Advertising in Family Firms

Intensity and Performance Influence

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Master Thesis
Erasmus University Rotterdam, 2010
Economics and Business
Entrepreneurship, Strategy and Organisation Economics
Master Thesis - FEM11072-09
August 11th 2010

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Preface

This master thesis was made to conclude the master study Entrepreneurship, Strategy and Organisation Economics. Over the past months I have worked with great interest on this thesis and I would like to thank the people who made this thesis possible. First of all my supervisor dilp.-kfm J.H. Block. His comments and insights were vital during the process of research and writing. I also would like to thank my family and girlfriend for their comments, patience and contributions.

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Peter Klop, August 2010

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Abstract

Depending on the used definition well over half of the firms in western economies can be classified as family firms. Although the role and impact of advertising on (the performance of) firms is studied intensively little research has been done on advertising in family firms. To extent literature on the subject this thesis investigates the relationship between advertising and (the performance of) family firms. Data on the S&P500 was used to research two subjects: first of all the difference in levels of advertising between family and non-family firms. For a number of definitions and characteristics of the family firm the advertising intensity is analysed. T-tests show a significant higher advertising intensity for family firms. Clustered OLS regressions including variables indicating ownership and managerial characteristics of the family firm show that businesses owned by lone founders (first generation family firms) and family owned businesses tend to have higher advertising intensity then other businesses. However only the results on the lone founders are significant.

Secondly the influence of advertising intensity on the (financial) performance of the family firms was investigated. In general this research finds that a higher advertising intensity has a positive influence on the market-to-book ratio of firms. The analysis on the interaction of family ownership and advertising intensity in relation to the market-to-book ratio gives mixed results. The data shows that, depending on the percentage of shares owned by the family or lone founder, advertising intensity influences the market-to ratio negatively. However only a few interactions were significant in the models.

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Executive Summary

The past two decades the family firm and its characteristics have been a source for academic research. Depending on the used definition family firms represent up to two-thirds of the firms in today's economies. In general family firm definitions incorporate the involvement of a family in a business on a managerial and/or an ownership level. Earlier research has shown that the family firm behaves and performs differently compared to non-family firms on a variety of subjects. Academic studies on the subject of advertising are wide ranging and date to the beginning of the twentieth century. However little research has been done on advertising in family firms. This thesis aims to extent literature on the subject of advertising in family firms and the effect of advertising on the performance of the family firm.

The two research questions in this thesis are: (1) "*To what degree do family firms have different levels of advertising spending than non-family firms?*" and (2) "*Does the effect of advertising on the firm performance differ between family and non-family firms?*" The advertising intensity is used as a measure for the level of advertising. The hypotheses state that family firms have different advertising intensities than other firms. Similar hypotheses were formulated for the individual managerial and ownership characteristics that are incorporated in the family firm definitions. With respect to the second research question the hypotheses state that the advertising intensity of family firms has a positive influence on the market-to-book ratio of the firm.

From the empirical results the t-tests indicate that family firms in both broad as well as narrow definitions have significantly higher advertising intensities than other firms. The same results were found on a managerial and ownership level. Interesting finding is that differences in advertising intensity were found for low and high levels of lone founder ownership (first generations family firms) and family ownership. Secondly clustered OLS was used to analyse the influence of family ownership and/or family management on the level of advertising intensity while controlling for other firm characteristics. A positive influence was found but only lone founder ownership was repeatedly found significant in the regressions. The regressions researching the effect of advertising on the firm performance show that advertising intensity negatively influences the market-to-book ratio of family firms.

To test the robustness of the findings the propensity score of the observations was calculated on the basis of firm characteristics using lone founder ownership as the treatment. Based on the calculated propensity scores samples of equal size were extracted from the original dataset. These samples were used to perform Wilcoxon rank-sum tests and the outcomes were compared with the earlier results. The findings on lone founder ownership were confirmed by the results of the robustness tests.

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This thesis found that family firms within the S&P500 have a significant higher advertising intensity then non-family firms. Specially lone founder ownership seems to have positive impact on advertising intensity. Although these lone founder businesses can be seen as first generation family firms market entry and the need for brand building could explain the higher levels of advertising intensity for lone founders. The effect of family firm advertising on the business performance leaves us mixed results. Initial results suggest that in general advertising intensity positively influences the market-to-book ratio of firms. However the interaction of family and/or lone founder ownership with advertising intensity seems to have a negative impact on the market-to-book ratio.

This thesis provides a starting point on the subject of family firm (performance) and advertising. Further research is recommended as this thesis just scratched the surface of the subject. The used dataset presents some limitations to this research as only large multinationals from the United States were included. The findings of this thesis could be tested on family firms of different sizes and geographical origins. Secondly the use of advertising intensity as a measure of advertisement has limitations as it gives little or no answer on the effectiveness of advertising. The empirical results indicate that family management negatively influences the advertising intensity. On theoretical grounds this could be explained by family specific motivations and strategies. However another explanation is the (possible) use of other, less costly, types of advertising by family managed firms. It is suggested to expend future datasets with information on the types of advertisement used by the family firms and their competitors.

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Content

Abstract

Executive summary

1. Introduction.....8

2. Theoretical Framework.....10

2.1 The Family Firm.....10

2.1.1 Family and Lone Founder Ownership.....10

2.1.2 Family and Lone Founder Management 11

2.1.3 Definitions of the Family Firm.....12

2.2 Advertising.....14

2.2.1. Definitions and Measures of Advertising.....14

2.2.2. Advertisement and Business Performance.....14

2.3 Family firms and Advertising.....15

3. Data and Methodology.....17

3.1 Data and Sample Construction.....17

3.2 Variables 17

3.2.1 Dependent Variables.....17

3.2.2 Independent Variables.....18

3.3 Methods.....21

3.3.1 T-tests and Wilcoxon Rank-sum Test.....21

3.3.2 Clustered OLS Regressions.....21

3.3.3 Propensity Score Matching.....22

4. Empirical results.....23

4.1 T-tests.....23

4.2 Clustered OLS regressions.....24

4.2.1. Correlations and VIF-values.....24

4.2.2 Advertising Intensity and Family Firms.....25

4.2.3 Family advertising and Firm Performance.....28

4.3 Robustness.....31

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5. Discussion.....33

5.1 Advertising Intensity and Family Firms.....33

5.2 Advertising Intensity and Family Firm Performance.....34

6. Conclusion.....35

6.1 Conclusions.....35

6.2 Limitations and Further Research.....36

References.....37

Appendix.....39

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1. Introduction

The past two decades increasing academic interest has been going to the family firm and the role it fulfils in today's economy. Bird et al. (2002) find “that family business research has become increasingly empirical and more rigorous in recent years”. They detect an increase in the use of large samples, more (in)dependent variables and multivariate statistical tools in family firm research. Key point of interest are the characteristics of the family firm and how they influence the structure and performance of the family firm compared to non-family firms. Examples of researched aspects are the growth of family firms (Ward, 1997), employment and layoffs in family firms (Block, 2008), the long-term orientation of family firms (James, 1999) and the impact of family ownership on firm performance (Anderson and Reeb, 2003). This thesis aims to extent literature of the family firm and will focus on the relatively unexplored subject of advertisement.

A question that raises when one starts research on the family firm is why one should investigate the family firm. Zahra et al. (2004) state that family firms are an important source of economic development and growth. Furthermore Ward & Aronoff (1995) present several arguments on why the family firm is interesting for academic study: First of all the majority of independent firms are owned by families. Depending on the used definition family firms make up two-thirds of all the firms (Kirchhoff & Kirchhoff, 1987). Secondly the prioritizing of objectives by family business owners is likely to differ from that of the owners of non-family business. Family firms are also likely to be managed differently from non-family firms. And finally owners of family businesses are more likely to be concerned with transferring the business to the next generation of the family. Academic research has shown that firms that are owned and/or managed by a family tend to differ from non-family firms in structure, performance and strategy. Further research on the subject will give more insight on the extent of the differences between family and non-family firms.

In contrast to the family firm the subject of advertising has a long, rich history in academic research and ranks high on the list of controversial economic topics (Telser, 1968). Both the functions and effectiveness of advertising has been investigated intensively. Politz (1975) found two goals of advertisements which he called the 'familiarity principle' and the 'persuasive principle'. The familiarity principle points to the fact that advertising provides knowledge on products and/or services to the consumer. The persuasive principle states that advertising tries to convince the consumer to buy a certain product or service.

From a firms perspective advertising is used to inform people about their products, improve brand familiarity and stimulate sales. There is however no consensus on the effect of advertising on the performance of the firm. Academic research has shown that advertising can have a positive effect on the return of investment (Telser, 1968) and can limit competition by creating

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entry barriers (Comanor and Wilson, 1979). On the other hand advertising can also stimulate competition by informing consumers about the various products available which in turn can lead to increased (price) competition and a hold on the sales growth of a firm (Comanor and Wilson, 1979). These studies show that the effect of advertising on the performance of firms is still an interesting subject of research.

Academic research has studied the impact of advertising on the financial performance of firms in general, but little research has been done on the specifics of advertising in family firms. In this thesis the relationship between advertising and (the performance of) the family firm is investigated. The first research question investigates whether family firms are different in spendings on advertising and is formulated as followed: *1. To what degree do family firms have different levels of advertising spending than non-family firms?* The second research question focuses on the effect of advertising spendings and the possible differences between (non-)family firms. The question is formulated as followed: *2. Does the effect of advertising on the financial performance differ between family and non-family firms?* By answering these research questions insight is gained on the differences and commonalities between (non-)family firms on the subject of advertising.

This thesis is divided into six chapters. In chapter two existing literature on the subjects of the family firm and advertising are reviewed. Also definitions on both the family firm and advertising are formulated. Based on the literature hypotheses are constructed which are used to answer the two research questions of this thesis. Chapter three describes the construction of the sample. The statistical methods and the (in)dependent variables are also discussed in this chapter. In chapter four the empirical results from the analysis are presented. Chapter five discusses the empirical results and links them to the hypotheses. Finally chapter six presents the conclusions of the thesis. Furthermore the limitations of this research and suggestions for future research are given.

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2. Theoretical Framework

In this chapter literature and theories on both the family firm and advertising are reviewed. Paragraph 2.1 focuses on the definition and the characteristics of the family firm. In paragraph 2.2 literature on advertising is reviewed and topics of discussion are definitions of advertising, measurement of advertising and the impact of advertising on firm performance. Finally the theoretical interaction between advertising and family firms is discussed in paragraph 2.3.

2.1 The Family Firm

From the small supermarket on the corner of the street to large multinationals: the family firm is present in all shapes and sizes (Pearl and Kristie, 2005). But what characteristic is essential for a firm to be classified a family firm? Family involvement in a company is possible on many levels: a family name can be used in the company name, a family can own a certain amount of the outstanding shares or hold one or more management positions. Literature on the family firm provides a wide range of definitions in which family involvement is present in certain firm characteristics. To find a family firm definition for this research two main types of family involvement are investigated. First the aspects of family ownership are discussed in paragraph 2.1.1. Secondly the role and influence of family management is investigated in paragraph 2.1.2. Finally in paragraph 2.1.3 these characteristics are combined to construct definitions on the family firm that will be used in the statistical analyses.

2.1.1 Family and Lone Founder Ownership

Ownership structure varies across businesses as shares can be hold by different parties (families, financial owners, lone founders, etcetera) in various combinations and numbers of shares owned. Company ownership gives certain financial rights like rights on generated profits or dividends and possible managerial rights to the owner(s) in the form of voting stock. The extent of the managerial rights often depends on the type and percentage of shares owned. Shareholders with a minimum of 5% of the outstanding shares are called blockholders and have shown to have an influence on the strategies and performance of a firm (Holderness, 2003; Edmans, 2009). When talking about family ownership the level of ownership needs to exceed the blockholder level to be able to influence the business.

Academic research on the family firm has investigated the definition of ownership family. In many research papers family ownership is considered to be present when "*a founding family or founding individual owns a fraction of the company.*" (Miller et al, 2007; Anderson and Reeb, 2003). This definition of family ownership thus incorporates also ownership of lone founders. Lone founder businesses can be defined as "*businesses in which an individual is one of the company's founders and is also a manager or a large owner, with no other family members involved*" (Pindado et al, 2008).

An argument for the inclusion of lone founder ownership in the family ownership definition is that lone founder businesses often turn out to be first generation family firms. Many firms are founded by individuals and as these lone founder firms grow and mature increased family involvement is seen in a part of the population. However the involvement of a family in early and/or later stadium of the lone founder firm development is not required and not detected in all lone founder firms. Literature on the inclusion of lone founder ownership is mixed: Anderson & Reeb (2003) make no difference between first generation family firms. This in contrast to Miller et al (2007) which argue that a distinction has to be made between “pure” family ownership and lone founder ownership.

There are two arguments against the inclusion of lone founder business in the family firm definition. First of all lone founder firms lack the involvement of family members and therefore it can be argued that lone founder firms should only be classified as a family business when at least one family member is working in the firm besides the lone founder(s) as a 'normal' employee or as member of the company management. The second argument focuses on the reasoning of the lone founder business being a first generation family firm. A large percentage of the founded firms are lone founder businesses. As an percentage of these firms will indeed evolve and grow into family firms a lot of these firms will not. Some lone founder businesses will stay in the sole possession and control of the founder. In determining a definition of the family firm one has to account for the role and influence of lone founders.

The effect of family and lone founder ownership on the performance and value of a firm is studied in several papers. Pindado et al (2008) find that family ownership has a positive impact on firm value. They point to the long-term horizons and reputation concern of fhe family as possible explanations. Villalonga & Amit (2006) found that family ownership only creates value when it is combined with specific forms of family management. And finally Anderson & Reeb (2003) find robust results disproving the hypothesis that family ownership is inherently less efficient in U.S. firms.

2.1.2. Family and Lone Founder Management

In the previous paragraph a distinction was made between family ownership and lone founder ownership on the argument that lone founder businesses are (possible) first generation family firms. On a management level a similar distinction can be made with family management on the one hand and lone founder control on the other hand. The distinction between family and lone founder management has consequences for the formulation of family firm definitions. Furthermore management strategies and underlying motivations of both types of managers are likely to be different.

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Among other things the management of a business is responsible for operational decision making and the construction of both short term and long strategy. The motivations and required incentives for people holding management positions in these businesses depend on a wide variety of factors: education, job requirements and personal preferences are just a few of these factors. Also principle-agent problems between management and firm owner(s) account for an important part in this subject (Demsetz, 1983). Academic research has shown that differences in motivations and required incentives can also be found between lone founder businesses, family firms and other businesses. Families that are active in a company have motivations to maintain a long term focus as the firm may end up in the hands of future generations and become an source of income and security for these generations. (James, 1999). Lone founders frequently have both sole ownership and control over the firm. As a result some principle-agent problems are tackled (Demsetz, 1983) but the influence of personal preferences of lone founder is also detected.

When talking about the management of a firm it is essential to incorporate management positions that have influence on the day-to-day decision making as well as the long term strategy formulation. A senior assistant manager of a local department store has some, but very limited influence in the decision making process in the head office. From the management functions the chief executive officer (CEO) and chairman are considered to be influential on the performance and strategy of a firm. The tasks and responsibilities of the chairman and the CEO are not universal determinant and therefore it can be questioned whether there is some overlap or duality in these two management positions. Findings on the influence of family management on the firm are mixed. Villalonga & Amit (2006) find that family management adds value to the company when the founder serves as the CEO or as its chairman with a non-family CEO. However family management destroys value when descendants of the founder serve as Chairman or CEO.

During recent years the position of the Chief Financial Officer (CFO) has become increasingly important and as a result more research has been done on the role and influence of the CFO on the firm performance. Casellia & Di Giulic (2010) investigated the CFO in Italian firms and they found that family firms with a non-family CFO drive firm performance in a positive direction. Family firms with a non-family CFO perform better than both family firms with a family CFO and non-family firms. Although these results are interesting and the CFO may contribute to the formulation of a familly firm definition little data is available on (the origins of) the CFO. Therefore the CFO is not specificly included in family management definition of this thesis.

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2.1.3 Definitions of the Family Firm

In literature many definitions on the family firm can be found and most definitions focus on the managerial and ownership influence a family can have on a business. A managerial orientated definition of a family firm is "*an organization controlled and usually managed by multiple family members*" (Shanker and Astrachan, 1996; Lansberg, 1999). Julio Pindado et al (2008) state that family businesses are those that include multiple family members as large shareholders on management positions. Villalonga and Amit (2006) define a family firm in a broad definition as "a firm whose founder or a member of the family by either blood or marriage is a director or the owner of at least 5 % of the firm's equity, individually or as a group". Gomez-Mejia et al. (2003) use a more narrow definition of the family firm in which two conditions are considered to be essential: two or more directors have a family relationship and family members own at least five percent of the voting stock". Finally Miller et al. (2007) define a family firm as a business in which multiple members of the same family are involved as major owners or managers, either contemporaneously or over time. This definition allows for variations in ownership levels and managerial roles fulfilled by family members.

In this thesis multiple definitions of the family firm are investigated as literature on advertising in family firms is limited and the influence of the used definitions on the outcomes unknown. Paragraph 3.2.2 discusses and describes the four constructed family firm definitions in detail. Based on the found literature and theories four elements were selected that are expected to be essential in this research. Four family firm definitions were constructed from these four elements :

1. The CEO or the chairman is a member of the family;
2. From the outstanding shares five percent or more is family owned;
3. From the outstanding shares five percent or more is owned by a lone founder;
4. Five percent or more of the outstanding shares is owned by either a lone founder or a family.

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2.2 Advertising

In this paragraph literature on advertising is reviewed. Paragraph 2.2.1 starts with definitions and the measurement of advertising. After this paragraph 2.2.2 discusses the relationship between advertisement and firm performance.

2.2.1 Definition and Measurement of Advertising

An early definition on advertising was constructed by Daniel Starch (1923): "*The simplest definition of advertising, and one that will probably meet the test of critical examination, is that advertising is selling in print*". Over the past century ways of communication have evolved and today advertising on paper is just one in a wide range of options. The introductions and popularity of the cinema, television, radio and the internet have had a major impact on commercial advertising and the used definitions. Like the definitions on the family firm there is no universal definition to describe advertising. Main causes are theoretical disagreement between experts and the different ways in which advertisement can be used. Richards and Curran (2002) find a wide variety of definitions in existing literature, but extracted five key elements that are frequently used in these definitions: (1) Paid, (2) non-personal, (3) identified sponsor, (4) mass media and (5) persuade or influence. With these elements they captured the essence of most definitions in a single phrase: "*Advertising is a paid non-personal communication from a identified sponsor using mass media to persuade or influence and audience*". When referring to advertising the definition of Richard and Curran is used in this thesis.

In empirical research advertising expenditures and the gross rating points (GRP) are the main used measures of advertising. Gross rating points are a product of the reach of an advertising medium and the average distribution of exposures it delivers to an audience (Tellis, 1988). Gross rating points have the advantage of containing a diversity of essential information on advertising, but a strong disadvantage is the fact that the rating points are hard to determine. Advertising expenses are a monetary representation of the advertising efforts of a company. In contrast to gross rating points advertising expenses tell little about the range and effectiveness of the advertising activities. An advantage of advertising expenses is that information is widely available as the expenses are reported in the financial reports of companies. Advertising expenses are mostly translated into a percentage of the sales thereby constructing the variable advertising intensity.

2.2.2 Advertisement and Business Performance

Lavidge and Steiner (1961) argue that advertising is aimed at creating a situation where an increase in the level of sales is realized. Chauvin and Hirschey (1993) provide evidence that advertising has a positive influence on the market value of a firm. Also research has shown that advertising can have a positive effect on the return of investment (Telser, 1968). There is however

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no consensus on the influence and long term effect of advertising on the (financial) performance of businesses. As managers often set the level of advertising to the expected level of sales (Tellis, 1988) a two-way interaction makes analyses on effect of advertising expenses complicated.

Several studies have investigated the effect of advertising on (the performance of) the firm: Sawyer (1981) finds that the effect of advertising on sales follows a logarithmic curve. The first advertising dollars have a higher marginal effect on sales than later amounts. Also indications on an optimal advertising level are found. Advertising can stimulate competition by informing consumers about the various products available which in turn can lead to increased (price) competition and can cause a hold on the sales growth of a firm (Comanor and Wilson, 1979). On the level of competition Gatignon (1984) finds competition to a be a moderator on the effect of advertising on sales. But on the other hand advertising can limit competition by creating entry barriers (Comanor and Wilson, 1979). These studies show that further research on the effect of advertising on the (family) firm performance is necessary.

2.3 Family firms and advertising

In the two previous paragraphs literature on the family firm and advertising was reviewed. In this paragraph literature and theories on both subjects are linked and hypotheses are formulated that will contribute in answering the research questions. Teal, Upton, and Seaman (2003) are one of the first to investigate the relation between marketing strategies and family firms. In their paper they tested the hypothesis that there is no difference between family and non-family firms in the allocation of financial resources for marketing. They found significant differences for mass advertisement between family and non-family firms. As literature on advertising in family firms is otherwise limited the hypotheses for this research were constructed to provide answers on some basic elements. The first hypothesis forms the basis of this thesis and investigates whether or not family firms have different advertising intensities than other firms. This hypothesis will be tested for a number of definitions.

Hypothesis 1: Family firms have different advertising intensities than other firms.

Continuing on this path the individual managerial and ownership characteristics of the family firm are investigated. First in line is family ownership and hypothesis 2 states that family owned firms will have a higher advertising intensity than other firms. More then in other businesses family members are often interested in transferring the owned business to the next generation (Anderson & Reeb, 2003: Miller et al, 2007). As advertising can be considered a long-term investment in future profits, family firms should invest more in advertising then other firms.

Hypothesis 2: Family owned firms have a higher advertising intensity than other firms.

As discussed in chapter two it is not uncommon to incorporate lone founder ownership into the family firm definition. In these cases lone founder businesses are seen as first generation family

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firms. When being a first generation is combined with the need for survival it is expected that lone founder owners have a higher advertising intensity then other firms. This is translated into hypothesis 3:

Hypothesis 3: Lone founder owned firms have a higher advertising intensity than other firms.

Besides ownership family management is considered to be influential on the performance of the firm. Family controlled firms are considered to have more loyal customers, making cost-intensive advertising unnecessary. Furthermore family firms may rely more on other types of advertisement which do not directly translate into advertising expenses. An example is word-to-mouth advertisement. Based on this hypothesis 4a states that family owned firms have a lower advertising intensity than other firms. On loyalty of customers Shum (2004) finds that advertising can overcome brand loyalty. Taking this into account one could argue that family firms would have to spent the same amount on advertising as non-family firms do. This argument leads to hypothesis 4b.

Hypothesis 4a: Family managed firms have a lower advertising intensity than other firms.
Hypothesis 4b: There is no difference in advertising intensity of family managed firms and other firms.

Besides the differences in levels of advertising the effect of advertising on the business performance is also of interest. Miller, Le Breton-Miller, Lester and Cannella (2007) found that lone founder businesses perform better than other U.S. Public corporations, while family businesses do not show superior market valuations. Based on this research hypothesis 5 is constructed which states that advertising by lone founder firms results in a better market performance compared to other firms.

Hypothesis 5: Advertising results in better market performance for lone founder firms than for other firms.

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3. Data and Methodology

This chapter describes the data, sample construction and methodology used in this research. Paragraph 3.1 handles the data and the construction of the sample. Paragraph 3.2 describes the (in)dependent variables of the models. Finally in paragraph 3.3 the statistical methods are discussed.

3.1 Data and Sample Construction

The sample used in this research was created from a dataset made available by the Erasmus University Rotterdam. The dataset contains Compustat data on the 500 firms from the Standard & Poor's 500 (S&P 500). The shares of these firms are traded on the NYSE Euronext and the Nasdaq OMX which are the two largest American stock markets: The firms represents approximately 70% of the U.S. publicly traded companies. The data was collected over twelve succeeding years (1992 up to 2003). The firms are sorted by industry by the two-digit codes of the Standard Industrial Classification (SIC). The sample contains data on 499 firms as the Coca-Cola company appeared two times in the S&P500 and one of these notations was excluded to prevent double counting. The combination of the firms and years gives a total of 5,988 observations.

3.2 Variables

3.2.1. Dependent variables

To analyze the level of advertising the continues variable advertising intensity is used. Advertising intensity is calculated by taking the advertising expenses and dividing it by the sales of the firm. Table I shows that in this dataset the variable has a skewness of 3.458 and a relatively high kurtosis of 16.886. Further transformation of the variable by taking the natural logarithm would normalize the distribution, however interpretation of the output is more straightforward without the transformation. The mean advertising intensity is 0.012 with a standard deviation of 0.029. However the ratio has a large range with a minimum of zero up to a maximum of 0.26. For data on the advertising intensity in the specific SIC-industries see table E on appendix IV.

For the regressions investigating the relationship between advertising and firm performance the logarithm of the market-to-book ratio is used as dependent variable. To calculate the market-to-book ratio the stock's book value is divided by its market value. In this calculation the book value is based on the company's balance sheet and the market value on the stock price. A ratio above 1 indicates a possible overvaluation of the stock and a ratio below 1 indicates a possible undervaluation. After some outliers were removed the kurtosis dropped from 297,41 to 82,58. Correcting for this high kurtosis the logarithm of the market-to-book ratio was taken. This transformation makes interpretation of the results somewhat challenging. The mean market-to-book ratio before logging the variable was 4.105 with a standard deviation of 6.159.

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Table I – Descriptive Statistics

Variable	Mean	St. deviation	Skewness	Kurtosis	Min	Max	N
Advertising Intensity	0.012	0.029	3.458	16.886	0.000	0.260	5723
Market to Book [L]	4.105	6.159	2.842	82.579	-99.231	90.604	5084
Log Market to Book	1.138	0.732	0.802	4.646	-1.863	5.442	5526
Family Ownership [L]	0.035	0.115	4.067	21.928	0.000	0.983	3254
Family Ownership (excl zero) [L]	0.309	0.183	1.230	4.781	0.044	0.983	365
Lone Founder Ownership [L]	0.019	0.069	5.679	45.216	0.000	0.837	3254
Lone Founder Own. (excl zero) [L]	0.156	0.131	2.420	9.966	0.050	0.837	397
Ownership Combined [L]	0.054	0.129	3.215	15.112	0.000	0.983	3254
Ownership Combined (excl zero) [L]	0.229	0.176	1.543	5.632	0.044	0.983	762
Assets [L]	22,288.830	65,648.610	7.547	78.683	0.308	1,097,190.000	5228
Log Assets [L]	8.617	1.656	-0.103	3.903	-1.178	13.908	5228
Debt / Assets [L]	0.259	0.200	2.968	52.653	0.000	4.766	5228
Log Firmage	3.932	0.984	-1.072	3.922	0.000	5.403	5894

1. [L] = Lagged variable is used (one year lag)

3.2.2 Independent variables

As discussed in chapter two a variety of definitions can be found for the family firm. In this thesis six models are used to analyze the effect of being a family firm on the level of advertising intensity. In two of these models the individual managerial aspects and ownership levels are investigated. In the remaining four models narrow and broad definitions of the family firm are incorporated as binary variables.

In the first regression the definition of the family firm is stripped into three individual variables. First of all the involvement of a family in the firm management is indicated with the binary variable “Family Management”. Family Management has a positive value when the CEO and/or the Chairman of the firm a member of the family is. Table II shows that a family CEO was observed 915 times on a total of 4,387 observations and the presence of a family chairman was found 1,120 times on a total of 4,368 observations. Interesting finding is that Family Management is found in 1,176 of the total 4,399 observations which indicates a high level of duality when the functions are held by family members. Based on the overlap and the discussed theory in chapter two it was decided to use the variable Family Management in the first and sixth model.

Besides the managerial characteristic of the family firm the ownership aspect is incorporated in the continues variables Family Ownership and Lone Founder Ownership. These variables show the percentage of shares owned by specific parties. Table I shows that when the observations with zero's are excluded family ownership is observed 365 times and Lone Founder Ownership has 397 observations. The mean ownership levels are respectively 30.9% and 15.6%. The standard deviations are 18.3% for family ownership and 13.1% for Lone Founder Ownership.

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Table II – Frequency Table

Variable		Frequency	Percentage	Cum. Perc.
CEO Family [L]	A	3,472	79.14	79.10
	B	915	20.86	100.00
Chairman Family [L]	A	3,248	74.36	74.36
	B	1,120	25.64	100.00
Family Managament [L]	A	3,223	73.27	73.27
	B	1,176	26.73	100.00
Ownership Family 5-10% [L]	A	3,230	99.26	99.26
	B	24	0.74	100.00
Ownership Family 10-20% [L]	A	3,157	97.02	97.02
	B	97	2.98	100.00
Ownership Family 20-30% [L]	A	3,182	97.79	97.79
	B	72	2.21	100.00
Ownership Family > 30% [L]	A	3,083	94.74	94.74
	B	171	5.26	100.00
Ownership Lone Owner 5-10% [L]	A	3,085	94.81	94.81
	B	169	5.19	100.00
Ownership Lone Owner 10-20% [L]	A	3,132	96.25	96.25
	B	122	3.75	100.00
Ownership Lone Owner 20-30% [L]	A	3,181	97.76	97.76
	B	73	2.24	100.00
Ownership Lone Owner > 30% [L]	A	3,221	98.99	98.99
	B	33	1.01	100.00
Family Firm Narrow [L]	A	3,034	93.61	93.61
	B	207	6.39	100.00
Family Firm Broad [L]	A	2,090	64.49	64.49
	B	1,151	35.51	100.00
Family Firm Narrow (Comb. Own.) [L]	A	2,742	84.60	84.60
	B	499	15.40	100.00
Family Firm Broad (Comb. Own.) [L]	A	1,985	61.25	61.25
	B	1,256	38.75	100.00

1. A= All observations that do not have the mentioned characteristic

2. B = The observations that have the mentioned characteristic

3. [L] = Lagged variable is used (one year lag)

In models 2, 3, 4 and 5 the four definitions of the family firm are analysed. First of all model 2 analyses a narrow definition of the family firm. To be classified a family firm two conditions have to be met: First of all the family has to hold a management position as CEO or chairman. Secondly the family has to own at least 5% of the outstanding shares. The broad family firm definition in model 4 is less strict and states that not both the managerial and the ownership conditions have to be met but at least one of them. The narrow and broad definitions of the family firm in models 3 and 5 have one important difference compared to the previous definitions. These definitions use the combined ownership level of both families and lone founders to test the ownership criteria. The criteria is met when a family or a lone founder owns at least 5% of the outstanding shares.

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In model 6 an analyses is made on the effect of different levels of family and lone founder ownership on the advertising intensity. Besides the managerial variable Family Management eight variables were included to indicate family and lone founder ownership. For each type of ownership four binary variables were created indicating the following levels of ownership: 5 to 10% ownership, 10 to 20% ownership, 20-30% and more than 30% ownership. Table II shows that the counts for Family Ownership 5 to 10% (24) and Lone Ownership >30% (33) are low, but acceptable, compared the total of more than 3,200 observations.

Besides the managerial, ownership and family firm variables other variables were included in the six models to control for firm characteristics and performance. First of all the size of the firm was controlled for by the logarithm of the firm assets. Logarithmic transformation of the variable was desirable looking at the high kurtosis of 78,68 for the original data. To control for firm and/or industry dependent financing structures the debt/assets-ratio was included. The variable return on assets (ROA) is used to control for firm performance.

Another variable needed to be included to control for industry influences. As the advertising intensity can be industry dependent a variable was constructed in which the median advertising intensity was calculated for each industry (SIC). By using this variable it was not necessary to included dummy variables to control for each of the 55 SIC-industries. The logarithm of firm age was taken to control for the age of the firms. Finally dummy variables were included to control for years 1992 up to 2003. All variables were lagged by one year with the exception of the age of the firm and the industry variable.

In models 7 to 10 the effect of advertising on the performance of family firms is researched. In these models the logarithm of the market-to-book ratio is used as the dependent variable. To control for industry influences the same technique as on the advertising intensity is used. The mean market-to-book ratio was calculated for each SIC-industry and incorporated into one variable. In the models advertising intensity is lagged by one year and included as an independent variable. In model 7 the continues variables family ownership and lone founder ownership are included. In model 8 two interaction variables on ownership and advertising intensity are introduced. For the first variable advertising intensity is multiplied with family ownership and for the second variable advertising intensity is multiplied with lone founder ownership. To control for other firm characteristics the same variables as in models 1 to 6 are used.

In model 9 the eight binary variables on the levels of family and lone founder ownership are included. In model 10 interaction variables are included in which the advertising intensity is multiplied with the various ownership levels.

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3.3 Methods

In this thesis several statistical techniques are used to analyze and investigate advertising intensity in both the family firm and other firms. In this paragraph these statistical techniques are discussed.

3.3.1 T-tests and Wilcoxon Rank-sum Test

First of all t-tests are used to determine weather or not there is a difference in the mean advertising intensity of family and non-family firms. The t-tests are preformed on the individual characteristics of the family firm as well as the broad and narrow family firms definitions. The t-test has the null hypothesis that there is no difference in the means of the test variables. A p-value smaller than the significant level of 0.05 results in the rejection of the null hypothesis and different means are assumed. To asses weather a t-test for equal or unequal variance should be used a Levene's test is performed. This test has the null hypothesis that the variances of the samples are equal. A p-value below the chosen level of 0.05 will lead to the rejection of the null hypothesis and unequal variances have to be assumed in the t-tests.

After the construction of the equal sized samples using the propensity score the Wilcoxon rank-sum test is used to test the robustness of the research findings. The Wilcoxon rank-sum test (Wilcoxon 1945; Mann and Whitney 1947) is a non-parametric test used to asses whether two independent equally sized samples of observations have equally large values. The test is based on the order in which observations from two samples fall. The results of the tests are used to verify the findings of earlier preformed t-tests.

3.3.2 Clustered OLS Regression

In this thesis clustered OLS regression, which is a variation on the ordinary least squares (OLS) regression, is used to investigate whether variables have a significant influence on advertising intensity. One of the assumptions of OLS regression is that the residuals are independent. Given the fact that the sample contains panel data on 500 firms collected over a period of twelve years it is possible that scores within the firms are not independent. This in turn could lead to residuals that are not independent within firms, but are independent between firms. In this case clustered OLS regression can be used in which the observations are clustered on a specific characteristic. In this thesis the observations are clustered by firm. When using clustered OLS regressions the estimate of the coefficients are the same as the OLS estimates, but the standard errors take into account that the observations within the firms are not independent. This techniques improves the robustness of the results within the firms.

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3.3.3 Propensity Score Matching

To test the robustness of the results two equal samples were created using the propensity score. Rosenbaum and Rubin (1983) proposed propensity score matching as a method to reduce the bias in the estimation of treatment effects with observational data sets. The propensity score is defined here as the conditional probability of receiving a treatment given pretreatment characteristics. In other words the propensity score is the probability of a unit being assigned to a condition or treatment given a set of known covariates.

Propensity scores are used to reduce selection bias by equating groups based on these pretreatment characteristics. The propensity score is often used to calculate the Average effect of Treatment on the Treated (ATT). But in this thesis the calculated propensity score is used to construct a sample in which treated an untreated observations are equally represented. After this the sample is analyzed using t-tests and the robustness is tested using Wilcoxon rank-sum tests.

In the statistical program STATA the propensity score is calculated using the following steps. First of all a logit model is estimated in which the propensity scores are calculated. Next the sample is split in equally spaced intervals of the propensity score. Within each interval it is tested that the average propensity score of treated and control variables do not differ. In the event this tests fails a interval is split in halve and after this the split intervals will be tested again. This process results in intervals in which the average propensity score of the treated and untreated do not differ. Next the means from the treated and untreated firms are tested for each (firm) characteristic and each interval. If one of the means in an interval is different the model is not rightly balanced and the variables used to calculate the propensity score have to be adjusted.

After these calculations 214 observations of both the treated and the untreated firms were selected by hand to form a new sample of 428 observations. The treatment or condition in this case was the binary variable ownership by lone founders. The selection of the observations was based on the propensity scores in which a firm with lone founder ownership was matched to an almost identical firm without lone founder ownership.

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4. Empirical results

In this chapter the empirical results of the statistical analysis are presented. In paragraph 4.1 the results on the t-tests are presented. Paragraph 4.2 reports the outcomes on the clustered regressions and finally paragraph 4.3 reports the results on the robustness tests.

4.1 T-Tests

Table III shows the results of the t-tests on advertising intensity. Before performing the t-tests a Levene's test was executed on each of the variables to determine whether the variances of the two groups were equal or unequal. For the variables lone ownership (5 to 10%) and lone ownership (10 to 20%) there is significant evidence to assume equal variances. For the other t-tests unequal variances were assumed. The t-test on family management shows a significant difference in the mean advertising intensity. Firms with a family management have a mean advertising intensity of 0.0153 compared to 0.0108 for firms without family management.

Table III – T-Tests: Advertising Intensity

				T-test for Equality of Means	
		Mean	**St. deviation**	**T-test**	**Sign.**
Family Management	A	0.0108	0.0026	-4.2651	0.0000
	B	0.0153	0.0349		
Family has >5% shares	A	0.0099	0.0255	-5.8013	0.0000
	B	0.0214	0.0388		
Lone Owner	A	0.0101	0.0258	-4.9515	0.0000
	B	0.0191	0.0371		
Family Firm Narrow Definition	A	0.0105	0.0264	-4.3952	0.0000
	B	0.0222	0.0397		
Family Firm Narrow Definition (Comb. Own)	A	0.0097	0.0250	-5.7025	0.0000
	B	0.0193	0.0383		
Family Firm Broad Definition	A	0.0096	0.0250	-4.5725	0.0000
	B	0.0142	0.0316		
Family Firm Broad Definition (Comb. Own)	A	0.0088	0.0241	-6.2132	0.0000
	B	0.0150	0.0321		
Family Ownership (5 to 10%)	A	0.0112	0.0276	1.4939	0.1460
	B	0.0075	0.0126		
Family Ownership (10 to 20%)	A	0.0108	0.0271	-3.0580	0.0028
	B	0.0220	0.0376		
Family Ownership (20 to 30%)	A	0.0109	0.0273	-2.4392	0.0168
	B	0.0199	0.0336		
Family Ownership (> 30%)	A	0.0105	0.0262	-4.0839	0.0001
	B	0.0238	0.0438		
Lone Ownership (5 to 10%)*	A	0.0111	0.0274	-1.6462	0.0998
	B	0.0144	0.0126		
Lone Ownership (10 to 20%)*	A	0.0109	0.0274	-2.8602	0.0043
	B	0.0176	0.0301		
Lone Ownership (20 to 30%)	A	0.0107	0.0264	-3.3761	0.0012
	B	0.0330	0.0574		
Lone Ownership (> 30%)	A	0.0111	0.0274	-1.4407	0.1585
	B	0.0202	0.0379		

* = Equal variances assumed. Based on Levene's test on sign. level: $p<0.05$

A= All observations that do *not* have the mentioned characteristic

B = The observations that have the mentioned characteristic

Also for family ownership and lone founder ownership significantly higher means were found compared to other firms. Family owned firms show a mean advertising intensity of 0.0214 were

as other firms have an intensity of 0.0099. For lone founder ownership these numbers are respectively 0.0191 and 0.0101.

In the t-tests on the narrow and broad definitions of the family firm the inclusion of combined ownership made little difference on the outcome of the tests. For all four definitions the t-tests show that the mean advertising intensity of the family firms is significantly higher than the mean advertising intensity of non-family firms. For the narrow definition of the family firm the mean is 0.0222 against 0.0105 for other firms. The narrow definition based on both family and lone founder ownership shows a mean of 0.0193 against a mean of 0.0097 for other firms. Similar result are found for the broad definition of the family firm. For the broad definition a mean of 0.0142 was found and a mean of 0.0096 for other firms. The broad definition based on both family and lone founder ownership showed a mean of 0.0150 against a mean of 0.0088 for non-family firms.

The last eight t-tests investigate the difference in advertising intensity means of the various ownership levels of family ownership and lone founder ownership. Three of the variables were not significant on a level of $P<0.05$. These were family ownership (5 to 10%) with a p-value of 0.1460, lone ownership (5 to 10%) with a p-value of 0.0998 and finally lone ownership (>30%) with a p-value of 0.1585. However one can see that these variables do show a higher mean advertising intensity compared to types and levels of ownership.

4.2 Clustered OLS Regression

This paragraph describes the statistical results on the clustered OLS regressions. In paragraph 4.2.1 the correlations and the VIF-values are discussed. Paragraph 4.2.2 handles the regressions on the level of advertising and paragraph 4.2.3 describes the regressions investigating the (interaction) effect of advertising intensity and family firms on the firm performance.

4.2.1 Correlations and VIF-values

The correlation tables are included in appendix II tables B and C. High positive correlations can be found for the continues variables ownership lone owner (0.315) and family ownership (0.257) in relation to the variable family management. The variable Sic_Median_Advertising_ intensity is highly correlated with Advertising Intensity. This is not surprising as this variable is constructed out of the variables SIC and Advertising intensity. The same level of correlation (0.234) is found on the variable Sic_Median_ Market_to_Book in relation to the logarithm of the market-to-book ratio. Finally the logarithm of the firm age has a high positive correlation of 0.410 with the logarithm of assets. These higher correlation levels were expected and do not cause problems in the regression.

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The Variance Inflation Factor or VIF-values gives an indication on the level of multicollinearity in an OLS regression. For each OLS regression the individual and mean VIF is calculated and the results are displayed in appendix III table D. For models 1 to 5 the individual VIF-values range from 1.03 to 2.46 and the mean VIF of the models fluctuates between 1.74 and 1.81. Multicollinearity is considered to become a problem when VIF-values become larger then 10. Thus the VIF-values of these models do not indicate problems with multicollinearity. Models 6 to 10 however have a mean VIF of 10.49 up to 12.47 which indicates high levels of multicollinearity. Further analyses shows that the year dummies in the regressions have a high VIF of 17.04 up to 29.22. When these dummies are excluded the mean VIF drops below 2 and therefore the higher VIF-values of the dummy variables are not considered to be a problem.

4.2.2 Advertising Intensity and family firms

In table IV the output on the first five clustered OLS regressions is presented. In the first model the individual managerial and ownership characteristics of the family firm were tested. Family management has a negative impact on advertising intensity (β-coefficient: -0.004), however this variable is not significant in the model. The results also show that family ownership and lone founder ownership have a positive effect on the advertising intensity with β-coefficients of respectively 0.021 and 0.048. However only lone founder ownership is significant on a level of $P<0.05$.

The variable market-to-book ratio has a positive β-coefficient of 0.0004 and a standard error of 0.0004. Due to high correlation with the dependent variable advertising intensity variable sic_median_advertising_intenstiy is significant on a level of $P<0.01$. This high significance level is also seen in the other regressions. The age of the firm has a positive β of 0.0009 but a relative high standard error 0.0020. The variables assets log and debt/assets-ratio have negative β of respectively -0.0011 and -0.0054. The R-squared of the first regression is 0.241.

In regressions 2 and 3 the two narrow definitions of the family firms are analysed. The results show that the use of both family ownership and lone founder ownership in the family definition of model 3 causes a small negative shift in the β-coefficient compared to model 2. The β drops from 0.0058 to 0.0050 and the standard error drops from 0.0056 to 0.0035. Both family firm definitions were not significant in the regressions. The R-squared of the regressions are respectively 0.227 and 0.229.

In regressions 4 and 5 the broad definitions of the family firms are analysed. In contrast to the narrow definitions the use of both family ownership and lone founder ownership here results in a higher β-coefficient compared to only family ownership. The β increases from 0.00025 to 0.0021 and the standard error remains almost constant with 0.0027 compared to the firstly found 0.0026.

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In line with the narrow family firm definitions the broad definitions are also not significant in the regression. The market-to-book ratio is significant in both regressions on a P-level of <0.05. The R-squared of the regressions 4 and 5 are respectively 0.225 and 0.226.

Table IV – Clustered OLS Regressions

Variables	**1**	**2**	**3**	**4**	**5**
Family Management ^{L}	-0.0040 (0.0026)				
Ownership Familyonly ^{L}	0.0208 (0.0135)				
Ownership Loneowner ^{L}	0.0483** (0.0194)				
Family Firm Narrow Definition ^{L}		0.0058 (0.0056)			
Family Firm Narrow Definition (Comb. Own) ^{L}			0.0050 (0.0035)		
Family Firm Broad Definition ^{L}				0.00025 (0.0026)	
Family Firm Broad Definition (Comb. Own) ^{L}					0.0021 (0.0027)
Debt / Assets ^{L}	-0.0054 (0.0043)	-0.0070 (0.0044)	-0.0061 (0.0043)	-0.0073 (0.0045)	-0.0072 (0.0045)
Assets Log ^{L}	-0.0011 (0.0009)	-0.0009 (0.0009)	-0.0011 (0.0009)	-0.0011 (0.0009)	-0.0010 (0.0009)
Market to Book ^{L}	0.0004** (0.0002)	0.0004** (0.0001)	0.0004** (0.0002)	0.0004** (0.0002)	0.0005** (0.0002)
Firmage Log	0.0009 (0.0020)	0.0008 (0.0019)	0.0013 (0.0020)	0.00107 (0.0020)	0.0012 (0.0021)
Sic Median Advertising Intensity	0.7070*** (0.1651)	0.7100*** (0.1652)	0.7030*** (0.1649)	0.7150*** (0.1686)	0.7080*** (0.1679)
Year 1996	-0.0001 (0.0011)	-0.0002 (0.0011)	-0.0002 (0.0011)	-0.0002 (0.0011)	-0.0002 (0.0011)
Year 1997	0.0001 (0.0013)	0.0002 (0.0013)	0.00015 (0.0013)	0.00025 (0.0013)	0.0002 (0.0019)
Year 1998	-0.0003 (0.0015)	-0.0003 (0.0015)	-0.0003 (0.0015)	-0.0003 (0.0015)	*-0.0003* (0.0015)
Year 1999	-0.0004 (0.0017)	-0.0005 (0.0017)	-0.0005 (0.0017)	-0.0005 (0.0017)	-0.0005 (0.0017)
Year 2000	0.0007 (0.0018)	0.0007 (0.0018)	0.0008 (0.0018)	0.0007 (0.0018)	0.0007 (0.0018)
Year 2001	0.0008 (0.0019)	0.0007 (0.0019)	0.0007 (0.0019)	0.0007 (0.0019)	0.0007 (0.0019)
Year 2002	0.00109 (0.0019)	0.0010 (0.0019)	0.0011 (0.0019)	0.0011 (0.0019)	0.0011 (0.0019)
Year 2003	0.0019 (0.0019)	0.0019 (0.0019)	0.0019 (0.0019)	0.0019 (0.0019)	0.0019 (0.0019)
Constant	0.0120* (0.0070)	0.0114* (0.0066)	0.0103 (0.0064)	0.0123* (0.0074)	0.0099 (0.0073)
Observations	3193	3193	3193	3193	3193
R-squared	0.2414	0.2272	0.2286	0.2245	0.2257

*1. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*
2. Dependent variable: Advertising Intensity
3. ^{L} = Variable is lagged by one year

In regression 6 both family and lone founder ownership are divided into four levels of ownership (Table V). Besides the ownership variables the variable family management was included. This variable has a negative impact on advertising intensity (β-coefficient: -0.0046) and

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is significant on a level of P<0.10. The direction and impact of the variable on the advertising intensity is in line with the results of the first regression. However in the first regression family management was not significant.

With the exception of family ownership (5 to 10%) all ownership levels have positive β-coefficients. To a certain level the β-coefficients increase as the level of ownership increases. Family ownership starts with a negative β of -0.006 for 5 to 10% ownership. The β then increases from 0.0078 for 10 to 20% ownership to 0.009 for 20 to 30% ownership. Finally a family ownership of more than 30% results in a β of 0.0094. From the four family ownership variables only the variable 20 to 30% ownership is significant to the regression and only on a level of P<0.10.

Lone founder ownership starts with a positive β of 0.0033 for 5 to 10% ownership. The β increases from 0.0077 for 10 to 20% ownership to 0.0243 for 20 to 30% ownership. Finally lone founder ownership of more than 30% results in a β of 0.0172. From the four family ownership variables both 20 to 30% ownership and ownership >30% are significant to the regression a level of P<0.05.

Like in the previous regressions the variable sic_median_advertising_intensity. is significant on a p-level of 0.05. Market-to-book ratio is the only other variable which is significant on P<0.05. Both Debt/Assets ratio and Assets Log have a negative β. The R-squared of the regression is 0.25.

Table V – Clustered OLS Regressions

Variables	**6**
Family Management ^{L}	-0.0046* (0.0026)
Family Ownership (5 to 10%) ^{L}	-0.0060 (0.0041)
Family Ownership (10 to 20%) ^{L}	0.0078 (0.0064)
Family Ownership (20 to 30%) ^{L}	0.0090* (0.0049)
Family Ownership (> 30%) ^{L}	0.0094 (0.0072)
Lone Ownership (5 to 10%) ^{L}	0.00328 (0.00435)
Lone Ownership (10 to 20%) ^{L}	0.00766* (0.00455)
Lone Ownership (20 to 30%) ^{L}	0.0243** (0.0110)
Lone Ownership (> 30%) ^{L}	0.0172** (0.00784)
Debt / Assets ^{L}	-0.00485 (0.00427)
Assets Log ^{L}	-0.00104 (0.000893)
Market to Book ^{L}	0.000387** (0.000173)
Firmage Log	0.000940 (0.00195)
Sic Median Advertising Intensity	0.701*** 0.1646728
Year 1995	0.00321 (0.0102)
Year 1996	0.00302 (0.0103)
Year 1997	0.00336 (0.0105)
Year 1998	0.00278 (0.0106)
Year 1999	0.00268 (0.0109)
Year 2000	0.00387 (0.0109)
Year 2001	0.00388 (0.0110)
Year 2002	0.00420 (0.0110)
Year 2003	0.00513 (0.0109)
Constant	0.00815 (0.0146)
Observations	3193
R-squared	0.2501

*1. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*
2. Dependent variable: Advertising Intensity
3. ^{L} = Variable is lagged by one year

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4.2.3 Family advertising and firm performance

In table VI the regression results of models 7 to 10 are presented. These models investigate the influence family management and family ownership have on the performance of firms. The performance is measured with the variable logarithm of market-to-book ratio. In regression 7 one can see that advertising intensity has a significant positive influence on the logarithm of the market-to-book ratio (β-coefficient: 3.046, P<0.01). Some recalculation shows that when the advertising intensity rises from 0.01 to 0.02 the market to book ratio increases with 3,046 percent. So in general an increase in advertising intensity is rewarded by the market in the form of an increased market value compared to the book value of the firm. Family management has a negative impact on the market-to-book ratio (β-coefficient: -0.0562), however family management is not significant in the regression. Furthermore ownership has a positive, but insignificant influence on the market-to-book ratio with a β-coefficient of 0.059 for family ownership and 0.172 for lone founder ownership. The variable assets log has a β-coefficient of -0.0789 and a standard error of 0.0203. (P<0.05). Given the negative correlation with the dependent variable (-0.28) this is not a surprising result. The influence and significance of assets log in the regressions is the same in the models 8 to 10. With the exception of 1995 and 2002 all year dummies were significant on at least P<0.05. The R-squared of the regression is 0.307.

In model 8 the interaction variables on family ownership and lone ownership were included. The interaction variable of advertising intensity and family ownership shows a negative, but insignificant β-coefficient of -4.49. The interaction variable of advertising intensity and lone founder ownership gives similar results with a β-coefficient of -7.02. Although the variable is insignificant in the regression limited information can be taken from the outcomes. It seems that family and lone founder ownership is rewarded by the market with a higher market-to-book ratio. However the interaction of family or lone founder ownership with an increase in advertising intensity seems to have a negative influence on the market-to-book ratio. The inclusions of the interaction variables has little or no effect on the R-squared of the regression with an increase of 0.0012 totalling to a R-squared of 0.3084.

In regression 9 the regression results show that advertising intensity has a significant positive influence on the logarithm of the market-to-book ratio (β-coefficient: 2.866, P<0.01). Family management has a negative impact on the market-to-book ratio (β-coefficient: -0.069), however family management is not significant in the regression. In the regression family ownership has no significant influence on the market-to-book ratio, but the β-coefficients increase as the level of family ownership increases. For family ownership of 5 to 10% a negative β of -0.206 was found. For 10 to 20% ownership and 20 to 30% ownership the β-coefficients were respectively 0.081 and 0.060. And finally a β-coefficient of 0.106 was found for family ownership larger than 30%.

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More significant results were found on lone founders ownership. Lone Ownership (5 to 10%) has a significant, negative influence on the market-to-book ratio (β-coefficient: -0.163 P<0.10). Lone founder ownership levels from 10 to 20% have a β-coefficient of 0.0167, but are insignificant in the regression. Lone Ownership (20 to 30%) is significant on a P-level of 0.10 with a positive β-coefficient of 0.2294. Lone founder ownership larger than 30% breaks the upward trend with a β-coefficient -0.05 and a significant effect on the logarithm of the market-to-book ratio.

The variable assets log has a β-coefficient of -0.0768 and a standard error of 0.0202. The variable is significant on a P-level of 0.01. With the exception of 1995 and 2002 all year dummies were significant on a significance level of at least P<0.10. The R-squared of the regression is 0.315.

In model 10 the interaction variables on advertising intensity and ownership were included. The interaction variables all show a negative β-coefficient in the range of -0.21 to -6.76. The interaction variables on family ownership were all insignificant in the regression. Significant results were found for three of the four the interaction variables on lone founder ownership. This indicates that lone founder ownership is 'rewarded' by the market with a significant lower market-to-book ratio. The interaction variable on 5 to 10% lone ownership has a negative β-coefficient of -6.759 (P<0.05). The interaction variable on 10 to 20% lone ownership has a negative β-coefficient of -6.0995 (P<0.1) and finally the interaction variable on lone ownership larger than 30% has a negative β-coefficient of -5.459 (P<0.1). The R-squared of the regression is 0.321 and almost unchanged in respect to the R-squared of model 9.

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Table VI – Clustered OLS Regressions

Variables	7	8
Advertising Intensity ^{L}	3.0456**	3.652**
	(1.2415)	(1.5337)
Family Management ^{L}	-0.0562	-0.0567
	(0.0578)	(0.0581)
Ownership Familyonly ^{L}	0.0590	0.1430
	(0.2902)	(0.3050)
Ownership Lone Owner ^{L}	0.1717	0.3002
	(0.3844)	(0.4067)
Interaction Adv.Int * Fam Own.		-4.4906
		(5.6603)
Interaction Adv.Int * Lone Own.		-7.0174
		(8.1656)
Debt / Assets ^{L}	-0.0588	-0.0615
	(0.1365)	(0.1371)
Assets Log ^{L}	-0.0789***	-0.0792***
	(0.0203)	(0.0202)
Firmage Log	-0.0483	-0.0477
	(0.0342)	(0.0342)
Sic Median MTB	0.2138***	0.2128***
	(0.0298)	(0.0298)
Year 1995	0.0599	0.0644
	(0.0733)	(0.0736)
Year 1996	0.1457**	0.1477**
	(0.0741)	(0.0741)
Year 1997	0.3431***	0.3451***
	(0.0731)	(0.0731)
Year 1998	0.3640***	0.3651***
	(0.0774)	(0.0773)
Year 1999	0.3460***	0.3476***
	(0.0773)	(0.0771)
Year 2000	0.3267***	0.3300***
	(0.0752)	(0.0754)
Year 2001	0.1933***	0.1965***
	(0.0745)	(0.0747)
Year 2002	-0.0519	-0.0492
	(0.0762)	(0.0763)
Year 2003	0.1456**	0.1487**
	(0.0737)	(0.0738)
Constant	1.154***	1.1503***
	(0.2447)	(0.2449)
Observations	3158	3158
R-squared	0.3073	0.3084

*1. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*
2. Dependent variable: Market to Book ratio (log)
3. ^{L} = Variable is lagged by one year

Variables	9	10
Advertising Intensity ^{L}	2.8655**	4.306***
	(1.2511)	(1.6210)
Interaction Adv.Int * Fam (5 to 10%)		-0.2096
		(9.2917)
Interaction Adv.Int * Fam (10 to 20%)		-2.0412
		(2.8193)
Interaction Adv.Int * Fam (20 to 30%)		-5.7045
		(2.5382)
Interaction Adv.Int * Fam (> 30%)		-2.6146
		(3.0073)
Interaction Adv.Int * LO (5 to 10%)		-6.7594**
		(3.1061)
Interaction Adv.Int * LO (10 to 20%)		-6.0995*
		(3.2145)
Interaction Adv.Int * LO (20 to 30%)		-0.8077
		(2.4498)
Interaction Adv.Int * LO (> 30%)		-5.4586*
		(2.8751)
Family Management ^{L}	-0.0691	-0.0695
	(0.0583)	(0.0579)
Family Ownership (5 to 10%) ^{L}	-0.2063	-0.2010
	(0.1549)	(0.1890)
Family Ownership (10 to 20%) ^{L}	0.0807	0.1035
	(0.1038)	(0.0987)
Family Ownership (20 to 30%) ^{L}	0.0603	0.1572
	(0.1151)	(0.1142)
Family Ownership (> 30%) ^{L}	0.1063	0.1487
	(0.1444)	(0.1558)
Lone Ownership (5 to 10%) ^{L}	-0.1629*	-0.0764
	(0.0932)	(0.0926)
Lone Ownership (10 to 20%)^{L}	0.0167	0.1064
	(0.1583)	(0.1836)
Lone Ownership (20 to 30%) ^{L}	0.2994*	0.2920
	(0.1618)	(0.1899)
Lone Ownership (> 30%) ^{L}	-0.0528	0.0504
	(0.1811)	(0.1867)
Debt / Assets ^{L}	-0.0533	-0.0693
	(0.1351)	(0.1361)
Assets Log ^{L}	-0.0768***	-0.0763***
	(0.0202)	(0.0203)
Firmage Log	-0.0558	-0.0569*
	(0.0340)	(0.0336)
Sic Median MTB	0.2127***	0.2110***
	(0.0290)	(0.0297)
Year 1995	0.0457	0.0607
	(0.0759)	(0.0756)
Year 1996	0.1354*	0.1466*
	(0.0763)	(0.0758)
Year 1997	0.3342***	0.3444***
	(0.0754)	(0.0748)
Year 1998	0.3499***	0.3597***
	(0.0796)	(0.0792)
Year 1999	0.3319***	0.3445***
	(0.0793)	(0.0788)
Year 2000	0.3121***	0.3269***
	(0.0776)	(0.0773)
Year 2001	0.1788**	0.1931**
	(0.0766)	(0.0765)
Year 2002	-0.0662	-0.0547
	(0.0782)	(0.0776)
Year 2003	0.1332*	0.1449*
	(0.0761)	(0.0756)
Constant	1.1850***	1.1711***
	(0.2436)	(0.2458)
Observations	3158	3158
R-squared	0.3149	0.3214

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4.3 Robustness

In this paragraph the results on the robustness tests are presented. In previous paragraphs t-tests and regressions have indicated that in the case of lone founder ownership the advertising intensity is significant higher compared to other firms. To test the robustness of these results a sample is constructed from the original dataset. First of all the propensity score was calculated for all observations using the binary variable lone founder ownership as treatment variable. The pretreatment characteristics that could be included in the logit regression were: the age of the firm, the debt/assets-ratio, return on assets and the variables on the years 1994 to 2003. It was not possible to included any industry variable or other variables as the balancing property would not be satisfied. The final sample contains 428 observations: half of these observations has lone founder ownership and in the other observations lone founder ownership is absent.

Table VII displays the results of t-tests preformed on the created sample. The t-tests were executed to determine the equality of the characteristics of the treated and untreated. To asses weather a t-test for equal or unequal variance should be used a Levene's test is performed. Besides the pretreatment characteristics used in the calculation of the propensity score also the variables on sales and assets were included in the tests. Only the t-test on the debt/assets-ratio is significant on P<0.05 which means that the mean debt/assets-ratio of the firms with lone founder ownership is different form the mean ratio of firms without lone founder ownership. The other t-tests were insignificant which indicates that the means are not significant different form each other. These results show that the observations in this new sample are not significant different on key firm characteristics. Based on this conclusion it is possible to analyse the advertising intensity and to test the robustness of the findings on lone founder ownership.

Table VII – T-Tests

				T-test for Equality of Means	
		Mean	**St. deviation**	**T-test**	**Sign.**
Firm age	A	17.4158	8.0129	-1.9449	0.0525
	B	19.1168	9.9737		
Debt/assets-ratio*	A	0.1027	0.1088	2.0196	0.0441
	B	0.0804	0.1196		
ROA	A	3.8611	39.2497	-1.0688	0.2861
	B	6.9020	13.8434		
Sales_Log*	A	7.5530	1.3219	-1.8248	0.0687
	B	7.7925	1.3918		
Assets_Log*	A	7.8954	1.3101	-1.2277	0.2202
	B	8.0580	1.4274		
Advertising Intensity	A	0.0103	0.0221	-3.9061	0.0001
	B	0.0218	0.0371		

* = Equal variances assumed. Based on Levene's test on sign. level: p<0.05

A = All observations that do not have lone founder ownership

B = All observations that have lone founder ownership

A normal t-test (table VII) shows that the mean advertising intensity is significant higher in case of lone founder ownership. These results are confirmed by the Wilcoxon rank-sum test (Table VIII) in which the null-hypothesis of equal advertising intensities in both groups is rejected. The advertising intensity is significantly higher in case of lone founder ownership. These results show that the findings on lone founder ownership are robust.

Table VIII – Wilcoxon Rank-Sum Test: Advertising Intensity

Ho: Advertising intensity is equal for Lone Owner = 0 and Lone Owner = 1

Lone Owner	Observations	Rank Sum	Expexted
0	214	40948	45903
1	214	50858	45903
	428	91806	91806

Unadjusted variance =	1637207.00
Adjustment for ties =	-314672.22
Adjusted variance =	1322534.78

z =	-4.309
Prob > |z| =	0.0000

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5. Discussion

In this chapter the findings on the empirical analyses are connected to the hypotheses. In paragraph 5.1 this is done for the family firm and it influences on the level of advertising intensity. Paragraph 5.2 discusses the hypotheses on the effect of advertising by family firms on the firm performance.

5.1 Advertising Intensity and Family Firms

Hypothesis 1 stated that family firms woud have different advertising. In t-tests the null-hypotheses of no difference in the mean advertising intensity were rejected. All four family firm definitions (both broad as well as narrow definitions) showed significantly higher advertising intensities compared to other firms. Interesting finding was that the introduction of lone founder owners into the variable made little difference on mean advertising intensities as well as the standard deviations. However in the regressions all four family firm definitions had an insignificant influence on the advertising intensity. This justified the more detailed analyses of the individual characteristics of the family firm.

Hypothesis 2 stated that family owned firms have a higher advertising intensity than other firms. This hypothesis was made on the argument that the family firm has an interest in transferring the firm to next generations. The t-tests showed that advertising intensity in family owned firms is significantly higher compared other firms. An exception was found in family ownership on a level of 5-10%. On this level the mean advertising intensity was lower for family firms compared to other firms and in the regressions this level of ownership had a negative effect on the advertising intensity. Overall the hypothesis was confirmed by the statistical analyses but unfortunately the findings were insignificant in the regressions.

Lone founder ownership turned out to play an important role in this thesis. Hypothesis 3 stated that family owned firms would have a higher advertising intensity than other firms. Being first generation family firms the lone founders turn out to have a significant positive influence on the level of advertising. The t-tests preformed on lone founder ownership also showed significant higher mean advertising intensity compared to other firms. This result was found on both the four lone ownership levels as well as the overall ownership variable.

Hypothesis 4a stated that family managed firms would have a lower advertising intensity than other firms. The t-test and regressions indeed showed lower levels of advertising in the case of family management. Unfortunately the results in the regressions were not significant. The lower advertising intensity is in line with the theory that family controlled firms have different visions and strategies on advertising as they may serve more loyal customers. The use of less cost-intensive advertising and other types of advertisement is also in line with these findings. Hypothesis 4b was rejected as results like does found by Shum (2004) were not found in this research.

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5.2 Advertising Intensity and Family Firm Performance

Hypothesis 5 stated that advertising results in better market performance for lone founder firms compared to other firms. This hypothesis was partly confirmed in this research. It became clear that lone founder ownership has an positive effect on the market-to-book ratio. However this positive effect does not originate from the interaction of advertising with lone founder ownership. In fact this interaction has a significant negative effect on the market-to-book ratio. No direct explanation could be found for this result, but it seem that the market is negative and/or sceptical towards lone founded firms with high(er) level of advertising intensity. The findings of Miller, Le Breton-Miller, Lester and Cannella (2007) that lone founder businesses perform better than other corporations were not found in this research.

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6. Conclusion

In paragraph 6.1 the main conclusions of this thesis are presented and the research questions are answered. Paragraph 6.2 discusses the limitations of this research and provides suggestions for future research.

6.1 Conclusions

The first research question investigated the level of advertising in family and non-family firms and was formulated as: *To what degree do family firms have different levels of advertising spending than non-family firms?* This research found significant higher levels of advertising intensity in family firms based on both broad as well as narrow family firm definitions. However for all four family firm definitions the family firm influence on the level of advertising turned out to be insignificant in the regressions. The analyses of the individual family firm characteristics lead to interesting results in which family management was found to have a negative effect on the advertising intensity. Theoretical explanations point to the use of other, possibly less costly, types of advertising by family management. These findings are in contrast with the results on family and lone founder ownership. Both types of ownership have a positive effect on the level of advertising and as the level of ownership increases the influence also tends to increase. For family ownership the positive effect on the advertising intensity can be explained by the long term focus of families and the desire to transfer the business to future generations. However most results on family ownership were not significant in the regressions. The need for brand building can explain the positive significant results for lone founder businesses. In this perspective a higher advertising intensity is more linked to aspects like market entry and business survival and the link with being a (first generation) family firm is pushed to the background.

The second research question investigated the effect of advertising and was formulated as followed: *Does the effect of advertising on the financial performance differ between family and non-family firms?* This research found that in general advertising intensity is rewarded by the (stock) market which results in a higher market-to-book ratio. Theoretical explanation is that more advertising will secure and/or stimulate sales which in turn translates into (a possibility of) higher profits. When investigating the influence of the family firm it became clear that especially lone founder ownership has an positive effect on the market-to-book ratio. However this positive effect does not originate from the interaction of advertising with lone founder ownership. In fact this interaction has a significant negative effect on the market-to-book ratio. No direct explanation could be found for this result, but it seem that the market is negative and/or sceptical towards lone founded firms with high(er) level of advertising intensity. Further research on this finding is necessary.

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6.2 Limitations and further research

In this research the used data and definitions lead to several limitations. First of all the size and geographical dispersion of the investigated firms present limitations on the outcomes as only large US-firms of the S&P500 have been used for this research. Furthermore the stocks of the these firms are actively traded and for a large share of the other firms this is not the case. One could argue therefore that the results only hold for a fairly small proportion of the economy. This leads to the suggestion that future research could use datasets that are more divers. An example is the inclusion of smaller firms and/or firms from another continents like Europe or Asia.

Another limitation is the used definition of advertisement. Advertising intensity is a monetary representation of advertising activities and thereby this research has ignored some important parts of the subject of advertising. Not all types of advertising are included in advertising expenses. An good example of advertising without (large) costs is word-to-mouth advertising which can be very effective. Although its is hard to collect specified data on these types of advertising the results could be interesting and possibly explain a large portion of the differences between family and non-family firms.

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Appendix I

Table A – Definitions of the variables

#	Variable	Definition
1.	Advertising Intensity	Advertising expenses divided by sales
2.	Market to Book	Ratio of book value of a stock divided by its market value
3.	Log Market to Book	The natural log of the market to book ratio
4.	Family Managament	Binary variable = 1 when the CEO or the chairman of the firm is a member of the family
5.	Family Ownership	Percentage of shares hold by members of the family
6.	Lone Founder Ownership	Percentage of shares hold by a lone owner
7.	Ownership Combined	Percentage of shares owned by members of the family and lone owners combined
8.	Ownership Family .... - ....%	Binary variable indicating that family members hold an amount of shares in a certain range
9.	Ownership Lone Owner .... - ....%	Binary variable indicating that lone owners hold an amount of shares in a certain range
10.	Family Firm Narrow	Binary variable = 1 when CEO, Chairman is family member *and* family has 5% or more ownership
11.	Family Firm Broad	Binary variable = 1 when CEO, Chairman is family member *or* family has 5% or more ownership
12.	Family Firm Narrow (Comb. Ownership)	Binary variable = 1 when CEO, Chairman is family member *and* combined ownership of family and lone owner is >= 5%
13.	Family Firm Broad (Comb. Ownership)	Binary variable = 1 when CEO, Chairman is family member *or* combined ownership of family and lone owner is >= 5%
14.	Firm Size	The natural log of assets of the firm
15.	Firm Age	The natural log of the age of the firm
16.	Debt ratio	Ratio of debt divided by assets
17.	Year ####	Binary/dummy variable indicating a year
18.	SIC Median Advertising Int.	Median Advertising Intensity of the sector (SIC) the firm is active in
19.	SIC Median Market to Book	Median Market to Book ratio of the sector (SIC) the firm is active in
20.	Interaction Adv. Int. – Family Ownership	Interaction variable of Family Ownership multiplied with advertising intensity
21.	Interaction Adv. Int. – Lone Ownership	Interaction variable of Lone Founder Ownership multiplied with advertising intensity
22.	Interaction Adv. Int. – Family .... - ....%	Interaction variable of family ownership of a certain percentage multiplied with advertising intensity
23.	Interaction Adv. Int. – Lone Owner .... - ....%	Interaction variable of lone ownership of a certain percentage multiplied with advertising intensity

Appendix II

Table B – Correlations

	Adv. Intensity	Fam. Man. L	Own. Familyonly L	Own. Loneowner L	Debt / Assets L	Assets Log L	MTB L	Firmage Log	Sic Med. Adv. I.	Year 1996	Year 1997	Year 1998	Year 1999	Year 2000	Year 2001
Advertising Intensity	1.0000	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Family Management L	0.0442	1.0000	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Ownership Familyonly L	0.1258	0.2568	1.0000	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Ownership Loneowner L	0.1126	0.3145	-0.0848	1.0000	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Debt / Assets L	-0.0418	-0.0781	-0.0614	-0.1107	1.0000	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Assets Log L	-0.0976	-0.2042	-0.1216	-0.0635	0.2442	1.0000	--------	--------	--------	--------	--------	--------	--------	--------	--------
Market to Book L	0.1613	0.0487	0.0399	0.1123	-0.0943	-0.1575	1.0000	--------	--------	--------	--------	--------	--------	--------	--------
Firmage Log	0.0076	-0.2927	0.0321	-0.2127	0.1450	0.4096	-0.1620	1.0000	--------	--------	--------	--------	--------	--------	--------
Sic_Median_Advertising Intensity	0.4516	0.0931	0.1215	0.0153	0.0568	-0.0646	0.0903	0.0597	1.0000	--------	--------	--------	--------	--------	--------
Year 1996	-0.0001	0.0051	0.0193	-0.0129	-0.0422	-0.0853	-0.0318	0.0210	0.0082	1.0000	--------	--------	--------	--------	--------
Year 1997	0.0063	0.0091	0.0146	0.0002	-0.0358	-0.0921	-0.0209	-0.0029	0.0132	-0.1009	1.0000	--------	--------	--------	--------
Year 1998	-0.0019	0.0243	0.0114	0.0191	-0.0312	-0.0767	0.0226	-0.0317	0.0008	-0.1089	-0.1152	1.0000	--------	--------	--------
Year 1999	-0.0086	0.0129	-0.0042	0.0145	-0.0058	-0.0191	0.0655	-0.0175	-0.0098	-0.1123	-0.1188	-0.1282	1.0000	--------	--------
Year 2000	0.0073	0.0029	-0.0030	0.0142	0.0119	0.0229	0.0785	-0.0189	-0.0065	-0.1160	-0.1228	-0.1325	-0.1366	1.0000	--------
Year 2001	-0.0003	-0.0065	-0.0121	-0.0003	0.0321	0.0787	0.0357	-0.0043	-0.0033	-0.1185	-0.1254	-0.1353	-0.1396	-0.1442	1.0000
Year 2002	-0.0053	-0.0130	-0.0168	-0.0045	0.0472	0.0943	-0.0322	-0.0032	-0.0045	-0.1192	-0.1261	-0.1361	-0.1404	-0.1450	-0.1481
Year 2003	-0.0011	-0.0244	-0.0242	-0.0135	0.0510	0.1117	-0.0832	0.0239	-0.0080	-0.1207	-0.1277	-0.1378	-0.1421	-0.1468	-0.1500

Table C – Correlations

	Adv. Int.	Fam. Man. L	Fam.Own. (5-10%) L	Fam. Own. (10-20%) L	Fam. Own. (20-30%) L	Fam. Own. (> 30%) L	Lone Own. (5-10%) L	Lone Own. (10-20%) L	Lone Own. (20-30%) L	Lone Own. (> 30%) L	Debt / Assets L
Advertising Intensity	1.0000	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Family Management L	0.0442	1.0000	--------	--------	--------	--------	--------	--------	--------	--------	--------
Family Own. (5 to 10%) L	-0.0196	-0.0498	1.0000	--------	--------	--------	--------	--------	--------	--------	--------
Family Own. (10 to 20%) L	0.0675	0.0226	-0.0153	1.0000	--------	--------	--------	--------	--------	--------	--------
Family Own. (20 to 30%) L	0.0454	0.0688	-0.0132	-0.0267	1.0000	--------	--------	--------	--------	--------	--------
Family Own. (> 30%) L	0.1083	0.2472	-0.0206	-0.0416	-0.0359	1.0000	--------	--------	--------	--------	--------
Lone Own. (5 to 10%) L	0.0266	0.1371	-0.0203	-0.0411	-0.0355	-0.0552	1.0000	--------	--------	--------	--------
Lone Own. (10 to 20%) L	0.0395	0.2261	-0.0173	-0.0351	-0.0303	-0.0471	-0.0465	1.0000	--------	--------	--------
Lone Own. (20 to 30%) L	0.1302	0.1761	-0.0133	-0.0269	-0.0232	-0.0362	-0.0357	-0.0305	1.0000	--------	--------
Lone Own. (> 30%) L	0.0390	0.1407	-0.0089	-0.0180	-0.0155	-0.0242	-0.0239	-0.0204	-0.0156	1.0000	--------
Debt / Assets L	-0.0418	-0.0781	-0.0119	-0.0137	0.0485	-0.0692	-0.0642	-0.0706	-0.0968	-0.0381	1.0000
Assets Log L	-0.0976	-0.2042	0.0128	-0.0339	-0.0435	-0.0792	-0.0611	-0.0352	-0.0774	-0.0174	0.2442
Market to Book L	0.1613	0.0487	-0.0165	0.0013	0.0049	0.0387	-0.0254	0.0494	0.0951	0.0642	-0.0943
Firmage Log	0.0076	-0.2927	0.0186	0.0376	0.0144	0.0374	-0.1332	-0.1325	-0.1184	-0.1057	0.1450
Sic_Median_Adv. Int.	0.4516	0.0931	0.0081	0.0683	0.0232	0.1258	0.0677	0.0240	0.0170	-0.0270	0.0568
Year 1996	-0.0001	0.0051	0.0117	0.0042	-0.0095	0.0262	0.0182	-0.0152	-0.0026	-0.0096	-0.0422
Year 1997	0.0063	0.0091	-0.0162	-0.0016	-0.0282	0.0270	0.0244	0.0068	-0.0145	0.0086	-0.0358
Year 1998	-0.0019	0.0243	0.0040	0.0023	-0.0132	0.0148	0.0079	-0.0182	0.0263	0.0133	-0.0312
Year 1999	-0.0086	0.0129	-0.0091	-0.0184	0.0236	-0.0076	0.0076	-0.0013	0.0161	0.0014	-0.0058
Year 2000	0.0073	0.0029	0.0003	0.0118	-0.0122	0.0004	-0.0147	0.0045	-0.0002	0.0274	0.0119
Year 2001	-0.0003	-0.0065	-0.0009	0.0092	0.0111	-0.0197	-0.0135	0.0065	-0.0023	-0.0022	0.0321
Year 2002	-0.0053	-0.0130	-0.0012	-0.0079	0.0167	-0.0246	-0.0143	0.0106	-0.0029	-0.0118	0.0472
Year 2003	-0.0011	-0.0244	0.0088	-0.0147	0.0153	-0.0305	-0.0203	0.0233	-0.0227	-0.0125	0.0510

Appendix II - (cont.)

Table C – Correlations (cont.)

	MTB [L]	Firmage Log	Sic Med Adv. I.	Year 1996	Year 1997	Year 1998	Year 1999	Year 2000	Year 2001	Year 2002	Year 2003
Advertising Intensity	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Family Management [L]	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Family Own. (5 to 10%) [L]	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Family Own. (10 to 20%) [L]	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Family Own. (20 to 30%) [L]	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Family Own. (> 30%) [L]	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Lone Own. (5 to 10%) [L]	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Lone Own. (10 to 20%)[L]	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Lone Own. (20 to 30%) [L]	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Lone Own. (> 30%) [L]	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Debt / Assets [L]	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Assets Log [L]	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Market to Book [L]	1.0000	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Firmage Log	-0.1620	1.0000	--------	--------	--------	--------	--------	--------	--------	--------	--------
Sic_Median_Adv. Int.	0.0903	0.0597	1.0000	--------	--------	--------	--------	--------	--------	--------	--------
Year 1996	-0.0318	0.0210	0.0082	1.0000	--------	--------	--------	--------	--------	--------	--------
Year 1997	-0.0209	-0.0029	0.0132	-0.1009	1.0000	--------	--------	--------	--------	--------	--------
Year 1998	0.0226	-0.0317	0.0008	-0.1089	-0.1152	1.0000	--------	--------	--------	--------	--------
Year 1999	0.0655	-0.0175	-0.0098	-0.1123	-0.1188	-0.1282	1.0000	--------	--------	--------	--------
Year 2000	0.0785	-0.0189	-0.0065	-0.1160	-0.1228	-0.1325	-0.1366	1.0000	--------	--------	--------
Year 2001	0.0357	-0.0043	-0.0033	-0.1185	-0.1254	-0.1353	-0.1396	-0.1442	1.0000	--------	--------
Year 2002	-0.0322	-0.0032	-0.0045	-0.1192	-0.1261	-0.1361	-0.1404	-0.1450	-0.1481	1.0000	--------
Year 2003	-0.0832	0.0239	-0.0080	-0.1207	-0.1277	-0.1378	-0.1421	-0.1468	-0.1500	-0.1508	1.0000

Appendix III

Table D – VIF

Regression 1

Variable	VIF	1/VIF
Year 2003	2.46	0.406
Year 2002	2.44	0.410
Year 2001	2.43	0.411
Year 2000	2.38	0.421
Year 1999	2.30	0.436
Year 1998	2.22	0.451
Year 1997	2.07	0.483
Year 1996	1.98	0.506
Assets Log [L]	1.38	0.725
Firmage_log	1.37	0.729
Family Management [L]	1.32	0.755
Ownership Loneowner [L]	1.19	0.844
Ownership Familyonly [L]	1.15	0.872
Debt / Assets [L]	1.09	0.916
Market to Book [L]	1.08	0.924
Sic Median Adv. Int.	1.05	0.954
Mean VIF	1.74	

1. [L] = Lagged variable is used (one year lag)

Regression 2

Variable	VIF	1/VIF
Year 2003	2.46	0.406
Year 2002	2.44	0.410
Year 2001	2.43	0.412
Year 2000	2.38	0.421
Year 1999	2.30	0.436
Year 1998	2.22	0.451
Year 1997	2.07	0.483
Year 1996	1.98	0.506
Assets Log [L]	1.37	0.730
Firmage_log	1.25	0.799
Debt / Assets [L]	1.08	0.924
Market to Book [L]	1.07	0.932
Sic Median Adv. Int.	1.03	0.966
Fam Firm Narrow Def. [L]	1.03	0.975
Mean VIF	1.79	

1. [L] = Lagged variable is used (one year lag)

Regression 3

Variable	VIF	1/VIF
Year 2003	2.46	0.406
Year 2002	2.44	0.410
Year 2001	2.43	0.412
Year 2000	2.38	0.421
Year 1999	2.30	0.436
Year 1998	2.22	0.451
Year 1997	2.07	0.483
Year 1996	1.98	0.506
Assets Log [L]	1.35	0.740
Firmage_log	1.28	0.783
Debt / Assets [L]	1.10	0.913
Market to Book [L]	1.07	0.932
FF Narrow def (Comb. Own.) [L]	1.07	0.939
Sic Median Adv. Int.	1.05	0.957
Mean VIF	1.80	

1. [L] = Lagged variable is used (one year lag)

Regression 4

Variable	VIF	1/VIF
Year 2003	2.46	0.406
Year 2002	2.44	0.410
Year 2001	2.43	0.412
Year 2000	2.38	0.421
Year 1999	2.30	0.436
Year 1998	2.22	0.451
Year 1997	2.07	0.483
Year 1996	1.98	0.506
Assets Log [L]	1.36	0.735
Firmage_log	1.30	0.770
FF Broad def. [L]	1.10	0.910
Debt / Assets [L]	1.08	0.925
Market to Book [L]	1.07	0.932
Sic Median Adv. Int.	1.05	0.951
Mean VIF	1.80	

1. [L] = Lagged variable is used (one year lag)

Appendix III – (cont.)

Table D – VIF (cont.)

Regression 5

Variable	VIF	1/VIF
Year 2003	2.46	0.406
Year 2002	2.44	0.410
Year 2001	2.43	0.412
Year 2000	2.38	0.421
Year 1999	2.30	0.436
Year 1998	2.22	0.451
Year 1997	2.07	0.483
Year 1996	1.98	0.506
Assets Log [L]	1.37	0.730
Firmage_log	1.31	0.762
FF Broad def. (Comb. Own.) [L]	1.13	0.882
Debt / Assets [L]	1.08	0.925
Market to Book [L]	1.07	0.932
Sic Median Adv. Int.	1.05	0.950
Mean VIF	1.81	

1. [L] = Lagged variable is used (one year lag)

Regression 6

Variable	VIF	1/VIF
Year 2003	29.22	0.034
Year 2002	28.71	0.035
Year 2001	28.48	0.035
Year 2000	27.61	0.036
Year 1999	26.31	0.038
Year 1998	25.11	0.040
Year 1997	22.36	0.045
Year 1996	20.48	0.049
Year 1995	17.12	0.058
Firmage_log	1.39	0.721
Family Management [L]	1.39	0.722
Assets Log [L]	1.38	0.726
Family Ownership (> 30%) [L]	1.16	0.862
Lone Ownership (10 to 20%) [L]	1.12	0.895
Debt / Assets [L]	1.11	0.904
Market to Book [L]	1.09	0.919
Lone Ownership (20 to 30%) [L]	1.09	0.921
Lone Ownership (5 to 10%) [L]	1.08	0.924
Sic Median Adv. Int.	1.07	0.938
Lone Ownership (> 30%) [L]	1.05	0.952
Family Ownership (20 to 30%) [L]	1.03	0.972
Family Ownership (10 to 20%) [L]	1.03	0.976
Family Ownership (5 to 10%) [L]	1.00	0.995
Mean VIF	10.49	

1. [L] = Lagged variable is used (one year lag)

Regression 8

Variable	VIF	1/VIF
Year 2003	28.87	0.034636
Year 2002	28.30	0.035335
Year 2001	28.13	0.035555
Year 2000	27.42	0.036468
Year 1999	26.07	0.038359
Year 1998	24.64	0.040589
Year 1997	22.07	0.045306
Year 1996	20.32	0.049213
Year 1995	17.03	0.058705
Interaction Adv.Int * Lone Ownership	1.59	0.628250
Interaction Adv.Int * Fam. Ownership	1.58	0.634686
Advertising Intensity [L]	1.56	0.642189
Lone Ownership [L]	1.51	0.663248
Assets Log [L]	1.48	0.676122
Family Ownership [L]	1.42	0.706216
Firmage Log	1.37	0.731650
Family Management [L]	1.32	0.759294
Sic Median MTB	1.24	0.805710
Debt / Assets [L]	1.10	0.906668
Mean VIF	12.47	

1. [L] = Lagged variable is used (one year lag)

Regression 10

Variable	VIF	1/VIF
Year 2003	28.89	0.035
Year 2002	28.32	0.035
Year 2001	28.14	0.036
Year 2000	27.44	0.036
Year 1999	26.08	0.038
Year 1998	24.65	0.041
Year 1997	22.08	0.045
Year 1996	20.33	0.049
Year 1995	17.04	0.059
Advertising Intensity [L]	1.80	0.554
Interaction Adv.Int * LO (20 to 30%)	1.60	0.626
Interaction Adv.Int * Fam (> 30%)	1.56	0.641
Lone Ownership (20 to 30%) [L]	1.51	0.663
Lone Ownership (10 to 20%) [L]	1.50	0.668
Assets Log [L]	1.49	0.671
Interaction Adv.Int * Fam (10 to 20%)	1.49	0.672
Family Ownership (> 30%) [L]	1.45	0.692
Interaction Adv.Int * LO (10 to 20%)	1.44	0.692
Interaction Adv.Int * Fam (20 to 30%)	1.41	0.711
Family Management [L]	1.40	0.715
Family Ownership (10 to 20%) [L]	1.39	0.717
Firmage Log	1.38	0.723
Lone Ownership (> 30%) [L]	1.37	0.728
Interaction Adv.Int * LO (5 to 10%)	1.37	0.730
Interaction Adv.Int * LO (> 30%)	1.37	0.732
Family Ownership (20 to 30%) [L]	1.36	0.734
Lone Ownership (5 to 10%) [L]	1.32	0.757
Family Ownership (5 to 10%) [L]	1.26	0.796
Interaction Adv.Int * Fam (5 to 10%)	1.26	0.796
Sic Median MTB	1.24	0.803
Debt / Assets [L]	1.12	0.892
Mean VIF	10.49	

1. [L] = Lagged variable is used (one year lag)

Appendix IV

Table E – Descriptive Statistics : Advertising Intensity

SIC	Obs.	Mean	Std. Dev	Skewness	Kurtosis
SIC 14	12	0,00045	0,00017	-1,51	5,70
SIC 15	36	0,00395	0,00576	1,16	3,37
SIC 20	198	0,06805	0,06107	0,45	2,04
SIC 21	31	0,03496	0,02111	-0,30	1,99
SIC 23	47	0,01842	0,02151	0,48	1,51
SIC 24	42	0,00207	0,00901	4,24	19,05
SIC 26	108	0,00509	0,01031	1,71	4,20
SIC 27	120	0,01752	0,02861	2,69	14,32
SIC 28	422	0,02320	0,03808	1,58	4,34
SIC 29	72	0,00006	0,00032	6,79	51,19
SIC 30	75	0,03310	0,03594	1,19	3,13
SIC 33	84	0,00004	0,00022	5,02	26,28
SIC 34	84	0,03678	0,05992	1,61	4,21
SIC 35	310	0,00711	0,01310	1,80	5,55
SIC 36	402	0,00739	0,01499	2,34	7,78
SIC 37	183	0,00285	0,00684	2,15	6,04
SIC 38	254	0,00471	0,01324	3,45	14,94
SIC 39	36	0,09454	0,06809	-0,52	1,50
SIC 44	12	0,04836	0,00159	0,26	2,09
SIC 45	36	0,01704	0,00858	0,40	1,97
SIC 48	162	0,01251	0,02319	2,65	10,83
SIC 50	24	0,00061	0,00212	3,27	12,26
SIC 51	66	0,00054	0,00229	4,50	23,09
SIC 52	24	0,00727	0,00650	0,51	2,23
SIC 53	144	0,02031	0,01863	0,21	1,84
SIC 54	60	0,00503	0,00578	0,45	1,43
SIC 55	22	0,00891	0,00736	1,51	5,24
SIC 56	48	0,01598	0,01571	0,58	2,25
SIC 57	47	0,02963	0,01843	-0,25	1,73
SIC 58	52	0,03847	0,01885	-0,60	2,87
SIC 59	84	0,01966	0,03321	2,78	10,97
SIC 61	78	0,00123	0,00391	3,12	11,41
SIC 62	97	0,02448	0,03180	0,92	2,42
SIC 63	299	0,00044	0,00182	4,26	20,48
SIC 67	26	0,00513	0,01091	1,68	3,96
SIC 70	31	0,00377	0,00908	2,11	5,84
SIC 73	376	0,01739	0,03560	3,32	16,29
SIC 75	12	0,00181	0,00426	1,86	4,59
SIC 78	12	0,02748	0,04985	1,17	2,41
SIC 79	12	0,00705	0,01276	1,16	2,36
SIC 80	53	0,00042	0,00132	2,79	8,81
SIC 87	30	0,00092	0,00355	3,63	14,52
SIC 99	36	0,00162	0,00295	1,42	3,41

1. Industries withs SIC-number 10, 13, 16, 25, 40, 42, 49, 60, 64, 65, 72 and 82 had a advertising intensity of zero or data on the level of advertising intensity was missing