital directly after the IPO.

Table 20. Long-run performance and underwriter reputation

	α	REP	IPOBNK	NR	R^2 adj. R^2	F-Ratio p-value
R 3.1	-0,2198 *0,3022*	-0,0764 *0,0949*			1,8860% *1,2190%*	2,83 *0,0949*
R 3.2 *C*	0,0359 *0,8250*		-0,0608 *0,0000*		15,2794% *n/a*	26,41 *0,0000*
R 3.3 *C*	-0,1501 *0,5750*	0,0708 *0,2210*	-0,0721 *0,0000*		16,3707% *n/a*	19,58 *0,0000*
R 3.4 *C*	0,5616 *0,0390*	0,0067 *0,9040*		-0,0150 *0,0000*	27,7243% *n/a*	21,02 *0,0000*
R 3.5 *C*	0,5832 *0,0040*		-0,0096 *0,6380*	-0,0137 *0,0010*	27,9152% *n/a*	24,82 *0,0000*
R 3.6 *C*	0,4944 *0,0840*	0,0293 *0,5810*	-0,0154 *0,4370*	-0,0134 *0,0010*	28,0969% *n/a*	19,03 *0,0000*

Table 21. Long-run performance and family ownership retention

	α	SHRNOM	SHREFF	FFLOAT	NR	R^2 adj. R^2	F-Ratio p-value
R 4.1	-0,4315 *0,1000*	-0,2933 *0,6839*				0,1138% *-0,5703%*	0,17 *0,6839*
R 4.2	-0,3322 *0,0531*		-0,0836 *0,1542*			1,3858% *0,7104%*	2,05 *0,1542*
R 4.3	-0,4262 *0,0060*			-0,4966 *0,3540*		0,5800% *-0,0900%*	0,86 *0,3540*
R 4.4	-0,4452 *0,0887*	0,5205 *0,5646*	-0,1094 *0,1395*			1,6120% *0,2549%*	1,19 *0,3078*
R 4.5	-0,2482 *0,2130*		-0,0775 *0,1900*	-0,4462 *0,4100*		1,8500% *0,4900%*	1,36 *0,2588*
R 4.6	-0,3886 *0,1450*	-0,0807 *0,9150*		-0,5168 *0,3630*		0,5800% *-0,6900%*	0,50 *0,6084*
R 4.7 *C*	0,6014 *0,0240*	-0,2283 *0,7650*	0,0494 *0,4260*	-0,0807 *0,8630*	-0,0155 *0,0000*	27,8400% *n/a*	10,16 *0,0000*

Table 21 seems to confirm the dilution hypothesis. All regression coefficients are negative but insignificant. Various combinations do not change the results. These findings are opposed to Ljungqvist (1996). Analyzing 145 IPOs in Germany floated between 1970 and 1990, Ljungqvist points out that especially firms where initial owners retain majority stakes underperform worst.

6 Summary

*'Shareholders are stupid and impertinent –
stupid, because they give their money to somebody
else without adequate control,
and impertinent, because they clamor for a dividend
as a reward for their stupidity.'*

Carl Fuerstenberg (1850-1933), German financier

As part of a wave of IPOs on German stock exchanges, a growing number of family-owned firms have taken the challenge of going public. This paper investigates initial returns and long-run performance of IPOs of 174 family firms floated in Germany between 1977 and 1998. Family businesses typically come closest to the ideal of non-separation of ownership from control, i.e. most of the firms comprised in the data set can be characterized by a high degree of congruence between ownership and management. The fundamental change in ownership structure induced by the flotation represents a change in the governance of the firm as for the first time dispersed outsiders hold equity capital. A detailed examination of the capital market's reactions to these changes in the ownership structure allows drawing conclusions which impact those changes have on firm value.

A prediction regarding the long-run stock price performance spans two theories: Advantages of modern corporations where management and ownership are separated are cut short by the principal-agent problem. Managers – the agents – could take actions against the interest of shareholders – the principals. Agency problems in closely-held family firms should be less predominant. Utilizing this idea, it could be considered that firms with controlling shareholders – e.g. family firms – should be more valuable. On the other hand, the rent-protection theory predicts that family owners have incentives to siphon off private benefits at the expense of firm performance. It is usually argued that private benefits are comparatively high in civil law countries. Especially non-pecuniary and non-transferable private benefits could have substantial effects on firm value. As the German economy – and especially firms associated with the typical

German *Mittelstand* – are even titled 'the paradise of private benefits'[73] it could be assumed that the negative consequences with regard to the existence of those private benefits should outweigh the positive effects regarding minimized principal-agent conflicts in family firms. Consequently, investors in those firms detecting those expropriation mechanisms should try to sell their stakes. Finally and as a result, family-owned firms where family members enjoy substantial substantial private benefits should be undervalued in comparison to the market.

Several other aspects provide evidence that investment decisions in family-owned firms do not follow the market investment rule. It seems some family firms prefer to survive, in a sense of reducing business risk, in comparison to maximizing shareholder value. Nevertheless, the extent of private benefits and the level of minority shareholder expropriation cannot be determined directly. Thus, long-run returns of IPO firms are used as a proxy as they accrue solely to cash flow claimants. Any persuasive and persistent negative abnormal performance could be interpreted as a deviation from the market investment rule and consequently as a measure for the level of private benefits within in the firm.

Regarding the long-run performance of family firm IPOs it can be concluded that a portfolio of 174 firms yields a positive unadjusted return of 19.29% after 5 years. Positive unadjusted returns turn negative after adjusting by the market movement. 3 years after the listing the market-adjusted return is on average –25.31% compared to a broad index (median: –28.69%). The underperformance increases to –53.50% after 60 months (median: –43.29%). Even when excluding potential new economy and *Neuer Markt* biases, i.e. analyzing IPOs between 1977 and 1995, the underperformance remains statistically significant different from zero with –10.50% and –50.13%, respectively. A more detailed examination shows that it needed at least the first year after the IPO until significant deviations from the market can be observed. Nevertheless, analyses regarding different market segments, industry sectors and even family ownership fractions as well as family involvement did not produce statistically significant results. Interestingly, firms within the sample managed by family members seem to outperform family firms without that type of family control. Contrary to Ehrhardt and Nowak (2002a) who attribute the underperformance of their set of family firms solely to the underperformance of firms using dual class share structures, the empirical findings in this study are opposed. If the hypothesis proves true that family shareholders use dual class share structures to have a lock on their private benefits in the long run it can be expected that capital markets detect this behaviour and consequently undervalue those firms.

Brav and Gompers (1997) argue that the

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[73] See Ehrhardt and Nowak (2000a), p. 12.

underperformance of IPOs can be attributed to investors being systematically over-optimistic about the future prospects of IPO firms. A comparison with non-family firm IPOs shows that the extent of underperformance is higher in case of family firms although statistical tests regarding the differences in means and medians of the two groups are not significant. Nevertheless, it could be asked if the difference can be attributed to potential private benefits in family-owned firms?

As for the expectations regarding future IPOs the results presented in this paper indicate that many firms do not achieve the expected lower cost of capital. This can be considered as a sign that German family businesses are only partially suited for the capital market. In any case, an in-depth analysis of a respective IPO candidate should be performed in order to derive a more specific judgement. Having in mind the empirical results presented in this and other studies, investors in family firm IPOs seem to be – at least – 'stupid'. In the past, IPO firms in general underperformed the market.

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