The Value Relevance of Goodwill, Advertising, and Research and Development (R&D) Expenditures: Some UK Evidence

Thesis submitted in accordance with the requirements of the University of Liverpool for the degree of Doctor in Philosophy

by

Maqsood Iqbal Qureshi

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Abstract

The global economy has changed rapidly and intangibles or knowledge assets constitute an increasingly important part of new economies. Resources spent on intangible assets, traditionally, have not been treated as valuable investments and not capitalised in the balance sheet. Instead they have been expensed and hence treated merely as costs and not as an investment. Financial statements contain accounting numbers and they impart information useful in assessing the future expected performance and cash flows of the reporting firm. There is a growing concern that financial statements have lost their value relevance because of change in economy and due to intangible assets not being disclosed. A core theme of recent research, therefore, is how financial statements can be made informative.

The research in this thesis is concerned with the value relevance of intangibles in the UK. The main purpose of this research is provision of empirical evidence on the value relevance of goodwill, advertising, research and development (R&D) expenditures and goodwill amortisation. This research also empirically investigates the potential differential media valuation effects by employing different levels of aggregation for advertising expenditures. The main issues dealt with in this research i.e. value relevance of goodwill, advertising, R&D, goodwill amortisation and differential media valuation effects, have not been treated in this way in prior research in the UK.

To examine the relation between goodwill numbers, advertising, R&D, and market value of the firm we employ cross-sectional valuation models. In these valuation models the market value of equity is a linear function of the sum of tangibles and intangible assets. We estimate deflated valuation models for a sample of UK firms for the period from 1998 to 2003. The regression coefficients are estimated by using OLS regressions based on White's (1980) heteroscedasticity consistent standard errors and covariance estimates. We report the p values under a two-tailed t-test along with slope coefficients. This study uses all non-financial companies over the study period for which appropriate data is available for the necessary tests. All the data, except for advertising, are extracted from DataStream and Datastream Worldscope. Advertising data are obtained from 'Nielsen Media Research'. To avoid survivorship bias the sample also includes dead companies for the period. In order to delete extreme values from the sample, the most generally accepted outliers' deletion criteria (deletions of top and bottom 0.5% of observations) are applied.

The results provide evidence that that market recognises purchased goodwill, R&D, and advertising investments as an asset and incorporate information relating to these variables in the valuation of the firm. These findings are consistent with the findings of similar studies in this area such as Jennings et al. (1996), Chauvin and Hirschey (1994), McCarthy and Schneider (1995) Hirschey (1982,1985) Green et al. (1996), Chauvin and Hirschey (1994). However this study provides some mixed evidence on value relevance of goodwill amortisation. We find some significant association between goodwill amortisation and market value of the firm. Jennings et al. (2001), and Moehrle et al. (2001), who examine the value relevance of goodwill amortisation also, provide less consistent results. Regarding differential media valuation effects, this research could not find strong evidence that effectiveness of advertising varies substantially with the type of medium used to communicate it. These findings could be of importance to those involved in and affected by standard-setting deliberations.

Declaration

It is hereby declared that I am the sole author of the thesis, and that no part of this thesis has been submitted in support of another degree or qualification at any university or institute of learning.

Maqsood Iqbal Qureshi

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I Dedicate This Work

To

My Parents

Muhammad Akram Qureshi

And

Nazir Begum

Chapter 1

Research Overview

1.1 Introduction

In recent years there has been a growing controversy on the accounting treatment of intangibles[1] (such as goodwill, advertising, and R&D) because of the changes in the business environment[2]. According to Lev (2002, p.135) '... *intangible-intensive firms are 'growing in size and importance', a fact that makes the study of the measurement, management, and reporting of intangible assets so relevant and exciting....*' There has been a shift from activities dependent on a physical asset-base to activities that have been variously described as 'new-economy' (see Moehrle et al., 2001; Lev, 2000 and 2001), 'knowledge-based' (Jennings et al., 2001), 'modern-economies' (Lev, 2002).

Greenhalgh and Longland (2001, p.671) argue that '*In the modern economy the durable assets of firms have become diversified away from the physical capital assets of the past and towards intangible assets ... such assets form part and parcel of the capital base now used by firms in their continuing competition for market share and profits.*' In the new-economy intangible assets are increasingly considered the ultimate roots of companies' success and major drivers of value and growth (Lev, 2002)[3]. In another study Lev (2001) highlights the dominant role of intangibles in

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[1] See Hoegh-Krohn et al. (2000, p.243) who argue that, '*...accounting for intangibles has become an increasingly important problem facing the accounting profession, especially standard-setting organizations*'.

[2] According to Barth and Kasznik (1999) '*...intangible assets are of substantial economic importance for many firms and the effects of recognition is currently under debate in the accounting profession*'.

[3] Deng et al. (1999) also advocate that innovation and technological change are the main drivers of companies' productivity and growth. Barth and Kasznik (1999) state that firm's long-lived income generating assets are intangible.

value creation by arguing (p.1&9)*' A growing share of economic activity today consists of exchanges of ideas, information, expertise, and services. Corporate profitability is often driven more by organizational capabilities than by control over physical resources, and even the value of physical goods is often due to such intangibles as technical innovations embodied in products, brand appeal, creative presentation, or artistic content... in today's 'new economy' have catapulted intangibles into the role of the major value driver of business'*. One can argue that intangibles are the major value drivers of the new economy.

The importance of intangibles is widely acknowledged[4], but identifying, measuring and reporting intangibles have raised questions. The cost of certain intangibles is generally treated as a current expense, not capitalised despite future utility or benefits that may arise[5], presumably because of concerns with reliability, objectivity and value-relevance[6].

In their study Hoegh-Krohn et al. (2000) highlight this and point out its consequences (p.243), '*Traditionally, resources spent on intangible assets have not been treated as valuable investments and capitalized in the balance sheet. Instead, they have been expensed and thus reported as costs that should hardly be expected to generate future benefits, after taking into consideration the considerable risk normally associated with the future benefits of intangible assets. This could mislead investors relying upon the financial statement as their primary source of information, and make short-term behavior attractive to managers.*' They propose capitalisation

[4] See Lev (1997, 2000, and 2002), Barth and Kasznik (1999), Hoegh-Krohn et al. (2000).
[5] Lev (1997, p.34) contends that, '*...today's generally accepted accounting principles call for the immediate expensing of R&D costs. But, unlike rent and interest payments, intangibles often produce rich future rewards...expensing them...produces serious distortions in reported earnings and detracts from the relevance of financial reports.*'
[6] Myopic accounting principles may be another potential reason.

and amortisation of intangibles to increase the relevance and informativeness of financial statements.

The absence of intangible value in traditional accounting means that today's financial statements may lack relevance. Companies' financial statements no longer reflect the true value because of a widening gap between accounting book values and market values due to intangible assets not being disclosed[7]. Lev and Zarowin (1999) argue for a decline of the usefulness of earnings information overtime. They identify the inability to recognize the information contained in intangibles as causing the loss in value relevance and support the view that accounting needs a new set of standards for the recognition of intangibles[8].

Lev (2002a) points out several private and social problems (such as excessive cost of capital to intangibles-intensive firms, hindering their investments and growth; abnormally high volatility of stock prices, undue losses to investors and misallocation of resources in capital markets; systematic bias in managerial decisions; and excessive insider gains) resulting from the intangibles-related information deficiencies.

In a new fast changing, knowledge based, and technology intensive economy, where for firms to strengthen competitive position and ensure their future viability investments in intangibles such as research and development (R&D), advertising, human resources etc. have become essential, the question arises how investors value such investments. This is especially interesting if financial statements are becoming less informative on the firms' current financial position and future prospects and development of regulation for intangible investments (assets) has become a major

[7] See Lev (2000).
[8] Also see Lev (1989), Easton and Harris (1991) Aboody and Lev (1998) for similar concerns.

issue in financial reporting (Hoegh-Krohn et al., 2000; Lev and Zarowin, 1999; Lev, 2002, Riegler and Hollerschmid, 2005). There is a need for considerable research in the area for determining an appropriate future direction on this issue.

This study investigates the valuation relevance of goodwill numbers[9], R&D and advertising expenditures[10] of UK firms for the period from 1998-2003. To detect the value relevance of these intangibles we employ a valuation model conceptually based on the valuation models of Hirschey (1982), Chauvin and Hirschey (1994), Hirschey and Weygandt (1985), and Connolly and Hirschey (1984)[11]. Data for all variables is extracted from the Datastream and Worldscope DataStream except data for the advertising expenditures. Advertising expenditures data is obtained form Nelson Media Research. For the elimination of survivorship bias dead firms are also included in the sample. Financial firms are excluded from the sample for standards reason that the relationship between market values and accounting numbers is considered to be different for financial as contrasted with non-financial firms. Rees (1997, p.1123) argue that '*...this restriction is conventional as the relationship between value and accounting numbers is thought to be very different for financial firms as opposed to those included in the sample*'.

The overall results of this study provide evidence on the value relevance of goodwill, R&D and advertising expenditures for the UK firms, while evidence on value relevance of goodwill amortisation is mixed and inconclusive. Also this research could not find strong evidence that effectiveness of advertising varies substantially with the type of medium used to communicate it. This research also provides some

[9] Capitalised goodwill and goodwill amortisation.
[10] We use total advertising expenditures as well as segregating these expenditures into different media expenditures to detect possible differential media impacts.
[11] Where market value (MV) is expressed as the sum of the market values of the tangible assets and intangible assets.

evidence that the UK market attaches different values to investments in goodwill, advertising and R&D by firms in different sectors, of different sizes and with different performances. Our results overall support the current requirement that intangible assets be reported in firms' financial reports, which enhance the usefulness of financial information to investors. The evidence on valuation relevance of intangibles is important to users of financial statements for decision-making and to accounting bodies for determining financial reporting policies.

This chapter proceeds as follows: the next section 1.2 describes the objectives of the study, the motivation and justification of the study is given in section 1.3, section 1.4 presents the thesis structure, and finally section 1.5 gives a brief summary of this chapter.

1.2 Objectives of the Study

Intangible assets are of substantial economic importance for many firms and the effects of their non-recognition are currently under debate in the accounting profession. Based on the above discussion, it is apparent that capitalization of intangibles is an important issue and its recognition as an asset warrants empirical enquiry. The primary aim of this study is provision of evidence on the valuation relevance of goodwill numbers, R&D and advertising expenditures in the UK.

The existing literature suggests the valuation relevance in the United States (US), while research in the United Kingdom (UK) on intangibles is relatively limited. The results of this study will allow some insight into whether the value relevance of intangibles only applies to the US market or whether it reflects a more general view of investors that applies in the UK as well.

To achieve the aim, the research sets the following objectives:

a) To investigate the association between market value and goodwill, R&D and advertising[12] expenditures of UK firms.

b) To assess the value relevance of goodwill amortisation.

c) To detect possible differential media impacts on firm value by segregating advertising expenditures into different media expenditures.

d) To study potential differences regarding the value relevance of goodwill, R&D, and advertising for different firm sectors (manufacturing and non-manufacturing), firm sizes (small and large) and firm performances (profit and loss making firms).

1.3 Motivation and Justification of the Study

There is a growing concern that historical cost financial statements have lost their value relevance because of changes in economy from industrialized to new knowledge based economy, where the source of value of products has shifted from physical content to knowledge content. Motivated by a perceived decrease in value relevance of financial information many studies such as Lev (1989), Easton and Harris (1991), Aboody and Lev (1998), Lev and Zarowin (1999), among others, investigate the value relevance of accounting data over time and document that the value-relevance of accounting has been decreasing over the past decades. The growing importance and increased investment in intangibles over time is one among several reasons for the decline in value-relevance and the large market-to-book ratios of companies (see Lev and Zarowin, 1999).

[12] R&D and advertising are not recognised as intangible assets in firms' financial statements.

A good amount of research such as Amir and Lev (1996), Aboody and Lev (1998), Lev and Sougiannis (1996,1999), Lev and Zarowin (1999), Connolly and Hirschey (1990), Chauvin and Hirschey (1994), Hirschey (1982, 1985), Jennings et al. (1996), and McCarthy and Schneider (1995), among others, using US data has investigated the relationship between intangibles and financial markets. Overall these empirical studies suggest that investments in goodwill, R&D and advertising are perceived as value relevant by investors. On the basis of these findings, the non-reflection of intangibles in financial statements can be taken as an explanation for the falling value relevance of traditional financial information[13]. For the US there have been many studies on this topic where as for the UK there have been relatively less research on the topic. The US findings await verification in future studies of data from the other countries. This thesis continues in the same vein of that research.

The existing literature seems to suggest the valuation relevance of intangibles in the US. On the other hand research on intangibles in the UK is limited and indecisive. Whereas US studies provide consistent evidence on the valuation relevance of R&D, evidence regarding advertising is mixed and inconclusive. One of the criticisms of the value relevance studies of R&D is that they failed to control the existence of alternative factors that may explain stock prices and returns with respect to which R&D may have little incremental explanatory power. Canibano et al. (2000) point out this (p.115), *'there may be certain corporate characteristics (such as firm size, or earnings persistence) or industry specific factors with which R&D investments are strongly associated, that explain cross-sectional valuations in stock prices or returns but are ignored in most empirical studies of the value relevance of R&D....'*

[13] There may be other reasons for difference in market value and book value such as under valuation of tangible assets based on their historic value, psychologically driven sentiments and increase in general market volatility (see Francis and Schipper, 1999) among others.

The previous research such as Hirschey and Weygandt (1985), Hirschey and Spencer (1992), Chauvin and Hirschey (1993), investigating the effectiveness of advertising expenditures has mainly considered total advertising expenditures at different points in time assuming homogenous effects of advertising regardless of the type of advertising medium used to communicate it. Studies such as Porter (1976), Rogers and Mueller (1980), Hirschey (1982), and Yiannaka et al. (2002) provide some evidence on differential media influences. The lack of research on possible differential media advertising expenditures effects may restrict advertisers' capacity to plan for and make optimal use of various media.

The value relevance of goodwill has been well documented in the US studies (see Ma and Hopkins, 1988; Chauvin and Hirschey, 1994; McCarthy and Schneider, 1995; and Jennings et al., 1996). One reason among others for the extensive attention focused on goodwill in the US is its materiality and widespread presence on corporate balance sheets. One limitation of prior goodwill studies is that they failed to control for the similar positive effects of other intangible assets such as R&D and advertising. Hirschey and Richardson (2002,p.187) argue, '*...cross-sectional valuation effects of accounting goodwill numbers have the potential to reflect, at least in part, similarly positive valuation affects of advertising and R&D expenditures, among other such influences. It is now well-known that both advertising and R&D give rise to 'intangible assets' with favourable effects on long-term profitability and the market value of the firm*'.

Before 1998 in the UK under Statement of Standard Accounting Practice 22 (SSAP 22)[14] goodwill could be written off directly to shareholders' funds in the period in which it was acquired or capitalised and amortised through the profit and loss

[14] Published by the Accounting Standard Committee (ASC) in 1984.

account. This standard received much criticism soon after it was published for allowing widely differing approaches to an issue. Accounting for goodwill in the UK was changed from 1998. For accounting periods ending on or after 23 December 1998, UK companies were required to capitalise purchased goodwill (recognise goodwill as an asset) and amortise it through periodic charges to the profit and loss account over a period that is usually 20 years or less and in the event of not being treated in this way, be subjected to regular tests of impairment. The approach to accounting for goodwill in the research period is specified in Financial Reporting Standard (FRS) 10 'Goodwill and Intangible Assets'[15]. The goodwill standard 'FRS 10' helps motivate us to investigate whether the recorded goodwill is relevant in the valuation of the equity to investors.

There is limited research investigating the value relevance of goodwill amortisation and this provides less consistent results. Norris and Ayers (2000) find a negative reaction of the market to goodwill amortisation. Jennings et al. (2002) report no value relevance of goodwill amortisation for their sample. Jennings et al. (1996) report weaker and mixed evidence of negative reaction.

Previous research such as Chauvin and Hirschey (1993 and 1994), Hirschey and Weygandt (1985), McCarthy and Schneider (1995), and Jennings et al. (1996) failed to include both earnings and book value explanatory variables, leaving their models seriously misspecified. Rees (1997) casts doubt on the results of such studies.

In conclusion, the existing literature seems to suggest the valuation relevance of intangibles (goodwill, R&D and advertising) in the US but research on intangibles in

[15] The current approach of the International Accounting Standards Board (IASB) is specified in International Financial Reporting Standards 3 (IFRS3) 'Business Combinations'. This standard requires that goodwill be recognised by the acquirer as an asset from the acquisition date and prohibits the amortisation of goodwill instead goodwill must be tested for impairment.

the UK is limited. There is little empirical evidence on the market valuation of goodwill, advertising and research and development expenditures in the UK. Also US research investigating the information value of goodwill amortisation provides less consistent results. The studies investigating advertising effectiveness concentrate on aggregate media expenditures leaving possible differential media influences ignored. The prior research focuses on single country settings (US) that need verification in future studies of data from elsewhere. Akbar and Stark (2003, p. 1230-31) argue that, '*...results from market based accounting research in the USA do not automatically carry over into the UK...investigating the robustness of conclusions about theory or empirical practice from US studies is a legitimate exercise...*'. In view of the above discussion further research in this area is justified.

1.4 Thesis Structure

This thesis is divided into six further chapters. Relevant past research is reviewed in chapter 2. We have divided this chapter into further sections. Section 1 presents the introduction, sections 2, 3, and 4 provide evidence on the valuation relevance of intangibles from the US, UK and from other countries respectively and finaly section 5 summarises the chapter.

Chapter 3 mainly deals with the research methodology and describes the data and sample. It describes value relevance, discusses valuation and return approaches, reviews some of the previous empirical research that provides evidence on the value relevance of accounting information (e.g. Book Value, Earnings, Dividends), describes and discusses the empirical models to be used in this study, and deals with the econometric problems associated with estimation of the models. It also describes

the sources of data, sample selection criteria, and data refining and define variables used in the analysis.

The results of the study are presented in chapters 4, 5 and 6. We use Ordinary Least Square (OLS) techniques to estimate the models. Chapter 4 provides the results of equations 3 and 4 developed in chapter 3. The results of equation 3 answer the question whether the market perceives investments in goodwill, R&D and advertising as assets and incorporates the information in the valuation of a firm. The results of equation 4 answer the question whether goodwill amortisation is value relevant to the investors. The research approach employed to detect the value relevance of goodwill, R&D, advertising and goodwill amortisation is also briefly described. This chapter also provides discussions on the findings. A brief summary is the last section of this chapter.

We decompose total advertising expenditures into different media expenditures to detect any differential media impacts on the value of the firm. We estimate equations 5, 6 and 7 described in chapter 3 by using separate measures of advertising expenditures (television and non-television advertising, print and electronic media advertising and press and television advertising) and reports results in Chapter 5. There is also a brief introduction to advertising media, a summary of relevant literature, and the research approach along with discussions on the out come of the analysis. This chapter also contains a short summary.

Chapter 6 presents the results of sub samples based on industry sector, firm size and firm performance. For additional insights into the valuation effects of goodwill, R&D and advertising we divide our main sample in to sub samples i.e.

manufacturing and non manufacturing firms, large and small firms[16] and profit and loss making firms and examine whether the market places different values to such investments of firms in different industry sectors, with different sizes, and with different performances. This chapter in line with previous empirical chapters contains an introduction, a brief discussion of the research approach, and the research findings along with discussions and ends with a brief summary.

The key findings of the research are summarised in the final chapter 7. This chapter also describes the contributions of the study and its limitations. It also suggests potential future areas of research on intangibles.

1.5 Summary

This chapter has presented a summary of the proposed research. It briefly describes the background, presents objectives of the study, provides the motivation and justification of this research and also gives an out line of this thesis. The next chapter presents a review of prior research.

[16] Ranked by market value.

Chapter 2

Review of the Literature

2.1 Introduction

There is a wide-ranging literature in economics, finance and accounting, which examines various aspects of the value relevance of intangibles. It provides empirical evidence on the relevance of intangibles for equity valuation. However, the measured magnitudes of these relationships vary with the data sets and statistical methods. Most of this prior literature has used US data and comparatively less studies of the market value of intangibles use UK data. The literature for the UK is considerably more limited both in the number of papers and in the time span of data analysed[17].

This chapter reviews major previous research carried out in this area. According to Beaver's (1982) literature review research can be organized in at least two major ways: 1) by summary of previous research findings and 2) by summary of the methodological (research design) issues. In the first case the review is organized by topic area and in the second case by methodological issues (the studies are used as illustrations). The present research adopts the former approach.

This chapter is divided into four main sections: section 2.2 reviews advertising and R&D research, evidence on valuation relevance of goodwill numbers are presented in section 2.3, research using other intangibles (patent, trademark) is reviewed in section 2.4 and finally section 2.5 presents a brief summary of this chapter.

[17]This may be due to the non-existence of disclosure requirements about these assets in the UK and non-availability of data, among other reasons.

2.2 Advertising and Research and Development (R&D) Expenditures

Advertising and R&D expenditures are among the most frequently used measures of intangible assets, in empirical studies investigating impacts of intangible assets on companies' market value. It is widely acknowledged that advertising and R&D investments have impacts on markets, directly and indirectly. An extensive body of literature provides empirical evidence on the positive association between investments in advertising and R&D and subsequent gains in companies' earnings and stock prices.

2.2.1 Duration of Advertising and R&D Effects

Over the past several decades, there has been a good amount of research attempting to measure the impact and duration of R&D and advertising effects on sales, profitability and market value, with a wide range of differing results depending on the data set and research approach employed. Research seems agreeing that R&D expenditures provide benefits well beyond the period in which they are made.

Clark (1925), in a theoretical study, reviews common criticisms (expensive and socially wasteful, acquisitive features, individualization of products and services, demand for luxuries and ineffectiveness and uncertainty) of advertising and argues that much advertising is ineffective and unnecessarily expensive. Telser (1961) views advertising expenditures as long-lived investments (capital goods) subject to depreciation over time and needing repair and maintenance in-order to maintain a specific level of sales[18].

[18] In their recent study Gu and Lev (2001) recognize empirically R&D and advertising among others, as drivers of intangible capital and of capital value and growth.

A case study of the Lydia Pinkham Medicine Company, Palda (1965) shows the long-run effects of advertising (an asset subject to amortization) by using Kyock's model and data for the period from 1908-60. Palda argues that Pinkham's advertising had a pronounced lagged effect on the firm's sales. Weiss (1969) also advocates capitalisation of advertising expenditures because they yield benefits mainly in the future.

Peles (1971) studies the effects of advertising expenditures on sales using data on firms from three industries i.e. beer, cigarettes and new passengers cars. Peles finds significantly positive effects of advertising on demand in both the car and cigarettes industries but no sufficient evidence for the beer industry. This study also finds annual rates of amortization of advertising between 40-50 percent for beer, 35-45 percent for cigarette and 100 percent for the cars industry. Peles further argues that present advertising effect future sales positively through peoples' memory of the advertising. The overall results of this study favour the capitalization and amortization of advertising expenditures instead of expensing as incurred.

Grabowski and Mueller (1978) assume a 10% and 5% depreciation rates for R&D and in their study of the returns earned by R&D intensive firms. They find that R&D and advertising expenditures have large and consistent effects on profits.

In his study, Abdel-Khalik (1975) find a similar wide range of depreciation rates: he finds very low depreciation rate for food (18%) and drug and cosmetics (16%), while he finds very high depreciation rates (100%) for soap, tobacco, and automobiles. Abdel-Khalik studies the effects of advertising on sales revenues by employing a sample of firms from food, auto, tobacco, soap and cleaners, and drugs and cosmetics industries for the period from 1955 to 1973. He finds long-lived effects of

advertising on sales in food and drug and cosmetic industries and short-lived effects for rest of the groups; and on the basis of his empirical analysis, he argues for different treatments of promotional costs of firms in different industries.

Clarke (1976) in his survey study (using the results of published studies) addresses the question of how long the cumulative effect of advertising persists and reports it as a matter of months rather than years. Clarke observes and argues (p.355) that '*...the duration of cumulative advertising effect on sales is between 3 and 15 months; thus this effect is a short-term (about a year or less) phenomenon.*' Clarke finds that the duration of advertising effects is almost always less than one year (100% depreciation rate).

Boyd and Seldon (1990) test the longevity of advertising's impact on cigarette demand by using data for the period from 1963-1984. They report short-term advertising effects and conclude that advertising effects on cigarette demand appear to be fully depreciated within a year. In a similar study Seldon and Doroodian (1989) find advertising non-durable as their results suggest that advertising effects depreciate within one year. Kwoka (1993) also measures the effects of advertising and product styling on US automobile industry sales for the period 1970-1982. Kwoka finds the effects of advertising short-lived but finds much longer effects for product styling.

In recent studies, researchers have applied advanced econometric estimation techniques and have increasingly relied upon financial market measures of the benefits from advertising and R&D. Hirschey (1982) uses valuation approach to derive estimates of annual R&D depreciation of 26% and advertising depreciation of 29%. Hirschey and Weygandt (1985), in a similar study, report depreciation rates

10-20% for R&D and advertising for non-durable and 30-60% for durable goods advertising. But these depreciation rates reported by Hirschey (1982) and Hirschey and Weygandt (1985) are sensitive to assumptions concerning the growth of rate of R&D and advertising.

Johnson and Pazderka (1993) suggest much higher depreciation of R&D stock (50% per year approximately) than assumed the15 % depreciation rate. The findings also suggest that although the market values R&D, it does not necessarily accord it full value and provide some support for the hypothesis that the market undervalues long-term investments.

Seldom and Jung (1995) study the durability of advertising effects on consumption by using personal consumption and advertising data for the period 1947-1988. Their findings show that advertising affects linger for nine years but they do not find precise reasons for this.

Landes and Rosenfield (1994) provide a critical re-examination of the results obtained form earlier studies such as Hirschey (1982) and Hirschey and Weygandt (1985) maong others, and conclude that once firms specific factors such product quality are considered, the estimates of useful life of advertising drops sharply. Landes and Rosenfield find "product quality" as a missing variable in previous studies, investigating the relationship between advertising and sales or between advertising or intangible capital. By employing a Koyck lag model and using unbalanced panel data for 417 US firms for the years from 1982 to 1986, Landes and Rosenfield (1994) find that the life of advertising effects is biased upwards unless firm effects are included. The results of the study reveal that advertising effects (advertising life) decrease significantly when firm-specific factors are controlled for

and failing to control for differences in firm-specific factors (e.g. product quality) results in an overstatement of advertising's useful life. The overall results of the study do not support the capital nature of advertising.

Lev and Sougiannis (1996), while studying the association between R&D spending and subsequent earnings for their sample of R&D intensive firms over a period of sixteen years through 1975 to 1991, find a significant inter-temporal association between firms' R&D capital and subsequent stock prices and returns. They find R&D capitalisation as statistically reliable and economically relevant information for investors. Lev and Sougiannis report estimates of the useful life of R&D range from 9 years for firms in the chemicals and pharmaceuticals to 5 years for firms in the scientific instruments industry.

Paton (2002) by using a standard Koyck transformation on an unbalanced panel data set of UK firms, studies the relationship between sales and advertising. He conducts a survey to collect advertising data for UK firms for the period from 1985 to 1991. Paton (2002) finds an estimated annual depreciation rate of 9.1% without the firm-specific effects and this rate escalates to 96.8% once firm-specific factors are allowed for. Overall results do not find advertising to be relatively long-lived and firm-specific effects reduce the durability of the advertising as Paton argues (p. 437), '*Once firm-specific effects are controlled for, the measured effect of advertising on sales seems to be restricted to one year or less*'.

The literature reviewed above generally suggests short duration of advertising effects as compared to R&D. Most of the studies reporting short advertising duration effects have relied upon 'sales-response' models, which only capture marginal rather than average effects of advertising. The above studies have relied on wide range of

data sources such as reported R&D and advertising expenditures of listed companies, survey results, aggregate statistics of industry wide R&D expenditures. These studies mainly rely upon direct advertising and R&D expenditures figures ignoring indirect advertising and R&D expenditures, which may increase many of these estimates of the rate at which advertising and R&D depreciates over time. Different studies define 'benefit' from advertising and R&D differently such as product sales, increase in market value and profits etc. and one should be careful while using and comparing these results.

2.2.2 Advertising, R&D - Barriers to Entry and Economies of Scale

There are many studies, which examine the entry barrier creating effects of advertising and R&D. Advertising may create barriers to entry in a number of ways and some suggested mechanisms include the creation of bran loyalty, product differentiation demand advantages, and economies of scale. R&D investments leads to cost reducing innovations and allow firms to maintain their own stable market share by deterring the potential entrants. To be competitive, in certain industries with rapid technological obsolescence, firms are often required to make heavy investments in R&D and such higher requirements can create barriers to entry for potential new entrants.

Earlier studies examining the relationship between advertising expenditures and profitability contend that industries with intensive advertising costs create barriers to entry for new entrants. These studies argue that new market entrants are forced to spend high level of initial advertising in order to attract customers away from the earlier market entrants and to compete them. Also, there are economies of scale in advertising and larger market share allows firm to enjoy an absolute cost advantage.

There are two sources of economy of scales in advertising. It may result from lower cost paid for advertising messages by large volume buyers and from the greater effectiveness of a larger volume of messages in terms of its impact on potential buyers of the advertised product. Studies such as Peel (1971), Connolly and Hirschey (1990), Hirschey and Spencer (1992), Chauvin and Hirschey (1993), among others, provide support that for the hypothesis that there are scale economies in advertising and R&D.

Comanor and Wilson (1967) by using multiple regression equations (which relate profit rates to various combinations of explanatory variables) and a sample of 41 consumer goods industries over the period 1954-57 examine the relationship between advertising, product differentiation and entry barriers. They find a statistically significant impact of advertising upon profit rates. Comanor and Wilson based on their empirical analysis conclude that in differentiable product industries investment in advertising is a highly profitable activity. They further argue that advertising in their analysis act as a proxy for product differentiation.

But there is a difference of opinion among researchers between those who believe that advertising deters entry and those who do not. Demsetz (1979) advocates the intangible capital nature of the advertising. This study documents a positive association between profit rates and advertising intensity and negates the idea that the value of advertising investment lies in the creation of barriers to entry.

Cubbin (1981), while explaining how advertising may act as an entry barrier, concludes that it is reasonable to suppose that advertising is responsible for some barrier effects in some industries. In their study Wiggins and Lane (1983) show how advertising can generate barriers, in type of product quality. They suggest that, to

avoid the risk of low quality, risk-averse customer purchase well-advertised products.

Ben-Zion and Kim (1983) by employing a sample of 1,200 US industrial firms from the COMPUSTAT tape for the period 1973-1978, study the relation between the return to R&D and firms' monopoly power measured by the price cost margin (PCM). They argue that (p. 355) ' ... *the return to R&D may indicate, in part, returns to monopoly power rather than a direct consequence of R&D.*' Ben-Zion and Kim document a correlation between R&D expenditures and monopoly power and state (p. 359) '... *R&D may be a proxy for monopoly power'.*

In another study Wakelin (2001) while studying the relationship between productivity growth and R&D expenditure for 170 UK firms (dividing the firms in the sample into two groups i.e. innovative and non-innovative) finds, along with other results, a higher rate of return for R&D intensive firms (innovative firms) than for non-intensive R&D firms (non-innovating).

2.2.3 Advertising and R&D as Intangible Capital

Studies such as Clark (1925), Telser (1961), Comanor and Wilson (1967), Peles (1971), and Clarke (1976) provide early evidence on the effectiveness and/or usefulness of advertising. Most of the above early previous research on advertising effectiveness uses Koyck Distributed lag models and is largely based on the assumption of decaying cumulative effects[19].

Hirschey (1982) finds the results of previous advertising studies such as Comanor and Wilson (1967), Peles (1971), and Clarke (1976), among others, conflicting and

[19] See Abdel-Khalik (1975).

vague and also incapable of resolving the policy question of whether to expense or capitalise advertising expenditure. He explains the reasons for these ambiguous results by identifying the theoretical and empirical problems of previous methods. Among the problems identified are: ignorance of multipurpose goals of advertising, emphasis upon an individual item's sales related or product advertising by ignoring the importance of firm's aggregate level of product and institutional advertising, ignoring possible media influences and only considering aggregate media expenditures, and failure to consider research expenditures in previous advertising studies. He argues that the major objective of advertising is profits instead of market share or sales growth as previously empirically tested.

Hirschey builds on previous studies by investigating the market value (intangible capital) effects of current advertising and R&D expenditures by using a market valuation model. His sample includes firms that both do and do not spend substantial amounts on advertising and R&D and firm data relating to 1977. He finds that on average advertising and R&D expenditures have positive and significant value effects.

Connolly and Hirschey (1984) expand on Hirschey (1982) by investigating the relation between R&D, market structure and a market value based measure of profits. They estimate a valuation model for a sample of 390 firms from the 1977 Fortune 500. The estimation results overall document a positive valuation effects of R&D and advertising and favour the 'intangible capital' view of R&D and advertising. Hirschey and Weygandt (1985) and Hirschey (1985) also find a significant and positive association between research and development expenditures and the market value of firms.

Hirschey and Weygandt (1985) examine the advertising and R&D expenditures treatment issue from a market value perspective. They approach it by looking whether advertising and R&D expenditures have positive effects on the market value of firms. They investigate the relationship between Tobin's Q ratio[20] and investment in advertising and R&D expenditures and find significant correlations between the two. They find a significant and positive association between research and development expenditures and the market value of firms.

Hirschey and Weygandt suggest that these expenditures should be capitalised and then amortised rather than given the current expense treatment and results also suggest a one to five years life for advertising and a five to ten years life for R&D. These expenditures give rise to significant long-lived benefits and advertising and R&D intensive firms enjoy tax benefits by virtue of their ability to immediately expense what is truly a capital item. The current expense treatment of advertising and R&D, of a constantly growing firm, can lead to a permanent reduction in a firm's tax liability. However, the findings of this study seem to support the view that R&D and advertising are an investment in long-term intangible capital.

Contrary to the results of Hirschey (1982), and Hirschey and Weygandt (1985), which conclude that advertising and R&D are long-lived, Bublitz and Ettredge (1989) only find evidence of longevity for R&D and not for advertising. The results of their study classify advertising as expense and R&D as intangible asset.

Toivanen and Stoneman (1988) by employing a sample of 185 UK firms over a period of 1984-1992 study the relationship between R&D, investment and stock market value. Their sample covers 22 industrial sectors with 25% of the sample in

[20] The ratio, of the market value of firm assets to their replacement cost.

the electrical and electronics, 8% in health services, 7% in chemical industry, 3% in aerospace, 12% in general manufacturing, 8% in construction industry and the remaining 37% spread across 16 other industrial sectors. Toivanen and Stoneman (1988) find that R&D and investment do only a little job in explaining the excess returns on the firm's equity and state (p.126) *'... R&D and investment explain only a tiny friction of the variation in q, the excess rate of return on the firm's equity.'*

Hall (1992) investigates the relationship between Tobin's Q ratio and investment in R&D and adverting by using a sample of US firms for the period from 1973 to 1991. Hall (1992) finds a significant correlation between Tobin's Q and investment in R&D and advertising. She also finds the associated market valuation for R&D to be four to five times high as for advertising and argues (p.20), *'...R&D is associated with a very important source of future profits for the firm, namely growth, whereas advertising expenditures may simply be maintenance expenditures, related only to current profits.'*

Hall (1993a) examines the stock market's valuation of the intangible capital created by R&D investment in the manufacturing sector in the US capital market during the 1980's by using Tobin's Q approach. The data used in the study includes all the US publicly traded firms in the manufacturing sector that existed in 1976 or entered between 1976 and 1991 (2480 firms) and covers the period from 1973 to 1991. Hall concludes that R&D intangible assets equally were valued with tangible capital during the period 1973 through about 1983-1984. But this relationship vanished during the mid-1980's and the stock market valuation of R&D capital collapsed from a high of 0.8-1.0 during 1979-1983 to a low of 0.2-0.3 during 1986-1991. She further states that advertising expenditures were approximately one tenth of R&D

expenditures in worth in the 1970's and this ratio changed by 1988-1990 when the two expenditures streams (advertising & R&D expenditures) were worth about the same. Among some explanations given for the findings are: a fall in the private rate of return to R&D, a rise in the depreciation rate of R&D capital, and the trend of mergers and leveraged buyouts during the 1980's.

Megna and Klock (1993) investigate the relationship between Tobin's Q ratio and investment in intangibles. They study to what extent intangible capital explains differences in the Q ratio across firms in the semi-conductor industry by considering two forms of intangible capital- R&D and patents. In addition to the firm's own R&D and patents, they include competitors' R&D and patents in the model, which can change the market's view of the value of the firm's own assets. Megna and Klock (1993) selected this industry because of the strategic importance of intangible capital in this segment of the electronics industry i.e. R&D accounts for 10% of sales in this sector as compared to 3 % across industries. They analysed a sample of 11 firms, over a period from 1972 to 1990, operating in semiconductor industry. They use the COMPUSTAT for R&D data and the NEXIS database for patents granted to each firm each year.

They document significant firm-specific differences persisting after adjusting for intangible capital i.e. R&D and patent stocks. They conclude that R&D and patent stock appear to measure different elements of intangible capital as they state (p.268), '*... patent and R&D are distinct measures of intangible assets since patents are marketable commodities, where as R&D is inchoate...*'. Overall the results of the study suggests a positive effect of firm's own R&D and patents on its market value but a negative effect of competitors' patents on market value. These findings raise

important questions on how competitors' R&D and patenting activities affect firms' market valuation and demands further research in this area by employing a wider sample.

Johnson and Pazderka (1993) using a series of short panel data sets for Canadian firms (52 firms during 1985-87 (156 observations), 54 firms for 1986-88 (162 observations) and 47 firms for 1985-88 (188 observations)) and a valuation model test the hypothesis that the market places a positive value on R&D expenses as an indication of future profitability and growth. Johnson and Pazderka (1993) document a statistically strong relationship between R&D and market value and they argue (p.21) '*...results show a systematically positive and statistically significant relationship between reported R&D spending and market value.*'

Capitalisation of costs of internally generated intangibles has been considered risky. But some recent research such as Aboody and Lev (1998) provides evidence that capitalised software development costs provide useful information to investors despite the subjectivity inherent in the capitalisation of such costs. They by using a sample of 168 companies for the period from 1987-1995 find a positive association between annually capitalised development costs and stock returns as well as a positive association between cumulative software assets reported on the balance sheet and stock prices.

Green et al. (1996) examine a cross-sectional valuation model of UK firms with the purpose of examining the value relevance of research and development expenditure in the UK capital market. They provide cross sectional and pooled estimates using UK data from 1991 to 1993. The model used by this study allows excess market value (dependent variable) to be affected by market share, concentration, the debt

equity ratio of the firm and industry and the annual variability of stock market returns in addition to R&D. The results of this study provide weak evidence on the market valuation of research and development expenditures, but generally support the point of view that they behave as if they are capital expenditures. Moreover results show a small impact of other variables on excess market valuation.

Stark and Thomas (1998) examine the relationship between residual income (RI) and market value and find an imperfect relationship between the two. They argue that residual income in conjunction with opening and closing book values and research and development expenditures has a strong association with market value. Their results overall provide evidence on the value relevance of research and development expenditures.

Bosworth and Mahdian (1999) investigate the relation between market value and R&D, Patents, and trademarks of a smaller subset of UK firms in the pharmaceuticals sector over the period 1986-1995. They attempt to find distinct and separate roles for both R&D and patents in the explanation of market value by employing Tobin's Q model. Bosworth and Mahdian (1999) find evidence that R&D, patents and trademarks all play a significant role in the market value of UK pharmaceutical companies and argue (p.89), '*...all three of our measures of intangibles played a significant role in explaining market valuation.*'

Lev and Sougiannis (1999) by using a sample of about 1,200 companies over a period through 1975 to 1989 estimate the value of unrecorded R&D capital and exhibit that unrecorded intangibles account for a significant proportion of the difference between market values and book values. They report that R&D is

significantly associated with subsequent returns when other fundamentals (beta, size, book-to-market, leverage and price-to-earnings) are accounted for.

Canibano et al. (2000) review the empirical literature that examines the relevance of intangibles for the purpose of firm valuation and conclude that R&D has always been found to be associated with subsequent earnings and stock returns, which supports the view that R&D should be capitalized. While previous research suggests a rather short lived impact of advertising expenditures on future earnings and supports arguments to expense advertising costs in the period in which they incurred.

Graham and Frankenberger (2000) by using a sample of 320 US firms show that changes in advertising expenditures are significantly associated with earnings and market values of the firms. One limitation of the study is that it uses changes rather than levels of advertising expenditures and its findings cannot be generalised regarding the asset value of absolute advertising expenditure levels.

Ballester et al. (2000) by using time series data collected from the 1998 COMPUSTAT Annual Industrial and Quarterly Industrial data files find R&D expenditures as value relevant. Their results support the argument for capitalisation and amortisation of R&D expenditures over their economic life. The results also indicate that past R&D expenditures are also taken into account while forecasting future earnings. Overall this study provides evidence that R&D investments are positively correlated with subsequent earnings.

Chan et al. (2001), investigate whether stock prices fully value (incorporate) firms' intangible assets e.g. R&D and advertising. In an efficient market, if the stock price incorporates the value of all intangible assets, there should be no association between R&D intensity and future stock returns. But the problem is that firms with

substantial amounts of intangible assets are highly volatile for the reason their future success is tied to the success of R&D projects.

Chan et al. find no significant differences between the returns of R&D intensive firms and returns of firms without significant R&D. These findings provide evidence of market efficiency and support that stock prices fully compound the value of intangible investments. For firms engaged in R&D, Chan et al. use R&D expenditures relative to sales[21] and R&D expenditures relative to market value of equity[22] as two measures for R&D intensity. They also show no difference between stock returns of firms with high R&D/sales ratio and with low R&D/sales ratio. Chan et al. however, find excess stock returns for the firms with high R&D investments to their equity market value (R&D/MV) as they argue (p.2454) '*...the clearest evidence that high R&D plays a distinctive role arises from stocks with high R&D relative to the market value of equity....*' They report that similar results and patterns uncovered in their analysis of R&D extend to advertising as well.

Bosworth and Rogers (2001) by using a sample of large Australian companies over the period 1994-1996, examine how R&D and intellectual property activity influence the market value of firms. They use Tobin's Q approach for analysis purposes and find R&D to be positively and significantly linked to market value but with a low magnitude of the coefficient when compared to those found in similar US and UK studies. They interpret this that in Australia the private return to R&D may be low. They also find that patents have positive effects on the firm's market value but report weak associations of trademark and design activity with market value.

[21] Indicates the amount of resources a firm devotes to R&D.
[22] Highlight the stocks that have large R&D expenditures and relatively low market value.

Zhao (2002) by employing a valuation model examines the relative value relevance of research and development (R&D) costs in France, Germany, the UK and the USA over the sample period 1990-1999. France and the UK permit for the conditional capitalisation of R&D costs, whereas accounting practices in Germany and the USA require the complete expensing (except for the soft ware industry) of all R&D costs. Zhao reports that the R&D reporting level has a significant effect on the association of equity price with earnings and book value and the allocation of R&D costs between capitalisation and expense imparts incremental information content over that of total R&D costs. Overall findings of this study provide evidence on the valuation relevance of R&D.

In recent study Toivanen et al. (2002) examine the impact of R&D and patents, among others, on market valuation of UK firms over the period from 1989 to 1995. They extract UK firm data (except that on patents) from Extel's Financial Company Analysis. Toivanen et al. (2002) document that R&D has a significant and positive impact on firm's market value but once the impact of R&D is taken into account patents have a negative impact upon market value. They also find that reporting R&D first time results in a higher impact on market value than does continuing R&D.

Callimaci and Landry (2002) investigate the value relevance of capitalised R&D by using a sample of 337 Canadian firms for the period 1997-1999 and employ price-level regression. They divide their sample into a capitalising group (126 firms) and an expensing group (211 firms). They assign an observation to the capitalising (expensing) group when an amount of capitalised R&D is revealed in the financial statements. Callimaci and Landry report positive and significant coefficients on the

R&D expense variable but for capitalized R&D they report positive coefficients but not significantly different from zero.

Al-Horani et al. (2003) provide evidence on the positive association between stock returns and R&D activity in UK. Al-Horani et al. (2003) conclude that '*... the cross-sectional results are consistent with intangible assets resulting from research and development activities having higher risk than tangible assets...overall, we believe that our results suggest that research and development is relevant factor in modelling returns....*'

Using cross-sectional valuation approach, Shah and Stark (2004) investigate the value relevance of UK firms advertising expenditures as captured by ACNielsen MEAL[23] for the period 1990-1998. The results of the study show a significant positive influence of advertising expenditures on market value of firms. Shah and Stark also investigate the firm size and sector effects by splitting their pooled sample in to small and large firms and manufacturing and non- manufacturing firms sub-samples. They find advertising expenditures valuation relevant for large and non-manufacturing firms.

In another study, Shah and Stark (2005), by employing valuation models and using major media advertising expenditure data of a balanced panel of 35 UK firms (who are persistent major-media advertisers) over the period 1990 to 1998, examine valuation relevance of advertising expenditures. They investigate whether advertising expenditures help in forecasting future earnings and are associated with market value. They find major media advertising expenditures valuation relevant and useful in predicting future values of earnings.

[23] A commercial source for advertising related information in the UK.

Earlier research such as Comanor and Wilson (1967), Peles (1971), and Abdel-Khalik (1975), among others, which provide some evidence on advertising effectiveness, have used disaggregated product level information or the consumer response to a particular promotional campaign for one product. However, it is evident that much attention had not been paid to the relationship between advertising and R&D until the early eighties. Consequently, instead having similar properties and effects there are few earlier studies on how advertising and R&D jointly affect the firms' performance. Recent research illustrate that it is possible and worthwhile to study advertising and R&D jointly. Recent intangible capitalisation literature, often studying advertising and R&D jointly, argue for to treat advertising and R&D expenditures as investments.

The above literature shows that the valuation relevance of R&D, and advertising has been the subject of intensive investigation in the US but there have been relatively less UK studies on the subject[24]. Previous research provides the evidence that the market is capable of determining the value-relevance from advertising and R&D expenditures. Above literature review, consistently find a positive relationship between R&D expenditures and future benefits to the firm, whether the latter are measured by sales, subsequent profits or firm value (stock prices). One of the criticisms of the value relevance studies of R&D is that they failed to control the existence of alternative factors (such as firm size, or earnings persistence or industry specific factors) that may explain stock prices and returns with respect to which R&D may have little incremental explanatory power. However, findings on valuation relevance of advertising expenditures are mixed and indecisive. The

[24] Advertising particularly has not attracted a large amount of research. This may be due to the lack of information on advertising expenditures and reluctance of UK companies to disclose information on their marketing/promotion efforts, among others.

impact of advertising on future earnings has been found to rather short providing support to the view that R&D outlays should be capitalized, while advertising expenditures should be fully expensed in the period in which they incurred.

2.2.4 Advertising and R&D – Firm Size and Industry Effects

A fairly large number of studies, building on the theory and evidence that advertising and R&D expenditures help investors form expectation of future cash flows, test firm size and industry size effects hypotheses. The firm effect hypothesis states that R&D and advertising spending are likely to be more effective for relatively larger firms. On the other hand, industry effect hypothesis states that R&D spending may be an effective means of new product development and product differentiation for manufacturing firms, while advertising may be broadly effective for both manufacturing and non-manufacturing firms.

Connolly and Hirschey (1990) investigate the implication of firm size for R&D effectiveness. They estimate a valuation model over a sample of 390 firms drawn from the Fortune 500. By using sales, market shares and concentration criteria, Connolly and Hirschey divide the total sample into 'small' and 'large' firm classifications. They report that small firms experience a favourable influence of R&D activity on the market value of the firm, comparable with that observed for larger firms. However, the results of the study overall indicate a positive valuation influence associated with both R&D and advertising.

Chan et al (1990) for a sample of 95 announcements of increased R&D spending by industrial firms during the period 1979-85 documents a significant market response to announcements of increased R&D expenditures. They report significant positive

stock price responses for high-tech firms but significant negative responses for low-tech firms.

Doukas and Switzer (1992) for their sample of 87 announcements of increases in R&D spending (by 45 companies) over the period 1965-1984 find a significant positive (negative) valuation effect for firms operating in industries characterized by high (low) concentration. They also find a positive relation between larger announced spending increases and a favourable market response.

Hirschey and Spencer (1992) examine size effects in the valuation of key fundamental factors i.e. cash flow, research and development expenditures, advertising expenditures and risk (β) for the years 1975-1990. For the examination of size effects they divided their sample into small, medium and large firms based upon their market value rankings. They find that firm size affects the influences of fundamental factors. They conclude that advertising has only valuation relevance for large firms and research and development affects the market value for all sizes but is significantly important for small firms. They also find that the relationship between research and development expenditures and the market value of firms varies with firm size.

Chauvin and Hirschey (1993) examine the association of advertising and research and development expenditures (R&D) with the market value of the US firms over the period 1988-1990. They estimate their valuation model for each year as well as over a pooled cross sectional sample for the same period. By dividing the sample on the basis of firm size classes and manufacturing and non-manufacturing industry groups, they consider the differences in the effectiveness of advertising and R&D across the industry groups and firm sizes. These analyses highlight the fact that as firms in

specific industries/groups have different characteristics, therefore the valuation implications of advertising and research and development may be different.

Chauvin and Hirschey find differences in the valuation implications of advertising and R&D according to firm size and for firm sectors i.e. manufacturing and non-manufacturing. This analysis reveals that stock returns associated with such expenditures are greater for large firms as compared to small firms. They also document evidence that R&D induced growth results in superior returns relative to growth in general. Overall they find that R&D and advertising investments have positive, large and consistent influences on the value of companies.

Kelm et al. (1995) study the relationship between market value and R&D project announcements at different stages i.e. initiation, continuation and new-product introduction by employing an event study methodology. They use a sample of 525 R&D project announcements over the period 1977 through 1989. Overall their results for the total sample report a favorable market response to R&D project announcements and document statistically significant increases in value during the continuation and new-product introduction stages. However they report a different market response for firms in the biotechnology industry than the market response for other firms. For the biotechnology firms, which are smaller firms and spend heavily on R&D, they observe vary large positive market value impacts from R & D announcements at the project initiation and continuation stages. They also report an inverse relationship between firm size and stock market effects as small firms experience larger wealth effects.

Two other event studies in Chan et al. (1990) and Doukas and Switzer (1992) report significant positive share-price reactions to announcements of increased R&D spending.

Szewczyk et al. (1996) use Tobin's Q ratio to study the market reaction to R&D investments for firms in high and low technology industries. Their findings confirm a significant market price response to increased R&D expenditures depending on the firm's industry, which is significantly positive and negative for high technology and low-technology industries respectively. Chan et al (1990) and Doukas and Switzer (1992) corroborate these results.

Goodacre and McGrath (1997) examine the mechanistic and myopic hypotheses in the context of R&D expenditures accounting policy in the UK. They conducted two experimental studies by using postal questionnaire mailed to 840 UK investment analysts. They asked analysts to forecast earnings and market values of three electronic sector hypothetical companies i.e. expenser (company immediately expensed all R&D expenditures), capitalizer (company capitalizes R&D expenditures), and fixed asset buyer (company which spend nothing on R&D, but instead spend on plant and equipment) based on simulated financial statements. Goodacre and McGrath find almost identical mean market value estimates for both expenser and capitalizer companies, suggesting that accounting treatment of R&D expenditures does not have significant effect on analysts' valuation of the company's shares. The analysts valued investment in R&D more highly than investment in tangible fixed assets.

Lev and Zarowin (1998) study markets' valuation of R&D across firms and industries by estimating time-series regressions. Their study covers the period

through 1976 to 1995. They find variation in R&D's market valuation across firms and industries and also observe a positive correlation between the market's valuation of R&D and its fundamental benefits and negative correlation with its risk.

Blundell et al. (1999) study the empirical relationship between technological innovation, market share and stock market value by using a pooled sample of 340 manufacturing firms listed on the London International Stock Exchange for the period from 1972 to 1982. They extract data from the Datastream International on-line service, London Business School's Share Price Database and measure innovative activity of the firm by a count of innovations taken from the Science Policy Research Unit (SPRU) database. In their market value equation in addition to the innovation variable, Blundell et al. also include market share, import penetration, concentration and union density variables. They document a significant positive impact of innovation variables on market value. Overall results of the study suggest that innovation variables have a significant positive impact on market value. Blundell et al. also study the 'new news' effect and find that a surprise innovation is associated with an increase in the firms' value.

Oswald (2000) by employing a sample of 1,780 UK firm–year observations over the period 1993-1997 investigates value relevance implications of accounting method choice for development expenditures. He finds that accounting treatment of development expenditures affect the value relevance of the firms' financial statements information. This study finds that certain factors such as firm size, the intensity of R&D programs, and whether firm is in a steady-state with respect to its R&D programmes influence the decision to expense versus capitalise qualifying development expenditures. Oswald overall reports mixed results regarding the

impact on value relevance of adjusted reported earnings and book value of equity to the alternative accounting rule for qualifying development expenditures.

Canibano et al., (2000), based on a sample of 148 Spanish firms and 289 pharmaceutical firms (R&D intensive firms) from the rest of the world over a period of 7 years through 1990 to 1996, test the hypothesis that the market to book (M/B) ratio is significantly greater for firms with greater amount of intangible investments. They document that the market values intangibles, which in turn results in higher M/B ratios for firms with higher intangible investments and/or higher levels of technology. Their results for the world wide sample of pharmaceutical firms also show that the book value of equity of these firms does not explain a substantial part of their market value.

In a recent study Core et al. (2003) explore the relation between equity value and traditional financial variables in the 'New Economy Period' (NEP), covering new developments form late1990s. They try to find the answer to the questions whether and to what extent traditional financial variables are relevant for explaining equity values of firms operating in NEP. They try to study any significant change in the relation between financial variables and equity value in the NEP period compared to earlier periods. They construct and test the null hypothesis that assumes that the relevant financial variables that explain equity value are applicable to firms in all time periods and the alternative hypothesis states that these differ across time periods for some or all firms.

They estimate equity valuation regression model on a broad sample of 108,493 firm-year observations over a period of 25 years (1975-1999). They further divide their sample into sub-samples i.e. high technology firms, young firms and young firms

incurring losses, for empirical analysis purposes. They include book value of equity, current earnings and proxies of expected earnings growth as regressors and market value of equity as the regressand in the model. To capture expected growth in earnings due to investments in intangible and tangible assts they also include research and development and advertising expenditures (intangible investments) and capital expenditures (tangible investments) in the model.

They find significant coefficients and a consistent relation with firm value for all explanatory variables in their full sample, with the exception of advertising expenditures. Core et al. (2003) over all report a lower explanatory ability of financial variables to explain stock prices in NEP. They state (p.66) '*...that traditional explanatory variables of equity value remain applicable to firms in the new economy sub period, but that there is greater variation in firm values remaining to be explained by uncorrelated omitted factors*'.

Shah and Stark (2003) investigate whether R&D effectiveness in terms of its impact on market values of firms varies across various industries and firm sizes, by employing valuation model, and a sample of UK firms over the period 1990 to 2001. They find and report significant positive coefficient on R&D for firms of all sizes (small, medium, and large), as well as, for their manufacturing and non-manufacturing industry sub-samples.

It is evident from above discussions that despite a large number of studies on firm size and industry effects, there is no explicit evidence existence on firm size effect and industry effect hypothesis.

2.2.5 Advertising Media Effects

The previous research investigating effectiveness of advertising expenditures has mainly considered total advertising expenditures at different points in time assuming homogenous effects of advertising regardless of the type of advertising message and /or the medium used to communicate it. Limited research such as Porter (1976), Rogers and Mueller (1980), Hirschey (1982), Notta and Oustapassidis (2001), and Yiannaka et al. (2002) has investigated differential media valuation effects.

In his study Porter (1976), by using advertising expenditure data for 39 consumer goods industries shows that different advertising media have different implications for market performance. He finds profitability effects for television advertising more significant than other types of media advertising. He also posits that the argument that repetition must occur for the effectiveness of messages would seem most significant for electronic media where the message is not available for repeating readings.

Rogers and Mueller (1980) hypothesize that different advertising media will have different impacts on industrial structure over time. They divide their total advertising (TA) variable into television plus radio (TVR) and newspapers, outdoor and magazines advertising (NOM) variables. They argue that the firms link media selection decision with its effectiveness to achieve particular objectives and suggest television as a more effective medium for the creation of product differentiation in consumer goods industries than other types of media such as newspapers, magazines etc. Rogers and Mueller find TVR positive and more significant than TA and NOM insignificant with a negative sign. They conclude that (p.95), '*...the most important finding of the study is that television advertising has played a potent role in*

increasing concentration of consumer goods industries. Studies that combine television advertising with all other forms of advertising have obscured this unique role of television advertising'.

Laband (1989) specify the advertising effects that can be more effective by selecting the means of media, for example Newspapers (print media) or TV (electronic media), and which are different by the type of a firm, retailer or manufacturer. for example local firms prefer newspapers to TV as a advertising media and retailers provide more price information than manufacturers.

Hirschey (1978) examines 96 large consumer products oriented US firms in 1972 to find various advertising media impacts on firms' performance (profitability). This study estimates its model by using total advertising expenditures, advertising expenditures other than television expenditures (AMTV), and television expenditures (TV) to find whether television advertising is more influential than advertising in general. Hirschey also disaggregates total television advertising expenditures into spot television (STV) and network television (NTV) advertising expenditures. Hirschey documents that although overall advertising has a positive effect on firm profitability but television advertising has a significantly greater positive impact on firm profitability than advertising in general.

While considering possible media influences, Hirschey (1982) also estimates a valuation model with total advertising divided into its television and non-television advertising components and finds both components to have positive effects on market value but only the television advertising effect statistically significant. This supports the case for treating television advertising as an intangible asset rather than other type of advertising promotions, which he finds relatively long-lived.

Notta and Oustapassidis (2001), investigate the effects of advertising expenditures for four media i.e. TV, radio, magazine and newspapers on firm profitability by using a panel data set of 350 Greek food manufacturing firms over the period 1993-1996. They find only television advertising positively and significantly affecting profitability.

Yiannaka et al. (2002) posit that the differential information content attached to different kinds of advertising (newspapers, television, radio etc) results in dissimilar effects on consumer utility. In their empirical study using data for Greek firms (in the processed meat sector) for the period from 1983-1997, Yiannaka et al. (2002) reject the hypothesis of a homogenous consumer response to advertising messages of different content communicated through different media. They estimate two models, the homogeneous consumer response model (sales being the dependent variable with total advertising one of the explanatory variables) and the heterogeneous consumer response model (wherein total advertising expenditures are disaggregated in to TV, radio and print media expenditures). They find total advertising expenditures an important determinant of the sales of their sample companies.

Yiannaka et al. for their heterogeneous consumer response model, find advertising effectiveness varying with advertising content and media used. They find the effect of print media advertising (newspapers and magazines) on sales more significant than the effect of both TV and radio advertising.

2.2.5 Advertising and R&D - Other Issues

Some research approaches this issue in several alternative ways. In an early study Peel (1975) analyses the relationship between advertising expenditures and total consumption by using a UK data over the period 1956 to 1966. He extracts

advertising expenditures data from the Statistical Review of Press and TV Advertising and consumption and disposable income data from Monthly Digest of Statistics. Peel (1975) documents a significant advertising impact on aggregate consumption.

Geroski (1982) and Khalilzadeh-Shirazi (1974) analyze the relationship between price-cost margins and market structure using UK data and report evidence of a positive relationship between advertising and profitability.

McGuinness and Cowling (1975) investigate the effect of advertising[25] on the demand for cigarettes by using quarterly UK data for the period from 1957 to 1968. They report statistically significant effects of advertising on sales[26]. In a similar study Radfar (1985) concludes that advertising has a positive, small but significant effect on the consumption of cigarettes.

Chowdhury (1994) examines the relationship between advertising expenditures and various macro-economic variables by using UK annual date for 32 years from 1960-1991. Chowdhury (1994) extracts data for advertising expenditures from various issues of the International Journal of Advertising, for population from World Tables published by the World Bank and for rest of the variables he uses OECD National Accounts: Main Aggregate Volume 1, published by OECD (Department of Economics and Statistics, Paris 1992). He employs cointegration[27] and causality[28] approaches for analysis. The overall results of this study fail to establish

[25] McGuinness and Cowling (1975) measure advertising in terms of messages instead of expenditures.
[26] Also see Johnston (1980), and McGuinness and Cowling (1980).
[27] Cointegration approach allows study of whether advertising and various macro-economic variables share a common trend so that they can be considered as a long-term equilibrium relationship, which holds except for a stationary stochastic error (short-run deviations).
[28] Causality approach allows examination of whether a casual link is present between advertising expenditures and each of the other macro variables.

relationships between advertising activity and macro variables i.e. the level of national income, disposable income, and personal consumption expenditures.

In their study Epstein et al. (1998) argue that an increase in advertising is likely to have positive effects on earnings. They further point out that there are three characteristics that should be reflected in the earnings-advertising model. First, that advertising will increase earnings both for 'search'[29] and 'experience'[30] goods firms. Advertising for experience goods would result more consumers switching products. But firms with poor quality experience goods would not invest much in advertising for the reason that they are unlikely to attract repeat sales and to recover advertising outlay. However in the case of search goods, firms would heavily advertise to increase their market share and revenue. The Second characteristic is that there will be diminishing marginal returns to advertising. This applies to either type of goods, search or experience. The third characteristic is that consumers are forgetful. This implies that continuous advertising is required to maintain a build up of consumer stock otherwise it will decay.

Ballot et al. (2001) by using a large sample of French and Swedish firms and for the period 1987-1993 examine the effects of human capital and technological capital (measured by value of patents and R&D expenditures) on firms' performance. They also study the interaction between training and technological capital at firm level. Using a production function and taking the value added as dependent variable and human capital and technological capital among others as explanatory variables, Ballot et al. confirm both R&D and training stocks as significant inputs in the production function (with different influential levels in each country) and have high

[29] Search goods are those that offer a known level of satisfaction but point of sale is not apparent.
[30] Experience goods are those, which are highly visible but offer an unknown level of satisfaction to the consumer.

returns (in terms of value added). In their tests R&D appears as the most robust intangible factor of production for Sweden as compared to France and training capital appears as a more significant factor of production for France as compared to Sweden. They also report a positive interaction effect of R&D and training but the results are not very robust.

Rowbottom (2002) examines the role of discretionary choices in financial reporting by investigating the use of intangible asset accounting and the selection of accounting polices in the UK football industry, where choices are discretionary in selecting policies in accounting for transfer fee payments. This study uses a sample of 102 football club companies in the English Premier League, English Football League, and the Scottish Premier League. Rowbottom tests the associations between motivational factors such as level of tax costs, political costs, equity depletion and underwriter pressure, and credible auditor and the transfer fee accounting policy by using data from the financial reports for the period ending 1995. This study finds significant association between level of tax costs, equity depletion and underwriter pressure, and auditors used and transfer fee accounting policy selection.

Wyatt (2005) by using a sample of Australian firms over the period 1993-1997 investigates the extent to which management choices to record intangible assets depend on prevailing technology conditions, technology cycle time, and property rights related factors. Wyatt finds intangible assets positively associated with technology strength, and negatively associated with the length of the technology cycle. This study also documents a positive and significant association between the property rights related factors (firm's ability to appropriate the benefits from

intangible assets) and the recorded intangible assets. The results of this study also provide some evidence on the valuation relevance of goodwill and R&D.

2.3 Goodwill – Valuation Relevance

Goodwill is an important and pervasive issue for the financial reporting community and other interested parties. The reason for the extensive attention focused on goodwill is its materiality and widespread presence on corporate balance sheets. The relative importance of goodwill as a component of firm value has increased in view of shift in general economy from manufacturing to 'knowledge-based' activities.

Overlong time, there has been considerable debate and controversy over the accounting treatment for purchased goodwill. The main concern is how goodwill is assessed in the determination of the firm value.

Several recent studies have examined empirically the relation between goodwill and the market value of the firm. Most of these works find a positive relationship between the reported goodwill of a firm and its market value in the US.

Zhemin (1993) using an equity valuation model and an average sample of 68 firms for the period 1988-1989 studies how investors value the goodwill assets reported by companies in the service industry. The reason mentioned for choosing the service industry is that it is generally believed that goodwill accounting has the greatest impact on service industry firms in which the major part of purchase price is goodwill as compared to capital-intensive industries where a large part of purchase price can be attributed to physical assets. Zhemin while assessing the market valuation of reported goodwill assets finds goodwill coefficient estimates (1.59 for 1988 & 1.57 for 1989) significantly larger than their theoretical value of +1 at a 1%

significance level. Overall this study provides evidence that goodwill is viewed as an asset by the investors.

The evidence on the relationship between goodwill and firm values is also provided by Amir et al. (1993) and Barth and Clinch (1996) that investigates the effects of differences in international accounting methods. Amir et al. (1993) study whether differences in US and non-US GAAP, as summarised on the Securities and Exchange Commission Form 20-F filings are value relevant. Amir et al. (1993) evaluate value relevance of specific disclosure items, including goodwill, in 20-F filings by using a sample of 467 observations from 101 foreign firms cross-listed in the US for the period 1981-1991.[31] They employ an event study and market to book ratio analysis methods to test the value relevance of the information provided on Form 20-F. Amir et al. (1993) find that the difference between US and non-US GAAP attributable to goodwill has value relevance[32].

Barth and Clinch (1996) investigate whether differences in accounting methods reveal any information which is used by market in setting share prices by using UK, Australian, and Canadian firms' samples and comparing the two sets of financial results reported under their domestic GAAP with results reported using US GAAP. The purpose of their study was to compare the value relevance of specific reconciliation items to the value relevance of the numbers that were reported under the firm's domestic GAAP. Overall their results provide evidence that differences between US and other countries' GAAP reflect information useful to market participants and provide incremental explanatory power for share returns or prices.

[31] The SEC requires foreign firms with a US exchange listing to offer their US investors either US GAAP measured financial reports through standard 10-K filings or to provide foreign GAAP statements with a reconciliation of differences between US and foreign GAAP through the 20-F filing.
[32] Barth and Clinch (1996), similar to Amir et al. (1993), also find goodwill amounts disclosed in the 20-F filing value relevant.

Barth and Clinch (1996) find the goodwill amount disclosed in the 20-F filing value relevant to setting prices in the UK.

Chauvin and Hirschey (1994) by using 2,693 firm observations over the period 1989-1991 documents that goodwill has a significant and positive impact on the profitability and market value of non-manufacturing firms.

McCarthy and Schneider (1995) investigate whether the market regards reported goodwill as an asset by using a US firms' sample that reports goodwill for the five-year period from 1988-1992. They also study how the market perceives goodwill in relation to all other assets. They apply a levels approach and include book value and earnings as independent variables in the regression. They argue that the market value of a firm's equity might be explained better by a model that includes both book value (a stock concept of value) and earnings[33] (a flow concept of value). McCarthy and Schneider (1995) provide empirical evidence that the market perceives goodwill as an asset when valuing firms. And regarding the magnitude of the market perception, by comparing the coefficients of goodwill and other assets, they document that the market values goodwill at least as much as other assets. McCarthy and Schneider (1995), support Chauvin and Hirschey's (1994) contention that the market regards accounting goodwill numbers as a useful indicator of goodwill assets.

Jennings et al. (1996) investigate the issue of goodwill from balance sheet and income statement perspectives. From a balance sheet point of view Jennings et al. (1996) investigate the issue whether goodwill should be capitalised or written off against owner's equity at the time of acquisition and on the other side with respect to the income statement they investigate the issue of whether there is impairment in the

[33] They offer several values that could serve as proxies for income e.g. clean surplus, net income for the period, or abnormal earnings.

value of goodwill over time or if it maintains its value indefinitely over time. For these purposes they use a sample of 259 US firms from 1982 to 1988 and estimate cross-sectional regressions for each of the years from 1982 to 1988. They extract their data from COMPUSTAT database and also conduct survey to supplement basic goodwill data by extracting information about goodwill balances, goodwill expense and good will accounting policies.

On the basis of their analysis, Jennings et al. (1996) document a strong positive cross-sectional association between equity values and recorded capitalised goodwill, which supports that investors view the purchased goodwill is an asset and is a source of value to the acquiring firm.

Henning et al. (2000) test the whether market attaches different values to different components of accounting goodwill numbers at the time of the purchase transaction. They also study if periodic amortization captures the market's perception of the change in value of goodwill. They decomposes goodwill into synergy (worked out as the combined cumulative abnormal returns to the target and the acquirer for the 11 days centred on the acquisition announcement), going concern (measured as the difference between the fair value of recognized assets and the pre-acquisition value of the target) and residual components (the excess of purchased goodwill over going-concern goodwill plus synergy goodwill).

By using a US sample of 1,576 acquisitions between the period 1990-1994 and stock price and return regressions, Henning et al. (2000) report that investors attach different weights (positive and negative) to various components of accounting goodwill numbers. They find significantly positive valuation effects of both going-concern and synergy goodwill but negative valuation effects of residual goodwill.

The results also show that the market values the going concern component of goodwill similarly to other assets but places larger weight on the synergy component of goodwill as compared to going concern.

They also examine the relation between stock returns and amortization of goodwill components in the year of acquisition and find no significant relation between returns and the going-concern and synergy components but report a significant negative relation between returns and the amortization of the residual component. Henning et al. (2000,p. 385) state, '*... results suggests either that the going-concern and synergy components are non-wasting assets or that the assumed amortization rule does a poor job of capturing the declines in the values of these assets*'. Overall the results of this study suggest that the components of goodwill are valued by the market except for the residual goodwill component and that the market does not view this portion as an asset but as an expense and is effectively written off by investors during the year of acquisition.

Petersen (2002) studies the value relevance of goodwill and goodwill amortisation by using the company data listed on the Danish stock exchange and examining whether investors perceive purchased goodwill as value relevant and as an asset with limited life. Prior to the change in Danish accounting legislation as of January 2002 that requires capitalization and amortization of goodwill over a period of twenty years, Danish companies were allowed to either write-off or capitalize (subsequent to amortize) goodwill. Petersen examines the justification of the new rule that required the capitalization and amortization of goodwill for Danish firms by examining the association between goodwill (goodwill amortization) and share prices (share returns). The results of the study support the new Danish accounting rule that

goodwill must be capitalised. He documents that investors perceive goodwill as an asset that contributes to the values of the sample companies. Regarding the value relevance of goodwill amortization, although the results of the study are mixed but support that it is perceived as an expense.

Taken together, the above studies suggest that purchased goodwill is value-relevant and should be capitalized. One limitation of prior goodwill studies is that they failed to control for the similar positive effects of other intangible assets such as R&D and advertising.

2.3.1 Goodwill Amortization – Valuation Relevance

Recent research has examined the valuation implications of goodwill amortization and suggests that it is difficult for the investors to identify the effect of goodwill amortization on net income.

Russell et al. (1989) search the accounts of 229 UK companies for the period from 1982 to 1986 to study the impact of two alternative treatments of goodwill (i.e. immediate write-off and goodwill amortisation with in a five years period) on firms' average level of profitability. They calculate the rates of returns for those companies by using two different treatments of goodwill. The results of the study reveal that one of the main effects of shifting from immediate write-off to five year amortisation of goodwill would be to reduce the average level of reported profitability by about three percentage points. Russell et al. argue that the choice between two alternative goodwill treatments is an important issue because of significant difference between the average rates of return and the earnings per share firms would report under the alternative methods. They further assert that the choice of method makes a

significant difference to the reported profitability of major acquirers relative to other companies.

Jennings et al. (1996) examine the value relevance of goodwill and goodwill amortisation and find weak evidence of negative association between share prices and goodwill amortization or in other words they find limited evidence of whether investors view goodwill amortization as an expense. They conclude that for the average company in the sample, goodwill is valued as an asset whose value is expected to decrease, but that for some firms' goodwill may be valued as a non-wasting asset. Jennings et al. (1996) propose an annual test of impairment as the most appropriate treatment of goodwill rather than amortisation of goodwill.

Norris and Ayres (2000) examine the relation between increased purchased goodwill (as a result of mergers and acquisitions) and security prices of acquiring companies at the time of the first earnings announcement following the completion of the merger. They argue that although there is a perception that required amortization of goodwill is negatively associated with firm valuation, there is no empirical evidence that confirms negative association between stock prices and non-cash write-offs to earnings caused by goodwill amortization.

To examine the issue whether increases in purchased goodwill are negatively associated with the security prices, Norris and Ayers (2000) use a sample of 116 acquisitions occurring during the period from 1984 to 1990 and employ event study and cross-sectional regression analyses. They report a negative market response to the earnings impact of goodwill amortization. They further state in abstract that their results are not contrary to the earlier research findings that suggest that goodwill is positively valued by the market but instead the results of this study suggest that,

although goodwill may be valued positively as an asset, investors react negatively to goodwill amortisation.

Choi et al. (2000) empirically examine the relation between the reported value of intangible assets, associated amortisation expense and firms equity market values. To test two hypotheses i.e. whether reported intangible assets and amortisation expenses are value relevant and whether these are valued differently by the market from other balance sheet and income statement items, they use a matched portfolio as well as a regression approach in their analysis. They select their sample firms from 1995 COMPUSTAT Industrial Annual file and the CRSP monthly return file and study period runs from 1978 to 1994 (17 years).

Choi et al. find the results of both portfolio analysis and regression analysis consistent. This study concludes that the financial market positively values balance sheet intangible assets and confirm the price-irrelevance of the related amortisation expense. A possible explanation forwarded by the authors for this insignificant relation between goodwill amortisation and firm returns is that the measure of amortisation expense used in financial reports measures the decline in the value relevance of intangible assets with considerable errors. Choi et al. find no difference between valuation of intangibles and other balance sheet items but observe differences in the market valuation of amortisation expenses and other income statement items. Overall their results are consistent with the results of previous studies such as Jennings et al. (2001), and Moehrle et al. (2001), among others, in the area.

Jennings et al. (2001) study the value relevance of goodwill amortization for a large sample of companies over the period 1993-1998. They examine whether goodwill

amortisation increases or decreases the value relevance of earnings as they assert (p. 20), '*...whether excluding goodwill amortization from the computation of earnings increases the usefulness earnings data to investors and analysts as an indicator of share value.*' They run cross sectional regressions of share price on per share earnings before and after goodwill amortization for each sample period year. To assess the usefulness of these alternative earnings measures as an indicator of share value, they compare R^2 i.e. the percentage of explained variation for the regressions.

Jennings et al. find higher R^2 for the model excluding goodwill amortization from earnings than R^2 for the model including goodwill amortization in earnings. They find earnings before goodwill amortization more useful than reported earnings as a summary indicator of share values as they explain more of the observed distribution of the share prices than earnings after goodwill amortization. Jennings et al. (2001) further argue that as goodwill amortization simply adds noise to the measure, it can be excluded from the net income computation without harming the usefulness of earnings to investors and analysts as a summary indicator of share value.

In another study similar to Jennings et al. (2001), Moehrle et al. (2001) examine the value relevance of earnings excluding goodwill amortisation compared to the traditional measures of earnings before extraordinary items and cash flow from operations. By using a sample of 2,421 company years of data for the period from 1988 to 1998, Moehrle et al. (2001) regress market adjusted return on net income after taxes and before extraordinary items and on net income after taxes and before extraordinary items but excluding intangibles amortisation and compare R^2 of each regression equation. They find both earnings measures equally informative.

A criticism on both studies, Jennings et al. (2001) and Moehrle et al. (2001), is that their regression models only include those independent variables (earnings measures and goodwill amortisation) that are the primary focus of their research and they fail to control for other variables that may also help to explain share price. Moehrle et al. (2001) can also be criticised for using intangible amortisation data as a proxy for goodwill amortisation in their analysis.

Hirschey and Richardson (2002) study the information content (market value effects) of accounting goodwill write-off decisions by using an event-study methodology. They use 80 goodwill write-off announcements as data for the period from 1992 to 1996 and report negative and statistically significant information effects of goodwill write-off announcements. Hirschey and Richardson (p.187) argue, '*...the information effects narrowly tied to goodwill write-off announcements are typically negative and material, on the order 2-3% of the company's stock price*.' Moreover this study also documents that goodwill write-offs are a firm specific event and report no link between goodwill write-off size and information effects (stock returns). Hirschey and Richardson further argue (178) argue that, '*...information value of goodwill write-off decisions lies in the role they play as a signal of important changes in the value of the company's intangible assets, and of important changes to come in the company's future earning potential*'.

Petersen (2002), for Danish firms sample, provide mixed evidence that goodwill amortization is perceived as expense by the market.

Market association studies find conflicting evidence on the usefulness of goodwill accounting practices. Prior evidence, support the capitalization of purchased goodwill as an asset, but shows little support for valuation relevance of goodwill

amortization (Jennings et al., 1996). Taken together, these studies suggest that goodwill amortization on average do not affect firm value. Previous research forward at least two alternative explanations for this apparent inconsistency i.e. either goodwill does not diminish in value or amortization periods do not reflect the decline in the value of goodwill.

2.3.2 Goodwill – Different Policies and Practices

Goodwill has been the subject of long debate held in the academic, financial and policy-making communities regarding its accounting treatment. As referred to by Lee (1971), Francis More[34] initiated this debate in 1891 and those eminent accountants and academicians such as Lee (1971), Ma and Hopkins (1988), Nobes (1992), Chauvin and Hirschey (1994), McCarthy and Schneider (1995) Jennings et al. (1996), and Higson (1998), among others have continued it over the years.[35] Nobes (1991, p.270) argues, '*the history of goodwill in the UK is long and complex...*'.

Even in recent times, this issue has remained firmly on the agenda of standard setting organisations. Most of the UK research work and studies on the subject are analytical and descriptive e.g. Nobes (1992), Brunovs and Kirsch (1991), Higson (1998), and Bryer (1995). Such studies suggest different factors[36] may be responsible for the 'controversial' status of goodwill in the UK.

Grinyer et al. (1991) in an empirical study explores the management choices of accounting for goodwill subsequent to acquisition in the UK. During 1980s UK

[34] A Scottish Chartered Accountant
[35] Hughes is quoted as identifying commercial and legal references to goodwill as early as 1417 (Brunvos and Kirsch 1991).
[36] Such as behavioural aspects of managers who have personal interests at stake and engage in lobbying for certain standard practice of accounting in the UK.

companies' managers had a substantial discretion in the choice of approaches to accounting for goodwill on acquisition[37].

Grinyer et al. by use a sample of 264 companies selected from the 400 UK listed companies with the largest sales value in 1987, to test the 'trade-off' hypothesis[38]. They use purchased goodwill as dependent variable and price, leverage and a dummy variable (signifying whether or not management took advantage of merger relief) as independent variables in their linear regression. Grinyer et al. report statistically significant results consistent with the 'trade-off' hypothesis. They find the proportion of acquisition price assigned to goodwill, negatively associated to post-acquisition leverage and the cost of the acquired firm and positively related to the availability of merger relief reserves.

Brunovs and Kirsch (1991) examine goodwill accounting standards and practices in six selected countries i.e. Australia, Canada, Ireland, New Zealand, the UK and the US in relation to the harmonisation of international accounting standards. In this analysis Brunovs and Kirsch (1991) review accounting standards covering five areas of goodwill i.e. internally generated goodwill, goodwill measurement, goodwill amortisation/reassessment and disclosure policy, prior to 1990. They find significant divergence between the various accounting standards as to the acceptable method for the computation of the amount of goodwill at the acquisition date.

Brunovs and Kirsch find the conceptual differences that exist between the goodwill accounting standards issued by the UK and Ireland and rest of the sample countries

[37] Also see Kelly (1996).

[38] The trade-off hypothesis states that the proportion of acquisition price assigned to goodwill was negatively related both to post-acquisition gearing and to the size of the price paid for the acquired firm relative to the post-acquisition market value of the acquirer and positively related with the availability of merger relief reserves.

that would have material impacts upon financial statements and the position of the corporation. In the study period the UK and Ireland standards advocated immediate goodwill elimination against reserves on acquisition where as other countries require goodwill to be capitalised and systematically amortised over the estimated useful life of that goodwill. The UK standards allowed reorganisation costs associated with an acquisition to form part of the cost of goodwill whereas these reorganisation costs were charged against income in the US. Brunovs and Kirsch consider these conceptual differences as the most significant findings of their analysis and highlight the consequences of inconsistency between standards.

In his study Nobes (1992) notes the goodwill subject as the most controversial issue facing the Accounting Standards Committee (ASC)[39] after the decline in interest in inflation accounting in the early 1980s. The crux of his study is the cyclical pattern of standard setting in the UK and political influences. He discusses political influences on the ASC and identifies different parties involved in the political process of standard setting. Nobes (1992) also discusses the problems, criticisms and background issues relating to Statement of Standard Accounting Practice 22 (SSAP22)[40]. In another study Nobes (1991) explains a cyclical model and identify its following four elements:

a) a start point of low standardisation;

[39] Which operated from 1970 to 1990.

[40] SSAP22 allowed two treatments for purchased goodwill i.e. immediate elimination by writing it off against reserves and capitalisation and amortisation through income statement over its useful economic life. Brockington (1996) while discussing SSAP22 requirements argue that (pp.123), '...the preferred treatment is for positive goodwill to be eliminated immediately by writing it off against reserves...an allowed, but not favoured, treatment under SSAP22 is for positive goodwill to be amortized through the profit and loss account over the period of its useful economic life.'

b) energy introduced by criticisms or economic events, international comparisons etc;

c) a pro-standardisation force e.g. senior members of the profession supported by government, press and international influences;

d) an anti-standardisation force e.g. management (it's motivation in all cases is to preserve flexibility and to avoid income-reducing requirements.

Bryer (1995) discusses the controversy associated with ASC's preference for immediate write-off goodwill against reserves instead of capitalization and amortization of goodwill being the required and dominant practice in all other countries with well-developed capital markets. Bryer (1995) argues that a prevalent explanation for the implementation of the write-off option has been the dominant interests of management (in boosting reported profits and thereby their remuneration). But he criticises this argument by quoting previous research such as the study by Gregg et al. (1992), which shows a very weak relationship between the salary and bonus of the highest paid directors and both capital market and accounting measures of performance[41], and argues (p.299), '*...apart form the fact that the evidence does not support the managerialist hypothesis, its real weakness is its unquestioned presupposition that managerial interests dominate UK accounting regulators...*'.

Instead Bryer presents another hypothesis to explain why companies preferred to write-off goodwill immediately as he argues (p.285), '*...UK companies were*

[41] Gore et al. (1996) conduct a survey to examine whether and why accounting for goodwill matters to financial directors and senior management and what their preferences are. They do not find compelling evidence that management preferences for goodwill treatment are strongly affected by whether they have rolling (current) or frozen GAAP –based compensation plans.

encouraged to write-off the record amounts of goodwill they purchased in the 1980's to hide the fact that, for many, dividends were being paid from capital'. He further adds that during the recession of the early 1980's when a number of British firms closed significant parts of their operations, dividends were substantially increased at the same time. On an historical cost basis the typical payout ratio of UK firms increased from 16% in the mid-1970's to around 35% by the later 1980's. The ratio was running at as high as around 55% by the early 1990's. He contends that if goodwill had been amortised and had reduced profits by a modest 10% in 1991 the payout ratio would have been an exceptional 62%. He takes it as an evidence of a potential need for creative accounting for goodwill and writing off purchased goodwill against capital helped to hide from public view the fact that dividends were being paid from capital.

Amir and Livne (2005) investigate whether the current accounting regulation (FRS 10) that purchased intangibles must be capitalised is appropriate. By using data on investment by the UK football industry in player contracts, Amir and Livne estimate the association between players' transfer fee and market value of listed football clubs. They also assess the association between accounting-based measures (sales, operating profits, and cash flows) of future economic benefits and current and lagged investment in player contracts.

Amir and Livne find a positive and significant association between transfer fee and market value of the football clubs indicating that the market views investment in player contracts as assets. In their second analysis seeking association between sales, operating profits, and cash flows and current and lagged investments in player contracts they report positive associations for current and previous year but not for a

second period lag for sales and operating profits and positive association for current year only for cash flows.

In their study Ferguson and Wine (1993) by using a sample of 150 Australian stock exchange listed companies examine the accounting policies adopted for goodwill and for identifiable intangible assets over the period from 1985 to 1989. They examine the financial statements of the above sample companies in order to detect any trends in accounting policies adopted for goodwill and other identifiable intangible assets. They report a wide range of accounting treatment for goodwill adopted by Australian companies before the issuance of Statement of Accounting Standards AAS18[42] (Accounting for goodwill) in March 1984. AAS 18 required companies to capitalise and amortise goodwill over the period for which benefits were expected to arise.

Ferguson and Wine report an increased compliance with the relevant goodwill accounting standard and a general decrease in the diversity of goodwill accounting polices over the study period. The results also report an increase in the number of companies recognizing identifiable intangible assets over the study period and also an increase in the diversity of accounting policies adopted for those identifiable intangibles.

2.4 Other Intangibles (Patents, Trademarks)

Another widely used measure of intangible capital along with R&D is patents. There is a significant literature that relates market valuation to patenting activity. While the positive relationship between patents and value of the firm has been confirmed in previous research (see Griliches, 1981; Ben-Zion, 1984; Pakes, 1985), it is not particularly strong.

[42] The first Australian accounting standard issued relating to intangible assets.

Griliches (1981) studies the relationship between the market value of the firm and its intangible capital, proxied by past R&D and the number of patents by using a data set of 157 large US firms for the years 1968-1974. He finds significant and positive effects of R&D and patents on the value of the firm.

Ben-Zion (1984) studies the effects of R&D investment, other capital investment and patenting on the market value of the firm by using a sample of 93 industrial firms for the period from 1969-77. Ben-Zion reports that R&D and patents affect market value significantly along with earnings and investment variables. R&D effects appear to be a little larger than the effect of capital investment. Ben-Zion also finds a quite large high effect of industry patents on the market value of the individual firm in his sample as compared to the firm's own patents.

Pakes (1985) analyses the dynamic relationship between R&D, patents and stock market values by using a sample of 120 firms over an 8-year period from 1968-75. Pakes reports a significant correlation between changes in the stock market rate of return and unpredictable changes in both patents and R&D expenditures. The empirical results of this study show that five percent of the variance in the stock market rate of return is the result of the events that changed both R&D and patent applications.

Cockburn and Griliches (1988) study the stock market valuation of knowledge capital (R&D and patent stocks) by using a sample of 722 large US manufacturing firms for 1980. They use cumulated stock of past R&D (K), the stock of cumulated past patents (SP), and an estimate of the current year's net investment in R&D (NR), as major independent variables and the market's relative valuation (Q) as the dependent variable. They construct stock of R&D and Patents (proxies for intangible

knowledge capital) from annual reported R&D expenditures and numbers of patents granted. Cockburn and Griliches (1988) document significant correlations between Q and investments in R&D and patents. In the absence of R&D variables, they find statistically significant coefficients for patent stock variables but the same become less significant when R&D variables are added.

Connolly and Hirschey (1988) examine the link between patents and market value of the firm by using a sample of 390 firms taken from the 1977 Fortune 500. They adopt a relative excess valuation (EV/S) approach. They also include R&D expenditures, advertising expenditures, concentration (CR), geometric sales growth (GR) and the firm's stock market beta (β) as controlled variables in their model.

Connolly and Hirschey find a positive and statistically significant effect of patents on excess value and argue (p. 86) *'... patent statistics can be considered economically relevant information.'* They also find positive effects for R&D, advertising, a small positive effect for GR and indiscernible effects for Cr and β.

Austin (1993) in an event study (using a three-day window) by employing the capital asset pricing model (CAPM) and data on 258 solitary-event patents owned by the 20 largest biotechnology firms (by market value) as of November 1991 finds average excess returns for product-linked patent events relative to non-linked ones and argues (p. 256), *'...patents readily identifiable with end products tend to be more valuable than the average patent'*. This study also observes that the patents announced in the press (The Wall Street Journal) are more highly valued when they are issued than those not announced in the press. In another study of the impact of patent scope on firm value, Lerner (1994) by using a sample of US firms in biotechnology industry

during the period 1973-1992 finds a statistically significant impact of patent scope on firm value.

Hall et al. (2001) regress Tobin's Q for 4,800 US manufacturing firms between 1965 to 1995 on measures of R&D stock, patent stock and patent stock weighted by citations to study the relations between firms' market value and their stocks of patents and patent citations. Hall et al. show a high correlation between R&D stock and market value than for either patents or citations and also find citation weighted patent stocks more highly correlated with market value than patent stocks themselves.

Bloom and Reenen (2000) estimate a production function and a market value equation of a sample of British firms for 1968-1996, to study the impact of patents on company market value and productivity. In the production function they regress sales on measures of knowledge stock (G), number of employees (N), and Capital stock (K). They use patent stocks and citation-weighted patent stock as empirical proxies of the knowledge stock (G). Both in the production function and in the market value equation (Tobin's average Q), Bloom and Reenen (2000) show a significant (statistically and economically) impact of patents on productivity and market value of the firm. They also find that weighted measures (citations) are more informative than un-weighted measures (patent counts) and patenting has weaker effects on productivity as compared to its effect on market values.

Griliches et al. (1987) survey previous research, which used patent statistics to study different aspects of the economics of technological change and find patents a good indicator of differences in inventive activity across different firms and report significant differences of propensity to patent across industries. They also show that

one reason that patents may not exhibit very much correlation with R&D or market value is that they are an extremely noisy measure of the underlying economic value of the innovations with which they are associated. This is because the distribution of the value of patented innovations is known to be extremely skewed, i.e. a few patents are very valuable, and many are worth almost nothing. They also typically find that patent counts by application dates are more tightly linked to market value than counts by granting date.

Harhoff et al. (1999), surveyed the German patent holders of 964 inventions made in the US and Germany, asking them to estimate at what price they would have been willing to sell the patent right in 1980, about three years beyond the date at which the German patent was filed, to examine the relationship between patent citation counts and economic value. They hypothesize that more valuable patents are more frequently cited and payment of patent renewal fees for longer periods of times will be paid for higher value patents to keep them in force. They use estimated patent value as the independent variable and the number of citations as dependent variable in the regression analysis.

Harhoff et al. find that the estimated value is correlated with subsequent citations to that patent and more valuable patents are more likely to be renewed to full term. They also measure regression by adding another variable, R&D expenditures per linked patent (RDPAT), and find that R&D expenditures have no explanatory power once private economic values have taken into account.

Archambault (2002) points out that using patent applications instead of patents granted can introduce an important overestimation. Archambault (2002, p.16 and 17) argues, '*...this method is associated with an overestimation of the number of*

inventions and it neglects to take in to account the varying success rate of countries in obtaining patent ... measuring applications rather than patents granted widely affects results... the resulting overestimation is not distributed homogenously between countries....' He further states that statistics on independent inventors are substantially different from institutional inventors and both must be tabulated separately.

Barth et al. (1998) use a sample of 1,204 brand value estimates obtained from Financial World (FW) magazine's annual surveys of brands over the period 1991 to 1996 and show a positive and significant relation between brand value estimates and share prices and returns as they posit (p. 63) *'we find consistent evidence that brand value estimates are significantly associated with equity market values....'* This study also finds that year-to-year changes in brand values are associated with annual stock returns, controlling for net income and changes in net income.

Greenhalgh and Longland (2002) by using a panel database of large British companies for the years 1987-94, study the contribution made by intangible knowledge assets as well as by capital and labour services to the creation of value added (increased real output). To relate firms' net output to the stocks of tangible capital, labour and intangible knowledge (number of new patents registered in three geographical domains, the US, UK and EU and trademarks registered in the UK), they use a standard production function, which assumes all input factors are acting interactively, but with different powers of impact. In addition to seeking evidence of productivity gains in firms acquiring intellectual property (IP) via patents and trademarks, Greenhalgh and Longland (2002) also investigate both the size and the

duration of benefits to IP protection to firms. For further insights into the returns to IP protection and R&D, they also divide sample in to high and low technology firms.

Greenhalgh and Longland document evidence of productivity gains/positive returns for firms that undertake R&D and register trademarks and patents. The productivity benefits evidenced from panel data analysis appear to be short lived. The results of their sub-samples i.e. high and low technology sector firms, show non-significant returns for acquiring new IP by firms in the high technology sector but which are significant for firms in the low technology sector. However firms in the high technological sector register the largest returns from R&D.

Bloom and Reenen (2002) explore the impact of US registered patents on both firms' market value and productivity by employing a market value equation and a production function and using a sample of major 200 UK firms for the period from 1968-1996. They use three different specifications for the patent variable – the patent stock, the citation weighted patent stock and the five year citation weighted stock and argue that while each should have its own merit in capturing different aspects of the knowledge stock, they proxy a similar measure of the technological innovation stock.

Bloom and Reenen find economically and statistically significant impacts of patents on firm-level productivity (as measured by the real sales variable) and market value. In their production function, they find patent stocks highly significant when estimated as the sole measure of knowledge in a firm but not significant when estimated jointly with citations. They argue (p.c111), '*...citations provide significant information over and above raw patents numbers...citations could*

provide valuable proxy for evaluating knowledge stocks and tracking knowledge flows.'

In the market value equation, Bloom and Reenen also find that citation provides significant additional information over and above raw patent accounts. They also find that patents affect market value much more quickly than they affect productivity measures and have a slower effect on productivity.

In their study of the value relevance of financial and non-financial information of US cellular companies for the period 1984-1993, Amir and Lev (1996) find that general administrative expenses, which mainly include customer acquisition costs, are not considered as current expenses by investors but rather as an investment having a substantial positive impact on future cash flows. They find a positive, large and statistically significant coefficient on the general administrative expenses variable. This indicates that the market capitalises customer acquisition costs.

The results of the studies that include patents as an independent variable in models to determine whether the patent variable measures something over and beyond the R&D are contradictory and inconclusive. For example Griliches (1981) finds a positive and significant impact of patents on market value while Cockburn and Griliches (1988) did not. Johnson and Pazderka (1993) conclude that patents are 'noisy' measures of innovative activity. The positive relationship between patents and value of the firm, as confirmed in previous research, is not particularly strong.

2.5 Summary

The review of literature reveals that there is an extensive body of literature that examines various aspects of intangible assets. Where a large body of previous

research generally seems to suggest the valuation relevance of intangibles in the US, there is comparatively little empirical evidence on the market valuation of goodwill numbers, advertising and research and development expenditures in the UK. For example prior research such as Hirschey (1982), Hirschey (1985), Hirschey and Wegandt (1985), Hirschey and Spencer (1992), Chauvin and Hirschey (1993), Chauvin and Hirschey (1994), McCarthy and Schneider (1995), and Jennings et al. (1996), among others, provides consistent evidence on the valuation relevance of goodwill, R&D and advertising expenditures in the US.

Empirical evidence on value relevance of these intangibles in the UK is mixed and inconclusive. Some studies of the value relevance of intangibles such as Green et al. (1996), Stark and Thomas (1998), Toivanen et al. (2002), and Wakelin (2001) have used UK and other countries, data. The literature for the UK is considerably more limited both in the number of papers published and in the time span of data analysed.

Prior research has mainly concentrated on aggregate advertising expenditures ignoring possible differential valuation media impacts. Also a limited amount of research examines the value relevance of the goodwill amortisation expense and provides less consistent results. For example while some studies find strong evidence of a negative reaction by the market to the amortisation of goodwill (e.g. Norris and Ayers, 2000), others report weaker negative reaction (e.g. Jennings et al., 1996), and/or no value relevance of goodwill amortisation (e.g. Jennings et al., 2001). Another possible limitation of prior research on the information content of goodwill numbers is that these studies failed to control for similar positive valuation effects of other intangibles such as R&D and advertising.

The present study investigates the valuation relevance of goodwill, goodwill amortisation, advertising, and research and development expenditures in the UK capital market. Empirical evidence exists on all these assets in the US. However these US findings await verification in future studies of data from other countries. In the next chapter we out line the methodology and research approach adopted to investigate the value relevance of these intangibles in the UK. The next chapter also presents the process of data collection, data cleaning procedures, and the measurement of variables.

Chapter 3

Research Methodology, Data, and Sample

3.1 Introduction

Empirical evidence on the valuation relevance of intangibles from past research has been reviewed in the previous chapter. This chapter presents the methodology underlying the research presented in this thesis. This study undertakes market based accounting research (MBAR)[43] and uses cross-sectional valuation models for investigating the valuation relevance of goodwill numbers[44], R & D and advertising for the period 1998-2003. This chapter presents discussions on valuation and return models used in valuation research, empirical model used in this study, econometric issues and also describes data and variables.

This chapter is divided in to following main sections: section 3.2 introduces value relevance research, section 3.3 presents discussions on valuation and return approaches, section 3.4 provides evidence on valuation relevance of accounting information, section 3.5 describes the models used in this research, statistical methodology and econometric issues are discussed in section 3.6, section 3.7 describes data, sample selection and variables definitions and their measurement and finally section 3.8 gives a summary of this chapter.

3.2 Value Relevance: An Introduction

The proposed research examines whether goodwill, research and development and advertising numbers have information value for users of financial statements and it falls with in the strand of research known as 'value relevance'. The value relevance

[43] A field of research, on the links between capital markets and financial statements.
[44] Goodwill and goodwill amortisation.

research investigates the relationship between a dependent variable based on security prices and independent variable(s) drawn from financial statements. Hung (2001) defines value relevance research as the ability of an accounting measure to capture or summarize information that has an impact on firm value. Holthausen and Watts (2001, p.20) define value relevance research as '*...value-relevance studies determine whether an accounting number is useful for valuing the firm by investigating whether the accounting number is associated with stock prices...*'.

Lev and Ohlson (1982, p.249), in their review study note that value relevance research is the search into the relationship between publicly disclosed accounting information and the consequences of the use of this information which reflects in characteristics of common stocks traded on major stock exchanges. Strong (1997) asserts that there is an increasing interest in financial statement analysis, examining the link between accounting numbers and firms' values.

Past research confirms that MBAR is a matter of longstanding interest and literature examining association between accounting numbers and equity market values extend back over thirty years.[45] But like the proverbial research on the characteristics of an elephant, different studies approach this topic from slightly different points of view. Kothari (2001) reviews last three decades research on the relation between capital markets and financial statements and notes that MBAR is a broad area of research that originated with the seminal publication of Ball and Brown (1968) and grown rapidly within the last three decades. It covers a broad range of topics such as research on earnings response coefficients and properties of analysts' forecasts, fundamental analysis and valuation research, and market efficiency tests, among others. Recently a number of researchers reviewed previous market-based

[45] See Barth et al. (2001).

accounting research (with different objectives) e.g. Lev and Ohlson (1982), Kothari (2001), Holthausen and Watts (2001), and Barth et al. (2001) and observe that MBAR dominates financial reporting research.

The review studies such as Holthausen and Watts (2001), and Barth et al. (2001) address some of the conceptual issues relating to value relevance. Holthausen and Watts (2001) divide value relevance research into three groups: relative association studies; incremental association studies and marginal information content studies. Watts define relative association studies comparing the relationship between stock market values (or changes in values) and alternative bottom-line measures; incremental association studies look into whether the accounting number of interest is helpful in explaining value or returns (over long windows) given other specified variables; and marginal information content studies examine whether a particular accounting number adds to the information set available to investors.

Relative association studies investigate the association between equity market values and various measures of performance such as earnings. In such types of studies regression equations of share price against various measures of performance (that are being compared) are usually estimated and the regression equation with higher R^2 is considered more value relevant. For example Jennings et al. (2001) compare the R^2 from regression of share price against earnings including and excluding goodwill amortisation.

Incremental association research views the extent to which an accounting number explains the market value given the presence of other variables. For example Jennings et al. (2001) examine whether the goodwill amortisation number has incremental explanatory power beyond that of earnings before goodwill amortisation. In such types of research the regression coefficient of the accounting number is

examined and if it is significantly different from zero, the number is considered to be value relevant. While on the other hand marginal information content research examines whether an accounting number imparts additional information to the market. Event studies are normally employed to determine whether market prices react to the release of the number and therefore whether the number is value relevant. Holthausen and Watts (2001) note that the majority value relevance papers, in their sample, perform association studies (relative and/or incremental) and a smaller number perform information content studies.

In another study Barth et al. (2001) point out the main accounting principles on which value relevance studies can be based, mainly the FASB's relevance and reliability criteria for accounting numbers. These criteria suggests that a financial statement number can only be related to equity values if it can be reliably measured and contains information that is of relevance when assessing a firm's market value.

To investigate the value relevance of financial statements information researchers employ valuation and/or return approaches, which we briefly discuss in next section.

3.3 Research Approaches -Valuation or Return

Ball and Brown (1968) and Beaver (1968) were the first who introduced market based accounting research (by empirically demonstrating the relation between earnings and stocks prices). They support the idea of the relevance of financial statement information. In his review study Kothari (2001) notes that these early studies show that accounting numbers do have value by using first time event and association study methodologies.

Current accounting research mainly employs a research design that measures the association between stock prices or stock returns and accounting numbers. One main

purpose of this type of research is to evaluate information in accounting numbers against information contained in stock prices. Barth (2000) states that objective of valuation research is to link accounting numbers to a measure of firm value to determine the characteristics of accounting numbers and their relation to value. The valuation research attempts to answer the questions such as how well do accounting amounts measure value and what accounting amounts provide information about value?

She further points out two basic components of valuation-based research i.e. a measure of value[46] and a valuation model linking firm values to firm-specific characteristics that investors are supposed to value. There is no consensus on a standard way of using valuation models to investigate the relation between accounting information and market values.

Value-relevance studies determine whether an accounting number is useful for valuing the firm by examining whether the accounting number is associated with stock prices (Holthausen and Watts, 2001). For this purpose value–relevance studies normally use either a return model or a valuation model to investigate the relation between accounting numbers and firm value. Both approaches, price levels and price changes, address related but different questions and failure to recognize these differences could result in drawing incorrect inferences (Barth et al., 2001)[47].

About choice between two approaches i.e. levels and returns, Easton and Sommers (2003) posit that both approaches address the validity of financial statement data as a summary of the events that have affected the firm to date or over a certain period of time.

[46] Share prices are the most common value measure used in research.
[47] Barth et al. (2001) distinguish between the two approaches and assert that value relevance studies are interested in determining what is reflected in firm value, while price changes studies are interested in determining what is reflected in changes in value over a specific period of time.

The return and valuation models are perhaps the most pervasive models in accounting research today[48]. In valuation models market value of equity, the ratio of market to book value or the price earnings ratio is regressed on explanatory variables, while in return models stock returns are regressed on scaled explanatory variables (Christie, 1987).

Holthausen and Watts (2001) investigate the appropriateness of valuation models used in value relevance research. They emphasise the use of appropriate valuation models to avoid the consequences of use of an inappropriate valuation model (e.g. wrong estimates of signs and magnitude of coefficients, and correlated omitted variables problem). The selection of model that is used in research, Barth et al. (2001) consider as a primary design issue.

There has been considerable research that attempts to point out the conceptual advantages and disadvantages of return and valuation models, for example Lev and Ohlson (1982), Landsman and Magliolo (1988), Christie (1987), Lev (1989), and Kothari and Zimerman (1995), among others.

In their study, Lev and Ohlson (1982) analytically review previous research that employs a number of methodologies and research designs in market based accounting research (MBAR). They note that in MBAR much emphasis has been placed on explaining returns rather than values, and question this in view of the existence of empirical evidence suggesting that unexpected accounting information is associated with excess returns, but the explanatory power of the examined data with respect to the distributions of stock returns is rather low. Lev and Ohlson argue that this is a reasonable reason to consider alternative methods of relating stock-price characteristics in financial markets to accounting signals.

[48] See Barth (2000)

Lev and Ohlson (1982) compare and contrast both approaches (valuation and returns) and conclude they are complementary and go on to comment (p.308) '*From a theoretical viewpoint, a return relationship is not possible unless there also is a valuation relationship, and conversely...valuation and value changes are complementary dimensions in the equilibrium theory of security behavior....*' Overall the discussion of Lev and Ohlson (1982) seems to be supporting valuation approach over the returns approach.

Later studies such as Francis and Schipper (1999), Ely and Waymire (1999) and Lev and Zarowin (1999), among others, investigate the changes in value relevance of accounting numbers by using both the returns and valuation models and report inconsistent findings for the two approaches. Although the overall results of these studies are inconclusive but it appears that the value relevance of accounting numbers increases (or does not decline) over time when using valuation models and declines over time when using returns models. Brown et al. (1999) point out the down side of the levels approach as argue (p.85) '*...some (if not all) of the differences between the 'too low' R^2 in returns regressions and the (higher) R^2 in levels regression are caused by scale effects'.*

Christie (1987) while examining the economic and econometric properties of valuation and return models, among other things, conclude that both approaches although not econometrically but economically are equal and argue (p.254) '*...economically the two classes of studies are equivalent, since the same cash flow (dividend) valuation model underpins both approaches; one is just a transformation of the other. One implication of economic equivalence is that an expectations model of expected future cash flows is required for both approaches.*'

Christie further claims that in spite of their economic equivalence, return and valuation models are not econometrically equivalent and return models are econometrically less problematic. However Landsman and Magliolo (1988) argue that an assumption that returns model designs always work best may be premature. Their overall arguments seem to be supporting valuation models rather than return models.

Kothari and Zimerman (1995) within economic and econometric framework assess return and valuation models and on the basis of their analysis suggest that the estimated slope coefficient from the price model, but not the return model, is unbiased.

Although Kothari and Zimerman (1995) do not suggest using either price or return models exclusively but on the basis of their empirical analysis they believe in the supremacy of valuation models over return models in market based accounting research. However they quote Gonedes and Dopuch (1974) arguing that return models are theoretically superior to price models in the absence of well-developed theories of valuation.

Strong (1997) also argues that from an econometric point of view, valuation models have an uncorrelated omitted variable but estimated slope coefficients obtained from these models are unbiased.

Rees (1997) notes that the vast majority of market based accounting research employs the returns approach rather than the valuation approach for detecting the information content of accounting variables but he advocates valuation approach over returns. He argues that parameters obtained by using valuation models are reasonably closed to those expected from theory.

Rees also finds the valuation approach more convenient than the returns approach for certain reasons. His main concerns regarding the returns approach are about the quality of data collected from financial databases and used in the analysis of changes in accounting variables and the sensitivity of the returns model to the event window over which returns are cumulated; as he states (p.1113) '*...the performance of returns models is sensitive to the window over which returns have been cumulated...in general the window should often be extended backwards to capture the share price reaction to changes in expectations which only appear in accounting numbers somewhat later. This problem does not occur when using levels, as all price reactions to available information are included in the current price...*'

Rees further comments that valuation models demonstrate a relatively high explanatory power (usually more than 50%) while returns models illustrate low explanatory power (normally in the range of 5 to 15 %). In another study Rees (1999) notes that a number of studies use valuation models and contends that valuation models are intuitively appealing and have generally proved to be robust.

Frank (2002) advocates in favour of the price models and argues that these capture all information known about the firm to date, while return models focus only on new information discovered during the period.

Both the return and valuation models have econometric problems (e.g. scale effects, heteroscedasticity, multicollinearity, and model misspecification) and Kothari and Zimerman (1995) warn that researchers should be aware of the econometric limitations in designing their experiment since each functional form has its weaknesses. Christie (1987) also points out that in both levels and returns studies, there is evidence of unresolved econometric problems.

The above review reveals that both return and valuation methodologies have advantages and disadvantages and no approach is superior to the other. Landsman and Magliolo (1988) argue that (p.603) '*...the advantages of one approach over the other are largely dictated by what the researcher wishes to assume...our ability to make claims about inherent advantages of almost any methodology is premature.*' The interdependence of both return and valuation methodologies is also obvious and if accounting and/or financial data do have information content that must be evident in either of the methodologies (Lev and Ohlson, 1982; Christie, 1987). A research question that does not require determining whether the accounting amount is timely or does not involve investigation of changes in value potentially qualifies for price-level research design.

The preceding discussions suggest that choice between alternative approaches i.e. valuation or return depends on the research question and viewpoint of the researcher (Barth et al., 2001; Easton and Sommers, 2003). The main focus of this thesis is on the valuation of intangible assets, of which the most important are likely to be goodwill, advertising and research and development expenditures. This research concentrates on how well accounting numbers reflect information embodied in market prices, which refers to the concept of value relevance. In this research the relevance of accounting information to investors is at issue and as per Lev and Ohlson (1982) the extent to which this information accounts for (explains) the values of stocks, rather than just triggers a change in these values, should be of major concern. A valuation approach, as explained in section 3.5, is adopted for this research.

Another objective of this thesis is to test whether the market places similar value on all type of advertising media expenditures. A level approach allows this comparison.

The valuation model used in this study is based upon the linear information dynamics approach of Ohlson (1989). Assuming that accounting variables in the system evolve according to a first-order system of linear information dynamics; it has the advantage that market value can then be expressed as a linear function of the variables in the system.

A number of studies, such as those of Hirschey (1982,1985), Landsman (1986), Ohlson (1989), Hirschey and Spence (1992), Chauvin and Hirschey (1994), Green et al. (1996), Jennings et al. (1996), Green et al. (1996), Rees (1997), Collins et al. (1997), Stark and Thomas (1998), and Shah and Stark (2004,2005), among others, use levels approach to examine the relationship between market value and different accounting measures. These studies examine whether levels of firms specific attributes are correlated with levels of security prices.

Barth et al. (2001) suggest that the key distinction between value relevance research examining price levels and those examining price changes, or returns, is that the former are interested in determining what is reflected in firm value and the latter are interested in determining what is reflected in changes in value over a certain period of time.

Frank (2002) contends that price level models capture all information known about the firm to date, while return models focuses only on new information discovered during the period. If research question is not examining timeliness or changes in value but rather involve capturing of 'all information to date' potentially qualifies for level approach. Landsman and Magliolo (1988, p.603) argue that, '*...advantages of one approach over the other are largely dictated by what the researcher wishes to assume.*'

McCarthy and Schneider (1995), claim certain advantages for using valuation approach such as, no estimates of the variables are required, no firms have to be discarded or become potential outliers as the result of negative book values or small book values, all firms in a levels study will have positive market value, and coefficients from a levels equation can be interpreted as valuation weights.

Our research questions do not require determining whether the accounting amount is timely or do not involve investigation of changes in value, potentially qualifies for valuation research design.

Researchers have investigated the value relevance of financial statements items by employing valuation and/or return approaches and different model specifications. There is evidence that different accounting variables behave differently in empirical research and differ in their value relevance. So the choice of these variables for model specification matters. We briefly review the previous research that has examined the value relevance of accounting information such as book value, earnings, and dividends in the following section.

3.4 The Value Relevance of Accounting Information

The concept of value relevance refers to the degree of association between accounting numbers and the market value of a firm and the term value relevance, in general, is often used to evaluate accounting numbers. It refers to the idea that financial statements information should correlate with stock prices to a significant extent. If an accounting number shows a high degree of association with a market measure of value it would be considered value relevant. When there exists a strong relation between an accounting item and stock returns, it is claimed that the particular item holds valuable information for investors and that item is considered

value relevant. In other words one can say that the stronger an item correlates with returns, the more value relevant it is.

Financial statements contain accounting summary numbers and users use the information imparted by these numbers for the assessment of the future expected performance of reporting companies. In order to evaluate information in financial statements against information contained in stock prices, association models are used in research. But the question is what explanatory variables should be included in the valuation models? A large number of model specifications have been developed to describe the relation between accounting numbers and market values. And they differ in their treatment and use of types of market and accounting information e.g. some identify a relation between prices and earnings and other use earnings, returns and book values. The relative importance of the stock (book value) and the flow (earnings) variables is one of the most important issues in financial accounting debate[49].

There is an impressive body of empirical evidence on the relationship between stock prices and some widely reported accounting and financial variables e.g. earnings, dividends, book values, and cash flows.

The fundamental role for earnings in valuation has been well established in the accounting literature for many years. Ball and Brown (1968) and Beaver (1968) were the first articles to empirically demonstrate the relation between earnings and stock returns. Ball and Brown (1968) tested the usefulness of existing accounting numbers and information empirically by examining their information content and timeliness. They investigated the association of accounting earnings with share price

[49] The stock is represented by the book value of equity in the balance sheet and reflects the net stock of assets at a given point in time. The bottom line net income in the income statement signifies the flow and it reflects the increase (or reduction) to the net stock of assets during the certain period.

movements. One motivation behind this research was to counter the contention that historical cost was an inadequate basis for financial reporting. The idea behind this paper refers to the efficient market hypothesis as Ball and Brown (1968,p.160) states '*Because net income is a number of particular interest to investors, the outcome we use as a predictive criterion is the investment decision as it is reflected in security prices'.*

The results of the Ball and Brown (1968) study, which evaluate the stock market reaction to earnings at the time of disclosure, are in conformity with the efficient market hypothesis. They document that earning announcements are anticipated to a large extent by the market but the announcement still results in the disclosure of new information. Ball and Brown show that 85-90 percent of information is incorporated into share prices before disclosure. The remaining information is captured in a timely way after the announcement.

Beaver (1968), in another seminal empirical study that demonstrated the relation between earnings and stock prices, documents that earnings numbers have information content by investigating share trading volume effects of earning announcements. The methodology used in this study is to measure trade volumes of stocks around the time of earnings announcements. Beaver observes particularly high trading volumes surrounding an earning announcement.

Patell and Wolfson (1984) extend the work of Ball and Brown (1968) and Beaver (1968) and investigate the intraday speed of adjustment of stock prices to earnings and dividend announcements. They report a quick price reaction to earnings and dividend announcements. This study documents a similar price reaction to dividend change announcements as in the case of earning announcements in both magnitude

and duration. The empirical results of the study confirm the idea of efficient capital markets i.e. the stock market impounds publicly available information very quickly.

Brief and Zorwin (1999) examine the information content of various income statement and balance sheet items (book value, dividends and earnings) by using cross-sectional regressions of share price on the value measures. They extract the data from COMPUSTAT files and cover the period from 1978-1997 (twenty years). Brief and Zorwin (1999) compare the value relevance of book value and dividends against book value and reported earnings. They find that for dividend paying firms on the whole, book value has greater explanatory power for price than either earnings or dividends. They demonstrate that the combination of book value and dividends has almost identical explanatory power as book value and earnings.

Brief and Zorwin also show that when earnings are permanent, earnings are the dominant sole valuation variable while when earnings are transitory, book value turns to be dominant valuation variable. However for firms with transitory earnings, dividends have greater individual explanatory than earnings.

Beaver et al. (1980) also examine the empirical relationship between price changes and earnings and report significant earnings information content. Board and Day (1989) while looking at the link between earnings (using three measures of earnings i.e. the traditional historical cost accounting return, and two cash flow measures) and share prices for a UK sample find significant information content in historical cost earnings.

Rippington and Taffler (1995) investigate the information content and value of firms' accounting disclosures (preliminary announcement, annual report and accounts, annual general meeting and interim report) to analysts and investors for a UK

sample. They find substantial amounts of new information associated with both preliminary announcements and interim reports and relatively little information with annual general meeting and annual accounts.

Where studies like Beaver (1968) that support the idea of relevance of financial statement information, there are other studies that indicate that the relationship of accounting information with stock returns is unclear. For example Lev (1989) surveys the literature from the three major accounting journals[50] for the period 1980-88 and concludes (p.173) '*... earnings and earnings-related information (e.g. cash flows) explain 2-5% of the cross-sectional or time-series variability of stock returns for relatively narrow windows, and up to perhaps 7% for very wide windows. Accordingly, earnings explanatory powers of about 5%, on the average, for large, heterogeneous samples appear representative.*' A weak and intertemporally unstable contemporaneous correlation between stock returns and earnings and a very meek contribution of earnings to the prediction of stock prices and returns suggests a limited extent of earnings usefulness.

Much attention has been given to earnings announcements and expected to have most dominant relationship with stock returns, attention averted slowly to some other financial variables such as book value, dividends, and cash flows. The research into the value relevance of equity book value has been limited and of more recent origin. In the second half of the 1990s, by using a valuation framework by Ohlsen (1995), researchers started to study the role of book value in equity valuation. Recent research using Ohlson's (1995) valuation framework finds an increase of relative and incremental importance of book value over time. It also provides evidence for a

[50]Journal of Accounting and Economics, Journal of Accounting Research and The Accounting Review

different role of book value relative to that of earnings and dividends in equity valuation.

Ohlson (1995) justifies the inclusion of book values in association models. According to Ohlson (1995) a model that includes a stock concept of value and a flow concept of earnings might better explain the market value of the firm. He provides evidence that these two measures complement each other in explaining the market value of firms.

Recent empirical research provides evidence that book values in addition to earnings and dividends play a vital role to explain variation in market value. Collins et al. (1997) study the systematic changes in the value relevance of earnings and book value over time. They report that book value has become increasingly important in explaining market values during the 40 years covering the period from 1953 to 1993. They do not agree with the claim that the conventional historical cost accounting model has lost its value-relevance. They conclude that while the incremental value-relevance of 'bottom line' earnings has declined, it has been replaced by increasing value-relevance of book values.

Burgstahler and Dichev (1997) develop and test an option style valuation model over a sample of all COMPUSTAT firms available in the years 1976-1994 and report that the value of equity is a convex function of both expected earnings and book value. These studies suggest that there is an important role of book value in the firm's valuation process.

It has been pleaded that dividends have 'information content' in the sense that they supply information about the firms' permanent earnings and dividend announcements are considered to convey new information to investors. Many

empirical studies have established that there exists a significant positive relationship between dividend changes and common stock returns and/or price changes. Livnat and Zarowin (1990) also report a positive association of dividends with stock returns.

Watts (1973) using annual data empirically tests the hypothesis that dividends hold information about the future earnings of the firm and finds results consistent with the information hypothesis suggesting a positive dividend announcement effect (a positive relationship between current dividends and future earnings).

Woolridge (1983) also finds his results consistent with a signalling hypothesis. The results of this study show an association between announcement date abnormal positive (negative) returns and unexpected dividends increase (decrease). Kwan (1981) observes a statistically significant positive association between unexpectedly large dividend changes and announcement day stock returns, using dividend announcements made in isolation of other firm news reports.

Aharony and Swary (1980) examine whether quarterly dividend changes hold information beyond that already provided by quarterly earnings, by separating the information content of earnings from that of unexpected quarterly dividend changes. For separation purpose Aharony and Swary use only those quarterly earnings and dividend announcements made public within any given quarter on different dates. They report that changes in quarterly cash dividends convey useful information separate from the information provided by corresponding quarterly earnings numbers.

Rees (1997) and Akbar and Stark (2003a) by using UK data document positive relationships between dividends and market value. Rees (1997,p.1136) concludes that '*...earnings distributed as dividends have bigger impact on value than does*

earnings retained with in the firms...the inclusion of the dividends in the valuation model improves the explanatory power of the model from 54% to 60%.'

Asquith and Mullins (1983) report that dividends convey exclusive and valuable information to investors. Pettit (1972) while examining whether changes in dividend levels convey important information to market participants, finds obvious support for the proposition that the market in assessing security values makes considerable use of the information implicit in the dividend payment change announcements. He also observes that the market's favourable reaction to dividend increases ranges between 10 to 25 percent and the market reacts unfavourably to all dividend decreases. He also finds support for the proposition that the market is reasonably efficient on both a monthly and daily basis.

A number of studies also examine the incremental information content of cash flows and report mixed results. Ali (1994) examines the incremental information content of earnings, working capital from operations (WCFO) and cash flows and reports inconclusive evidence of cash flows having incremental information relative to two other performance variables i.e. earnings and working capital from operations.

Livnat and Zarowin (1990) examine the information content of components of cash flows and conclude that disaggregating cash flows into different components improves its association with stock returns. Their study also implies that there is more information in financial statements than just the bottom line earnings figures. Dechow (1994) notes that earnings are more strongly related with stock returns than cash flows and observe an important role for accruals in improving the ability of earnings to reflect firm performance.

Ali and Pope (1995) study the incremental information content of cash flow, earnings and funds flow for UK firms. They find higher information content for earnings than cash flow and funds flow and that funds flow have higher relative information content than cash flow. Overall their results show that all three accounting performance measures i.e. earnings, fund flow, and cash flow have incremental information content. Board and Day (1989) investigate the incremental information content for cash flow for a sample of UK firms for the period of 1961 to 1977, and report no evidence of a significant relationship between stock returns and cash flows.

The literature reviewed above suggests that different accounting variables behave differently in empirical research and differ in their value relevance. Generally, results show that all investigated variables correlate to some extent with market values. So the choice of these variables for a research plan or methodology does matter, as models are sensitive to the way they are specified.

3.4.1 Goodwill, Advertising and R&D

Goodwill, advertising and R&D are our main variables of interest in this research. It's worthwhile to briefly discuss these variables before model development.

Intangible assets are often acknowledged (with goodwill) as the excess of the cost of an acquired company over the value of its tangible net assets. Intangible assets are those assets that lack a physical substance and are likely to produce future benefits. They are generally divided into two main categories: goodwill and other identifiable intangibles such as patents, trademarks etc (Canibano, Garcia-Ayuso and Sanchez, 2000).

The goodwill is recorded as residual between the total price paid for the target company and the fair market value of its net tangible assets and identifiable

intangible assets. It is also defined as 'superior earning power'. It is often attributed to numerous factors such as location, management quality, and proprietary knowledge (Frances and Betty, 1996).

Ma and Hopkins (1988) argue that the price paid for a firm over and above the fair value of its net assets is the purchaser's expectation of 'superior earnings'. Goodwill depreciates overtime and can be replenished by advertising and R&D.

Internally generated intangible assets generally are ignored during development because the conservatism bias reflected in financial reporting; and in practice intangibles are measured only at the time one firm seeks to acquire another. Studies such as Grabowski and Mueller (1978), Hall (1993 a), Austin (1993), Chauvin and Hirschey (1994), and Mueler and Supina (2002), among others, attempt to empirically determine what factors create goodwill.

Mueler and Supina (2002) study the causes and characteristics of goodwill capital and define goodwill capital, like the capital arising from R&D and advertising, as a form of intangible asset. To estimate a firm's goodwill capital, Mueler and Supina deduct firm's physical capital stock, its stock of intangible R&D capital and its stock of intangible advertising capital from its market value. They argue that (p.241), '*...changes in goodwill capital are driven by changes in a firm's market value, which in turn will largely reflect changes in its share price. Changes in share price are caused by information about the company, like current profits, revenue growth, its level of investment in capital equipment, R&D and advertising, common factors affecting the stock market and random disturbances...*'.

Mueler and Supina further argue that intangible capital produced by investments in R&D consists of the knowledge that a firm acquirers through R&D about product

improvements or cost reductions; whereas advertising shifts the firm's demand schedule outward by disseminating information acquired through R&D. Comanor and Wilson (1979) suggest that advertising expenditures are designed to influence consumer demand for the firm's products. They deem that advertising differentiates products and thus reduces cross-elasticities of demand, sustaining high profit and market shares.

Advertising is intended to strengthen a firm's intangible capital, such as brand equity or customer loyalty. The effect of advertising depends on the type of information provided, and especially on its influence on customers' knowledge of relative product quality. The cost of R&D and advertising is likely to be related with future stock performance if it is effective and has long-lived effects. Hirschey and Richardson (2002,p.187) argue, '*...it is now well-known that both advertising and R&D give rise to 'intangible assets' with favourable effects on long-term profitability and the market value of the firm*'.

3.5 Model Development

The general form of the model that defines the relation between market values and accounting numbers can be portrayed as follow:

$M = f(A, X)$

Where

M= a variable representing some market measure of value

A= any vector of accounting variables

X= any vector of information other than information in accounting numbers

Mainstream accounting research uses various specifications of this model and these specifications are denoted as valuation models.

The economics, accounting and finance literature such as Thomadakis (1977), Lindenberg and Ross (1981), Kane and Unal (1990), and Barth et al. (1998), among others, suggests that the market value of the firm will reflect both tangible and intangible factors which have systematic influences on firm's future profitability.

For example Thomadakis (1977) posits that in a capital market that evaluates all available information about the future profitability of the firm, the market value of such firm will exceed the cost of its investment to the extent that ex ante rates of return on investment exceed the competitive rate i.e. the cost of capital. Thomadakis (1977) further explains that the set of 'options' that a firm holds for future investment is another source of market value in addition to the assets already held by the firm.

To capture the hidden reserves in US banking firms, Kane and Unal (1990) develop a model where they express the market value (MV) of the firm as the market value of bookable and unbookable assets minus the market value of bookable and unbookable liabilities. They partition the market value of a firm into two components i.e. recorded capital reserves and unrecorded (or hidden) net worth. They argue that hidden capital exists whenever the accounting measure of a firm's net worth diverges from its economic value. They further point out two sources of hidden capital which exists and are accountants' misevaluations of portfolio positions that accounting principles designate as on-balance-sheet items and the off-balance sheet sources of value that accounting principles do not permit to be formally booked.

In their study Barth et al. (1998) express the market value of equity (MVE) as a linear function of recognised net assets (book value of equity, BVE) and unrecognised net assets (UNA) such as research and development expenditures, advertising expenditures, technological core competencies, customer loyalty and growth options.

On a theoretical basis, the market value of a firm is a function of a future profit stream discounted to the present at the risk-adjusted discount rate. But practically this depends on various indications of future profitability. Hirschey (1982) argues that (p.379) '*...the market value of the firm is dependent upon various 'indicators' of firm's future profit potential. One such indicator is the level of firm investment in tangible capital...adverting and R&D expenditures will also constitute important determinants of firm market value to the extent that such expenditure result in the creation of an economically relevant amount of intangible capital....*'

Hirschey (1982) hypothesizes that current advertising and R&D expenditures are indicators of future profitability and hence are important determinants of firm market value along with current profits and level of firm investment in tangible assets. Based on the above considerations Hirschey (1982) suggests the following basic model of market value:

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 \pi + \alpha_3 R\&D + \sum_{i=1}^{n} \alpha_I AD_i + u$$

and $\sum_{i=1}^{n} AD_i = AD$

Where BV is the accounting book value of the firm's capital investment, π is current profit, R&D current research and development expenditures and AD total current advertising expenditures.

Hirschey (1985), Hirschey and Weygandt (1985), and Connolly and Hirschey (1984) also view market value of a firm as the risk adjusted present value of all future profits and identify its following two major components as follows:

$$MV(F) = MV(T) + MV(I) \qquad (1)$$

Where MV (T) and MV (I) are the capitalized values of profits attributable to tangible and intangible assets respectively.

The basic approach employed in these studies relates market value of the company to the value of its tangible assets and various measures of its intangible assets. In equation (1) MV (F) is observable but MV (T) and MV (I) are not. Recent research (e.g. Hirschey, 1982 and 1985; Connolly and Hirschey, 1984 and1990; Hirschey and Weygandt, 1985; Chauvin and Hirschey, 1993 and 1994) has extensively used various measures of intangibles such as R&D and advertising expenditures as proxies to account for unrecognised intangible capital.

As market value of tangible assets MV (T) is also not observable, book value of tangible assets (an imperfect but useful measure of the market value of the tangible assets)[51] is used as proxy for their market value. Hirschey and Weygandt (1985, pp. 328) argue that '... *accounting book values and replacement cost values can be viewed as useful, though imperfect, measure of the market value of tangible assets. Using these accounting data, one can in principle isolate the market value effects of tangible assets from any additional influences of intangible assets such as goodwill, market power, brand loyalty, patents, etc.*'

Previous research such as Hirschey (1982 and 1985), Connolly and Hirschey (1984 and 1990), Hirschey and Weygandt (1985), Chauvin and Hirschey (1993 and 1994),

[51] See Hirschey (1985) and Kane and Unal (1990).

Lev and Sougiannis (1999) , Ma and Hopkins (1988) , McCarthy and Schneider (1995) Jennings et al. (1996), and Green et al. (1996) , provide consistent evidence on the value relevance of intangibles such as goodwill, R&D and advertising expenditures. Based on this evidence and above considerations we identify three types of intangible assets, as goodwill (GW), advertising (AD) and research and development (R&D) in equation (1). We can thus rewrite equation (1) as follows:

$$\mathbf{MV\ (F) = MV\ (T) + MV\ (GW + AD + RD)} \qquad \mathbf{(2)}$$

Recent research such as Collins and Kothari (1989), Landsman (1986), Barth (1991), and Barth et al. (1992), Easton and Harris (1991), Kothari and Zimmerman (1995), Ohlson (1995), and Barth et al. (1998) among others, provide evidence of valuation relevance of both equity book value and earnings and thus omitting one or the other from the model potentially leads to model misspecification.

Rees (1997) casts doubt on the findings of valuation relevance studies such as Chauvin and Hirschey (1993 and 1994), Hirschey and Weygandt (1985), and Jennings et al. (1996), where models fail to include both an earnings and book value explanatory variable. In their recent study Akbar and Stark (2003) name the model which fails to include valuation relevant variables such as R&D, advertising expenditures, dividends, and capital contributions the 'stripped down model'.

In Ohlson's valuation framework, market value can be expressed as a linear function of three separate information variables i.e. current earnings, book value and dividends. Ohlson (1989) models a link between firm value and accounting information where current earnings, book value and dividends are three separate information variables affecting firm value. He states (p.169) '*...the present value of future expected dividends determines the financial market equilibrium value of the*

firm. The information used in the prediction of future expected dividends are current earnings, book value, and dividends, so that the market value depends on these three information variables.' In Ohlson's model market value is a linear function of book value, earnings, and net dividends (net shareholder cash flows)[52]. He employs a clean surplus relation along with linear information dynamics to model this link.

Ohlson does not restrict his valuation framework to three accounting variables but allows for information other than earnings, dividend and book value but restricts the stochastic relation between other information and the basic accounting variables. Ohlson (1989) explains this as follows (p.172) '*...the analysis extends to allow for information other than earnings, book value, and dividends. The model restricts the stochastic relation between such "other information" and the basic accounting variables. This feature of the model attempts to capture an important "real world" attribute of financial reporting: earnings and book value must (at least partially) anticipate future valuation relevant events. However, such other information may be useful in predicting future earnings and book values, and to the extent it does, the information becomes relevant in the valuation of the firm...*'.

Given Ohlson's (1989) theory and making some simplifications, equation (2) results in a model that can be estimated as follow:

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi \qquad (3)$$

Where the subscript 'it' denotes firm i at time period t, MV is market value, BV is book value, E is earnings, GW is goodwill, RD is research and development expenditures, AD advertising expenditures, D is dividend, CC is capital contributions

[52] Akbar and Stark (2003a) partition net shareholder cash flow into dividends and capital contributions and argue that (p.1230)'...it is inappropriate to amalgamate dividends with capital contributions in to net shareholder cash flows...'

and ξ is an error term. Constant and error term capture the effects of variables omitted from the model.

3.5.1 Goodwill Amortisation

Previous research such as Jennings et al. (1996), Norris and Ayers (2000), and Jennings et al. (2001) that examines the information value of goodwill amortisation provides less consistent results. For example while some studies find strong evidence of a negative reaction by the market to the amortisation of goodwill e.g. Norris and Ayers (2000) other reports weaker negative reactions e.g. Jennings et al., (1996), and/or no value relevance of goodwill amortisation e.g. Jennings et al. (2001). To investigate value relevance of goodwill amortisation for UK companies, we following Jennings et al. (2001) and Moehrle et al. (2001) and disaggregate earnings (E) into earnings before goodwill amortisation and amortisation of goodwill and estimate the following equation:

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 EBA_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \alpha_8 GWA_{it} + \xi \quad (4)$$

Where EBA is earnings excluding goodwill amortisation and GWA is goodwill amortisation.

3.5.2 Differential Media Impacts

Hirschey (1982) posits that previous research concentrates only on aggregate advertising expenditures ignoring possible differential media influences. Muller and Rogers (1980), argue that firms link the media selection decision with its effectiveness to achieve particular objectives and suggest television as a more effective medium for the creation of product differentiation in consumer goods

industries than other types of media. Porter (1976) provides evidence that different advertising media have different implications for market performance.

To investigate possible differential media impacts on the market value of the firm we segregate total advertising expenditures (AD) in to print media advertising expenditures (ADPRNT) and electronic media advertising expenditures (ADELC) variables. We estimate the following model:

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{51} ADPRNT_{it} + \alpha_{61} ADELC_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi \quad (5)$$

Where the 'ADPRNT' variable comprises newspapers, magazines and outdoor advertising and the 'ADELC' variable comprises television, radio and cinema advertising expenditures. All other variables are as previously prescribed.

To test the differential impacts of press advertising and television advertising we also estimate the following equation:

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{52} ADPRES_{it} + \alpha_{62} ADTV_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi \quad (6)$$

Where 'ADPRES' represents press advertising expenditures and 'ADTV' television advertising expenditures.

To track down the effectiveness of television advertising in relation to other media (newspapers, radio, cinema, outdoor), we disaggregate total advertising expenditures (AD) into television advertising (ADTV) and non-television advertising (ADNTV) and estimate the following model:

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{53} ADTV_{it} + \alpha_{63} ADNTV_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi \quad (7)$$

Where 'ADTV' represents television advertising expenditures and 'ADNTV'

consists of press, radio, cinema, and outdoor advertising expenditures. All other variables are as previously prescribed.

Many potential econometric problems associated with the estimation of valuation models have been mentioned in previous research e.g. Hirschey (1982), Jennings et al (1996), McCarthy and Schneider (1995), Landsman (1986), and Christie (1987) among others. We discuss these problems along with their possible remedies in the following sections.

3.5.3 The Models, Expected Coefficient Values and Hypotheses

To address our first research question on whether the market view purchased goodwill and investments in R&D and advertising as an important variable in firm's value determination, we estimate the following valuation model:

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi \qquad (3)$$

To investigate this question, α_3, α_4, α_5, are the coefficients of main interest. If the market places value on goodwill, R&D and advertising, α_3, α_4, α_5, should be positive and statistically significant. This provides evidence of the valuation relevance of these variables. To examine the relationship between goodwill, R&D, advertising and market value of the firm, we test the following null hypotheses:

H_{01} $\quad \alpha_3 = 0$

H_{02} $\quad \alpha_4 = 0$

H_{03} $\quad \alpha_5 = 0$

To examine the information value of goodwill amortisation we estimate the following model:

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 EBA_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \alpha_8 GWA_{it} + \xi \quad (4)$$

Here our focus is on α_8 the slope coefficient of goodwill amortisation (GWA). Previous research is inconclusive regarding an association between equity value and goodwill amortisation. To test the relation between market value and goodwill amortisation we test the following null hypothesis:

H_{04} $\quad \alpha_8 = 0$

Testing this hypothesis provides an answer to the question on whether investors take into account GWA when valuing firms. In this case a non-zero coefficient of GWA will be interpreted as its valuation relevance. A negative/positive coefficient on GWA will indicate negative/positive information effects of goodwill amortisation.

To test possible media differences in valuation effects (our second main research question) we segregate advertising expenditures into print media advertising expenditures and electronic media expenditures and estimate the following model:

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{51} ADPRNT_{it} + \alpha_{61} ADELC_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi \quad (5)$$

In this case the coefficients α_{51}, α_{62}, are of main interest. To investigate the relative importance of different media in firm valuation we test the following null hypotheses:

H_{05} $\quad \alpha_{51} = 0$

H_{06} $\quad \alpha_{61} = 0$

H_{07} $\quad \alpha_{51} = \alpha_{61}$

We also use press advertising expenditures and television advertising expenditures as two separate measures of advertising expenditures and estimate the following model:

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{52} ADPRES_{it} + \alpha_{62} ADTV_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi \quad (6)$$

Coefficients α_{52} and α_{62} are our main focus in order to examine the differential impacts of press advertising and television advertising on the value of the firm. If both press and television advertising create value for the firm, these coefficients should be positive and significant. We test the following null hypothesis:

H_{08} $\quad \alpha_{52} = 0$

H_{09} $\quad \alpha_{62} = 0$

H_{10} $\quad \alpha_{52} = \alpha_{62}$

To further evaluate intermedia influences and following Hirschey (1982) we use two different levels of aggregation for advertising expenditures i.e. into TV advertising expenditures and non-TV advertising expenditures and estimate the following model:

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{53} ADTV_{it} + \alpha_{63} ADNTV_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi \quad (7)$$

Here α_{52}, α_{62}, are our coefficient of main interest. To find the relation between these two types of media advertising and market value and the magnitude of the market perception of TV advertising in relation to non-TV advertising we test the following null hypotheses:

H_{011} $\quad \alpha_{53} = 0$

H_{012} $\quad \alpha_{63} = 0$

H_{013} $\quad \alpha_{53} = \alpha_{62}$

We apply Wald statistics to test our H_{07}, H_{010} and H_{013} null hypotheses. These hypotheses (H_{07}, H_{010}, H_{013}) examine the magnitude of the market perception i.e. how these two different advertising expenditures are perceived in relation to each other. If the coefficients are statistically different then the market places a different value on these two types of media advertising expenditures. Alternatively if these two

coefficients are not statistically different then this would suggest that the market treats the both advertising media the same.

3.6 Statistical Methodology

The first main objective of this study is to examine whether the market views purchased goodwill and investments in R&D and advertising as important variables in firm value determination. In other words the main purpose is to provide evidence on the valuation relevance of goodwill, R&D and advertising expenditures. The second main objective is to test possible media differences in valuation effects (whether advertising effectiveness varies with use of different media) by segregating total advertising expenditures into press media advertising expenditures and electronic advertising media expenditures. To achieve these objectives we employ a valuation model where market value is explained as a linear function of various independent variables such as book value of equity, earnings, net shareholder cash flow, R&D, and advertising.

The Ordinary Least Square (OLS) method is an appropriate technique to explain the relation between the dependent variable and various explanatory variables (Gujarati, 1995; and Hair et al., 1998). Following Hirschey (1982), Connolly and Hirschey (1984), Chauvin and Hirschey (1993), and Jennings et al. (1996), we use OLS technique and estimate the model for each annual cross section (for each of the six years for the period 1998-2003) and for the pooled sample.

But when investigating differential advertising media effects, we only estimate the model for pooled cross-sectional sample for the same period. The larger sample size with pooled data provides a better opportunity for detecting the differences between different media advertising than would have been the case if we had attempted to

detect differences using the relatively small yearly samples. Moreover large sample sizes increase statistical power and decrease random sampling error. We estimate all models in deflated form (use BV, OMV and NS as deflators) as Rees (1999, p.59) argues, *'...the deflated version is less likely to surfer from heteroscedasticity and from dependence between the error terms where the samples are pooled cross-sections and time series'.*

3.6.1 Sample Partitioning

We also divide our pooled sample and estimate model 4 for each of the following sub samples:

1. Analysis on the basis of manufacturing and non-manufacturing firms
2. Analysis on the basis of profit and loss making firms
3. Analysis on the basis of small and large firms (ranked by market value)[53]

One reason, among others, for splitting our sample on the above basis is that in this new knowledge based economy there is an increase in the number of companies that are less dependent on physical assets and more geared towards providing services. Lev (2001, p. 1 & 9) state *'A growing share of economic activity today consists of exchanges of ideas, information, expertise, and services. Corporate profitability is often driven more by organizational capabilities than by control over physical resources, and even the value of physical goods is often due to such intangibles as technical innovations embodied in products, brand appeal, creative presentation, or artistic content... in today's 'new economy' have catapulted intangibles into the role of the major value driver of business'.* In such companies it is more likely those

[53] We split data into three groups, based on market value, and ignore middle group to avoid contamination within the middle group.

intangibles such as goodwill, R&D, advertising, patents etc. are their major value drivers[54]. Consequently it is quite reasonable to study whether such investments (goodwill, R&D and advertising) for manufacturing and non-manufacturing companies[55], large and small companies, as well as for profit and loss making firms are valued differently by the market.

Connolly and Hirschey (1990) suggest that there may be firm size effects on the R&D and the market value relation. Chauvin and Hirschey (1993) expand on the study with the firm size and industry effects hypotheses[56] and their results provide some support for these hypotheses. Acs and Audretsch (1988) report higher level of innovative activity in industries that comprise large firms.

Hirschey and Spencer (1992) report R&D an important factor in the valuation of firms of all sizes but find its strength inversely related to firm size. They find a positive influence of advertising on the market value of the large firms. Jennings et al. (2001) and Hayan (1995), among others, report different coefficient measures for profit and loss firms. For example Jennings et al (2001) report much smaller coefficients for negative earnings firms than those reported for positive earnings firms. This suggests the potential for differences in the effectiveness of goodwill, R&D and advertising for manufacturing and non-manufacturing, small and large as well as profit and loss making firms.

By using dummy variables, we test for significant differences between coefficients in all of the splits (small and large firms; manufacturing and non-manufacturing firms;

[54] According to Barth and Kasznik (1999) intangible assets are of substantial economic importance for many firms.
[55] Jennings et al. (2001) argue that business service industry includes more 'New Economy' firms.
[56] The firm size hypothesis states that R&D and advertising spending are likely to be more effective for larger firms and as per industry effect hypothesis R&D may be an effective means of new product development and differentiation for manufacturing firms and advertising may be effective mean for product differentiation for both manufacturing and non manufacturing firms.

and profit and loss making firms)[57]. Dummy variables allow dividing a sample into various subgroups based on qualities or attributes. We pool the sample and run one regression for subgroups. We estimate following model:

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 GW + \alpha_4 RD + \alpha_5 AD + \alpha_6 D + \alpha_7 CC + \alpha_{13} GWDMY + \alpha_{14} RDDMY + \alpha_{15} ADDMY + \xi \qquad (8)$$

Where GWDMY is goodwill dummy variable, RDDMY is research and development dummy variable, and ADDMY is advertising dummy variable and BV, E, GW, RD, AD, D, CC and ξ as defined previously in model 4. The dummy variables in the multiplicative form allow differentiating between slope coefficients of two the groups. This type of specification in a linear regression model is useful to define subsets of observations that have different intercepts and/or slopes without the creation of separate models. The significance of differential slope coefficients (α_{13}, α_{14} and α_{15}) will indicate differences in the slope coefficients of the two different firm groups. The dummy variables take the values of either 0 or 1.

DMY = 1 if manufacturing firm

= 0 if non-manufacturing firm

DMY = 1 if large firm

= 0 if small firm

DMY = 1 if profit-making firm

= 0 if loss-making firm

We report the p values[58] (probability values) under a two-tailed t-test along with slope coefficients. It may be defined as the lowest significance level at which a null hypothesis can be rejected (Gujrati 1995). If a p value is sufficiently low we reject the null hypothesis. The p value is the exact probability of acquiring the estimated

[57] See Gujarati (1995).

[58] Also known as the observed or exact level of significance.

test statistic under the null hypothesis. In our results a non-zero coefficient on these intangibles will be interpreted as their valuation relevance. We use the statistical packages 'Eviews', and 'Stata' to carry out all these estimations and calculations.

3.6.2 Econometric Issues

Heteroscedasticity (scale and scale effects), multicollinearity, omitted or irrelevant variables in the model, and serial correlation[59] are some main econometric issues associated with this type of empirical research which the literature acknowledges (Barth et al., 2001; Strong, 1997; Barth, 2000; Landsman and Magliolo, 1988; Rees, 1997; Kothari and Zimmerman, 1995; Christie, 1987; Bernard, 1987; and Landsman, 1986, among others) and suggests methods to mitigate these problems.

Barth et al. (2001) point out the coefficient bias induced by correlated omitted variables, measurement error, and cross-sectional differences in valuation parameters, and inefficiency and potentially incorrectly calculated coefficient standard errors induced by heteroscedasticity as the econometric concerns associated with specifications based on price levels. In his study Strong (1997) notes the following econometric problems of running levels models on pooled and cross-sectional data i.e. omitted variables, scale effects, and heteroscedasticity. Barth (2000) also describes omitted variables and heteroscedasticity as econometric concerns in levels specifications.

Christie (1987), while studying the economic and econometric properties of cross-sectional analysis in market-based accounting research, highlights the important econometric concerns and states (p.232) '*...the most important econometric issues are those that generate dependencies between the error term in a regression and the*

[59] Serial correlation is normally a problem of times series studies.

included independent variables, since they lead to biased, inconsistent estimators. These specification errors include errors in variables, correlated omitted variables, variation in coefficients across observations, and simultaneous equation problems. Other difficulties such as heteroscedastic or dependent error terms are efficiency issues provided the correct standard error is used.'

Scale and scale effects are longstanding and perhaps the most debated econometric issues in value-relevance research. Failing to control for these can lead to spurious relations in valuation models. However different researchers posit scale differently in accounting research and recommend the use of different deflators for control of scale.

In their study Easton and Sommers (2000), while describing and clarifying the meaning of scale and scale effects (in price-level regressions) argue that (p.28) '*...scale is market capitalization and that the scale effect is the undue influence of large firms...this scale effect results in coefficient bias and heteroscedasticity in un-deflated price-levels regression*' and also suggest market capitalization as an appropriate deflator in price-levels regressions. They contend that, in view of the central role of market prices in market-based accounting research, it is difficult to support an argument that any variable is better measure of scale than market capitalization.

In return studies the correct deflator (to control for scale effects) is agreed to be the market value of equity at the beginning of the period according to Christie (1987). Regarding levels approaches Christie argues that (p.233) '*There is no natural deflator in levels models, but deflation by any thing other than a function of independent variables can generate specification errors.*'

In their discussion paper Akbar and Stark (2003) reject the claim of Easton and Sommers (2000) that in price-levels regressions 'market capitalization' is the superior deflator. They partially replicate Easton and Sommers (2000) on UK data and conclude that their empirical results do not support the superiority of market value as the deflator in estimating cross-sectional valuation equations on UK data but a number of different deflators appear to have relatively similar effects.

The econometric issues as pointed out above are if not properly dealt with or controlled can cause biased coefficient estimates, estimation inefficiency and biased standard error estimates. We briefly discuss below the econometric issues, which are important to this study.

3.6.2.1 Cross-sectional Scale Differences and Heteroscedasticity

Scale differences arise because of the presence of large as well as small firms in the same sample and large (small) firms will have large (small) market capitalization, large (small) book value, and large (small) earnings which potentially can cause coefficient bias and heteroscedastic error variances. In the presence of heteroscedasticity the standard errors are understated, resulting in overstated t-statistics.

Easton and Sommers (2000) argue that the scale effect may lead to spurious inferences. Brown et al. (1999) analyse the consequences of scale differences on the regression R^2 and assert that (p.85) '*...the R^2 from a scale-affected regression will, under fairly general conditions, be higher then the R^2 from the same regression without scale effects....*' They also point out other problem of R^2 comparisons between samples with different scale effects. The R^2 of the estimated model will be higher in samples in which the cross-sectional distribution of the scale factor has a

larger variance relative to its mean. Easton and Sommers suggest deflation and inclusion of a scale proxy as an explanatory variable in models as remedial measures for this problem.

The problem of heteroscedasticity (unequal variance) is likely to be more common in cross-sectional methods than in time series analysis as Gujarati (1995) contends: '*...in a cross-sectional analysis heteroscedasticity is generally expected if small-, medium- and large-size firms are sampled together*'[60]. Gujarati (1999) argues that it has implications for results and states that '*...in the presence of heteroscedasticity..., the conventionally computed standard errors and t statistics of the estimators suspect... if we continue to use the usual method... we are likely to draw misleading conclusions...this is because estimated standard errors are likely to be biased and therefore the resulting t ratios are likely to be biased, too...*'.

To avoid misleading conclusions remedial measures are required to mitigate these problems. Deflation of both dependent and explanatory variables by some measure of size (book value, sales, number of shares etc.) is a common remedial measure to mitigate heteroscedasticity and cross-sectional scale differences in market-based accounting research. However there is no consensus among researchers on the best measure of scale.

Barth and Kallapur (1996) name sales, total assets, market value of equity, book value, net income and the number of shares as proxies for unidentifiable scale. Rees (1997) seem to advocate book value as a deflator because of its relative stability and the lower frequency of negative values. While Christie (1987), Easton (1998) and Easton and Sommers (2000) contend that the best measure of scale is market value of

[60] Time series analysis is subject to autocorrelation and multicolinearity problems.

equity. Easton and Sommers (2000, p.47) argue that '*...deflation of a price-levels regression by market capitalization not only mitigates econometric problems caused by the scale effect, but the regression residuals are also more economically meaningful.*'

This study uses three deflators[61] as previously employed in cross-sectional valuation research as proxies for scale i.e. number of shares (Rees 1997), book value (Easton 1998; and Hirschey, 1982), and opening market value (Akbar and Stark 2003). These deflators are used to deflate all the models used in this research. In addition deflators also deflate the constant term. This is done in order to eliminate any size-related naturally existing correlation in the data and also to relieve the problem of size-induced heteroscedasticity in the error term.

Wallace and Silver are quoted as writing as follows (Gujarati 1995, p.383) '*Generally speaking, it is probably a good idea to use the WHITE option [available in regression programs] routinely, perhaps the output with regular OLS output as a check to see whether heteroscedasticity is a serious problem in a particular set of data.*' This study also employs White's (1980) heteroscedasticity consistent standard errors and covariance estimates procedures (which produces standard errors of estimated regression coefficients that take into account heteroscedasticity) to rule out the possibility of presence of the heteroscedasticity despite deflation. The use of deflation as well as the White's (1980) procedure increases our results' unbiased ness.

[61] We employ three deflators (BV, OMV, NS) to check the robustness of the results.

3.6.2.2 Multicollinearity

The term multicollinearity is used where the independent variables are intercorrelated perfectly or non-perceptively (Gujarati (1995)). The presence of multicollinearity can change the significance and signs of regression coefficients, resulting in imprecision of estimation. The presence of a severe multicollinearity problem could result in drawing misleading inferences.

The existence of a linear relationship among explanatory variables of a regression model causes the problem of muticollinearity. Gujarati (1995) asserts that '*...muticollinearity is a question of degree and not of kind. The meaningful distinction is not between the presence and the absence of muticollinearity, but between its various degrees...it is a feature of the sample and not of the population. Therefore, we do not 'test for muticollinearity' but can, if we wish, measure its degree in any particular sample....*'

In multiple regression, when an exact relationship exists between explanatory variables this is known as perfect muticollinearity. The nature of muticollinearity can be ranked as perfect, near or very high muticollinearity[62]. In near to very high muticollinearity cases explanatory variables are not perfectly but approximately linearly related. In the case of perfect muticollinearity, it is not possible to estimate multiple regressions as regression coefficients of variables are indeterminate and their standard errors are infinite. In the case of imperfect muticollinearity (near to or very high muticollinearity) it is possible to estimate regression coefficients but with less precision and accuracy.

[62] In practice cases of perfect muticollinearity are rare.

High pair-wise correlation among independent variables, high R^2 with few significant t ratios or high standard errors and low t-statistics with high R^2 are some of the indications of the presence of muticollinearity in estimated regression. Johnston (1984) points out that high collinearity can yield regressions with very high overall R^2, but with some (or many) individual coefficients apparently insignificant. The presence of severe muticollinearity problems could result in drawing misleading inferences from t-statistics.

Some of the remedial measures proposed to alleviate this muticollinearity problem are dropping collinear variables from the model, change of sample or acquiring additional data[63], re-examining the model (its functional forms, omission of variables etc.) and variable transformation, among others. We calculate and report correlation between variables to detect the problem of presence and severity of muticollinearity in this study. Correlation matrixes show no severe muticollinearity problem with incur sample and none of our variables are highly correlated.

3.6.2.3 Model Specification

Correct specification of the model used in the analysis, is one of the assumptions of the linear regression model. This implies that there is no specification bias or error in the model. Among the reasons of specification errors might be unavailability of appropriate data and weak underlying theory. Normally two misspecifications such as omitted and/or unnecessary or irrelevant variables in the model are identified[64]. Omission of relevant variables from the regression, correlated with the remaining variables, biases the coefficients of the retaining variables. On the other side, inclusion of irrelevant variables in the model results in loss of efficiency of the least

[63] It is a problem of particular sample, rather than the population from which sample is drawn.
[64] Other possible specification errors may also exists such as wrong functional form, errors of measurement bias.

square estimators (estimated variances of the coefficients are larger) although coefficients still remain unbiased.

3.7 Data and Sample Selection

This section describes data sources, data collection, and sample selection procedures, and defines the variables used in the analysis.

3.7.1 Data Sources

We used Datastream and Datastream Worldscope as our major data sources and extracted all relevant data for variables from these databases except for advertising. Advertising data was obtained from 'Nielsen Media Research' as the same was not available from Datastream. Advertising expenditures comprise major media expenditures i.e. newspapers, radio, cinema, TV and outdoor.

The advertising data needs to be described in details as obtained from a particular non-financial source[65]. Nielsen Media Research, as an organisation, monitors advertising activity across all major consumer media (such as TV, radio, outdoor, press, cinema, and direct mail) in the UK. If a firm has not advertised on the media they monitor, then that will not appear on their database. However, their database also covers those firms that ran advertising campaigns occasionally or in bursts, during our sample period. Nielsen Media Research provides month level data, which can be analysed against advertiser, brand, category, agency, and media.

The advertising data/reports provided by Nielsen Media Research, for the period from 1998-2003, base on their full Multimedia database, and show our sample firms ranked down the side with individual months (January to December) across the top,

[65] 'Nielsen Media Research' is a relevant and reliable source and is used by researchers, advertising agencies, and manufacturers, among others.

in Excel format. For detailed media advertising data, reports in Excel format show our sample firms and media type details (such as TV, radio, outdoor, press, cinema, and direct mail) down the side and months split out across the top.

Nielsen Media Research, in certain cases, provided firms' divisional data, which we aggregated and traced through to firms, for each month. To identify annual advertising expenditures by firms with different financial year-ends in the sample, monthly advertising data are aggregated to create an annual figure. For example, if a firm has a financial year-end in June 2003, the last six months' (from July to December) total advertising expenditures of 2002 are added to the total of first six months' (from January to June) advertising expenditures of 2003, to work out the annual advertising figure for 2003 for respective firm. The same procedure is followed for other financial year-ends. Tables 3.11, 3.12, and 3.13 provide detail of the advertising and non-advertising firms in the final sample for the period from 1998 to 2003.

3.7.2 Sample Selection

To investigate the valuation relevance of goodwill, advertising and R&D expenditures we start with an initial sample of all UK listed firms[66] for the period 1998-2003[67] (both inclusive). To avoid survivorship bias we also include dead companies in our sample for the period. A range of companies (from small to large) from a number of different industry sectors is represented in the sample[68]. We exclude financial and insurance firms from our initial sample for standard reasons.

[66] All firms listed on the London Stock Exchange.
[67] Period selection is mainly driven by the availability of data.
[68] See appendices 1,2,3 and 4.

We extracted a list of all available UK live and dead companies separately from DataStream along with other information such as DataStream company code (DSCD), industrial classification code (INDC), industrial grouping code (INDM), and latest financial year-end (LYE). We merged both live and dead companies into one list when transferred to *Microsoft Excel.* We used this list to extract data for our analysis.

The initial problem with the data was missing information such as missing values of dependent and independent variables, last financial year end (LYE) not available for certain firms, an industrial classification for some firms un-reported etc. Most of the firms with missing LYE and data were start-ups. Firms with NA (not available) values for any of the variables were deleted from the sample. We also excluded firms with suspended and unquoted equities and firms with double codes (included twice in the list) from the sample. We further cleaned our data by deleting firms with negative closing book value[69].

Firms in our sample in each annual cross section (from 1998 to 2003) must satisfy the following restrictions:

1. All the data for our variables must be available;
2. Closing book value must be positive;
3. The firm should be from the non-financial sector.
4. The firm should be listed on the LSE.

We stared up with an initial sample of 5,771 firms (both live and dead UK firms). As a first step we deleted all those firms with a latest financial year-end on or before

[69] Closing book value should be positive because it is employed as deflator.

31 December 1997[70] and firms with missing a financial year-end (3,184 firms). We also deleted those firms, from the initial sample, with a latest financial year-end not on the final day of the month (19 firms). In next step we deleted those firms with missing industrial classifications, and unquoted equities (46 firms) from our initial sample. We further cleaned our sample by deleting all financial and insurance firms from our sample resulting in a sample of 2,226 firms before deletions of outliers, negative book values, firms double codes, suspended equities, and variables for which data is not available. Table 3.1 provides summary deletion details.

In the second round of sample cleaning we began with an initial sample of 2,226 firms, and further cleaned sample by deleting firms with negative book values, firms with double codes, suspended equities, firms with missing NS and OMV information (when NS and OMV are used as deflators), and firms with missing data. We also deleted outliers from the sample (outlier deletion is explained in the next section).

3.7.3 Deletions of Outliers and High Influence Points Diagnostics

The presence of extreme values (too small or too large values of variables) in such a large sample can be significant problem. Failing to deal with this problem can lead to spurious relations in valuation models. To delete outliers from our sample we applied the traditional criterion of deletion of 0.5% of top and bottom values of each variable[71]. To mitigate scale related problems in the data we used three deflators i.e. closing book value, opening market value, and no of shares. These deflators also deflate the constant term. This will be done in order to eliminate any size-related naturally existing correlation in the data and also to relieve the problem of size-induced heteroscedasticity in the error term. Tables from 3.2 to 3.10 shows a

[70] For the reason that the study period starts from 1st of January 1998.
[71] Easton and Harris (1991), and Rees (1997), among others, also apply this criterion to clean their samples from extreme values.

summary of deletions and the final sample in each annual cross section and pooled sample for each deflator used.

While outliers are systematically removed from the data, some apparently large values still remain in the data. We formally test, by using Cook's D, and DFFITS techniques[72], whether they are influential observations. High influential observations are unusual data points in both x (regressors) space and y (response variable) space. A high influence point has an impact on the regression analysis in that it can shift the regression line in its direction.

One measure for the high influence points is Cook's D, which compares all regression coefficients simultaneously. An observation with Cook's D greater than one could be a potential high influence point.

DFITS provides another measure to determine whether an observation is unusual. The DFFITS measure the impact that the i^{th} observation has on the predicted value. DFITS represents roughly the number of estimated standard deviations that the fitted value changes when the i^{th} observation is removed from the data.

Vellmam and Welsch (1981) recommend that $|DFFITS|$ values greater than 1 to 2 warrant special attention. Some other suggestions such as comparing DFFITS values to one another, and identifying values that are extremely large relative to the others are also available in the literature.

In our sample for all three deflators, there is no observation with Cook's D greater than one. DFFITS statistics show that very few observations (2 when NS deflator, 1 when OMV deflator, and 4 when BV is deflator) in our sample slightly exceeding cut-off point[73]; however their omissions from the sample do not affect our results and

[72] See Belsley et al. (1980).
[73] Following Vellmam and Welsch (1981), we select cut off point for DFFITS statistics as 1.

important features of the analysis. Our coefficient estimates or predictions do not depend on these observations.

3.7.4 Variable Definitions and Measurement

1. **Market Value, MV,** Market value of equity is measured as the share price on a specific date multiplied by the number of ordinary shares in issue. It is measured six months after the balance sheet date. For example firms with a financial year-end on December 31, 2003 hence their market value extracted on July 1, 2004. Six months after the balance sheet date is used to ensure that the information in the financial statements for a given financial year is reflected in the market price, bearing in mind that UK listed companies have six months in which to prepare and release their annual accounts.

2. **Book Value (Opening or Closing), BV,** is measured as the sum of shareholders equity capital and reserves (Datastream item no 305).

3. **Earnings, E,** are measured as profit for the financial year as reported in the financial statements (Datastream item no 1087).

4. **Goodwill, GW,** is measured as excess cost over the fair market value of the net assets purchased (World Scope item WC 18280).

5. **Advertising Expenditures, AD,** are measured as the expenditures made on advertising in the financial year and include major media expenditures i.e. television, press, radio, cinema, outdoor (Nielsen Media Research).

6. **Research and Development Expenditures, RD,** are measured as R & D expense recognised in the income statement (Datastream item no 119).

7. **Dividend, D,** measured as net amounts paid on ordinary shares, and amounts paid on participating preference shares (Datastream item no187).

8. **Capital Contributions, CC,** measured as the negative of the sum of the equity raised for acquisitions and cash (Datastream items no. 412+414).

9. **Goodwill Amortisation, GWA,** measured as cost allocation for intangibles (Datastream item 562)[74].

10. **Earnings Excluding Goodwill Amortisation, EBA,** measured as profit for the financial year as reported in the financial statements excluding goodwill amortisation.

11. **ADPRNT** is measured as advertising expenditures on print media (press, and outdoor advertising expenditures) during the financial year.

12. **ADELC** is measured as advertising expenditures on electronic media (television, radio, and cinema advertising expenditures) during the financial year.

13. **ADPRES** is measured as advertising expenditures on press during the financial year.

14. **ADTV** is measured as advertising expenditures on television during the financial year.

15. **ADNTV** is measured as advertising expenditures other than television during the financial year and it includes expenditures of press, radio, cinema, and outdoor.

[74] We use data on intangible amortisation (which includes but is not restricted to goodwill amortisation) as a proxy for goodwill amortisation. Moehrle et al. (2001) also use the former item as a proxy for the later item to detect information content of goodwill amortisation.

16. **Number of shares, NS**, for year *t* is measured as the number of shares issued and outstanding at the end of the financial year *t*, (Datastream item NS).

17. **Opening Market Value, OMV**, opening Market value of equity is measured six months after the last year balance sheet date (share price multiply by the number of ordinary shares in issue).

3.8 Summary

The research methodology is backbone of the thesis. This chapter presents discussions on valuation and return models, value relevance research, variables definition and measurement, statistical methodology, major econometric issues relevant to this research, data sources and sample selection. In this chapter we also develop the valuation models we use in the subsequent analysis.

We have discussed the statistical methodology adopted in this research to estimate our models. We find the OLS technique suitable for this type of research. This chapter also provides discussions on research relevant econometric problems along with the techniques used to deal with these issues. Data sources, sample and data selection along with the data cleaning process (outlier deletion criterion etc) has also been presented in this chapter.

Data analysis and empirical results (based on model 3) are presented in next chapter. This will mainly provide answer to our first main question on whether the market views purchased goodwill and investments in R&D and advertising as an asset and incorporate information on them in the valuation of a firm.

Table 3.1: Sample Reorganization

Sample Reorganisation	Firms Deleted	Total Firms
Total live and dead firms (1673+4,098)		**5,771**
Firms with financial year end (FYE) on or before 31/12/1997 and firms with missing FYE. (2,533 +651)	3,184	
Firms with latest financial year-end (LYE) not on the final day of a month.	19	
Firms with missing industrial classifications and unquoted equities (19+27)	46	
All financial sector firms 210+86	296	
Deletions Total	**3,545**	**(3,545)**
Remaining Firms		**2,226**

Table 3.2: Value Relevance of GW, RD and AD- Sample Deletions (BV deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Final Sample
1998	2,226	734	43	08	11	57	1,373
1999	2,226	801	48	14	08	59	1,296
2000	2,226	812	33	17	15	58	1,291
2001	2,226	784	48	18	19	49	1,308
2002	2,226	811	81	15	16	55	1,248
2003	2,226	933	96	16	07	52	1,122
All	13,356	4,875	349	88	76	330	7638

Table 3.3: Value Relevance of GW, RD and AD- Sample Deletions (OMV deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Missing OMV	Final Sample
1998	2226	722	43	08	11	63	28	1351
1999	2226	799	48	14	08	53	18	1286
2000	2226	798	33	17	13	54	69	1242
2001	2226	784	48	18	18	61	47	1250
2002	2226	815	81	15	16	55	23	1221
2003	2226	924	96	16	07	60	12	1111
All	13356	4,842	349	88	73	346	197	7461

Table 3.4: Value Relevance of GW, RD and AD- Sample Deletions (NS deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Missing NS	Final Sample
1998	2226	711	43	08	11	52	63	1338
1999	2226	807	48	14	08	57	88	1204
2000	2226	801	33	17	15	54	69	1237
2001	2226	793	48	17	19	57	44	1248
2002	2226	825	81	14	11	53	40	1202
2003	2226	922	96	16	07	66	23	1096
All	13356	4859	349	86	71	339	327	7325

Table 3.5: Value Relevance of Goodwill Amortization – Sample Deletion (BV deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Final Sample
1998	2226	734	43	08	11	63	1367
1999	2226	801	48	14	08	61	1294
2000	2226	812	33	17	15	69	1280
2001	2226	784	48	18	19	54	1303
2002	2226	811	81	15	16	68	1235
2003	2226	933	96	16	07	57	1117
All	13356	4,875	349	88	76	372	7596

Table 3.6: Value Relevance of Goodwill Amortization – Sample Deletion (OMV deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Missing OMV	Final Sample
1998	2226	722	43	08	11	63	28	1351
1999	2226	799	48	14	08	53	18	1286
2000	2226	798	33	17	13	54	69	1242
2001	2226	784	48	18	18	64	47	1247
2002	2226	815	81	15	16	59	23	1217
2003	2226	924	96	16	07	70	12	1101
All	13356	4,842	349	88	73	363	197	7444

Table 3.7: Value Relevance of Goodwill Amortization – Sample Deletion (NS deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Missing NS	Final Sample
1998	2226	711	43	08	11	58	63	1332
1999	2226	807	48	14	08	61	88	1200
2000	2226	801	33	17	15	57	69	1234
2001	2226	793	48	17	19	62	44	1243
2002	2226	825	81	14	11	57	40	1198
2003	2226	922	96	16	07	73	23	1089
All	13356	4,859	349	86	71	368	327	7296

Table 3.8: Media Advertising Expenditures (ADPRNT and ADELC) - Sample Deletion

Panel A (BV as Deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Final Sample
Pooled	13356	4875	349	88	76	329	7639

Panel B (OMV as Deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Missing OMV	Final Sample
Pooled	13356	4842	349	88	73	371	197	7436

Panel C (NS as Deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Missing NS	Final Sample
Pooled	13356	4,859	349	86	71	288	327	7376

Table 3.9: Media Advertising Expenditures (ADPRES and ADTV) - Sample Deletion

Panel A (BV as Deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Final Sample
Pooled	13356	4875	349	88	76	339	7629

Panel B (OMV as Deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Missing OMV	Final Sample
Pooled	13356	4842	349	88	73	371	197	7436

Panel C (NS as Deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Missing NS	Final Sample
Pooled	13356	4859	349	86	71	293	327	7371

Table 3.10: Media Advertising Expenditures (ADTV and ADNTV) - Sample Deletion

Panel A (BV as Deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Final Sample
Pooled	13356	4875	349	88	76	324	7644

Panel B (OMV as Deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Missing OMV	Final Sample
Pooled	13356	4842	349	88	73	368	197	7439

Panel C (NS as Deflator)

Year	Total Observations	Data n. a.	Neg. BV	Double Code	Suspended Equity	Outliers 0.5%	Missing NS	Final Sample
Pooled	13356	4859	349	86	71	297	327	7367

Table 3.11: Nielsen Media Research Advertising Expenditures – Sample Distribution for 1998-2003

(BV Deflator)

Year	Non-Zero Advertising Firms	Zero Advertising Firms	Total
1998	479	894	1373
1999	511	785	1296
2000	553	738	1291
2001	532	776	1308
2002	475	773	1248
2003	405	717	1122
Pooled Sample 1998-2003	2955	4683	7638

Table 3.12:Nielsen Media Research Advertising Expenditures – Sample Distribution for 1998-2003

(OMV Deflator)

Year	Non-Zero Advertising Firms	Zero Advertising Firms	Total
1998	486	865	1351
1999	509	777	1286
2000	535	707	1242
2001	516	734	1250
2002	470	751	1221
2003	405	706	1111
Pooled Sample 1998-2003	2921	4540	7461

Table 3.13:Nielsen Media Research Advertising Expenditures – Sample Distribution for 1998-2003

(NS Deflator)

Year	Non-Zero Advertising Firms	Zero Advertising Firms	Total
1998	464	874	1338
1999	465	739	1204
2000	527	710	1237
2001	500	748	1248
2002	443	759	1202
2003	390	706	1096
Pooled Sample 1998-2003	2789	4536	7325

Chapter 4

Value Relevance of GW, RD and AD – Empirical Analysis

4.1 Introduction

Relevant past research was reviewed in chapter 2. We discussed research design and overview of data in the previous chapter. This chapter reports the empirical results of the study and discuss the findings using valuation models defined and discussed in chapter 3.

The rest of the chapter is organised as follows: section 4.2 presents the research approach employed, section 4.3 tests the null hypothesis and provides answers to the research questions, discussions of regression results are given in section 4.4, and finally section 4.5 concludes.

4.2 Research Approach

In this section we briefly summarise the research approach. The research is concerned with the valuation relevance of intangible assets. These include goodwill, advertising, research and development expenditures and goodwill amortisation. To detect the value relevance of intangible assets we employ following valuation models where market value is explained as linear function of various independent variables such as book value of equity, earnings, dividend, capital contributions, goodwill, R&D, and advertising.

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi \quad (3)$$

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 EBA_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \alpha_8 GWA_{it} + \xi \quad (4)$$

Where MV is market value, BV is book value, E is earnings, GW is goodwill, RD is research and development expenditures, AD advertising expenditures, D is dividends, CC is capital contributions, GWA is goodwill amortisation, EBA is earnings excluding goodwill amortisation and ξ is an error term. We test the following null hypotheses:

H_{01} $\alpha_3 = 0$

H_{02} $\alpha_4 = 0$

H_{03} $\alpha_5 = 0$

H_{04} $\alpha_8 = 0$

We use OLS techniques and estimate the models for a series of annual cross sections of data (i.e. for each year for the period 1998-2003) and for pooled sample. To mitigate heteroscedasticity problems we estimate models in deflated form[75]. We report results for each of the six years separately as well as for the pooled sample but our discussions are mainly based on the pooled sample findings. In our results a non-zero coefficient on the intangibles variables is interpreted as indications of their valuation relevance. The regression coefficients reported for Models 3, and 4 are estimated by using OLS regressions based on White (1980) heteroscedasticity consistent standard errors and covariance estimates. Their associated probability values under a two-tailed t-test are reported with them.

To check that our regression estimates are not affected by one or more observations in the sample, we apply DFFITS and Cook's D detective techniques[76]. DFFITS statistics show that very few observations (2 observation when NS is deflator, 1 observation when OMV is deflator and 4 observations when BV is deflator) in our

[75] We use three deflators i.e. closing book value, opening market value and number of shares.
[76] We do not report DFFITS and Cook's D statistics for brevity reasons.

sample slightly exceeding cut-off points; however they are not influential observations, as their deletions from the sample do not affect our results[77]. While, Cook's D statistics show that no observation exceeds 1 for our sample for all three deflators used. Our coefficient estimates do not depend on these observations but on majority of the data.

4.3 Descriptive statistics and Correlation Matrices

Tables 4.1 and 4.2 provide descriptive statistics and correlation matrices of pooled annual cross sections. The descriptive statistics reveal some degree of skew-ness in most of our variables[78]. The maximum and minimum values, the median and mean values of each variable are presented in Table 4.1 and this suggests that the overall sample appears to be heavily concentrated at the lower end of the distribution for most of the variables. In a non-skewed distribution the mean, median and mode are equal but differences exist in these measures in our data. Table 4.2 presents the matrix for the correlations between all the variables used in the analysis. The correlation statistics for all of our variables are quite moderate and suggests that our sample does not suffer with a significant multicollinearity problem. Table 4.11 identifies the expected signs for each coefficient.

4.4 Empirical Findings

4.4.1 Value Relevance of Goodwill, R&D and Advertising

We mainly focus on the slope coefficients of goodwill (α_3), R&D (α_4) and advertising (α_5). If goodwill, R&D and advertising are valuation relevant, then these

[77] We delete observations, exceeding cut-off points, form the sample and run regressions, but we do not report results for brevity reasons.
[78] As per Rees (1997) skewness is a normal feature of cross-sectional data.

coefficients should be significant and positively correlated with the firm's market value.

Ordinary least squares results for equation (3) using closing book value (BV), opening market value (OMV) and number of shares (NS) as deflators are given in tables 4.3, 4.4, and 4.5 respectively. The estimates presented in tables 4.3, 4.4, and 4.5 from Model 3 are based on White's (1980) heteroscedasticity consistent standard errors. There are a number of clear general findings linked with these results, which can be summarised along the following lines. All the variables have the expected coefficients of correct sign with respect to their theoretical values. Coefficients on GW, RD, and AD, are positive and statistically significant (pooled sample) for all three deflators. BV, E, D, and CC, have consistent significant influence on market value.

Estimation results using the three deflators are presented in tables 4.3, 4.4, and 4.5 and indicate significant explanatory power for GW, RD and AD and hence we reject all our first three null hypotheses at the 1% level of significance (for the pooled sample). The pooled sample GW coefficient is positive and statistically significant at the 1% level of significance for all three deflators BV, OMV and NS. As the coefficient of GW is significantly non-zero, we reject the null hypothesis ($\alpha_3 = 0$) at the 1% level of significance. In all of the six annual cross sections the GW coefficient is positive and statistically significant in four out of six cases where BV is the deflator. Similarly the coefficient of GW is positive and statistically significant at the 1% level of significance when OMV and NS are the deflators. In all six of the six annual cross sections, the coefficient of GW is positive and statistically non-zero

for OMV and NS deflators. The significance of GW improves with the use of OMV and NS deflators.

The pooled coefficient values of goodwill are 0.39, 0.39, and 0.57 respectively for BV, OMV and NS deflators. In the year-by-year analysis, the coefficient values on goodwill ranges from 0.10 to 5.42 when BV is the deflator, 0.19 to 2.03 when OMV is the deflator and 0.53 to 1.46 when NS is the deflator. These coefficient values are consistent with similar previous research. For example Chauvin and Hirschey (1994) report a coefficient value of 0.76, and Jennings et al. (1996) a coefficient value of 0.68 for their pooled (fixed effects) regression analysis. Coefficient values of goodwill reported by McCarthy and Schneider (1995), range from 1.64 to 2.64. Shah and Stark (2004) find and report coefficient value of goodwill, for UK sample, of 0.39. Overall we find a positive and statistically significant valuation impact of goodwill. These findings suggest that the market considers goodwill as an important variable when valuing a firm.

The pooled coefficient of RD for each of the three deflators is positive and statistically significant at the 1% level of significance. As the pooled coefficient of RD is significantly non-zero, we reject the null hypothesis ($\alpha_4 = 0$) at the 1% level of significance. Regarding annual cross sections, in all six of the six cross sections, the coefficient of RD is significant for all deflators at the 1% significance level. Our coefficient values for RD are 8.43 (when BV is the deflator), 4.19 (when OMV is the deflator) and 7.98 (when NS is the deflator) and this is also consistent with previous similar studies. Thus Chauvin and Hirschey (1994) report a coefficient value of 7.34, Hirschey (1985) reports coefficients of 6.81 and 7.07 for two different model specifications, Green et al. (1996) report a coefficient value of 4.84, and Hirschey

(1982) reports a value of 3.15. Shah and Stark (2004) report a coefficient value of 9.51, for their UK firms' pooled sample. In another study, Shah and Stark (2005) find and report higher coefficient value of 11.01 for R&D. Overall the results of this study suggest a positive and statistically significant association between market value and RD.

AD is another variable of main interest in the analysis. The estimation results presented in tables 4.3, 4.4, and 4.5 reveal that the pooled coefficient of AD is positive and statistically non-zero. Thus we can reject our third null hypothesis ($\alpha_5 = 0$) at the 1% level of significance[79]. Regarding the year-by-year analysis, the coefficient of AD is positive for all the years (for all deflators) and is statistically significant in five of the six years when BV is the deflator, and in six of the six years when OMV and NS are the deflators. The estimated pooled coefficient on AD is 12.38 when BV is the deflator, 5.15 when OMV is the deflator, and 15.5 when NS is the deflator. Hirschey (1985) reports AD coefficient of 5.55 and 7.55 for two different model specifications, Chauvin and Hirschey (1994) finds and reports an AD coefficient of 6.20. In the UK, Shah and Stark (2004) and Shah and Stark (2005) report AD coefficients of 7.33 and 8.98 respectively. These findings overall suggest a positive and statistically significant effect of AD on market value.

The results of equation (3) show that other variables (i.e. BV, E, D, and CC) in the regression have significant and consistent effects on market value. The coefficient of BV is positive and statistically significant at the 1% significance level for all three deflators for the pooled as well as each of the six annual cross sections. We also find significant effects for E on market value. The pooled coefficient of E is positive and significant at the 1% level. For the year-by–year analysis we find the coefficient of

[79] Level significance varies from 1% to 10% in the year-by-year analysis.

E to be positive and significant for four years and negative but insignificant for two years when BV is the deflator. When OMV is the deflator, the coefficient of E is positive and significant for five years of six and negative but insignificant for one year. However all E coefficients for all six years are positive and significant when NS is the deflator.

The results also show a positive and significant association between market value and dividends (D). The pooled coefficient of D is positive and significant at the 1% level of significance for all three deflators. Also we find its coefficients significant at the 1% level for all the six years for all deflators. The pooled coefficient of CC is negative and significant at 1% level for all three deflators. For the annual six cross sections we find it significant for all years for the OMV and NS deflators. In five of the six years, CC is significant (when BV is the deflator). Overall these results suggest that BV, E, D, and CC have consistent significant influence on market value.

The success of the model in predicting the values of the dependent variable is captured R^2 statistics (also known as the 'goodness of fit' statistic). R^2 measures the proportion of the variation in the dependent variable explained by the independent variables. A model's value relevance is judged by its explanatory power regarding stock prices and/or stock returns as specified. Ashbaugh and Olsson (2002) explain that '*The regression model's R^2 measures the strength of the association between the accounting variable(s) and price...*' and Brown et al. (1999) confirm that '*...R^2 is a measure of the explanatory power of the independent variables in a linear regression...*'. The empirical results of the present research report an R^2 of 0.21 when BV is the deflator, -0.34 when OMV is the deflator and 0.41 when NS is the deflator. It indicates that the regressions explain a good portion of the variance in

market value. In comparable studies broadly similar levels of explanatory power are reported. Thus Hirschey (1982) reports an R^2 of 0.50, Hirschey (1985) R^2's between 0.30 and 0.32 for different specifications of models used, Chauvin and Hirschey (1994) report an R^2 of 0.59, and Hirschey, Weygandt (1985) a statistic of 0.31 and Green et al. (1996) 0.30. In the UK, Shah and Stark (2004, and 2005) report R^2 of 0.28 and 0.51 respectively.

4.4.2 Value Relevance of Goodwill Amortisation

Sample means, median, standard deviations and minimum and maximum values of variables included in the relevant model 4 are shown in table 4.6. Study of maximum and minimum values, the median and mean values of each variable shows that our sample is skewed. Table 4.7 reports correlation coefficients between the variables used in the model 4. The low correlations indicate that multicollinearity is not a problem in our study.

Tables 4.8, 4.9, and 4.10 report the estimation results for regression 4, estimated for each of the six annual cross sections as well as for the pooled data. We employ three deflators i.e. closing book value (BV), opening market value (OMV) and number of shares (NS) and report results separately for each deflator. The results include the coefficient estimates for each cross section and pooled sample, p values and R^2 s based on White's (1980) consistent covariance estimator. The results in table 4.8 (for the BV deflator) indicate that the coefficient on amortisation expense is not significantly related to the market value of the firm. In the pooled annual cross sections the coefficient estimate on GWA is negative but insignificant. In the yearly analysis the coefficient estimates on GWA are positive for four out of six years (but significant only for one year) when BV is used as the deflator. However the

coefficient estimates are positive for all years but significant in five of the six years when OMV is the deflator. When NS is the deflator the coefficients are positive for all six years but significant for three out of six years. For the pooled data the regression coefficients on GWA, are positive and highly significant for both OMV and NS deflators. Thus we can reject our null hypothesis at the 1% level.

The findings also show that there is strong association between market value of equity and the intangible investments (goodwill, R&D and advertising expenditures) of the firm. The coefficients on the control variables i.e. BV, EBA, D, and CC are all statistically different from zero. BV, EBA, and D are significantly positively related to firm market value and CC is significantly negatively related to the market value of equity. The pooled regression R^2s' are 0.22, -0.34, and 0.42, respectively when BV, OMV and NS are the deflators.

4.5 Discussions of Regression Results

The above results for the effects of goodwill, R&D and advertising on market value are quite robust both in coefficient significance and overall explanatory power.

The first hypothesis focuses on the relation between the capitalised amount of goodwill and the market value of the firm. The results show that the market places a significant value on the goodwill amount reported by the firm. These findings suggest that reported goodwill is viewed as an economic resource by investors. Jennings et al. (1996) argue that (p.515), ' *at the time of acquisition, the amount recorded as purchased goodwill represents the present value of expected cash flows...if the book value of purchased goodwill continues to reflect these expected cash flows, there should be positive association between equity values and recorded amounts for purchased goodwill...and if the correspondence between the book value*

of purchased goodwill and its economic value diminishes rapidly following the acquisition...would expect to observe no association between recorded goodwill and equity values'.

The positive and highly significant regression coefficients on GW offer support for the argument that goodwill numbers are of value-relevance to the market. The results of our study are consistent with those of previous studies. Thus Jennings et al. (1996), Chauvin and Hirschey (1994), and McCarthy and Schneider (1995) find that investors include goodwill when valuing a firm. One main difference between the present study and the above studies is that this study uses both earnings and book value variables in its valuation model while the models used in the previous studies failed to include these variables. The omission of these variables leaves the models seriously misspecified (Ress 1997). Our results are consistent with the findings of Shah and Stark (2004), with respect to the impact of goodwill on the market value.

The findings suggest that advertising and R&D investments have positive and significant effects on market values of firms. However our results provide more strong and consistent empirical evidence of valuation relevance for R&D than advertising. In the year-by-year analysis we can reject the null hypothesis at the 1% significance level for RD for all annual cross sections whilst nothing that the significance level varies from 1% to 10% in the case of advertising. But in the pooled annual cross-sections we find the RD and AD coefficients to be significantly non-zero at the 1% level allowing us to reject the null hypotheses. This finding adds to the argument that advertising and R&D outlays should be treated in accounting terms as investments in intangible assets rather than expenses. Similar studies such as Hirschey (1982, and 1985), Green et al. (1996), and Chauvin and Hirschey (1994),

Shah and Stark (2004, 2005), among others, provide evidence that the market treats R&D and advertising as investments rather than expenses.

Our findings regarding value relevance of goodwill amortisation (GWA), like those of previous research, are mixed and inconclusive. The pooled coefficient on goodwill amortisation is negative but insignificant when the BV deflator is used. However in the year-by-year regression analysis the coefficient estimates on GWA are positive for four out of six years (but significant only for one year). Jennings et al. (1996) also report a weak negative relation between goodwill amortisation and market value. They report an estimated coefficient on goodwill amortisation, which is negative in five of seven years but statistically significant only for one year. They argue that (p.530), '*...this evidence is somewhat weak, suggesting that the relation between equity values and goodwill amortisation may vary substantially across firms...investors may view purchased goodwill as an economic resource that does not decline in value for some firms*'. The present study reports pooled regression coefficients on GWA, which are positive and statistically significant when OMV and NS are used as deflators. These results seem consistent with Choi et al. (2000) who also find positive but insignificant coefficients on amortisation expenses. They offer a possible explanation of these results (p.44), '*...the measure of amortization expense used in financial reports measures the decline in the value of intangible assets with considerable error. The economic value of intangible assets may decline for some firms but increase for others*'.

Other US research such as Jennings et al. (2001) and Moehrle et al. (2001), which examines the value relevance of goodwill amortisation, provides less consistent results. Their empirical evidence indicates that amortisation of goodwill is not

considered as value relevant by investors. Jennings et al. (2001) while examining the value relevance of earnings (using two measures of earnings including and excluding goodwill amortisation) report no value relevance of goodwill amortisation and describe goodwill amortisation as merely a noise which imparts no information to investors for value purposes.

Moehrle et al. (2001) find earnings excluding goodwill amortisation and including goodwill amortisation equally informative suggesting no value relevance of goodwill amortisation. Jennings et al. (2001) and Moehrle et al. (2001) both used return models and only include those independent variables (i.e. earnings and goodwill amortisation) in the models which are the primary focus of their research and failed to control for other variables that may also help to explain share price and/or market returns. One possible explanation for their findings that goodwill amortisation has no value relevance is that return models potentially do not capture systematic goodwill amortisation because it does not provide new information to the market. The differences in findings of the present study (which provide some evidence of value relevance of goodwill amortisation) and previous US research may also be due to the differences in the goodwill amortisation rules of both countries. While the maximum amortisation period in the UK is has been recently 20 years the maximum period was 40 years until July 2001 in the US. A longer amortisation period could potentially turn amortisation expense as non-value relevant or 'noise'.

Overall our results for the value relevance of goodwill amortisation indicate that investors do not appear to consider goodwill amortisation as an expense. In other words our results do not show a decline in the economic value of goodwill. One possible explanation for this result may be that the market views purchased goodwill

as an economic resource that declines in value for some firms but increases for others. Another explanation, which can be offered, is that financial statements measure and report the amortisation expense with considerable error (see Jennings et al., 1996; and Choi et al., 2000). A criticism which can be made regarding our GWA results is that we used data on intangibles amortisation as a proxy for goodwill amortisation. The reason for using a proxy for goodwill amortisation is that Datastream only reports intangible amortisation not goodwill amortisation. However previous research such as Moehrle et al. (2001) has used intangible amortisation as proxy for goodwill amortisation.

Other variables in our model i.e. BV, E, D, and CC all significantly affect the market value of the firm and coefficient signs on all these variables are in line with their theoretical values which justify their inclusion in the model.

A model's value relevance is judged by its explanatory power regarding stock prices and/or stock returns (Brown et al., 1999). The R^2 for our pooled regression (3) is 0.21 when BV is used as deflator, -0.34 when OMV is the deflator and 0.41 when NS is the deflator. Similarly the R^2 is 0.21, -0.34 and 0.42 for BV, OMV and NS deflators respectively for pooled equation (4). This suggests that the explanatory variables in the models explain a significant portion of the variation in market value.

4.6 Summary

This chapter presents the empirical results based on our models 3 and 4. We empirically investigate the relation between goodwill, R&D advertising and goodwill amortisation and market value of the firm by using UK firms' data for the period 1998-2003. We analyse and report results for both pooled cross sections and for all six cross sections separately. The overall results of this study suggest that the market

recognises purchased goodwill, R&D, and advertising investments as assets and incorporates information relating to these variables in the valuation of the firm. The results show a positive and significant association between GW, RD, and AD and the market value of the sample firms.

The findings of this study are consistent with the findings of similar studies in this area such as Jennings et al. (1996), Chauvin and Hirschey (1994), McCarthy and Schneider (1995), Hirschey (1982 and 1985), Green et al. (1996), Chauvin and Hirschey (1994), and Shah and Stark (2004, 2005). Our results also provide mixed evidence on the value relevance of goodwill amortisation. We find some significant association between goodwill amortisation and the market value of the firm. In summary the overall results presented in this chapter, with some exceptions, are consistent with theoretical predictions.

We have provided evidence on the value relevance of aggregate advertising expenditures in this chapter. To study possible differential media valuation impacts, we segregate advertising expenditures into print media advertising and electronic media advertising as well as into television advertising (TV) and non-television advertising (NTV). The next chapter presents empirical analysis to investigate possible differential media impacts on firms' value.

Table 4.1: Value Relevance of GW, RD and AD - Descriptive Statistics

Panel A (BV as Deflator)

	MV	BV	D	E	GW	RD	AD	CC
Mean	2.81	NA	0.048	-0.074	0.19	0.04	0.002	-0.16
Median	1.52	NA	0.03	0.07	0.00	0.00	0.00	-0.00
Maximum	48.68	NA	1.08	1.85	4.90	2.57	0.84	0.62
Minimum	0.10	NA	0.00	-11.58	0.00	0.00	0.00	-8.13
Std. Dev.	4.04	NA	0.07	0.66	0.42	0.13	0.02	0.44
Observations	7638	NA	7638	7638	7638	7638	7638	7638

Panel B (OMV as Deflator)

	MV	BV	D	E	GW	RD	AD	CC
Mean	1.15	0.78	0.026	-0.03	0.10	0.02	0.002	-0.06
Median	1.00	0.60	0.02	0.05	0.00	0.00	0.00	-0.00
Maximum	12.65	8.51	0.35	0.53	4.05	1.12	0.26	0.34
Minimum	0.03	0.01	0.00	-4.47	0.00	0.00	0.00	-4.25
Std. Dev.	0.85	0.67	0.03	0.30	0.24	0.05	0.01	0.22
Observations	7461	7461	7461	7461	7461	7461	7461	7461

Panel C (NS as Deflator)

	MV	BV	D	E	G	R	A	CC
Mean	1.96	1.14	0.05	0.06	0.16	0.02	0.002	-0.08
Median	1.16	0.63	0.02	0.05	0.00	0.00	0.00	-0.00
Maximum	25.05	24.73	0.76	1.93	6.00	0.64	0.23	0.57
Minimum	0.002	0.001	0.00	-3.01	0.00	0.00	0.00	-4.38
Std. Dev.	2.40	1.55	0.07	0.25	0.44	0.05	0.01	0.29
Observations	7325	7325	7325	7325	7325	7325	7325	7325

Table 4.2: Value Relevance of GW, RD and AD -Correlation Matrix

Panel A (BV as Deflator)

Variable	BV	D	E	GW	RD	AD	CC
BV	NA	NA	NA	NA	NA	NA	NA
D	NA	1.00	0.27	0.06	-0.04	0.07	0.15
E	NA	0.27	1.00	-0.11	-0.25	0.01	0.21
GW	NA	0.06	-0.11	1.00	0.02	0.01	-0.11
RD	NA	-0.04	-0.25	0.03	1.00	-0.01	-0.09
AD	NA	0.07	0.01	0.01	-0.01	1.00	-0.04
CC	NA	0.15	0.21	-0.11	-0.09	-0.04	1.00

Panel B (MV as Deflator)

Variable	BV	D	E	GW	RD	AD	CC
BV	1.00	0.22	-0.07	0.05	-0.00	0.03	-0.03
D	0.22	1.00	0.30	-0.04	-0.09	0.06	0.16
E	-0.07	0.30	1.00	-0.11	-0.18	-0.01	0.16
GW	0.05	-0.04	-0.11	1.00	0.06	-0.01	-0.15
RD	-0.00	-0.09	-0.18	0.06	1.00	-0.02	-0.03
AD	0.03	0.07	-0.01	-0.01	-0.02	1.00	-0.01
CC	-0.03	0.16	0.16	-0.15	-0.03	-0.01	1.00

Panel C (NS as Deflator)

Variable	BV	D	E	GW	RD	AD	CC
BV	1.00	0.61	0.42	0.16	0.02	0.05	-0.07
D	0.61	1.00	0.54	0.18	0.06	0.10	0.05
E	0.42	0.55	1.00	0.03	-0.06	0.07	0.13
GW	0.16	0.18	0.03	1.00	0.11	0.02	-0.28
RD	0.02	0.06	-0.06	0.11	1.00	-0.02	-0.07
AD	0.05	0.10	0.07	0.02	-0.02	1.00	-0.01
CC	-0.07	0.05	0.13	-0.28	-0.07	-0.01	1.00

Table 4.3: Model 3 Estimation Results -Yearly and Pooled Samples (BV Deflator)

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Variable	1998	1999	2000	2001	2002	2003	Pooled
Const	3288.98	4016.82	3414.36	1463.47	828.26	1876.02	1634.02
(p-value)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
BV	1.00	1.13	0.80	0.87	0.70	1.42	1.12
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	1.70	1.07	1.96	0.31	-0.10	-0.33	0.45
(p-value)	(0.00)	(0.08)	(0.00)	(0.03)	(0.52)	(0.32)	(0.00)
D	13.10	17.92	15.58	13.38	14.83	15.58	17.12
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GW	5.42	2.36	0.82	0.38	0.15	0.10	0.39
(p-value)	(0.00)	(0.00)	(0.02)	(0.03)	(0.26)	(0.63)	(0.00)
RD	11.13	19.31	11.94	6.08	3.31	4.46	8.43
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
AD	6.07	7.87	17.78	18.59	14.68	14.80	12.38
(p-value)	(0.43)	(0.03)	(0.04)	(0.07)	(0.08)	(0.00)	(0.00)
CC	-1.77	-3.72	-1.75	-0.87	-1.16	-0.19	-1.49
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.37)	(0.00)
R^2	0.30	0.28	0.26	0.25	0.31	0.29	0.21
Cases	1373	1296	1291	1308	1248	1122	7638

Notes:
MV is Market value of a firm; BV is Book value of equity of a firm; E is Earnings as reported in income statement; D is Ordinary Dividends; GW is Goodwill; RD is Research and Development Expenditures; AD is Advertising Expenditures and CC is Capital Contributions.

Table 4.4: Model 3 Estimation Results-Yearly and Pooled Samples (OMV Deflator)

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Variable	1998	1999	2000	2001	2002	2003	Pooled
Const	1001.79	2245.11	742.63	569.70	807.01	654.89	906.32
(p-value)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.05	(0.00)
BV	0.44	0.40	0.48	0.44	0.38	0.70	0.50
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.41	0.76	0.38	0.12	0.08	-0.05	0.20
(p-value)	(0.03)	(0.00)	(0.00)	(0.06)	(0.02)	(0.67)	(0.00)
D	7.56	7.66	8.92	10.20	10.42	8.95	9.13
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GW	2.03	1.38	0.47	0.37	0.19	0.52	0.39
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	5.29	15.36	6.62	1.97	1.67	3.15	4.19
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
AD	8.01	5.92	3.00	4.06	3.18	7.32	5.15
(p-value)	(0.07)	(0.07)	(0.05)	(0.04)	(0.00)	(0.00)	(0.00)
CC	-1.13	-1.71	-0.96	-0.38	-0.60	-0.38	-0.80
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	-0.91	-0.28	-0.46	-0.32	-0.37	-0.41	-0.34
Cases	1351	1286	1242	1250	1221	1111	7461

Notes:
MV is Market value of a firm; BV is Book value of equity of a firm; E is Earnings as reported in income statement; D is Ordinary Dividends; GW is Goodwill; RD is Research and Development Expenditures; AD is Advertising Expenditures and CC is Capital Contributions.

Table 4.5: Model 3 Estimation Results -Yearly and Pooled Samples (NS Deflator)

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Variable	1998	1999	2000	2001	2002	2003	Pooled
Const	236.30	680.63	349.61	480.21	534.07	1447.73	499.32
(p-value)	(0.68)	(0.00)	(0.08)	(0.00)	(0.00)	(0.02	(0.00)
BV	0.42	0.32	0.36	0.54	0.42	0.57	0.42
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	1.47	2.52	1.40	0.98	1.02	1.40	1.48
(p-value)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
D	11.63	12.03	11.70	10.50	10.42	13.40	12.16
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GW	1.42	1.46	0.54	0.56	0.63	0.53	0.57
(p-value)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
RD	8.832	14.22	15.32	5.45	2.67	5.80	7.98
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
AD	25.01	12.57	13.38	12.83	9.73	21.30	15.55
(p-value)	(0.00)	(0.08)	(0.01)	(0.06	(0.09)	(0.00)	(0.00)
CC	-2.39	-3.23	-1.53	-0.93	-0.78	-0.66	-1.71
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02	(0.00)
R^2	0.38	0.24	0.36	0.60	0.73	0.67	0.41
Cases	1338	1204	1237	1248	1202	1096	7325

Notes:
MV is Market value of a firm; BV is Book value of equity of a firm; E is Earnings as reported in income statement; D is Ordinary Dividends; GW is Goodwill; RD is Research and Development Expenditures; AD is Advertising Expenditures and CC is Capital Contributions.

Table 4.6: Value Relevance of Goodwill Amortization - Descriptive Statistics (Pooled Sample)

Panel A (BV as Deflator)

	MV	BV	D	EBA	GW	RD	AD	CC	GWA
Mean	2.79	NA	0.04	-0.03	0.18	0.03	0.002	-0.16	0.02
Median	1.51	NA	0.03	0.08	0.00	0.00	0.00	-0.00	0.00
Maximum	48.68	NA	1.07	1.84	4.89	2.56	0.84	0.62	1.20
Minimum	0.10	NA	0.00	-11.51	0.00	0.00	0.00	-8.12	0.00
Std. Dev.	4.00	NA	0.06	0.55	0.40	0.12	0.01	0.43	0.07
Observations	7596	NA	7596	7596	7596	7596	7596	7596	7596

Panel B (OMV as Deflator)

	MV	BV	D	EBA	GW	RD	AD	CC	GWA
Mean	1.14	0.78	0.02	-0.02	0.09	0.01	0.001	-0.06	0.01
Median	1.00	0.60	0.02	0.04	0.00	0.00	0.00	-0.00	0.00
Maximum	12.65	8.50	0.34	0.52	4.04	1.12	0.26	0.34	0.76
Minimum	0.03	0.01	0.00	-4.47	0.00	0.00	0.00	-4.24	0.00
Std. Dev.	0.84	0.67	0.02	0.29	0.24	0.04	0.01	0.22	0.04
Observations	7444	7444	7444	7444	7444	7444	7444	7444	7444

Panel C (NS as Deflator)

	MV	BV	D	EBA	GW	R	A	CC	GWA
Mean	1.95	1.13	0.05	0.06	0.16	0.02	0.001	-0.08	0.01
Median	1.15	0.63	0.02	0.05	0.00	0.00	0.00	-0.00	0.00
Maximum	25.05	24.73	0.76	1.93	6.00	0.64	0.23	0.59	0.44
Minimum	0.002	0.001	0.00	-3.00	0.00	0.00	0.00	-4.38	0.00
Std. Dev.	2.38	1.53	0.07	0.25	0.44	0.05	0.009	0.29	0.03
Observations	7296	7296	7296	7296	7296	7296	7296	7296	7296

Table 4.7: Value Relevance of Goodwill Amortization -Correlation Matrix (Pooled Sample)

Panel A (BV as Deflator)

Variable	D	EBA	GW	RD	AD	CC	GWA
D	1.00	0.29	0.05	-0.03	0.06	0.15	-0.03
EBA	0.29	1.00	-0.04	-0.22	0.02	0.24	-0.24
GW	0.05	-0.04	1.00	0.01	0.01	-0.10	0.33
RD	-0.03	-0.22	0.01	1.00	-0.01	-0.09	0.08
AD	0.06	0.02	0.01	-0.01	1.00	-0.04	0.01
CC	0.15	0.24	-0.10	-0.09	-0.04	1.00	-0.08
GWA	-0.03	-0.24	0.33	0.08	0.01	-0.08	1.00

Panel B (OMV as Deflator)

Variable	BV	D	EBA	GW	RD	AD	CC	GWA
BV	1.00	0.21	-0.07	0.05	0.001	0.03	-0.02	0.08
D	0.21	1.00	0.29	-0.03	-0.08	0.07	0.15	-0.10
EBA	-0.07	0.29	1.00	-0.10	-0.17	-0.01	0.16	-0.33
GW	0.05	-0.03	-0.10	1.00	0.06	-0.01	-0.15	0.33
RD	0.001	-0.08	-0.17	0.06	1.00	-0.02	-0.03	0.13
AD	0.031	0.07	-0.01	-0.01	-0.02	1.00	-0.01	0.003
CC	-0.02	0.15	0.16	-0.15	-0.03	-0.01	1.00	-0.10
GWA	0.08	-0.10	-0.33	0.33	0.13	0.003	-0.10	1.00

Panel C (NS as Deflator)

Variable	BV	D	EBA	GW	RD	AD	CC	GWA
BV	1.00	0.61	0.42	0.16	0.02	0.06	-0.06	0.09
D	0.61	1.00	0.54	0.18	0.06	0.09	0.05	0.08
EBA	0.42	0.55	1.00	0.03	-0.05	0.07	0.11	-0.16
GW	0.16	0.18	0.03	1.00	0.10	0.02	-0.28	0.53
RD	0.02	0.05	-0.05	0.10	1.00	-0.02	-0.07	0.18
AD	0.05	0.10	0.07	0.01	-0.02	1.00	-0.01	-0.00
CC	-0.06	0.05	0.11	-0.28	-0.07	-0.01	1.00	-0.16
GWA	0.09	0.08	-0.16	0.53	0.18	-0.00	-0.16	1.00

Table 4.8: Model 4 Estimation Results-Yearly and Pooled Samples (BV Deflator)

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 EBA_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \alpha_8 GWA_{it} + \xi$$

Variable	1998	1999	2000	2001	2002	2003	Pooled
Const	3865.91	3817.32	3294.59	1462.50	2083.83	1747.01	2330.48
(p-value)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
BV	0.91	1.04	0.82	0.87	0.62	1.43	1.04
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
EBA	1.99	1.17	1.98	0.34	0.43	-0.31	0.68
(p-value)	(0.00)	(0.07)	(0.00)	(0.13)	(0.00)	(0.40)	(0.00)
D	12.70	18.14	14.36	13.35	13.53	15.61	16.79
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GW	5.27	1.97	0.53	0.40	0.22	0.15	0.41
(p-value)	(0.00)	(0.00)	(0.08)	(0.03)	(0.05)	(0.48)	(0.00)
RD	11.08	18.79	12.72	6.15	3.05	4.65	8.45
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
AD	6.04	7.32	19.50	18.46	11.02	14.22	11.90
(p-value)	(0.43)	(0.03)	(0.02)	(0.07)	(0.09)	(0.01)	(0.00)
CC	-1.96	-3.81	-1.62	-0.88	-0.92	-0.22	-1.46
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.29)	(0.00)
GWA	2.75	10.94	4.83	-0.77	0.46	-0.20	-0.51
(p-value)	(0.78)	(0.02)	(0.12)	(0.34)	(0.26)	(0.87)	(0.40)
R^2	0.30	0.28	0.25	0.25	0.31	0.28	0.22
Cases	1367	1294	1280	1303	1235	1117	7596

Notes:
MV is Market value of a firm; BV is Book value of equity of a firm; EBA is Earnings as reported in income statement excluding goodwill amortisation; D is Ordinary Dividends; GW is Goodwill; RD is Research and Development Expenditures; AD is Advertising Expenditures, CC is Capital Contributions and GWA is Goodwill Amortisation.

Table 4.9: Model 4 Estimation Results-Yearly and Pooled Samples (OMV Deflator)

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 EBA_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \alpha_8 GWA_{it} + \xi$$

Variable	1998	1999	2000	2001	2002	2003	Pooled
Const	985.53	2223.47	749.09	577.30	811.58	716.41	926.08
(p-value)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.03)	(0.00)
BV	0.43	0.39	0.47	0.43	0.36	0.66	0.49
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
EBA	0.47	0.76	00.42	0.17	0.08	0.13	0.28
(p-value)	(0.01)	(0.00)	(0.00)	(0.02)	(0.06)	(0.36)	(0.00)
D	7.58	7.83	8.89	10.17	10.72	8.76	9.16
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GW	1.82	1.23	0.40	0.33	0.16	0.36	0.31
(p-value)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)
RD	5.18	15.27	6.56	1.97	1.75	2.92	4.10
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
AD	7.98	5.92	3.04	3.98	2.12	7.05	4.84
(p-value)	(0.07)	(0.07	(0.04)	(0.04)	(0.05)	(0.00)	(0.00)
CC	-1.12	-1.67	-0.94	-0.39	-0.62	-0.34	-0.80
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
GWA	6.49	3.80	2.15	0.52	0.16	3.18	1.23
(p-value)	(0.00)	(0.02)	(0.02)	(0.08)	(0.57)	(0.00)	(0.00)
R^2	-0.89	-0.28	-0.45	-0.31	-0.42	-0.39	-0.34
Cases	1351	1286	1242	1247	1217	1101	7444

Notes:
MV is Market value of a firm; BV is Book value of equity of a firm; EBA is Earnings as reported in income statement excluding goodwill amortisation; D is Ordinary Dividends; GW is Goodwill; RD is Research and Development Expenditures; AD is Advertising Expenditures, CC is Capital Contributions and GWA is Goodwill Amortisation.

Table 4.10: Model 4 Estimation Results-Yearly and Pooled Samples (NS Deflator)

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 EBA_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \alpha_8 GWA_{it} + \xi$$

Variable	1998	1999	2000	2001	2002	2003	Pooled
Const	172.05	683.95	359.75	479.58	536.78	1,462.19	513.18
(p-value)	(0.76)	(0.00)	(0.06)	(0.00)	(0.00)	(0.01)	(0.00)
BV	0.40	0.32	0.33	0.54	0.42	0.53	0.40
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
EBA	1.81	2.76	1.83	1.15	1.26	1.99	1.81
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
D	11.72	11.55	11.18	10.23	10.20	12.07	11.81
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GW	0.78	1.23	0.20	0.46	0.48	0.24	0.32
(p-value)	(0.15)	(0.02)	(0.40)	(0.00)	(0.00)	(0.08)	(0.00)
RD	8.20	13.96	13.92	5.20	2.36	5.21	7.43
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
AD	23.63	12.44	12.97	12.86	7.89	20.62	14.99
(p-value)	(0.00)	(0.08)	(0.02)	(0.06)	(0.15)	(0.00)	(0.00)
CC	-2.32	-3.24	-1.41	-0.91	-0.83	-0.37	-1.68
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)
GWA	31.95	3.29	9.99	1.04	1.29	4.94	4.03
(p-value)	(0.00)	(0.45)	(0.00)	(0.48)	(0.20)	(0.00)	(0.00)
R^2	0.38	0.24	0.38	0.60	0.74	0.68	0.42
Cases	1332	1200	1234	1243	1198	1089	7296

Notes:
MV is Market value of a firm; BV is Book value of equity of a firm; EBA is Earnings as reported in income statement excluding goodwill amortisation; D is Ordinary Dividends; GW is Goodwill; RD is Research and Development Expenditures; AD is Advertising Expenditures, CC is Capital Contributions and GWA is Goodwill Amortisation.

Table 4.11: Expected Coefficient Signs - Explanatory Variables

Variable	Symbol	Expected Coefficient Sign
Book Value	BV	+
Earnings	E	+
Goodwill	GW	+
Advertising Expenditures	AD	+
Research and Development Expenditures	RD	+
Dividend	D	+
Capital Contributions	CC	-
Goodwill Amortization	GWA	-
Earnings Excluding Goodwill Amortization	EBA	+

Chapter 5

Advertising Media Valuation Effects

5.1 Introduction

Results from the previous chapter tend to suggest evidence that goodwill, R&D and advertising are value relevant. In the previous analysis aggregate advertising expenditures are used to investigate the value relevance of this intangible variable. This chapter provides the empirical results for possible media differences in valuation effects by segregating advertising expenditures into print media advertising and electronic media advertising as well as into television (TV) advertising and non television (non-TV) advertising expenditures. To detect possible differential media impacts we use the valuation models prescribed and discussed in our methodology chapter 3.

The reminder of this chapter is structured as follows: section 5.2 gives a brief introduction to advertising media, section 5.3 out-lines the research approach used in the analysis of data, the results are presented in section 5.4, discussions of results are provided in section 5.5, and section 5.6 summarizes the findings of this chapter.

5.2 Advertising Media

From an economic point of view, advertising provides two major functions. One is persuasion the other is information basis. Tirole (1988) explains in relation to the persuasion function, advertising creates differentiation that is not real, and advertising is meant to persuade and fool customers. In contrast the other view (informational) enables the customers to make rational choices by providing information to them. In

such types of advertising, information regarding the existence of a product, its price, retail locations, and other product characteristics such as quality may be conveyed[80]. A favourite medium of the proponents of the first view is television while the press is a favoured medium of the proponents of second view.

In a consumer oriented economic system, commercial media (e.g. newspapers, radio, television, billboards, magazines etc.) play a crucial role in promoting goods and services in the market place (Chen and Allmon, 1998). The media are the places where advertising appears. Lei (2000) asserts that (p.466) '*At the heart of the advertising are the media where client dollars are spent to convey an advertising message*'. Television, press, outdoor advertisements, cinema and radio are considered the five main advertising media available in all developed countries[81]. However they differ in their importance in different countries.

White (2000) posited that overall the press was then still ahead of TV in importance and that other media are significantly smaller in importance[82]. Jefkins (2000) contends that the press remains the predominant advertising medium irrespective of the impact of TV's vision, its colour, sound and movement and further argues that (p.76), '*...the press dominates in literate, industrial countries. It may be arguable that television has greater impact and realism, and it is true that the biggest spenders on advertising spend most of their money on TV, but the number of TV advertisers is relatively small and the amount of time available for television advertising is limited...*'

[80] Also see James and Alman (1996).
[81] World Wide Web (WWW) is now rapidly emerging medium in all developed countries. It is a potential substitute or complement for all other categories of existing media.
[82] Ling et al. (1999) contend that TV and Press dominate mass media advertising.

Each of the aforementioned media is used in varying degrees to convey an advertising campaign message to a target audience with minimum costs. Philport and Arbittier (1997) assert that every medium has an effect on its advertising content, for example the unlimited message length of print media, and the fixed exposure duration of broadcast media offer unique parameters for advertisers. Tirole (1988) contends that the amount of information attached to advertising varies with the medium used.

A number of studies in the marketing and advertising literature such as Boyer (1974), Nelson (1974), Resnik and Stern (1977), Taylor (1983), Bergh et al. (1990), and Abernethy and Franke (1996), among others, have focused on the persuasiveness and information content of advertisements in specific media classes. Whit (2000) argues that media planners face two types of choice: the inter-media choice (to decide which medium or combination of media to use) and the intra-media choice (to decide where and how to deploy the advertising within the selected media) and further contends that (p. 129), '*...inter-media decisions have become more difficult and more important...*'.

Press and TV are the main advertising media used in the UK. Out of the total UK advertising expenditures for the year 2003 of over £17 billion, 48.7% was spent on press advertising and 25.4% on television advertising. Appendices 8, 9 and 10 present total UK advertising expenditures for the period from 1998 to 2003, total advertising expenditure by media sector for the same period, and report media sector percentages of total advertising expenditures respectively. The analysis of these expenditures reveals that advertisers generally use either press or TV as their main advertising medium. However press is ahead of TV and resets of the media (e.g. radio, outdoor, and cinema) are obviously small.

Previous research investigating effectiveness of the advertising expenditures has mainly considered total advertising expenditures at different points in time assuming homogenous effects of advertising regardless of the type of advertising message and /or the medium used to communicate it. As each advertising medium varies from each other in terms of the information it provides, the costs associated with it, the number of repetitions of the messages and so on. A relevant question is then what is the effect of each medium on market value of the firm. There is a small empirical research such as Porter (1976), Rogers and Mueller (1980), Hirschey (1982), Notta and Oustapassidis (2001), and Yiannaka et al. (2002), which has investigated differential media impacts. However, the majority of this research has almost exclusively relied on US data.

5.3 Research Approach

To test possible media differences in valuation effects we segregate total advertising expenditures into different media expenditures and use different levels of aggregation for advertising expenditures such as print and electronic media expenditures, press and television advertising expenditures, and television and non-television advertising expenditures. For the purpose of analysis we estimate the following three valuation models. The first of which is as follows:

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{51} ADPRNT_{it} + \alpha_{61} ADELC_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi \quad (5)$$

In the equation 5 the ADPRNT variable consists of press and outdoor advertising and the ADELC variable comprises television, radio and cinema advertising expenditures.

To investigate the relative importance of print and electronic media the α_{51}, and α_{61} slope coefficients are of main interest. Thus, we test the following hypotheses:

H_{05} $\alpha_{51} = 0$

H_{06} $\alpha_{61} = 0$

H_{07} $\alpha_{51} = \alpha_{61}$

We segregate advertising expenditures into press and television advertising expenditures and estimate the following valuation model:

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{52} ADPRES_{it} + \alpha_{62} ADTV_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi \quad (6)$$

In equation 6 ADPRES captures press advertising expenditures and ADTV captures television advertising expenditures.

To investigate the relative importance of press and television advertising the slope coefficients α_{52} and α_{62} are of main interest. Thus we test the following hypotheses:

H_{08} $\alpha_{52} = 0$

H_{09} $\alpha_{62} = 0$

H_{10} $\alpha_{52} = \alpha_{62}$

To investigate the valuation impact of television advertising and non-television advertising we estimate the following valuation model:

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{53} ADTV_{it} + \alpha_{63} ADNTV_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi \quad (7)$$

In equation 7 ADTV captures television-advertising expenditures and ADNTV captures press, radio, cinema, and outdoor advertising expenditures. All other variables are as previously described in chapter 4.

To investigate the relative importance of television and non-television advertising the slope coefficients α_{53} and α_{63} are of main interest. Thus, we test the following hypotheses:

H_{011} $\alpha_{53} = 0$

H_{012} $\alpha_{63} = 0$

H_{013} $\alpha_{53} = \alpha_{62}$

We use Wald statistics to test our H_{07}, H_{010} and H_{013} null hypotheses, which answer the question of how the market perceives the two main different advertising expenditures in relation to each other. If the coefficients are statistically different then the market places different values on these two types of media advertising expenditures. Otherwise the market treats both advertising media the same. We estimate deflated[83] models on pooled samples (for the period from 1998 to 2003). The regression coefficients reported are estimated by using OLS regressions based on White (1980) heteroscedasticity consistent standard errors and covariance estimates. Their associated probability values under a two-tailed t-test are reported with them. Table 5.13 identifies the expected signs for each coefficient.

5.4 Differential Media Impacts – Empirical Results

5.4.1 Print and Electronic Media Advertising - Empirical Findings for Model 5

Table 5.1 provides descriptive statistics for the pooled annual cross sections for all three deflators. The descriptive statistics show some degree of skewness in most of our variables. Table 5.2 presents the matrix for the correlations between all the

[83] We use three deflators i.e. closing book value (BV), opening market value (OMV) and number of shares (NS).

variables used in the analysis. The correlation statistics for all of our variables are quite moderate and indicates that our sample does not suffer from significant multicollinearity problems.

Ordinary least squares results for equation (5) using closing book value (BV) opening market value (OMV) and number of shares (NS) as deflators are given in table 5.3. These estimation results overall show significant explanatory power for the ADPRNT and ADELC variables and hence we can reject our null hypotheses H_{05}, and H_{06}. The coefficients on APRNT and ADELC are positive and significant at the 1% and 10% levels respectively when BV is used as the deflator. When OMV and NS are used as deflators, we can reject the null hypotheses (H_{05}, and H_{06}) at the 1% significance level for APRNT and at the 5% for ADELC. The estimated coefficient values on ADPRNT are 20.49, 9.91and 26.45 for the BV, OMV and NS deflators respectively. While the estimates for ADELC are 24.60 when BV is the deflator, 6.61 when OMV is the deflator and 19.22 when NS is the deflator.

Table 5.4 provides results corresponding to the Wald Test of restrictions imposed on relationship $\alpha_{51} = \alpha_{61}$. The p values for each deflator used (0.82, 0.56, and 0.52 for BV, OMV, and NS respectively) are quite high and hence we can decisively accept the null hypothesis H_{07}. The results show that the coefficients of APRNT and ADELC are not statistically different. This indicates that the market does not place different values on these two types of media advertising expenditures.

The findings also show that there is a strong association between the market value of equity and other intangibles i.e. goodwill and R&D. The coefficients on both GW and RD are highly significant. The coefficients on GW are 0.38, 0.37, and 0.51 when BV, OMV and NS are deflators respectively. The coefficient estimates on variable

RD are 8.55 when BV is the deflator, 4.15 when OMV is the deflator and 9.58 when NS is the deflator.

The coefficients on the other control variables i.e. BV, E, D, and CC are all statistically different from zero. BV, E, and D are significantly positively related to firm market value and CC is significantly negatively related to the market value of equity.

The R^2 for regression (5) is 0.22 when BV is used as the deflator, -0.33 when OMV is the deflator and 0.41 when NS is the deflator. This suggests that the explanatory variables in the model explain a significant portion of the variation in market value.

5.4.2 Press and Television Advertising - Empirical Findings for Model 6

Table 5.7 provides results based on equation 6, where two different levels of aggregation for advertising expenditures i.e. press advertising and TV advertising expenditures are used to detect their possible differential valuation impacts. Tables 5.8, 5.5 and 5.6 present Wald Test results, descriptive statistics and the correlation matrix respectively. Study of maximum and minimum values, and the median and mean values of ADPRES and ADTV presented in Table 5.5 suggests that the overall sample emerge to be heavily concentrated at the lower end of the distribution for these variables. The correlation statistics presented in table 5.6 for these two variables and for the other variables are quite normal and indicate no significant multicollinearity problems that could affect our results.

The results presented in table 5.7 show that the coefficients on ADPRES and ADTV are positive and statistically significant. ADPRES is positive and significant at 1% when BV and OMV are deflators and at 5% levels when NS is the deflator. ADTV is

positive and significant at the 10% level when BV is the deflator and at the 5% level when OMV and NS are used as deflators. Hence we can reject our null hypotheses H_{08} and H_{09} for each deflator used. These findings overall suggest positive and statistically significant effects of ADPRES and ADTV on market value.

The estimated pooled coefficient on ADPRES is 21.14 when BV is the deflator, 14.32 when OMV is the deflator, and 18.76 when NS is the deflator. The coefficient values of ADTV are 28.16 (when the deflator is BV), 8.47 (when OMV is the deflator) and 12.93 (when NS is the deflator). The results of the Wald test for the restriction $\alpha_{52} = \alpha_{62}$ are given in table 5.8. The p values (0.71, 0.36, and 0.61 for the BV, OMV, and NS deflators respectively) reported in table 5.9 for each of the three deflators are quite high and hence we can categorically accept our null hypothesis H_{10} ($\alpha_{52} = \alpha_{62}$). This indicates that the two coefficients are statistically not different.

The positive and highly significant coefficients on goodwill and R&D indicate that the market recognizes these investments as assets and incorporates information relating to these variables in the valuation of the firm. The pooled coefficients on GW and RD are 0.38 and 9.64 (when BV is the deflator), 0.37, and 4.20 (when OMV is the deflator) and 0.55 and 9.60 (when NS is the deflator) respectively. These results also suggest that BV, E, D, and CC have consistent significant influence on market value. The coefficient signs of all variables are in line with their theoretical values.

The R^2's for regression (6) are 0.22 when BV is used as the deflator, -0.34 when OMV is the deflator and 0.41 when NS is the deflator. It indicates that the regression explains a good portion of the variance in market value.

5.4.3 Television and non-Television Advertising - Empirical Findings for Model 7

To further evaluate inter-media influences and following Hirschey (1982) we use two different levels of aggregation for advertising expenditures i.e. TV advertising expenditures and non-TV advertising expenditures. Tables 5.11, 5.12, 5.9, and 5.10 report estimation results of equation 7, Wald Test results, descriptive statistics and the correlation matrix respectively. Some degree of skewness and concentration at the lower end of the distribution for almost all variables can be observed from the information given on maximum and minimum values, and the median and mean values of each variable in the descriptive statistics.

The results presented in table 5.11 show that the estimated coefficients on ADTV is positive and statistically significant at the 5% level when OMV and NS are used as deflators. In contrast the coefficient on ADTV is positive but not statistically significant when BV is used as deflator[84]. We can reject our null hypothesis H_{011} ($\alpha_{53} = 0$) at the 5% level for the two deflators i.e. OMV and NS. The slope coefficient on ADNTV is statistically significant at the 1% level for all the three deflators. The coefficient on ADNTV for each of three deflators is positive and statistically significant at the 1% level. As the slope coefficient on ADNTV is significantly non-zero, we reject the null hypothesis H_{012} ($\alpha_{63} = 0$) at the 1% level of significance. The coefficient estimates of ADTV are 6.65, 6.72, and 15.32 for the BV, OMV and NS deflators. The estimates for ADNTV are 24.62 when BV is the deflator, 10.16 when OMV is the deflator and 26.81 when NS is the deflator.

[84] The small number observation of the TV variable may have caused this statistical insignificance.

Table 5.12 provides results corresponding to the Wald Test of the restrictions imposed on $\alpha_{53} = \alpha_{63}$. The p values for all three deflators used (0.23, 0.54, and 0.22 for BV, OMV, and NS respectively) are quite large and we hence cannot reject the null hypothesis H_{013} ($\alpha_{53} = \alpha_{63}$). Although the coefficient estimates of ADNTV are higher than the coefficient estimates of ADTV they are not statistically different.

The empirical results for the present research report an R^2 of 0.22 when BV is the deflator, -0.33 when OMV is the deflator and 0.41 when NS is the deflator, suggesting good explanatory power for the model.

The estimation results of equation 7 show that the other intangibles (goodwill and R&D) also have significant and consistent positive effects on market value. Also it should be noted that control variables in our model (i.e. BV, E, D, and CC) significantly affect the market value of the firm. The coefficient signs on all these variables are in line with their theoretical values.

5.5 Empirical Results - Discussions

To study differential media influences we used different levels of aggregation for advertising expenditures i.e. print and electronic media advertising, press and television advertising as well as non-television and television advertising expenditures. The overall results of the above regression analysis show a positive and significant association between different measures of advertising expenditures and the market value of the firm. We could not find strong evidence that the effectiveness of advertising varied substantially with the type of medium used to communicate it[85].

[85] Our findings do not confirm the previous US research claims of television advertising superiority.

Previous research such as Hirschey (1982), Muller and Rogers (1980), and Hirschey (1978), among others, suggests that television advertising has a significantly larger positive impact on market value/profitability than the effects of other media advertising (non-television advertising). Jefkins (2000) questions that (p.101), '*...if commercial television was the last word in effective advertising media...how have all other media survived, and how is it that the press continues to dominate...*'.

The most of the previous research has a single country setting using data from the US only and this may challenge the applicability of those results to other settings.

To detect possible differential media influences in the UK, we estimated three equations (5, 6 and 7) by decomposing total advertising into its print media advertising (ADPRNT) and electronic media advertising (ADELC), into press advertising (ADPRES) and television advertising (ADTV) and finally into television (ADTV) and non-television advertising (ADNTV) components. We find positive and statistically significant effects of all components of advertising on the market value. We find bigger coefficient estimates for ADPRES, ADPRNT, and ADNTV than for the corresponding coefficient estimates on ADTV, ADELC, and ADTV respectively, but according to the Wald test statistics they are not statistically different. We cannot reject our null hypotheses of equalized coefficients H_{07} ($\alpha_{51} = \alpha_{61}$), H_{010} ($\alpha_{52} = \alpha_{62}$), and H_{013} ($\alpha_{53} = \alpha_{63}$) on the basis of Wald test statistics. These results generally suggest value relevance of all advertising media / aggregation levels of advertising expenditures.

A recent study by Yiannaka et al. (2002) finds print media advertising more significant and effective than TV and radio advertising for Greek processed meats sector firms. They argue that television advertising is characterised by a relatively

low informational content while press advertising conveys significant amounts of information on the attributes/characteristics of the product. Aaker and Norris (1982) find that informative commercials are perceived to be convincing, effective, and interesting by consumers and these are important reasons why advertisers should create more informative advertising.

The differences in findings of this study when compared to relevant previous studies (which claim superiority of TV advertising in the US) may be explained in the context of differences in country settings[86], technology innovation[87], informational content of different advertising media[88], advertising form[89], media technologies sophistication, along with emergence of new media such as the World Wide Web (WWW).

As compared to the US, the UK is a compact country with good road, rail and air communication systems that provide efficient means to allow printed media (newspapers, magazines etc) to reach a large number of prospective buyers whether in locality, region or country. Scott and Solomon (1998) consider the UK media environment very different from the US. They find for the UK advertisement awareness response 1.8 times higher to print advertisements than for television and further argue (p.250), '*...because print is an active media, messages are assimilated quickly if they are considered relevant.*'

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[86] The American economy is much larger and its legal environment is much more litigious than that in the UK. US institutions are also more open to public input and debate than in the UK (Reinstein et al. (2002,p.68)

[87] Such as the videocassette recorder (VCR), this provides greater viewer control over TV, programmes. Papazian (1986 as in Lee and Lumpkin (1992)) claims that about 30 to 50 percent of VCR owners normally delete commercials when recording programmes and about 50 to 60 percent fast forward commercials while viewing tapes. Nakra (1991) argues that advanced technology has made it easier for the viewer to avoid commercials and this results in loss of commercial exposures and audience erosion.

[88] Abernethy and Franke (1996) point out that advertising information is an important influence on consumers' responses to the ad and the brand.

[89] It involves the organisation and packaging of the advertising message.

Schofield (1991) compares advertising practices in 15 different countries with the specific purpose to draw out the contrasts in advertising practices between UK advertisers and those in other countries including the US. Among the major differences noted in Schofield's study are that Britain differs in competitive environment (more external competition than in other countries), timing of advertising expenditures (British advertisers do not time their advertising to coincide with sales promotions), in allocation of advertising budget to different media (British advertisers make heavier use of TV), and in creative approaches[90] (humour in all media and slice-of-life commercials in TV).

In reviewing previous American and British research on public attitudes to advertising (public approval or acceptance levels with respect to advertising), O'Donohoe (1995) notes the differences in attitudes between the two cultures[91] and finds British advertisements different from American advertisements in terms of style and content[92]. O'Donohoe (1995) raises concerns at the heavy reliance on American theories and surveys in the field of advertising and suggests (p.260), '*...practitioners and academics should be wary of generalization concerning attitudes to advertising – not to mention advertising theories – which draw so heavily on one research tradition and one culture, however dominant they may have been in the past*'.

Katz and Wei-Na (1992) apply four social communication formats i.e. product information, product image, personalisation and lifestyle to a content analysis of US

[90] Schofield (1991, p.304) argues, '*In Great Britain the situation differed in a number of ways. In print media, the use of product identification ...and of a dominant photo were less extensive than in other countries. humour was much more widely used, in both types of media, in Britain then elsewhere. But the greatest difference lay in the much greater use...of the slice-of-life approach in broadcast media ...*'.

[91] O'Donohoe (1995) finds British people much more favourable disposed to advertising than Americans.

[92] For example US advertisers use comparative advertising while the same is used much less in the UK (see Barry,1993).

and UK prime-time television commercials in an attempt to differentiate the different styles and appeals contained with in each country's advertising messages. Katz and Wei-Na (1992) find US television more commercialised than UK television in terms of numbers of commercials aired during prime-time viewing hours and also noted the greater use of short time commercials of around 15 seconds on UK television[93]. They also indicate that while both countries have public and private channels, the UK relies very much on the former and the US on the latter. White (2000) argues that existence of strong non-commercial channels have the effect of reducing the audience and the potential for commercial channels. White further argues that (p.151), '*...the big problem for the commercial sector is that the BBC manages to hold on to over 40 per cent of TV viewing*'.

Katz and Wei-Na (1992) finds differences in the products and services categories advertised on of both UK and US television. For example UK commercials include more retail and service spots while in US commercials personal care items and cars appear far more[94]. Katz and Wei-Na further argue (p.80), '*...television advertisements in the US seem to be more `people-oriented` showing how the product fits in to the viewer's way of life and/or how it is right for the average viewer... in the UK... the focus is on what the good and service is or does*'. The overall results suggest significant differences both in product and services categories advertised and the formats used in both countries.

Jobber and Kilbride (1986) examine the commercial pre-testing methods used by leading British agencies and highlight the US and UK differences of TV commercials' pre-testing procedures. They report better facilities available in the US than the UK to

[93] The longer commercials provide more opportunity to include more information.
[94] Martenson (1987) finds fairly large differences between American and Swedish advertising.

advertisers to pre-test commercials. They argue that advertisers in the US are much more thorough in testing finished commercials before launching on a national scale and are more willing to take the risk of discarding or modifying of their costly television commercials at final stages than their British counterparts. This may result in more advertising effectiveness and more positive consumer response.

Prior research such as Zanot (1984), Aaker and Stayman (1990), and Stewart and Koslow (1989) (as cited in Abernethy and Franke, 1996) show that informative advertising increases commercial recall, comprehension, and persuasion and that consumers prefer advertising, which helps in decision-making. There is some evidence that British consumers like informative advertising (see O`Donohoe, 1995). Tirole (1988) contends that the amount of the information attached to advertising varies with the medium used. Tirole (1988) further argues that (p.290), '*...TV advertising...is very image-oriented, and it conveys little information beyond the existence of the product...*'. In their study Stern and Resnik (1991) support this view by arguing (p.44), '*...with the greater artistic flexibility of television over magazines, the advertiser may be trying to create an impression or image rather than communicating more concrete information*'.

Boyer (1974) and Nelson (1974), consider newspapers as an ideal medium for informative advertising. According to Batra (1986, as in Chaudhuri, 1996) consumers are more active and willing to process information in print than in electronic media, which is considered to be more 'intrusive'. Lee and Lumpkin (1992) claim that the non-informational and perceived materialistic nature of TV commercials contributes to commercial avoidance behaviour and suggest that advertisers should design commercials containing more useful product/brand information to effectively

communicate with commercial avoiders. Chaudhuri and Buck (1995, as in Berkowitz et al., 2001) show that electronic media are more emotionally involving than print media, which are more rationally involving. Moreover they argue that it is easier to achieve emotional responses with electronic than print media.

In another study Chaudhuri (1996) investigates the effects of media, product and advertising strategy variables on consumers' thoughts and feelings. Chaudhuri (1996) finds television and print media equal in generating interest about the advertised brands and argues (p. 213), *'...advertisers can use both types of media with equal effectiveness in the generation of cognitions about their brands'.*

Stern and Resnik (1991) posit, on the basis of existing evidence, that print advertisements are more informative than television commercials. Stern and Resnik (1991) also offer potential explanations[95] for the observation of higher levels of information in magazines advertisements than television commercials. They argue (p.44), *'...magazines tend to be an informative medium compared to television, which is predominantly entertaining...magazine ads are of 'directory' type where the reader can be more selective about those ads that are of interest. When an ad is actually selected, there may be more potential to communicate information because of greater motivation and higher involvement. On the other hand television ads are 'intrusive' thereby minimizing a viewer's selectivity and concomitantly lowering involvement for a large proportion of the audience...'.*

Bergh et al. (1990) investigate the information and puffery effects of advertising by using a sample of 50 magazine car advertisements, which appeared in *Business Week, Newsweek, Sports Illustrated, and Time* magazines between February 1985 and June

[95] Such as the nature of medium and the context in which an advertisement is communicated that influence the level of informativeness.

1987. They find advertisements with larger information content more effective than advertisements containing larger proportions of puffery and argue (p.356), '*...while information content does influence an advertisement's effectiveness, the influence of puffery is less conclusive...we believe that...information is important in an advertisement...*'.

In a meta-analysis of studies of advertising content, Abernethy and Franke (1996) find that television advertising contains less information than newspapers, magazines, and radio. The meta-analysis also shows that findings on advertising information are influenced by media type in addition to the level of economic development, the research procedures used, and product durability. They further add that the most important influence on both the type and the amount of information is the medium in which the advertising appeared. Fay and Currier (1994) also note that TV commercials carry less information than print advertisements. O`Donohoe (1995) finds press advertisements as consistently the most informative with magazine advertisements while reviewing previous research addressing perceptions about advertising in different media.

Resnik and Stern (1977) conceptually define an advertisement as being informative if it permits a typical viewer to make a more intelligent buying decision after seeing the commercial than before seeing it. In content analysis of a randomly selected sample of 378 US commercials broadcast by the three major networks in the US, Resnik and Stern (1977) find less than one-half (49.2%) of advertisements informative. Reid and Rotfeld (1981, as in Bergh et al. 1990) also find less than half of the TV commercials of their sample containing at least one informational cue.

Stern et al. (1981) in their study of 1491 advertisements from randomly chosen US magazines, find that 86 percent of these advertisements provide consumers with some useful information. Taylor (1983) examines the information content of advertisements appearing in selected women's magazines in October 1981. Taylor finds 83 percent of the advertisements informative, containing at least one information cue. Assael (1992, as in Berkowitz et al., 2001) asserts that broadcast media are better at imagery and symbolism, whereas print media are better at communicating detailed information. Informative advertising is thought to be economically useful while persuasive advertising is an economic waste (Bergh et al., 1990).

Due to the increasing sophistication of media technologies commercial communication has become more targeted and individual in focus, and more consumer-driven. In this then new emerging situation Dawson (1996) argued that television advertising was in terminal decline and cited the *Wall Street Journal* (Europe) as commenting, '*It is hard to believe that in a digital, interactive world, any one will sit for numbing repetitions of intrusive jingles, or unrewarding 30-second spots*'. White (2000) argues that (p.168) '*TV is a dynamic medium, world-wide, which is changing rapidly under the impact of new technology...the industry's structure varies quite widely by country, as do buying practices and the nature of commercial breaks*'.

Kitchen (1986), while studying to what extent are consumers using new technology to interfere with commercial breaks, notes that new consumer technologies strike at the heart of television advertising commercial breaks resulting in a high proportion of commercial loss due to channel-flicking and video recording. Jefkins (2000) also points out that there is some evidence that during prime time TV in the UK (that is

roughly between 7 pm to 11pm) Internet usage peaks[96]. Consumers surfing the Internet cannot at the same time be watching TV and this is a disadvantage for television advertisers. Use of computers had limited general appeal beyond work related activities for the time period covered by previous research such as Hirschey (1982), Muller and Rogers (1980), and Hirschey (1978).

In the 1990s use of Internet began growing at a very fast pace. Lei (2000, p.465) argues, '*...in the past 5 years, the development of services, such as e-mail and Web access, have broadened the appeal of computer use, and it now competes for a consumers' free time and impacts on their traditional media exposures. This competition for a consumers' leisure time and entertainment has come at a particularly critical time in the highly complex and dynamic environment of traditional media...*'. Silk et al. (2001) mention that Internet advertising outlays have increased rapidly from $55 million in 1995 to $2 billion in 1998. Lei (2000) further argue that audiences of new media come largely at the expense of existing ones. In the UK, Paton and Conant (2002) analyse survey data on 843 UK-based firms and report that more than half of the firms in the survey that advertised at all also advertised on the Internet and over half of the remaining advertisers intend to advertise on the Internet in the near future.

Silk et al. (2001) investigate the question of which of the existing major advertising media will the Internet becomes a substitute or complement for. Their probit model's predictions show that the Internet would be a substitute to television, radio and outdoor advertising, and a complement to newspapers and direct mail.

[96] Coffey and Stipp (1997) also provide some evidence on increased Internet usage during TV prime time in the US.

Terence (1992) evaluates differences in the information content[97] of US and UK television advertising and argues that British television commercials tend to contain less information than the US ones, apply a soft sell (indirect) rather than a hard sell (direct) approach[98] and attempt to entertain viewers. Terence (1992) further adds that the higher proportion of local advertising in the US than the UK helps to explain the higher level of information content of US commercials and the harder sell approach.

In their study which identifies similarities and differences between US, French and Taiwanese advertising, Zandpour et al. (1992) find US advertising addressing the consumer directly in a friendly, conversational tone but tending to display the product aggressively. Reinhard and Phillips (1985) (as cited in Cutler and Javalgi, 1992) point out that cultural difference between the US and the UK have led to differences regarding price information in advertising. Weinberger and Spotts (1989) (as cited in Zandpour et al., 1992) find US television commercials more informative than commercials in the UK.

The above discussion reveals that between the US and UK differences exist in country settings, in competitive environment, in creative approaches, and in advertisements styles and contents. This may provide evidence to explain differences in advertising media valuation effects in the two countries.

5.6 Summary

We empirically investigate potential differential media valuation effects in the UK by employing different levels of aggregation for advertising expenditures (such as print

[97] Also see Johnstone et al. (1987) for comparative analysis of the information content of Canadian and US TV advertisements.

[98] In hard sell approach, advertising normally give information regarding existence of the product, its price, the retail outlets in which product is distributed, product's physical appearance etc.

and electronic media expenditures, press and television advertising expenditures, and television and non-television advertising expenditures) for a sample of UK firms' over the period 1998-2003. We analyse and report results for pooled cross sections, including Wald statistics.

The overall regression analysis findings suggest a positive and significant association between different measures of advertising expenditures and the market value of the firm. We could find no strong evidence that the effectiveness of advertising varies substantially with the type of medium used to communicate it. However we find larger regression coefficients for print media advertising than electronic media advertising. However Wald statistics indicate that the two coefficients are not statistically different and thus we could not reject our null hypotheses of equalized coefficients. Our findings differ from previous US research such as Porter (1976), Rogers and Mueller (1980), and Hirschey (1982), which identify the superior economic effects of television advertising. However our findings are more in line with the results of the study by Yiannaka et al. (2002), which reports more significant effects of print media advertising (newspapers and magazines) on sales than for both TV and radio advertising for Greek firms sample.

The differences in findings of our study when compared to relevant previous studies (which claim superiority of TV advertising in the US) may be justified in the context of differences in country settings, development of innovatory technologies, differences in the informational content of different advertising media, differences in advertising form, variation in the sophistication of media technologies and the emergence of new media such as the World Wide Web, among other factors. Research such as Jobber and Kilbride (1986), Schofield (1991), Katz and Wei-Na

(1992), Zandpour et al. (1992), Terence (1992), O'Donohoe (1995), Scott and Solomon (1998), and White (2000), among others, show that Britain differs from the US in competitive environment, in creative approaches, in ads styles and contents, and in country settings.

The previous chapter presented evidence on value relevance of goodwill, R&D and aggregate advertising expenditures. In this chapter we have provided an empirical evidence of possible differential media impacts. The next chapter investigates the potential for differences in the effectiveness of goodwill, R&D and advertising for manufacturing and non-manufacturing, small and large firms, as well as profit and loss making firms.

Table 5.1: Print and Electronic Media Advertising - Descriptive Statistics

Panel A (BV as Deflator)

	MV	D	E	GW	RD	ADPRNT	ADELC	CC
Mean	2.82	0.04	-0.07	0.18	0.040	0.001	0.01	-0.16
Median	1.52	0.03	0.06	0.00	0.00	0.00	0.00	-0.00
Maximum	48.59	1.07	2.39	4.89	2.56	0.23	0.18	0.90
Minimum	0.10	0.00	-11.57	0.00	0.00	0.00	0.00	-8.12
Std. Dev.	4.09	0.06	0.67	0.41	0.12	0.01	0.01	0.44
Observations	7639	7639	7639	7639	7639	7639	7639	7639

Panel B (OMV as Deflator)

	MV	BV	D	E	GW	RD	ADPRNT	ADELC	CC
Mean	1.14	0.77	0.02	-0.03	0.09	0.01	0.001	0.001	-0.06
Median	1.00	0.60	0.02	0.04	0.00	0.00	0.00	0.00	-0.00
Maximum	12.65	8.50	0.34	0.54	4.04	1.12	0.08	0.06	0.34
Minimum	0.03	0.01	0.00	-4.47	0.00	0.00	0.00	0.00	-4.24
Std. Dev.	0.85	0.66	0.02	0.30	0.24	0.04	0.004	0.003	0.22
Observations	7436	7436	7436	7436	7436	7436	7436	7436	7436

Panel C (NS as Deflator)

	MV	BV	D	E	GW	RD	ADPRNT	ADELC	CC
Mean	1.98	1.13	0.05	0.06	0.16	0.01	0.008	0.001	-0.08
Median	1.16	0.63	0.02	0.04	0.00	0.00	0.00	0.00	-0.001
Maximum	25.05	24.73	0.75	1.92	5.51	0.64	0.09	0.12	0.56
Minimum	0.002	0.001	0.00	-3.00	0.00	0.00	0.00	0.00	-4.38
Std. Dev.	2.46	1.5	0.07	0.25	0.43	0.05	0.001	0.01	0.28
Observations	7376	7376	7376	7376	7376	7376	7376	7376	7376

Table 5.2: Print and Electronic Media Advertising - Correlation Matrix

Panel A (BV as Deflator)

	D	E	GW	RD	ADPRNT	ADELC	CC
D	1.00	0.25	0.06	-0.02	0.03	0.08	0.14
E	0.25	1.00	-0.10	-0.24	-0.03	0.02	0.20
GW	0.06	-0.10	1.00	0.02	-0.001	0.03	-0.11
RD	-0.02	-0.24	0.02	1.00	-0.01	-0.001	-0.08
ADPRNT	0.03	0.20	-0.11	-0.08	1.00	0.30	-0.02
ADELC	0.08	-0.03	-0.00	-0.01	0.30	1.00	0.013
CC	0.14	0.02	0.03	-0.001	-0.02	0.01	1.00

Panel B (OMV as Deflator)

	BV	D	E	GW	RD	ADPRNT	ADELC	CC
BV	1.00	0.22	-0.06	0.05	0.002	0.05	0.015	-0.02
D	0.22	1.00	0.29	-0.03	-0.08	0.03	0.07	0.15
E	-0.06	0.29	1.00	-0.10	-0.18	-0.03	0.01	0.16
GW	0.05	-0.03	-0.10	1.00	0.06	-0.02	-0.01	-0.15
RD	0.002	-0.08	-0.18	0.06	1.00	-0.02	-0.02	-0.03
ADPRNT	0.05	0.03	-0.03	-0.02	-0.02	1.00	0.51	-0.01
ADELC	0.01	0.07	0.01	-0.01	-0.02	0.51	1.00	0.01
CC	-0.02	0.15	0.16	-0.15	-0.03	-0.01	0.01	1.00

Panel C (NS as Deflator)

	BV	D	E	GW	RD	ADPRNT	ADELC	CC
BV	1.00	0.60	0.40	0.15	0.01	0.040	0.06	-0.06
D	0.60	1.00	0.53	0.18	0.07	0.06	0.12	0.05
E	0.40	0.53	1.00	0.01	-0.05	0.05	0.06	0.12
GW	0.15	0.18	0.01	1.00	0.11	0.01	0.05	-0.26
RD	0.01	0.07	-0.05	0.11	1.00	-0.02	-0.00	-0.06
ADPRNT	0.04	0.06	0.05	0.01	-0.02	1.00	0.35	-0.01
ADELC	0.06	0.12	0.06	0.05	-0.00	0.35	1.00	-0.01
CC	-0.06	0.05	0.12	-0.26	-0.06	-0.01	-0.01	1.00

Table 5.3: Model 5 Estimation Results -Pooled Sample (1998-2003)

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{51} ADPRNT_{it} + \alpha_{61} ADELC_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Panel A (BV as Deflator)

Variable	Const	BV	E	GW	RD	ADPRNT	ADELC	D	CC	R^2	Cases
Pooled	1690.30	1.08	0.45	0.38	8.55	20.49	24.60	17.81	-1.48	0.22	7639
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.07)	(0.00)	(0.00)		

Panel B (OMV as Deflator)

Variable	Const	BV	E	GW	RD	ADPRNT	ADELC	D	CC	R^2	Cases
Pooled	1149.70	0.49	0.22	0.37	4.15	9.91	6.61	9.05	-0.81	-0.33	7436
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)		

Panel C (NS as Deflator)

Variable	Const	BV	E	GW	RD	ADPRNT	ADELC	D	CC	R^2	Cases
Pooled	619.27	0.42	1.45	0.51	9.58	26.45	19.22	12.23	-1.67	0.41	7376
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	()	

Table 5.4: Wald Test - ADPRNT and ADELC Coefficients Equalized

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{51} ADPRNT_{it} + \alpha_{61} ADELC_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Panel A (BV as Deflator)

	ADPRNT Coefficient (α_{51})	ADELC Coefficient (α_{61})	F-statistic
Pooled sample (1998-2003)	20.49	24.60	0.05
p-value			(0.82)

Panel B (OMV as Deflator)

	ADPRNT Coefficient (α_{51})	ADELC Coefficient (α_{61})	F-statistic
Pooled sample (1998-2003)	9.91	6.61	0.34
p-value			(0.56)

Panel C (NS as Deflator)

	ADPRNT Coefficient (α_{51})	ADELC Coefficient (α_{61})	F-statistic
Pooled sample (1998-2003)	26.45	19.22	0.41
p-value			(0.52)

Note: Restriction: $\alpha_{51} = \alpha_{61}$ based on White's heteroscedasticity adjusted consistent standard errors

Table 5.5: Press and Television Advertising - Descriptive Statistics

Panel A (BV as Deflator)

	MV	D	E	GW	RD	ADPRES	ADTV	CC
Mean	2.78	0.04	-0.07	0.18	0.037	0.001	0.00	-0.16
Median	1.52	0.03	0.06	0.00	0.00	0.00	0.00	-0.001
Maximum	43.35	0.95	1.47	4.89	1.12	0.22	0.04	0.62
Minimum	0.10	0.00	-11.57	0.00	0.00	0.00	0.00	-8.12
Std. Dev.	3.939	0.06	0.65	0.41	0.10	0.01	0.003	0.44
Observations	7629	7629	7629	7629	7629	7629	7629	7629

Panel B (OMV as Deflator)

	MV	BV	D	E	GW	RD	ADPRES	ADTV	CC
Mean	1.14	0.78	0.02	-0.03	0.09	0.01	0.001	0.00	-0.06
Median	1.00	0.60	0.02	0.04	0.00	0.00	0.00	0.00	-0.00
Maximum	12.65	8.50	0.34	0.52	4.04	1.12	0.05	0.05	0.34
Minimum	0.03	0.01	0.00	-4.47	0.00	0.00	0.00	0.00	-4.24
Std. Dev.	0.85	0.67	0.02	0.30	0.24	0.04	0.003	0.00	0.22
Observations	7436	7436	7436	7436	7436	7436	7436	7436	7436

Panel C (NS as Deflator)

	MV	BV	D	E	GW	RD	ADPRES	ADTV	CC
Mean	1.98	1.14	0.05	0.06	0.16	0.018	0.001	0.001	-0.08
Median	1.16	0.63	0.02	0.04	0.00	0.00	0.00	0.00	-0.001
Maximum	25.04	24.73	0.75	1.92	5.51	0.64	0.13	0.13	0.56
Minimum	0.002	0.002	0.00	-3.00	0.00	0.00	0.00	0.00	-4.38
Std. Dev.	2.42	1.52	0.07	0.25	0.43	0.05	0.01	0.01	0.28
Observations	7371	7371	7371	7371	7371	7371	7371	7371	7371

Table 5.6: Press and Television Advertising - Correlation Matrix

Panel A (BV as Deflator)

	D	E	GW	RD	ADPRES	ADTV	CC
D	1.00	0.25	0.06	-0.01	0.08	0.11	0.15
E	0.25	1.00	-0.09	-0.20	-0.02	0.03	0.22
GW	0.06	-0.09	1.00	0.03	-0.01	0.01	-0.11
RD	-0.01	-0.20	0.03	1.00	-0.01	-0.01	-0.09
ADPRES	0.08	-0.02	-0.01	-0.01	1.00	0.26	-0.02
ADTV	0.11	0.03	0.01	-0.01	0.26	1.00	0.02
CC	0.15	0.22	-0.11	-0.09	-0.02	0.02	1.00

Panel B (OMV as Deflator)

	BV	D	E	GW	RD	ADPRES	ADTV	CC
BV	1.00	0.21	-0.06	0.05	0.001	0.05	0.01	-0.02
D	0.21	1.00	0.29	-0.03	-0.08	0.04	0.05	0.15
E	-0.06	0.29	1.00	-0.10	-0.18	-0.01	0.01	0.16
GW	0.05	-0.03	-0.10	1.00	0.06	-0.01	-0.004	-0.15
RD	0.001	-0.08	-0.18	0.06	1.00	-0.02	-0.02	-0.03
ADPRES	0.05	0.04	-0.01	-0.01	-0.02	1.00	0.42	-0.01
ADTV	0.01	0.05	0.01	-0.004	-0.02	0.42	1.00	0.01
CC	-0.02	0.15	0.16	-0.15	-0.03	-0.01	0.01	1.00

Panel C (NS as Deflator)

	BV	D	E	GW	RD	ADPRES	ADTV	CC
BV	1.00	0.60	0.40	0.15	0.02	0.05	0.06	-0.06
D	0.60	1.00	0.53	0.18	0.07	0.07	0.11	0.05
E	0.40	0.53	1.00	0.01	-0.04	0.05	0.06	0.12
GW	0.15	0.18	0.01	1.00	0.12	-0.01	0.03	-0.26
RD	0.02	0.07	-0.04	0.12	1.00	-0.02	0.01	-0.06
ADPRES	0.05	0.07	0.05	-0.01	-0.02	1.00	0.40	-0.01
ADTV	0.06	0.11	0.06	0.03	0.01	0.40	1.00	-0.002
CC	-0.06	0.05	0.12	-0.26	-0.06	-0.01	-0.002	1.00

Table 5.7: Model 6 Estimation Results -Pooled Sample (1998-2003)

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{52} ADPRES_{it} + \alpha_{62} ADTV_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Panel A (BV as Deflator)

Variable	Const	BV	E	GW	RD	ADPRES	ADTV	D	CC	R^2	Cases
Pooled (p-value)	1683.51 (0.00)	1.08 (0.00)	0.40 (0.00)	0.38 (0.00)	9.64 (0.00)	21.14 (0.00)	28.16 (0.09)	16.83 (0.00)	-1.43 (0.00)	0.22	7629

Panel B (OMV as Deflator)

Variable	Const	BV	E	GW	RD	ADPRES	ADTV	D	CC	R^2	Cases
Pooled (p-value)	920.71 (0.00)	0.49 (0.00)	0.18 (0.00)	0.37 (0.00)	4.20 (0.00)	14.32 (0.00)	8.47 (0.01)	9.23 (0.00)	-0.82 (0.00)	-0.34	7436

Panel C (NS as Deflator)

Variable	Const	BV	E	GW	RD	ADPRES	ADTV	D	CC	R^2	Cases
Pooled (p-value)	522.85 (0.00)	0.42 (0.00)	1.44 (0.00)	0.55 (0.00)	9.60 (0.00)	18.76 (0.01)	12.93 (0.03)	12.24 (0.00)	-1.63 (0.00)	0.41	7371

Table 5.8: Wald Test - ADPRES and ADTV Coefficients Equalized

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{52} ADPRES_{it} + \alpha_{62} ADTV_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Panel A (BV as Deflator)

	ADPRES Coefficient (α_{52})	ADTV Coefficient(α_{62})	F-statistic
Pooled sample (1998-2003)	21.14	28.16	0.14
p-value			(0.71)

Panel B (OMV as Deflator)

	ADPRES Coefficient (α_{52})	ADTV Coefficient α_{62})	F-statistic
Pooled sample (1998-2003)	14.32	8.47	0.84
p-value			(0.36)

Panel C (NS as Deflator)

	ADPRES Coefficient (α_{52})	ADTV Coefficient α_{62})	F-statistic
Pooled sample (1998-2003)	18.76	12.93	0.26
p-value			(0.61)

Note: Restriction: $\alpha_{52} = \alpha_{62}$ based on White's heteroscedasticity adjusted consistent standard errors

Table 5.9: Television and non-Television Advertising- Descriptive Statistics

Panel A (BV as Deflator)

	MV	D	E	GW	RD	ADTV	ADNTV	CC
Mean	2.82	0.04	-0.07	0.18	0.04	0.001	0.001	-0.16
Median	1.52	0.03	0.06	0.00	0.00	0.00	0.00	-0.001
Maximum	48.59	1.07	1.945	4.89	2.56	0.11	0.13	0.90
Minimum	0.10	0.00	-11.57	0.00	0.00	0.00	0.00	-8.12
Std. Dev.	4.07	0.06	0.66	0.41	0.12	0.01	0.01	0.44
Observations	7644	7644	7644	7644	7644	7644	7644	7644

Panel B (OMV as Deflator)

	MV	BV	D	E	GW	RD	ADTV	ADNTV	CC
Mean	1.14	0.78	0.02	-0.03	0.09	0.01	0.000378	0.001	-0.06
Median	1.00	0.60	0.02	0.04	0.00	0.00	0.000000	0.00	-0.00
Maximum	12.65	8.50	0.34	0.52	4.04	1.12	0.058719	0.09	0.34
Minimum	0.03	0.01	0.00	-4.47	0.00	0.00	0.000000	0.00	-4.24
Std. Dev.	0.85	0.66	0.02	0.30	0.24	0.04	0.003089	0.01	0.22
Observations	7439	7439	7439	7439	7439	7439	7439	7439	7439

Panel C (NS as Deflator)

	MV	BV	D	E	GW	RD	ADTV	ADNTV	CC
Mean	1.98	1.13	0.05	0.06	0.16	0.01	0.001	0.001	-0.08
Median	1.16	0.63	0.02	0.04	0.00	0.00	0.00	0.00	-0.001
Maximum	25.05	24.73	0.75	1.92	5.51	0.64	0.10	0.13	0.56
Minimum	0.002	0.001	0.00	-3.01	0.00	0.00	0.00	0.00	-4.38
Std. Dev.	2.45	1.52	0.07	0.25	0.43	0.05	0.01	0.01	0.28
Observations	7367	7367	7367	7367	7367	7367	7367	7367	7367

Table 5.10: Television and non-Television Advertising - Correlation Matrix

Panel A (BV as Deflator)

	D	E	GW	RD	ADTV	ADNTV	CC
D	1.00	0.25	0.06	-0.02	0.10	0.10	0.14
E	0.25	1.00	-0.10	-0.25	0.03	-0.01	0.21
GW	0.06	-0.10	1.00	0.02	0.02	-0.01	-0.11
RD	-0.02	-0.25	0.02	1.00	-0.01	-0.01	-0.09
ADTV	0.10	0.03	0.02	-0.01	1.00	0.38	0.02
ADNTV	0.10	-0.01	-0.01	-0.01	0.38	1.00	-0.02
CC	0.14	0.21	-0.11	-0.09	0.02	-0.02	1.00

Panel B (OMV as Deflator)

	BV	D	E	GW	RD	ADTV	ADNTV	CC
BV	1.00	0.21	-0.06	0.05	0.002	0.01	0.05	-0.02
D	0.21	1.00	0.29	-0.03	-0.08	0.05	0.04	0.15
E	-0.06	0.29	1.00	-0.10	-0.17	0.01	-0.02	0.16
GW	0.05	-0.03	-0.10	1.00	0.06	-0.01	-0.01	-0.15
RD	0.002	-0.08	-0.17	0.06	1.00	-0.02	-0.02	-0.03
ADTV	0.01	0.05	0.01	-0.01	-0.02	1.00	0.47	0.01
ADNTV	0.05	0.04	-0.02	-0.01	-0.02	0.47	1.00	-0.01
CC	-0.02	0.15	0.16	-0.15	-0.03	0.01	-0.01	1.00

Panel C (NS as Deflator)

	BV	D	E	GW	RD	ADTV	ADNTV	CC
BV	1.00	0.60	0.41	0.15	0.02	-0.06	0.06	0.04
D	0.60	1.00	0.53	0.18	0.07	0.05	0.12	0.07
E	0.41	0.53	1.00	0.01	-0.05	0.11	0.06	0.05
GW	0.15	0.18	0.01	1.00	0.11	-0.27	0.05	0.01
RD	0.02	0.07	-0.05	0.11	1.00	-0.06	0.01	-0.02
ADTV	0.06	0.12	0.06	0.05	0.01	-0.01	1.00	0.36
ADNTV	0.04	0.07	0.05	0.01	-0.02	-0.01	0.36	1.00
CC	-0.06	0.05	0.11	-0.27	-0.06	1.00	-0.01	-0.01

Table 5.11: Model 7 Estimation Results -Pooled Sample (1998-2003)

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{53} ADTV_{it} + \alpha_{63} ADNTV_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Panel A (BV as Deflator)

Variable	Const	BV	E	GW	RD	ADTV	ADNTV	D	CC	R^2	Cases
Pooled (p-value)	1676.12 (0.00)	1.12 (0.00)	0.47 (0.00)	0.40 (0.00)	8.73 (0.00)	6.65 (0.57)	24.62 (0.00)	16.87 (0.00)	-1.45 (0.00)	0.22	7644

Panel B (OMV as Deflator)

Variable	Const	BV	E	GW	RD	ADTV	ADNTV	D	CC	R^2	Cases
Pooled (p-value)	1146.31 (0.00)	0.50 (0.00)	0.22 (0.00)	0.37 (0.00)	4.16 (0.00)	6.72 (0.03)	10.16 (0.00)	8.94 (0.00)	-0.80 (0.00)	-0.33	7439

Panel C (NS as Deflator)

Variable	Const	BV	E	GW	RD	ADTV	ADNTV	D	CC	R^2	Cases
Pooled (p-value)	758.94 (0.06)	0.42 (0.00)	1.47 (0.00)	0.53 (0.00)	9.55 (0.00)	15.32 (0.02)	26.81 (0.00)	12.16 (0.00)	-1.66 (0.00)	0.41	7367

Table 5.12: Wald Test - ADPRES and ADTV Coefficients Equalized

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_{53} ADTV_{it} + \alpha_{63} ADNTV_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Panel A (BV as Deflator)

	ADTV Coefficient α_{53}	ADNTV Coefficient α_{63}	F-statistic
Pooled sample (1998-2003)	6.652	24.62	1.43
p-value			(0.23)

Panel B (OMV as Deflator)

	ADTV Coefficient α_{53}	ADNTV Coefficient α_{63}	F-statistic
Pooled sample (1998-2003)	6.72	10.16	0.37
p-value			(0.54)

Panel C (NS as Deflator)

	ADTV Coefficient α_{53}	ADNTV Coefficient α_{63}	F-statistic
Pooled sample (1998-2003)	15.32	26.81	1.50
p-value			(0.22)

Note: Restriction: $\alpha_{53} = \alpha_{63}$ based on White's heteroscedasticity adjusted consistent standard errors

Table 5.13: Expected Coefficient Signs - Explanatory Variables

Variable	Symbol	Expected Coefficient Sign
Book Value	BV	+
Earnings	E	+
Goodwill	GW	+
Research and Development Expenditures	RD	+
Dividend	D	+
Capital Contributions	CC	-
Print Media Advertising Expenditures	ADPRNT	+
Electronic Media Advertising Expenditures	ADELC	+
Press Advertising Expenditures	ADPRES	+
Television Advertising Expenditures	ADTV	+
Non-Television Advertising Expenditures	ADNTV	+

Chapter 6

The Value Relevance of Goodwill, Advertising and R&D: Some Evidence on Industry, Firm Performance and Size Effects

6.1 Introduction

In the previous chapter we have provided empirical evidence on differential media valuation effects by segregating total advertising expenditures into different media expenditures. In chapter 4 we estimated our model 4 on the full sample of firms to examine the valuation relevance of goodwill, R&D and advertising. Connolly and Hirschey (1990), Chauvin and Hirschey (1993), Acs and Audretsch (1988), Chauvin and Hirschey (1994), Hirschey and Spencer (1992), Chan et al. (1990), and Doukas and Switzer (1992), among others, provide support for testing firm size (small versus large) and industry effects (manufacturing versus non-manufacturing) hypotheses. Jennings et al. (2001) and Hayan (1995), among others, report different coefficients measures for profit and loss firms.

In this chapter we partition the pooled sample used in chapter 4 into manufacturing and non-manufacturing firms, profit and loss making firms, and small and large firms[99] to study potential differences regarding the value relevance of goodwill, R&D, and advertising for different firm sectors, firm sizes and firm performances. In this chapter we estimate model 4 (as described in chapter 3) for each pooled sub-sample and report the empirical results.

The rest of the chapter is divided into the following sections: section 6.2 briefly describes the research approach, the empirical results and discussion are provided in

[99] See appendices 5, 6 and 7 for sample distribution details on the basis of size, industry sector and firm performance respectively.

section 6.3, and section 6.4 concludes the findings and gives a summary of the chapter.

6.2 Research Approach

We divide our pooled sample as used in chapter 4 into the following sub-samples to examine potential differences regarding value relevance of goodwill, R&D, and advertising for different firm sectors, firm sizes and firm performances:

- Manufacturing and Non-Manufacturing firms
- Profit and loss making firms
- Small and large firms (ranked by market value)[100]

We estimate model 3 for each of the pooled sub-samples using three deflators i.e. BV, OMV, and NS. Model 3 is specified as follows:

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi \quad (3)$$

We examine the relationship between goodwill, R&D, advertising and market value of the firm in each sub- sample by testing following null hypotheses:

H_{01} $\alpha_3 = 0$

H_{02} $\alpha_4 = 0$

H_{03} $\alpha_5 = 0$

The regression coefficients are estimated by using OLS regressions based on White (1980) heteroscedasticity consistent standard errors and covariance estimates. We report the p values (probability values) under a two-tailed t-test along with slope

[100] We split data into three groups, based on market value, and ignore middle group to avoid contamination within the middle group.

coefficients. In our results a non-zero coefficient on these intangibles will be interpreted as their value relevance. Table 6.7 identifies the expected signs for each coefficient. We apply dummy variable technique[101] to test equality between sets of coefficients.

6.3 Empirical Results and Discussion

6.3.1 Manufacturing and Non-Manufacturing Firms

Tables 6.1 and 6.2 provide OLS estimation results for the manufacturing and non-manufacturing firms sub samples. For manufacturing firms the GW coefficients are positive but statistically significant for only the OMV and NS deflators. These coefficient values are respectively 0.13, 0.35 and 0.44 when BV, OMV and NS are deflators. We can reject null hypotheses only for two deflators OMV and NS.

For non-manufacturing firms the GW coefficients (0.63, 0.42, and 0.68 when BV, OMV and NS are deflators respectively) are highly significant and larger than the corresponding coefficients of the manufacturing firms' sample. Hence we reject the null hypothesis $\alpha_3 = 0$ at the 1% significance level for all three deflators. Results seem supporting the perception that service companies have more of their value driven by goodwill and other intangible assets.

Table 6.8, summarises the results of coefficient equality test for manufacturing and non-manufacturing firms pooled sample. We only find significant coefficient for our dummy variable GWDMY for two deflators (BV and OMV). Coefficients for two other dummy variables, RDDMY and ADDMY, are not statistically significant for any of

[101] See section 3.6.1.

three deflators (BV, OMV and NS) used. These results show that slope coefficients are only statistically different for goodwill for two groups.

In a similar study to the present research Chauvin and Hirschey (1994) find significant positive goodwill effects for non-manufacturing firms only. They argue that (p.176), '*...goodwill numbers have a generally positive and statistically significant effect on the market value of the firm...this generally positive market-value influence of goodwill numbers stems from the non-manufacturing sector; no significant market-value impact is obvious for manufacturing firms*'. Their research indicates that market assign more value to non-manufacturing firms' goodwill.

The variable RD in the present research has a positive and significant effect on market value in each of the manufacturing and non-manufacturing sub-sectors. We can therefore reject the null hypothesis at the 1% level in each of the manufacturing and non-manufacturing firms' sub-samples separately for all three deflators used. However the sizes of slope coefficients on RD are almost the same for both sectors. The slope coefficients on the variable AD are positive and significant in each sub-sample. These findings are consistent with the view that advertising is an effective means for product differentiation for both manufacturing and non-manufacturing firms[102]. These findings are also in line with the findings of previous studies such as Chauvin and Hirschey (1993 and 1994), which report consistent valuation effects of both RD and AD in manufacturing and non-manufacturing firms. In the UK, our results are consistent with those of Shah and Stark (2003), which find and report valuation effects of RD in manufacturing and non-manufacturing firms.

[102] Chauvin and Hirschey (1993) argue that (p.136), '...it is likely that advertising expenditures give rise to effective product differentiation in a broad range of industries'.

The control variables in the models (i.e. E, D, and CC) have significant influence on market value in both sub-samples and the results do not show any critical differences.

6.3.2 Profit and Loss Making Firms

OLS estimation results for profit and loss making firms are shown in tables 6.3 and 6.4. For the profit making firms the variables GW, RD and AD are positive and highly significant for all three deflators used. For the loss making firms the coefficients on GW are inconsistent with the hypothesised values being negative when BV and NS are the deflators (but significant at the 5% level only when BV is the deflator) and positive and significant at the 5% level when OMV is the deflator.

We can reject null hypothesis 1 ($\alpha_3 = 0$) at the 1% level for the profit making firms sample for all three deflators and at the 5% level in the loss making firms sample only for two deflators (BV and OMV). RD and AD are highly significant for loss making firms also. We can reject null hypotheses 2 and 3 ($\alpha_4 = 0$ and $\alpha_5 = 0$) at the 1% level in both sub-samples and for all three deflators used. The RD coefficient estimates are almost equal for both profit-making and loss-making firms but the AD coefficient estimates are larger for loss making firms than for profit making firms.

The above findings suggest that the market perceives investment in R&D and advertising by both profit-making and loss-making firms as good news and values advertising expenditures more for loss-making firms than for profit-making firms. The positive and significant valuation effects observed for RD and AD for loss-making firms suggest that investors ignore negative profitability in their valuation estimation and look beyond the short-term impact of major strategic investments when valuing a firm. These results also indicate that investors do not solely rely on

accounting information, but also take into account positive signals of managerial confidence in the future prospects of the firm when valuing the firm.

Table 6.9, summarises the results of coefficient equality test for profit-making and loss-making firms pooled sample. We find and report significant coefficients for GWDMY and ADDMY for all three deflators, while coefficient on RDDMY is only significant for one deflator (BV). These results show that slope coefficients are statistically different for goodwill and advertising for two groups.

BV, D, and CC have significant influences on market value in both sub-samples and the results do not show any critical differences. The difference between the results for profit-making firms and loss-making firm is the coefficient for earnings (E). The coefficient is positive and significant for profit-making firms but negative and not significant for loss-making firms.

6.3.3 Small and Large Firms

Tables 6.5 and 6.6 present the OLS estimation results for the two sub-samples of the small and large firms, which have been divided on the basis of market value of the firms. In the small firms sample, the slope coefficients of goodwill (GW) are not consistently statistically distinguishable from zero at 1% level. GW coefficient is only positive and statistically significant for OMV deflator; while, the same is negative and insignificant for BV and NS deflators[103]. In the large firms sample, the GW coefficients are positive but significant for two deflators i.e. OMV and NS. Also, the GW coefficients for the large firms sample are larger than for the small firms sample.

[103] Shah and Stark (2004), also report negative coefficients of GW for their small firms sample.

The slope coefficients of RD are positive and highly significant for both sub-samples and for all deflators used except for BV deflator in small firms sample. In small firms sample for BV deflator, the RD coefficient is positive but insignificant. For the small firms sample, the AD coefficients are positive but significant only for two deflators (OMV and NS) at the 5% and 1% levels respectively. However these coefficients are positive and significant for the large firms sample for all three deflators used. Also the coefficients of RD and AD are larger for the large firms sample than for the small firms sample. These results seems to support the firm size hypothesis that states that R&D and advertising spending are likely to be more effective for larger firms. The results suggest that larger firms (in terms of market capitalisation) may more efficiently utilise intangible assets due to economies of scale (as argued by Chauvin and Hirschey, 1993). In addition these results are consistent with other previous research such as Chan et al. (1990) and Doukas and Switzer (1992).

Chauvin and Hirschey (1993) provide empirical evidence of size effects of advertising and R&D and argue (p.137), '*...the potential exists for the market value impact of advertising and R&D effectiveness to differ according to firm size. To the extent that economies of scales or other size advantages in advertising and R&D are present, the market value effect of a dollar in advertising and/or R&D expenditures will be greater for larger firms as opposed to smaller firms...based upon a market value perspective, the advertising and R&D activity of larger firms appears to be relatively more effective than that of smaller companies*'.

Hirschey and Spencer (1992) also find differences in the market valuation of R&D and AD across size classes, but they find R&D value relevant within each size class

but more important for small firms as they argue (p.94), '*...these results may imply that the risk-reducing benefits offered by patent protection are especially important to small firm. Alternatively, the market may place a relatively higher value on small firms whose growth options are specifically tied to R&D expenditures*'. . Hence, their findings overall do not confirm the large-firm superiority notion in R&D effectiveness. In contrast to significant positive market valuation effects of R&D for all sizes, Hirschey and Spencer (1992) find strong positive influence of AD on market value only for large firms. Taken together these findings suggest that size advantages matter in determining the valuation effects of R&D and advertising.

Table 6.10, summarises the results of coefficient equality test for large and small firms pooled sample. We find significant coefficients for GWDMY and ADDMY for two deflators (OMV and NS), while coefficients on RDDMY are highly significant for all three deflators (BV, OMV and NS). These results suggest that slope coefficients are statistically different for goodwill, advertising, and research and development for both sub-samples.

The coefficients on BV, E, D, and CC are larger for large firms than small firms. All these variables have significant influences on market value in both sub-samples and the results do not show any critical differences with the exception of the variable E. In the large firms sample E is positive but only significant for two deflators, BV and NS.

6.4 Summary and Conclusions

Connolly and Hirschey (1990), Chauvin and Hirschey (1993 and 1994), Hirschey and Spencer (1992), Chan et al. (1990), Doukas and Switzer (1992), Jennings et al. (2001), Hayan (1995), and Shah and Stark (2003) among others, suggest the potential

for differences in the effectiveness of goodwill, R&D and advertising for manufacturing and non-manufacturing, small and large firms as well as profit and loss making firms.

To obtain additional insights into the valuation effects of goodwill, R&D and advertising, we estimated model 3 for different sub-samples (manufacturing and non-manufacturing, profit and loss making firms, and small and large firms). This chapter present these regression results.

The results obtained from the manufacturing and non-manufacturing sub-samples show that while RD and AD are valued equally for these sectors, the market assigns more value to non-manufacturing firms' goodwill. We also find that the market values investments in R&D and advertising for both profit-making and loss-making firms almost equally. This suggests that investors look beyond the short-term impact of major strategic investments when valuing a firm. There is also some evidence that goodwill, R&D, and advertising are likely to be more effective for larger firms. Overall our findings show that size advantages are relative in determining the valuation effects of goodwill, R&D and advertising.

These results of sub-sample analysis overall confirm our earlier findings in chapter 4 and add some additional evidence that the market attaches different values to investments in GW, RD and AD by firms in different sectors (manufacturing and non-manufacturing), of different sizes (large and small) and with different performances (profit making and loss making). The next chapter summarizes and concludes the findings of this thesis.

Table 6.1: Estimation Results - Manufacturing Firms Pooled Sub-Sample

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Panel A (BV as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	1490.17	1.07	0.42	16.66	0.13	8.57	12.88	-1.69	0.23	4,010
(p-value)	(0.01)	(0.00)	(0.01)	(0.00)	(0.41)	(0.00)	(0.00)	(0.00)		

Panel B (OMV as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	836.29	0.45	0.31	8.50	0.35	4.57	5.08	-0.82	-0.33	3,913
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)		

Panel C (NS as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	375.89	0.41	1.35	13.02	0.44	7.79	17.07	-1.85	0.47	3,858
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)		

Notes:

MV is Market value of a firm; BV is Book value of equity of a firm; E is Earnings as reported in income statement; D is Ordinary Dividends; GW is Goodwill; RD is Research and Development Expenditures; AD is Advertising Expenditures and CC is Capital Contributions.

Table 6.2: Estimation Results – Non-Manufacturing Firms Pooled Sub-Sample

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Panel A (BV as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	1943.75	1.16	0.48	17.70	0.63	8.81	10.91	-1.21	0.19	3,628
(p-value)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)		

Panel B (OMV as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	1112.80	0.54	0.07	10.09	0.42	4.56	4.79	-0.76	-0.33	3,548
(p-value)	(0.00)	(0.00)	(0.34)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		

Panel C (NS as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	1643.24	0.42	1.63	11.39	0.68	9.40	14.93	-1.55	0.35	3,467
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		

Notes:
MV is Market value of a firm; BV is Book value of equity of a firm; E is Earnings as reported in income statement; D is Ordinary Dividends; GW is Goodwill; RD is Research and Development Expenditures; AD is Advertising Expenditures and CC is Capital Contributions.

Table 6.3: Estimation Results - Profit Making Firms Pooled Sub-Sample

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Panel A (BV as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	1249.70	0.08	11.21	5.86	0.97	10.20	7.57	-1.66	0.36	5,220
(p-value)	(0.01)	(0.43)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		

Panel B (OMV as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	542.69	0.25	5.58	4.31	0.58	3.46	2.97	-1.10	-0.31	5,151
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		

Panel C (NS as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	410.95	0.20	5.60	8.10	0.76	6.79	10.39	-1.59	0.45	4,946
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		

Notes:

MV is Market value of a firm; BV is Book value of equity of a firm; E is Earnings as reported in income statement; D is Ordinary Dividends; GW is Goodwill; RD is Research and Development Expenditures; AD is Advertising Expenditures and CC is Capital Contributions.

Table 6.4: Estimation Results - Loss Making Firms Pooled Sub-Sample

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Panel A (BV as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	1326.96	1.38	-0.16	8.48	-0.40	6.31	25.14	-1.11	0.19	2,418
(p-value)	(0.00)	(0.00)	(0.29)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)		

Panel B (OMV as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	934.14	0.48	-0.09	4.61	0.19	4.00	9.09	-0.56	-0.14	2,310
(p-value)	(0.00)	(0.00)	(0.10)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)		

Panel C (NS as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	783.87	0.56	-0.24	6.52	-0.15	6.52	46.94	-1.45	0.28	2,379
(p-value)	(0.25)	(0.00)	(0.23)	(0.00)	(0.29)	(0.00)	(0.00)	(0.00)		

Notes:

MV is Market value of a firm; BV is Book value of equity of a firm; E is Earnings as reported in income statement; D is Ordinary Dividends; GW is Goodwill; RD is Research and Development Expenditures; AD is Advertising Expenditures and CC is Capital Contributions.

Table 6.5: Estimation Results - Small Firms Pooled Sub-Sample

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Panel A (BV as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	87.95	0.63	0.04	1.37	-0.01	0.05	0.56	-0.01	0.06	2,546
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.15)	(0.45)	(0.27)	(0.27)		

Panel B (OMV as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	495.50	0.32	0.04	6.37	0.19	1.67	3.68	-0.21	-1.39	2,487
(p-value)	(0.00)	(0.00)	(0.06)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)		

Panel C (NS as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	1093.36	0.36	0.03	1.86	-0.04	1.68	5.17	-0.09	0.08	2,442
(p-value)	(0.00)	(0.00)	(0.19)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)		

Notes:

MV is Market value of a firm; BV is Book value of equity of a firm; E is Earnings as reported in income statement; D is Ordinary Dividends; GW is Goodwill; RD is Research and Development Expenditures; AD is Advertising Expenditures and CC is Capital Contributions.

Table 6.6: Estimation Results - Large Firms Pooled Sub-Sample

$$MV = \alpha_0 + \alpha_1 BV_{it} + \alpha_2 E_{it} + \alpha_3 GW_{it} + \alpha_4 RD_{it} + \alpha_5 AD_{it} + \alpha_6 D_{it} + \alpha_7 CC_{it} + \xi$$

Panel A (BV as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	1170.20	4.25	0.29	10.93	0.19	6.87	9.67	-1.09	0.11	2,546
(p-value)	(0.00)	(0.00)	(0.05)	0.00)	(0.35)	(0.00)	(0.01)	(0.00)		

Panel B (OMV as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	1102.10	0.69	0.15	11.04	0.53	5.16	4.73	-1.07	-0.75	2,487
(p-value)	(0.00)	(0.00)	(0.16)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)		

Panel C (NS as Deflator)

Variable	Const	BV	E	D	GW	RD	AD	CC	R^2	Cases
Pooled	493.80	0.39	1.89	13.55	0.57	10.72	24.77	-2.18	0.09	2,442
(p-value)	0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		

Notes:

MV is Market value of a firm; BV is Book value of equity of a firm; E is Earnings as reported in income statement; D is Ordinary Dividends; GW is Goodwill; RD is Research and Development Expenditures; AD is Advertising Expenditures and CC is Capital Contributions.

Table 6.7: Expected Coefficient Signs - Explanatory Variables

Variable	Symbol	Expected Coefficient Sign
Book Value	BV	+
Earnings	E	+
Goodwill	GW	+
Advertising Expenditures	AD	+
Research and Development Expenditures	RD	+
Dividend	D	+
Capital Contributions	CC	-

Table 6.8: Coefficients Equality Test Results – Manufacturing – Non-Manufacturing Firms

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 GW + \alpha_4 RD + \alpha_5 AD + \alpha_6 D + \alpha_7 CC + \alpha_{13} GWDMY + \alpha_{14} RDDMY + \alpha_{15} ADDMY + \xi$$

Panel A (BV as Deflator)

Variable	GWDMY	RDDMY	ADDMY	Cases
Pooled	-0.54	-0.50	1.11	7,637
(p-value)	(0.00)	(0.65)	(0.82)	

Panel B (OMV as Deflator)

Variable	GWDMY	RDDMY	ADDMY	Cases
Pooled	-0.25	-0.92	-1.94	7,461
(p-value)	(0.01)	(0.31)	(0.41)	

Panel C (NS as Deflator)

Variable	GWDMY	RDDMY	ADDMY	Cases
Pooled	-0.09	-1.33	3.27	7,325
(p-value)	(0.30)	(0.41)	(0.51)	

Table 6.9: Coefficients Equality Test Results – Profit and Loss Making Firms

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 GW + \alpha_4 RD + \alpha_5 AD + \alpha_6 D + \alpha_7 CC + \alpha_{13} GWDMY + \alpha_{14} RDDMY + \alpha_{15} ADDMY + \xi$$

Panel A (BV as Deflator)

Variable	GWDMY	RDDMY	ADDMY	Cases
Pooled	1.16	5.79	-16.55	7,637
(p-value)	(0.00)	(0.00)	(0.01)	

Panel B (OMV as Deflator)

Variable	GWDMY	RDDMY	ADDMY	Cases
Pooled	0.48	-0.04	-5.37	7,461
(p-value)	(0.00)	(0.93)	(0.05)	

Panel C (NS as Deflator)

Variable	GWDMY	RDDMY	ADDMY	Cases
Pooled	0.74	-0.88	-41.31	4,946
(p-value)	(0.00)	(0.29)	(0.00)	

Table 6.10: Coefficients Equality Test Results – Large and Small Firms

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 GW + \alpha_4 RD + \alpha_5 AD + \alpha_6 D + \alpha_7 CC + \alpha_{13} GWDMY + \alpha_{14} RDDMY + \alpha_{15} ADDMY + \xi$$

Panel A (BV as Deflator)

Variable	GWDMY	RDDMY	ADDMY	Cases
Pooled	0.31	6.05	9.952	5,091
(p-value)	(0.27)	(0.00)	(0.30)	

Panel B (OMV as Deflator)

Variable	GWDMY	RDDMY	ADDMY	Cases
Pooled	1.02	5.34	9.85	4,974
(p-value)	(0.00)	(0.00)	(0.01)	

Panel C (NS as Deflator)

Variable	GWDMY	RDDMY	ADDMY	Cases
Pooled	1.22	8.91	30.25	4,884
(p-value)	(0.00)	(0.00)	(0.05)	

Chapter 7

Key Findings, the Contributions of the Research, and Limitations of the Research

7.1 Introduction

This research is concerned with the valuation relevance of intangible assets. The purpose of this research is to provide evidence on the valuation relevance of goodwill, research and development and advertising expenditures in the UK capital markets. Previous research, using mostly US data, generally suggests the valuation relevance of goodwill numbers, advertising and R&D expenditures but overall the empirical evidence, which is available, is contradictory and indecisive. An area where empirical evidence is especially scare and inconclusive is the UK. In addition studies that examine the information value of goodwill amortisation provide inconsistent results. Also as mentioned by Hirschey (1982), previous research concentrates only on aggregate advertising expenditures ignoring possible differential media influences.

Building on the previous research themes just noted, the main goals of this thesis are: a) to examine the association between reported goodwill numbers, R&D and advertising expenditures and market value; b) to investigate possible differential media impacts on the market value of the firm by disaggregating total advertising expenditures into different media level expenditures; and c) to examine potential differences regarding the value relevance of goodwill, R&D, and advertising for different firm sectors, firm sizes and firm performances.

The sample of UK companies that we examine covers the period 1998-2003. Our sample includes all UK listed non-financial companies (both dead and live) for which data are available. To remove extreme values from our sample we applied conventional 0.5% deletion criteria.

To investigate the value relevance of intangibles i.e. goodwill, research and development and advertising expenditures, cross-sectional valuation models (in deflated form) are used in this study. The Ordinary Least Square technique is used to explain the relation between the dependent variable and various explanatory variables. We report the p values (probability values) under a two-tailed t-test along with slope coefficients.

This chapter summarises the key findings of this thesis and discusses their implications. It also discusses the study's limitations and identifies the areas for further research. It is structured as follows: section 7.2 summarises the key findings of this study, research contributions are provided in section 7.3 and the final section 7.4 presents the limitations of the study and suggestions for further research.

7.2 Key Findings

Several prior studies as discussed in chapter 2, provide empirical evidence on the relevance of intangibles (goodwill, R&D and advertising, among others) for equity valuation. Most of this prior research focused on single country settings (normally having used US data). Previous research provides consistent evidence on the valuation relevance of R&D. Research findings from prior research regarding the value relevance of advertising are mixed and inconclusive. Also a very little research has investigated possible differential advertising effects with regard to the medium used to communicate it. There is some evidence on media influences, which suggest

television advertising to be more effective than advertising in general. A number of relatively recent studies such as Chauvin and Hirschey (1994), McCarthy and Schneider (1995), and Jennings et al. (1996), have examined empirically the value relevance of goodwill numbers and consistently find a positive association between firm value and goodwill. However, these studies failed to control for similar positive valuation effects of R&D and advertising in their model. In these studies goodwill may be partly reflecting similar positive effects of R&D and adverting. On the other hand research that studies the information value of goodwill amortisation provides inconclusive results and less consistent results. The literature for the UK is considerably more limited both in the number of papers and in the time span of data analysed.

The present study by using a sample of UK firms for the period 1998-2003 finds that the market places a significant value on goodwill, R&D and advertising investments during the period studied. Our results are quite robust both in coefficient significance and overall explanatory power. Our findings provide more consistent empirical evidence of valuation relevance for goodwill and R&D than advertising. These findings are also consistent with previous studies such as Hirschey (1982 and 1985), Hirschey and Wegandt (1985), Hirschey and Spencer (1992), Chauvin and Hirschey (1993), Chauvin and Hirschey (1994), McCarthy and Schneider (1995), Jennings et al. (1996), Henning et al. (2000), and Norris and Ayres (2000), which find these intangible investments of value-relevance to investors.

Our results regarding goodwill amortisation are mixed and inconclusive. In the pooled annual cross sections the coefficient estimate on GWA is negative but insignificant but the equivalent coefficient is positive and significant when OMV and

NS are deflators. Taken together the results generally provide some evidence on the value relevance of goodwill amortisation although this evidence is not decisive. These findings are in line with the findings of other studies such as Jennings et al. (1996), who report mixed results for the association between goodwill amortisation and market value of the firm. Jennings et al. (1996) report weak evidence of a negative relationship between goodwill amortisation and market value of the firm and conclude that for the average firm, goodwill is valued as an asset whose value is expected to decrease, but that for some firms goodwill may be valued as non-wasting asset. Choi et al. (2000) report positive but an insignificant coefficient on goodwill amortisation.

An interesting aspect of much the literature on advertising has been the consideration of only total advertising expenditures at different points in time. The previous research, using aggregate advertising expenditures presumes uniform-advertising effects regardless of type of the medium used to communicate it. However limited prior empirical research such as Hirschey (1982), Muller and Rogers (1980), Hirschey (1978), and Yiannaka et al. (2002), suggests dissimilar effects of advertising communicated through different media.

We measure advertising expenditures using separate levels of aggregation of advertising expenditure (TV advertising, non-TV advertising, print media advertising, electronic media advertising, and press advertising) to detect differential advertising media impacts on firm value. Our overall findings show a positive and significant association between different measures of advertising expenditures and market value of the firm. We find larger coefficients, although not statistically different, for print media advertising compared to electronic media advertising, for non-TV advertising compared to TV advertising, and for press advertising variable

compared to television advertising. However we could not find strong evidence that the effectiveness of advertising varies substantially with the type of medium used to communicate it. The differences in findings of this study when compared to relevant previous studies (which show a supremacy of television advertising over other types of advertising) may be explained in the context of differences in country settings, innovatory technologies, and informational content of different advertising media along with emergence of new media such as the World Wide Web.

Hirschey (1978 and 1982) finds superior effectiveness of television advertising over other advertising in general. Hirschey (1982) argues that this greater impact of television advertising makes a stronger case for television advertising to be treated as and intangible asset than for other types of advertising promotion. In a recent study Yiannaka et al. (2002), find print media advertising more effective than television advertising for Greek processed meats sector firms. Our results provide evidence for the effectiveness of all types of advertising media and this could be used to advocate the treatment of all types of advertising as intangible assets rather than only any one particular type of advertising as suggested in earlier studies.

Prior research such as Connolly and Hirschey (1990), Chauvin and Hirschey (1993 and 1994), Hirschey and Spencer (1992), Chan et al. (1990), Doukas and Switzer (1992), Jennings et al. (2001), and Hayan (1995), among others, suggest the potential for differences in the effectiveness of goodwill, R&D and advertising for manufacturing and non-manufacturing, small and large firms as well as profit and loss making firms.

The results of our analysis of sub-samples provide some additional evidence that the market attaches different values to investments in GW, RD and AD by firms in

different sectors (manufacturing and non-manufacturing), of different sizes (large and small firms) and with different performances (profit-making and loss-making firms). In the manufacturing and non-manufacturing sub-samples, the results of this study suggest that the market seems to assign more value to non-manufacturing firms' goodwill. These findings are consistent with Chauvin and Hirschey (1994), who find significant positive goodwill effects for non- manufacturing firms only.

Positive and significant valuation effects of RD and AD are found for both the profit-making firms and loss-making firms sub-samples which suggests that investors ignore negative profitability in their valuation estimation and look beyond the short-term impact of major strategic investments when valuing a firm. Our findings also provide some evidence that goodwill, R&D and advertising are likely to be more effective for larger firms (in terms of market capitalisation). This further suggests that larger firms efficiently utilise intangible assets due to economies of scale (Chauvin and Hirschey, 1993).

In summary the overall results of this study suggest that the UK market recognises purchased goodwill, R&D, and advertising investments as assets and incorporate information relating to these variables in the valuation of the firm. In view of the evidence provided by this study and prior studies, investments in R&D and advertising should be capitalised and amortised over their economic estimated life. These findings could be of importance to those involved in and affected by accounting standard-setting deliberations.

These findings have significant implications for future standard setting in the UK and other countries where such investments (e.g. R&D and advertising) are generally expensed as incurred leading to downward bias in the value of assets, current

earnings and shareholders' equity. Companies' financial statements may not reflect the true value of the firm because of a widening gap between accounting book values and market values due to intangible assets not being capitalised. Canibano et al. (2000,p.124) argue that, ' *...accounting has failed to provide an accurate view of intangible value drivers and therefore traditional (historical cost) financial statements have experienced a significant loss of relevance...as a consequence, there is currently a significant gap between the accounting estimate of the firm's value...and its market value'.* Canibano et al. (2000) demand that standard setting bodies should make efforts to improve current accounting regulations in order to provide relevant information on the intangible determinants of the value of companies. From the results of this study it is quite clear that capitalised goodwill imparts important information to the market, which supports the view that FRS10[104] is consistent with the nature of underlying intangible assets.

These results should also interest analysts and creditors seeking to evaluate firms' intangible investments, professionals engaged in designing disclosure strategies, and academics exploring issues related to intangibles.

7.3 Research Contributions

This research contributes in a number of ways. One of the major contributions of this study is that it adds to the very limited research available on intangibles in the UK. This study helps understand better the extent to which intangibles (goodwill, R&D, and advertising) plays a role in firm valuation by using recent goodwill, R&D and advertising data. The results of this study improve our understanding of the gap between market value and book value by focusing on intangible assets (R&D and

[104] FRS10 requires goodwill be capitalised and amortised with an impairment test.

advertising), which do not appear on financial statements. Our research covers a recent period when reported goodwill has become more material on balance sheets in the UK (due to the implementation of FRS10) than in the past.

This study uses a valuation model that includes both balance sheet (stock measures) as well as income statement variables (flow measures). According to Ohlson (1995) a model that includes a stock measure of value and a flow measure of earnings might better explain the market value of the firm. Rees (1997) casts doubt on the findings of valuation relevance studies such as Chauvin and Hirschey (1993 and 1994), Hirschey and Weygandt (1985), McCarthy and Schneider (1995), and Jennings et al. (1996), where models fail to include both an earnings and book value explanatory variables.

Previous research investigating the valuation relevance of goodwill numbers failed to control for possible similar positive effects of R&D and advertising, resulting in possibly biased goodwill coefficients (Hirschey and Richardson, 2002). This study uses broad measures of intangibles (goodwill, R&D and advertising) as compared to previous research and controls for such similar effects. This study provides empirical evidence that FRS10 is consistent with the nature of the underlying asset (goodwill). The research findings improve our understanding of the gap between market value and book value by focusing on intangibles assets (R&D and advertising), which do not appear on balance sheet.

Very little research has been done to identify the differential media impacts of advertising and the lack of such research may restrict an advertiser's capacity to plan for and make optimal use of alternative media. This research provides empirical evidence on the possible differential media impacts by disaggregating total

advertising expenditures of the companies into different media expenditures such as television advertising, non-television advertising, print media advertising, and electronic media advertising.

Previous studies of the value relevance of intangibles have made no particular efforts to investigate whether the market attaches different values to investments in goodwill, research and development and advertising by firms in different sectors (manufacturing versus non-manufacturing), of different sizes (large versus small) and with different performances (profit-making versus loss-making). This study, by dividing its main sample into sub-samples on the basis of size, sector and performance of the firm provides evidence that the market attaches different values to investments in goodwill, research and development and advertising by firms in different sectors, of different sizes, and with different performances.

Most of the previous research on intangibles has mainly focused on one country (the US) and cross-country evidence is scare. Evidence from this study shows that the value relevance of intangibles not only applies to the US market but rather reflects a more general view of investors that applies in the UK also.

Since intangible resources constitute an increasingly important part of modern economies, accounting for intangibles has become an increasingly important problem facing the accounting profession, especially standard setting organisations. The evidence from this study on the value relevance of intangible assets combined with the evidence from previous studies provides useful guidance to standard setters on accounting for the said intangibles.

7.4 Limitations of the Study and Suggestions for Further Research

7.4.1 Limitations of the Research

There are two main limitations of this research, i.e. the source of advertising data and the measurement of the goodwill amortisation variable. As advertising data is not available from accounting data sources it was obtained for this study from 'Nielsen Media Research'[105]. As this is a non-accounting data source, it is therefore difficult to rely thoroughly on the reliability of this advertising data. This possible imprecision may have affected estimation results.

The other most important limitation of this study relates to the measurement of the independent variables. This study used data on intangible amortisation as a proxy for goodwill amortisation. The reason for using the former variable, as a proxy for the latter one is that Datastream only reports intangible amortisation, not goodwill amortisation. It is not apparent what the effect of this measurement limitation might have had on the results other than to insert noise into the measurement of the goodwill amortisation variable (GWA). Moehrle et al. (2001) have also used intangible amortisation expense as a proxy for goodwill amortisation to examine the value relevance of earnings including and excluding goodwill amortisation.

7.4.2 Further Research

The existence of few value relevance studies of the UK capital market itself highlights the need for further research. Also there is scope for further development of this analysis. Further exploration of the same specification on different samples,

[105] A commercial non-financial data source.

larger data sets, the inclusion of financial firms[106] and extension to other countries are some obvious possibilities.

Henning et al. (2000) suggest that investors are likely to attach different values to various components of total reported goodwill. Future research should attempt to study whether the UK market attaches different values to different components of accounting goodwill numbers by splitting it into the different components as suggested by Henning et al. (2000). The separation of the components of goodwill may provide additional information to the market beyond the information contained in the total goodwill number. Another potential research question may be whether UK investors attach different valuation weights on various components of UK firms' goodwill when it is divided into different 'ages[107]'. Future research also may attempt to examine whether there is useful information contained in UK companies' choices regarding goodwill amortization periods. Lev and Zarowin (1999, p.379) argue, '*...the amortization and write-offs of these assets will convey valuable information about managers' assessment of the expected benefits of intangibles*'.

The results of Hirschey (1978) suggest more positive significant effects of network television advertising on firm profitability than general advertising[108]. Future research should also look at differential media impacts in more depth by splitting total television advertising into national and regional television advertising. Another interesting area may be to investigate differential television advertising effects on the

[106] Financial firms have largely been ignored in prior research of value relevance, instead being a substantial part of the market.
[107] As future economic benefits are consumed with the age of the goodwill, the market may attach a lower valuation to this goodwill.
[108] The results of this study show a negative but insignificant impact of spot television advertising.

market value of the firm by dividing television advertising on the basis of commercial channels[109].

Tirole (1988, p.289) argues that '*...high-quality firms have an incentive to reveal their quality through advertising, which puts low-quality firms at a disadvantage*'. Tirole (1988) further points out that print media are the favourite media for high quality firms to reveal their superiority in technology and quality. In view of the arguments of Tirole, the effectiveness of various media can be further explored by segregating advertising expenditures on the basis of company campaigns[110] advertising expenditures and expenditures on product advertising campaigns.

Lei (2000) argues that audiences for new medium come largely at the expense of existing media. As Internet advertising outlays are increasing rapidly[111], it is worthwhile to investigate the question which of the existing major advertising media will the Internet become a substitute or complement for.

Moreover, it may also be interesting in future research to inquire whether valuation relevance of the intangibles varies across industries. Despite being a substantial part of the market, financial firms have largely been ignored in previous research. It is worthwhile to investigate value relevance of intangibles for a sample of financial firms.

[109] Some commercial channels sell airtime only on a national basis and some on both national and regional bases.
[110] Company advertising campaigns generally communicate the firm's philosophy, technological superiority, advance production conditions and quality of material used etc.
[111] See Silk et al. (2001).

References:

Aaker D. A., and Norris D., (1982). 'Characteristics of TV Commercials Perceived as Informative', *Journal of Advertising Research*, Vol. 2.

Aaker D. A., and Stayman D. M., (1990). 'Measuring Audience Perceptions of Commercials and Relating Them to Ad Impact', *Journal of Advertising Research*, Vol. 30 (4), pp.7-17.

Abdel-Khalik A. R., (1975). 'Advertising Effectiveness and Accounting Policies', *The Accounting Review*, Vol. 50 (supplement), pp. 657-670.

Abernethy A. M., and Franke G. R., (1996). 'The Information Content of advertising: A meta-analysis', *Journal of Advertising*, Vol. 25(2), pp.1-17.

Aboody D., and Lev B., (1998). 'The Value-Relevance of Intangibles: The Case of Software Capitalization', *Journal of Accounting Research*, Vol.36 (supplement), pp. 161-191.

Achen C. H., (1982). '*Interpreting and Using Regression*', Sage Publications, Beverly Hills, Calif.

Acs Z. J., and Audretsch D. B., (1988). 'Innovation in Large and Small Firms: An Empirical Analysis', *The American Economic Review*, Vol.78 (4), pp. 678-690.

Aharony J., and Swary I., (1980). 'Quarterly Dividend and Earnings announcements and Stockholders' returns: An Empirical Analysis' *The Journal of Finance*, Vol. 35 (1), pp. 1-12. (1)

Akbar S., and Stark A. W., (2003). 'Discussion of Scale and the Scale effect in Market-based Accounting Research', *Journal of Business Finance and Accounting*, Vol. 30 (1&2), pp.57-72.(35)

Akbar S., and Stark A. W., (2003a). 'Deflators, Net Shareholder Cash, Dividends, Capital Contributions and Estimated Models of Corporate valuation', *Journal of Business Finance and Accounting*, Vol. 30 (9&10), pp.1211-1233.

Al-Horani A., Pope P. F., and Stark A. W, (2003). 'Research and Development Activity and Expected Returns in the United Kingdom', *European Finance Review*, Vol. 7, pp. 27-46.

Ali A., (1994). 'The Incremental Information Content of Earnings, Working Capital from Operations, and Cash Flows' *Journal of Accounting Research*, Vol. 32 (1), pp. 61-74.

Ali A., and Pope P. F., (1995). 'The Incremental Information Content of Earnings, Funds Flow, and Cash Flow: The UK Evidence' *Journal of Business Finance and accounting*, Vol. 22 (1), pp. 19-34.

Amir E., and Lev B., (1996). 'Value-relevance of Nonfinancial Information: The Wireless Communications Industry', *Journal of Accounting and Economics*, Vol. 22, pp. 3-30.

Amir E., and Livne G., (2005). 'Accounting, Valuation, and Duration of Football Player Contracts', *Journal of Business Finance and Accounting*, Vol. 32(3 & 4), pp. 549-586.

Amir E., Harris T., and Venuti E. K., (1993). 'A Comparison of the Value Relevance of U.S. versus Non-U.S. GAAP Accounting Measures Using Form 20-F Reconciliations', *Journal of Accounting Research*, Vol. 31 (Supplement), pp. 230-264.

Archambault E., (2002). 'Methods for Using Patents in Cross-Country Comparisons', *Scientometrics*, Vol. 54 (1), pp. 15-30.

Ashbaugh H., and Olsson P., (2002). 'An Exploratory Study of the Valuation Properties of Cross-Listed Firms' IAS and U.S. GAAP Earnings and Book Values', *The Accounting Review*, Vol. 77(1), pp.107-126.

Asquith P., and Mullins D. W., (1983). 'The Impact of Initiating Dividend Payments on Shareholders' Wealth', *The Journal of Business*, Vol. 56 (1), pp. 77-96.

Austin, D. H., (1993). 'An Event Study-Approach to Measuring Innovative Output: The case of Biotechnology', *The American Economic Review*, Vol. 83 (2), pp. 253-258.57

Ball R., and Brown P., (1968). 'An Empirical Evaluation of Accounting Income Numbers', *Journal of Accounting Research*. Vol.6, pp.159-178.

Ballester M., Garcia-Ayuso M., and Livnat J., (2000). 'Estimating the R&D Intangible Asset', Working Paper. 14

Ballot G., Fakhfakh F., and Taymaz E., (2001). 'Firms' Human Capital, R&D and Performance: A Study on French and Swedish Firms', *Labour Economics*, Vol. 8 (4), pp.443-462.

Barry T. E., (1993). 'Twenty Years of Comparative Advertising in the United States', *International Journal of Advertising*, Vol. 12(4), pp.325-350.

Barth M. E., (2000). 'Valuation-Based Accounting Research: Implications for Financial Reporting and Opportunities for Future Research', *Accounting and Financing*, Vol. 40, pp. 7-31.

Barth M. E., and Kallapur S., (1996). 'The Effects of Cross-Sectional Scale Differences on Regression Results in Empirical Accounting Research', *Contemporary Accounting Research*, Vol. 13, pp. 527-567.

Barth M. E., and Clinch G., (1996). 'International Accounting Differences and Their Relation to Share Prices: Evidence from U.K., Australian, and Canadian Firms', *Contemporary Accounting Research*, Vol. 13 (1), pp. 135-170.

Barth M. E., and Kasznik R., (1999). 'Share Repurchases and Intangible Assets', *Journal of Accounting and Economics*, Vol. 28, pp. 211-241.

Barth M. E., Beaver W. H., and Landsman W. R., (1998). 'Relative Valuation Roles of Equity Book Value and Net Income as a Function of Financial Health', *Journal of Accounting and Economics*, Vol. 25, pp. 1-34.

Barth M. E., Beaver W. H., and Landsman W. R., (2001). 'The Relevance of the Value-Relevance Literature for Financial Accounting Standard Setting: Another View' *Journal of Accounting and Economics*, Vol. 31, pp. 77-104.

Barth M. E., Clement M. B., Foster G., and Kasznik R., (1998). 'Brand Values and Capital Market Valuation', *Review of Accounting Studies*, Vol. 3. pp. 41-68.

Beaver W. H., (1968). 'The Information Content of Annual Earnings Announcements' *,Journal of Accounting Research*, Supplement. Pp. 67-92.(7)

Beaver W. H., (1982). 'Discussion of Market–Based Empirical Research in Accounting: A Review, Interpretation, and extension' *Journal of Accounting Research*, Vol. 20 (supplement), pp.323-331.

Beaver W. H., (1997). '*Financial Reporting: An Accounting Revolution*', 3rd Ed., Prentice Hall, New Jersy.

Beaver W. H., Lambert R., and Morse D., (1980). 'The Information Content of Security Prices', *Journal of Accounting and Economics*, pp.3-28.

Belsley D. A., Kuh E., and Welsch R. E., (1980). Regression Diagnostics: identifying influential data and sources of Collinearity, New York, New York: John Wiley & Sons, Inc.

Ben-Zion U., (1984). 'The R&D and Investment Decisions and its Relationship to the Firm's Market Value: Some Preliminary Results', in Zvi Griliches (ed.), R&D, Patents and Productivity, Chicago: The University of Chicago Press, pp. 299-312.

Ben-Zion U., and Kim M., (1983). 'Profit Cost Margin, Monopoly Power And R&D Intensity For Industrial Firms', *Economics Letters*, Vol. 12, pp. 355-359.

Bergh B. G. V., James E. L., and Rifon N., (1990). 'The Information/Puffy Profile and Magazine Advertising Readership', *International Journal of Advertising*, Vol. 9(4), pp. 345-358.

Berkowitz D., Allaway A., and D'Souza G., (2001). 'Estimating Differential Lag effects for Multiple Media Across Multiple Stores', *Journal of Advertising*, Vol. 30(4), pp.59-66.

Bloom N., and Reenen J. V., (2000). 'Real Options, Patents, Productivity and Market Value: Evidence from a Panel of British Firms', The Institute for Fiscal Studies (IFS), Working Paper 00/21, November.

Bloom N., and Reenen J. V., (2002). 'Patents, Real Options and Firm Performance', *The Economic Journal*, Vol. 112, pp. C97-C116.

Blundell R., Griffith R., and Reenen J. V., (1999). 'Market Share, Market Value and Innovation in a Panel of British Manufacturing Firms', *Review of Economic Studies*, Vol.66, pp.529-554.

Board J. L. G., and Day J. F. S., (1989). 'The Information Content of Cash Flow Figures' *Accounting and Business Research*, Vol. 20 (77), pp. 3-11.

Bosworth D., and Mahdian H., (1999). 'Returns to Intellectual Property in the Pharmaceuticals Sector', *Economic Appliquee*, Vol. 52 (2), pp. 69-93.

Bosworth D., and Rogers M., (2001). 'Market Value, R&D and Intellectual Property: An Empirical Analysis of Large Australian Firms', *The Economic Record*, Vol. 77 (239), pp.323-337.

Boyd R., and Seldon B. J., (1990). 'The Fleeting Effect of Advertising: Empirical Evidence From a Case Study', *Economics Letters*, Vol. 34, pp. 375-379.

Boyer K. D., (1974). 'Informative and Goodwill Advertising', *The Review of Economics and Statistics*, Vol. 56(4), pp. 541-548.

Brennan M. J., (1995). 'A Perspective on Accounting and Stock Prices' *Journal of applied Corporate Finance*, Vol. 8 (1), pp. 43-52.

Brief R. P., and Zarowin P., (1999). 'The Value Relevance of Dividends, Book Value and Earnings' Working Paper Leonard N. Stern School of Busuness, New York University.

Brockington R., (1996). '*Accounting for Intangible Assets, A New Perspective on the True and Fair View*', Addison-Wesley Publishers Ltd., Cambridge.

Brown J., (1998). 'December 1998—the Season of Goodwill', *Accountancy*, Vol. 121 (1253), pp.61.

Brown S., Lo K., and Lys T., (1999). 'Use of R^2 in Accounting Research: Measuring Changes in Value Relevance Over the Last Four Decades', *Journal of Accounting and Economics*, Vol. 28 (2), pp. 83-115.

Brunovs R., and Kirsch R. J., (1991). 'Goodwill Accounting in Selected Countries and the Harmonization of International Accounting Standards', *Abacus*, Vol. 27(2), pp.135-161.

Bryer R. A., (1995). 'A Political Economy of SSAP22: Accounting for Goodwill', *British Accounting Review*, Vol. 27, PP. 283-310.

Bublitz B., and Ettredge M., (1989). 'The information in Discretionary Outlays: Advertising, Research and Development', *The Accounting Review*, Vol. LXIV (1), pp. 108-124.

Burgstahler D. C., and Dichev I. D., (1997). 'Earnings, Adaptation and Equity Value', *The Accounting Review*, Vol. 72 (2), pp. 187-215.

Callimaci A., and Landry S., (2002). 'Capitalization of Development Costs: A Canadian Perspective', working paper 09-2002, The University of Quebec at Montreal.

Canibano L., Garcia-Ayuso M., and Sanchez M. P., (2000). 'Shortcomings in the measurement of Innovation: Implications for Accounting standard Setting', *Journal of Management and Governance,* Vol. 4, pp. 319-342.

Canibano L., Garcia-Ayuso M., and Sanchez P., (2000). 'Accounting for Intangibles: A Literature Review' *Journal of Accounting Literature*, Vol. 19, pp.102-130.

Chan L. K.C., Lakonishok J., and Sougiannis T., (2001). 'The stock market valuation of research and development expenditures' *Journal of Finance*, Vol. 56 (6), pp. 2431-2456.

Chan S. H., Martin J. D., and Kensinger J. W., (1990). 'Corporate Research and Development and Share Value', *Journal of Financial Economics*, Vol. 26, pp. 255-276.

Chaudhuri A., (1996). 'The Effect of Media, Product, and Message Factors on Ad Persuasiveness: The Role of Affect and Cognition', Journal of marketing Communications, Vol. 2, pp. 201-218.

Chauvin K. W., and Hirschey M., (1993). 'Advertising, R&D Expenditures and the Market Value of Firms', *Financial Management*, Volume 22(4), pp. 128-140.

Chauvin K. W., and Hirschey M., (1994). 'Goodwill, Profitability, and the Market Value of the Firm', *Journal of Accounting and Public Policy*, 13(2), pp. 159-180.

Chen H. C. K., and Allmon D., (1998). 'Perceptions of the media in three different cultures: the US, Australia & Taiwan', *International Journal of Advertising*, Vol. 17(2), pp.233-253.

Choi W. W., Kwon S. S., and Lobo G. J., (2000). 'Market Valuation of intangible assets' *Journal of Business Research*, Vol. 49(1). pp 35-45.

Chowdhury A. R., (1994). 'Advertising Expenditures and the Macro-Economy: Some New Evidence', *International Journal of Advertising*, Vol. 13, pp.1-14.

Christie A. A., (1987). 'On Cross-Sectional Analysis in Accounting Research', *Journal of Accounting and Economics*, Vol. 9 (3), pp. 231-258.

Clark F. E., (1925). 'An Appraisal of Certain Criticisms of Advertising', The *American Economic Review*, Vol. 15 (1) supplement, pp.5-13.

Clarke D.G., (1976). 'Econometric Measurement of the Duration of Advertising Effect on Sales', *Journal of Marketing Research*, Vol. XIII, pp. 345-357.

Cockburn I., and Griliches Z., (1988). 'Industry Effects and Appropriability Measures in Stock Market's Valuation of R&D and Patents', *The American Review*, Vol. 78 (2), pp.419-423.

Coffey S., and Stipp H., (1997). 'The Interactions Between Computer and Television Usage', *Journal of Advertising Research*, Vol. 37(2), pp.61-67.

Collins D. W., and Kothari S., (1989). 'An Analysis of Intertemporal and Cross-Sectional Determinants of Earnings Response Coefficients', *Journal of Accounting and Economics*, pp. 143-181.

Collins D. W., Maydew E. L., and Weiss I. S., (1997). 'Changes in the Value Relevance of Earnings and Book Values Over the Past Forty Years', *Journal of Accounting and Economics*, Vol. 24 (1), pp. 39-67.

Comanor W. S., and Wilson T. A., (1967). 'Advertising Market Structure and Performance', *The Review of Economics and Statistics*, Vol. 49(4), pp. 423-440.

Comanor W. S., and Wilson T. A., (1979). 'The Effect of Advertising on Competition: A Survey', *Journal of Economic Literature*, Vol. 17, pp. 453-476.

Connolly R. A., and Hirschey M., (1984). 'R&D, Market Structure and Profits: A Value-Based Approach' *The Review of Economic and Statistics*, Vol. 66 (4), pp. 682-686.

Connolly R. A., and Hirschey M., (1988). 'Market Value and Patents: A Bayesian Approach', *Economics Letters*, Vol. 27, pp. 83-87.

Connolly R. A., and Hirschey M., (1990). 'Firm Size and R&D Effectiveness: A Value-Based Test' *Economics Letters*, Vol. 32 (3), pp. 277-281.

Core E. J., Guay W. R., and Buskirk A. V., (2003). 'Market Valuation in the New Economy: an investigation of what has changed', *Journal of Accounting and Economics*, Vol. 34, pp.43-67.

Cubbin J., (1981). 'Advertising and the Theory of Entry Barriers', *Economica*, Vol. 48, pp. 289-298.

Cutler B. D., and Javalgi R. G., (1992). 'A Cross-Cultural Analysis of the Visual Components of Print Advertising: The United States and The European Community', *Journal of Advertising Research*, Vol. 32(1), pp.71-80.

David A., and Lev B., (1998). 'The Value Relevance of the Intangibles: the case of software capitalisation' *Journal of Accounting Research*, Vol. 369, pp. 161-191.

Dawson C., (1996). 'Television Advertising: In Need of Reinvention?', *International Journal of Advertising*, Vol. 15(4), pp.302-313.

Dechow P. M., (1994). 'Accounting earnings and Cash flows as Measures of Firm Performance, The Role of Accounting Accruals', *Journal of Accounting and Economics*, Vol. 18, pp. 3-42.

Demsetz H., (1979). 'Accounting for Advertising as a Barrier to Entry' *The Journal of Business*, Vol. 52(3). pp345-360.

Deng Z., Lev B., and Narin F., (1999). 'Science and Technology as Predicators of Stock Performance', *Financial Analysts Journal*, Vol. 55 (3), pp. 20-33.

Doukas J., and Switzer L., (1992). 'The Stock Market's Valuation of R&D Spending and Market Concentration', *Journal of Economics and Business*, Vol. 44, pp. 95-114.

Dunne K. M., and Rollins T. P., (1992). 'Accounting for Goodwill: A Case of the U.S., U.K. and Japan', *Journal of International Accounting Auditing and Taxation*, Vol. 1 (2), pp. 191-207.

Easton P. D., (1998). 'Discussion of Revalued Financial, Tangible and Intangible Assets: Association with Share Prices and Non-Market-Based Value Estimates', *Journal of Accounting Research*, Vol. 36, pp. 235-247.

Easton P. D., and Sommers G. A., (2003). 'Scale and the Scale effect in Market-based Accounting Research', *Journal of Business Finance and Accounting*, Vol. 30(1&2), pp.25-55.

Easton P.D., and Harris T. S., (1991). 'Earnings as an Explanatory Variable for Returns', *Journal of Accounting Research*, Vol. 29, pp. 19-36.

Elliott C., (2001). 'A Cointegration Analysis of Advertising and Sales Data', *Review of Industrial Organization*, Vol. 18, pp. 417-426.

Ely K., and Waymire G., (1999). 'Accounting Standard Setting Organizaions and Earnings relevance: Longitudinal Evidence from NYSE Common Stocks 1927-1993', Journal *of Accounting Research*, Vol. 37, pp. 293-317.

Enzo B., Vittorio C., Alberto G., and Raffaella M., "Evaluating intangible assets: the measurement of R&D performance." Working paper 91

Epstein D., Mayor N., Schonbucher N., Whalley A. E., and Wilmott P., (1998). 'The Valuation of A Firm Advertising Optimally', *The Quarterly Review of Economics and Finance*, Vol. 38 (2), pp. 149-166.

Fay M., and Currier G., (1994). 'The Rise and Fall of the Copy Point: The Changing Information Content of Print Advertisements from 1953-1988', *European Journal of Marketing*, Vol. 28 (10), pp. 19-31.

Ferguson C., and Wine G., (1993). 'An empirical Investigation of Accounting Methods for Goodwill and Identifiable Intangible Assets: 1985 to 1989', *Abacus*, Vol. 29(1), pp90-105.

Firth, (1976). 'The Impact of Earnings Announcements on the Share Price Behaviour of Similar Type Firms', *The Economic Journal*, Vol. 86 (342), pp. 296-306.

Frances L. A., and Betty R. J., (1996). 'What Generates Goodwill?', Ernst and Young / Tax Foundation Report, Washington.

Francis J., and Schipper K., (1999). 'Have Financial Statements Lost Their Relevance', *Journal of Accounting Research*, Vol. 37, pp. 319-352.

Frank K., (2002). 'The Effect of Growth on the Value Relevance of Accounting Data', *Journal of Business Research*, Vol. 55, pp. 69-78.

Geroski P. A., (1982). 'Simultaneous Equations Models of the Structure-Performance Paradigm', *European Economic Review*, Vol. 19, pp. 145-158.

Gonedes, N. J., and Dopuch N., (1974). 'Capital Market Equilibrium, Information Production, and Selecting Accounting Techniques: Theoretical Framework and Review of Empirical Work', *Journal of Accounting Research*, Vol. 12, pp. 48-130.

Goodacre A., and McGrath J., (1997). 'An Experimental Study of Analysts' Reactions to Corporate R&D Expenditures', *British Accounting Review*, Vol. 29(2), pp. 155-179.

Gore P., Taib F., Taylor and Paul, (1996). 'Does Goodwill Accounting Matter?', *Accountancy*, Vol. 117 (1231).pp.64-66.

Grabowski H. G., and Mueller D. C., (1978). 'Industrial research and Development, Intangible Capital Stocks, Firm Profit Rates', *The Bell Journal of Economics*, Vol. 9 (2), pp. 328-343.

Graham R. C. Jr., and Frankenberger K. D., (2000). 'The Contribution of Changes in Advertising Expenditures to Earnings and Market Values', *Journal of Business Research*, Vol. 50, pp. 149-155.

Green J. P., Stark A. W., and Thomas H. M., (1996). 'U. K. Evidence on the Market Valuation of Research and Development Expenditures', *Journal of Business Finance & Accounting*, Vol. 23(2), pp. 191-216.

Greenhalgh C., and Longland M., (2001). 'Intellectual Property in UK firms: Creating Intangible Assets and Distributing the Benefits via Wages and Jobs', Oxford Bulletin of Economics and Statistics, Vol. 63 (special issue), p.671-696.

Greenhalgh C., and Longland M., (2002). 'Running to Stand Still? – Intellectual Property and Value Added in Innovating Firms', Oxford IP Research Centre Working Paper 02/01.

Gregg P., Machin S., and Szymanski, (1992). 'The Disappearing Relationship Between Directors' Pay and Corporate Performance', National Institute of Economic and Social Research and Centre for Economic Performance Working Paper 282 (2).126

Griliches Z., (1967). 'Distributed Lags, A Survey', *Econometrica*, Vol. 35 (1), pp.16-49.

Griliches Z., (1981). 'Market Value, R&D, and Patents', *Economics Letters*, Vol. 7, p.183-187.

Griliches, Z., Pakes A., and Hall B., (1987).'The Value of Patents as Indicators of Inventive Activity', in Partha Dasgupta and Paul Stoneman (ed.), *Economic Policy and Technological performance*, Cambridge: Cambridge University Press.

Grinyer J. R., Russell A., and Walker M., (1991). 'Managerial Choices in the Valuation of Acquired Goodwill in the UK', *Accounting and Business Research*, Vol. 22 (85), pp. 51-55.

Gujarati D. N., (1995). *Basic Econometrics*, 3rd ed., McGraw-Hill, USA.

Hair J. F., Anderson R. E., Tatham R. L., and Black W. C., (1998). '*Multivariate Data Analysis*', 5th edition, Prentice Hall.

Hall B. H., (1992). 'The Value of Intangible Corporate Assets: An Empirical Study of the Components of Tobin's Q', University of California Berkeley and National Bureau of Economic Research, working Paper No.93-207.

Hall B. H., (1993 a). 'The Stock Market's Valuation of R&D Investment During the 1980's' *The American Economic Review*, Vol. 83(2). pp259-264.

Hall B. H., (1993 b). 'Industrial research during the 1980s: did the Rate of Return Fall?' Brookings papers on Economic activity. *Microeconomics*, Volume 1993 (2), pp. 289-330.

Hall B. H., Jaffe A. B., and Trajtenberg M., (2001). 'Market Value and Patent Citations: A First Look', University of California Berkeley Working paper NO. E01-304. http://www.hass.berkeley.edu/groups/iber/wps/econwp.html.

Hall B. H., Jaffe A. B., and Trajtenberg M., (2001). 'The NBER Patent Citations Data File: Lessons, Insights and Methodological Tools', NBER Working Paper 8498.

Hall S. C., (1993). 'Determinants of Goodwill Amortization Period', *Journal of Business and Accounting*, Vol. 20(4), pp. 613-621.

Harhoff D., Narin F., Scherer F. M., and Vopel K., (1999). 'Citation Frequency and the Value of Patented Inventions', *The Review of Economics and Statistics*, Vol. 81 (3), pp.511-515.

Hayn C., (1995). 'The Information Content of Losses', *Journal of Accounting and Economics*, Vol., pp.125-153

Henning S. L., Lewis B. L., and Shah W. H., (2000). 'Valuation of the Components of Purchased Goodwill', *Journal of Accounting Research*, Vol. 38 (2), p. 375-386.

Higson C., (1998). 'Goodwill', *British Accounting Review*, Vol. 30, pp. 141-158.

Hirschey M., (1978). 'Television Advertising and Profitability', *Economics Letters*, Vol. 1 (3), p. 259-264.

Hirschey M., (1982). 'Intangible Capital Aspects of Advertising and R&D Expenditures', *The Journal of Industrial Economics*, Vol. 30(4), pp. 375-390.

Hirschey M., (1985). 'Market structure and market value', *Journal of Business*, Vol.58 (1), pp.89-98.

Hirschey M., and Spencer R. S., (1992). 'Size Effects in the Market Valuation of Fundamental Factors', *Financial Analysts Journal*, (March-April), pp. 91-96.

Hirschey M., and Richardson V. J., (2002). 'Information Content of Accounting Goodwill Numbers', *Journal of Accounting and Public policy*, Vol. 21(3), p.173-191.

Hirschey M., and Spencer R. S., (1992). 'Size Effects in the Market Valuation of Fundamental Factors', *Financial Analysts Journal*, Vol. 48 (2), pp. 91-96.

Hirschey M., and Weygandt J. J., (1985). 'Amortisation Policy for Advertising and Research and Development Expenditures', *Journal of Accounting Research*, Vol. 23(1), pp.326-335.

Hoegh-Krohn N. E. J., and Knivsfla K. H., (2000). 'Accounting for Intangible Assets in Scandinavia, the UK, the US, and by the IASC: Challenges and a Solution', *The International Journal of Accounting*, Vol. 35(2), pp. 243-265.

Holthausen R. W., and Watts R. L., (2001). 'The Relevance of the Value-Relevance Literature for Financial Accounting Standard Setting', *Journal of Accounting and Economics*, Vol. 31, pp.3-75.

Hung M., (2001). 'Accounting Standards and Value Relevance of Financial Statements: An International Analysis', *Journal of Accounting and Economics*, Vol. 30, pp. 401-420.

James E. L., and Alman K. C., (1996). 'Consumer Expectations of the Information Content in Advertising', *International Journal of Advertising*, Vol. 15(1), pp.75-88.

Jeff P. B., and Raman K. K.,(2001). 'On R&D Capitalization and Value Relevance: a Response', *Journal of Accounting and Public Policy*, Vol.20 (3), pp.255-261.

Jefkins F., (2000). *Advertising*, 4th ed., Essex, Pearson Education limited.

Jennings R., LeClere M., and Thompson II R. B., (2001). 'Goodwill Amortization and the Usefulness of earnings', *Financial Analysts Journal*, Vol. 57 (5), pp. 20-28.

Jennings R., Robinson J., Thompson II R. B. and Duvall L., (1996). 'The Relation Between Accounting Goodwill Numbers and Equity Values', *Journal of Business Finance and Accounting*, Vol. 23(4), pp. 513-533.

Jobber D., and Kilbride A., (1986). 'How Major Agencies Evaluate TV Advertising in Britain', *International Journal of Advertising*, Vol. 5, pp. 187-195.

Johnson L. D., and Pazderka B., (1993). 'Firm Value and Investment in R&D', *Managerial and Decision Economics*, Vol. 14, pp. 15-24.

Johnston J., (1980). 'Advertising and the Aggregate Demand for Cigarettes: A Comment', *European Economic Review*, Vol. 14, pp. 117-125.

Johnston J., (1984). *Econometric Methods*, 2nd Ed., McGraw-Hill, New York.

Johnstone H., Kaynak E., and Sparkman R. M. Jr., (1987). 'A Cross-Cultural/Cross national Study of the Information Content of Television Advertisements', *International Journal of Advertising*, Vol. 6(3), pp.223-236.

Joshua R., (2001). 'On R&D Capitalization and Value Relevance: a commentary' *Journal of Accounting and Public Policy*, Vol.20 (3), pp.241-254.

Kane E. J., and Unal H., (1990). 'Modeling Structural and Temporal Variation in the Market's Valuation of Banking Firms', *The Journal of Finance*, Vol. 45 (1), pp.113-136.

Katz H., and Wei-Na L., (1992). 'Oceans Apart: an Initial Exploration of Social Communication Differences in US and UK Prime-time Television Advertising', *International Journal of Advertising*, Vol. 11 (1), pp. 69-82.

Kelly J., (1996). 'Putting goodwill in its proper place: Jim Kelly explains the latest move to solve the longest-running dispute in UK accounting', *The Financial Times*, 27th June, London, pp.30.

Kelm K. M., Narayanan V. K., and Pinches G. E., (1995). 'The Response of Capital Markets to the R&D Process', *Technological Forecasting and Social Change*, Vol. 49, pp. 75-88.

Khalilzadeh-Shirazi J., (1974). 'Market Structure and Price-Cost Margins in the United Kingdom Manufacturing Industries', *The Review of Economics and Statistics*, Vol. 56(1), pp. 67-76.

Kitchen P. J., (1986). 'Zipping, Zapping and Nipping', *International Journal of Advertising*, Vol. 5, pp. 343-352.

Kothari S. P., (2001). 'Capital Markets Research in Accounting', *Journal of Accounting and Economics*. Vol.31 (1-3), pp.105-231.

Kothari S.P., and Zimerman J. L., (1995). 'Price and Return Models', *Journal of Accounting and Economics*, Vol. 20 (2), pp. 155-192.

Kwoka Jr. J. E., (1993). 'The Sales and Competitive Effects of Styling and Advertising Practices in the U.S. Auto Industry', *The Review of the Economics and Statistics*, Vol. 75(4), pp. 649-656.

Laband D. N., (1989). 'The Durability of Informational Signals and the Content of Advertising', *Journal of Advertising*, Vol. 18 (1), pp. 197-207.

Landes E.M., Rosenfield A.M., (1994). 'The durability of advertising revisited', *Journal of Industrial Economics*, Vol. 42 (3) pp. 263-276.

Landsman W. R., (1986). 'An empirical Investigation of Pension Fund Property Rights', *The Accounting Review*, Vol. LXI (4), pp662-691.

Landsman W. R., and Magliolo J., (1988). 'Cross-Sectional Capital Market Research and Model Specification', *The Accountancy Review*, Vol. LXIII (4), pp.586-604.

Lee S., and Lumpkin J. R., (1992). 'Differences in Attitudes toward TV Advertising: VCR Usage as a Moderator', *International Journal of Advertising*, Vol. 11(4), pp.333-342.

Lee T. A., (1971). 'Goodwill An Example of Will-o`-the Wisp Accounting', *Accounting and Business Research*, Vol.1 (Autumn), pp.318-328.

Lei R. M., (2000). 'An Assessment of the World Wide Web as an Advertising Medium', *The Social Science Journal*, Vol. 37 (3), pp. 465-471.

Lerner J., (1994). 'The Importance of Patent Scope: An Imperial Analysis', *The RAND Journal of Economics*, Vol. 25 (2), p. 319-333.

Lev B., (1989). 'On the Usefulness of Earnings and Earning Research: Lessons and Direction from Two decades of Empirical Research' *Journal of Accounting Research*, Vol. 27 (Supplement), pp.153-192.

Lev B., (1997). 'The Old Rules No Longer Apply', *Forbes* (April).

Lev B., (2000). 'Knowledge Management: Fad or Need', Research Technology *Management*, Vol. 43(5), pp.9-10.

Lev B., (2001). *Intangibles: Management, Measurement, and Reporting*, Washington, DC: The Brookings Institute.

Lev B., (2002). 'Where have all Enron's intangibles gone?' *Journal of Accounting and Public Policy*, Vol. 21, pp. 131-135.

Lev B., (2002a). 'Rethinking Accounting', *Financial Executive*, Vol. 18(2), pp.34-40.

Lev B., and Ohlson J. A., (1982). 'Market –Based Empirical Research in Accounting: A Review, Interpretation, and extension', *Journal of Accounting Research*, Vol. 20 (supplement), pp.249-322.

Lev B., and Sougiannis T., (1996). 'The capitalization, amortization, and value relevance of R&D', *Journal of Accounting and Economics*, Vol. 21, pp. 107-138.

Lev B., and Sougiannis T., (1999). 'Penetrating the Book-to-Market Black Box: The R&D Effect', *Journal of Business Finance & Accounting*, Vol.26 (3&4), pp. 419-449.

Lev B., and Zarowin P., (1998). 'The Market valuation of R&D Expenditures' Working paper. New York University, Leonard N. Stern School of Business.

Lev B., and Zarowin P., (1999). 'The Boundaries of Financial Reporting and How to Extend Them', *Journal of Accounting Research*, Vol. 37 (2), pp.353-385.

Lev B., Nissim, D. and Thomas J., (2001). 'On the informational usefulness of R&D capitalization and amortization' Working Paper Columbia Business School, NewYork.

Lindenberg E. B., and Ross S. A., (1981). 'Tobin's q Ratio and Industrial Organization', *The Journal of Business*, Vol. 54 (1), pp. 1-32.

Ling M., Lawler K., McBain N., and Moscardini A., (1999). 'Economics of Advertising: Emerging Functions of Internet Advertising', *Netnomics*, Vol.1, pp. 127-136.

Livnat J., and Zarowin P., (1990). 'The Incremental Information Content of Cash-Flow Components' *Journal of Accounting and Economics*, Vol. 13, pp. 25-46.

Martenson R., (1987). 'Advertising Strategies and Information Content in American and Swedish Advertising', *International Journal of Advertising*, Vol. 6 (20), pp.133-144.

Mary E. B., and Ron K., (1999). 'Share Repurchases and Intangible Assets' *Journal of Accounting and Economics*,Vol. 28, pp. 211-241.

McCarthy M. G., and Schneider D. K., (1995). 'Market Perception of Goodwill: Some Empirical Evidence', *Accounting and Business Research*, Vol. 26 (1), pp.69-81.

McGuinness T., and Cowling K., (1975). 'Advertising and the Aggregate Demand for Cigarettes', *European Economic Review*, Vol. 6 (3), pp. 311-328.

McGuinness T., and Cowling K., (1980). 'Advertising and the Aggregate Demand for Cigarettes: A Reply', *European Economic Review*, Vol. 14 (3), pp. 127-130.

Megna P., and Klock M., (1993). 'The Impact of Intangible Capital on Tobin's q in the Semiconductor Industry', *The American Economic Review*, Vol. 83 (2), pp. 265-269.

Megna P., and Muller D. C., (1991). 'Profit Rates and Intangible Capital', *The Review of Economics and Statistics*, Vol. 73, pp. 632-642.

Metwally M. M., (1975). 'Advertising and Competitive Behaviour of Selected Australian Firms', *The Review of Economics and Statistics*, Vol. 57 (94), pp. 417-427.

Metwally M. M., (1976). 'Profitability of Advertising in Australia: A Case Study', *The Journal of Industrial Economics*, Vol. 24 (3), pp. 221-231.

Moehrle S.R., Reynolds- Moehrle J. A., and Wallace J. S., (2001). 'How Informative are Earnings Numbers that Excludes Goodwill Amortization', *Accounting Horizons*, Vol. 15 (3), pp. 243-256.

Mueler D. C., and Supina D., (2002). 'Goodwill Capital', *Small Business Economics*, Vol. 19, pp. 233-253.

Nakra P., (1991). 'Zapping Nonsense: Should Television Media Planners lose Sleep Over It?', *International Journal of Advertising*, Vol. 10 (3), pp. 217-222.

Nelson P., (1974). 'Advertising as Information', *The Journal of Political Economy*, Vol. 82 (4), pp. 729-754.

Nobes C., (1991). 'Cycles in UK Standard Setting', *Accounting and Business Research*, Vol. 21 (83), pp. 265-274.

Nobes C., (1992). 'A Political History of Goodwill in the U.K.: An Illustration of Cyclical Standard Setting', *Abacus*, Vol. 28(2), pp.142-166.

Norris K. B., and Ayres F. L., (2000). 'Security Market Reaction to Purchase Business Combinations at the First Earnings Announcement Dater', *Journal of Business Research*, Vol. 49, pp. 79-88.

Notta O., and Oustapassidis K., (2001). 'Profitability and Media Advertising in Greek Food Manufacturing Industries', *Review of Industrial Organization*, Vol. 18, pp. 115-126.

O'Donohoe S., (1995). 'Attitudes to Advertising: A Review of British and American Research', *International Journal of Advertising*, Vol. 14 (3), pp.245-261.

Ohlson J. A., (1989). '*Accounting Earnings, Book Value, and Dividends: The Theory of the Clean Surplus Equation*', Part 1, Columbia University.

Ohlson J. A., (1995). 'Earnings Book Value and Dividends in Equity Valuation', *Contemporary Accounting Research*, Vol. 11 (2), pp. 661-687.

Oswald D. R., (2000). 'The Determinants and Value Relevance of the Choice of Accounting for R&D Expenditures in the UK', Working Paper, London Business School

Pakes A., (1985). 'On Patents, R&D, and the Stock Market Rate of Return', *The Journal of Political Economy*, Vol. 93 (2), p. 390-409.

Pakes A., and Griliches Z., (1980). 'Patents and R&D at the Firm Level: A First Report', *Economics Letters*, Vol. 5, p. 377-381.

Palda K. S., (1965). 'The Measurement of Cumulative Advertising Effects', *The Journal of Business*, Vol.38 (2), pp. 162-179.

Patell J M. and Wolfson M A., (1984), 'The Intraday Speed of Adjustment of Stock Prices to Earnings and Dividend Announcements', *Journal of Financial Economics*, Vol. 13, pp. 223-252.

Paterson R., (1998). 'Will FRS 10 Hit the Target?', *Accountancy*, Vol. 121 912540,pp. 124-125.

Paton D., (2002). 'Advertising, Quality and Sales', *Applied Economics*, Vol. 34, p. 431-438.50

Paton D., and Conant N., (2002). 'Internet Advertising by UK Firms', *Journal of Strategic Marketing*, Vol. 10, pp. 115-133. 185

Peel D., (1975). 'Advertising and Aggregate Consumption', in Cowling K., Cable J., Kelly M and McGuiness T., (eds) *Advertising and Economic Behaviour.* London: Macmillan.101

Peles Y., (1971). 'Rates of Amortization of Advertising Expenditures', *The Journal of Political Economy*, Vol. 79 (5), pp. 1032-1058.

Petersen C., (2002). 'Is Goodwill Value Relevant-A Danish Perspective', Working Paper Copenhagen Business School, Denmark.

Pettit R. R., (1972). 'Dividend Announcements, Security Performance, and Capital Market Efficiency' *The Journal of Finance*, Vol. 27 (5), pp. 993-1007.

Philport J. C., and Arbittier J., (1997). 'Advertising: Brand Communications Styles in Established Media and the Internet', *Journal of Advertising Research*, Vol. 37 (2), pp. 68-76.

Porter M. E., (1976). 'Interbrand Choice, Media Mix and Market Performance', *The American Economic Review*, Vol. 66 (2), pp. 398-406.

Radfar M., (1985). 'The Effect of Advertising on Total Consumption of Cigarette in the U.K. A Comment', *European Economic Review*, Vol. 29, pp. 225-231.

Rees W. P., (1997). 'The Impact of Dividends, Debt, and Investment on Valuation Models', *Journal of Business Finance and Accounting*, Vol. 24 (7 & 8), pp. 1111-1140.

Rees W. P., (1999). 'Influences on the Value Relevance of Equity and Net Income in the UK', *Managerial Finance*, Vol.25 (12), pp. 58-65.

Reinhard K., and Phillips W. E., (1985). 'Global Marketing: Experts Look at Both Sides', *Advertising Age*, Vol. 56 (29).

Reinstein A., Husband G. R., and Weirich T. R., (2002). 'US and UK GAAP: Important differences for Financial Statement Prepares and Users', *Managerial Finance*, Vol. 28(1), pp. 59-72.

Resnik A., and Stern B. L., (1977). 'An Analysis of Information Content in Television Advertising', *Journal of Marketing*, Vol. 41 (1), pp.50-53.

Riegler C., and Hollerschmid C., (2005). 'Voluntary Disclosure on Project Intangibles from R&D in Business Reporting: A Principles-based Approach for R&D intensive Companies', Working Paper , Vienna University of Economics and Business Administration, Austria.

Rippington F. A., and Taffler R J., (1995). 'The Information Content of Firm Financial Disclosures', *Journal of Business Finance and Accounting*, Vol. 22 (3), pp. 345-362.

Rogers R. T., and Mueller W. F., (1980). 'The Role of Advertising in Changing Concentration of Manufacturing Industries', *The Review of Economics and Statistics*, Vol. 62 (1), pp. 89-96.

Rowbottom N., (2002). 'The Application of Intangible Asset Accounting and Discretionary Policy Choices in the UK Football Industry', *British Accounting Review*, Vol. 34 (4), pp. 335-355.

Russell A., Grinyer J. R., Walker M., and Malton P. A., (1989). 'Accounting for Goodwill', Chartered Association of Certified Accountants Research Report 13.

Samuels J. M., (1970) *'The Effect of Advertising on Sales and Brand Shares', The Advertising Association*, London, The Jupiter Press Ltd.119

Schankerman M., and Pakes A., (1986). 'Estimates of the Value of Patent Rights in European Countries During the Post-1950 Period', *The Economic Journal*, Vol. 96 (384), pp. 1052-1076.

Schofield A., (1991). 'International Differences in Advertising Practices: Britain Compared with Other Countries', *International Journal of Advertising*, Vol. 10 (4), pp. 299-308.

Scott D. R., and Solomon D., (1998). 'What is Wearout Anyway?', *Journal of Advertising Research*, Vol. 38 (5), pp.19-28.

Seldom B. J., and Jung C., (1995). 'The Length of the effect of Aggregate Advertising on Aggregate Consumption', *Economics letters*, Vol. 48, pp. 207-211.

Seldon B. J., and Doroodian K., (1989). 'A Simulation Model of Cigarette Advertising: Effects on Demand and Industry Response to Public Policy', *The Review of Economics and Statistics*, Vol. 71 (4), pp. 673-677.

Shah Z., and Stark A. W., (2003). 'Market Valuation of R&D Expenditures in the UK: Some Evidence on Industry and Size Effects', Working Paper, Warwick Business School, UK.

Shah Z., and Stark A. W., (2004). 'On the Value Relevance of Costly Information on Major Media Advertising Expenditures in the UK', Working Paper, Warwick Business School, UK.

Shah Z., and Stark A. W., (2005). 'Do Major Media advertising Expenditures Help Forecast Earnings, and Are They Associated with Market Values? – A Study of Persistent UK Advertisers', Working Paper, Warwick Business School, UK.

Silk A. J., Klein L. R., and Berndt E. R., (2001). 'The Emerging Position of the Internet as an Advertising Medium', *Netnomics*, Vol. 3, pp. 129-148.

Stark A. W., and Thomas H. M., (1998). 'On the Empirical Relationship Between Market Value and Residual Income in the U.K', *Management Accounting Research*, Vol. 9, pp. 445-460.

Stern B. L., and Resnik A. J., (1991). 'Information Content in Television Advertising: A Replication and Extension', *Journal of Advertising Research*, Vol. 31(3), pp. 36-46.

Stern B. L., Krugman D. M., and Resnik A., (1981). 'Magazine Advertising; Analysis of its Information Content', *Journal of Advertising Research*, Vol.21, pp. 39-44.

Stewart D.W., and Koslow S., (1989), 'Executional Factors and Advertising Effectiveness: A Replication', *Journal of Advertising*, Vol.18 (3), pp. 21-32.

Strong N. C., (1997). 'Discussion of The Impact of Dividends, Debt, and Investment on Valuation Models', *Journal of Business Finance and Accounting*, Vol. 24 (7 & 8), pp. 1141-1145.

Szewczyk S. H., Tsetsekos G. P., and Zantout Z., (1996). 'The Valuation of Corporate R&D Expenditures: Evidence from Investment Opportunities and Free Cash flow' *Financial Managmenet*, Vol. 25 (1), pp.105-111.

Taylor D. B., (1983). 'The Information Content of Women's Magazine Advertising in the UK', *European Journal of Marketing*, Vol.17 (5), pp.28-32.

Telser L. G., (1961). 'How Much Does It Pay Whom to Advertise', *The American Economic Review*, Vol. 51 (2), pp. 194-205.

Terence N., (1992). 'Differences Between American and British Television Advertising; Explanations and Implications', *Journal of Advertising*, Vol. 21(4), pp.61-72.

Thomadakis S. B., (1977). 'A Value-Based Test for Profitability and Market Structure', *The Review of Economics and Statistics*, Vol. 59 (2), pp. 179-185.

Tirole J., (1988). *The Theory of Industrial Organization*, London, The MIT Press.

Toivanen O., and Stoneman P., (1998). 'Dynamics of R&D and Investment: UK Evidence', *Economics Letters*, Vol. 58, pp. 119-126.

Toivanen O., Stoneman P., and Bosworth D., (2002). 'Innovation and the Market Value of UK Firms, 1989-1995', *Oxford Bulletin of Economics and Statistics*, Vol. 64 (39), p.39-61.

Vellman P. F., and Welsch R. E., (1981). 'Efficient Computing of Regression Diagnostics', *The American Statisticians*, Vol. 35, pp. 234–242.

Wakelin K., (2001). 'Productivity Growth and R&D Expenditure in UK Manufacturing Firms', *Research Policy*, Vol. 30, pp. 1079-1090.

Watts R., (1973). 'The Information Content of Dividends' *The Journal of Business*, Vol. 46 (2), pp. 191-211.

Weinberger M. G., and Spotts H. E., (1989). 'Humour in U.S. Versus U.K. TV Commercials: A Comparison', *Journal of Advertising*, Vol. 18 (2). pp. 39-44.

Weiss L. W., (1969). 'Advertising, Profits, and Corporate Taxes', *The Review of Economics and statistics*, Vol. 51 (4), pp. 421-430.

Whit R., (2000). *Advertising,* 4th ed., Cambridge, McGraw-Hill Publishing Company.

White H., (1980). 'A Heteroscedasticity Consistent Covariance Matrix Estimator and a Direct Test for Heteroscedasticity', *Econometrica,* Vol. 48 (4), pp. 817-838.

White R., (2000). *Advertising,* UK: McGraw-Hill Publishing Company.

Wiggins S. N., and Lane W. J., (1983). 'Quality Uncertainty, Search, and Advertising', The American Economic Review, Vol. 73 (5), pp. 881-894.

Woolridge J. R., (1983). 'Dividend Changes and Security Prices' *The Journal of Finance,* Vol. 38 (5), pp. 1607-1615.

Wright P. L., (1974). 'Analyzing Media Effects on Advertising Responses', *The Public Opinion Quarterly,* Vol. 38 (2), pp. 192-205.

Wyatt A., (2005). 'Accounting Recognition of Intangible Assets: Theory and Evidence on Economic Determinants', *The Accounting Review,* Vol. 80 (3), pp. 967-1003.

Yiannaka A., Giannakas K., and Tran K. C., (2002). 'Medium, Message, and Advertising Effectiveness in the Greek Processed Meat Industry', *Applied Economics,* Vol. 14, pp. 1757-1763.

Zandpour F., Chang C., and Catalano J., (1992). 'Stories, Symbols, and Straight Talk: A Comparative Analysis of French, Taiwanese, and U.S. TV Commercials', Journal *of Advertising Research,* Vol. 32 (1), pp. 25-38.

Zanot E., (1984). 'Public Attitudes Toward Advertising: The American Experience', *International Journal of Advertising,* Vol. 3 (1), pp. 3-15.

Zhao R., (2002). 'Relative Value Relevance of R&D Reporting: An International Comparison', *Journal of International Financial Management and Accounting,* Vol. 13 (2), pp. 153-174.

Zhemin W., (1993). 'An Empirical Evaluation of Goodwill Accounting', *Journal of Applied Business Research,* Vol. 9 (4), pp. 127-133.

Appendices

Appendix 1: List of industry sectors which are included in the sample Total observations for each cross-section (1998-2003)

No.	Industry Sector	INDC	Total
1	AEROSPACE	AEROS	14
2	AIRLINES & AIRPORTS	AIRLN	14
3	AUTO PARTS	AUPRT	20
4	BIOTECHNOLOGY	BIOTC	34
5	BUILDING MATERIALS	BMATS	48
6	BUILDERS MARCHANTS	BMERC	17
7	BEVERAGES-BREWERS	BREWS	05
8	BUSINESS SUPPORT SERVICES	BUSUP	143
9	CHEMICALS, COMMODITY	CHEMS	11
10	CHEMICALS, ADVANCED MATERIAL	CHMAV	12
11	CHEMICALS SPECIALITY	CHMSP	28
12	CLOTHING & FOOTWARE	CLTHG	22
13	COMPUTER SERVICES	CMPSV	67
14	CONSUMER ELECTRONICS	CNELE	17
15	COMMERCIAL VEHICLES & TRUCKS	COMMV	04
16	COMPUTER HARDWARE	COMPH	17
17	DEFENCE	DEFEN	06
18	DELIVERY SERVICES	DELSV	05
19	DISTILLERS &VINTNERS	DISTV	11
20	DIVERSIFIED INDUSTRIES	DIVIN	18
21	DISCOUNT STORES	DSCST	03
22	VEHICLES DISTRIBUTION	DSVHL	19
23	EDUCATION BUSINESS TRAINING	EDUTR	42
24	ELECTRICITY	ELECT	19
25	ELECTRICAL EQUIPMENT	ELEQP	21
26	ELECTRONIC EQUIPMENT	ELETR	54
27	ENGINEERING CONTRACTORS	ENGCO	18
28	ENGINEERING FABRICATORS	ENGFA	17
29	ENGINEERING GENERAL	ENGIN	71
30	RETAILERS E-COMMERCE	ERETL	06
31	FOOD PROCESSORS	FDPRD	46
32	FOOD & DRUG RETAILERS	FDRET	24
33	FARMING & FISHING	FMFSH	15
34	FURNISHING & FLOORCOVERINGS	FURFL	24
35	GAMBLING	GAMNG	18
36	GAS DISTRIBUTION	GASDS	04

37	GOLD MINING	GOLDS	15
38	HSEHOLD APPS & HOUSEWARES	HAPPL	28
39	RETAIL-HARDLINES	HARDL	45
40	HOSPITAL MANAGEMENT	HOSPM	09
41	HOTELS	HOTEL	14
42	HOUSE BUILDING	HOUSE	37
43	HOUSEHOLD PRODUCTS	HSEPR	04
44	INTERNET	INTNT	29
45	LEISURE FACILITIES	LEISR	70
46	LEISURE EQUIPMENT	LSREQ	16
47	MEDIA AGENCIES	MEDAG	47
48	MEDICAL EQUIPMENT & SUPPLIES	MEDEQ	36
49	OTHER MININGS	MINES	32
50	MULTI-UTILITIES	MTUTL	03
51	RETAILERS-MULTI DEPARTMENT.	MULTI	26
52	NON-FERROUS METALS	NOFMS	05
53	OIL & GAS EXPL. & PROD.	OILEP	37
54	OIL INTEGRATED	OILIN	10
55	OIL SERVICES	OILSV	10
56	OTHER CONSTRUCTION	OTHCN	36
57	OTHER HEALTH CARE	OTHCR	09
58	PAPER	PAPER	08
59	PHOTOGRAPHY	PHOTO	02
60	PHARMACEUTICALS	PHRMC	34
61	PERSONAL PRODUCTS	PRNSL	09
62	PUBLISHING & PRINTING	PUBLS	96
63	RESTARURNTS AND PUBS	RESTS	66
64	RAIL, ROAD & FREIGHT	RROAD	31
65	SECURITY & ALARMS SERVICES	SECAL	14
66	SEMICONDUCTORS	SEMIC	10
67	SHIPPING & PORTS	SHPNG	18
68	SOFT DRINKS	SOFTD	03
69	REAL ESTATE DEV	RLDEV	136
70	RETAILERS, SOFT GOODS	SOFTG	40
71	SOFTWARE	SOFTW	121
72	STEEL	STEEL	09
73	SUBSCRIPTION ENTERTAINMENT	SUBEN	05
74	TELECOMMUNICATIONS EQUIPMENT	TELEQ	17
75	TELECOM FIXED LINE	TELFL	31
76	TELECOM WIRELESS	TELWR	11

77	TEXTILES & LEATHER GOODS	TEXOT	23
78	TOBACCO	TOBAC	03
79	TRANSACTION + PAYROLL	TRPAY	16
80	TV, RADIO & FILM	TVRFE	39
81	ENVIRONMENTAL CONTROL	WASTE	09
82	WATER	WATER	43
	Total		2226

Appendix 2: Distribution of Final Pooled Sample by Industry (BV Deflator)

No.	Industry Sector (INDM)	INDC	Frequency	%
1	AEROSPACE	AEROS	55	0.72
2	AIRLINES & AIRPORTS	AIRLN	48	0.63
3	AUTO PARTS	AUPRT	79	1.03
4	BIOTECHNOLOGY	BIOTC	124	1.62
5	BUILDING MATERIALS	BMATS	174	2.28
6	BUILDERS MARCHANTS	BMERC	61	0.80
7	BEVERAGES-BREWERS	BREWS	11	0.14
8	BUSINESS SUPPORT SERVICES	BUSUP	548	7.17
9	CHEMICALS, COMMODITY	CHEMS	16	0.21
10	CHEMICALS, ADVANCED MATERIALS	CHMAV	46	0.60
11	CHEMICALS SPECIALITY	CHMSP	83	1.09
12	CLOTHING & FOOTWARE	CLTHG	94	1.23
13	COMPUTER SERVICES	CMPSV	241	3.16
14	CONSUMER ELECTRONICS	CNELE	40	0.52
15	COMMERCIAL VEHICLES & TRUCKS	COMMV	17	0.22
16	COMPUTER HARDWARE	COMPH	65	0.85
17	DEFENCE	DEFEN	27	0.35
18	DELIVERY SERVICES	DELSV	14	0.18
19	DISTILLERS &VINTNERS	DISTV	34	0.45
20	DIVERSIFIED INDUSTRIES	DIVIN	41	0.54
21	DISCOUNT STORES	DSCST	13	0.17
22	VEHICLES DISTRIBUTION	DSVHL	84	1.10
23	EDUCATION BUSINESS TRAINING	EDUTR	162	2.12
24	ELECTRICITY	ELECT	42	0.55
25	ELECTRICAL EQUIPMENT	ELEQP	73	0.96
26	ELECTRONIC EQUIPMENT	ELETR	187	2.45
27	ENGINEERING CONTRACTORS	ENGCO	69	0.90
28	ENGINEERING FABRICATORS	ENGFA	66	0.86
29	ENGINEERING GENERAL	ENGIN	255	3.34
30	RETAILERS E-COMMERCE	ERETL	16	0.21
31	FOOD PROCESSORS	FDPRD	158	2.07
32	FOOD & DRUG RETAILERS	FDRET	104	1.36
33	FARMING & FISHING	FMFSH	57	0.75
34	FURNISHING & FLOORCOVERINGS	FURFL	75	0.98
35	GAMBLING	GAMNG	46	0.60
36	GAS DISTRIBUTION	GASDS	13	0.17
37	GOLD MINING	GOLDS	32	0.42
38	HOUSEHOLD APPS & HOUSEWARES	HAPPL	76	1.00

39	RETAIL-HARDLINES	HARDL	141	1.85
40	HOSPITAL MANAGEMENT	HOSPM	29	0.38
41	HOTELS	HOTEL	53	0.69
42	HOUSE BUILDING	HOUSE	182	2.38
43	HOUSEHOLD PRODUCTS	HSEPR	22	0.29
44	INTERNET	INTNT	75	0.98
45	LEISURE FACILITIES	LEISR	254	3.33
46	LEISURE EQUIPMENT	LSREQ	42	0.55
47	MEDIA AGENCIES	MEDAG	141	1.85
48	MEDICAL EQUIPMENT & SUPPLIES	MEDEQ	151	1.98
49	OTHER MININGS	MINES	88	1.15
50	MULTI-UTILITIES	MTUTL	9	0.12
51	RETAILERS-MULTI DEPARTMENT.	MULTI	103	1.35
52	NON-FERROUS METALS	NOFMS	4	0.05
53	OIL & GAS EXPL. & PROD.	OILEP	146	1.91
54	OIL INTEGRATED	OILIN	18	0.24
55	OIL SERVICES	OILSV	29	0.38
56	OTHER CONSTRUCTION	OTHCN	157	2.06
57	OTHER HEALTH CARE	OTHCR	25	0.33
58	PAPER	PAPER	22	0.29
59	PHOTOGRAPHY	PHOTO	9	0.12
60	PHARMACEUTICALS	PHRMC	105	1.37
61	PERSONAL PRODUCTS	PRNSL	23	0.30
62	PUBLISHING & PRINTING	PUBLS	292	3.82
63	RESTARURNTS AND PUBS	RESTS	232	3.04
64	RAIL, ROAD & FREIGHT	RROAD	117	1.53
65	SECURITY & ALARMS SERVICES	SECAL	67	0.88
66	SEMICONDUCTORS	SEMIC	38	0.50
67	SHIPPING & PORTS	SHPNG	67	0.88
68	SOFT DRINKS	SOFTD	15	0.20
69	REAL ESTATE DEV	RLDEV	521	6.82
70	RETAILERS, SOFT GOODS	SOFTG	162	2.12
71	SOFTWARE	SOFTW	422	5.53
72	STEEL	STEEL	31	0.41
73	SUBSCRIPTION ENTERTAINMENT	SUBEN	6	0.08
74	TELECOMMUNICATIONS EQUIPMENT	TELEQ	59	0.77
75	TELECOM FIXED LINE	TELFL	72	0.94
76	TELECOM WIRELESS	TELWR	22	0.29
77	TEXTILES & LEATHER GOODS	TEXOT	72	0.94
78	TOBACCO	TOBAC	3	0.04

79	TRANSACTION + PAYROLL	TRPAY	35	0.46
80	TV, RADIO & FILM	TVRFE	137	1.79
81	ENVIRONMENTAL CONTROL	WASTE	27	0.35
82	WATER	WATER	67	0.88
	Total		7638	100.00

Appendix 3: Distribution of Final Pooled Sample by Industry (NS Deflator)

No.	Industry Sector (INDM)	INDC	Frequency	%
1	AEROSPACE	AEROS	52	0.71
2	AIRLINES & AIRPORTS	AIRLN	43	0.59
3	AUTO PARTS	AUPRT	81	1.11
4	BIOTECHNOLOGY	BIOTC	120	1.64
5	BUILDING MATERIALS	BMATS	157	2.14
6	BUILDERS MARCHANTS	BMERC	56	0.76
7	BEVERAGES-BREWERS	BREWS	11	0.15
8	BUSINESS SUPPORT SERVICES	BUSUP	540	7.37
9	CHEMICALS, COMMODITY	CHEMS	13	0.18
10	CHEMICALS, ADVANCED MATERIALS	CHMAV	44	0.60
11	CHEMICALS SPECIALITY	CHMSP	76	1.04
12	CLOTHING & FOOTWARE	CLTHG	90	1.23
13	COMPUTER SERVICES	CMPSV	238	3.25
14	CONSUMER ELECTRONICS	CNELE	35	0.48
15	COMMERCIAL VEHICLES & TRUCKS	COMMV	16	0.22
16	COMPUTER HARDWARE	COMPH	66	0.90
17	DEFENCE	DEFEN	27	0.37
18	DELIVERY SERVICES	DELSV	14	0.19
19	DISTILLERS &VINTNERS	DISTV	29	0.40
20	DIVERSIFIED INDUSTRIES	DIVIN	39	0.53
21	DISCOUNT STORES	DSCST	13	0.18
22	VEHICLES DISTRIBUTION	DSVHL	74	1.01
23	EDUCATION BUSINESS TRAINING	EDUTR	164	2.24
24	ELECTRICITY	ELECT	33	0.45
25	ELECTRICAL EQUIPMENT	ELEQP	68	0.93
26	ELECTRONIC EQUIPMENT	ELETR	188	2.57
27	ENGINEERING CONTRACTORS	ENGCO	68	0.93
28	ENGINEERING FABRICATORS	ENGFA	63	0.86
29	ENGINEERING GENERAL	ENGIN	256	3.49
30	RETAILERS E-COMMERCE	ERETL	12	0.16
31	FOOD PROCESSORS	FDPRD	153	2.09
32	FOOD & DRUG RETAILERS	FDRET	95	1.30
33	FARMING & FISHING	FMFSH	51	0.70
34	FURNISHING & FLOORCOVERINGS	FURFL	70	0.96
35	GAMBLING	GAMNG	48	0.66
36	GAS DISTRIBUTION	GASDS	12	0.16
37	GOLD MINING	GOLDS	32	0.44
38	HSEHOLD APPS & HOUSEWARES	HAPPL	78	1.06

39	RETAIL-HARDLINES	HARDL	123	1.68
40	HOSPITAL MANAGEMENT	HOSPM	29	0.40
41	HOTELS	HOTEL	48	0.66
42	HOUSE BUILDING	HOUSE	181	2.47
43	HOUSEHOLD PRODUCTS	HSEPR	18	0.25
44	INTERNET	INTNT	75	1.02
45	LEISURE FACILITIES	LEISR	238	3.25
46	LEISURE EQUIPMENT	LSREQ	38	0.52
47	MEDIA AGENCIES	MEDAG	144	1.97
48	MEDICAL EQUIPMENT & SUPPLIES	MEDEQ	145	1.98
49	OTHER MININGS	MINES	84	1.15
50	MULTI-UTILITIES	MTUTL	8	0.11
51	RETAILERS-MULTI DEPARTMENT.	MULTI	96	1.31
52	NON-FERROUS METALS	NOFMS	5	0.07
53	OIL & GAS EXPL. & PROD.	OILEP	137	1.87
54	OIL INTEGRATED	OILIN	16	0.22
55	OIL SERVICES	OILSV	30	0.41
56	OTHER CONSTRUCTION	OTHCN	157	2.14
57	OTHER HEALTH CARE	OTHCR	26	0.35
58	PAPER	PAPER	21	0.29
59	PHOTOGRAPHY	PHOTO	9	0.12
60	PHARMACEUTICALS	PHRMC	81	1.11
61	PERSONAL PRODUCTS	PRNSL	15	0.20
62	PUBLISHING & PRINTING	PUBLS	269	3.67
63	RESTARURNTS AND PUBS	RESTS	221	3.02
64	RAIL, ROAD & FREIGHT	RROAD	122	1.67
65	SECURITY & ALARMS SERVICES	SECAL	60	0.82
66	SEMICONDUCTORS	SEMIC	39	0.53
67	SHIPPING & PORTS	SHPNG	62	0.85
68	SOFT DRINKS	SOFTD	14	0.19
69	REAL ESTATE DEV	RLDEV	486	6.63
70	RETAILERS, SOFT GOODS	SOFTG	154	2.10
71	SOFTWARE	SOFTW	426	5.82
72	STEEL	STEEL	28	0.38
73	SUBSCRIPTION ENTERTAINMENT	SUBEN	6	0.08
74	TELECOMMUNICATIONS EQUIPMENT	TELEQ	60	0.82
75	TELECOM FIXED LINE	TELFL	70	0.96
76	TELECOM WIRELESS	TELWR	25	0.34
77	TEXTILES & LEATHER GOODS	TEXOT	71	0.97
78	TOBACCO	TOBAC	2	0.03

79	TRANSACTION + PAYROLL	TRPAY	33	0.45
80	TV, RADIO & FILM	TVRFE	142	1.94
81	ENVIRONMENTAL CONTROL	WASTE	26	0.35
82	WATER	WATER	60	0.82
	Total		**7325**	**100.00**

Appendix 4: Distribution of Final Pooled Sample by Industry (NS Deflator)

No.	Industry Sector (INDM)	INDC	Frequency	%
1	AEROSPACE	AEROS	54	0.72
2	AIRLINES & AIRPORTS	AIRLN	48	0.64
3	AUTO PARTS	AUPRT	78	1.05
4	BIOTECHNOLOGY	BIOTC	114	1.53
5	BUILDING MATERIALS	BMATS	174	2.33
6	BUILDERS MARCHANTS	BMERC	58	0.78
7	BEVERAGES-BREWERS	BREWS	10	0.13
8	BUSINESS SUPPORT SERVICES	BUSUP	536	7.18
9	CHEMICALS, COMMODITY	CHEMS	16	0.21
10	CHEMICALS, ADVANCED MATERIALS	CHMAV	44	0.59
11	CHEMICALS SPECIALITY	CHMSP	84	1.13
12	CLOTHING & FOOTWARE	CLTHG	89	1.19
13	COMPUTER SERVICES	CMPSV	244	3.27
14	CONSUMER ELECTRONICS	CNELE	39	0.52
15	COMMERCIAL VEHICLES & TRUCKS	COMMV	17	0.23
16	COMPUTER HARDWARE	COMPH	59	0.79
17	DEFENCE	DEFEN	28	0.38
18	DELIVERY SERVICES	DELSV	13	0.17
19	DISTILLERS &VINTNERS	DISTV	34	0.46
20	DIVERSIFIED INDUSTRIES	DIVIN	38	0.51
21	DISCOUNT STORES	DSCST	13	0.17
22	VEHICLES DISTRIBUTION	DSVHL	81	1.09
23	EDUCATION BUSINESS TRAINING	EDUTR	155	2.08
24	ELECTRICITY	ELECT	43	0.58
25	ELECTRICAL EQUIPMENT	ELEQP	72	0.97
26	ELECTRONIC EQUIPMENT	ELETR	186	2.49
27	ENGINEERING CONTRACTORS	ENGCO	63	0.84
28	ENGINEERING FABRICATORS	ENGFA	66	0.88
29	ENGINEERING GENERAL	ENGIN	258	3.46
30	RETAILERS E-COMMERCE	ERETL	15	0.20
31	FOOD PROCESSORS	FDPRD	160	2.14
32	FOOD & DRUG RETAILERS	FDRET	103	1.38
33	FARMING & FISHING	FMFSH	56	0.75
34	FURNISHING & FLOORCOVERINGS	FURFL	70	0.94
35	GAMBLING	GAMNG	42	0.56
36	GAS DISTRIBUTION	GASDS	12	0.16
37	GOLD MINING	GOLDS	28	0.38
38	HSEHOLD APPS & HOUSEWARES	HAPPL	76	1.02

39	RETAIL-HARDLINES	HARDL	143	1.92
40	HOSPITAL MANAGEMENT	HOSPM	29	0.39
41	HOTELS	HOTEL	53	0.71
42	HOUSE BUILDING	HOUSE	178	2.39
43	HOUSEHOLD PRODUCTS	HSEPR	22	0.29
44	INTERNET	INTNT	69	0.92
45	LEISURE FACILITIES	LEISR	245	3.28
46	LEISURE EQUIPMENT	LSREQ	40	0.54
47	MEDIA AGENCIES	MEDAG	143	1.92
48	MEDICAL EQUIPMENT & SUPPLIES	MEDEQ	149	2.00
49	OTHER MININGS	MINES	88	1.18
50	MULTI-UTILITIES	MTUTL	9	0.12
51	RETAILERS-MULTI DEPARTMENT.	MULTI	104	1.39
52	NON-FERROUS METALS	NOFMS	5	0.07
53	OIL & GAS EXPL. & PROD.	OILEP	138	1.85
54	OIL INTEGRATED	OILIN	18	0.24
55	OIL SERVICES	OILSV	29	0.39
56	OTHER CONSTRUCTION	OTHCN	161	2.16
57	OTHER HEALTH CARE	OTHCR	26	0.35
58	PAPER	PAPER	22	0.29
59	PHOTOGRAPHY	PHOTO	9	0.12
60	PHARMACEUTICALS	PHRMC	99	1.33
61	PERSONAL PRODUCTS	PRNSL	23	0.31
62	PUBLISHING & PRINTING	PUBLS	284	3.81
63	RESTARURNTS AND PUBS	RESTS	222	2.98
64	RAIL, ROAD & FREIGHT	RROAD	120	1.61
65	SECURITY & ALARMS SERVICES	SECAL	61	0.82
66	SEMICONDUCTORS	SEMIC	35	0.47
67	SHIPPING & PORTS	SHPNG	66	0.88
68	SOFT DRINKS	SOFTD	14	0.19
69	REAL ESTATE DEV	RLDEV	508	6.81
70	RETAILERS, SOFT GOODS	SOFTG	162	2.17
71	SOFTWARE	SOFTW	392	5.25
72	STEEL	STEEL	29	0.39
73	SUBSCRIPTION ENTERTAINMENT	SUBEN	7	0.09
74	TELECOMMUNICATIONSEQUIPMENT	TELEQ	54	0.72
75	TELECOM FIXED LINE	TELFL	68	0.91
76	TELECOM WIRELESS	TELWR	23	0.31
77	TEXTILES & LEATHER GOODS	TEXOT	71	0.95
78	TOBACCO	TOBAC	4	0.05

79	TRANSACTION + PAYROLL	TRPAY	35	0.47
80	TV, RADIO & FILM	TVRFE	140	1.88
81	ENVIRONMENTAL CONTROL	WASTE	27	0.36
82	WATER	WATER	61	0.82
	Total		7461	100.00

Appendix 5: Distribution of the Final Sample on the Basis of Size

Panel A (Closing Book Value is the Deflator)

Years (1998-2003)	Final Sample	Small firms	Large Firms
Pooled	7638	3819	3819
%	100	50	50

Panel B (Number of Shares is the Deflator)

Years (1998-2003)	Final Sample	Small firms	Large Firms
Pooled	7325	3662	3663
%	100	49.99	50.01

Panel C (Market Value is the Deflator)

Years (1998-2003)	Final Sample	Small firms	Large Firms
Pooled	7461	3730	3731
%	100	49.99	50.01

Appendix 6: Distribution of the Final Sample on the Basis of Sectors

Panel A (Book Value is the Deflator)

Years (1998-2003)	Final Sample	Manufacturing Firms	Non-Manufacturing Firms
Pooled	7638	4010	3628
%	100	52.50	47.50

Panel B (Number of Shares is the Deflator)

Years (1998-2003)	Final Sample	Manufacturing Firms	Non-Manufacturing Firms
Pooled	7325	3858	3467
%	100	52.67	47.33

Panel C (Opening Market Value is the Deflator)

Years (1998-2003)	Final Sample	Manufacturing Firms	Non-Manufacturing Firms
Pooled	7461	3913	3548
%	100	52.45	47.55

Appendix 7: Sample Distribution on the Basis of Profit and Loss Making Firms

Panel A (Book Value is the Deflator)

Years (1998-2003)	Final Sample	Profit Making Firms	Loss Making Firms
Pooled	7638	5220	2418
%	100	68.34	31.66

Panel B (Number of Shares is the Deflator)

Years (1998-2003)	Final Sample	Profit Making Firms	Loss Making Firms
Pooled	7325	4946	2379
%	100	67.52	32.48

Panel C (Opening Market Value is the Deflator)

Years (1998-2003)	Final Sample	Profit Making Firms	Loss Making Firms
Pooled	7461	5151	2310
%	100	69.04	30.96

Appendix 8: Total UK Advertising Expenditure

Year	£bn
1998	14.41
1999	15.41
2000	16.98
2001	16.54
2002	16.81
2003	17.23

Source: The Advertising Association

Appendix 9: Total Advertising Expenditure by Media Sector £m

	1998	1999	2000	2001	2002	2003
Press	7531	7877	8604	8504	8333	8382
Television	4029	4321	4646	4147	4332	4374
Direct Mail	1666	1876	2049	2228	2378	2431
Outdoor & Transport	613	649	810	788	816	901
Radio	460	516	595	541	545	582
Cinema	97	123	128	164	180	180
Internet	19	51	155	166	233	376
TOTAL	14415	15412	16988	16537	16817	17227

[Note: TV, outdoor, radio, cinema and direct mail data include production costs. Internet excludes production costs. Press production costs are shown separately.]

Source: The Advertising Association

Appendix 10: Total Advertising Expenditure, Percentage of Total %

	1998	1999	2000	2001	2002	2003
Press	52.2	51.1	50.6	51.4	49.6	48.7
Television	28.0	28.0	27.4	25.1	25.8	25.4
Direct Mail	11.6	12.2	12.1	13.5	14.1	14.1
Outdoor & Transport	4.3	4.2	4.8	4.8	4.9	5.2
Radio	3.2	3.3	3.5	3.3	3.2	3.4
Cinema	0.7	0.8	0.8	1.00	1.1	1.0
Internet	0.1	0.3	0.9	1.00	1.4	2.2
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

Source: The Advertising Association