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# Earnings properties and accounting valuation in the euro zone

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# EARNINGS PROPERTIES AND ACCOUNTING VALUATION

## IN THE EURO-ZONE

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**By Christos A. Grambovas**

**A Thesis Submitted to the University of Wales**
**in Fulfilment of the Requirements**
**for the Degree of Doctor of Philosophy**

**School of Business and Regional Development**
**University of Wales, Bangor**
**United Kingdom**

**January 2003**

*"Το ήθος για τον άνθρωπο είναι ο προστάτης θεός του"*

Ηράκλειτος, (Στοβαίος, Ανθολόγιον, IV 40, 23)

*"Ethos is for man his protector god"*

Heracletus, (Stovaios, Anthologion, IV 40, 23)

To those whose values and life philosophy I try to follow,

To my parents

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In addition, I would like to dedicate this work to my grandparents in Florina and to my late grandparents from Thessaloniki who supported me since my early years of education.

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# CHAPTER 1: INTRODUCTION

This study focuses on a key issue in accounting and finance, that of value relevance, and relates it to recent economic developments in Europe. At the present time, amongst the various developments under way in Europe, there are three in particular that affect international companies and their valuation in capital markets:

a) The recent introduction of the new common currency (*the Euro*) by twelve European countries.
b) The process of Accounting Harmonisation, through which all listed firms in the EU will adopt IAS rules by 2005.
c) Proposals on Tax Harmonisation, where there is a continuing debate since some countries (e.g. the UK) desire to keep their fiscal independence.

This thesis explores these issues by considering accounting differences among EU countries and the capital market benefits that may arise from the programme of accounting harmonisation that is under way. Furthermore, it will also assess the value relevance of corporate taxation across different countries and the potential capital market effects of future tax harmonisation. Finally, the thesis will attempt to identify the implications of the introduction of the Euro and to suggest potential advantages and disadvantages for the countries which seek to join the Euro-zone in the next years.

The three empirical studies contributing to this thesis are part of the 'Harmonia' programme, a European Commission research project which attempts to assess the progress of European accounting harmonisation and its effects on capital markets. Identifying interconnections between finance and accounting in Europe is essential to explain the reactions of capital markets to developments in accounting practice and the relevant company legislation. There are policy implications not only regarding the interconnections between financial disclosures by firms and valuation in international markets, but also with regard to the differences among EU countries in

corporate behaviour and financial regulations. This thesis addresses these policy issues, and provides results that are of importance not only to the understanding of accounting practices by a wide cross section of European firms but also how such information is utilised in the process of firm valuation in European capital markets.

*Interesting Research Questions*

Several research questions are addressed in this study. Initially, the thesis reports on a study of capital market influences on accounting earnings, specifically the asymmetric timeliness of earnings in reflecting stock price changes across different European equity markets. The properties of accounting earnings and their connection to information valued by the market deserves more attention in the European environment, since there is scarcity of relevant published research. The thesis also includes the results of an investigation of the way in which equity values are influenced by the information provided in financial accounts, again placing emphasis on the differences that exist among European countries. Moreover, special attention is paid to the fiscal and monetary conditions which are specific to the European context and under which European firms have operated in the past decade. Here, the focus is on assessing the implications for firm valuation of the varying taxation policies across European countries and of exchange rate effects before and after the adoption of the Euro. In addition, evidence is provided of the changing properties of company earnings in Europe, in this case at the time of the ERM monetary crisis of 1992.

The studies reported in this thesis concentrate on those EU member states that have adopted the Euro. By way of comparison, the studies report results not only for the Euro-zone countries but also the UK. There are several additional reasons that support the choice of Euro-zone countries, especially with respect to an analysis that attempts to account for changing economic conditions. They form a unique economic area, with a single currency, and the authorities of these countries (and the UK as well) appear to be committed to the creation of a Pan-European stock market. In addition, there has been considerable macroeconomic convergence since the Maastricht Treaty of 1992 established the economic pre-conditions for participation in the Economic and Monetary Union. Furthermore, the Euro-zone countries have

mainly followed a similar trajectory towards harmonisation in the institutional aspects of their accounting during the period in question. Together, these factors are important determinants of the environment in which European equities are valued and in which the firms that are involved account for their performance. Therefore, a major contribution of this thesis is to control for relevant economic effects whilst examining accounting based valuation models in an international context.

*Recent Modelling Developments*

Recently, there have been several developments in the design of research that addresses issues relevant to those of this study. In the area of value relevance, the Ohlson (1995) and Feltham and Ohlson (1995) models provide an economic framework that was previously lacking when relating the market value of the firm to information provided in company accounts. Furthermore, with regard to the basic properties of accounting, Basu (1997) defines the notion of earnings' conservatism as the asymmetric timeliness of earnings in reporting 'bad' news (declines is share prices) and 'good' news (increases in share prices), and employs a 'reverse regression' research design in order to estimate these effects. There have been few empirical applications of these models, especially from a European point of view. Thus, a further contribution of this thesis is to provide evidence on recent theoretical advances using samples of firms that operate in countries that have not been examined to date.

*Empirical Findings*

In terms of the properties of accounting numbers, the results indicate the existence of a clear asymmetric behaviour in the contemporaneous incorporation of 'good' and 'bad news' in the accounting earnings of European firms, and that 'good news' seems to be reflected in earnings in following years. The degree of accounting conservatism is shown to be influenced by severe changes in economic conditions, appearing to increase or decrease according to the impact of international monetary crisis on domestic economies.

The thesis also provides evidence that taxes have greater influence over stock prices in countries with lower taxation rates, resulting in higher coefficients in the tax-

modified Ohlson (1995) model that is tested. Furthermore, there is evidence of different effects of earnings and taxes on the valuation of equity in small and medium-sized companies when compared with large firms, and the results suggest that the impact of future tax harmonisation may be restricted to larger firms in most countries.

Finally, the results of the study appear to suggest the importance of exchange rates, especially for the countries which have faced greater fluctuation in their currency's value. The findings show that exchange rate changes with respect to an international currency basket were important for the market value of firms in the Euro-zone countries prior to the introduction of the Euro. After its adoption, however, fluctuations in exchange rates cease to have significant effects for firms' share prices in the same region. Such results are particularly important for those European countries that have not substituted their national currencies, especially since further results provided in this study indicate an increase in the importance of exchange rate volatility for the UK firms at the end of the period.

*Structure*

Chapter 2 provides a discussion of capital markets research in accounting, with special attention first to the development of valuation models and their empirical application (Section 2.2) and second to research on accounting conservatism (2.3).

In Chapter 3, developments in the international environment are analysed, including the implications of accounting harmonisation (3.1), the value relevance of corporate taxation (3.2) and the effects of fluctuation in the exchange rates on the market equity of the firm (3.3).

Certain aspects of the methodology of the study are highlighted in Chapter 4. These comprise the development of the tax-modified version of the Ohlson model (4.1), the inclusion of exchange rates in the Feltham and Ohlson model (4.2), the presumed scale effects in the Ohlson framework (4.3), and finally the development of the reverse regression approach adopted in conservatism studies (4.4).

Chapter 5 consists of the three empirical studies which examine the principal research questions set out above. These studies are presented as self-contained papers, each with its own introduction, discussion of prior literature and issues of research design, data selection, empirical results and conclusions. The sections related to the previous literature and research design are complementary to the previous chapters and not repetitive. The first study investigates the existence of earnings' conservatism in the Euro-zone (5.1), the second analyses tax effects on firm valuation (5.2) and the third identifies the influences of currency fluctuations on equity values (5.3). In all cases, large samples of European firms are employed, and the results as a whole provide wide-ranging evidence on accounting and valuation in the changing economic environment of Europe.

Finally, Chapter 6 provides and overview of the study and discusses the findings and conclusions drawn.

# CHAPTER 2: CAPITAL MARKETS RESEARCH

Capital markets research in accounting has received considerable attention in recent years, not only due to the theoretical developments that have taken place in both accounting and finance but also to the increase in the importance of capital markets in the world's economies. Indeed, the role of capital markets has evolved considerably. With many companies worldwide now issuing capital on their national stock markets, globalisation has also led many such firms to cross frontiers in order to increase the marketability of their equity, and to introduce their shares on new markets, all in the search for a lower cost of capital.

Clearly, such events have increased the significance of capital markets, and have led to greater global capital market integration. At the same time, there have been important developments in market based accounting, both in theory and evidence. This chapter provides an overview of the main areas of market-based accounting research (2.1), and then leads to a more detailed discussion of value relevance models (2.2) and accounting conservatism (2.3). Recent empirical work on these two areas is presented in each section, providing an insight into the present state of knowledge in the main areas of interest to this thesis.

## 2.1 FINANCIAL ACCOUNTING RESEARCH

The first empirical research studies in financial accounting appeared at the end of the 1960s, since up to that point the literature was focused predominantly on the nature of the economic value of the company. Two important seminal papers were published at that time which completely altered the direction of accounting research, namely the market based analyses conducted by Ball and Brown (1968) and Beaver (1968). These two studies implied a shift in the purpose of accounting research towards the examination of the usefulness of accounting numbers, particularly for investment purposes.

Ball and Brown (1968) test their hypothesis that abnormal stock returns will be influenced by the earnings announcement by employing a random walk model and a market model in earnings. More precisely, the underlying hypothesis argues that part of the increase (decrease) in earnings would be unexpected and thus that a positive (negative) surprise in the market leads to a rise (decline) in stock prices. The authors' results demonstrate that there is a positive correlation between the sign of abnormal monthly stock returns and the sign of the annual earnings change, thus supporting their hypothesis. In addition, Ball and Brown (1968) provide evidence that the market's reaction to the earnings announcement is biased since, when 'bad earnings news' is announced, the market takes several months to adjust, indicating the existence of a post earnings announcement drift.

In the second paper that pioneered this research paradigm, Beaver (1968) conducts an event study with the main hypothesis being that the trading volume of shares is higher in the period of an earnings announcement than in other periods. The results support the hypothesis, indicating an increase in return volatility in the periods of earnings announcements. Moreover, the author suggests that the problem of heterogeneity of earnings expectations seems to be at least partly resolved by the effect of the earnings announcement.

Following these two seminal papers, research into the capital market consequences of accounting increased considerably and has been reviewed since then on a number

of occasions. Lev and Ohlson (1982) analyse the early studies, whilst the development of capital markets research in the 1980s is discussed by Bernard (1989). Recently, Kothari (2001) provides a new review of the literature in this area and Lee (2001) discusses some key points from Kothari's (2001) study. Furthermore, Dumontier and Raffournier (2002) summarise the European evidence in the area and Beaver (2002) provides his own perspective on some important aspects of the capital markets accounting literature.

In the light of these review papers, the previous literature can be divided into three major lines of research, namely: Stock Returns and Earnings (see 2.1.1 below), Market Efficiency and Regulation (2.1.2), and Fundamental Analysis and Valuation (2.1.3).[1] The main area relevant to this study, and the one to be discussed more thoroughly, is the third, particularly the studies on value relevance and the related property of conservatism in accounting numbers. The discussion of value relevance is further developed in detail in Section 2.2 of the study, and earnings conservatism is taken up again in greater detail in Section 2.3. At this point, however, a brief overview of the major lines of capital market research is provided by way of an introduction.

### 2.1.1 Stock Returns and Earnings

Initially, capital markets research was focused on the nature of the returns-earnings relationship, particularly the estimation of earnings response coefficients. At the same time, a substantial volume of research also considered the time series properties of earnings, and more recently earnings management, together with the methodological issues surrounding such empirical analysis.

Research on the earnings response coefficient (ERC) was advanced by Kormendi and Lipe (1987), who provide evidence that ERCs mirror the time series properties of earnings when the values of share prices fluctuate. In addition, other studies in the area at this time (see Easton and Zmijewski (1989) and Collins and Kothari (1989))

[1] One could also categorise the literature in a different way, since there are many studies that can be considered as belonging to more than one category. The classification made here covering the different areas of accounting research in capital markets builds on the approach adopted by Kothari (2001).

point to the economic determinants of earnings response coefficients, such as the persistence of earnings, the risk (described as the systematic component of the equity cash flows' volatility), the firm's growth and the interest rate. But, even at this stage, concern had been expressed about the magnitude of the estimated coefficients as, compared to theory, empirical studies showed them to be low.

The literature gives several possible explanations, starting with a key insight by Beaver, Lambert and Morse (1980). They suggest that share prices lead earnings, since more current information is reflected in prices than in contemporaneous accounting earnings, which biases ERCs towards zero.[2] The presumed inefficiency of the capital markets has been put forward as another explanation for low ERCs, while the existence of transitory earnings is said to influence the magnitude of the earnings response coefficients as well. Finally, in more recent studies, several different research designs have been used to extend the terms in the returns predictor. For example, Warfield and Wild (1992) include future earnings and Easton, Harris and Ohlson (1992) expand both returns and earnings measurement windows in testing the economic determinants of ERCs, providing additional explanations for ERC magnitude.

The time-series properties of earnings were for a period the main focus of the methodological debate in capital markets research (see Brown (1993) for a literature survey), attempting to assess which time series model could forecast earnings more accurately. However, as Kothari (2001) points out, such research has been superseded by studies employing analysts' forecasts of earnings. Beaver (2002) also agrees that research on analysts' forecasts is the successor to the time series of earnings literature, and includes tests of the presumed optimism in analysts' forecasts (e.g. Brown, 1997), estimates of the forecasting bias (e.g. Lim, 1998) and its efficiency (e.g. Abarbanell, 1991), and measures of accuracy across different types of analysts.

In addition to the above, the accruals accounting method that generates reported earnings figures has been under investigation. For instance, models of discretionary

[2] For a further discussion on the "prices lead earnings" concept, see Section 4.4 in Chapter 4.

and non-discretionary accruals have been developed, where the discretionary part is used as a proxy for earnings management (see for example Dechow, Sloan, and Sweeney (1995)). The manipulation of accruals in general is related, in the literature, to opportunistic behaviour by managers with personal or other incentives, which includes a capital market dimension as well (see for example Jiambalvo (1996)).

Given the extensive volume of applied research in this area, empirical concerns have arisen frequently in capital markets research. Kothari and Wasley (1989) discuss the issue of bias in test statistics while several econometric concerns related to price and return regression models are analysed by Brown, Lo and Lys (2000). The authors review the use and misuse of $R^2$ in accounting research, focusing on scale effects and suggesting deflation of the variables as a solution. Easton and Sommers (2002) extend the discussion on general scale effects on regression coefficients, as well as on $R^2$, and they suggest the use of previous period price as the appropriate deflator to avoid such effects. However, Barth and Clinch (2001) disapprove of variable deflation and suggest in turn the inclusion of a proxy for scale as a separate independent variable in the models. These methodological concerns are further developed in Section 4.3 of Chapter 4.

There has indeed been a substantial volume of published work regarding the returns-earnings relationship, the properties of earnings and the methodological issues that arise. However, further analysis goes beyond the scope of this study and henceforth at this point accounting research on market efficiency will be considered.

### 2.1.2 Market Efficiency and Regulation

The efficiency or not of the market ought to be central to research that is concerned with capital markets, and even more when, in the majority of studies, the efficiency of the capital market is the main assumption. An additional factor is that accounting is highly regulated, which places constraints on market-driven analysis and also introduces a policy dimension to capital markets research in accounting.

Previous research on market efficiency can be divided into two major approaches: event studies, which test efficiency either over a short window or a long horizon, and cross-sectional studies of return predictability which mainly examine long horizons. In the short window studies, events such as earnings announcements or mergers (among others) are used and the market reaction is tested in a period of between a few hours and a few days. In general, the evidence of these studies is in favour of the existence of market efficiency. In the long horizon event studies, the hypothesis that is usually tested is that the market overreacts or underreacts to an event and then takes a long time (one to five year returns are tested) to adjust to such a reaction. This was first tested by Ball and Brown (1968) as discussed previously. Since then, more studies have been conducted that identify the post-announcement drift anomaly. Bernard and Thomas (1990) provide evidence to show that abnormal returns are related to inefficient processing of earnings announcements. Their study is one of the most prominent in the area, with Beaver (2002, p. 454) arguing that "*their studies represent a classical example of excellent research design*", producing results that are 'compelling' and point towards market inefficiencies. Finally, cross-sectional tests of return predictability test long horizons and also provide evidence against the efficiency of the market (see for example Ou and Penman (1989) and Abarbanell and Bushee (1997)).

The adoption of new regulation is also central to the accounting research agenda, and it appears to have taken on even greater importance recently due to the debate as to whether one set of accounting rules should prevail in the world's capital markets. Mainly, empirical research related to capital markets tests the stock market effects of a change in a specific disclosure regulation. The existing findings are almost exclusively concentrated on the US, i.e. on changes in Financial Accounting Standards (FAS) and their consequences in financial reporting. Holthausen and Watts (2001) provide a comprehensive review of these studies (see 2.1.5 below). In general, the change to a standard gives the opportunity to academic researchers to assess whether or not the new standard provides incremental value relevance over the previous standard (see for example Ayers (1998) on deferred taxation). These results are directly applicable to regulators and standard setters who, for instance, can identify the market reaction to a new regulation. Such research is particularly important in Europe, the setting for the research reported in this thesis, given the

changes under way and expected in future such as the adoption of IAS rules for all European Union listed firms (see Chapter 3 below).

### 2.1.3 Fundamental Analysis and Valuation

Fundamental analysis involves the assessment of the intrinsic value of the firm by employing current and past financial statement information along with other industry and macroeconomic variables. The intrinsic value may then be compared with the market value of equity, and thus lead to the identification of a possible mispricing of the firm's shares. Another objective of fundamental analysis is analysis of the determinants of the value of the firm in an effort to help investment decisions and to calculate the value of non-listed firms. A key area of research on fundamental analysis is the use of financial ratios, either for forecasting future earnings or for identifying mispriced securities. Ou and Penman (1989) provide an important contribution in this area, performing a multivariate analysis of financial ratios in order to predict earnings. In more recent research, Penman (1998) attempts to combine price-earnings and price-to-book ratios in order to predict earnings. The results incline in favour of the combination of the information provided by the two ratios. Elsewhere, Beaver and Ryan (2000) provide evidence of forecasting future book returns on equity by disaggregating the price-to-book ratio into "bias" (resulting from conservative accounting) and "lag" (the time of adjustment of the book value to the market value changes).

Valuation studies attempt to examine the intrinsic value of the firm in a slightly different way, i.e. they arrive at the market value of the firm by employing accounting and economic variables. Naturally, the distinction between the two approaches may not always be clear since many studies involve a fundamental analysis as well as value relevance techniques in order to assess the value of the firm. As the value relevance line of research is central to the analysis of this study, it is therefore discussed in detail below.

Value relevance research attempts to identify, in general, the relationship between a security price-based dependent variable and a number of accounting variables. The

accounting variables are said to be value relevant if they are significantly related to the dependent variable. The value relevance line of research is extensive, with a wide focus, and builds on many of the capital markets studies outlined above. For instance, a number of short window event studies attempt to assess the value relevance of specific releases of accounting information, starting with the seminal paper of Beaver (1968) discussed previously. Other published papers in this category involve association studies, where determinants of the market value of the firm or of market returns are examined.

Until the recent pioneering work of Ohlson (1995), many value relevance studies have relied explicitly or implicitly on the dividend discounting model. This model, attributed to Williams (1938), mainly suggests that the share price is equal to the present value of expected future dividends when these are discounted at their risk adjusted expected rate of return. Since then, there have been several developments of the model, with Gordon (1962) deriving the Gordon Growth Model and Fama and Miller (1972) providing further insights. Studies of value relevance that have utilised the dividend discounting model employ accounting variables as proxies of future dividends instead of dividends in order to derive the value of equity. Penman (1992, p. 467) describes the substitution of dividends by future dividends as the 'dividend conundrum', since according to the author "*price is based on future dividends but observed dividends do not tell us anything about price*". The recognition of such weaknesses in the valuation model underlying early capital markets research has led more recently to widespread interest in the residual income valuation model.

Even though predecessors of such a framework appeared early on in the literature (Preinreich (1938), for example), the crucial turning point came with the studies of Ohlson (1995) and Feltham and Ohlson (1995). Starting from the dividend discounting model, these authors provided a set of considerably more plausible assumptions, which of course are simplifications of the reality that is described. These models suggest that the market value of the firm equals the book value when this is adjusted for profitability and other 'non-accounting' information that affects the prediction of future profitability. The theoretical work of Ohlson (1995) and Feltham and Ohlson (1995) was soon matched with empirical studies from Dechow, Hutton and Sloan (1999) and Frankel and Lee (1998) among others. This line of

research is crucial to the study reported in this thesis and therefore is analysed in greater detail in Section 2.2 below.

A second research line which involves association studies between share prices and accounting numbers is that of earnings conservatism.[3] The models involved do not have a research design based on returns as the dependent variable and earnings as the independent variable, but utilise the 'reverse regression' articulated by Beaver, Lambert and Morse (1980) and Beaver, Lambert and Ryan (1987). Thus, such studies have earnings as the dependent variable and stock returns as the independent predictor.

Basu (1997) first described the notion of earnings' conservatism as the asymmetric timeliness of earnings in reflecting share price changes. According to this, 'bad news', described as a fall in share prices, will be reflected in earnings in a more timely way than 'good news'. The latter, an increase in share prices, tends to be reflected in earnings in years ahead. While Basu's (1997) analysis is based on US data, Pope and Walker (1999) compare the UK with the US and Ball, Kothari and Robin (2000) assess earnings' conservatism in seven countries. Since then, more studies have been conducted in an effort to identify the magnitude and different aspects of earnings' conservatism in different countries. The area of earnings' conservatism is also vital to the analysis presented in this study, and therefore will be discussed further in Section 2.3 below.

Whilst such value relevance research has increased in popularity, there exists an ongoing discussion on the 'relevance' of value relevance studies themselves. This is especially the case for standard setting, as articulated by Holthausen and Watts (2001) and in response by Barth, Beaver and Landsman (2001). Holthausen and Watts (2001) suggest that, despite the large volume of recent research in the area, the actual contribution to the standard setting process appears, in the authors' views, modest. The main reason is the absence of any kind of descriptive accounting theory

[3] The earnings' conservatism literature can be classified elsewhere in the capital markets research literature. Kothari (2001), for example, discusses aspects of this partly in the analysis of the earnings response coefficients and partly in the work related to the time series properties of earnings. Mainly for structural reasons, the earnings' conservatism discussion is included here at this point of the study. In addition, it involves the association of accounting numbers and share prices (returns), even though it employs the 'reverse regression' analysis of Beaver et al (1980).

of standard setting. Indeed, many valuation studies have the deficiency that they do not attempt to construct one. The authors argue that, in the absence of such a theory, the conclusions of the empirical value relevance studies can be challenged in terms of their 'real world' validity.[4] Furthermore, Holthausen and Watts (2001, p. 63) challenge the structure of value relevance models in the sense that the accounting numbers should not be tested as direct determinants of share prices since "*this conflicts with the FASB's explicit denial that accounting is concerned with providing direct estimates of value and with the nature and history of US accounting practice*". In addition, they argue that even if value relevance studies provide insights into the process of equity investor valuation, they certainly neglect according to the authors other roles of accounting and its effects on practice and standard setting.

In reply, Barth et al (2001) argue that value relevance research provides important insights for standard setting and they identify six misconceptions in the Holthausen and Watts (2001) study. First, they suggest that research in value relevance attempts to examine the relevance and reliability of accounting numbers by employing well accepted valuation models. Second, Barth et al (2001) point out that equity investment valuation is one of the most important issues for standard setters, and that the Holthausen and Watts (2001) criticism regarding the research focus on equity valuation is misguided. Third, they demonstrate the validity of the inferences from empirical tests despite the criticisms levelled against the simplifying assumptions of such models. Fourth, the authors suggest that value relevance models can assess other effects of accounting, like conservatism, and evidence on this point is seen in the incorporation of conservatism measures into value relevance models. Fifth, Barth et al (2001) argue that value relevance studies are constructed in order to investigate the information content of accounting numbers, rather than an abstract, badly-defined notion of 'usefulness'. Finally, the authors show that the use of new econometric techniques help to avoid some of the well known statistical problems, thus improving the validity of the empirical tests that have been reported. Overall, to use their words, Barth et al (2001, p. 98) "*clarify the relevance of the value relevance literature to financial accounting standard setting*".

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[4] One could argue that, even in the presence of an accounting descriptive theory, the 'real world' validity of empirical research can be challenged since tests ought to employ models which unavoidably make simplifying assumptions. Thus, despite the fact that such criticism may have some basis in social science research, it is not that certain if it is a relevant one in this case.

Despite the existence of the kind of problems raised above, relating to the absence of a descriptive theory (Holthausen and Watts (2001)), the questionable modelling and the methodological shortcomings of certain studies (see for example Section 4.3 in Chapter 4), this thesis attempts to demonstrate the relevance of such a line of research for investors, markets and standard setters. Consequently, the next section concentrates on the two areas introduced above that are most relevant to this study, namely *residual income valuation*, with the focus on the Ohlson (1995) and Feltham and Ohlson (1995), and *accounting conservatism*, with reference to Basu's (1997) earnings conservatism.

## 2.2 VALUE RELEVANCE MODELS AND EMPIRICAL APPLICATIONS

While value relevance research commences with the seminal works of Ball and Brown (1968) and Beaver (1968), the construction of models relating accounting results to the value of the firm was not a priority at that time. Subsequently, however, financial modelling has been used extensively by accounting academics based initially on the dividend discounting model, from which the Gordon (1962) model was derived, and then on the residual income valuation model.

### 2.2.1 DIVIDEND DISCOUNTING MODEL

The dividend discounting model (DDM) shows that the market value of equity can be described as the present value of expected dividends in future periods when discounted at the risk adjusted expected rate of return. The model is based on the seminal work of Williams (1938) and is defined as:

$$P_t = \sum_{k=1}^{\infty} [E_t (d_{t+k}) / \prod_{j=1}^{k} (1 + r_{t+j})] \qquad \textbf{(DDM)} \qquad (1)$$

Where $P_t$ is the share price, $E_t(d_{t+k})$ the expected value of dividends (d) for the period t+k, and $r_{t+j}$ is the risk adjusted discount rate that can be identified as the systematic risk of dividends in period t+j.

As is evident from equation (1), the share price can be simplified to expectations on future dividends at a perpetual discount. Given the above, Gordon (1962) constructed a new model, which is based on several assumptions and known as the Gordon Growth Formula. First, the author assumes that the following equations stand:

$$d_{t+\tau} = (1-\varphi)\, x_{t+\tau} \qquad (2)$$

$$x_{t+\tau} = \rho\, y_{t+\tau-1} \qquad (3)$$

Where $x_{t+\tau}$ are the earnings at period $t+\tau$, $y_{t+\tau-1}$ is the book value at period $t+\tau-1$, $\varphi$ is the portion of retained earnings and $\rho$ is the book return on equity. In addition, according to Lo and Lys (1999, p. 350), the Gordon model assumes clean surplus accounting (i.e. that $y_t = y_{t-1} + x_t - d_t$) although this was not stated clearly at the time. Based on these assumptions and by defining the growth rate $g = \varphi \rho$ ($g \geq 0$), Gordon (1962) obtains:

$$\mathbf{P_t = d_{t+1} / (r-g) = [(1+g)\, d_t\, ] / (r-g)} \qquad \textbf{(GGM)} \qquad \textbf{(4)}$$

It is Equation (4) that is known in the literature as the Gordon Growth Model (GGM).

### 2.2.2 Residual Income Valuation Model

According to Bernard (1995, p. 741), the Residual Income Valuation (RIV) model "*was used in a crude form by the Internal Revenue Service (IRS) as early as 1920 to estimate the impact of prohibition on the value of breweries*". In terms of its appearance in the academic literature, Preinreich (1938) was the first to discuss a rudimentary form of the model. Edwards and Bell (1961) developed the model as it is understood today, and it was later reassessed by Peasnell (1982).

The general form of the Residual Income Valuation model suggests that the value of the firm equals the invested capital plus the present value (PV) of future residual income, which derives from the operating activities of the firm that create wealth. One could construct a simple outline of the model as follows:

$$\textbf{Firm Value = Capital + PV (future residual income)} \qquad \textbf{(5)}$$

Indeed, there are several versions of equation 5, that have been specified either in the course of developing accounting theory or for commercial purposes. All these new versions of the RIV model are also based on the Dividend Discounting Model, with those of Ohlson (1995) and Feltham and Ohlson (1995) being the most articulated

developments in the academic literature, providing a theoretical derivation that replaces dividends by book values of earnings and capital recorded in the company's accounts. In part recognition of its evolution, the theoretical model has also been referred to as the EBO model, i.e. Edwards-Bell-Ohlson, initially by Bernard (1994). In terms of commercial developments, there are three major models, namely the Stern Stewart's EVA™, the Holt Value Associate's CFROI™, and the McKinsey's Economic Profit Model™. Detailed discussion of these recent commercial developments goes beyond the scope of this thesis. However, the main features of these models are summarized and compared with EBO in Table 1, which is provided by Lee (1999).

### 2.2.3 Theoretical Developments by Ohlson (1995) and Feltham and Ohlson (1995)

As noted above, one of the most important developments in the area of value relevance modelling has been the theoretical articulation of the Residual Income Valuation model by Ohlson (1995) and Feltham and Ohlson (1995). In a review of these efforts to explain firm value with accounting numbers, Beaver (2002) emphasises that the models of Ohlson (1995) and Feltham and Ohlson (1995) together constitute one of the few attempts in recent years to construct a new 'theory of accounting'. In addition to the general importance of these developments, the Ohlson (1995) model is central to the research reported in this thesis and, therefore, attention will now be paid in detail to its derivation, and to its further modification in Feltham and Ohlson (1995). Both models will be applied in the empirical part of this study and thus a sound understanding of their theoretical development and related empirical work to date is essential.

**Table 1. Residual Income Valuation Models**

| *Alternative Academic and Commercial Forms of the RIV model* | | | |
|---|---|---|---|
| **Capital** | **Cost of Capital** | **Earnings** | **Examples** |
| *Panel A: Value to Both Debt holders and Shareholders* | | | |
| Net Operating Assets (or Total Assets ± adjustments for specific items) | WACC | EBI or NOPAT ± specific adjustments depending on how capital is defined | Stewart (1991) EVA™, Copeland et al (1995) Economic Profit Model ™ |
| Net Financial Assets | WACC | Free Cash Flow (EBI ± Accounting Accruals ± Net Capital Expense | Rappaport (1986) ALCAR ™, Copeland et al (1995) Discounted Cash Flow Model |
| Net Operating Assets with Inflation and other adjustments | WACC | EBI with specific adjustments (including inflation) | Madden (1998) Value Associates CFROI ™ |
| *Panel B: Value to Shareholders* | | | |
| Shareholder's Equity (reported Book Value) under a particular country's GAAP | Cost of Equity | Net Income to Shareholders under the same GAAP | Discounted Residual Income Model or "EBO" in the financial accounting literature |

Source: Lee (1999), p. 417.

Note: The "EBO" model refers to recent RIV models and stands for "Edwards – Bell – Ohlson", first called as such by Bernard (1994).

In the finance literature, the traditional view is that firm valuation can be achieved through the forecasting of dividends, as discussed before in the context of the Dividend Discounting Model. It follows that one could attempt to forecast future dividends by using accounting data and other relevant information. However, Modigliani and Miller (1958) suggested that the financial activities of a firm, including its dividend policy, result in a zero net present value effect.[5] This is also known as the dividend irrelevancy proposition and implies that, in an efficient market, a dollar of dividends displaces one dollar of market value (Ohlson (1995), p. 665). Therefore, if one takes dividend policy irrelevancy into consideration, the effort to forecast dividends can be replaced with an effort to explain the current price.

When the direction of research turned to that issue, the models were such that stock prices would be the dependent variable and accounting data the explanatory variables (see Ou and Penman (1989), for example). Even though the change of direction can be seen as positive, an important issue is that any such model can only describe what is 'known by the market'. To tackle this, the focus of research shifted once more from the explanation of the current price to the prediction of future earnings (see for example Abarbanell and Bushee (1994), among others). Despite the fact that the prediction of future earnings was not a new endeavour, it had not been explored thoroughly in the context of valuation modeling due to the concern that "*earnings are manipulable artifacts of arbitrary accounting choices*", as Bernard (1995, pp. 735-736) points out. Ohlson (1995), however, incorporates earnings' prediction into a model where the firm value is approximated as a function of book value, forecasted earnings and discount rates.

In building his model, Ohlson makes three plausible assumptions. Firstly, he maintains that the equilibrium condition of equation (6), which is a variation of equation (1) discussed previously, holds.[6]

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[5] For a further discussion of the traditional approach as well as the dividend irrelevancy proposition, see Penman (1992).

[6] This is the no-intertemporal arbitrage price that results when interest rates are non-stochastic, beliefs are homogeneous, and individuals are risk-neutral (Lundholm (1995), p. 750).

$$P_t = \sum_{\tau=1}^{\infty} R^{-\tau}_f \, E_t(d_{t+\tau}) \qquad (6)$$

Secondly, Ohlson assumes that the clean surplus relation (CSR) of equation (7) below holds. That implies that the book value at the end of the present period ($y_t$) equals the book value at the beginning of the period ($y_{t-1}$) plus the reported earnings ($x_t$) minus the dividends ($d_t$) net of appropriations and contributions.

$$y_t = y_{t-1} + x_t - d_t \qquad (7) \quad =>$$

$$=> d_t = y_{t-1} + x_t - y_t \qquad (8)$$

Despite some criticism over the CSR's applicability in real life situations, in terms of empirical research the CSR is considered to be a reasonable approximation of reality, as argued by Lundholm (1995, p. 750), among others. By substituting equation (8) for dividends in equation (6), and by defining abnormal earnings as the amount that the firm earns in excess of the risk-free rate of interest ($R_f - 1$) on the book value [$x^a_{t+\tau} = x_{t+\tau} - (R_f - 1)\, y_{t+\tau-1}$], Ohlson reaches equation (9):

$$P_t = y_t + \sum_{\tau=1}^{\infty} R^{-\tau}_f \, E_t(x^a_{t+\tau}) \qquad (9)$$

Ohlson's third and final assumption, that of Linear Information Dynamics (LID), provides the 'missing' intuition from equation (9). Accordingly, both the abnormal earnings ($x^a_t$) and other non-accounting information (which is defined as $v_t$) are deemed to follow an autoregressive process as described in equations (10) and (11):

$$x^a_{t+1} = \omega \, x^a_t + v_t + \varepsilon_{1\,t+1} \qquad (10)$$

$$v_{t+1} = \gamma \, v_t + \varepsilon_{2\,t+1} \qquad (11)$$

According to Ohlson (1995, p. 668), the parameters $\omega$ and $\gamma$, which capture the persistence of 'abnormal earnings' and 'other information' respectively, are fixed and known, since the firm's economic environment and accounting principles determine them. The model restricts the parameters to be non-negative and less than one, implying that the unconditional means of abnormal earnings and the 'other information' variable are zero.

When the three assumptions are satisfied, Ohlson (1995) reaches the following equation (12). Known now as the Ohlson Model, it implies that the market value of the firm equals the book value when this is adjusted for excess profitability (abnormal earnings) and other information that affects the prediction of future profitability (through the stochastic process in equation (10)).

$$\mathbf{P_t = y_t + \alpha_1 x^a_t + \alpha_2 v_t} \qquad \textbf{"The Ohlson Model – O95"} \quad \textbf{(12)}$$

Where the coefficients:

$$\alpha_1 = \omega / (R_f - \omega) \geq 0$$

$$\alpha_2 = R_f / (R_f - \omega)(R_f - \gamma) > 0$$

While the Ohlson model provides a good starting point, Feltham and Ohlson (1995) improve the model in certain respects. The authors keep the structure of the Ohlson model, without revision insofar as the model's development is concerned. The first modification they introduce is to divide the book value into financial assets ($fa_t$) and operating assets ($oa_t$). Based on Modigliani-Miller (1958), one expects the financial activities of a firm to result in changes to the market value on a one to one basis, as mentioned above. However, the operating activities of the firm do not affect the market value as predictably as the financial activities and therefore their behaviour can be considered as more important in applying the model. The second modification reflects this. The abnormal earnings described in the Ohlson model are now defined as abnormal *operating* earnings ($ox^a_t$), since the financial activities in a 'perfect markets' context are not expected to lead to abnormal earnings.

Feltham and Ohlson (1995) also modify the LID of the Ohlson model. Initially they propose the inclusion of several more variables to capture 'other information', which at the end is restricted to two ($v_{1\,t}$ and $v_{2\,t}$) just for reasons of simplicity in the analysis. Furthermore, the importance now attached to operating assets is emphasised by their inclusion in the new linear information dynamics. By assuming that the evolution of all information follows a linear Markovian structure, the new Linear Information Model (LIM) takes the following form:

$$ox^{a}_{t+1} = \omega_{11}\, ox^{a}_{t} + \omega_{12}\, oa_{t} + v_{1\,t} + \varepsilon_{1\,t+1} \qquad (13)$$

$$oa_{t+1} = \omega_{22}\, oa_{t} + v_{2\,t} + \varepsilon_{2\,t+1} \qquad (14)$$

$$v_{1\,t+1} = \gamma_1\, v_{1\,t} + \varepsilon_{3\,t+1} \qquad (15)$$

$$v_{2\,t+1} = \gamma_2\, v_{2\,t} + \varepsilon_{4\,t+1} \qquad (16)$$

There are several restrictions according to Feltham and Ohlson (1995, p. 703) on the parameters of the LIM. First, the absolute values of $\gamma_1$ and $\gamma_2$ should be less than one, ensuring that the random effects on other information have no long run influence on future other information. The authors suggest (p. 703) that the other information should behave as "*serially correlated, but convergent, noise in the prediction of abnormal earnings and operating assets*". Second, the parameter $\omega_{11}$ can be equal to or higher than zero and lower than one, imposing a restriction on the persistence of abnormal earnings. Third, the parameter $\omega_{22}$ has to be higher than (or equal to) one and lower than $R_f$ in order to restrict the long run growth in operating assets while the upper bound secures the avoidance of growth paradoxes. Finally, $\omega_{12}$ must be equal to or higher than zero. This restriction provides for unbiased accounting for $\omega_{12} = 0$ and for conservative accounting for $\omega_{12} > 0$ (having zero as the lower bound eliminates the possibility of 'aggressive' accounting for simplicity but also for consistency with real practices according to the authors).

Based on the above and on the development of the Ohlson model, Feltham and Ohlson reach the following equation (17), which is also known as Feltham and Ohlson (1995) Model.[7]

[7] Equation (17) has also appeared in the literature with the book value separated into financial assets and operating assets

**"Feltham and Ohlson Model – FO95":**

$$P_t = y_t + \alpha_1 ox^a_t + \alpha_2 oa_t + \beta_1 v_{1t} + \beta_2 v_{2t} \qquad (17)$$

Where the coefficients are:

$$\alpha_1 = \omega_{11} / (R_f - \omega_{11}) \geq 0$$

$$\alpha_2 = \omega_{12} R_f / (R_f - \omega_{11})(R_f - \omega_{22}) \geq 0$$

$$\beta_1 = R_f / (R_f - \omega_{11})(R_f - \gamma_1) > 0$$

$$\beta_2 = \alpha_2 / (R_f - \gamma_2) \geq 0$$

An appealing improvement of the Feltham and Ohlson model (comparing with O95) is that it can account for conservative as well as for unbiased accounting as indicated by the parameter restrictions. As described, the parameter $\omega_{12}$ in equation (13) accounts for conservatism while, if it is equal to zero, the model becomes the Ohlson model. As one can observe above, the parameter $\omega_{12}$ is positively related to the coefficient $\alpha_2$ which in turn will be affected by the level of conservatism. Furthermore, the coefficient $\alpha_2$ will be affected by the growth of the firm since it is positively related to the parameter $\omega_{22}$ and, as indicated in equation (14), it accounts for growth, i.e. the rate of growth of the operating assets in the next period. Finally, the coefficients $\alpha_1$, $\alpha_2$ and $\beta_1$ of the Feltham and Ohlson Model will be influenced by the persistence of abnormal earnings since they are positively related to the parameter $\omega_{11}$ in equation (13) which, as mentioned before, accounts for persistence, i.e. how persistent the abnormal earnings are in future periods.

### 2.2.4 Advantages and Disadvantages of the Ohlson Framework

All academic developments have strengths and weaknesses and, as such, the Ohlson (1995) and the Feltham and Ohlson (1995) frameworks have attracted considerable attention. Whilst both positive and negative points have been highlighted in the

literature, the arguments pointing out the very important contributions of the O95 and FO95 models outweigh the criticisms over certain weaknesses. Below, a (non-exhaustive) discussion of the most important issues of concern to the academic community is presented.

There are several advantages of the Ohlson and Feltham and Ohlson models. Firstly, as Easton (1999, p. 402) argues, a significant contribution of the Ohlson (1995) model, as well as its developments in Feltham and Ohlson (1995, 1996) and Ohlson (1999), is that "*it forms a framework for understanding the relation between prices and accounting data*", while Beaver (2002, p. 458) identifies the merits of the model since it relates "*published accounting data to equity valuation, allows us to interpret the coefficients on the valuation equation, and allows us to relate the coefficients from the valuation equation to coefficients from the time series of earnings equations*". Moreover, one can decompose the earnings' prediction exercise in order to reveal information about how or why an event is useful in explaining the value of the firm (Bernard, 1995). In addition, a number of studies (e.g. Fama and Miller, 1972 and Collins and Kothari, 1989, among others) attempt to develop a price – earnings relation starting from the dividend discounting formula (equation (1)). However, only Ohlson (1995) and Feltham and Ohlson (1995) use a plausible set of assumptions, and their models predict and explain prices better than any of the previously used models (Dechow et al, 1999).

Objections regarding dividend policy irrelevancy based on dividend signalling are rejected, since using dividends as signals of good news appears to be costly and their overall effect is not very significant (Lundholm, 1995). In addition, the importance of the Ohlson (1995) model in terms of policy making is highlighted by the Coopers & Lybrand Accounting Advisory Committee (1997) by stating that the Ohlson Model is the best way to empirically research evaluating financial reporting standards. Finally, studies that use earnings-based models (like the O95 and FO95) provide better estimates than using dividend discounting models (Kothari (2001)).

On the other hand, there have been a number of criticisms of the Ohlson (1995) and Feltham and Ohlson (1995) models. First, it has been argued that the Clean Surplus Relationship which is one of the central assumptions of the models does not hold,

especially in the case of the US (see for example Lo and Lys (2000)). Holthausen and Watts (2001) argue that the models do not provide for the existence of expected rents and the existence of options. In a response paper, Ohlson (2000) articulates an answer to the first criticism, suggesting, by developing the model, that the O95 model provides for the existence of rents or positive Net Present Value (NPV) projects if one allows for variations to the assumptions.

Furthermore, Beaver (2002) claims that a major criticism of the models is that they do not create an endogenous demand for accounting data, which are exogenously determined. He argues, however, that the main concern of the O95 and FO95 models is to provide a framework to assess how earnings and book value relate to firm value. Moreover, Lo and Lys (2000) point to the limited role of accounting in the absence of information asymmetry and the acceptance of the Miller and Modigliani (1958) properties. Of course, as Beaver (2002, p. 458) suggests, the models are just a beginning and "*not all issues of interest in accounting involve information asymmetry*".

Overall, it should be noted that, as with all models, the Ohlson (1995) and Feltham and Ohlson (1995) are a simplification of reality. Certainly weaknesses exist. However, most academics would agree that these models appear to constitute the most fully articulated and well-defined theoretical analysis in this area at the present time. This theoretical analysis has become the basis of empirical research in recent years and as such will be employed in the empirical analysis of this study (Chapter 5). Therefore, a discussion of the empirical literature is appropriate at this point in the thesis in order to assess the importance of the Ohlson framework for empirical research, particularly the interaction of accounting numbers with non-accounting data in determining price and also the significance of Linear Information Dynamics in the research design.

### 2.2.5 EMPIRICAL RESEARCH IN VALUE RELEVANCE: O95 AND FO95

Before reviewing the empirical literature, it is convenient to point out that, since the theoretical development of the Ohlson framework is still relatively new, several papers have attempted to amplify the theoretical analysis and to discuss the underlying assumptions of the O95 model.

As discussed previously, Feltham and Ohlson (1995) include the possibility of conservative accounting in the Ohlson framework, which is further discussed by Zhang (2000). Feltham and Ohlson (1996) develop a theory of depreciation based on O95, while Ohlson (1999) discusses the properties of earnings and decomposes earnings into permanent and transitory components within the model. Lo and Lys (2000) discuss the incorporation of dirty surplus accounting in the framework and Ohlson (2000) provides an analysis of the possibility of incorporating projects with positive Net Present Value. Finally, Lundholm (1995), Bernard (1995), Lo and Lys (2000) and Liu and Ohlson (2000) evaluate the empirical implications of O95.

The detailed discussion of these extensions to the Ohlson framework goes beyond the scope of this study, which concentrates on the Ohlson (1995) and the Feltham and Ohlson (1995) models. A discussion of the empirical applications of these two models now follows.[8]

Empirical studies utilising O95 and FO95 either test the basic model without using other information ('v') variables (for example Frankel and Lee (1998)) or incorporate the 'v' variables (for example Dechow, Hutton and Sloan (1999)), and some studies empirically examine the Linear Information Dynamics whereas others do not.[9] However, such a distinction in previous research is not sufficiently clear-cut to be able to provide a comprehensive framework for discussion of the findings to date, and therefore the following review is structured in chronological order showing the development of the evidence. In fact, a good summary of the main conclusions of the

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[8] It should be noted that studies related to taxation which utilise the O95 or the FO95 models will be discussed in Chapter 2, Section 2.2.

[9] There is another potential category that attempts to empirically validate the Linear Information Dynamics. Bar-Yosef, Callen and Livnat (1996) and Morel (1999) test the autoregressive process of equations (10) and (11) discussed previously. Lo and Lys (2000) argue that the empirical invalidation of one of the assumptions of a model does not invalidate necessarily the model as a whole, and the authors identify some problems in terms of methodology in the above studies. Livnat (2000) questions the methodological concerns voiced by Lo and Lys (2000), in particular the issue of scale problems which is discussed further in chapter 3 of this study.

extant studies employing the Ohlson framework is already given by Beaver (2002) as outlined in Box I below.

**BOX I. EMPIRICAL CONCLUSIONS OF STUDIES EMPLOYING O95 AND FO95 MODELS**

***A) Both book value and earnings are significant pricing factors.***

***B) The relative importance of book value is inversely related to the financial health of the firm.***

***Γ) The coefficient of earnings is lower for firms with a low return on equity.***

***Δ) The coefficient on positive earnings is positive and significant, while the coefficient on losses is insignificantly different from zero.***

***E) Accrual vs. cash flow components of earnings are priced significantly differently from one another. In general, the accrual components are associated with a lower coefficient.***

Source: Beaver (2002), p. 458.

Bernard (1995) provides some of the first empirical results utilising the O95 model, giving preliminary results from a comparison between the Ohlson framework and the Dividend Discounting Model (DDM) that was described previously. Bernard (1995) utilises a US data set for the period between 1978 and 1993, with 670 firm year observations for the O95 model (without LIM) and 712 observations for the DDM, using abnormal earnings and dividends per share for four years ahead (Value Line Forecasts).

The results indicate that the Ohlson (1995) framework appears to be better for explaining stock prices since it produces an average $R^2$ of 68%, compared with just 29% for the Dividend Discounting Model. The author claims that 100% explanatory power is not achieved because of the restrictions set by him, mainly the constancy of discount rates and of accounting conservatism across firms and that all available information is reflected in the forecasts and share prices. Lo and Lys (2000) argue that the results obtained by Bernard (1995) may be affected by 'scale-problems' because, book value and earnings are more scale-sensitive than dividends.

Collins, Maydew and Weiss (1997) employ US data for the period 1953-1993 in an effort to assess the value relevance of earnings and book value over time. They utilise annual cross-sectional regressions and their evidence indicates that the combined value relevance of the two accounting variables has not declined in this time period. Moreover, the authors attempt to decompose explanatory power of earnings and book value into the common explanatory power of the two and the incremental explanatory power of earnings and book value separately. Collins et al (1997) suggest that during the time period under consideration the value relevance of the book value has increased while the value relevance of earnings has declined.

Joos (1997) provides the first international study incorporating the Ohlson framework. He tests the relation between prices, and book value and earnings, for the cases of France, Germany, the UK and the US. The author suggests that, due to higher conservatism in continental countries, the coefficients on earnings and book value would be larger for France and Germany than in the UK. The results, however, indicate that while the book value coefficient is higher for France and Germany than for the UK, the earnings coefficient does not appear to be very different when comparing the three samples. Furthermore, Joos (1997) infers that accounting information is more value relevant for France than for Germany and the UK, since $R^2$ in the French case appears to be higher.

The study by Frankel and Lee (1998) is a particularly significant empirical application of the Ohlson (1995) framework, in view of their research design, although they do not use the Linear Information Dynamics of the Ohlson framework. The authors attempt to identify the validity of a valuation model based on analysts' earnings forecasts for stock return prediction. Their US sample includes 18,162 firm-year observations from 1975 to 1993 relating to non-financial companies that are listed in the NYSE, AMEX and NASDAQ stock markets. In addition, they utilise IBES analysts' forecasts of earnings as a proxy for future earnings, producing an approximation which they call 'firm fundamental value' ($V_t$).

In terms of methodology the authors employ cross-sectional Spearman's rank correlation and Monte Carlo Simulation techniques and they provide a sensitivity

analysis in order to test the robustness of their results.The evidence indicates that 'firm fundamental value' explains more than 70% of the cross-sectional changes in share prices in recent years. Then, the authors attempt to identify the value relevance of the ratios of 'firm fundamental value' $V_t$ to price and, secondly, book to market. Their findings suggest that within a 12-month-horizon both ratios are significant for the prediction of cross-sectional stock prices, while in longer horizons (two to three years) the book to market ratio declines in significance in comparison to the value to price ratio. Furthermore, Frankel and Lee (1998) argue that, as the errors in the forecasts provided by analysts are predictable, when they account for them the predictive power of the initial valuation model rises even more.

The next three papers to appear (Hand and Landsman (1998), Dechow, Hutton and Sloan (1999) and Myers (1999)) evaluate the usefulness of Linear Information Dynamics in the Ohlson framework. First, Hand and Landsman (1998) develop three different versions of the Ohlson (1995) model in an effort to examine the importance of the 'v' other information variable in equation (12). The first version is the O95 model without the 'v' variable and with net income instead of abnormal earnings. In the second, dividends and 'other net capital flows' are added, and in the third the authors incorporate future earnings in order to capture the autoregressive process assumed in the 'other information' variable, as described previously. Their sample consists of 105,510 firm-year observations for US firms listed on the NYSE, AMEX and NASDAQ, and the sample period is from 1974 and 1996. The main tests use unscaled data, while tests with scaled data are reported for robustness..

Hand and Landsman (1998) find results contrary to their initial predictions since neither the assumption that the other information variable is zero, nor that the 'v' other information variable affects future abnormal earnings can be supported by the evidence. The authors suggest that there are three possible explanations, either that there are problems in the research design, or that systematic risk factors (e.g. scale effects) are omitted, or that dividends play a role in the valuation procedure. Rejecting the first two, Hand and Landsman (1998) support the importance of dividends not as a violation of the Modigliani-Miller properties but with respect to profitability signalling. Regarding the general indifference of the 'other information' variable in their models, the authors argue that the role of other non-accounting

information might have been overestimated in previous research. However, one could suggest that the problem lies in the possible misspecification of the 'other information' variable and not in the (logical) existence of non-accounting influences on the value of the firm that are not captured in the financial statements.

Dechow, Hutton and Sloan (1999) assess empirically the Ohlson framework, arguing that the importance of the O95 model lies with the information dynamics. The sample used covers a period of twenty years, from 1976 to 1995, and includes 50,133 firm-year observations for US companies. The normal Ohlson (1995) model is utilised with IBES analysts' forecasts of earnings as a proxy for the 'other information' variable. The authors perform annual regressions and then present the mean results for all variables in the O95 model with and without the 'other information' variable. In addition, tests for the autoregressive processes of the LID are reported, and the parameter estimates ($\omega$ and $\gamma$) are provided.

The results, in general, tend to support the linear information dynamics of the model. The information dynamics appear to be empirically relevant, and the valuation model employed appears to explain stock prices better than without LID. In particular, the inclusion of analysts' forecasts of earnings seems to affect share prices significantly, as investors appear to over-weight information in the analysts' forecasts and under-weight information in current book value and earnings. Concluding, the authors claim that the Ohlson (1995) model "*provides a parsimonious framework for incorporating information in earnings, book value and earnings forecasts in empirical research*" (Dechow, Hutton and Sloan (1999), p. 3).

Myers (1999) attempts to shed some more light on the linear information dynamics,, and argues that studies that make ad hoc modifications to the information dynamics have many theoretical inconsistencies. The author employs a US sample and performs time series regressions with four different models based on the Ohlson framework, in a process similar to Hand and Landsman (1998). Initially Myers (1999) empirically assesses the O95 model without utilising the LID and in the next two models incorporates the Feltham and Ohlson (1995 and 1996) extensions of the Ohlson framework. It is only with the last model that Myers tests the information dynamics of the Ohlson (1995) model by using order backlog as a proxy for the

'other information' variable. His results suggest that the value estimates resulting from testing the LIDs of Ohlson (1995) and Feltham and Ohlson (1995) seem to be no better than tests with book value alone.

Following these assessments of the linear information dynamics, the next two papers discuss the fundamentals of the Ohlson framework. Brief and Zarowin (1999) contest the irrelevancy of dividends while Bartholdy, Peare and Willett (2000) examine the linearity of the model. Brief and Zarowin (1999) compare two models (a dividends-model and the Ohlson framework), attempting to identify the value relevance of book value and dividends and book value and earnings respectively. Their sample consists of 113,491 firm-year observations for US companies for a period of twenty years (1978-1997). The authors' findings are that the explanatory power of the two models is of a similar magnitude. Furthermore, in the case of firms with transitory earnings, dividends seem to be more value relevant than earnings. Finally, when transitory earnings exist and book value is not a good indicator of value, then dividends are the most value relevant of the three accounting variables.

Bartholdy, Peare and Willett (2000) assess the relationship between market values and book values employing the Ohlson (1995) model. The data set utilised consists of annual values of the Standard and Poor Industrial Index from 1962 to 1997. A major development of the Bartholdy et al (2000) paper is the introduction of a new methodology in the context of the Ohlson-framework-studies. The authors argue that the OLS methodology would have been appropriate if share prices and book values would have been stationary. However, both appear to be non-stationary in levels but integrated of order one (i.e. their first differences are stationary). This implies the use of the cointegration methodology that Bartholdy et al (2000) then employ. The results indicate the existence of a long run relationship between share prices and book values when a three-year lag period is tested. In addition, the relation described by the Ohlson (1995) model is indeed linear in the long run. However, the authors reckon that, for share prices and book values to converge, a period longer than ten years would be necessary, and therefore long-run linearity is not of any practical use.

Finally, five papers that focus on countries other than the US provide further evidence . Stromann (2000) utilises a Feltham and Ohlson (1995) framework in order to assess valuation with respect to the German accounting system and to compare it with the USA. The author tests the valuation model by including IBES analysts' forecasts of earnings in the place of the two 'other information' variables, and she performs tests on the LID of the model as well, for the periods 1989-1999 for Germany and 1987-1999 for the US. Stromann's (2000) results do not suggest a strong influence of violations of the clean surplus relationship in the valuation process. Mixed results in the case of conservatism are attributed to insufficient definition of the conservatism effects in the model. Finally, it appears that the accounting information is reflected in market values on a more timely basis in the US than in Germany, and this according to Stromann (2000) suggests differences in the efficiency of the capital markets in the two countries.

McCrae and Nilsson (2001) examine the explanatory and predictive ability of the Ohlson framework for the case of Sweden. The authors incorporate IBES analysts' forecasts of earnings in the calculation of the 'other information' variable in the O95 model when they test a sample of 1,339 firm year observations for the period from 1987 to 1997. McCrae and Nilsson (2001) argue that their results reinforce those of Dechow et al (1999) in terms of the mean reversion of abnormal earnings, although in the Swedish case the mean reversion is faster. In addition, the inclusion of analysts' forecasts improves the explanatory and the predictive powers of the Ohlson (1995) model for Sweden.

Karathanassis and Spilioti (2001), in a study relevant to Brief and Zarowin (1999), compare the power to explain share prices using both the Ohlson framework and the 'traditional' framework including dividends. The data set used covers the period between 1993 and 1998 and consists of Greek companies, listed on the Athens Stock Exchange. The sample is divided amongst four important sectors of the Greek economy, namely the metallurgical sector, the commercial and industrial sector, the banking sector, and the food sector. The Ohlson (1995) model appears to perform slightly better, without however leading to clear conclusions. In particular, the results for the banking sector appear to be of interest since all previous studies exclude such companies from their analyses. The very low value relevance of the accounting

numbers in this sector when compared with any of the others in the study suggests important differences in accounting for the banking industry, which is the major reason for excluding this sector from previous studies.

In another study, Arce and Mora (2002) assess the differences in the accounting systems of eight European countries in relation with value relevance. The authors utilise the Ohlson framework without incorporating Linear Information Dynamics, using data from Belgium, France, Germany, Italy, the Netherlands, Spain, Switzerland and the UK for the period 1990-1998. The results suggest that earnings appear to be more value relevant than book value in market-orientated countries (the authors include the Netherlands and the UK) and the opposite would seem to be the case for creditor-orientated countries (the other six countries). In general, book value and earnings are important for share price valuation in all countries except Germany.

Finally, Ota (2002) provides the only non-American and non-European evidence in empirical applications of the Ohlson framework. He examines a data set of 21,986 firm-year observations for Japanese companies for the period 1965-1998. Ota (2002) attempts to improve the LID of the Ohlson (1995) model, developing six alternative Linear Information Models (LIM2-7) by utilising Durbin's alternative statistics (for LIM2-7) and Generalised Least Squares (for LIM7) techniques. The author suggests that LIM2-6 do not provide any improvement on the original LID, whilst the results of LIM7 have a higher adjusted $R^2$ and better Durbin statistics.

Overall, it can be seen that the developments in the valuation literature initiated by Ohlson's seminal work of 1995 have had an important impact on market based accounting research. On the one hand, the creation of a theoretical framework, that was previously absent, is in itself a significant advance in relating market and accounting data. At the same time, subsequent empirical applications demonstrate the importance of the modelling innovations introduced by the Ohlson framework, and also provide more robust findings than was the case in earlier models. The theoretical extensions to O95, and the recent empirical applications, suggest that such research is still in its early years and that more analysis is needed both in examining the potential 'other information' variables and in testing the validity of the underlying assumptions of the model, and the LID in particular. Finally, the vast

majority of the evidence is based on US samples and therefore further discussion is necessary in order to identify the nature of the suggested relationship in other settings.

## 2.3 ACCOUNTING CONSERVATISM

The concept of earnings conservatism is, nowadays, at the centre of the debate surrounding financial accounting research. The general idea of conservatism was recognised early in accounting research (see for example Bliss (1924) and Penndorf (1930)), although the term has been applied to different issues at different periods of time. The traditional form of conservatism was based on the idea of prudence, i.e. on the recognition of all potential and existing losses in the financial statements. Indeed, this version of conservatism is still relevant, and is one of the issues underlying the extensions in Feltham and Ohlson (1995) (see section 2.2.3 above).

However, the recent literature has focused on the notion of earnings conservatism, i.e. on the timelier recognition of events that are evaluated in the market on the reporting of earnings. Based on the concept that 'prices lead earnings' (Beaver, Lambert and Morse (1980)) and on the distinction between 'bad and good news' (Ball and Brown (1968)), Basu (1997) suggests that the recognition of 'news', in terms of decreases or increases in stock prices, in earnings is asymmetric. . This theoretical analysis is supported by evidence that 'bad news' is incorporated in earnings on a more timely basis than 'good news'. Basu (1997) defines this asymmetric timeliness as *earnings' conservatism*..

The transition from the traditional form of conservatism to the new concept of earnings' conservatism is a significant development in accounting research, and requires further attention (2.3.1). In addition, since the first empirical study included in this thesis attempts to identify the existence of earnings' conservatism amongst firms in the Euro-zone (Section 5.1 of Chapter 5), recent empirical research in this area will also be discussed below (2.3.2).

### 2.3.1 FROM TRADITIONAL TO EARNINGS' CONSERVATISM

Conservatism or prudence has traditionally been considered as a tendency to report lower earnings at any point in time. In fact, this implies the following well known rule:- *'anticipate no profits and provide for all possible losses'*. If clean surplus

accounting is assumed, book value will be lower as well. So earnings conservatism leads to balance sheet conservatism. In the past, this concept justified the creation of secret and hidden reserves. Although nowadays this is not generally accepted, a conservative approach in valuation is still allowed under the well-known *'lower of cost or market'* rule. Indeed, the 4th European Directive (1978) took this into account, and included the prudence principle as a general rule governing the valuation process (see article 31c).

As Belkaoui (1992, p. 246) argues that the conservatism principle *"implies that preferably the lowest values of assets and revenues and the highest values of liabilities and expenses should be reported. The conservatism principle therefore dictates that the accountant displays a generally pessimistic attitude when choosing accounting techniques for financial reporting*". This view is shared by Solomons (1986, p.100), who stresses the following important implications: *"too often in the past conservatism has been an excuse for attempts to present too consistently gloomy a picture of an enterprise's financial position and earnings by, for example, undervaluing inventory or over providing for deferred maintenance"*.

Conservatism is not included among the accounting concepts in the FASB framework, but the IASB considers prudence as an attribute of reliability.[10] It is defined as "*the inclusion of a degree of caution in the exercise of the judgements needed in making the estimates required under conditions of uncertainty, such that assets or income are not overstated and liabilities and expenses are not understated. However the exercise of prudence does not allow, for example, the creation of hidden reserves or excessive provisions*" (IASC (1989), par.37). Therefore, in a sense it may be seen as a corrective to the over-optimistic behaviour of managers that has to be applied when exercising judgments, but taking into consideration the probability of different outcomes. This implies an important change with respect to the old notion of conservatism that suggested adoption of the lowest value in any situation.

Some reasons have been provided to justify this attitude (or principle). Devine (1963) offered several explanations for the profession's attitude towards conservatism: 1)

[10] The notion of a principle is gradually disappearing in current accounting regulation, which tends to distinguish between underlying assumptions and accounting characteristics.

businessmen tend to slant reports to favour their immediate goals, and, unless their goals have changed, this implies the reporting of favourable rather than pessimistic results, so accounting numbers would be biased if there were not such a rule; 2) the pitfalls of over-optimism may be more obvious and more direct than those of pessimism, and at the same time optimism is less difficult to induce than an equivalent quantity of pessimism; and 3) the auditor's risk is not the same when he/she accepts as good something that is bad, than the opposite. More recently, other justifications of conservatism have been taken into account, such as: the avoidance of legal liabilities and claims, and the protection of creditors against an unwarranted distribution of a company's assets as dividends. The asymmetries of information between managers and potential users of the accounting information (mainly earnings) lie behind these arguments (see Alchian (1984)).

All these reasons explain the existence of the rule on conservatism as a way of protecting third parties from managers' actions. In addition, one could also mention the desire to decrease or postpone tax payments, when there is an influence of taxation on accounting, or to avoid political costs linked to company size and profit, as positive accounting theory suggests (see Watts and Zimmerman (1986)). In these situations, it is in the company's interest and not in the interest of others to adopt conservative practices. As Basu (1997, p. 9) sustains: "*While contracting considerations appear to explain the origins of conservatism, tax, litigation, political process and regulatory forces have also influenced the degree of conservatism in GAAP*". This notion of prudent conservatism is connected with the possibility of choosing between different alternatives. Although Belkaoui (1992, p. 246) recognises that: "*Conservatism was a more highly esteemed virtue in the past than it is today*", this obviously differs among countries and companies. For instance, in many of the EU countries, the principle of prudence dominates over other accounting principles, but to a lesser extent in Finland, the Netherlands and the UK (Walton, Haller and Raffournier (1998), p. 325).

The cautious approach to recognition generally adopted by the standard setters is a clear consequence of the traditional notion of conservatism, which leads in turn to the delayed recognition of profits. For example, nowadays the recognition of holding gains is not generally accepted neither in the profit and loss account nor in equity

(although the IASB allows this procedure as an alternative treatment for certain assets). This is related to the view on conservatism presented by Basu (1997), that implies that earnings reflect 'bad news' quicker than 'good news', as a consequence of which there is a systematic difference between 'bad' and 'good' news in the timeliness and persistence of earnings. If this is the case, accounting earnings do not follow a linear relationship with market prices of the company's shares, which may have serious implications for previous studies that assume a linear relationship between them. This new definition of conservatism may be probably better understood as delayed recognition of 'good news', which has also the effect of reducing the current earnings figure and smoothing it over time.

There are several reasons for the appearance of earnings' conservatism. Basu (1997) suggests that the increase in the legal liability of managers and auditors in cases where they fail to report and detect 'bad news' respectively has increased their awareness on this issue, whereas the less timely reporting of 'good news' does not have any type of legal consequences. In addition, Ball, Kothari and Robin (2000) explain the existence of higher and lower levels of earnings' conservatism as a function of institutional factors such as the level of public disclosure required, the different regulatory regimes and litigation risks across countries, and differences in the short term importance of dividend policy to the reported earnings due to differences in laws and practices among countries.

Recently, taking a different approach, Beaver and Ryan (2000) have related the traditional notion of conservatism to book values rather than earnings. They demonstrate that there are two sources of variation in the book-to-market ratio, bias and lags, which have different implications for the ability of this ratio to predict the future book return on equity. The bias component, linked to the traditional notion of conservatism that implies a low book value, has a more persistent negative implication for future return on equity than the lag component. This component reverses and it is produced when unexpected gains or losses are not fully recognized in the period when they occur.

In short, conservatism may be perceived in two different ways. The first is the traditional notion, pervasive conservatism, which is the bias in Beaver and Ryan

(2000). The second, the delayed recognition of 'good news', is the lag mentioned by these authors and more generally understood as the asymmetric timeliness discussed in Basu (1997). In the international context addressed in this thesis, empirical research on these two notions of conservatism has already led to conclusions that are rather different. Those countries that have been traditionally perceived as very conservative, such as Germany (see for example Joos and Lang (1994)), are seen as less conservative under the Basu (1997) approach (see for example Ball, Kothari and Robin (2000)), and the opposite seems to be the case for countries such as the UK. However, as Giner and Rees (2001) suggest, this may be due to the tendency of the conservative regimes to expense investments when they are incurred (for example R & D).

Having said that, Basu (1997) argues that the traditional notion of conservatism can be captured by the intercept term of the regression of news and earnings, such that the higher the level of traditional conservatism, the smaller the intercept of the regression. Once this aspect is taken into account, both approaches to the conservatism notion may be reconciled. At this point, closer attention will be paid to the empirical literature related to Basu's (1997) version of conservatism, taking these points into account.

### 2.3.2 Empirical Research on Earnings Conservatism

The empirical research literature relating to the Basu (1997) notion of conservatism follows a standard methodology that is based on the 'reverse regression' developed by Beaver, Lambert and Morse (1980) and Beaver, Lambert and Ryan (1987). This methodology has reversed the dependent and the independent variables of the traditional price–earnings model, with earnings now as the dependent variable and returns as the independent explanatory variable. With this relationship, one can assess therefore the effects of changes in share prices on the earnings reported in the financial statements.[11]

[11] The development of the 'reverse regression is discussed further in Chapter 4, Section 4.4.

Basu (1997) employs this model and applies a number of econometric techniques ranging from an association long-window study to an information content or event short-window study, and from a time series analysis to a cross sectional analysis. The author utilises a US sample that consists of 43,321 firm-year observations for the time period 1963-1990. The empirical findings provide supporting evidence for the author's initial predictions, i.e. that 'bad news' is reflected in a more timely manner in the earnings figures than 'good news'. The existence of earnings' conservatism is supported by the empirical results reported in Basu (1997), since the sensitivity of earnings to 'bad news' is two to six times larger than the sensitivity to 'good news'.

By testing periods of high and low exposure of auditors to legal liability separately, Basu (1997) infers that the sensitivity of earnings to 'bad news' is greatly affected by the changes in exposure. The author also provides some alternative explanations of conservatism, such as the abandonment option and management incentives for early disclosure based on exposure to investor litigation and the signalling effect. Basu (1997) suggests that management incentives for early disclosure are consistent with his analysis, but he argues that the abandonment option does not explain his conservatism findings despite the fact that some of the predictions appear to be similar.

In addition, Basu (1997) employs the 'normal' regression and presents evidence that positive changes in earnings appear to be more persistent than negative changes in earnings as a result of conservatism. In fact, he argues that timeliness and persistence are the two different sides of the same coin. That is to say, while greater timeliness means that more current 'news' is recognised in earnings (leaving less for inclusion in future earnings), increased persistence means in contrast that less current 'news' is reported in current earnings and more will be in future earnings.

Ball, Kothari and Robin (2000) – hereafter BKR – built on Basu's (1997) analysis in the context of an international comparison, focusing their attention on the reasons that explain the demand for timely accounting income in different institutional contexts, and how they affect the properties of the earnings figure. In their view "*information asymmetry more likely is resolved in code-law countries by institutional features other than timely and conservative public financial statements, namely*

*closer relations with major stakeholders"* (BKR 2000, p. 2), and therefore they argue that accounting income is likely to be more smoothed and less timely in code law countries (BKR 2000, p. 16).

The authors use an 11-year sample (1985-1995) for seven countries, which they divide into two broad categories based on the political influence on accounting, the classification of countries into code law and common law systems being a proxy for this influence. Accordingly, Ball, Kothari and Robin (2000) divide their sample between a common law group that includes Australia, Canada, the UK and the USA, and a code law group that includes France, Germany and Japan. As the authors point out, *"the code/common classes are by no means homogeneous, with financial reporting in no country being determined in a purely market or planning system"* (BKR 2000, p. 3). Nevertheless they argue that their results indicate that the classification is a valid proxy for the hypothesis relative to the political influence on accounting income.

By comparing the $R^2$s for country samples, the authors conclude that their results support their hypothesis: the pooled common-law sample $R^2$ is 14.4%, which is significantly higher than the code-law $R^2$ of 5.2%. However, as they point out, France (code-law) is an exception, because it has an $R^2$ that is much higher than Australia (common-law) and similar to the UK (also common-law). In addition they mention that a secondary sample of eighteen countries was tested and the results were supportive of their hypothesis. Furthermore, Ball, Kothari and Robin (2000) test the hypothesis of earnings conservatism in all countries, by running an independent regression for 'good news' and 'bad news'. While their results support the hypothesis when the coefficients on returns are compared (the coefficient on 'bad news' is higher), when they incorporate in their analysis the $R^2$s, they find that, in two of the three code-law countries and for code law countries as a whole,' the notion of conservatism as described by Basu (1997) is reversed.

In a later paper, Ball, Robin and Wu (2000) make a similar analysis, focused on Hong Kong, Malaysia, Singapore and Thailand, with a sample covering thirteen years from 1984 to 1996. In this case, they argue that the swifter recognition of 'bad news' in the earnings figures implies a higher level of transparency. The authors

suggest that accounting regulation in these countries would suggest a high level of transparency, whereas, based on political factors that affect the incentives of the financial statement preparers, the level of transparency is presumed to be low. Hence, Ball, Robin and Wu (2000) attempt to assess which influence (the regulatory or the political) is stronger in shaping the level of transparency in these East Asian countries.

The authors suggest that their findings show a general lack of transparency. However, a closer look at their results indicates the absence of evidence in favour or against conservatism. As far as timeliness is concerned, they conclude that "*accounting income in these Asian countries is similar to code-law countries, even though their formal accounting standards can be better described as having common-law origins*" (Ball, Robin and Wu (2000), p. 23). In general, the findings are inconclusive, and the link between conservatism and transparency remains unclear.

Pope and Walker (1999) compare earnings conservatism under US and UK generally accepted accounting principles (GAAP). Their sample consists of 18,380 US observations and 7,189 UK observations for a long period of twenty years (from 1976 to 1996). They provide an economic derivation for Basu's (1997) model, and define five different measures of conservatism, that take into account, among other aspects, the relation between the parameter coefficients and the $R^2$s of 'bad' and 'good' news. Moreover, the authors argue that the difference in asymmetric timeliness is sensitive both to the "*measurement of conservatism and to the components of earnings examined*" (Pope and Walker 1999, p. 54). More precisely, the authors suggest, in contrast with BKR (2000), that UK firms tend to recognise 'bad news' faster than US firms do, but in fact they just classify the 'bad news' in a different way.

After testing Basu's (1997) model for earnings before extraordinary items, Pope and Walker (1999) indicate the similarity between their results and those of BKR (2000), but argue that this is due to the fact that UK firms use extraordinary items in order to 'smooth' ordinary earnings. Therefore, when the authors use earnings after extraordinary items instead, their findings suggest that UK GAAP earnings are

notably more timely in recognising 'bad news' than US GAAP earnings, suggesting that UK accounting is even more conservative than US accounting. These authors also include in their study the recognition of prior period news in earnings and their results suggest that the 'good news' coefficients increase as the lag increases while most of the delayed recognition of 'good news' is captured in earnings with a lag of one year. On the contrary, the 'bad news' coefficients decrease with the lag, reaching a statistically insignificant coefficient by the third year.

Following Pope and Walker (1999), Giner and Rees (2001) examine the extent to which the conclusions reached in the former paper apply to three European countries that represent different accounting traditions. Over a period of nine years (1990-1998), they test the notion of conservatism for France, Germany, and the UK, dividing the sample of 8,838 observations by size and industry. In order to capture prior news, they incorporate previous earnings in their analysis, as well as prior period news, and the authors check the robustness of their findings by employing a number of different deflators. In addition, Giner and Rees (2001) attempt to identify the interaction between traditional conservatism (which they name 'pervasive') and earnings' conservatism.

Their results regarding the British firms are very similar to Pope and Walker (1999), substantiating their conclusions regarding the conservative nature of UK accounting when earnings after extraordinary items are considered. Indeed, they find that the contemporaneous association between earnings and returns is much stronger for 'bad news' than for 'good news' in all three countries, although the inter-country differences are not statistically significant. Only the intercept of the German sample is significantly different, and lower than the other countries, which is consistent with pervasive conservatism being higher in Germany than in France and the UK. This is confirmed when previous news is included in their analysis. Furthermore, Giner and Rees (2001) report significant evidence that small firms are more conservative than large firms, while the classification by industry does not change the general conclusions.

Givoly and Hayn (2000) attempt to identify a potential increase in the level of conservatism in recent years. They employ a US sample for the period between 1950

and 1998 and they test for several different forms of conservatism. The authors argue that, since there is no clear agreed definition of conservative accounting, one should examine all versions and thus they test several conservatism measures which rely on the accumulation of non-operating accruals, earnings' conservatism (the Basu (1997) framework), specific characteristics of the earnings' distribution, and the market to book value ratio.

The results seem to indicate a change in the time-series properties for earnings, accruals and cash flows. Furthermore, the authors suggest that financial reporting in the United States has become more conservative in the last two decades. In terms of earnings' conservatism, Givoly and Hayn (2000) identify the timelier reporting of 'bad news' in all time periods. However, 'good news' reporting becomes less timely from 1980 onwards, while 'bad news' is reported in the earnings figures on a much more timely basis after 1985. Overall, the authors findings support the existence of an upward trend in the level of conservatism.

Garcia and Mora (2001) adopt a European perspective in their analysis, and consider eight countries (Belgium, France, Germany, Italy, the Netherlands, Spain, Switzerland and the UK) that will presumably form the European Stock Market, assuming that there are limited macro-economic differences among them. Their sample consists of 12,060 firm-year observations for a time period between 1988 and 2000. They follow the Basu (1997) approach but introduce a different definition of news, excluding market wide effects from the returns. In addition, Garcia and Mora (2001) use earnings after extraordinary items based on the suggestion by Pope and Walker (1999). Furthermore, following BKR (2000), the authors expect earnings in the 'common law' country in their sample (namely the UK) to be more conservative than earnings in the 'code law' countries.

Their results confirm the asymmetry in capturing good and bad news in all countries, being lower in the continental countries than in the UK, with the only exception of Spain. Moreover, the authors argue that the introduction of the different definition of news provides better results in terms of obtaining less biased estimates of the slope coefficient. As far as the intercept is concerned, they assume that it reflects

unrecognized prior period news, concluding that the positive values of the intercept estimates imply that "good news" is more persistent that "bad news".

Raonic, McLeay and Asimakopoulos (2001) study the notion of earnings conservatism in the context of European interlisted firms across international capital markets. The authors follow the model originated by Basu (1997) and their data set consists of 3,724 firm-year observations for a period of thirteen years, from 1987 to 1999. Raonic, McLeay and Asimakopoulos (2001) attempt to identify the linkages between earnings conservatism and institutional frameworks focusing on the importance of different equity markets, the level of disclosure and the degree of regulatory enforcement.

The findings indicate the existence of earnings conservatism for the sample of interlisted firms under consideration. Furthermore, the authors show that the degree of conservatism has increased during the recent years. Regarding the influence of the institutional factors, the results suggest that the level of disclosure and the degree of enforcement are significantly related to earnings' conservatism and timeliness. Overall, even though there are still differences that depend on the country of domicile of the interlisted firms, in general the study suggests that the harmonisation of the institutional environment has led to convergence in the properties of earnings of interlisted European firms, which questions the distinction drawn between the different legal environments sometimes attributed to European countries.

Coppens, Buijink and Peek (2002) examine the influence of incentives, regulation and enforcement on conservatism for both public and private companies. They employ a data set including all European Union member states for a time period between 1995 to 1999, which leads to a total of 10,185 firm-year observations for public companies and 60,653 observations for non-listed firms. The authors show that the orientation of national accounting regulation has no influence on non-listed firms' accounting practices. However, Coppens, Buijink and Peek (2002) do provide evidence that listed firms report more conservatively than non-listed firms, especially in investor oriented (common-law) countries. However, the authors suggest that, for listed companies, reporting incentives are as important as legal and institutional structures in determining conservatism.

In another study, Dargenidou (2001) discusses the potential problems in the use of conservative accounting in comparing accounting systems. She uses data from 45 Italian firms and 81 British firms (a total of 623 firm-year observations) in a period between 1995 and 1999. Although the author identifies the existence of higher earnings' conservatism in the UK than in Italy, she suggests caution in the interpretation of results such as these since they can be influenced by the possibility of omitted variables from the model and from differences in the level of market efficiency between the countries.

Lubberink and Huijgen (1999) propose an alternative point of view regarding research on earnings conservatism. They suggest that the equal treatment of the effects of litigation pressure on different managers is not realistic, since the managers' choice and their behaviour will differ according to their own wealth. The authors test 124 Dutch listed companies for a thirteen-year period (1983-1995) resulting in 1019 observations, and they divide their sample in three different ways, according to managers' compensation preferences, the time period and the industry in which the firm operates. Lubberink and Huijgen (1999) argue that their results support their hypothesis that the degree of conservatism is heavily related to the wealth of the managers. Furthermore, the findings indicate no relation between earnings conservatism and industry type.

In another study of managerial effects, Beekes, Pope and Young (2001) examine the influence of the composition of the board on the level of earnings' conservatism. They employ a UK sample which consists of 676 firm-year observations for the period 1992 to 1995. The authors argue that earnings' conservatism is affected by the internal board structure in the sense that non-executive directors monitor better the activities of the senior manager (the 'opportunistic' behaviour of managers that Basu (1997, pp. 32-33) refers to) and therefore that limits the use of earnings management. The results show that the companies that have a median of non-executive directors higher than the sample average, face a higher level of earnings conservatism and vice versa.

In a recent study, Pope and Walker (2001) attempt to identify the relation between ex-ante and ex-post conservatism. They describe earnings' conservatism as ex-post conservatism since reported earnings respond to new information which would affect the firm's future cash flow. On the other hand, ex-ante conservatism is described as the "*tendency of accounting practices to apply amortisation rates to certain classes of assets that are higher than their expected economic rate of depreciation*" (p. 1). Their main proposal is that ex-ante conservatism constrains the practice of ex-post conservatism. The authors employ a US data set of 48,885 firm-year observations for the period between 1985 and 1999. They utilise the Basu (1997) framework, while they add the book value to market value ratio at the beginning of the period as proxy for ex-ante conservatism. The empirical findings indicate a positive relation between ex-post conservatism, i.e. the asymmetric earnings' responsiveness to 'bad news' and the proxy for ex-ante conservatism, i.e. the book to market ratio. Moreover, Pope and Walker (2001) highlight the existence of methodological difficulties in incorporating in one model both versions of conservatism. However, they infer the existence of linkages between ex-post and ex-ante conservatism in their preliminary results.

In a similar vein, Garrod and Valentincic (2001) examine how the existence of abandonment options affects the earnings' reaction to ex-post conservatism. The authors employ a UK sample for a period between 1968 and 2001, which results to 24,854 firm-year observations. The authors results indicate that the asymmetric timeliness of earnings can be greatly affected by the behaviour of loss making firms in the sample. In addition, companies with a high market to book value ratio show a lower asymmetric reaction to 'bad news' in comparison with companies with a low market to book value ratio, and such effects are visible for different industry classifications as well. Finally, Garrod and Valentincic (2001) claim that there is no evidence of an upward trend in the level of conservatism in the case of the UK in the recent years.

Finally, Muller and Riedl (2001) attempt to challenge the aforementioned evidence on the existence of earnings conservatism. The authors suggest that the results presented above are an econometric artifact of the research design. Muller and Riedl (2001, p. 1) argue that "*the use of stock returns to proxy for news leads to differences in 'bad' and 'good' news 'reverse regression' slope coefficients that are completely*

*determined by two types of bias*" (emphasis by the authors). The authors suggest that by reversing the 'economically correct' regression, this produces a sample-variance-ratio bias, while the division of the sample based on the sign of the independent variable leads to a sample truncation bias. Muller and Riedl (2001) use a US sample for the period 1951-1997 in order to test their suggestions. The results provide some evidence on the existence of such biases; however, further tests on more samples are needed in order to provide viable conclusions as to whether and by how much these biases might affect the overall results reported in the previous literature.

The general conclusion of this type of research is that the timeliness of earnings is greater in reflecting decreases in market prices than increases, so there is clear evidence of earnings conservatism. It also appears that 'good news' tends to be reflected with a lag in the accounting earnings. Regarding the international comparisons reported to date, the results are not consistent with regard to the precise nature of the differences in earnings properties across countries, nor the driving forces behind them.

# CHAPTER 3: INTERNATIONAL DEVELOPMENTS

The international financial environment has witnessed several momentous changes in recent years. The liberalisation of capital flows and the 'market-orientated' approach of governments in several countries, together with the process of globalisation, have led to important financial developments in a period of just fifteen years. From the establishment at the end of the 1980s of capital markets throughout the world as important global economic players that influence national economies to the rapid growth of international stock exchanges in the second half of the 1990s and their dramatic decline in recent months.

From a European perspective, there are several recent developments that potentially affect the value of European firms and the valuation of their equity in the global capital markets. The process of Accounting Harmonisation, the pressures for greater Tax Harmonisation and the introduction of a single currency (the Euro) for most EU member states appear to be important developments. This Chapter will focus on issues related to these three areas. First, the international accounting developments are discussed in 3.1. Then, the issue of corporate taxation and its influence on firm value is analysed (3.2), and finally a discussion on the effects of currency fluctuations on the value of the firm concludes (3.3).

## 3.1 INTERNATIONAL ACCOUNTING DEVELOPMENTS

The second half of the last century saw significant changes in the political and economic environment world-wide in general and in Europe in particular. One of the most important developments in the global arena was the creation of the European Union (EU), which started with the Treaty of Paris of 1951 that founded the European Coal and Steel Community. There were six member states initially (Belgium, France, Germany, Italy, Luxembourg and the Netherlands), increasing to fifteen by 1995. In April 2003, ten more countries are expected to sign the treaty of enlargement in Athens, a major step in the ongoing effort to bring these countries together not only by way of a trade agreement, but into a political, cultural and economic union.

Without doubt, one of the major driving forces behind the European unification was the common economic benefit that those in the countries involved thought they could accumulate by joining forces. The authorities of the European Union (earlier known as the European Economic Community, or EEC, but hereafter referred to by its current name) initially agreed on the free movement of individuals and of capital inside the EU and later pursued the goal of a single market and unified economic environment where the rules of the 'economic game' would be the same for all companies and individuals. One of the important areas where the creation of a set of common rules was necessary in order to unify the economic environment was that of accounting, with the first relevant initiative commencing in 1965 (see Van Helleman and Slomp (2002)), p. 216).

In a similar but unrelated effort to harmonise international accounting rules, the International Accounting Standards Committee (IASC) was created in 1973 by 16 accountancy bodies representing 10 countries (Australia, Canada, France, W. Germany, Ireland, Japan, Mexico, the Netherlands, the UK and the USA).[12] The IASC set as its objective the formulation of high quality International Accounting Standards (IAS), the promotion of worldwide acceptance of IASs and the publication of discussion documents on international accounting issues. In addition, another objective was the effort to improve cooperation with national standard setters

[12] The IASC has been recently transformed to the International Accounting Standards Board, a change which is discussed with more detail in the next pages.

and international organisations. Coincidentally, in the same year that the IASC was created, 1973, the European Union experienced its first enlargement with Britain, Denmark and Ireland joining the initial six member states mentioned above. That same year, the Financial Accounting Standards Board (FASB) was formed, taking over standard setting responsibility from the Accounting Principles Board in the US.

The FASB is a private standard setting body with its board appointed by the also private Financial Accounting Foundation. The FASB issues Financial Accounting Standards (FAS) that form the corpus of US GAAP. The supervisory body of the FASB is the Securities and Exchange Commission (SEC), with its members appointed by the US President, which decides on Financial Accounting Standards. In general, the SEC is satisfied by the standards of the FASB, confirmed as such in its own 'Releases'. However, in some cases, the SEC itself issues binding rules overriding the FASB's views, as in the case of FAS 19 on 'Financial Accounting and Reporting for Oil and Gas Producing Companies' issued in 1978 (as discussed by Flower (2000), p. 5) . The supervisor of the SEC (and the FASB) is the US Congress which can also change or put a stop to accounting standards that are passed to the Congress by the FASB for approval, or lobby the SEC and the FASB for their withdrawal as in the case of the standard that the FASB was preparing in 1993 for accounting for share options (as described by Zeff (1997)).

One year after the creation of the IASC and the FASB, in 1974, the Interamerican Conference of Securities Agencies and Similar Organisations was founded, and by 1983 changed its name to the International Organisation of Securities Commissions (IOSCO). IOSCO was formed as an international federation of regulators of securities, having today as members stock markets and other related organisations from 83 countries.

As can be seen, since the beginning of the 1970s there has been an increased interest both inside the EU and internationally in more harmonised accounting standards, while several groupings have been formed to promote international cooperation. However, before discussing the consequent process of harmonisation of accounting regulation, one should consider how exactly harmonisation is defined.

McLeay, Neal and Tollington (1999) as well as Giner and Mora (2001) suggest that harmonisation is distinct from standardisation, while the latter implies a process leading to uniformity in accounting rules for every case everywhere, the former is a movement towards harmony as Giner and Mora (2001, p.107) articulate. Indeed, McLeay et al (1999, p. 43) argue that while standardisation leads to uniformity, "*harmonisation implies a movement towards similarity in the choice between alternative accounting treatments*". Although such debate was soon decided in favour of harmonisation, a number of parties interested in and affected by accounting regulation challenged the need for a global set of accounting standards on two grounds. First, it has been argued that different countries have different needs and that the existing differences in accounting standards have been produced by a number of factors which are based in different cultural, historical, economic and institutional aspects (Giner and Mora (2001), p. 108). Second, the need for one overriding set of standards was challenged on the grounds that different sets of rules could compete, and that such competition would lead to the dominance of the 'best' accounting standards.

However, today's world becomes more and more internationalised and local differences diminish in the international capital market. In addition, there are many companies which have crossed national frontiers seeking capital and operations abroad, and therefore an agreed set of international rules is needed. Moreover, the harmonisation of accounting standards will lead to international comparability by reporting similar things across countries in a similar way. As the SEC Commissioner R.C. Campos suggests "*it is clear that investors globally could benefit to the extent that transparency and high quality information might be provided by a common worldwide approach*" (SEC 2002-154). Furthermore, the harmonisation of accounting regulation would result in a reduction in information processing costs, in uncertainty and ultimately would lead to a fall in the cost of capital as suggested by Geoffrey Whittington (2001) of the IASB. Overall, the advantages of harmonised accounting rules outperform the disadvantages and, based on that, from the early 1970s a process of harmonisation has been initiated. Moreover, the process of accounting harmonisation was pursued by different groups and interests in the last three decades. This overview will concentrate mainly on the events related to the

European Union in its international context, and can be divided into three phases or periods.

*First Phase of Harmonisation*

In the first phase, the initiative of harmonisation was taken by the European Union through its process of Council Directives that are drawn up in order to define the rules not only in accounting but in many different areas of regulation. Initially, and after lengthy negotiations, the European Union dealt with the issue of accounting harmonisation in the Fourth Council Directive of 1978 on annual individual accounts. The Fourth Directive attempted to provide a set of accounting rules that all the qualifying companies of the European Union would follow without departing from the national GAAP of their country of origin. What the EU authorities tried to achieve through this directive was to make firms in the European Union report in a similar manner.

On the other hand, the purpose of the directive was not to produce an EU GAAP, an option not rejected at that time by the EU, as evidenced in the existence of about 60 different Member State options, as highlighted by Van Helleman and Slomp (2002). The latter point however made comparability among EU firms very difficult since each company could, in most cases, continue with its current practice, which was usually available amongst the different options. Another problem with the Fourth Directive was the "*mixture of creditor protection, tax basis and shareholder information*" (Van Helleman and Slomp (2002), p. 215) produced by the balancing efforts of the authorities to accommodate the two major accounting traditions, the Anglo-American and the Continental, which in the end led to many contradicting options in the directive.

At about the same time, in 1979, the European Monetary System (EMS) was established as an attempt to achieve relative stability among the EU currencies participating in the Exchange Rate Mechanism (all currencies except the British Pound, which did not join until 1990) and to maintain fluctuation inside certain pre-agreed ranges vis-à-vis the other EMS currencies. The targeted stability among the EU currencies would result in lower exchange rate risk for companies involved in intra-EU activities, thus further harmonising the EU economic environment.

Two years later, in 1981, Greece became the tenth EU member state.. Greece, as a new member (and as all new members that followed), signed all the previous agreements and adopted (or agreed to adopt in the next years) all EU regulation including the fourth directive. Greece did not participate in the EMS since the devaluation of the Drachma was needed as an economic instrument in the Greek effort to converge economically to its EU partners.

The Seventh Council Directive was presented in 1983 by the European Union authorities after hard negotiations. While the Fourth Directive regulated accounting for individual accounts, the Seventh attempted to provide a set of rules for the consolidated accounts of EU firms. In fact, in many countries companies had not been obliged to present consolidated accounts, and one of the basic objectives of the 7th Directive was to make compulsory for all EU groups of companies the disclosure of consolidated accounts.

The new directive faced similar problems to the previous one, and this time around 50 options were made available to provide choice on the detailed rules governing consolidated accounts (Van Helleman and Slomp (2002)). In addition, both Council Directives were not adopted immediately by the national authorities but many years later which made the presumed harmonisation rather problematic. Indeed, it is apparent that accounting rules negotiated in the beginning of the 1970s, published in the Directives in the beginning of the 1980s, and adopted by many countries at the beginning of the 1990s lost a lot of financial relevance. As Cairns (1997, p. 307) states "*parts of the directives may be out of date... this is inevitable with requirements which have remained unchanged for almost 20 years*".

While the European Union authorities faced all of the aforementioned problems regarding harmonisation, and with Portugal and Spain joining in1986, on the other side of the Atlantic the SEC decided to 'activate' (and presumably dominate) IOSCO in order to pursue solutions to its own international concerns of insider trading and market manipulation, as well as the non-comparability of accounting and auditing standards. In the international arena, until that moment, the role of the IASC was constrained to providing some general standards that mainly served in guiding

developing countries and young stock markets. However, the IASC decided to play a more significant role and the activation of IOSCO in the same period seemed to be very timely. These events initiated the second phase of accounting harmonisation.

*Second Phase of Harmonisation*

By 1987, the Single European Act came into effect in the EU, leading to a Single Market and hence to further European integration. In that same year, the IASC established a Committee on Comparability in order to restrict the wide range of free choices in its IASs. IOSCO was invited to participate as observer on this committee and it was also invited to join the IASC's consultative group. The cooperation of the two organisations continued, and in 1989 the IASC issued a 'Statement of Intent' which, based on the suggestions of the Committee on Comparability and the subsequent comments from other groups, proposed the elimination of 21 choices in 10 standards (for a further discussion on this see Zeff (1998), p. 91). Such a move signalled the serious intentions of the IASC to create a high quality set of standards which could be used worldwide. The globalisation process of the 1990s and the increasing integration of the international capital markets made companies, national authorities, regulators and investors assess the increasing necessity of international accounting standards of high quality.

The European Union continued its process of integration and in 1992 the Maastricht Treaty was signed, creating the notion of the Economic and Monetary Union (EMU) which would be achieved when a number of countries would reach certain macroeconomic criteria set by the treaty. The monetary part of this project implied the adoption of a single currency by the countries which would participate in the EMU. At the end of 1992, IASC approved IAS 7 which was endorsed by IOSCO in 1993 (and accepted for foreign registrants by the SEC). However, the next year (1994) some problems appeared in the relations between IASC and IOSCO, with IOSCO refusing to endorse any further IAS if the 24 existing standards were not completed to IOSCO's satisfaction. In the meanwhile, the EU authorities recognised the problems surrounding the use of directives and, as observed *a posteriori,* inclined to the creation of a global set of accounting rules rather than to the creation of EU GAAP.

The year 1995 was very important to the accounting harmonisation process; it was a year full of hopeful signs but also the initiation of a power struggle. First, IASC and IOSCO reached an important agreement. The IASC would have to revise a number of IASs (IOSCO had already given a 'green light' for some) and to present them to IOSCO by mid-1999 for endorsement. Such a development indicated the continued effort to produce worldwide standards with the support of an important organisation like IOSCO. IOSCO, however, was thought by many to be dominated by the G4+1 group of national accounting regulators from Australia, Canada, the UK and the US (later New Zealand was added) plus the IASC. Therefore, it was likely that the regulators from the G4 countries would seek to lobby for their views in the IAS setting.

The second important development in 1995 was a Communication produced by the European Commission supporting the harmonisation of accounting standards and proposing to its Member States to allow global players to prepare their accounts based on the IASC rules, provided that these would not deviate from the directives. This event gave an even greater boost on the credibility of IASC standards which, together with the agreement with IOSCO, left IASC as the only international body setting accounting standards. However, one could guess that the European Union from that moment onwards would lobby on the standard setting process for its interests. It should be noted here that the European Commission's moves were partly prompted by the fact that many large European companies were already publishing their accounts in accordance with US GAAP and therefore the main alternative to IASC would be a full convergence towards US regulations, an event that the Commission wanted to avoid both for economic and political reasons. In an unrelated development, Austria, Finland and Sweden join the EU, increasing its members to 15.

*Third Phase of Harmonisation*

The third phase of international harmonisation consists of the more recent developments in the area. With regard to the economic background, the EMU was established in 1999 and the Euro was introduced. Twelve European countries (all the EU except Denmark, Sweden and the UK) decided to drop their currencies for one single currency and to designate monetary policy to the European Central Bank

(ECB). The cost of capital around the EU has, since, been converging, with the ECB controlling the interest rates for the whole of the Euro-zone. At the same time, several voices were raised inside the EU pressing for the creation of a pan-European stock market and, in March 2000, the Euronext stock exchange was launched by the Amsterdam, Brussels and Paris stock markets. In addition, an agreement between London and Frankfurt stock exchanges was reached on the potential creation of the International Exchange IX in May 2000, although this has not been operationalised in the meantime. These developments led to a European Commission proposal in June 2000, after approval by the Council of Ministers, to introduce uniform financial reporting standards for all European Union listed firms by 2005.By July 2002, the initial proposal was transformed into an official EU Regulation by the European Parliament. Consequently, all EU listed firms must prepare consolidated accounts based on IASC rules, and it is expected that the relevant Directives will be modified in 2003.

While many would argue that IOSCO is dominated by the SEC (see for example Flower (2000)), a 'velvet war' took place inside the IASC in the second part of the 1990s. The IASC board then included a wide range of participants with geographic representation as the main selection criterion, however much concern was expressed regarding the dominance of a certain group of countries. For instance, Gebhardt (2000, p. 358) argues that "*members from the Anglo-Saxon G-4 clearly dominate in the steering committees*" and Zeff (1998, p. 96) suggests that "*some representatives from the European continent have viewed the G4+1 with suspicion, as an attempt by the Anglo-American countries' standard setters to gain undue leverage in the work of the IASC and in the harmonisation movement generally*". Cairns (1997), on the other hand, claims that IASC has been impartial and that its decisions have been balanced, with the purpose of producing the best possible standards. The reality was rather somewhere in between, with the (continental) European fears not being completely justified and the Anglo-American influence not as strong as claimed by some (see Cairns (1997) for relevant arguments and examples).

However, the recent restructuring of the IASC (from 2001) rekindled the continental European concerns. The main reasons for the restructuring were the independence from the accounting profession that was previously lacking and the need to adopt a

more professional approach by appointing full-time members who would work towards optimal accounting standards. The IASC was renamed as the International Accounting Standards Board (IASB) and the new structure can be seen in Graph 1, below. Whilst both name and structure imitate the US FASB, that is not the major concern of critics.

**Graph 1. The New Structure of IASB**

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Source: www.iasb.co.uk

The main concern lies in one particular aspect of the new structure. In this 'velvet war', the continental Europeans have supported geographical representation on the IASB board whilst the preference of the Anglo-Americans has been for an 'independent expert' model. The latter appear to have won, and the new IASB board has been chosen by the trustees in terms of expertise rather than geographic origin. In spite of the widespread respect for the apparent capabilities of the board members, it remains the case that nine out of the fourteen members of the board are nationals of

the countries represented in G4. Indeed, with the new structure, decisions are approved with 8 votes out of 14, and unanimity is not necessary. Of course, a counter argument is that seven members are European (three from the Continent plus four British), but there is still criticism of the bias that may be introduced (see for example Flower (1997), p. 295).

The European Commission, despite its views on the need for the creation of suitable accounting standards and the independence of standard setters, has nevertheless paid attention to the above mentioned concerns. In fact, the Commission decided to intervene in the new harmonisation process. First, the European Commission decided that only IASs endorsed on behalf of the EU would be mandatory with respect to the preparation of the accounts of EU listed firms from 2005 onwards. Now, the European Commission is assisted regarding the acceptance of IASs by an Accounting Regulatory Committee, while the Commission takes ultimate responsibility for endorsing IASs after informing the Member States, the European Parliament and the Council of Ministers.

The European Commission's decisions on endorsement will be based on technical expertise and thus the Commission laid its support to the creation of the European Financial Reporting Advisory Group (EFRAG), a private body of experts. EFRAG is the second pressure point of the EU on the IASB and probably the most direct one. The major objective of EFRAG is clear, and is described by its Chairman Professor Van Helleman (in Van Helleman and Slomp (2002), p. 222) as the "*proactive coordination of European standard-setters, the accounting profession, users and preparers so as to contribute to and influence the IASB standard-setting process efficiently*". The changes in the EU Council Directives and the interpretation of the IASB rules are also objectives of EFRAG and as Van Helleman and Slomp (2002, p. 222) state "*the rejection of an IAS should be exceptional and contemplated only as a last resort*". Therefore, the European Commission believes that, with appropriate lobbying both from EFRAG and the Commission, the European concerns regarding the IASB standard-setting process will be taken into account. Both the IASB and EFRAG are new bodies and the future will show the development of the harmonisation process and the relations between the two.

The process of international harmonisation of accounting standards appears to have developed rapidly in recent years, alongside other fundamental shifts in the political and economic international environment. In October 2002, the IASB and the FASB published a common memorandum of understanding stating their commitment on the convergence of US and international accounting standards and setting a joint short-term convergence project to achieve it (FASB, 29/10/02). On the same day, both the European Commission (EC IP/02/1576) and the SEC (SEC 2002-154) supported the agreement and issued important statements in favour of worldwide convergence of accounting standards.. At the same time, audit harmonisation will be affected positively by such a process, as described by Lopez Comparros (2000). Overall, Lopez Comparros (2000, p. 654) states that "*as a result of the evolution of economic and social events, the greater globality of business and the increasing frequency of transnational operations, over the next four to five years accounting harmonisation will undoubtedly proceed at a very rapid pace both internationally and in the European Union*". It seems that, despite the 'velvet war' and the criticisms, the potential for a harmonised environment in accounting regulation has been advanced, opening the door for a pan-European stock exchange. It is in this context that the study reported in this thesis may contribute to the wider policy debate, by throwing light on the institutional environment within which companies in the Euro-zone operate, and particularly by documenting the observable links between the financial information made available by such firms in recent years and their valuation in European capital markets.

## 3.2 CORPORATE TAXATION

Corporate taxation is an important burden for both small and large corporations and thus affects the market value of the firm. Due to the usually high level of statutory tax rates in developed countries, corporate taxation affects several aspects of the firm and drives a number of its policies. Although the corporate tax charge consists primarily of a proportion of the year's income levied at the statutory tax rate, in many countries surtaxes and local taxes exist which increase further the effective government excise. Moreover, taxation is an important source of government revenue and therefore the authorities are particularly sensitive to potential changes.

In addition, corporate tax may be progressive, by charging a different percentage of income for lower revenues and for smaller businesses, or it may be uniform for all companies, depending on the different taxation regimes. With regard to the present study, a review of corporate tax rates and other relevant information in the European Union countries is presented in Appendix E. Overall, the complexity of tax effects on European firm value constitutes a key component of the relationship between corporate income and market values. Below, a discussion of these tax effects and a review of relevant empirical studies is provided.

### 3.2.1 TAXATION: THEORETICAL DEVELOPMENTS

It is usual for a range of tax instruments and incentives to be employed by the authorities as part of fiscal policy, in addition to changes in the statutory tax rate. Such measures include, for example, carry-forwards and carry-backs of tax losses, incentives based on factors such as company size or the level of R&D expenditure, and varying tax rates for different types of income such as capital gains (See Buijink et al (2002), p.117). In the research literature that compares corporate taxation across countries, several measures of the 'effective' rate of taxation have been constructed in order to assess which of these factors are significant to companies and to provide an indicator of the overall tax charge. Effective tax rate measures can be divided into two broad categories, those based on financial accounting data, and those based on

investment criteria.[13] The first category appears to be more relevant to this study since it is more concerned with the actual tax effects on the market value of firms and henceforth attention will be paid to research in this particular area.

Collins and Shackelford (1995) analyse effective tax rates in Canada, Japan, the UK and the US. They suggest that Japanese companies pay higher taxes overall (i.e. effective tax rates are higher) than companies based in the UK and in the US, while Canadian companies are taxed at a lower effective rate.. In a similar analysis, Chennels and Griffith (1997) study the effective tax rates for ten countries (Australia, Canada, France, Germany, Ireland, Italy, Japan, Spain, the UK and the US). The total number of firm observations is 3,626, although the samples vary in size across countries and a limitation of the paper concerns the low number of observations for certain countries (e.g. 21 for Ireland and 28 for Italy). Despite this, for the countries with sufficiently large samples, it can be seen again that Japan has higher effective tax rates compared with the US which, in this case, is higher in turn than the UK. Although the number of observations is more limited, there is some indication that German based companies incur lower taxes than companies in France. More recently, Buijink, Janssen and Schols (2002) have carried out an analysis regarding statutory and effective tax rates in the European Union as a whole. Their results suggest that effective tax rates differ significantly from the statutory tax rates, and that effective tax rates are on average 9.6% lower, the largest differences are found in Portugal, Belgium, Austria and Italy.[14]

Overall, the discussion regarding effective tax rates shows that it is not only the statutory tax rate that affects the market value of the firm but also other tax related incentives and costs that a firm might face. Indeed, both statutory and effective corporate tax rates are likely to affect the market value of the firm in more ways than one. These include: a) effects on current profitability, b) effects on future profitability, and, less directly, c) effects on general economic activity.

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[13] A further discussion of the differences would go beyond of the scope of this study. A useful discussion can be found in Appendix A of Chennels and Griffith (1997).

[14] In addition, Ballas and Hevas (1999) present evidence of a significant interconnection between effective tax rates and accounting numbers for the case of Greece.

The most obvious influence of taxes on the market value of the firm is through current profitability, i.e. through its direct influence on earnings, resulting in efforts on the part of companies to reduce as much as possible their tax obligations by employing various methods of tax minimisation, including earnings management.[15] Such behaviour is prompted by the stronger interconnection in some countries between tax and accounting, since the income from the financial statements is used to calculate the taxable income (see Appendix D).[16] Investors await the earnings announcements of firms in order to assess their profitability and financial condition. Although earnings announcements are related in the empirical literature with stock price reactions, this is without however identifying the role of taxation in these earnings figures.

Another issue related with current earnings is that of their persistence which apparently affects future profitability (see for example Pope and Wang (2001) related to persistence and forecasting), and again the role of taxation is not evaluated although it is likely to have a significant effect in this regard. In contrast, some studies that have focused on the tax influence on mergers and acquisitions have related it both to current and future profitability (see for example Hayn (1989) and Erickson (1998)), although the evidence is limited. Overall, one could argue that, in the empirical literature, the earnings variable is defined in most cases as after-tax earnings and therefore accounts indirectly for the effects of taxation, although this point is not made in most studies in the area. In general there appears to be sparse evidence and indeed little recognition of the role that tax plays in the link between current earnings and firm values in much of the recent research linking accounting and finance.

With regard to *future* profitability, this drives the current market value since investors and analysts attempt to foresee the future of each company and to assess the sustainability of potential investments. In this context, corporate taxation affects future profitability in various ways, including its impact on internal investment

[15] For a comprehensive discussion on earnings management worldwide see Leuz, Nanda and Wysocki (2001).

[16] Since the implementation of the 7th EU Directive interconnections between tax and accounting were eliminated in the European Union countries. However, in many countries the taxable income is still calculated through the income reported in the financial statements producing 'side' effects such earnings management in this direction.

allocations, the choice between debt and equity financing, and also on more specific matters such as foreign direct investment decisions, whether inward by foreign investors and multinationals or outward by local firms (the list is by no means exhaustive).

The magnitude of taxes influences the internal investment plans of the firm, affecting future profitability and current market value as a result. For instance, decisions on corporate investment in plant and equipment can be directly related to taxation and to relevant tax incentives. As Hines (2001, p. 4) affirms, "*higher tax rates generally reduce investment, though this depends on tax treatment of investment expenditure*". Furthermore, Hassett and Hubbard (2001) suggest that corporate investment is inversely related to effective tax rates. [17] By way of illustration of this point, the President of the Association of the German Chambers of Industry and Commerce (DIHK), Ludwig Georg Braun, made the following comment regarding the recent decline of the German tax rate: "*The decrease in the corporate tax rate (to 25%) favours internal financing for joint-stock companies*".[18]

With regard to capital sourcing, high tax rates lead to more aggressive debt financing instead of equity financing. This choice between debt financing and equity financing has direct effects on the current market value of the firm's equity, since the rate of interest on outstanding debt, and the term structure in general, will affect future earnings expectations.. At the same time, as Hines (2001) suggests, the most important tax concern in corporate finance is that interest payments to bondholders are in most countries deductible from the income to be taxed, while dividends are not, and this can lead to the issuing of more debt than companies would issue in other circumstances. , Auerbach (2001) provides evidence that debt/equity ratios are much higher than expected in such circumstances.[19] On the other hand, Bogner, Fruhwirth and Schwaiger (2001, p. 3) detect a recent change in tax legislation in many European countries towards "*deductibility of imputed equity interest [which]*

[17] In Hassett K.A. and Hubbard R.G. (2001), "Tax Policy and Business Investment", in A.J. Auerbach and M. Feldstein, (2001) "Handbook of Public Economics", 3, North-Holland, Amsterdam.
[18] In the "Taxes in the Federal Republic of Germany", commissioned by the Federal Ministry of Economics and Technology, and prepared by PricewaterhouseCoopers and the University of Mannheim, 2nd Edition, November 2001, p.8.
[19] Auerbach, A.J. (2001), "Taxation and Corporate Financial Policy", in A.J. Auerbach and M. Feldstein, (2001) 'Handbook of Public Economics", 3, North-Holland, Amsterdam.

*compensates (at least in part) for the preferential tax treatment of debt*". The same trend is identified by the report on "Corporate Taxes in Germany" (2001, p.65) where the authors (see note 19 above) argue that Ireland and the UK have changed their systems to "*a classical system of corporation tax alleviated by relief to the shareholders*".

Further evidence on this is reported by Collins and Shackelford (1992) who show how tax considerations determine the choice made by firms between debt and preferred stock, in this case with respect to foreign tax credit limitations. Finally, when Gordon and Lee (2001) show that increasing corporate taxes would result (ceteris paribus) in a direct increase in debt financing, they also suggest that the tax effects would be much lower for small firms, in the case of progressive taxation. Therefore one should account for size in this respect, a point that is taken up later in the research design for the present study.

In the same way that internal investment and capital sourcing decisions have significant tax implications for future profitability, (external) project investment likewise depends upon effective and statutory tax rates, and particularly in an international context. For instance, when inward foreign direct investment (FDI) attracts international investors to a country who seek to implement business plans together with domestic firms, this can result in increased market value of the latter. Taxes affect directly the future profitability of any investment and thus play an important role for inward FDI. Hines (1996) shows that different state tax rates in the US affect directly the amount of inward FDI directed to different states, a result that is particularly important due to the fact that the choice of the geographical direction of FDI can be attributed largely to taxation since most other factors are equal, being in the same country (USA). Hines (1996) also suggests that the impact of tax differences on inward investment is even more pronounced among different states at lower tax rates. Gupta and Mills (2002), with another sample of large US firms, also suggest that, due to differences in effective tax rates, companies choose whether or not to site operations in different US states. Devereux and Griffith (1998) investigate the impact of effective tax rates on the FDI planning of US multinationals in Europe. They show that the choice within Europe of the country in which to invest is largely affected by the effective tax burden they would face in each of the different countries

involved. Their results demonstrate that a 1% increase in the effective tax rate in the UK would lead to a 1.3% reduction in the probability that US firms invest in the United Kingdom. A good example is offered in the European Union, where in the last decade much of the inward FDI was directed to Ireland due to the large cut in the corporate tax rate (from 50% in 1986 to an average of 21.94% between 1990 and 1996, see Table 9 in Chapter 5). The very high FDI inflows to Ireland, reaching 1.79% (net FDI) of the Irish GDP when most EU member states faced FDI outflows (1990-1997 average, see Gropp and Kostial (2001), p. 12) led to the rapid growth of the Dublin stock market affecting directly the market value of Irish firms.

Outward foreign direct investment utilizes local funds abroad, depriving the local market of investment funds which could in turn affect the market value of local firms that would otherwise be involved in possible common projects and also in the supply of local products. Gropp and Kostial (2001) suggest that if a country's effective tax burden is higher in comparison to others, especially where competitive characteristics are similar, the tax base (i.e. the firm's registered headquarters) might move to countries with lower effective taxation, thus leading to outward FDI. Their results indicate a strong link between FDI and the tax regime, as suggested.

Furthermore, the outward flow of foreign direct investment affects domestic investment negatively and, therefore, general economic activity in the specific country. Domestic investment, instead of outward FDI, boosts the local economy, producing multiplied investment effects on the whole local market and thus indirectly affecting the market value of local firms. Also, lower tax revenue for the central government and local (regional) authorities resulting from outward FDI would affect joint public-private investments, again influencing the value of relevant local companies. On the contrary, inward FDI would produce positive effects on general economic activity, influencing the market value of local firms.

All the above have led to an important debate amongst theorists, market participants and policy makers in international organisations (for example in the European Union), a debate that is ongoing between governments and individuals who favour tax harmonization on the one side and those favouring tax competition on the other. In a report prepared by OECD (2001) for its member countries, a trend of corporate

tax cuts is identified, which inevitably is leading to lower but also more harmonised tax rates. Interestingly, whilst having a harmonising effect, this trend towards lower taxes is consistent with the arguments put forward by those sympathetic with tax-competition. Countries with lower tax rates benefit from international investments in their domestic markets, as the Irish case demonstrates. With increasing capital market integration in Europe, supported by the European Union principle of free capital mobility, and in the absence therefore of benefits attributable to segmented markets, tax effects become more important as a criterion for the selection of an investment location. As stated in a recent Working Paper (2001, p. 45) by the Directorate-General for Research of the European Parliament, "*the launching of the Euro reduces transaction costs and cancels exchange rate uncertainty in the Euro-zone, magnifying capital mobility*". In fact, the loss of the tool of competitive devaluation within the Euro-zone makes the countries involved more eager to compete with the remaining tools at their disposition, taxation being one of the most important.

However, such competition might lead to a 'race to bottom' of tax rates which would "*unambiguously deteriorate fiscal balances since no country would be able to attract investment from its EU partners through lower corporate taxation*" as the same European Parliament Working Paper (2001) mentions (p. 45). In addition, in a world of growing financial integration and with less and less capital controls, it is argued that a reduction of the tax costs on capital would 'pass' the tax burden to more rigid factors such as labour, producing another social problem. There are several arguments in favour and against tax harmonisation, which are summarised in Table 2 below extracted from the European Parliament Working paper (2001) mentioned above.

In conclusion, corporate taxation is a significant determinant of the market value of the firm. The above discussion indicates the existence of several channels through which taxation affects the firm's current and future profitability and consequently its share price. Despite that, the issue of taxation is neglected in much of the research relating market value and accounting information. Those studies that do attempt to assess empirically the possible connections between share prices and corporate taxation from an accounting point of view are discussed below.

**Table 2. Tax Competition versus Tax Harmonisation (Co-ordination): The Arguments**

| Arguments for Harmonisation / against Competition | Arguments for Competition / against Harmonisation |
|---|---|
| With the disappearance of risks based on currency fluctuations, the differences in tax systems have become clearer, and have greater impact on capital flows. Capital allocation will be distorted if it takes place solely for tax efficiency. | Competition takes place, not between tax systems in isolation, but between revenue/expenditure systems as a whole. Countries with higher taxation, e.g. Scandinavia, remain competitive by offering attractive social and other factors. |
| Tax competition will result in a "race to the bottom", eroding Member States' tax bases. | Tax competition has not, in fact, resulted in a fall in the proportion of GDP taken in tax: rather the opposite. |
| There is an imbalance between the lack of co-ordination of tax on the one hand; and, on the other, the centralisation of monetary policy within the € area, together with tightly constrained budgetary policy. | Since national governments within the € area have lost the ability to change interest rates, exchange rates, or monetary aggregates, the only instrument left to them for stabilisation policies is freedom to vary taxes. |
| Welfare maximisation through competition only works when both capital and labour can move between competing jurisdictions. Where one factor (capital) is mobile, but another is not, the tax system will be distorted. Tax competition is increasing the tax burden on labour, which increases the level of unemployment. | The gains from co-operation are not necessarily shared equally between participants. Lower taxes are one of the mechanisms through which relatively poor and/or small economies can compete in attracting investment (e.g. Ireland). Tax harmonisation may therefore be merely an attempt by richer/larger economies to protect their revenues. |
| Tax competition makes it extremely difficult to pursue social and environmental objectives through the tax system: e.g. income redistribution, the taxation of pollution, etc. Only harmonisation will prevent "free – loading". | The desired mix of taxation/public expenditure may not be the same in all economies. Devolved tax decisions are thus more likely to correspond to citizens' preferences. Tax competition is in accordance with the principles both of subsidiarity and democracy. |
| Business has to deal with fifteen different tax systems and fifteen different tax authorities within the EU, causing considerable costs and distortions. | "There is no art which one nation more swiftly learns of another than that of draining money from the pockets of the people". (Adam Smith) |

*Source: European Parliament, Economic Affairs Series ECON 125 (2000)*

### 3.2.2 Empirical Studies on Taxation and Accounting

As indicated earlier, the empirical research conducted for this thesis attempts to shed light on the value relevance of taxation from an accounting perspective. In a recent review paper, Shackelford and Shevlin (2001) point to three main areas of interest in this respect: a) the coordination of tax and non-tax factors, b) the taxation of international commerce, and c) the effects of taxes on asset prices. The first of these is mainly focused on the reasons why tax minimisation is not necessarily the best strategy for firms, and involves research into relevant financial reporting matters such as inventory accounting, regulated industries and intertemporal income shifting, and also involves the analysis of agency costs related to compensation and tax shelters. The second line of research concerns multinational and multistate commerce and the influence of different taxes on this. Finally, the third line of research assesses the effects of the taxation of corporate income and the taxation of returns to investors on the market value of the firm, and is reviewed in detail below because of its central importance to the empirical part of this thesis.

In a relatively early study of corporate income tax effects, Beaver and Dukes (1972) found for a US sample that the inclusion of tax deferrals in unexpected earnings measures improves significantly their correlation with unexpected stock returns. Similar research into the decomposition of earnings components, even though the main concern is not the value relevance of taxation per se, also provides results showing the significance of taxes to the share prices of firms. Such studies were initiated by Lipe (1986) where the author identifies, using a price-earnings regression with a US sample, the small but significant value relevance of six decomposed items including income taxes.[20] In another US study, where Ohlson and Penman (1992) utilise a returns-earnings model in which they disaggregate income and book value of equity into a number of components, and introduce the tax expense and the deferred tax liabilities into the predictor of the market value of the firm. Their results, however, are not very conclusive with regard to taxes since they differ according to short and long time horizons tested. In a related study, Ayers (1998) disaggregates deferred taxation from the book value of assets in order to assess differences after the

[20] The other decomposed items being gross profit, general and administrative expense, interest expense, depreciation expense and other items.

implementation of the SFAS No. 109 in the US. Using two samples (before and after SFAS No. 109), which result to 988 and 498 observations, he tests a model which relates share prices to financial statement measures, and finds that the net deferred tax liabilities disclosed under the new rule are more value relevant than in the previous regime.

In the context of recent developments in valuation modelling, Giner and Reverte (1999) use a model based on Ohlson (1995) to disaggregate corporation tax from earnings and they test if that provides incremental price–relevant information. The authors focus on the Spanish market covering a sample period from 1991 to 1995 and identify a strong relation between stock prices and corporate taxation. Recently, papers employing the Feltham and Ohlson (1995) framework, also test the relation between taxes and share prices. Amir, Kirschenheiter and Willard (1997) include deferred taxes within such a framework by disaggregating them from the net operating assets. Their US sample consists of 1,114 firm-year observations for a period of three years (1992-1994), and the results indicate the significance of deferred taxation in the valuation process. In addition, Amir et al (1997) decompose deferred taxes into seven categories and they argue that this decomposition provides even more value relevant results. Zeng (2001) also incorporates corporate taxes in the Feltham and Ohlson model (1995), claiming a tax effect on firm market value through 'abnormal financial earnings' that results from the tax deduction on interest expenses. With 1,136 firm-year observations for Canadian firms for the period between 1995 and 1998, the findings partly support this view. Overall, however, the available evidence shows that taxation in general (including tax deduction on interest expenses as well as other direct and indirect taxes and incentives) affect the value of the firm in more than one way.

Investor taxation and its effects on the market value of the firm have also been the subject of recent research, first regarding dividend taxation and second capital gains taxes. In the first area, Harris and Kemsley (1999), Collins and Kemsley (2000) and Harris, Hubbard and Kemsley (2001) attempt to shed some light on the dividend tax relation with share prices. Harris and Kemsley (1999) test the Ohlson (1995) model with a US sample of 27,647 firm-year observations that covers the period 1975-1994, And conclude that taxes on dividends are a relevant determinant given the lower

coefficient value for retained earnings than for the book value overall. In the same way, Collins and Kemsley (2000) test the Ohlson (1995) model using a sample of US firms and they find that the coefficient for their proxy of future dividends (retained earnings in this case as well) again appears to be lower than the coefficient of book value. Therefore, they suggest that equity is discounted for dividend taxes. In a further paper, Harris et al (2001) follow the Harris and Kemsley (1999) framework, again employing the Ohlson (1995) model.[21] The authors extend the previous research by developing the tax interpretation of the results and by testing the model in different tax regimes. They find that a substantial portion of the dividend is capitalised in equity values in the US but also in Australia, Japan, France, Germany and the UK despite the systemic differences.

With regard to capital gains taxes, Landsman and Shackelford (1995) point out that shareholders require compensation for the expected effects of long-term capital gains taxes, and that this impacts on current market values. Their analysis involves a single case, that of RJR Nabisco, and the evidence is based on confidential feedback from individual shareholders. Subsequently, Blouin, Smith Raedy and Shackelford (2000) provided empirical support for this hypothesis from a market based study. Employing quarterly earnings announcements and a short-window model of abnormal stock returns, and a sample of 97,478 firm-quarter observations on US companies for the period 1983-1997, the authors demonstrate that information concerning the capital gains taxes that shareholders are likely to be subject to affects stock price responses. Further insight into the capital gain taxation effect is to be found in the context of institutional investment analysed by Bergstresser and Poterba (2002, p. 381) who show that "*a large capital gain overhang discourages both gross fund inflows and gross outflows*" while testing the taxation effect on mutual fund flows. [22]

Overall, prior research in the area, as discussed above, has taken account of a number of valuation modelling developments in order to assess the value relevance of

[21] The sample selection is somehow peculiar since the authors employ a US sample for the period 1975-1997 which results in 72,620 firm-year observations while for the rest of the countries the sample covers the period 1984-1994 resulting to a total of 14,525 firm-year observations.
[22] The authors employ a tax adjusted returns-dividends model for the period between 1993 and 1999 with a US sample of 7,798 fund-years.

taxation. In particular, it has been shown that the Ohlson (1995) framework has played a central role in a number of recent studies. In this context, a number of innovations in research design have been introduced:- income taxes have been disaggregated from earnings, deferred taxes from assets and dividend taxation has been incorporated in the relevant analysis, providing a more useful model with which to examine the value relevance of taxation, a point which is taken further in the empirical part of this thesis.

## 3.3 EXCHANGE RATES

Companies with international involvement are affected by the variability of exchange rates, both with regard to the direct exposure of their assets and liabilities to foreign exchange risk and due to the more general effects on future operations. Indeed, all firms in a market are influenced either directly or indirectly by currency fluctuations and their impact on the economic environment.. The vast majority of relevant research on this issue is in finance and international economics, while in the area of financial accounting a paucity of empirical studies exists that relate exchange risk to accounting-based valuation modelling. Of course, there are several ways that the value of the firm is affected by foreign exchange risk, and prior research that throws light on this is discussed below.

### 3.3.1 EXCHANGE RATES: THEORETICAL DEVELOPMENTS

The value of the firm is *directly* affected by exposure to gains or losses from changes in exchange rates when future transactions in a foreign currency are already agreed. For instance, firms that are involved with international trade may denominate their exports or imports in a foreign currency and these will change value in terms of the local currency with changes in the exchange rate. Allayannis and Ofek (1996), among others, refer to such transaction exposure as a short-term risk, which is expected to be assessed and hedged by the market. As, Chow, Lee and Solt (1997, p. 107) state, "*for current cash flows, where the short term impact of exchange rate changes is easily assessed, the presumption of hedging effectiveness is reasonable*". Albeit a reasonable, presumption, it will nevertheless not apply to all firms. While larger exporters will usually hedge their exchange rate exposure, the same can not be said for smaller firms that are unlikely to have access to hedging instruments and derivatives markets. In such cases, the value of the firm remains exposed to any unexpected changes in the currencies in which the assets and liabilities are denominated, even in the short term.

In general, as Bartov and Bodnar (1994) argue, current and future expected cash flows of firms will be affected by changes in the exchange rate. To a great extent,

such exposure, known as economic or operating exposure will arise from the way in which changes in the exchange rate, together with price adjustments, affect forecasts of the firm's operational cash flows. This results in more permanent changes in the value of the firm as indicated by Rees and Unni (1996), among others. ,Although short term transaction exposure can be hedged effectively in some circumstances, as noted above, this is unlikely to be straightforward in the case of economic exposure. On this issue, Chow, Lee and Solt (1997, p. 107) point out that "*for future cash flows, where the long run effects of exchange rate changes are difficult to ascertain, hedging effectiveness is doubtful*".

Economic theory suggests that changes in the exchange rate can produce a shift in stock prices, directly in the case of multinational firms, exporting and importing companies, and firms which import part of their inputs, and indirectly on those of the remaining listed companies. For instance, for a multinational firm, the earnings of a foreign subsidiary may remain at the same level in terms of the operating currency but will differ when consolidated if there is a change in the exchange rate between reporting periods. This will lead to changes in the consolidated earnings denominated in the parent's currency, and, after the announcement of this news, this will have a direct effect on the stock price. Similarly, domestic firms will be affected if their costs and revenues vary as a result of exchange rate changes, if they are importing inputs or exporting final goods.

However, operating exposure does not affect only those firms that have direct international involvement. As Sercu and Uppal (1995, p. 488) point out: "*There are two misconceptions about the source of operating exposure. The first is that only those firms that have foreign operations are exposed to the exchange rate*".[23] Domestic companies will be affected by changes in the prices of goods or services provided by the aforementioned firms with whom they might trade. Another indirect but very real influence of the exchange rate fluctuations comes through competition. Exchange rate movements affect both the prices of imported finished goods and the costs of imported inputs, thus influencing indirectly those companies that compete with such firms.

[23] The other misconception according to Sercu and Uppal (1995, p. 488) is that "*if a firm denominates all of its sales and purchases in terms of its own currency, it faces no exposure to the exchange rate*".

Finally, exchange rate changes affect capital inflows into the local market. If the local currency depreciates, local equity become cheaper (in terms of the foreign currency) in the eyes of foreign investors, and thus an increase in the demand of local stocks will drive their prices up (in terms of the local currency). The opposite can occur in cases of appreciation of the local currency which would not only deter foreign inward investment but would produce capital outflows and local outwards direct investment. In addition, fluctuations in exchange rates lead to interest rate changes that are consistent with interest rate parity, and also indirectly affect the inflation rate. Such changes in the cost of capital affect all companies and not only those with foreign operations, while changes in inflation also have a widespread effect.

Overall, therefore, theory supports the existence of a relationship between the value of the firm and exchange rate movements. The economic background of such a relationship can be seen in Box II below, where the effects of fluctuations in the exchange rate on an individual stock are described in a simple standard discounted cash-flow framework. The extent to which the theoretical link between firm value and exchange rates is confirmed by empirical evidence is discussed in the next section .

**BOX II: EXCHANGE RATE SENSITIVITY OF STOCK PRICES – ECONOMIC BACKGROUND**

We can consider how the individual stock responds to exchange rate movements in a standard discounted cash-flow framework. We assume that "fundamentals" determine the price of a stock, excluding the possibility of asset bubbles. The value of a firm at time zero, $V_0$, is thus assumed to equal the expected present value of current and future profits according to:

$$V_0 = E_0 \sum_{t=0}^{\infty} \{ \pi_t \prod_{j=0}^{t} (1 + r_t)^{-1} \}$$

Where $E_0$ is the expectations operator at time zero, $\pi_t$ the profits and $r_t$ the discount factor. In each period, profits can be expressed as the maximised sum of domestic and foreign sales minus domestic and foreign inputs according to:

$$\pi_t = \max_{L, L^*} [p_t q_t + e_t p^*_t q^*_t - w_t L_t - e_t w^*_t L^*_t]$$

Where q and $q^*$ are quantities of domestic and foreign sales, p and $p^*$ domestic and foreign output prices, L and $L^*$ domestic and foreign inputs, w and $w^*$ respective costs, and e the exchange rate.

The maximisation problem will not have a well-defined interior solution for all possible assumptions regarding technology and market structure. In particular if perfect competition is assumed, i.e. the firm is a price taker, the quantities produced will be either zero or infinity if there are no fixed factors in the production function that generate decreasing returns. Also, if L and $L^*$ are the only inputs, the choice of these would determine the total quantity produced but not the composition of domestic and foreign sales. Similarly, in the case of a firm selling in both domestic and foreign markets, there need to be factors that restrict the sale in one market if the firm is a price taker in both markets. In summary, frictions prevent profits in each period from being equalised across sectors.

Differentiating profits with respect to the exchange rate, we get:

$$(d\pi_t / de_t) = p^*_t q^*_t - w^*_t L^*_t + (\partial p_t / \partial e_t) q_t + e_t (\partial p^*_t / \partial e_t) q^*_t - (\partial w_t / \partial e_t) L_t - e_t (\partial w^*_t / \partial e_t) L^*_t$$

The first two terms are the direct effects on profits from a change in the exchange rate, i.e. the change in profit that will result if the firm produces the same quantities as before with the same inputs and the input and output prices remain unchanged. The last terms are indirect effects that are all related to changes in prices, both of produced goods and inputs. Due to the envelope theorem, there are no quantity effects, since quantities are chosen to maximise profits. It is important to note that the lack of quantity effects is only valid for small changes in the exchange rate. In reality, in cases of large exchange rate changes, such the abandonment of a pegged exchange rate regime, the magnitude of the change would warrant the inclusion of quantity effects in the above expression.

Source: Becker, Gelos and Richards (2000), Appendix II

### 3.3.2 EMPIRICAL STUDIES ON EXCHANGE RATES

There are two major lines of empirical research regarding the effects of exchange rates on stock prices. The first of these is related to the effects of exchange rate exposure on the market value of multinational firms and firms involved in international trade. The second line of empirical research consists of papers relating the movements of exchange rates to the whole capital market, implying that both direct and indirect influences from a change in the exchange rate should be taken under consideration.

*International Trade Effects*

Jorion (1990) attempts to identify the currency exposure of US multinationals for the period 1971-1987 (287 observations), employing a generalised least squares estimation for a stock returns – change in exchange rate model, while he argues that exposure represents the sensitivity of the value of the firm to exchange rate randomness. The author suggests that there is some evidence of an association between the value of US multinationals and exchange rate, indicating that this association is correlated with the degree of foreign involvement.

Bartov and Bodnar (1994) employ a sample of US firms which report foreign currency adjustments (as an indicator of foreign operations) for the time period 1973 to 1989 for a total of 2,264 firm-quarter observations. The model that they employ is similar to the one used by Jorion (1990), while later in the analysis they include the lagged changes in the exchange rate variable. The results suggest that changes in the US dollar (using a trade weighted exchange rate index) have little power in explaining abnormal stock returns. In addition, Bartov and Bodnar (1994) infer that, given the results from the inclusion of lagged variables, the complete market response to the impact of an exchange rate change is delayed for more than one quarter.

Chow, Lee and Sholt (1997) argue that changes in current exchange rates affect both future interest rates and future cash flows. Thus, they suggest that the use of a short horizon, as in much of the prior research, can not capture all the effects of exchange rate changes. Using a Fama and French framework with a sample of US companies

for the period 1977-1989,[24] the authors provide evidence of the importance of the first and second year responses of stock prices to exchange rate movements, indicating the significance of the long term nature of the relationship.. Dominguez and Tesar (2001) reinforce the results of Chow et al (1997) by testing a sample of weekly observations of firms from seven countries where the US is not included.[25] The sample consists of a total of 2,387 firms for the time period between 1980 and 1999, while the market model is used relating the individual firm return to the market return and the change in the exchange rate. The authors find that the highest level of exchange rate exposure is identified when a one-year (52-weeks) horizon is employed. Overall, the authors suggest that a high percentage of firms from all countries is exposed to currency risk. However, the sign of exposure coefficients varies across the different sub-periods tested, while exposure appears not to be related with firm size, industry affiliations and, very importantly, international involvement (described as firms' multinational status, the existence of foreign sales or the control of international assets).

The next five papers to be discussed below involve country-specific studies, in Spain, South Korea, Australia, the US and Japan. The first, by Martinez-Solano (1998), attempts to identify the level of foreign exchange exposure in the Spanish stock market (67 firms), employing monthly data from 1992 to 1997. The author performs time-series regressions between returns on individual stocks or portfolios and market returns and the nominal effective exchange rate of the Spanish Peseta. He finds a significant effect from economic (operational) exposure for many Spanish firms, while cross-sectional differences depend on operational and financial firm-specific characteristics.

Di Iorio and Faff (2001) utilise a Fama and French framework, in contrast, they claim, to most previous studies which use a multi-factor framework based on the Capital Asset Pricing Model. Their sample consists of both daily and monthly data for Australian firms. The sample with the daily observations is for a period between April 1996 and September 1998 (618 observations), while the sample with the

[24] In the Ordinary Least Squares regression analysis they include a sample of 65 industry portfolios.
[25] The countries in their sample are Chile, France, Germany, Italy, Japan, the Netherlands, Thailand and the UK.

monthly observations covers a period from December 1990 to September 1998 (93 observations). The results of the study indicate evidence of exchange rate exposure for the Australian firms, especially with daily data. In addition, the authors show that the firms in their sample were more exposed to exchange rate changes after the East Asian financial crisis of 1997.

Doukas, Hall and Lang (2001) attempt to identify the exchange rate exposure of 1079 Japanese firms for a period between 1975 and 1995. These authors find support for the existence of a relationship between Japanese stock returns and unexpected changes in the exchange rate, and provide evidence that exposure to this currency risk is priced in the stock market.

Ihrig (2001) tests the exchange rate exposure of US multinationals for a five year period (13,560 firm-month observations for January 1995 – December 1999). The main difference with the previous research lies in the use of a more accurate exchange rate basket for each multinational and the inclusion of a provision for those months when exchange rate crises occurred. The latter is defined as when the relevant exchange rate is higher than one of three monetary indicators of crisis in the specific country where the subsidiary is based. The author suggests that, due to these modifications, the evidence of exchange rate exposure is significantly greater, affecting about 25% of the firms in his sample.

In an attempt to introduce accounting variables into the relationship between market values and currencies, Choi (2001) tests the implications of changes in the exchange rate on the value of the firm in a model relating abnormal stock returns to the change in earnings and the change in exchange rate. Choi (2001) explicitly attempts to detect the behaviour of multinational companies and the value relevance of their exchange rate exposure in the South Korean stock market, but the working paper is inconclusive in this respect.

Other recent work involves groups of countries rather than individual cases. and different types of firms, again in an attempt to assess the effects of exchange rate changes on share prices. Using a sample of monthly data for firms from 18 countries for a period between 1975 and 1999 (17,929 observations), Doidge, Griffin and

Williamson (2002) use the conventional two-factor (market returns – exchange rate returns) augmented market model and find evidence that foreign activities and size are significantly related with exchange rate exposure.[26] These authors test the influence of exchange rate changes on specific stocks in order to determine the extent to which currency risk exposure can be priced by the market.. Bartram, Karolyi and Kleimeier (2002) study the impact of the adoption of the Euro on the exchange rate exposure of European, American and Japanese non-financial firms from 21 countries, testing 26,251 observations for the time period 1973-2001. They estimate a market regression model incorporating dummies for three periods (pre-EMS, pre-Euro and post-Euro), and find that market risk was reduced significantly after the adoption of the Euro when exchange rate volatilities decreased. In addition, they show that there was a more significant fall in market risk for companies with sales in Europe than for the rest of firms in their sample.

*Market Effects*

As mentioned above, the second line of empirical research involves studies which relate the movements of exchange rates to the stock market as a whole, suggesting that direct and indirect effects would influence most companies in a stock market. It should be noted that, for some of the following papers, the relationship between stock prices and exchange rates is tested as bi-directional where stock prices affect exchange rates as well as the reverse.

Empirical evidence was first provided by Solnik (1987), and Ma and Kao (1990) who use monthly data from eight and six OECD countries respectively, over the same sample period, 1973-1983.[27] Both studies utilise a regression analysis and they find weak evidence that real exchange rate depreciation is associated with general increases in equity prices. Furthermore, Solnik (1987) treats stock returns as a proxy of real economic growth and attempts to assess its influence on the exchange rate differentials. However, he admits that the weakness of the results can be related to the fact that stock returns are a poor proxy for real economic growth. In addition, Ma

[26] The market model employed is $R_i = a_i + b_i R_{FX} + d_i R_M + e_i$ where $R_i$ is the stock return, $R_M$ is the country specific value-weighted market return, and $R_{FX}$ is the percentage change of the exchange rate.
[27] Solnik (1987) includes Canada, France, W. Germany, Japan, the Netherlands, Switzerland, UK and the USA in the sample, while Ma and Kao (1990) use the same countries but exclude the Netherlands and Switzerland and include Italy.

and Kao (1990) turn the discussion to a different issue by suggesting that, if the investment flow is from a strong currency country, investors expect to gain a higher rate of return when the payoff is converted back into their domestic currency. Hence, depreciation of the domestic currency value is on average associated with favourable stock price movements.

The previous papers focused on a macro-level analysis using time-series regressions. Frennberg (1994) maintains that exchange rate sensitivity can change over time due to switches in exchange rate regimes. He suggests that discrete data should be used, and considers the impact of four large exchange rate adjustments in Sweden, within the period 1977-1992. He utilises a cross-sectional approach in which he tests by an ordinary least squares estimation the relation between the stock market index and prices of individual equity of 43 non-financial firms listed on the Stockholm SE. Frennberg (1994) identifies positive reactions of the market index to devaluation events, while he suggests that one third of the cross-sectional differences between companies can be explained by the level of foreign involvement (estimated by using the level of foreign sales and foreign employees).

More recent studies have employed variants of Granger causality and cointegration methodology to identify the short and long-run relationship between changes in stock prices and exchange rates. Qiao (1996) studies three Asian countries, Japan, Hong Kong and Singapore, using daily data for a period of around eleven years (1/1983 – 6/1994), with contrasting results. In the short-run, he suggests the existence of a two-way causal relationship between real exchange rates and stock prices in the case of Japan. In Hong Kong, exchange rates Granger cause changes in stock prices in the short-run while no short-run relationship is detected for Singapore. Qiao (1996) conjectures that the results imply different macroeconomic trading strategies among the three countries. In the long-run, cointegration tests detect a relationship between the levels of stock prices and exchange rates for all of the countries, which the author attributes to the intensive globalisation of the three Asian financial centres.

Ajayi and Mougoue (1996), and Abdalla and Murinde (1997), utilise the Engle and Granger cointegration procedure. Ajayi and Mougoue (1996) study the same countries (with the addition of the Netherlands) as Ma and Kao (1990), employing

daily data for a period of six years (1985-1991). They find that an increase in aggregate domestic stock price induces a depreciation of the domestic currency in the short-run. The authors suggest that this is due to increasing inflationary expectations generated by a bullish stock market. However, in the long-run, increases in stock prices lead to an appreciation of the currency, which they conjecture arises from an increased demand for the currency, partly driven by investors revealed willingness to hold assets denominated in that currency. Furthermore, currency depreciation has a negative effect on the stock market, both in the short and the long-run.

Abdalla and Murinde (1997) study a group of emerging markets utilising monthly data for a period from January 1985 to July 1994. They find no long-run relationship between stock prices and exchange rates for South Korea or Pakistan, although it is detected in India and the Philippines. In the short-run, exchange rates movements Granger cause stock price adjustments in South Korea, Pakistan and India, while reverse Granger causality is detected for the Philippines.

Bahmani-Oskooee and Domac (1997) apply both Engle and Granger and Johansen and Juselius cointegration procedures to a study of interaction between Turkish stock prices and the value of the Turkish lira for monthly data for the period 1986-1994. They identify a two way short-run causal interaction, an also a long-run relationship between Turkish stock prices and the two leading exchange rates (Turkish lira-US dollar and Turkish lira-Deutschmark), whereby a depreciation of the currency is related to an increase in the stock prices.

Furthermore, Phylaktis and Ravazzolo (1999) perform Johansen and Juselious cointegration tests on the stock prices and exchange rate relationship for a group of Pacific Basin countries for the period from 1980 to 1998. They explore the possibility of omitted variable bias by utilising both bivariate and trivariate specifications, incorporating the US stock index as an additional variable. They find that the US stock prices variable appears to act as a conduit through which the exchange rates and the domestic stock markets are linked.

Granger, Huang and Yang (2000) examine the interdependence of stock returns and exchange rates by using data from nine countries of East Asia. Since the time period

of the data set includes the events of the Asian financial crisis of 1997, all economies exhibit pronounced structural breaks. The unit root tests employed are adjusted in order to account for these structural breaks. Their results seem to suggest that changes in stock returns tend to lead changes in the exchange rate, and that, for Hong Kong, Malaysia, Singapore, Thailand and Taiwan, there is a strong feedback interaction between the two. In two recent studies, Wu (2000 and 2001) tests the relationship between equity prices and exchange rates for the case of Singapore. The author shows that the rate of the Singapore dollar to a number of developed economies' currencies is negatively related to stock prices in the Singapore stock market. In addition, when the Singapore dollar depreciates with respect to the Japanese yen and the Indonesian rupiah, Singapore stock prices increase on a long run basis.

Moreover, Nieh and Lee (2001) test the dynamic relation between exchange rates and equity prices in the G-7 countries. The authors argue that their results fail to identify any long run relationship between the two financial variables in contrast to the majority of prior empirical research. Finally, Grambovas (2003) studies the cases of the Czech Republic, Greece and Hungary, employing Granger causality and cointegration methodology for a data set of weekly observations for the period between January 1994 and February 2000, finding evidence supporting the long run relation between the international financial environment, local equity prices and exchange rates for Greece and Hungary. On the other hand, there is no long run relationship between exchange rates and stock prices in the Czech Republic.

Overall, both theoretical and empirical analyses suggest that currency fluctuations affect stock prices. In particular, changes in exchange rate are value relevant in countries that face more unstable exchange rates. Furthermore, the existence of weak evidence of exchange rate exposure when samples of multinational firms are tested and the strong evidence of a relationship between exchange rates and share prices when samples which include all firms are employed, indicate that all firms should be included in any relevant analysis and not only those with a direct foreign connection, since both direct and indirect, as well as, short run and long run effects influence such relationship. Finally, given the above, the issue of the influence of exchange

rates on the value of the firm takes on even more importance in the light of the decision of twelve European countries to drop their own currencies in favour of a common currency (the Euro), and this issue is developed further in the empirical research that is conducted as part of this thesis.

# CHAPTER 4: METHODOLOGY

The models that will be employed in the empirical part of the thesis are based on those that were set out and critically reviewed in the previous chapters. Since the empirical research will be structured as three separate studies, this chapter will present the models to be utilised, the modifications that are proposed and any methodological concerns that arise. However, issues relating to the data that is used as well as to specific ad hoc empirical concerns will be discussed in the three empirical studies in Chapter 5.

Thus, in section 4.1 the tax-modified Ohlson model will be developed and Section 4.2 will show how exchange rate changes are incorporated in the framework of the Feltham and Ohlson (1995) model. Furthermore, in Section 4.3 some methodological concerns are discussed with respect to the suggested problem of scale effects. Finally, Section 4.4 will focus to the nature of the 'reverse regression', which, as mentioned above, is employed in the empirical application of Basu's (1997) notion of earnings conservatism.

## 4.1 THE TAX MODIFIED OHLSON MODEL

The Ohlson (1995) model will be the basis of the analysis in the empirical study regarding the value relevance of taxation in the Euro-zone countries (5.2). The research design builds on equation (12) in Section 2.2.3 of Chapter 2.:

$$P_t = y_t + \alpha_1 x^a_t + \alpha_2 v_t \qquad \text{"The Ohlson Model – O95"} \quad (12)$$

Where $P_t$ denotes share prices, $y_t$ is the book value, $x^a_t$ denotes the abnormal earnings and $v_t$ is the other information variable. Where the coefficients:

$$\alpha_1 = \omega / (R_f - \omega) \geq 0$$

$$\alpha_2 = R_f / (R_f - \omega)(R_f - \gamma) > 0$$

As discussed previously, the Linear Information Dynamics of the O95 model, where the autoregressive process of abnormal earnings and other information is defined and the parameters $\gamma$ and $\omega$ are set accordingly, are the following:

$$x^a_{t+1} = \omega x^a_t + v_t + \varepsilon_{1\,t+1} \qquad (10)$$

$$v_{t+1} = \gamma v_t + \varepsilon_{2\,t+1} \qquad (11)$$

One of the empirical objectives of this study is to identify the value relevance of taxation and its interrelation with other accounting variables. To assess that, taxes will be disaggregated from the abnormal earnings in equation (12). The abnormal earnings are defined in Ohlson (1995) as the amount that the firm earns in excess of the risk-free rate of interest ($R_f - 1$) on the book value. Thus:

$$x^a_t = x_t - (R_f - 1)\, y_{t-1} \qquad (18)$$

The earnings in this model consist of after-tax earnings, which therefore can be divided into pre-tax earnings ($x^{bt}_t$) and the tax cost ($ta_t$), where tax costs have a negative sign and tax rebates a positive sign[28]:

$$x_t = x^{bt}_t + ta_t \qquad (19)$$

Using equation (19) to substitute earnings in equation (18), a new description of abnormal earnings is created:

$$x^a_t = x^{bt}_t + ta_t - (R_f - 1)\, y_{t-1} \qquad (20)$$

and adjusted abnormal earnings ($ax^a_t$) will be defined as follows:

$$ax^a_t = x^{bt}_t - (R_f - 1)\, y_{t-1}$$

By substitution, equation (20) is modified to:

$$x^a_t = ax^a_t + ta_t \qquad (21)$$

Therefore, by now substituting equation (21) for abnormal earnings in the Ohlson Model, (12) leads to:

$$P_t = y_t + \alpha_1\, ax^a_t + \alpha_1\, ta_t + \alpha_2\, v_t \qquad (22)$$

Equation (22) is the Tax Modified Ohlson (TMO) model that will be used to assess the value relevance of taxation and its interaction with other accounting variables, as indicated previously. It should be noted that, although income taxes, as well as other components of earnings, have been disaggregated in some prior related research studies, this has not been the case with respect to the Ohlson (1995) model itself, i.e. where the valuation model is based on abnormal earnings..

[28] The tax paid is considered to be a cost and hence a negative number, and therefore it is added to the before tax earning in order to reach the after-tax earnings number. Indeed in the data, used later on, the tax cost is normally a negative number (see Appendix C with the descriptive statistics of the Ohlson (1995) model related analysis).

Furthermore, in prior research that decomposes earnings,, no reference has been made to the way in which this affects the Linear Information Dynamics and, in addition, there has been no discussion with regard to the estimation of the coefficients of the disaggregated variables (see section 5.2.3 of the next Chapter). In fact, while equation (22) comprises the Tax Modified Ohlson model as used in this study, it is important to note that the linear information dynamics must also change.. Although equation (11) remains unchanged, equation (10) will be modified as follows:

$$\textbf{(10)} \quad x^a_{t+1} = \omega\, x^a_t + v_t + \varepsilon_{1\,t+1} \quad =^{(21)}>$$

$$ax^a_{t+1} + ta_{t+1} = \omega\, ax^a_t + \omega\, ta_t + v_t + \varepsilon_{1\,t+1} \quad =>$$

$$ax^a_{t+1} = \omega\, ax^a_t - ta_{t+1} + \omega\, ta_t + v_t + \varepsilon_{1\,t+1} \quad =>$$

$$ax^a_{t+1} = \omega\, ax^a_t - \Delta ta_{t+1} + (\omega - 1)\, ta_t + v_t + \varepsilon_{1\,t+1} \qquad \textbf{(23)}$$

$$v_{t+1} = \gamma\, v_t + \varepsilon_{2\,t+1} \qquad \textbf{(11)}$$

Equations (23) and (11) are the Modified Linear Information Dynamics (MLID) of the TMO model. In equation (23), adjusted abnormal earnings follow an autoregressive process but now they are affected both by the magnitude of the tax paid in the last period and the change in tax from the last period. While the change in tax affects negatively the adjusted abnormal earnings on a one-to-one basis, the previous period tax influences adjusted abnormal earnings through the parameter ($\omega$-1).

Theory suggests that the parameter $\omega$ is non negative and less than one, which implies that the previous year tax affects adjusted abnormal earnings negatively. Given that tax is perceived here as a cost, i.e. a negative number, the relation indicates that high previous year taxes are connected with high current abnormal earnings. It can be argued that investors interpret high tax payments in the previous year as an indicator of firm profitability, i.e. a proxy for high current profits and their persistence in the future, in view of the aforementioned autoregressive process.

Finally, the change to the MLID will not affect the coefficients of the TMO model which will remain the same as in equation (12) described above.

In this thesis, the Tax Modified Ohlson Model derived in equation (22) will be employed in order to assess the value relevance of earnings and book values in Europe in the light of the tax regimes that are in operation in the countries involved. The findings are reported in the empirical study in Section 5.2.

## 4.2 FELTHAM AND OHLSON (1995) AND EXCHANGE RATES

The second research question to be addressed is that of the influence of exchange rates on the market value of the firm, and specifically when the valuation is based on accounting information. This is an issue with clear policy implications. In Europe, for instance, company earnings have been denominated in a variety of currencies until recently, and one of the major arguments in favour of the introduction of the Euro has been based on the benefits that would result to European companies from a strong and stable common European currency that would directly affect their firm value. As discussed previously (3.3.1), currency fluctuations create short and long term risks for firms. The short term risk, however, is related to the financial activities of the firm and, as it can be hedged, does not generate abnormal earnings or losses. On the other hand, the long term risk is related to the operating activities of the firm and, as it is difficult to hedge, it results in abnormal operating earnings or losses.

A major objective of this thesis is to assess the value relevance of exchange rate movements for firms from the Euro-zone and to examine the effects of the introduction of the Euro into the market value of these firms. While the Ohlson (1995) model was employed in the research design regarding the value relevance of taxation, in this case the development provided by Feltham and Ohlson (1995) is more appropriate. This is due to the articulation of that model that is based on the separation between the financial and operating activities of the firm, with only operating activities resulting in abnormal earnings. Therefore, as the exchange rate movements appear to influence firm market value through their effects on the abnormal operating earnings, the FO95 will be used.

The Feltham and Ohlson (1995) model was described earlier in Section 2.2.3: and may be summarised as follows:

**"Feltham and Ohlson Model – FO95":**

$$P_t = y_t + \alpha_1 ox^a_t + \alpha_2 oa_t + \beta_1 v_{1t} + \beta_2 v_{2t} \qquad (17)$$

$P_t$ denotes the market value of equity, $y_t$ the book value, (which may be divided into net financial assets and net operating assets), $ox^a_t$ the abnormal operating earnings, $oa_t$ the net operating assets and $v_{1\,t}$ and $v_{2\,t}$ are the 'other – non accounting – information' variables, where the coefficients are:

$$\alpha_1 = \omega_{11} / (R_f - \omega_{11}) \geq 0$$

$$\alpha_2 = \omega_{12}\, R_f / (R_f - \omega_{11})(R_f - \omega_{22}) \geq 0$$

$$\beta_1 = R_f / (R_f - \omega_{11})(R_f - \gamma_1) > 0$$

$$\beta_2 = \alpha_2 / (R_f - \gamma_2) \geq 0$$

As discussed previously, the FO95 Linear Information Model, where the autoregressive processes of abnormal operating earnings, operating assets and the other information variables are defined,, is the following:

$$ox^a_{t+1} = \omega_{11}\, ox^a_t + \omega_{12}\, oa_t + v_{1\,t} + \varepsilon_{1\,t+1} \qquad (13)$$

$$oa_{t+1} = \omega_{22}\, oa_t + v_{2\,t} + \varepsilon_{2\,t+1} \qquad (14)$$

$$v_{1\,t+1} = \gamma_1\, v_{1\,t} + \varepsilon_{3\,t+1} \qquad (15)$$

$$v_{2\,t+1} = \gamma_2\, v_{2\,t} + \varepsilon_{4\,t+1} \qquad (16)$$

The change in the exchange rate will be incorporated in the Feltham and Ohlson (1995) model in the place of the 'other – non accounting – information' variable $v_{1\,t}$. The coefficient $\beta_1$ in equation (17) will be influenced by the persistence of abnormal operating earnings since they are positively related to the parameter $\omega_{11}$ in equation (13) which, as mentioned before, accounts for persistence, i.e. the persistence of abnormal operating earnings in future periods. Thus, it is an assumption of the model that whichever variable is to be used as a proxy for $v_{1\,t}$ (exchange rates in this case), it should be related to earnings persistence.

It is argued in this thesis that the persistence of abnormal operating earnings in the future will be affected by current changes in the exchange rate. Previously, Bartov and Bodnar (1994, p. 1758) have shown that "*movements in the exchange rate (not resulting from changes in aggregate price levels) result in direct changes in the*

*relative prices of domestic and foreign goods that influence both the current and future expected cash flows of firms with international operations*". In addition to the firm itself, the effects of exchange rate changes on interest rates and inflation rates would influence all companies in the market. The direct and indirect effects of exchange rate fluctuations were discussed in Section 3.3.1 of Chapter 3, where it was shown that unexpected changes in the exchange rate would influence the current abnormal operating earnings of the firm and their persistence in future years.

The employment of the spot exchange rate as proxy for the persistence of operating earnings in the future can be challenged. An alternative suggestion could be the inclusion of the forward rate as a predictor of the future spot rate. However, Jorion (1990) suggests that the forward rate is a biased predictor of the future spot rate, and Meese and Rogoff (1983) and Baillie and McMahon (1989) provide significant evidence that the current spot rate outperforms the forward rate as a predictor of the future spot rate. In this thesis, it is held that changes in the spot rate affect the persistence of abnormal earnings and they are employed therefore as the 'other – non accounting – information' variable $v_{1\,t}$.

## 4.3 SCALE EFFECTS

A methodological concern that is related to the aforementioned models (the TMO model and the FO95 with exchange rates) relates to the possibility of the existence of scale effects when such models are tested using regression techniques. In their original form, O95 and FO95 are specified on a firm-level basis, thus taking into account the market capitalisation of the firm and accounting variables in their totality (total book value, earnings, etc.). Scale effects are likely to be encountered in the regressions of such models since the larger companies may dominate the results of the tests, due to the much higher values of the variables in question. Therefore, the empirical implementation of O95 and FO95 has been on a per-share basis, with the aim of diminishing the extreme differences amongst observed values in the samples. However, recent studies have contested the ability of such a method to remove all scale effects from the tests and a further debate has been fuelled. Next, therefore, the most relevant aspects of this ongoing discussion are summarised.[29]

The existence of scale effects implies that the results of the regression of the market capitalisation of the firm on its accounting information will be driven by the undue influence of the largest firms in the sample. Easton and Sommers (2002) argue that such scale effects produce a coefficient bias in the results due to the non-linearity of the model. In addition, Barth and Clinch (2001, p.5) propose that "*a scale effect that can result in spurious inferences must be one whose existence does not reflect differences in economics the researchers seek to test*". Overall, however, there is no theoretical framework to explain the influence of scale effects and the nature of the spurious inferences that scale effects create. The general practice in academic research in this respect is to attempt to identify ways to avoid the problem empirically, to test them and then to compare the results with those from fitting the original model in order to assess their potential superiority. Such *a posteriori and ad hoc* analysis has been subject to criticism both in principle and in practice.

In those empirical studies that address the issue of scale effects, two main solutions are suggested. First, Barth and Kallapur (1996) propose the inclusion of a scale

[29] Garcia (2002, pp. 68-85) provides a good revision of several econometric problems related to the regression analysis including scale effects.

variable as an independent variable in the model. Following this suggestion, Barth and Clinch (1998) include the number of shares, total sales or a non-market-based measure of firm value as the independent variable in their model. The authors find that the inclusion of 'scale-proxies' of this kind mitigate the problem of scale effects. However, Easton (1998) argues that this approach is not correct since the problems surrounding scale effects are in the dependent variable (market capitalisation) and not in the independent variables of the model. In addition, Easton (1998) suggests that the omitted variables used by Barth and Clinch (1998) are not appropriate proxies for scale. Regarding the empirical analysis of this thesis it should be noted that the theoretical development of the Ohlson (1995) model does not provide for the inclusion of 'omitted' independent variables just in order to mitigate scale effects. Furthermore, since the model already incorporates the book value as an independent variable, which appears to be a good proxy for scale, the question remains as to whether this will mitigate the scale effects.

The second proposed solution to the problem of scale effects is to deflate all variables in the model with a scale proxy. Christie (1987) argues that the 'natural' deflator is the beginning period share price. Moreover, he argues that any other deflator would be problematic since it could be an omitted variable from the model correlated to the independent variables. On this issue, Barth and Kallapur (1996) show that the deflation by any proxy correlated with the 'true' scale factor would produce spurious inferences. Furthermore, Easton and Sommers (2002) suggest that deflation by any other variable (except beginning period price) would change the nature of the variables and the nature of the relationship under consideration. Thus, Easton (1998) and Easton and Sommers (2002) conclude that one could mitigate the scale effects by deflating all variables by the beginning period share price.

However, Livnat (2000, p. 370) argues that there is "*no theoretical basis for choosing beginning price as the proper scaler*" and that other variables could be equally good or even better in mitigating scale effects. In addition, a potential problem arises from the use of the beginning period share price as deflator since the dependent variable $P_t$ is transformed to 'returns' by scaling [to $((P_t - P_{t-1}) / P_{t-1}) + 1$,

i.e. to $R_t + 1$].[30] Despite the fact that the use of returns regressions has been advocated in the previous literature (see Christie (1987) and Easton and Sommers (2002)) as part of the solution to the problem of scale effects, stock returns can not be explained by the variables in levels of the right hand-side of the model, and they produce very low adjusted $R^2$s (as commented by Dumontier and Raffournier (2002, p. 131) among others).

More importantly, by transforming the relation from a levels regression to a returns one, the research question changes inherently since the study would cease to be a valuation study (i.e. examining the value of the firm). Brown, Lo and Lys (1999, p. 103) argue that deflating by the beginning period price provides an appealing interpretation of the results: "*if $1 were invested in each of the stocks in the beginning of the year, the $R^2$ represents how much of the variation in the value of the resulting investment at the end of the year could be explained by earnings and book value information released over that period*". However appealing such a conclusion might be, it is not the answer to the research questions posed neither in this thesis nor in most of the previous literature.

Even though the issue of the effects of scale has prompted an ongoing debate, there is still no consensus. However, one can argue that the process of *a posteriori* rationalisation of empirical results is not the most appropriate way to provide solutions to such problems. Some authors have discussed the issue by accepting such *a posteriori* rationales and, based on those, have contested the validity of most of the empirical evidence to date concerning the Ohlson framework.[31] However, as Barth and Clinch (2001, p. 28) argue, it is equally likely that scale effects do not influence the reliability of inferences and they add: "*Challenges to this conclusion require evidence that the inferences are subject to scale bias, not merely that they can be*" (emphasis by the authors).

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[30] It should be noted that the situation is completely different in the Basu (1997) model of earnings' conservatism which utilises the 'reverse regression'. In the Basu (1997) model by construction returns are necessary and the variables are deflated by the beginning period price without the problems discussed here.

[31] Lo and Lys (2000, p. 362) suggest that almost all empirical applications of the Ohlson (1995) model are in reality misapplications and "*draw inappropriate conclusions*".

Overall, one should first build a theoretical framework where potential scale effects will be explained and the way that they influence the results will be identified. Ad hoc findings do not provide a basis for imposing a common practice (as, for example, tends to be the case with deflation) in research, and they can easily be contested by opposing evidence. Indeed, in the case of the Ohlson framework, Barth and Clinch (2001, p. 3), after a careful and well articulated investigation, provide findings vital to this study that demonstrate that "*contrary to commonly expressed beliefs, size differences across firms in and of themselves do not evidence scale differences that cause incorrect inferences*".

Finally, if the scale effects were better defined and the nature of their influence on regression results better known, a potential solution could be the selection of a more appropriate econometric technique that would tackle the issue of non-linearity of the relation (which according to Easton and Sommers (2002) causes the scale effects) together with other empirical problems that have been identified in the regression methodology (for example, problems of heteroscedasticity, autocorrelation, endogeneity, etc). A potential solution could be the employment of multivariate cointegration methodology on the logarithms of the variables employed in the Ohlson framework. However, this proposal certainly needs further investigation both in terms of the assumptions of the Ohlson (1995) model and the appropriate econometric solutions to the current problems.

In terms of the empirical part of this study, the issue of spurious scale effects remains unresolved in the current accounting literature. The evidence presented until now does not strongly support the view that scale effects influence the reliability of the conclusions and therefore, in this thesis, per-share variables will be employed in testing the TMO model and the FO95 model with exchange rates.. Nevertheless, results obtained when the variables of the two models are deflated by different proxies of scale will also be provided for the purposes of comparison (see Appendix D), together with a short discussion.

## 4.4 REVERSE REGRESSION TECHNIQUES

The final methodological issue relates to the notion of "prices leading earnings". Due to the structure of financial reporting, it is apparent that the release of important information will be reflected in the earnings figures with a delay, depending on the formal accounting rules with regard to income recognition. On the contrary, such information will be directly reflected in the share price of the firm. The idea that share prices lead earnings in reflecting information was first put forward by Beaver, Lambert and Morse (1980), but such a relation between prices and earnings influences the returns – earnings model since it introduces a bias on the slope coefficient of earnings, known as the measurement error. The measurement error is due to the fact that a part of the earnings' proxy used in the models does not involve (current) price relevant information. Therefore, the earnings' figure $x_t$ will have a price relevant part ($\chi_t$) and a part with no price implications ($\xi_t$):

$$x_t = \chi_t + \xi_t$$

The theoretical implication resulting from that suggests that the returns ($R_t$) or price – earnings models should take the following form:

$$R_t = \alpha + \beta \chi_t$$

Instead of this form, however, price – earnings models include all the earnings figure thus biasing the coefficient estimates towards zero. In an effort to mitigate this problem, Beaver, Lambert and Ryan (1987) propose to reverse the model from price – earnings to earnings – price. Thus the 'reverse regression' model would be:

$$x_t = \alpha + \beta R_t \qquad (24)$$

Such a specification was an important development in the accounting literature and it has since been employed for a number of different purposes. Beaver, Lambert and Ryan (1987, p. 139), for example, suggest that the "*reverse regression offers a more intuitive and direct way to assess the information content of security prices*". In

addition, Collins and Kothari (1989) point to the importance of the 'reverse regression' in avoiding measurement error and propose its application in studies on earnings response coefficients.

Basu (1997) provides another application of the methodology proposed by Beaver et al (1987). The author provides a discussion on his notion of earnings' conservatism, i.e. the timelier recognition of 'bad news' (falls in share prices) in earnings than of 'good news' (increases in share prices), as discussed previously (Chapter 2, Section 2.3). Basu (1997, p. 11) utilises the 'reverse regression' in his analysis since "*OLS standard errors and test statistics are better specified when the leading variable* [returns] *is specified as independent and the lagging variable* [earnings] *as dependent*". The author attempts to assess the differing effects that 'bad and good' news would have on the reported earnings and hence he includes a dummy variable in equation (24) for 'bad news'. In addition, Basu (1997) controls for heteroscedasticity problems by deflating all variables by the beginning period price creating percentage returns and an earnings over prior period price dependent variable. Henceforth, the Basu (1997) model appears to be the following:

$$\mathbf{x_t / P_{t-1} = \alpha_0 + \alpha_1 D_t + \beta_0 R_t + \beta_1 D_t * R_t} \qquad \mathbf{(25)}$$

Where $x_t$ is the earnings per share figure in time period t and $P_{t-1}$ is the price per share at the end of the previous time period (t-1). $D_t$ is a dummy variable taking the value of 0 when there is 'good news' and the value of 1 when there is 'bad news'. $R_t$ is economic income, the proxy in this case by the percentage change in the share price. In Box III below one can observe the economic derivation of the Basu (1997) model as articulated by Pope and Walker (1999).

## BOX III. ECONOMIC DERIVATION OF THE BASU (1997) MODEL.

Assume that stock prices efficiently reflect publicly available information, and define permanent earnings as the perpetuity which when capitalised at the firm's cost of capital is consistent with the observed stock price. Permanent earnings ($x^p_t$) are defined by the identity:

$$P_t = \kappa\, x^p_t \qquad \text{(B3a)}$$

Where $\kappa$ the earnings multiple is the reciprocal of cost of equity. Further assume that dividends are equal to permanent earnings and that stock price and hence permanent earnings follow a random walk:

$$x^p_t = x^p_{t-1} + e_t \qquad \text{(B3b)}$$

Where $e_t$ is the random shock to permanent earnings. For the derivations below note that equations (B3a) and (B3b) together imply:

$$e_t / P_{t-1} = 1/\kappa\,(P_t / P_{t-1} - 1) \qquad \text{(B3c)}$$

Assume that reported earnings ($x_t$) are related to permanent earnings as follows:

$$x_t = x^p_t - \theta_0\, e^+_t + \gamma_0\, e^-_t + w_t \qquad \text{(B3d)}$$

Where $\theta_0$ is a parameter capturing under-recognition of good news in period t ($e^+ > 0$, $e^- = 0$), $\gamma_0$ reflects the over-recognition of period t bad news ($e^+ = 0$, $e^- < 0$) and $w_t = w_t\,(e^+_{t-\tau}, e^-_{t-\tau}, \forall\, \tau = 1, \ldots, T)$ represents the effects of prior period news on current period earnings. If wealth shocks are assumed to show up in earnings eventually, but contemporaneous reported earnings and permanent earnings differ, current earnings will also reflect prior period 'accounting errors'.

In equation (B3d) if the permanent earning shock is positive ($e^+ > 0$), recognition of a proportion $\theta_0$ of the shock is delayed under conservative accounting. If the permanent earnings shock is negative ($e^- < 0$), a multiple, $\gamma_0 + 1$, of the shock is recognised in current period reported earnings. If $\gamma_0 > 0$, income recognition is conservative and reported earnings are less than permanent earnings. If $\gamma_0 = \kappa - 1$, the entire capitalised value of the permanent earnings shock is written off immediately against current period earnings. An unbiased and perfectly timely GAAP regime would be one in which $\theta_0$ and $\gamma_0$ are both equal to 0. The term $w_t$ reflects the effects of prior period news on current period income recognition. $W_t$ captures the multi-period effects of delayed recognition and any reversal of accelerated recognition of bad news in earnings under conservative accounting. Consistent with Basu (1997) it is assumed initially that the effects of prior period news on current period income are uncorrelated with the current period shock. A priori, this assumption seems reasonable since current shocks to permanent earnings are, by definition, uncorrelated with the prior period shocks. In order to apply equation (B3d) in empirical analysis, first all components are deflated by beginning-of-period price, and using equation (B3a) one obtains:

$$x_t / P_{t-1} = (1/\kappa)\,(P_t / P_{t-1}) - (\theta_0\, e^+_t) / P_{t-1} + (\gamma_0\, e^-_t) / P_{t-1} + w_t / P_{t-1} \qquad \text{(B3e)}$$

Defining $R_t = (P_t / P_{t-1}) - 1$, equations (B3e) and (B3c) give:

$$x_t / P_{t-1} = 1/\kappa + [(1 - \theta_0) / \kappa]\, R_t + w_t / P_{t-1} \qquad \text{If } R_t \geq 0$$

$$x_t / P_{t-1} = 1/\kappa + [(1 + \gamma_0) / \kappa]\, R_t + w_t / P_{t-1} \qquad \text{If } R_t \leq 0$$

These can be combined by introducing a dummy variable $D_t$ being one if $R_t < 0$ and zero otherwise:

$$x_t / P_{t-1} = 1/\kappa + [(1 - \theta_0) / \kappa]\, R_t + [(\gamma_0 + \theta_0) / \kappa]\, R_t\, D_t + w_t / P_{t-1}$$

This can be used to interpret the Basu (1997) model in equation (25).

Source: Pope and Walker (1999), pp. 58-60.

Equation (25) is employed in the empirical part of the analysis in order to assess the asymmetric timeliness of earnings in the European countries under consideration. Relevant to the discussion in Section 4.3 above, one should highlight the different perspective of the 'Basu model' with regard to the discussion on scale effects. While previously the Ohlson framework was examined, i.e. a valuation model relating prices and accounting numbers (and non accounting), in the Basu framework the relation is between earnings and returns. While in the previous setting, deflation by the previous period price would transform the basic meaning of the model (creating returns in the dependent variable and thus leading away from the firm's valuation), in the latter case the existence of returns as the independent variable is consistent with such deflation. In addition, deflation by previous year price is included in the model by construction and as such will be employed in the empirical part of this thesis too.

While the above discussion involved earnings and returns for the same year, Easton, Harris and Ohlson (1992) suggest the amplification of the window of the study by including earnings and prices figures for a period up to ten years. The authors use the 'normal' regression in order to test how the relationship between earnings and prices is affected if one considers more periods. Thus, the results of Easton, Harris and Ohslon (1992, p. 140) indicate that "*the correlation between earnings and returns improves with increases in the return interval, and that for a ten-year return period 'most' of the returns can be explained*". Furthermore, Kothari and Sloan (1992), test the 'normal' regression as well in order to assess information in share prices relevant to future earnings. Their results indicate that equity prices anticipate future periods' earnings, especially for the following three years.

Based on the above, Pope and Walker (1999) suggest the inclusion of previous periods' returns in the Basu (1997) model of equation (25). The authors argue that, while the Basu (1997) model is an important starting point in examining the relationship between current period earnings and current period economic income, "*it sheds no light on the speed with which prior period news is recognised in earnings*" (p. 64). Since Kothari and Sloan (1992) identify an anticipation period of three years,, the incorporation of the three previous periods' returns figures would account for the ability of previous years returns to explain current earnings. The model then transforms to the following (based on Pope and Walker (1999, p. 64)):

$$x^i_t / P^i_{t-4} = \alpha + \sum_{\tau=0}^{3} \alpha_\tau D^i_{t-\tau} + \sum_{\tau=0}^{3} \beta_\tau R^i_{t-\tau} + \sum_{\tau=0}^{3} \gamma_\tau D^i_{t-\tau} * R^i_{t-\tau} \qquad (26)$$

The notation is the same as in equation (25) and i indicates the i-th firm in the sample. Equation (26) will also be employed in the empirical part of the study in order to assess the recognition of prior period news in earnings for the European countries in the sample.

After describing each of the models to be utilised (Basu's (1997) model, the TMO model and FO95 with exchange rates), the thesis now proceeds with the empirical analysis..

# CHAPTER 5: EMPIRICAL RESEARCH

At this point the analysis turns to the empirical examination of the research questions that have been developed above. Three studies are presented and structured as separate research papers. As mentioned above, the empirical work is centred in the Euro-zone countries and the UK is included for comparison reasons.

The first study (5.1) discusses the basic properties of earnings and in particular the asymmetric timeliness of earnings in reporting market news. The existence of earnings conservatism in all countries is tested. Furthermore, the hypothesis that earnings conservatism has increased in recent years is examined by dividing the sample period in two. An important conclusion emerging from the study is that, in cases of crises, the level of earnings conservatism will change, leading to more conservative behaviour. The events around the 1992 European monetary crisis are tested in this respect. Finally, prior period 'news' is incorporated in the research framework in order to assess the hypothesis that 'good news' is reflected in earnings for the years to come.

The second empirical study (5.2) focuses on the value relevance of corporate taxation. The hypothesis that taxes will be more value relevant in countries with lower taxation is tested. In addition, the value relevance of taxation is tested for small and medium size European companies in comparison with large European companies. Finally, the sample is divided according to the market to book ratio and industry effects are discussed.

In the third empirical study (5.3), the value relevance of changes in exchange rates is examined. Also, an important contribution of this study lies in testing value relevance effects arising from the introduction of the Euro as the single currency adopted by the twelve Euro-zone countries and the comparison of these results with those of the UK. Furthermore, two additional proxies for the exchange rate variable are employed. The analysis of all three empirical studies is presented below.

# 5.1 THE BASIC PROPERTIES OF EARNINGS

## 5.1.1 INTRODUCTION: CONSERVATISM

The notion of earnings conservatism has received greater attention in the empirical research recently, even though conservatism has a long tradition in accounting. The valuation rule *'the lower of cost or market'* was included in the 1673 French Commercial Code and in the German codified law in 1869, and it is widely accepted in the accounting community. Due to the link between the balance-sheet and the profit and loss account (nowadays known as the *clean surplus* relationship, discussed in Section 2.2.2), traditionally conservatism has implied a tendency to report less earnings at any point in time, and potentially they could be undervalued.

However, with the establishment of the conceptual frameworks of the Financial Accounting Standards Board (FASB) and the International Accounting Standards Committee (IASC), now IASB, during the last part of the twentieth century, conservatism has been linked to uncertainty and implies the exercise of judgements about the future with caution. Very recently, following the approach adopted by Basu (1997), accounting research on this topic has focused on the timeliness with which accounting earnings reflect economic income. In fact the use of changes in prices to appreciate the degree of conservatism of accounting earnings has an intuitive appeal as long as the market captures more information than the accounting system. Since the seminal work by Ball and Brown (1968), it has been shown that prices lead earnings, or earnings lag prices, but Basu (1997) provided evidence on an asymmetry in accounting earnings, in that firms report 'bad news' (a fall in equity prices) faster than 'good news' (an increase of equity prices) in earnings.

Basu's (1997) work is based on a sample of US companies, but later, this notion of conservatism has been tested by other researchers in comparing different national settings, such as the UK and the USA (Pope and Walker (1999)), or a number of countries (Ball, Kothari and Robin (2000) -BKR-; Ball, Robin and Wu (2000); Giner and Rees (2001); Garcia and Mora (2001)). Such research has documented differences in the properties of earnings of companies across countries and an analysis of relevant dissimilarities appears to be significant for the rapidly integrating

financial markets, where international investors and multinational companies play a very important role. This empirical study is based on the Euro-zone countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain), a group that has not been studied before as a whole, although some of those countries have been tested individually.

There are several reasons that explain the interest on the analysis on the relationship between economic and accounting earnings in these countries. First, they form a unique economic area, with a common currency, and second, they are committed to establish a Pan-European stock exchange (as well as the UK). European Union policy has evolved during the last thirty years from one of harmonisation through the accounting directives that were introduced in all of these countries by 1992, to a more standardised accounting system linked to the IASB rules that will be utilised for financial reporting by EU listed firms from 2005 onwards.[32] Therefore, it is both interesting and relevant to analyse the properties of accounting earnings in these countries, in order to see if the differences have been reduced or not during the last decade.

In addition, by focusing on the Euro-zone countries one can minimise the possible influence of other factors, such as macroeconomic issues, especially after 1992, when the Maastricht Treaty established the conditions that would govern Economic and Monetary Union (EMU). Due to these events, the analysis is divided into two periods; before and after 1992. Since that year, the authorities of the countries which today form the Euro-zone have followed policies that have seen a convergence in their macroeconomic performance. An issue arises in the creation of the sample set since, due to the lack of a sufficient number of firm-year observations necessary for valid analysis from an econometric point of view, Greece, Luxembourg and Portugal were excluded from the study. Finally, the UK has been included in the analysis for comparison reasons.

[32] For the implementation of the 4th (78/660/EEC) and the 7th (83/349/EEC) EU Directives, related to annual accounts and consolidated accounts respectively, see the Introduction chapter in McLeay (1999), as well as the other chapters for a more thorough country specific analysis.

The initial Basu (1997) relationship is tested, between economic income, using the change in equity price as a proxy, and accounting income, as given by the earnings per share figure. Ball, Kothari and Robin (2000) concluded that the German accounting system is less conservative than the British one, in the sense that the coefficient in the relationship between bad news and earnings is smaller in Germany than in the UK. However, this empirical study argues that the German and, in general the continental accounting system, might be so conservative that it tends to include a higher level of expense in the profit and loss account than the British one. In other words, they tend to anticipate future losses by not recognizing assets or undervaluing them, which may explain the lower relationship previously mentioned. This is what Giner and Rees (2001) call *pervasive conservatism*. To consider this fact the intercept of the regression will be taken into account along with the regression coefficient.

Furthermore, it is argued below that the degree of conservatism will change in the case of extreme situations, as for example in an international financial crisis. To take this aspect into account, the study focuses on the European currency crisis of 1992 (other examples, however loosely related to this study, can be the East Asian financial crisis or others prompted by events such as the 11th September 2001). In addition, following Pope and Walker (1999), an attempt will be made to identify the notion that 'good news' is reported in accounting earnings in the years following its market recognition, by including the three previous years 'news' in the Basu (1997) model.

The findings of the study are consistent with previous research, clarifying that there is a clear asymmetric behaviour in reporting 'good' and 'bad news' in the accounting earnings in all countries under analysis, with the only exception of Austria. The findings also infer that 'good news' seems to be reflected in earnings in the following years. Regarding the two sub-periods under analysis (1988-1992 and 1993-2000), an increase in conservatism is verified, indicating greater similarity internationally in earnings properties in the latter period due to accounting harmonisation as well as macroeconomic and political convergence. Finally, the effects of the 1992 monetary crisis depend on the particular situation in each country. This appears to emphasise the conclusion that much further effort is needed on the study of the properties of

earnings in order to capture the different aspects that are not at the firm level that can influence the relationship between earnings and stock returns. It can be argued that an important contribution of this empirical study is the consideration of macroeconomic factors that can assist in the understanding of the relation between accounting earnings and economic earnings.

### 5.1.2 Selected Conservatism Literature

A review of the literature on earnings' conservatism has been presented in Section 2.3 of Chapter 2. However, more specific discussion is required regarding some particular aspects of related prior studies. As mentioned, the Basu (1997) framework will be employed and the notion of earnings conservatism as the asymmetric timeliness of earnings in terms of reporting 'bad' and 'good news' will be examined.

The aforementioned study of Ball, Kothari and Robin (2000) is significant for this study since it tests the existence of earnings conservatism for France, Germany and the UK, countries examined in this thesis as well. It should be highlighted that the distinction made by BKR (2000) between 'common-law' (Australia, Canada, the UK and the US) and 'code-law' (France, Germany and Japan) countries is not made in this empirical study since I would argue that overall the differences and the similarities that countries face are complex and interrelated in a way that can not lead to their classification into such broad groups. However, one should also note the importance of the BKR (2000) study in providing a persuasive analysis of the factors creating and/or affecting earnings' conservatism.

Furthermore, Ball, Kothari and Robin (2000) discuss their results by comparing the $R^2$s of their tests. However, in this thesis it is argued that the $R^2$s produced by the 'reverse regression' are too low to be economically relevant as pointed out as a generalisation of market based accounting research by Lev (1989). Moreover, comparisons of $R^2$s have been subject to a number of criticisms. It is argued that $R^2$ values are not very useful or powerful as a comparison tool, since, among other limitations, they are under the control of the experimenter (Charemza and Deadman, 1997), and that such comparisons would be invalid due to scale effects (Brown, Lo

and Lys 1999), as discussed previously. Such issues may have effects on BKR's (2000) results when they test the hypothesis on the existence of earnings conservatism in all countries, by running independent regressions for 'good' and 'bad' news. While the results support the hypothesis when the coefficients on returns are compared, when they incorporate in their analysis the $R^2$s, they find that, in two of the three code-law countries and on average, the notion of conservatism as described by Basu (1997) is reversed.

Another issue arises from the use by BKR (2000) of pooled samples for 'common' and 'code' law countries by including all observations available. Such an average can be problematic, since the sample and subsequently the result can be greatly influenced by the behaviour of companies in countries which dominate the sample in terms of observations.[33] An equally weighted sample will be used here in order to compare the Euro-zone results with those of the UK, as can be seen below. Finally it is necessary to note that these authors do not report the results for the intercepts of their regressions, and therefore it is not possible to compare their results with those obtained here with respect to the notion of traditional conservatism.

Another important study for this thesis is the one conducted by Pope and Walker in 1999. Their results on earnings conservatism are not only relevant regarding the UK but also because of their findings on the recognition of prior period news in earnings. The latter will be examined in this study for all of the countries under consideration. In addition, Pope and Walker (1999) develop an economic explanation (see Box III) for the Basu (1997) model, assuming that prices reflect value relevant information partially captured by permanent earnings. However, they allow reported earnings to differ from permanent earnings by random shocks to the latter. If this is the case, the intercept of the regression expresses the cost of capital and the effect of prior period news on current earnings, unless this news is properly included in the model. Moreover, Pope and Walker (1999) claim that, if reported earnings show a downward bias with respect to permanent earnings, the intercept will capture the effect of this type of conservatism as well.

[33] The average result for the three-code-law-country could be dominated by the behaviour of the Japanese companies, which comprise the 75% of the sample

Basu (1999) provides a detailed discussion of the Pope and Walker (1999) study. The author comments that the Pope and Walker (1999) work provides a useful addition to existing knowledge and he identifies the valuable insights that are provided. In addition, however, Basu (1999) suggests that the use of only December fiscal year-end firms might bias the sample towards large firms and that a possible problem could arise through the use of two different databases which define the variables (especially the extraordinary items) in different ways. Both recommendations are taken up in the following empirical study by using one database and employing all fiscal year-ends available (mainly December and March year-ends) in order to not bias the sample towards large firms.

Furthermore, Basu (1999) notes that, in comparisons between countries, a lower contemporaneous relation between earnings and returns can either suggest the existence of less accounting timeliness or (and) greater market efficiency. In a methodological proposal, the author indicates a preference for pooled regressions to annual cross-sectional regressions due to sound econometric considerations. Therefore, only pooled regressions are employed in the following empirical study.

Giner and Rees (2001) provide relevant evidence regarding the asymmetric timeliness of earnings in France, Germany and the UK. They identify the existence of earnings conservatism in the three countries of their sample. Their results gain further importance in relating the notion of earnings conservatism with the notion of traditional conservatism that may be observed in the intercept of the 'reverse regression'. This suggestion is also an important consideration for the empirical results of this study, as reported below.

Moreover, the findings of Garcia and Mora (2001) are relevant to this empirical study since they examine earnings conservatism from a European perspective, testing eight countries, seven of which form part of the sample set of this thesis too. Their results confirm the asymmetry in capturing 'good' and 'bad news' in all countries, reporting lower asymmetry in continental European countries than the UK, with the exception of Spain. As far as the intercept is concerned, they assume that it reflects unrecognized prior period news, concluding that positive values imply 'good news' are more persistent that 'bad news'. However, in the opinion of the author of this

thesis, the intercept is expected to be positive because it captures not only prior period 'good news' but also pervasive conservatism.

Finally, Lubberink and Huijgen (1999) examine the asymmetric timeliness of earnings in the Netherlands and their findings appear to indicate the existence of earnings conservatism in companies in their sample. Despite the differences in sample selection, Lubberink and Huijgen's (1999) results will be used for comparison reasons in the case of the Netherlands.

At this point, some further attention will be paid to the research design underlying this empirical study. Although the main methodological issues were discussed in Section 4.4 of Chapter 4, some more specific aspects need further clarification and discussion. In addition, even though the main objectives of this empirical study have been discussed, the hypotheses to be tested will also be set out in more detail in the next Section.

## 5.1.3 Research Design and Conservatism Hypotheses Setting

### *Research Design*

As indicated previously, the purpose of this empirical study is to analyse the degree of conservatism in different European accounting settings. To this end the analysis is based on previous research by Basu (1997) and Pope and Walker (1999). Earnings' conservatism as described by Basu (1997) and the inclusion of previous years 'news' as described by Pope and Walker (1999) are tested on a sample of representative countries belonging to the Euro-zone. In addition the effect of wide scale economic crisis on conservatism will be examined. The basic model used is the following:

$$x_t / P_{t-1} = \alpha_0 + \alpha_1 D_t + \beta_0 R_t + \beta_1 D_t * R_t \qquad (25)$$

Where $x_t$ is the earnings per share figure in the time period t and $P_{t-1}$ is the price per share in the previous time period (t-1). $D_t$ is a dummy variable taking the value of 0 when there is 'good news' and the value of 1 when there is 'bad news'. $R_t$ is the economic income, a proxy for which in this case is the annual percentage change of stock prices.

Due to econometric considerations, and following Basu's (1999) advice, pooled regression results for the empirical tests of the hypotheses are presented instead of annual cross sectional regressions. [34] In addition, this is a clearer way to present such results given the number of countries under analysis.

The initial results refer to the whole time period, but the sample is also divided in two sub-periods, prior to and after 1992. This division is made in order to observe the effects of both macroeconomic and accounting factors on the results, since one may suggest that, after 1992, the macroeconomic performance of the Euro-zone countries has converged due to the provisions of the Maastricht treaty, and that accounting regulation is more harmonised due to the implementation of the 4th and 7th Directives. It can be argued that the aforementioned convergence would lead to similarities in the properties of earnings in the countries of the Euro-zone, and individual country findings for the nine Euro-zone countries are presented, plus the UK for comparison.

In addition, pooled results for the whole of the Euro-zone are estimated by taking a random - equally balanced (randomly chosen equal number of firm-year observations from each country) - sample. In this way, I try to avoid the bias on the results due to the behaviour of companies in countries with more firm-year observations. This result is compared with the findings of a randomly chosen group of British company-year observations that is the same in size.

To compare between different samples, a conservatism index is employed. Since the measure of conservatism is used to assess the validity of the economic explanations

[34] For a further discussion on Basu's (1999, p. 96) suggestions on the issue see paragraph 4.2 Pooled Versus Annual Cross Sectional Regressions.

and to compare results and not for the purposes of interpreting the actual number, I would suggest that a useful transformation could be the following:

$$C^* = \frac{BN}{1+GN} = \frac{(\beta_0 + \beta_1)}{1+\beta_0}$$

BN and GN denote 'bad news' and 'good news' coefficients, respectively. As Pope and Walker (1999) point out, the direct comparison by division of the 'bad and good news' coefficients is problematic when the $\beta_0$ coefficient moves close to zero. [35] Therefore, the C* measure has been chosen as a conservatism measure which now provide a ranking of conservatism among countries whilst also avoiding extreme values. Of course, the coefficient $\beta_1$ is another conservatism measure since it indicates the difference between 'bad news' and 'good news', and henceforth the difference in the timeliness of income recognition.

In addition following Basu (1997) the intercept of the regression will be taken into account as an indicator of the traditional notion of conservatism linked to accounting choice. The lower the intercept, the more conservative in the traditional (pervasive) way is the accounting system.

### *Hypotheses*

Four different hypotheses are tested in an effort to explain better the nature of the conservative behaviour of European companies and the relationship between accounting and economic income, proxied by the change in market price.

Initially, following Basu (1997), this empirical study will test the notion of earnings conservatism for the group of countries in the sample. I expect to justify the existence of asymmetric timeliness in the reporting of earnings throughout the Euro-

[35] Pope and Walker (1999) construct five conservatism indices (C1 to C5) mentioning that the first two are independent of the cost of capital and therefore they are ideal for comparing between countries with different cost of capital (p. 62). The measure C1 is the ratio between the total coefficient of "bad news" and the one of "good news". C2 is a ratio of $R^2$'s and as it was mentioned above their use for comparison tool has been heavily criticised. Thus, this study focuses on the measure C1 of which C* is a modification.

zone countries in what can be considered as the first hypothesis. However due to the similar institutional factors that influence the accounting system, major differences among the Euro-zone countries are not expected. As previously indicated (equation 25), the model used is the following:

$$x^i_t / P^i_{t-1} = \alpha_0 + \alpha_1 D^i_t + \beta_0 R^i_t + \beta_1 D^i_t * R^i_t + u^i_t \qquad (27)$$

Where $x^i_t$ is the earnings per share figure, after extraordinary items, of company i in time period t and $P^i_{t-1}$ is the price per share of company i in the previous time period (t-1). $D^i_t$ is a dummy variable taking the value of 0 when company i has 'good news' (i.e. an increase in equity prices) and the value of 1 when company i has 'bad news' (i.e. a decrease in equity prices). $R^i_t$ is the economic income, the proxy in this case being the change of the price per share of company i at time period t deflated by the price at t-1 $[(P_t - P_{t-1}) / P_{t-1}]$ [36]. Finally, $u^i_t$ is a disturbance term.

In the second hypothesis, it is argued that the earnings-returns relationship has changed over time in the Euro-zone countries, due to macroeconomic as well as accounting changes. To test this,, the sample is divided into two periods, one pre-1992 (1988-1992) and another post-1992 (1993-2000). It is assumed that the signing of the Maastricht Treaty in February 1992 and the implementation of the 4th and the 7th Directives of the Commission by all the EU countries by the end of 1992 would have had an effect on the notion of earnings' conservatism around the Euro-zone, reducing the diversity across countries in terms of accounting earnings behaviour.[37] The increased integration of the national European markets in the global capital market during recent years is expected to lead to a more converged result for European companies in the second period of the study.

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[36] Due to the lack of information on dividends I did not have the possibility of including this information to calculate market return. However, previous studies have shown that their results do not vary with the inclusion/exclusion of dividends (see for example Giner and Rees 2001). Prices have been adjusted for stock splits and other capital changes.

[37] The author is conscious that some countries adopted earlier the Directives, so for some of the countries in the sample the effects of the implementation of the Directives will not be captured through this partition. However, the increasing internationalisation of the 1990s with many companies crossing their national frontiers would have produced a more 'harmonised behaviour' in terms of the properties of earnings. Another point regarding the Maastricht Treaty is that the negotiations started on December 2001 and the signing of the Treaty occurred at 7th of February 1992, while the Treaty came in force by January 1993.

As long as accounting conservatism is not a very precise notion, but rather a general concept that accountants employ, it is proposed here that the degree of conservatism will increase in case of extreme situations, such as, for example, an international or a national financial crisis. In other words, if there is a crisis which is expected to affect directly or indirectly the earnings of firms, managers would behave far more conservatively than in a 'normal' situation. This can allow them to feel justified in reporting bad results in the period in question, since they will not be considered their responsibility, and they may then be reversed in following years. So the third hypothesis argues that the degree of earnings conservatism increases when there is an economic crisis.

For instance, the European (ERM) currency crisis of 1992 could have affected the degree of conservatism, especially for firms based in countries that faced the larger exchange rate devaluations (mostly Italy, Portugal, Spain and the UK). This year is well inside the data sample and therefore the hypothesis testing will be focused on this specific crisis. In the time period under consideration, there is no other important event that has affected the European financial environment in such magnitude. In order to examine this hypothesis, another dummy variable, for 1992, is included in equation (27), that allows the distinction between the degree of conservatism in all years and the relevant degree of conservatism in 1992. The model is the following:

$$x^i_t / P^i_{t-1} = \alpha_0 + \alpha_1 D^i_t + \alpha_2 D^i_{92} + \alpha_3 D^i_t * D^i_{92} + \beta_0 R^i_t + \beta_1 D^i_t * R^i_t + \beta_2 D^i_{92} * R^i_t + \beta_3 D^i_t * D^i_{92} * R^i_t + u^i_t \quad (28)$$

Here, where $D^i_{92}$ is a dummy variable taking the value of 1 if the year is 1992 and the value of 0 if the year is any but 1992. The rest of the notation is as in equation (27) above.

The fourth hypothesis argues that 'good news' will be reflected in the earnings figures in following years, as discussed previously (Section 4.4). This delayed recognition of earnings appears to be the other side of the coin regarding the 'prices lead earnings' phenomenon that has been documented in the previous literature,

described in Chapters 2 and 4, ever since the seminal article by Ball and Brown (1968). Previous research, such as Kothari and Sloan (1992), has shown that equity prices anticipate the three following years' earnings, so the three previous market returns will be included. Econometric considerations, assumed by Pope and Walker (1999) too, dictate the use of a common deflator for all changes in prices used in a regression.[38]

One would expect that the longer the lagged 'good news' the higher will be the coefficients, while the opposite will happen with the lagged 'bad news'. In addition, one should take into account, as Pope and Walker (1999) remark, that the intercept and the coefficient on the oldest good news variable tend to approximate the cost of capital, and, as Giner and Rees (2001) show, this is in particular true if the deflator is the oldest price, in this case Pt-4. Thus, this price is utilised as the common deflator of the regression. The model tested is the following:

$$x^i_t / P^i_{t-4} = \alpha + \sum_{\tau=0}^{3} \alpha_\tau D^i_{t-\tau} + \sum_{\tau=0}^{3} \beta_\tau R^i_{t-\tau} + \sum_{\tau=0}^{3} \gamma_\tau D^i_{t-\tau} * R^i_{t-\tau} + u^i_t \qquad (29)$$

Here, where $R^i_{t-\tau}$ is the economic income, of which the proxy in this case is the change of the price per share value of company i at time period t-τ deflated by price at t-4 $[(P_{t-\tau} - P_{t-\tau-1}) / P_{t-4}]$. The rest of the notation is as in equation (27) above.

Before moving to the empirical results, the issue of data selection is discussed below together with comments on the descriptive statistics concerning the sample.

### 5.1.4 Sample Selection: Conservatism

The final data set was obtained from the Extel Company Analysis Database for the years 1988-2000, leading to 9,108 firm-year observations for the Euro-zone (without Greece, Luxembourg and Portugal) and 8,578 for the UK. The sample was reduced

[38] See Brown, Lo, and Lys (1999).

when lagged variables were included in the analysis, resulting in 5,325 firm-year observations for the Euro-zone and 4,990 observations for the UK. The rule used to avoid outliers was to eliminate 1% in the upper and lower tails for all the variables including the lagged variables as well. The data sample consists of both 'dead' and 'live' companies in order to avoid 'survivorship' bias, and, as Basu (1999) suggests, observations with year ends different than December were not eliminated in order not to bias the sample towards large firms (which mainly have December fiscal year ends).

While, in general, previous research has used observations that are denominated in the same currency (Euros or US Dollars), I have chosen to use the local currency of each country. Despite the fact that differences in exchange rates do not play a role when one tests prices and earnings for the same time period, this is not the case when previous years are included in the model (as in the Returns variable and in the case of lags), and hence the results of the tests will be distorted by changes in exchange rates, unless this fact has been properly taken into account in the source database. One can argue that, by focusing on the Euro-zone countries, this avoidance of differences in exchange rates can be one of the benefits and thus that the Euro exchange rate could be used, since the currencies are pegged through the Exchange Rate Mechanism (ERM). However, as this peg became a strict rule for most of countries' exchange rate polices only after the end of 1992, and since the sample also consists firm-year observations before 1992, I have chosen to use the local currencies.

In Table C1 of Appendix C, the descriptive statistics are provided for the sample that is used to test the model presented in equation (27), where the variables are deflated by the price at the beginning of the period. The descriptive statistics indicate that the earnings variable is negatively skewed with the median exceeding the mean in all countries but Finland. In Belgium, Finland and the Netherlands the mean of the earnings variable is considerably higher than in the other countries and the weighted sample of the Euro-zone has a significantly higher mean than that of the UK sample. The returns variable appears to be positively skewed with the means of all countries exceeding the medians. The highest returns (as means) appear in Finland, Spain and Ireland, and the mean of the Euro-zone sample is slightly above the UK mean. It

should be noted that, for the Euro-zone sample, a random -equally balanced- sample was taken from the different countries (3,033 cases), and for the UK a sample of 3,033 cases randomly chosen is also used.

Below, the results of the hypotheses testing are presented and discussed.

### 5.1.5 CONSERVATISM EMPIRICAL RESULTS

The empirical results of testing the first hypothesis are presented in Table 3, below. In terms of the traditional notion of conservatism, as indicated by the intercept of the regression, it is shown that the lower, but significant, value is found in Germany, followed by France, while the Netherlands, Ireland and Finland have the highest values, while the UK occupies an intermediate position. Such results appear to challenge categorisations of countries made before into 'common' and 'code' law groups when the notion of conservatism (earnings and traditional) was examined

In terms of earnings conservatism, in all cases (except of Austria) the findings give support to the initial hypothesis, that the reporting of earnings is timelier for 'bad news' than for 'good news'. The $\beta_1$ coefficient is statistically significant evidencing the difference in the timeliness of income recognition. 'Bad news' appears to be recognised timelier than 'good news' in all the countries of the sample except of Austria, where both returns coefficients, $\beta_0$ and $\beta_1$, are statistically insignificant. For the case of France, the coefficient on 'bad news' ($\beta_0 + \beta_1$) is consistent with the results of Ball, Kothari and Robin (2000), Giner and Rees (2001) and Garcia and Mora (2001) for the same country, while the same is concluded for the case of Germany.

**Table 3. Contemporaneous earnings and returns regressions**

$$x_t / P_{t-1} = \alpha_0 + \alpha_1 D_t + \beta_0 R_t + \beta_1 D_t * R_t + u_t \qquad (27)$$

| *Country* | Obs. | $\alpha_0$ | $\alpha_1$ | $\beta_0$ | $\beta_1$ | Adj. $R^2$ |
|---|---|---|---|---|---|---|
| **Austria** | 435 | **0.0628**** | **-0.0305**** | 0.0089 | 0.0515 | **4.80** |
| **Belgium** | 529 | **0.0690**** | 0.0056 | **0.0507**** | **0.1795**** | **10.07** |
| **Finland** | 337 | **0.1044**** | -0.0168 | 0.0039 | **0.1821**** | **11.72** |
| **France** | 2518 | **0.0615**** | -0.0015 | **0.0397**** | **0.1726**** | **12.51** |
| **Germany** | 2404 | **0.0410**** | 0.001 | **0.0353**** | **0.1631**** | **8.16** |
| **Ireland** | 428 | **0.0969**** | -0.0471 | **-0.0734**** | **0.4005**** | **13.98** |
| **Italy** | 781 | **0.0632**** | -0.0173 | 0.0259 | **0.1463**** | **7.91** |
| **Netherlands** | 1002 | **0.0922**** | -0.0095 | **0.0309**** | **0.1500**** | **12.52** |
| **Spain** | 674 | 0.0275 | **0.0829**** | **0.0714**** | **0.3788**** | **8.51** |
| **UK** | 8578 | **0.0709**** | -0.0039 | -0.0008 | **0.2349**** | **11.18** |
| ***UK*** | *3033* | ***0.0739**** | *-0.0053* | *-0.0069* | ***0.2566**** | ***10.71*** |
| ***Euro-zone*** | *3033* | ***0.0693**** | *-0.0080* | *0.0089* | ***0.1830**** | ***6.01*** |

Notes: ** shows statistical significance at 5% or more. Where $x_t$ is the earnings per share figure in the time period t and $P_{t-1}$ is the price per share in the previous time period (t-1). $D_t$ is a dummy variable taking the value of 0 when there is 'good news' and the value of 1 when 'bad news'. $R_t$ is the economic income, of which proxy is considered in this case the change of the price per share, and $u_t$ is the disturbance term. Adjusted $R^2$ is in percentage.

In addition, despite the fact that the sample selection here is different from the selection made in Lubberink and Huijgen (1999), the results for the Netherlands appear to be similar. Finally, the results for the UK (for both samples) are consistent with findings presented by Pope and Walker (1999), BKR (2000) and Giner and Rees (2001) for the same country. However, it should be noted that in the results here the coefficient on 'good news', $\beta_0$ , is not statistically significant, while it is in other studies, although very low. As a whole the Euro-zone companies report 'bad news' in a less timely way than in the UK.

A special inference need to be made for the Irish result. The coefficient for 'good news' appears to be negative, which shows that in the case of 'good news', i.e. an increase in the share prices, accounting earnings is negative, i.e. there are losses. This statement can be explainable if one considers the rapid growth of the Irish economy during the 1990s, which affected accordingly the behaviour of firms in the Dublin stock market. [39] Therefore, in such cases, share prices on the stock exchange continued increasing, even when companies (especially in the sector of technology) were reporting losses. That can be justifiable in the finance literature when contagion effects are taken under consideration that imply that expectations could be built that the rapid growth in some sectors of the economy (e.g. in 'new' economy) can be contagious to other sectors (e.g. 'old' economy), driving stock prices upwards even though the financial statements of companies were reporting losses. Regarding the Spanish results, a later analysis shows that the high earnings conservatism (also found in Garcia and Mora (2001)) could be due to the monetary crisis that took place in a particular year of the sample period. Such result highlights the need to take into account aspects related to other factors (e.g. macroeconomic) in this type of analysis, as this thesis attempts to do below (see Table 7).

Table 4, below, shows the conservatism measure C* as an additional comparison tool of earnings conservatism across countries. The findings show that the highest amount of conservatism is detected for Spanish and Irish firms, and the lowest for Italian and Dutch firms.[40] In a similar manner, the British accounting system seems to be more earnings conservative than the German and the French accounting systems, and higher conservatism appears to exist in the UK than in the Euro-zone as a whole. The comparison of the C* measures and of the $\beta$ coefficients show us the differences between the countries regarding earnings conservatism. However one should check if these differences are statistically significant or not.

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[39] The growth of the Irish economy reached percentages close to 10% or above during the 90s, to fall in more modest numbers in the recent years (Detragiache and Hamann, 1997).

[40] Austria is not included since the coefficients of 'good-news' as well as of 'bad-news' are found to be insignificant. If Pope and Walker's (1999) C1 is measured problems are identified in most of the countries, since five have infinite values, and the one for Ireland is negative.

**Table 4. Conservatism measures**

| *Country* | $C^* = \frac{(\beta_0 + \beta_1)}{1 + \beta_0}$ | Ranking |
|---|---|---|
| **Belgium** | **0.2191** | **4** |
| **Finland** | **0.1821** | **7** |
| **France** | **0.2042** | **5** |
| **Germany** | **0.1916** | **6** |
| **Ireland** | **0.3530** | **2** |
| **Italy** | **0.1463** | **9** |
| **Netherlands** | **0.1755** | **8** |
| **Spain** | **0.4202** | **1** |
| **UK (8578 obs.)** | **0.2349** | **3** |
| **UK** *(3033 obs.)* | *0.2566* | |
| **Euro-zone** *(3033 obs.)* | *0.1830* | |

Notes: The coefficients used to calculate the conservatism index are estimated from the following model:

$$x_t / P_{t-1} = \alpha_0 + \alpha_1 D_t + \beta_0 R_t + \beta_1 D_t * R_t + u_t \qquad (27)$$

Where $x_t$ is the earnings per share figure in the time period t and $P_{t-1}$ is the price per share in the previous time period (t-1). $D_t$ is a dummy variable taking the value of 0 when there is 'good news' and the value of 1 when 'bad news'. $R_t$ is the economic income, of which proxy is considered in this case by the change of the price per share, and $u_t$ is the disturbance term.

Following Giner and Rees (2001), the differences between coefficient $\beta_0$ and coefficient $\beta_1$ is tested for different countries in terms of statistical significance.[41] The results of these tests show that the differences found for Germany and France is not statistically significant, as expected. On the other hand, the results for Spain and

[41] The test examines if the ratio $(\beta_0^{C1} - \beta_0^{C2}) / [(S.E.^{C1})^2 + (S.E.^{C2})^2]$ provides with statistically significant numbers. Where $\beta_0^{C1}$ is the coefficient for 'good news' for Country 1 (C1) and $S.E.^{C1}$ is the standard error of the aforementioned coefficient (see note 5 at Giner and Rees 2001).

Ireland are significantly different from those for Italy and the Netherlands clarifying the high level of conservatism in the first two countries. Finally, it is important to highlight that the difference in the coefficients of 'bad news' between the Euro-zone and the UK is statistically significant indicating the differences between the two economic zones.

The results reported in Table 5, below, seem to support the second hypothesis, namely that the relation between accounting and economic income has changed after 1992 due to macroeconomic as well as accounting developments. The implementation of the 4th and the 7th Directives by all EU countries, the convergence of macroeconomic variables that followed the Maastricht Treaty, and the accelerating integration of world's capital markets, have led to more harmonised findings, with a general tendency towards higher earnings conservatism. For the cases of Finland and Italy, there is an absence of influence from changes in prices to reported earnings before 1992, whereas in the second part of the sample, 'bad news' is reported in a timelier manner to the earnings figures. Even in the case of Austria, after 1992, 'news' seems to affect earnings, something that is not evidenced in the result for the whole time period.

The results obtained for companies in Germany and France appear to be consistent with those reported by BKR (2000), while the results for UK companies are consistent with Pope and Walker (1999), with the exception of the lack of significance of 'good news' in both periods.[42] [43] Finally, the Irish result appears to indicate the insignificance of 'good news' prior to 1992, and the negativity of the $\beta_0$ coefficient after 1992, giving support to the previous explanation regarding the Irish economic growth, that has occurred mainly in the second part of the sample period.

[42] Ball, Kothari and Robin (2000) divide their sample (1985-1995) in two sub-samples prior to and after 1991.
[43] Pope and Walker (1999) divide the sample (1976-1996), in two sub-samples prior to and after 1992 to consider the changes due to FRS 3 (ASB 1992) that eliminated extraordinary items in the UK from 1993 onwards.

**Table 5. Contemporaneous earnings and returns regressions for the two sub-periods**

| Country | 1988 - 1992 | | | | | | 1993 - 2000 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Obs. | $\alpha_0$ | $\alpha_1$ | $\beta_0$ | $\beta_1$ | Adj $R^2$ | Obs. | $\alpha_0$ | $\alpha_1$ | $\beta_0$ | $\beta_1$ | Adj $R^2$ |
| Austria | 105 | **0.0495**** | -0.0348 | -0.0270 | 0.0632 | **1.46** | 330 | **0.0634**** | -0.0275 | **0.0422**** | 0.0192 | **7.18** |
| Belgium | 166 | **0.0941**** | -0.0385 | 0.0647 | 0.0761 | **13.75** | 363 | **0.0615**** | 0.0265 | **0.0427**** | **0.2663**** | **9.71** |
| Finland | 78 | **0.0907**** | -0.0491 | -0.0014 | 0.1469 | **17.96** | 259 | **0.1087**** | -0.0158 | 0.0021 | **0.1397**** | **5.26** |
| France | 482 | **0.0674**** | 0.0000 | **0.0815**** | 0.0439 | **11.80** | 2036 | **0.0593**** | 0.0011 | **0.0339**** | **0.2155**** | **13.77** |
| Germany | 686 | **0.0383**** | -0.0005 | **0.0471**** | **0.0874**** | **11.16** | 1718 | **0.0420**** | 0.0010 | **0.0301**** | **0.1905**** | **7.79** |
| Ireland | 128 | 0.0903 | -0.0676 | -0.0390 | **0.3426**** | **9.88** | 300 | **0.0968**** | -0.0371 | **-0.0765**** | **0.3843**** | **14.26** |
| Italy | 251 | **0.0604**** | -0.0026 | 0.0586 | 0.0804 | **8.79** | 530 | **0.0630**** | -0.0168 | 0.0211 | **0.2320**** | **8.77** |
| Netherlan. | 252 | **0.1191**** | -0.0023 | **0.0624**** | **0.2154**** | **24.71** | 750 | **0.0808**** | -0.0101 | **0.0327**** | **0.1118**** | **10.14** |
| Spain | 207 | 0.0378 | 0.0862 | 0.0891 | **0.3816**** | **9.52** | 467 | 0.0237 | **0.079**** | **0.0695**** | **0.3683**** | **6.31** |
| UK | 2333 | **0.0830**** | -0.0079 | 0.0228 | **0.2367**** | **16.73** | 6299 | **0.0642**** | -0.0013 | -0.0042 | **0.2604**** | **10.11** |
| ***UK*** | ***821*** | ***0.0828**** | *-0.0022* | *0.0406* | ***0.2089**** | ***17.92*** | ***2212*** | ***0.0689**** | *-0.0027* | *-0.0081* | ***0.2667**** | ***10.23*** |
| ***Euro-Zone*** | ***850*** | ***0.0766**** | ***-0.0083*** | ***0.0084*** | ***0.2002**** | ***9.03*** | ***2183*** | ***0.0671**** | ***-0.0035*** | ***0.0108*** | ***0.2114**** | ***5.84*** |

Notes: ** shows statistical significance at 5% or more. The $R^2$ is in percentage. The estimated model is: $x_t / P_{t-1} = \alpha_0 + \alpha_1 D_t + \beta_0 R_t + \beta_1 D_t * R_t + u_t$ Where $x_t$ is the earnings per share figure in the time period t and $P_{t-1}$ is the price per share in the previous time period (t-1). $D_t$ is a dummy variable taking the value of 0 when there is 'good news' and the value of 1 when 'bad news'. $R_t$ is the economic income, of which proxy is considered in this case by the change of the price per share, and $u_t$ is the disturbance term.

The timeliness of 'bad news' appears to have increased for firms in most countries along time, with the exceptions of Spain and the Netherlands where conservatism appears to have decreased.[44]

In an effort to identify if the changes on the level of conservatism are important, the statistical significance of the difference of coefficients is tested between the two time periods. The results show significant differences for the 'good news' coefficients in Austria and Ireland, for the 'bad news' coefficients in Finland, Germany and Italy, and for both coefficients in Belgium and France indicating the importance of the macroeconomic and accounting changes after 1992. In contrast, the difference of the 'bad news' coefficients for the two time periods for UK firms is not significant. Regarding the intercepts, one can observe a general tendency to decrease, which is consistent with a higher degree of accounting choice conservatism after the 4th Directive, and a decrease in the cost of capital. Having said that, it is necessary to comment that there are exceptions, as for the cases of Austria and Finland.

As previously indicated, the conservative attitude in the reporting of firm earnings can be affected by the particular economic situation of each country and especially by the existence of extraordinary economic and financial developments. In the context of this study, the impact of the European financial and currency crisis of 1992 is considered. Selected results of the empirical testing for the third hypothesis are presented in Table 6, for four out of the ten countries plus the Euro-zone. As noted, the third hypothesis, i.e. the suggestion that the degree of earnings conservatism increases in the case of a crisis, is perceived to hold in countries that were mostly affected by the ERM currency crisis of 1992, i.e. Italy, Spain and the UK (as well as Portugal).[45] In addition, the German findings are presented due to their important features commented below.

[44] However this can be due to other factors as it will be considered for the case of Spain later on this study.

[45] The reader should recall that Portugal is not included in the analysis due to the lack of a sufficient number of data.

**Table 6. Contemporaneous earnings and returns regressions – The case of Crisis**

$$x^i_t / P^i_{t-1} = \alpha_0 + \alpha_1 D^i_t + \alpha_2 D^i_{92} + \alpha_3 D^i_t * D^i_{92} + \beta_0 R^i_t + \beta_1 D^i_t * R^i_t + \beta_2 D^i_{92} * R^i_t + \beta_3 D^i_t * D^i_{92} * R^i_t + u^i_t \quad (28)$$

| Country | Obs. | $\alpha_0$ | $\alpha_1$ | $\alpha_2$ | $\alpha_3$ | $\beta_0$ | $\beta_1$ | $\beta_2$ | $\beta_3$ | Adj. $R^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| **Germany** | 2404 | **0.041**** | 0.001 | -0.016 | 0.019 | **0.033**** | **0.165**** | **0.241**** | **-0.238**** | **8.30** |
| **Italy** | 781 | **0.065**** | -0.018 | -0.064 | 0.055 | 0.023 | **0.158**** | 0.293 | -0.342 | **7.68** |
| **Spain** | 674 | 0.027 | **0.059**** | 0.191 | -0.028 | **0.073**** | **0.220**** | **-1.918**** | **2.677**** | **12.31** |
| **UK** | 8578 | **0.071**** | -0.003 | -0.012 | -0.015 | -0.005 | **0.250**** | 0.035 | 0.056 | **12.05** |
| ***UK*** | ***3033*** | ***0.075**** | *-0.004* | *-0.017* | *-0.019* | *-0.008* | ***0.252**** | *0.066* | *-0.030* | ***12.08*** |
| ***Euro-zone*** | ***3033*** | ***0.070**** | *-0.007* | *-0.018* | *0.023* | *0.009* | ***0.190**** | *0.054* | *0.010* | ***6.88*** |

Notes: ** shows statistical significance at 5% or more level. Where $x_t$ is the earnings per share figure in the time period t and $P_{t-1}$ is the price per share in the previous time period (t-1). $D_t$ is a dummy variable taking the value of 0 when there is 'good news' and the value of 1 when 'bad news'. $R_t$ is the economic income, of which proxy is considered in this case by the change of the price per share, and $u_t$ is the disturbance term. Where $D^i_{92}$ is a dummy variable taking the value of 1 if the year is 1992 and the value of 0 if the year is any but 1992. The adjusted $R^2$ is in percentages.

The findings indicate that the crisis did not affect the notion of earnings conservatism in the cases of Italy and the UK, since no different behaviour is detected for this year. The $\beta_1$ coefficients for these countries are at the same level as in Table 3, while the coefficients for the year 1992 are not statistically significant. In contrast, the effects of the crisis seem to be very significant for the notion of earnings conservatism in Spain. The $\beta_2$ and $\beta_3$ coefficients are highly significant indicating the change in the recognition of both 'good' and 'bad news' this year. The negative sign of the 1992 'good news' coefficient ($\beta_0 + \beta_2$) illustrates that due to the extreme events of the crisis, Spanish managers were eager to report losses in their accounts possibly due to the expectancy that sooner or later the effects of the crisis would reach them, even when they had increases of their price in the Madrid stock market.

The above results can be interpreted in the context of the events of the 1992 crisis. Italy, Spain and the UK (along with Portugal) were the countries mostly affected and their currencies faced important devaluations. However, both the Italian and the British governments took direct action by withdrawing their currencies from the Exchange Rate Mechanism, imposing strict capital controls and intervening heavily in the FOREX markets in support of their currencies. These actions stimulated confidence in the local markets in both countries and therefore it can be argued that managers were deterred from changing their behaviour towards the reporting of accounting income. On the other hand, the Spanish authorities did not react as heavily, by keeping the Spanish Peseta in the ERM and by not imposing strict capital controls, and henceforth uncertainty and in a certain extent panic prevailed in the local market.[46]

Two further points are worth referring to. First, the fact that earnings conservatism in the Euro-zone as a whole does not seem to be affected by the ERM crisis, as indicated by the results in Table 6. Second, the notion of conservatism in earnings seems to be reversed in that particular year for German firms. This result could be also attributed to the events related to the crisis. The EU currencies started depreciating from September 1992 towards the US dollar but more importantly

[46] A very good analysis of the ERM crisis and its effects on specific countries can be found at Buiter, Corsetti and Pesenti (1998).

towards the Deutschmark. The German re-unification and the firm decision of the German authorities to not change their internal policies, in order to facilitate the problems of the other EU currencies, fuelled the German market with confidence and optimism. This optimism, regarding the state of the German economy and the prospects of the unified German business environment, seems that has led to the presumption that 'bad-news' did not matter for companies listed on German stock exchanges.

From the discussion above, one can reach an interesting conclusion regarding the first hypothesis. Firms in Spain seem to be the most earnings conservative in the Euro-zone and more conservative than UK firms. Such high level of conservatism appears to lack a theoretical backing for the particular case of Spain. For a number of countries previous research has argued the existence of high levels of conservatism based on accounting regulation (for common-law countries), however Spain was categorised in the group that allegedly faced low levels of conservatism (code-law). In this thesis such categorisation has not been followed. However, the level of earnings conservatism for Spain appeared, based on any standards, to be very high without a plausible explanation. The findings of the third hypothesis appear to explain the high levels of conservatism based on the events surrounding the 1992 financial crisis.

Overall, it can be argued that earnings conservatism can be affected by several different factors, as in the Spanish case by macroeconomic - international finance developments. The vast majority of literature ignores the existence of such factors and this can potentially lead to the distortion of results, and henceforth of conclusions drawn. In order to demonstrate the above, the level of earnings conservatism for Spanish firms is examined by testing the relationship excluding the 'special' year 1992. The results are expected to present similarities with findings for the other European countries. One should notice that the results presented below are still subject of any other omitted factor from the analysis, such were the macroeconomic developments in 1992, for the Spanish case.

**Table 7. Contemporaneous earnings and returns regression for Spain (all years except 1992)**

$$x_t / P_{t-1} = \alpha_0 + \alpha_1 D_t + \beta_0 R_t + \beta_1 D_t * R_t + u_t \quad (27)$$

| Country | Obs. | $\alpha_0$ | $\alpha_1$ | $\beta_0$ | $\beta_1$ | Adj. $R^2$ |
|---|---|---|---|---|---|---|
| **Spain** | 607 | **0.0436**** | 0.0272 | **0.0483**** | **0.1617**** | **3.78** |

Notes: ** shows statistical significance at 5% or more. The adjusted $R^2$ is in percentage. Where $x_t$ is the earnings per share figure in the time period t and $P_{t-1}$ is the price per share in the previous time period (t-1). $D_t$ is a dummy variable taking the value of 0 when there is 'good news' and the value of 1 when 'bad news'. $R_t$ is the economic income, of which proxy is considered in this case the change of the price per share, and $u_t$ is the disturbance term.

Comparing the results in Table 7 with those in Table 3, it is evident that the $\beta_1$ coefficient on 'bad news' for the Spanish sample without 1992 is rather similar in magnitude with that of the other countries.[47] In an attempt to identify the importance of the result I compared statistically the coefficients $\beta_1$ for Spain in the whole sample and in the sample excluding the year 1992. The difference of the coefficients is, by no surprise, statistically significant providing one more indication of the importance of the 1992 events.

Finally, on Table 8 the results from the empirical tests of the fourth hypothesis are reported. Consistently with expectations, they suggest that 'good news' seems to be reflected in earnings in the following years.

[47] Saying that, one should point out that for the second period of the sample (1993-2000) Spain seems to be one of the most conservative countries when earnings conservatism is regarded. In the first period, when 1992 is excluded, results not reported here show that all coefficients are statistically insignificant. Therefore, the behaviour of the Spanish companies has changed in the second period of the sample.

**Table 8. Regressions with lagged returns**

$$x^i_t / P^i_{t-4} = \alpha + \sum_{\tau=0}^{3} \alpha_\tau D^i_{t-\tau} + \sum_{\tau=0}^{3} \beta_\tau R^i_{t-\tau} + \sum_{\tau=0}^{3} \gamma_\tau D^i_{t-\tau} * R^i_{t-\tau} + u^i_t \qquad (29)$$

| Country | $\alpha$ | $\alpha_0$ | $\alpha_1$ | $\alpha_2$ | $\alpha_3$ | $\beta_0$ | $\beta_1$ | $\beta_2$ | $\beta_3$ | $\gamma_0$ | $\gamma_1$ | $\gamma_2$ | $\gamma_3$ | Adj. $R^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Austria** 268 Obs | **0.066**** | -0.029 | -0.007 | 0.007 | -0.018 | **0.068**** | 0.051 | **0.073**** | **0.073**** | -0.052 | 0.077 | -0.030 | -0.086 | **30.2** |
| **Belgium** 352 Obs | **0.098**** | -0.018 | -0.008 | -0.001 | 0.007 | 0.001 | **0.063**** | **0.062**** | **0.100**** | **0.183**** | 0.063 | 0.058 | 0.077 | **27.2** |
| **Finland** 195 Obs | **0.170**** | **-0.1**** | -0.061 | -0.014 | -0.028 | 0.005 | 0.034 | **0.074**** | **0.154**** | -0.012 | 0.030 | 0.086 | -0.124 | **36.4** |
| **France** 1324 obs | **0.085**** | **-0.03**** | **-0.02**** | 0.001 | -0.008 | **0.015**** | **0.056**** | **0.061**** | **0.048**** | **0.086**** | 0.006 | 0.026 | -0.004 | **23.7** |
| **German** 1395 obs | **0.040**** | -0.012 | -0.006 | -0.002 | 0.005 | **0.054**** | **0.068**** | **0.072**** | **0.088**** | 0.037 | 0.049 | 0.002 | -0.052 | **20.4** |
| **Ireland** 264 Obs | **0.154**** | -0.013 | -0.023 | -0.044 | -0.030 | **0.034**** | 0.014 | 0.029 | 0.056 | **0.095**** | **0.105**** | 0.068 | 0.078 | **36.0** |
| **Italy** 503 Obs | **0.102**** | **-0.04**** | -0.027 | -0.024 | **-0.04**** | 0.019 | **0.092**** | **0.061**** | **0.066**** | 0.025 | -0.051 | 0.011 | -0.101 | **23.0** |
| **Netherl.** 584 Obs | **0.132**** | **-0.04**** | **-0.03**** | -0.013 | 0.007 | -0.002 | **0.036**** | **0.080**** | **0.077**** | 0.042 | 0.021 | 0.006 | 0.037 | **29.0** |
| **Spain** 440 Obs | **0.122**** | -0.020 | -0.035 | -0.020 | -0.009 | 0.016 | **0.055**** | **0.050**** | **0.103**** | 0.061 | 0.061 | 0.081 | -0.032 | **23.2** |
| **UK** 4990 obs | **0.109**** | **-0.02**** | **-0.02**** | **-0.01**** | -0.004 | **0.010**** | **0.040**** | **0.060**** | **0.080**** | **0.095**** | **0.074**** | **0.064**** | 0.024 | **32.6** |
| ***UK*** *1755 obs* | ***0.104**** | ***-0.02**** | ***-0.02**** | *-0.011* | *-0.002* | ***0.015**** | ***0.057**** | ***0.054**** | ***0.082**** | ***0.097**** | ***0.051**** | ***0.059**** | *0.012* | ***32.9*** |
| ***Eurozone*** *1755 obs* | ***0.087**** | ***-0.02**** | ***-0.02**** | *-0.006* | *-0.002* | ***0.022**** | ***0.058**** | ***0.076**** | ***0.120**** | ***0.066**** | ***0.042**** | *0.041* | ***-0.063**** | ***31.8*** |

Notes: ** shows statistical significance at 5% or more. Where $x_t$ is the earnings per share figure in the time period t and $P_{t-4}$ is the price per share in the previous time period (t-4).,$D_t$ is a dummy variable taking the value of 0 when there is 'good news' and the value of 1 when 'bad news'. $R_{t-\tau}$ is the economic income, of which proxy is considered in this case by the change of the price per share, and $u_t$ is a disturbance term. The adjusted $R^2$ is in percentages.

For all countries (except of Ireland)[48] the coefficients on 'good news' $\beta_t$ are statistically significant back to the three previous years, while in the majority of cases, 'bad news' (due to the coefficients $\gamma_t$) affects the earnings figures just in the current period. The results for the UK are consistent with those of Pope and Walker (1999) and Giner and Rees (2001), while the evidence for the cases of France and Germany seems to be consistent with those of Giner and Rees (2001) only for the 'good news' coefficients. As previously mentioned the coefficient of the oldest 'good news' can be considered as the best estimate of the cost of capital. Furthermore, the difference between the coefficient on the oldest 'good news' and the intercept is claimed to be an indicator of pervasive conservatism, not related to 'news'. According to the results, and consistently with the aforementioned expectations, the Euro-zone as a whole presents pervasive pessimism ($\alpha_0 < \beta_4$), while the UK presents pervasive optimism ($\alpha_0 > \beta_4$).

In a number of countries 'bad news' appears to play the same role as 'good news' since the $\gamma_t$ coefficients are statistically insignificant.[49] Therefore, in these countries when the 'news' from the three previous years is included, earnings conservatism seems to disappear. Such findings may be connected with the small size of some of the samples used, as an economic explanation of such result appears to be absent.

### 5.1.6 Conservatism Conclusions

The traditional notion of conservatism, pervasive conservatism, has evolved during the years, from a recommendation to report always all current and potential losses, to the more recent, with regard to the uncertainty that surrounds a particular situation. In addition, the empirical research has recently considered another notion of conservatism, linked to the timeliness of earnings in reflecting economic income. Related to such issues, the purpose of this empirical study is to analyse the conservatism practices in the different countries that form the Euro-zone considering

[48] The results of Ireland regarding the 'good-news' appear to be at least debatable as it is highlighted in the discussion of the first hypothesis. The change in the sign of the current period 'good-news' might be due to the different and smaller sample employed (264 obs.) since each observation of returns to be used should have matching data for the three previous years.

[49] Such results are also reported in Giner and Rees (2001), although at a lesser extent, for the French and German samples.

both perspectives, the traditional pervasive conservatism, and the recent earnings conservatism linked to timeliness.

By focusing on this economic zone the impact of possible macroeconomic differential aspects that could influence the relationship of returns-earnings can be minimised. At the same time it is supported that the Euro-zone is *per se* an important group of countries named to form the future European Stock Exchange. In addition, the UK is also considered for comparative reasons and due to its potential role in such stock market.

The relationship between accounting earnings and economic income, that a proxy consists the change in stock prices, is examined for the period 1988-2000. To this end, the Basu's (1997) research design is adopted in order to appreciate the timeliness of earnings in reflecting 'good' and 'bad news'. The intercept of the regression is also considered in order to assess the traditional notion of conservatism. In taking into consideration the different European environment created by the Maastricht Treaty, signed in 1992, and the adoption of the Directives, the sample is divided in two periods prior and after 1992. The impact of macroeconomic events, such the European monetary crisis of 1992, is also considered in the relationship. In addition, following Pope and Walker (1999) the influence of previous 'news' was examined.

In all cases (except of Austria) the results give support to the initial hypothesis, that the reporting of earnings is made in a timelier way for 'bad news' than for 'good news', and this is stronger in the UK than in the Euro-zone as a whole. However when the intercept of the regression is observed, the results are consistent with the traditional accounting choice conservatism, with a higher level of traditional conservatism in the Euro-zone than in the UK. This result is confirmed when old news is introduced in the analysis, as long as the Euro-zone countries show pervasive pessimism while the UK shows pervasive optimism. In addition this analysis suggests, as hypothesised, that 'good news' seems to be reflected in earnings figures in following years.

When the sample period is divided in two, the relation between accounting and economic income changes after 1992. It is argued that this is due to the macroeconomic as well as the accounting developments. The implementation of the 4th and the 7th Directives by all EU countries and the convergence of the macroeconomic variables that followed the Maastricht Treaty, as well as the accelerating integration of world's capital markets, lead to more harmonised findings for the European firms. The timeliness of 'bad news' appears to have increased for most countries along time. As far as the intercepts, there is a general tendency to decrease, which is consistent with a higher degree of accounting choice conservatism after the 4th Directive, and a decrease in the cost of capital.

In terms of the analysis of other factors that affect the managers' attitude towards accounting earnings, it is argued that it is influenced by external events. The findings of the study indicate that the 1992 monetary crisis did not affect the notion of earnings' conservatism in Italy and in the UK, since no different behaviour is detected for this specific year. In contrast, the effects of the crisis seem to be very significant for the notion of earnings conservatism in Spain in this particular year. As suggested above, these results could be understood taking into account the different attitudes of the governments towards the ERM crisis.

Overall, the results suggest that the research over earnings' conservatism still deserves much effort. One interesting line of research could be to identify the possible determinants of conservatism and potential the causes of changes in conservative behaviour, that are not clearly addressed in the current literature.

## 5.2 THE VALUE RELEVANCE OF TAXATION

### 5.2.1 INTRODUCTION: OHLSON (1995) AND TAXATION

The creation of a Pan-European stock market appears to be both timely and relevant since it is widely expected that a more united Europe would have its own stock market, despite some drawbacks in attempted mergers (e.g. between the City and Frankfurt SEs). With the highest degree of European integration currently observed in the Euro-zone, it seems appropriate that the European area with the highest degree of unification and a common currency would have its own stock market. Such conclusion is reinforced by the high level of integration among the stock markets of the Economic and Monetary Union, as highlighted by Hardouvelis, Malliaropoulos and Priestley (1999).

However, the valuation of firms and its relation with accounting data still differs across countries despite the recent convergence in terms of accounting rule and practice. Accounting harmonisation seems to be desirable on the prospect of the creation of a Pan-European stock market but also for the further integration of the EU member states, and consequently it is pursued by the European Commission. Although the European Commission has indicated its support to the IAS standards (see Section 3.1) there is not always a unique interpretation of all the rules. Based on that, it can be supported that in order to achieve real harmonisation one should identify existing differences and to understand the reasons of their existence. In the light of an integrated stock market, the question of the value relevance of accounting numbers seems to be significant. By itself, such a question is important for international investors who seek to assess the informativeness of accounting data regarding equity values in different accounting systems in different markets. Those differences appear to be important and they have been in the focus of empirical research.

However, there are certain important issues related to value relevance that have not been widely discussed, as for instance the issue of taxation. Taxation is an accounting variable that affects the market value of the firm with the relevant discussion around it, considerably limited (see Section 3.2). A major channel of

influence of taxation on the market value is through the profitability of the firm. In the empirical research the earnings employed in most of the cases are after tax earnings, thus accounting for the effects of taxation. However the relevant implications lack of a comprehensive analysis in the bulk of the value relevance empirical literature. In addition, there are several other channels through which taxes affect the market value of the firm. Low or high corporate taxation influences the internal investment plans of firms and leads to more or less aggressive debt financing, affecting the market value of firm equity.

Also, corporate taxation, effective and statutory rates, affects the inward and outward foreign direct investment (FDI) in/from a country. Inward FDI attracts foreign investors who seek to implement business plans together with local companies, resulting to increased market value for the latter. On the other hand, outward FDI utilises local funds abroad, depriving local markets of investment funds which directly influence the value of local firms. Indeed, the investment plans of multinational firms are largely affected by the tax burden that they would face in each country and consequently high tax rates act as a deterrent for investment in the specific market.

Overall, the influence of corporate taxation on share prices is important and a study on this would bear a significant interest among policy makers and investors. Additionally, such discussion is timely due to the important debate in the European Union between governments and individuals favouring either tax harmonization or tax competition (see Table 2, Section 3.2.1). Therefore, a study to assess the importance of taxation and other accounting variables for the market value of the firm among the European Union countries is both timely and significant. As discussed previously, the countries participating in the Euro-zone are on focus, since they have reached the higher degree of integration, and the UK is added for comparison reasons.

The results of this empirical study indicate the high significance of corporate taxation for the market value of European firms. The differences in taxation regimes appear to be one of the major determinants of the different magnitude of the taxation influence on stock prices across countries. Furthermore, the findings indicate that the effects of

taxation on the market value of the European firm differ according to company size and industry classification.

### 5.2.2 OHLSON (1995) AND TAXATION: SELECTED LITERATURE

A review of the empirical research on applications of the Ohlson (1995) model has been presented in Section 2.2.5. In addition, a literature review on empirical studies related to the value relevance of taxation has been discussed in Section 3.2.2. Therefore, at this Section the discussion is going to be concentrated in some aspects of previous research specific to this study.

Bernard (1995) provides some of the first evidence of an application of the Ohlson (1995) model. The author utilises a US sample with the variables in a per share basis and in the same way the variables were chosen in this empirical study (see the discussion on deflations in Section 4.3). Even though the magnitude of $R^2$s is not central in the empirical studies of this thesis, it should be noted that Bernard (1995) report a considerably high adjusted $R^2$ at 68%. On the same issue, Joos (1997) identifies the higher importance of accounting information for France than for Germany and the UK, since the $R^2$ of the French case is higher than those of the other two countries. This study will assess the suggestion made by Joos (1997) and the results will also be compared with those of Bernard (1995) regarding the $R^2$ magnitude.

Arce and Mora (2002) support that for firms from the Netherlands and the UK earnings are more value relevant than book value. On the contrary, the authors argue that for firms from the other continental European countries book value is more important in valuation than earnings. On that topic, Joos (1997) suggests that the value relevance of book value and earnings is expected to be higher in France and Germany than in the UK due to traditional conservatism. However, his hypothesis is not backed by his results since only the book value coefficient is higher for firms in France and Germany in comparison to the UK. This issue will also be on focus in this empirical study.

In terms of taxation, the results will be compared with those by Giner and Reverte (1999) for the Spanish case since these authors utilise a version of the Ohlson (1995) model. However, to the knowledge of the author of this thesis, there is not any more available evidence on European countries related to the value relevance of taxation and thus some papers that suggest the importance of taxes for the value of European firms are going to be employed despite that they do not utilise value relevance modelling to test their suggestions (for example Bogner, Fruhwirth and Schwaiger (2001) for Austria and the Sheltons report (1998) for the Netherlands). Such studies analyse the significance of taxation based on the magnitude of the tax that companies pay. Since the tax level appears to be significant for the influence that taxation has on firm value the European inter-country tax differences are of a particular interest and thus they are presented in Table 9 below both in terms of statutory and effective tax rates.

At this point, the research design of the study is going to be developed and the key hypotheses will be set.

**Table 9. Corporate Taxation in Europe in the last 15 years.**

| Countries | OECD | | | | Buijink et al – 1990-1996 | | | | European Parliament | | Ernst & Young | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *1986* | *Rank* | *2000* | *Rank* | *STR* | *Rank* | *ETR1* | *Rank* | *1997* | *Rank* | *2002* | *Rank* |
| Austria | 30 | *1* | 34 | *6* | 36.02 | *8* | 19.72 | *3* | 34 | *5* | 34 | *5* |
| Belgium | 45 | *7* | 39 | *10* | 40.28 | *10* | 21.64 | *5* | 28-41 | *3* | 40.2 | *10* |
| Finland | 33 | *2* | 29 | *2* | 34.02 | *4* | 25.28 | *7* | 28 | *1* | 29 | *2* |
| France | 45 | *7* | 33.3* | *5* | 34.70 | *5* | 28.45 | *10* | 33.33 | *4* | 35.43 | *8* |
| Germany | 56 | *12* | 40 | *11* | 50.05 | *11* | 33.61 | *12* | 30-45 | *12* | 39.4 | *9* |
| Greece | 49 | *10* | 40* | *11* | 32.53 | *2* | 19.79 | *4* | 35 | *6* | 35 | *7* |
| Ireland | 50 | *11* | 24 | *1* | 21.94 | *1* | 13.78 | *1* | 28-36 | *2* | 16 | *1* |
| Italy | 36 | *5* | 37 | *9* | 50.48 | *12* | 30.66 | *11* | 37 | *11* | 40.25 | *11* |
| Netherlands | 42 | *6* | 35 | *7* | 35.00 | *6* | 26.84 | *9* | 35-36 | *6* | 34.5 | *6* |
| Portugal | 47 | *9* | 32 | *4* | 39.29 | *9* | 16.89 | *2* | 36 | *10* | 33 | *4* |
| Spain | 35 | *3* | 35 | *7* | 35.30 | *7* | 22.90 | *6* | 35 | *6* | 35 | *7* |
| UK | 35 | *3* | 30 | *3* | 33.35 | *3* | 25.98 | *8* | 23-35.5 | *9* | 30 | *3* |

*Sources: OECD Tax Database (2001), Buijink et al (2002), European Parliament, Economic Affairs Series (1998), Ernst & Young, Worldwide Corporate Tax Guide, January 2002*

Notes: STR is Statutory Tax Rate and ETR1 is the Effective Tax Rate. * The OECD 2000 rates for Greece and France are from the years 1996 and 1999 respectively. In the European Parliament 1997 rates, the ranges denote the existence of progressive tax rates.

### 5.2.3 RESEARCH DESIGN: THE TMO MODEL

As discussed above, the Ohlson (1995) model will be employed in order to examine the research questions of this empirical study. Henceforth, the research design will be based to equation (12) in Section 2.2.3:

$$\mathbf{P_t = y_t + \alpha_1 x^a_t + \alpha_2 v_t} \qquad \mathbf{(12)}$$

Where $P_t$ denotes share prices, $y_t$ is the book value, $x^a_t$ denotes the abnormal earnings and $v_t$ is the other information variable.

The main objective of this study is to identify the value relevance of taxation and its interrelation with the other accounting numbers. To assess that, taxes will be disaggregated from the abnormal earnings at the Ohlson (1995) model as it has been described in Section 4.1. Thus, the Tax Modified Ohlson (1995) model of equation (22) below will be used in this analysis.

$$\mathbf{P_t = y_t + \alpha_1 ax^a_t + \alpha_1 ta_t + \alpha_2 v_t} \qquad \mathbf{(22)}$$

The adjusted abnormal earnings ($ax^a_t$) are defined (see page 92) as earnings before tax minus the beginning period book value multiplied with the risk free rate of interest [$\mathbf{ax^a_t = x^{bt}_t - (R_f - 1)\, y_{t-1}}$]. Furthermore $ta_t$ denotes the tax cost, while the rest of notation is defined as in equation (12).

The TMO Model of equation (22) will be used in order to assess the value relevance of taxation and the other accounting variables under consideration. There are some empirical issues to be resolved before the testing of the model. First, an intercept is added in the model as suggested by all previous empirical research in order to capture effects on prices from factors different than the ones tested here. The inclusion of the intercept appears even more significant due to the fact that an 'other non-accounting information' variable for $v_t$ is not employed. Several 'other information' variables have been used in the literature, however the purpose of the present study is to assess the value relevance of taxation and the differences of the

taxation effects on share prices across European countries, without taking other aspects into account. Another issue of concern is the introduction of a coefficient for book value. According to theory the coefficient should be equal to one, however in practice that might not be exactly the case. A coefficient will be added which is expected to be close to the unity. Thus, the Ohlson (1995) model to be employed for the empirical testing will be the following:

$$\mathbf{P_t = \beta_0 + \beta_1\, y_t + \beta_2\, x^a{}_t + u_t} \qquad \mathbf{(30)}$$

Where $u_t$ is an error term and the rest of the notation as in equation (12).

One of the contributions of this study lies on the empirical implications of the coefficient $\alpha_1$ of the TMO model on adjusted abnormal earnings and taxation. According to theory described above (Section 4.1), taxes and adjusted abnormal earnings should have the same effect on share prices since they have the same coefficient $\alpha_1$. This can be expected to be the case if the only way that taxes influence share prices is through earnings (by increasing or decreasing current earnings). However, as it has been suggested previously (Section 3.2), taxation affects share prices through their influence to future profitability and to the general economic activity, in addition to the effects on current profitability. Therefore, the present study argues the existence of an additional 'tax-effect' on share prices.

In order to check the existence of such additional tax effects, a Wald test will be employed on the coefficients of taxes and adjusted abnormal earnings in an effort to assess their presumed (by the theory) equality. From the above the TMO model is transformed to the equation (31) below:

$$\mathbf{P_t = \beta_0 + \beta_1\, y_t + \beta_2\, ax^a{}_t + \beta_3\, ta_t + u_t} \qquad \mathbf{(31)}$$

Notation as in equations (22) and (30).

Based on the discussion above a number of hypotheses will be set. First, it is expected that both book value and abnormal earnings of the Ohlson (1995) model in

equation (30) will be found statistically significant for all countries. The coefficient of the book value is expected to be close to the unity for all cases. In addition, when the tax-modified Ohlson model of equation (31) is tested, the coefficient of the tax variable is expected to be found negative and significant, with the countries with lower taxation (both in terms of statutory and effective tax rates) to experience higher tax coefficients, since stock prices in such countries are expected to be more sensitive to taxation effects. Furthermore, the taxation coefficient is expected to be significantly different from the coefficient on adjusted abnormal earnings for all countries, and thus the Wald test on the equality of the two coefficients is expected to be rejected in all cases.

At this point, the sample selection and the descriptive statistics of the variables to be tested will be discussed.

### 5.2.4 SAMPLE SELECTION: OHLSON (1995) AND TAXATION

The final sample consists of 22,689 firm-year observations for non-financial companies from the Euro-zone countries (except Luxemburg due to the lack of a sufficient number of observations) plus the United Kingdom. The abnormal earnings per share $x^a_t$ are defined as earnings per share less 'normal' earnings which consist the beginning of period net operating assets per share times the one-year Treasury bill rate plus 4% following Ahmed et al (2000). In the literature several risk free rates were used including flat rates (e.g. 12% from Dechow et al (1999) or 10% by Amir et al (1997)) and interest rates plus premiums (e.g. 1-year T-bill + 4% from Ahmed et al (2000)). The latter view is supported in this paper, since changes in the cost of capital are significant during the years and among the countries. The earnings (after-tax) number was divided into pre-tax earnings and taxes directly in the collection of the data from the data base. The book value is defined as equity minus preferred shareholders equity.

The accounting and market data are collected by the Extel Company Analysis Database for the twelve European countries for a time period of thirteen years (1988-2000). All data for all variables are in local currencies and per share. All variables

are adjusted for stock splits and dividends using the adjustment factor of the Extel Company Analysis database. The usual outlier rule of the exclusion of one percentage point on the top and from the bottom of all samples was performed. The one-year Treasury bill rates were collected from the IMF's International Financial Statistics for the years under discussion.

The selection of the sample and the descriptive statistics of the variables for all countries can be observed in Tables C2a-l in Appendix C.[50] In all cases, prices are positively skewed with the mean exceeding the median while the same happens for the adjusted abnormal earnings which appear to be positively skewed for all countries except Portugal and Spain where the mean adjusted abnormal earnings appear to be negative. Finally, regarding the taxation variable both the means and medians are negative for all countries and in all cases the variable is negatively skewed since the median is higher than the mean.

### 5.2.5 TAX MODIFIED OHLSON (1995) MODEL: EMPIRICAL RESULTS

#### 5.2.5A GENERAL RESULTS

Initially, the Ohlson model of equation (30) is tested. One can observe the regression results in Table 10, below, for the twelve European countries under discussion.

The intercepts in Table 10 are positive and statistically significant in all cases but Greece, Ireland and Portugal (see note 50 on the treatment of the value of intercepts). The coefficients on the book value are very consistent with theory while most are very close to the unity. The two countries with statistically insignificant intercepts, Greece and Ireland, have $\beta_1$ coefficients on book value larger than the expected unity indicating a possible connection. In the other cases, the prediction of Joos (1997) that the coefficients on book value will be higher in the continental European countries

[50] One should take under consideration that all variables are in local currencies and this will affect the comparability of the intercepts among samples. In order to compare the intercepts of the regressions as well as the descriptive statistics one should have in mind that: 1 Euro= 13.7603 Austrian Schillings = 40.3399 Belgian Franks = 5.94573 Finnish Markkas = 6.55957 French Franks = 1.95583 German Marks = 340.75 Greek Drachmas = 0.787564 Irish Punts = 1936.27 Italian Liras = 2.20371 Dutch Guilders = 200.482 Portuguese Escudos = 166.386 Spanish Pesetas and approximately 0.66 British Pounds.

finds very weak support since there are continental European countries with lower (Belgium and Italy) or similar (Finland and the Netherlands) coefficient on book value comparing to the UK.

**Table 10. Regression results of the Ohlson Model**

$$P_t = \beta_0 + \beta_1 y_t + \beta_2 x^a_t + u_t \qquad (30)$$

| Countries | Obs. | $\beta_0$ | $\beta_1$ | $\beta_2$ | Adj. $R^2$ |
|---|---|---|---|---|---|
| Austria | 551 | **176.2**** | **1.190**** | -0.152 | **64.4** |
| Belgium | 688 | **460.4**** | **0.885**** | **0.831**** | **69.5** |
| Finland | 423 | **11.66**** | **1.017**** | **2.063**** | **64.4** |
| France | 3679 | **45.51**** | **1.097**** | **2.112**** | **66.4** |
| Germany | 2816 | **78.47**** | **1.534**** | **1.738**** | **37.2** |
| Greece | 135 | 202.5 | **2.953**** | **10.79**** | **50.8** |
| Ireland | 437 | -0.113 | **1.812**** | **6.330**** | **53.5** |
| Italy | 1116 | **247.2**** | **0.997**** | **1.160**** | **75.8** |
| Netherlands | 1237 | **11.84**** | **1.010**** | **4.414**** | **69.9** |
| Portugal | 116 | 15.90 | **0.594**** | **-12.61**** | **97.1** |
| Spain | 895 | **116.9**** | **1.219**** | **3.809**** | **69.4** |
| UK | 10776 | **0.958**** | **1.004**** | **4.578**** | **44.5** |

Note: ** and * denote statistical significance at a 5% and 10% levels respectively. $P_t$ denotes share prices, $y_t$ is the book value, $x^a_t$ denotes the abnormal earnings and $u_t$ is an error term. Adjusted $R^2$ is in percentage.

The case of Portugal appears to be overall 'erratic', since except of the results of the $\beta_0$ intercept and the $\beta_1$ book value coefficient, the abnormal earnings coefficient appears to be negative, and the adjusted $R^2$ is very close to an unprecedented 100%. The Portuguese sample is the smallest employed and a possible explanation of such results can be that only few erratic observations (despite the deletion of outliers) might drive the whole sample.

In terms of the coefficients on abnormal earnings $\beta_2$, they are positive and significant (except of the Austrian case) ranging from 0.831 for Belgium to 10.79 for Greece. As it was previously pointed out the prediction made by Joos (1997) that the earnings coefficient will be higher for the continental European countries was not backed by his results. This is also the case in Table 10. There are differences among the abnormal earnings coefficients however no clear pattern can be detected. Moreover, the results seem to support the suggestion of Arce and Mora (2002) that for the Netherlands and the UK earnings are more value relevant than book value. However, their reverse suggestion that book value is more value relevant than earnings for the other continental European countries is not supported by the findings of the present study.

Finally, in terms of $R^2$s, most appear to be significantly high with the exceptions of Germany and the UK. The cases of Austria, Belgium, Finland, France, the Netherlands and Spain appear to have a percentage very close to the one reported by Bernard (1995) for the case of the US (68%). The results of Table 10 are consistent with those of Joos (1997) in the sense that the $R^2$ for the French case is higher from the ones for Germany and the UK.

The discussion will now concentrate to the results of the disaggregated model (31) as they can be seen in Table 11, below.

**Table 11. Regression results of the TMO model**

$$P_t = \beta_0 + \beta_1 y_t + \beta_2 ax^a_t + \beta_3 ta_t + u_t \qquad (31)$$

| Countries | Obs. | $\beta_0$ | $\beta_1$ | $\beta_2$ | $\beta_3$ | Adj. $R^2$ | *WALD* $X^2$ |
|---|---|---|---|---|---|---|---|
| Austria | 545 | **161.9**** | **1.106**** | -0.573 | **-4.21**** | **64.5** | *10.63*** |
| Belgium | 680 | **334.6**** | **0.460**** | -0.005 | **-12.2**** | **79.4** | *294.1*** |
| Finland | 421 | **11.16**** | **0.914**** | **2.047**** | -0.668 | **68.2** | *4.325*** |
| France | 3659 | **40.26**** | **0.816**** | **0.828**** | **-4.86**** | **69.0** | *308.3*** |
| Germany | 2796 | **71.57**** | **1.254**** | **0.937**** | **-3.37**** | **40.6** | *137.8*** |
| Greece | 133 | 230.4 | **2.060**** | **9.799**** | -6.914 | **47.9** | *4.053*** |
| Ireland | 431 | 0.084 | **1.985**** | **7.513**** | **17.56**** | **54.7** | *9.682*** |
| Italy | 1105 | **213.2**** | **0.746**** | **0.576**** | **-3.15**** | **78.1** | *85.84*** |
| Netherlands | 1229 | **9.492**** | **0.565**** | 0.108 | **-11.3**** | **75.9** | *410.1*** |
| Portugal | 116 | **10.66**** | **0.540**** | **-3.40**** | **-18.5**** | **99.5** | *574.9*** |
| Spain | 887 | **79.88**** | **0.718**** | **1.587**** | **-11.9**** | **78.3** | *227.2*** |
| UK | 10687 | **0.697**** | **0.562**** | **2.566**** | **-9.38**** | **53.0** | *1777*** |

Note: ** and * denote statistical significance at a 5% and 10% levels respectively. The Wald test is testing the equality of the coefficients $\beta_2$ and $\beta_3$. $P_t$ denotes share prices, $y_t$ is the book value, $ax^a_t$ denotes the adjusted abnormal earnings, $ta_t$ is taxation and $u_t$ is an error term. Adjusted $R^2$ is in percentage.

According to these results the intercept is significant and positive in all countries except of Ireland and Greece, while the magnitude of the intercept is similar and thus consistent to the results of Table 10. The case of Portugal appears once more to be 'erratic' and therefore further conclusions are not going to be drawn for firms in this country. The importance of the intercept verifies the choice of introducing one despite the absence of a strong theoretical background. The $\beta_1$ coefficient on the book value is in all cases statistically significant and considerably close to the unity as suggested by the theoretical analysis and expected to be in this study (once more with the exceptions of Greece and Ireland).

For Austria when the Ohlson (1995) model was tested the coefficient on abnormal earnings resulted to be statistically insignificant. In Table 11 one can observe that the coefficient on the adjusted abnormal earnings continues being insignificant. However, the coefficient $\beta_3$ on taxation is statistically significant and negative indicating the influence of taxation to the market value of the Austrian firms. The Austrian case is somehow different from the others since in this country (as well as in Italy) the corporate taxation has increased since 1986 (see Table 9) in contrast to the general trend. However, the effective tax rate calculated by Buijink et al (2001) in the Austrian case (Table 9) is one of the lowest in the European Union and henceforth FDI and capital inflows in Austria appear to be in particular attracted.

One would expect that the coefficient on taxation would be higher in comparison with the rest of the countries since Austria is ranked third in terms of ETR, having one of the lowest rates. However, the magnitude of the coefficient may be affected from the fact that the Austrian firms are largely based on equity financing as pointed out by Bogner et al (2001), and also from the new opportunities for Austrian firms developed after the initiation of transition in Eastern Europe which directed outward flows from Austria to the east. Overall, however, taxes in Austria affect share prices independently from the channel through earnings as the Wald test on the equality of $\beta_2$ and $\beta_3$ coefficients (on adjusted abnormal earnings and on taxes respectively) indicates.

In the Belgian case, one can attribute the importance of abnormal earnings to share prices of Table 10 to the influence solely of taxation as it is disaggregated in Table 11. Thus, one can argue that the influence of taxation on current abnormal earnings is not the one driving share prices but the influence of taxation on future profitability through inward and outward FDI, internal investment planning and debt financing policies. Despite that in terms of the statutory tax rate Belgium appears to be a high tax country, when the effective tax rates are compared (Table 9), Belgium appears to be in the bottom half in terms of the effective tax burden and due to that the $\beta_3$ coefficient on taxation is the highest from all other cases. To the latter point one can mention the existence of progressive taxation for Belgian companies which drives taxes even lower for a certain set of firms and is discussed below when firms are classified by size. The rise in the adjusted $R^2$ when the two tables (10-11) are compared indicates the increase in the explanatory power in the second model (TMO) due to the disaggregation of the taxation variable, indicating once more its importance.

The results for Finland appear to differ from the findings mentioned above. The coefficient on abnormal earnings is positive and statistically significant in Table 10 while the same seems to occur for the coefficient on the adjusted abnormal earnings of Table 11. Moreover, the magnitude of the coefficients $\beta_2$ of the two equations appear to be the same indicating the influence of earnings to share prices and the absence of taxation effects on the market value of Finnish firms. Finland can be considered as a low-tax country in relation to the statutory tax rates since 1986 (see Table 9). However, when one takes under account the effective tax rate, Finland moves from the second to the seventh place out of twelve countries. This can be one of the reasons leading to the presumed absence of tax effects on share prices.

In France both adjusted abnormal earnings and taxes seem to be important for the market value of French firms. Despite the fact that France is ranked as a high tax country in terms of effective taxation, the variable of corporate taxes seems to affect much more share prices than that of earnings as it is shown by the rejection of the assumed equality of their coefficients by the Wald test. The coefficient $\beta_3$ on taxation for the French case is similar in magnitude to the one of Austria, while the statutory tax rates of both countries have converged in the last decade. In addition, there is a

modest increase on the adjusted $R^2$ when the two models are compared indicating the increased explanatory power of the disaggregated model.

The results of Germany and Italy will be discussed together due to their similarities. The two countries rank 12th and 11th out of 12 countries in the effective tax rate (Table 9) and as far as the statutory tax rates are concerned they occupy again the lower places. This would imply the low influence of taxes into the market value of German and Italian firms. Indeed, the coefficients on taxation for the two countries are the lowest (from the statistically significant ones) indicating that higher taxes result to a lower influence of taxation on share prices, due to low inward FDI, increased outward flow of capital and FDI and less internal investment among other reasons. The difference of these two cases with the situation in Finland, lies on the fact that Germany and Italy are two of the biggest economies of the Euro-zone and thus inevitably attract inward FDI even though in lower levels than they would with more competitive tax rates, when in Finland the few large companies dominating the Helsinki stock market are more keen to outward FDI to neighbouring countries (for example the NOKIA plant in Estonia). In addition, abnormal earnings continue to play an important role for German and Italian share prices as highlighted by the positive and statistically significant coefficients. Finally, the explanatory power of the model is increased when it is disaggregated indicating the importance of both taxes and abnormal earnings for these two countries.

In the Greek case, in both models the earnings variables appear to have a significant and similar in magnitude coefficient $\beta_2$. Despite that Greece appears to be both in statutory and effective tax rates in the low-tax group of countries, taxes seem to be insignificant for the market value of firms listed in the Athens stock market. This can be explained by the situation in the local market. The continuous expansion of the Athens market has not been driven by inward FDI or by capital inflows. The expansion was mainly internally driven by many small investors which led to large equity financing (and not debt financing) for Greek companies. In addition, many Greek firms, especially from the north, have been involved in outward FDI to the neighbouring transition economies. Henceforth, taxation is not one of the important determinants of Greek share prices, while earnings appear to be significant.

A special inference should be made for the case of Ireland. The coefficient on taxation for the Irish sample is positive suggesting high share prices with high taxes. This can be attributed to the rapid growth in the Dublin stock market (as well as in the Irish economy as a whole) in the years under discussion. The stock prices went on a rally for most of this period and even when taxes increased they continued growing. One can argue that investors would foresee high taxes as an indicator, i.e. a proxy, of high profits for companies based in the Dublin market.

The Netherlands and Spain are in general described (looking at Table 9) as medium-tax countries, both in terms of effective and statutory tax rates, and consequently one would expect the relative importance of taxes for the market value of firms based in the Amsterdam and Madrid stock markets. In table 10 one can observe the importance of abnormal earnings as a whole for both countries' share prices, while in Table 11 a high coefficient on the taxation variable is identified for Dutch and Spanish companies. Taxes appear to be very important since the coefficients are two of the highest found.

In the Dutch case, taxation seems to be important and one of the determinants of such importance appears to be the amount of capital inflows related the fact that the Netherlands are situated in the heart of Europe and are a popular location for international companies, as highlighted by the Sheltons report (1998). The adjusted abnormal earnings seem to be insignificant for the market value of Dutch-based firms.

In the Spanish case, during the largest part of the sample period Spain was a destination for foreign direct investment (very large inward FDI for example in the automobile industry) since its geographic location and the low labour costs together with a stable taxation system which provided certain incentives, especially for some geographic regions. This result seems to be consistent with the one found by Giner and Reverte (1999) for taxes in the Spanish case. From the Wald test is indicated that despite the importance of earnings to Spanish based firms, taxes play a very significant role while their coefficient is much higher (in absolute terms) and statistically different from the coefficient on adjusted abnormal earnings.

Finally, in the United Kingdom, the results seem to be consistent with the initial expectations. The UK is considered to be a low-tax country and therefore one would expect the high significance of corporate taxation for the British based companies. Indeed, the coefficient on taxation is high and statistically different from the one of adjusted abnormal earnings, as in all cases discussed. The fact that in terms of effective tax rate the UK occupies a rather medium position in the rankings of Table 9 might be offset by the progressive corporate tax regime which implies that taxes are even lower for small and medium enterprises (discussed below). The adjusted $R^2$ increases significantly when the models in tables 10 and 11 are compared indicating the importance of the disaggregation and of the tax component of earnings.

### 5.2.5B CLASSIFICATION BY SIZE

Next, this empirical study will attempt to identify the existence of differences in the value relevance of taxation due to the firm size. In addition, in three countries of the sample (Belgium, the Netherlands and the UK) progressive tax rates exist and therefore small and medium firms face lower marginal tax rates than large firms as highlighted by Gordon and Lee (2001).

In order to discuss the importance of firm size and of progressive taxation across countries, the sample is divided in Small and Medium Enterprises (SME) and Large Companies (LC). The classification was based on the Company Law of the EU and the latest Council Directive (1999/60/EC) of the 17th June 1999 which qualifies as SME companies with total assets of less than 10 million euros.[51] The results can be observed in Table 12 below. Findings for Finland, Greece and Ireland are not reported since the number of observations for the SMEs was very low and therefore the results for the LCs consist almost the whole sample.

[51] Actually, the directive sets three conditions: Total assets less than 10 million euros, Net turnover less than 20 million euros and less than 250 employees. In the present study only the first condition is considered for reasons of simplicity.

**Table 12. Regression results of the TMO model for SMEs and LCs**

$$P_t = \beta_0 + \beta_1 y_t + \beta_2 ax^a_t + \beta_3 ta_t + u_t \quad (31)$$

| Countries | Small and Medium Enterprises | | | Large companies | | |
|---|---|---|---|---|---|---|
| | *Obs.* | $\beta_2$ | $\beta_3$ | *Obs.* | $\beta_2$ | $\beta_3$ |
| Austria | *40* | **5.050**** | -4.010 | *500* | -0.558 | **-4.165**** |
| Belgium | *252* | -0.437 | **-18.73**** | *429* | -0.210 | **-10.69**** |
| France | *573* | 0.068 | **-5.951**** | *3099* | **0.494**** | **-5.154**** |
| Germany | *61($R^2$=3%)* | -1.363 | -5.494 | *2730* | **0.890**** | **-2.981**** |
| Italy | *713* | **3.301**** | -1.323 | *386* | 0.488 | **-3.269**** |
| Netherlands | *51* | **1.705*** | -0.926 | *1174* | 0.123 | **-12.01**** |
| Portugal | *86* | 2.543 | -7.704 | *27* | -0.051 | **-9.043**** |
| Spain | *481* | **3.178**** | **6.992**** | *403* | 0.822 | **-13.56**** |
| UK | *757* | **2.093**** | 1.115 | *9920* | **2.624**** | **-9.227**** |

Note: ** and * denote statistical significance at a 5% and 10% levels respectively. SMEs are the Small and Medium Enterprises while LCs are the Large Corporations. $P_t$ denotes share prices, $y_t$ is the book value, $ax^a_t$ denotes the adjusted abnormal earnings, $ta_t$ is taxation and $u_t$ is an error term. Adjusted $R^2$ is in percentage.

The results indicate the existence of significant valuation differences between SMEs and LCs. The general conclusion from the whole sample of the eight countries that the classification could be made (the German result can not be trusted due to the very low $R^2$ for SMEs), is that for SMEs, earnings play an important role while taxes are not as significant for share prices (in both cases for five out of eight countries).

A special inference should be made for the three countries with progressive tax regimes. In the case of the Netherlands the difference in the tax rate (SMEs: 35% - LCs: 36% in Table 9) is not large and therefore one could not expect, based only on that aspect, a different behaviour for the Dutch SMEs in comparison to other

countries with uniform tax rates. The Belgian result is largely expected, since the progressive tax regime provides much lower taxation for small companies in comparison with large firms, and henceforth the relatively lower importance of taxation in the latter (even though with a considerably high coefficient) was expected. For the UK, however, the result is not expected, since the progressive tax rate should have given importance to the taxation variable for the share prices of British-based SMEs, an expectation not supported by the results.

On the other hand, for LCs taxes are very significant in influencing stock prices (in all countries), and adjusted abnormal earnings are shown to not affect stock prices (in five out of eight countries). It is interesting to note that the three countries where earnings affect as well the share prices of the large companies are France, Germany and the UK highlighting that in more developed and more competitive capital markets all factors are important in influencing share prices. In all three countries the coefficient on taxation is much higher than the one of adjusted abnormal earnings suggesting the higher importance of taxes for LCs.

### 5.2.5C CLASSIFICATION BY INDUSTRY

Finally, some more segmented results are provided in order to explain in a better way the aforementioned findings, the sample is divided for all countries into three groups according to the market to book value ratio for each industry. Thus, industries were divided into three categories of low, medium and high market to book value ratio (see Table 13). The group of industries which belong into each of these categories differs from country to country based on the special economic characteristics, the development of the capital market, and other local factors as for example in countries with highly developed tourism, e.g. Greece, the industries of Hotels, and Eating and Drinking Places belonged to the high market to book value ratio group when in others, e.g. Ireland, belonged to the low market to book value group.

**Table 13. Regression results of the TMO model for Different Industries**

$$P_t = \beta_0 + \beta_1 y_t + \beta_2 ax^a_t + \beta_3 ta_t + u_{3,t} \quad (31)$$

| | Low MBV Ratio | | | Medium MBV Ratio | | | High MBV Ratio | | |
|---|---|---|---|---|---|---|---|---|---|
| | $\beta_0$ | $\beta_2$ | $\beta_3$ | $\beta_0$ | $\beta_2$ | $\beta_3$ | $\beta_0$ | $\beta_2$ | $\beta_3$ |
| France | **19**** | **0.8**** | **-1.8**** | **35**** | 0.1 | **-4**** | **55**** | **2.2**** | **-5.1**** |
| German | **32**** | -0.06 | **-3.12**** | **62**** | **1**** | **-2**** | **129**** | **-2**** | **-4.6**** |
| Ireland | **1.1**** | **4.2**** | -2.87 | 0.11 | **5**** | 0.27 | -0.28 | **5.6**** | **15.2*** |
| Italy | **281**** | **1**** | **-3.7**** | **168**** | **0.4**** | **-8**** | 201 | -0.55 | **-21**** |
| Netherl. | **4.8**** | **2.1**** | -2.09 | -0.96 | **-3**** | **-20**** | **17**** | **4.4**** | 1.81 |
| Spain | **154**** | **0.8**** | **1.76*** | 45.01 | **2.9**** | -1.78 | 154 | **-3**** | **-30**** |
| UK | **0.6**** | **2.1**** | **-4.1**** | **0.7**** | **2.9**** | **-7**** | **0.6**** | **2.7**** | **-14**** |

Note: ** and * denote statistical significance at a 5% and 10% levels respectively. The MBV Ratio is the Market to Book Value ratio. $P_t$ denotes share prices, $y_t$ is the book value, $ax^a_t$ denotes the adjusted abnormal earnings, $ta_t$ is taxation and $u_t$ is an error term. Adjusted $R^2$ is in percentage.

One would expect that for industries belonging to the high market-to-book-value ratio group, the coefficients on adjusted abnormal earnings, taxes but also the intercept would be higher than in other groups. This is argued based on the high interest that this group attracts from local and foreign investors. This interest would make investors more careful into the specific characteristics that can affect the share prices such earnings and taxes, while the intercept shows the other factors affecting prices not captured by the model. Indeed, in most of the cases the intercept and the coefficients $\beta_2$ and $\beta_3$, on adjusted abnormal earnings and taxation respectively, are significant and higher in the 'high MBV ratio group' than in the other two groups.

In very few cases met in all three groups one can identify negative and significant coefficients for the adjusted abnormal earnings. A possible explanation may be based on the definition on adjusted abnormal earnings, since this variable can not be explained in exactly the same way as the abnormal earnings of the mainstream Ohlson (1995) model. Abnormal earnings affect in a positive way the share prices,

however abnormal earnings (of equation 30) comprise of both adjusted abnormal earnings and taxation (of equation 31). In these few cases, negative $\beta_2$ coefficients are always accompanied with very high tax coefficients $\beta_3$, indicating that overall, abnormal losses will be reported, thus resulting to a positive relationship with share prices.

### 5.2.6 OHLSON (1995) AND TAXATION: CONCLUSIONS

The issue of the value relevance of accounting numbers has been central in the financial accounting empirical literature. The evidence of this study suggests that for twelve European countries (the Euro-zone plus the UK) both book value and abnormal earnings provide value relevant information and henceforth influence the share prices of European firms. Furthermore, when a tax-modified Ohlson (1995) model is employed, the adjusted abnormal earnings (the residual of abnormal earnings when the income tax is deducted) provide value relevant information for most of the countries under consideration.

While, theory suggests the influence of taxation on stock prices through the channel of earnings, it is argued in this empirical study that there are several other ways that taxes affect share prices. In order to demonstrate that, in the previously mentioned tax-modified Ohlson (1995) model, the theoretical equality between the coefficients of the adjusted abnormal earnings and taxes is tested. In the case of empirical verification of the theoretical equality, the hypothesis that taxes affect the equity of European firms only through the channel of earnings is examined. The results indicate that the taxation coefficients are in all twelve cases different from the coefficients on adjusted abnormal earnings supporting the expectations of this study.

Taxes appear to affect the European share prices negatively in most countries with the exceptions of Finland and Greece. The findings suggest that taxes have a more significant effect on countries with lower taxation since they can attract foreign investment while in the case of high taxation the fly of local investment seems to stagnate the local markets. In addition, the different influence of taxation and

earnings (adjusted abnormal) on the share prices of small and medium firms when compared with that on the stock prices of large firms is identified. For the majority of the cases, earnings affect more the share prices of small and medium companies, while taxation affects more the share prices of large corporations. Finally, when the samples are divided according to different industries in three groups, those of high, medium and low market to book value ratio, the evidence seems to indicate that in industries which belong to the first group, earnings and taxes play a more significant role for the market value of the firm equity, in the light of a higher interest of local and foreign investors.

Overall, the value relevance of accounting numbers is very important for local investors and even further for international investors who attempt to identify the differences among different capital markets and environments. In spite that inside the European Union many dissimilarities appear to be harmonised, still, several issues remain different and seem to influence in various ways the capital markets. A significant relevant issue is that of taxation and the evidence provided in this study seems to reinforce the initial expectation regarding the high importance of taxation. Such evidence can be significant for investors and for policy makers, especially in relation to the ongoing debate on tax harmonisation versus tax competition inside the European Union.

# 5.3 THE VALUE RELEVANCE OF EXCHANGE RATES

## 5.3.1 INTRODUCTION: FELTHAM AND OHLSON (1995) AND EXCHANGE RATES

From the Treaty of Paris of 1951 which created the European Coal and Steel Community to the introduction of Euro notes on January 1st, 2002, the European Union moves continuously to further and further integration.[52] One of the most important integration steps was the adoption of a single currency among twelve European countries and the creation of the Economic and Monetary Union. It is argued that the introduction of a single currency would benefit largely the European firms and it would facilitate the operation of the Single Market. The elimination of the exchange rate risk (within the Euro-zone) and the reduction in costs of hedging that firms bear (and ultimately pass to the customers), give the opportunity to European firms to operate in a unified financial environment, with a converging cost of capital since the interest rates are now controlled by the European Central Bank.

This effort of the European Union authorities to create a unified economic environment has been directed in other areas as well as the currency union. Thus, further accounting integration is pursued from the European Commission throughout the EU in a process described previously in Section 3.1. The accounting developments and the common currency implementation, together with the free capital movement within the EU, does affect the market value of European firms, since foreign investors are attracted and the mobility of capital among the Euro-zone countries is further facilitated.

Although both exchange rate changes and accounting numbers are very significant for firm valuation, there is a scarcity of empirical research relating these two determinants of firm value. The value relevance of accounting numbers has been explored previously, however, the influence of exchange rates, well discussed in the

[52] The Treaty of Paris was signed by Belgium, France, Luxembourg, Italy, the Netherlands, and Germany. In addition, the European community grew further in the 1970's when Denmark, Ireland and the UK entered, in the 1980's with Greece, Portugal and Spain, and in the 1990's with the addition of Austria, Finland and Sweden. The next enlargement will take place in May 2004 and is going to include ten Central and Eastern European countries.

finance literature, was not taken under consideration in this framework. The present empirical study examines the value relevance of accounting numbers and of changes in exchange rate. As before, the discussion is concentrated in the Euro-zone countries with the addition of the United Kingdom for comparison reasons.

The results of this empirical study indicate the significance of accounting numbers, in this case financial assets, operating assets and abnormal operating earnings for the valuation of firms in all countries examined. In addition, the importance of exchange rates, in particular for countries that face higher currency fluctuations, when the Real Effective exchange rate, that accounts for trade and inflation movements, is employed. On the other hand, the exchange rate of the local currencies towards the US dollar seems to be significant for the market value of firms in fewer countries. These results are expected since the largest amount of foreign trade for the European Union countries concerns intra-EU trade and therefore fluctuations of the exchange rates towards the US currency do not seem to have a great influence on the market value of the European firms. Finally, very important is the evidence indicating the significance of the adoption of the Euro for Euro-zone countries, since the currency risk identified for the period 1988-1998 seems to be eliminated after the 'locking' of the local currencies to the Euro (1/1/1999), providing additional evidence in favour of the participation in the Euro-zone for the countries still outside the Economic and Monetary Union.

### 5.3.2 Feltham and Ohlson (1995) and Exchange Rates: Selected Literature

Empirical research on applications of the Feltham and Ohlson (1995) model has been discussed in Section 2.2.5. In addition, an extended literature review of empirical work on exchange rate influences on the stock market was the focus of Section 3.3.2. Henceforth, at this point some attention is paid to some specific aspects of previous papers relevant to this empirical study. An issue, in terms of comparability, arises from the fact that there is not any study up to date (to the knowledge of the author) that relates exchange rates with accounting numbers in a valuation framework and

therefore the results will be compared with research utilising different research designs and methodologies, as discussed in Section 3.3.2.[53]

Initially, the findings will be compared to results reported by Joos (1997) and Arce and Mora (2002) in terms of the coefficients of the Ohlson framework relative to firms in European countries. As mentioned in the previous empirical study, Joos (1997) provides results that indicate the higher value relevance of book value for France comparing with the cases of Germany and the UK. In addition, the author finds that the $R^2$ of the Ohlson (1995) model is higher for French firms than for German and British firms. Arce and Mora (2002) argue that earnings are more value relevant than book value (i.e. resulting to higher coefficients) in 'market-oriented' countries (they include the Netherlands and the UK) and that the opposite occurs for 'credit-oriented' countries (including the rest of EU continental countries). It should be noted that both studies utilise the Ohlson (1995) model and therefore the consistency of the results will be examined in a broad sense.

The results of the present study regarding the value relevance of exchange rate movements will be analysed on the light of previous research in international finance that discusses share price – exchange rate interconnections. In particular, papers analysing the issue from a European perspective will be utilised. Dominguez and Tesar (2001) examine the exchange rate exposure of several countries including five Europeans among which they identify the Netherlands and Italy as those with the highest exchange rate exposure. Martinez-Solano (1998) identifies the importance of operational exposure for most of Spanish firms in his sample. In addition, Doidge et al (2002) test a group of eighteen countries suggesting that exchange rate exposure is related to foreign activities and size while they provide results to indicate the percentage of firms with negative and positive exchange rate effects to their stock prices. Bartram et al (2002) present evidence for the importance of the introduction of the Euro for companies with activities in the Euro-zone countries.

[53] The only case of some relevance relating accounting numbers and exchange rates in a valuation framework is that of the very preliminary study by Choi (2001) relating abnormal stock returns with earnings and exchange rate changes with inconclusive findings (Section 3.3.2).

Moreover, Solnik (1987) examines the relationship between stock returns and changes in the exchange rate for several countries including France, Germany, the Netherlands and the UK. His findings provide some evidence of a relationship between the two variables. Ajayi and Mougoue (1996) study the relation between stock price changes and exchange rate movements for France, Germany, Italy, the Netherlands and the UK (among others). Their results show the bi-directional effects between European returns and currency movements. Finally, the results for Greece will be compared with those of Grambovas (2003) where a relationship between Greek stock prices and the drachma exchange rate towards the US dollar is identified.

At this point, the discussion will be directed to the research design of the study and the setting of the hypotheses tested.

### 5.3.3 Feltham and Ohlson (1995) with Exchange Rates: Research Design, Hypotheses Setting and Sample Selection

In order to assess the research questions the Feltham and Ohlson (1995) model will be employed. The FO95 model implies that the market value of firm equals the book value, as divided to operating and financial assets, when adjusted for profitability (abnormal operating earnings) and predictions of future profitability (through other non-accounting information variables). The model, as developed in Section 2.2.3, takes the following form (after dividing book value to financial and operating assets):

$$\mathbf{P_t = fa_t + \alpha_2\, ox^a_t + \alpha_3\, oa_t + \beta_1\, v_{1\,t} + \beta_2\, v_{2\,t}} \qquad \mathbf{(32)}$$

$P_t$ denotes the market value of equity, $fa_t$ the net financial assets, $ox^a_t$ the abnormal operating earnings, $oa_t$ the net operating assets and $v_{1\,t}$ and $v_{2\,t}$ are the 'other – non accounting – information' variables.

In the present empirical study the Feltham and Ohlson model (1995) is used, as it appears to be the latest and most articulated development in the valuation studies literature and has certain documented advantages (see Section 2.2.4). The preference of the Feltham and Ohlson (1995) model instead of the Ohlson (1995) model, used in the previous empirical study, lies on the discussion made earlier regarding exchange rates. The objective of this study is to examine the value relevance of exchange rate movements and as described in Section 3.3.1, the fluctuations of the exchange rate affect the operating activities of the firm providing abnormal operating earnings. The effects of exchange rate changes on the financial activities of the firm are coined in the literature as a short term risk and do not provide, because of hedging, abnormal earnings. Thus, the development of the Ohlson (1995) model by Feltham and Ohlson (1995) seems to be the appropriate research design for this empirical study.

Relevant to the discussion of the empirical findings to follow are the points made in Section 2.2.3 regarding the coefficients of the Feltham and Ohlson (1995) model, namely that the coefficients $\alpha_2$ and $\beta_1$ will be affected by the persistence of abnormal operating earnings, while the coefficients $\alpha_3$ and $\beta_2$ will be affected by the level of traditional conservatism due to the Linear Information Model. In addition, some issues of empirical research design will be addressed. An intercept is included in the model in order to capture effects on equity prices from factors that are omitted from the model, as suggested by Begley and Feltham (2000) among others. The expectation is that the intercept will be positive and statistically significant. Another issue appears, related to financial assets that theoretically influence prices in a one-to-one basis. In practical terms the coefficient of financial assets might deviate from the predicted unity and to assess that a coefficient ($\alpha_1$) will be included in the model with the expectation that should be close to the unity in all cases.

According to Feltham and Ohlson (1995), the coefficient of net operating assets ($\alpha_3$) is also expected to be positive, significant and close the unity. Furthermore, the abnormal operating earnings per share $ox^a_t$ are defined as operating earnings per share less 'normal' operating earnings which consist the beginning of period net operating assets per share times the one-year Treasury bill rate plus 4% following Ahmed et al (2000). As discussed in the previous empirical study, in the literature

several risk-free rates were used but since changes in the cost of capital are significant during the years and among the countries an interest rate plus a premium is employed.

The focus of this study is on the influence of changes in exchange rates on firm market value and thus, as described in Section 4.2, the change of the exchange rate will be used in place of the 'other – non accounting – information' variable $v_{1\,t}$. An issue might arise regarding the volatility of the foreign exchange market (FOREX). In this study annual changes will be used, however, the FOREX market is very volatile and the use of a more frequent variable may be suggested. Prior research in exchange rate exposure utilises quarterly (e.g. Bartov and Bodnar (1994)), monthly (e.g. Martinez-Solano (1998); Ihrig (2001)), or weekly data (e.g. Dominguez and Tesar (2001)). However, most studies reach the conclusion that the evidence of exchange rate exposure increases if larger time periods are considered. Dominguez and Tesar (2001) identify that the currency exposure for the European countries in their sample reaches its highest point when an annual period is used. Chow, Lee and Solt (1997) infer that in the short run, firms have the ability to assess the currency risk and subsequently hedge it and according to the authors this is one of the most important reasons that exchange rate change effects are absent in many previous studies that utilise short horizons. However, they argue, the long run effects, relative to future cash flows, are difficult to ascertain and thus the hedging effectiveness is considered to be doubtful. Furthermore, their results indicate the importance of long run effects of changes in the exchange rate on share prices and in particular the first and second year effects. Based on the above, it is argued in the present thesis that the use of the annual change of exchange rates is consistent with evidence reported in prior research and it is important in identifying long run effects of exchange rate movements on European stock prices.

First, the change of the Real Effective Exchange Rate (REER - $\mathbf{xr_t}$) index is used. The REER index represents the ratio (expressed on the base 1995) of an index of the period average exchange rate of the currency in question to a weighted geometric average of exchange rates for the currencies of selected countries. In addition, the REER index is adjusted for relative movements in national price or cost indicators of

the home country and selected countries. An increase in the index reflects an appreciation. The model tested is the following:

$$\mathbf{P_t = \alpha_0 + \alpha_1\, fa_t + \alpha_2\, ox^a{}_t + \alpha_3\, oa_t + \beta_1\, xr_t + u_t} \qquad \mathbf{(33)}$$

Where $xr_t$ is the exchange rate variable utilised here, i.e. the change in the REER index and $u_t$ is an error term. The rest of the notation is the same as in equation (32).

In addition to the REER index, the change of the exchange rate of the local currency towards the US dollar ($\mathbf{us_t}$) is employed in place of the $v_{1\,t}$ for comparison reasons. On the contrary with the previous index, an increase in this exchange rate variable indicates a depreciation of the local currency. The following equation is tested.

$$\mathbf{P_t = \alpha_0 + \alpha_1\, fa_t + \alpha_2\, ox^a{}_t + \alpha_3\, oa_t + \beta_1\, us_t + u_t} \qquad \mathbf{(34)}$$

Where $us_t$ is the change in the exchange rate of the local currency towards the US dollar. The rest of the notation as in equations (32) and (33).

Finally, the absolute value of the REER index ($\mathbf{xr^v_t}$) is going to be used in place of the other information variable in order to test the validity of choosing the change of exchange rates instead of their absolute values. Therefore, the model tested is the following:

$$\mathbf{P_t = \alpha_0 + \alpha_1\, fa_t + \alpha_2\, ox^a{}_t + \alpha_3\, oa_t + \beta_1\, xr^v{}_t + u_t} \qquad \mathbf{(35)}$$

Where $xr^v{}_t$ is the absolute value of the REER index, while the rest of the notation is the same as in equations (32) and (33).

At this point the discussion concentrates on the formulation of the hypotheses. First, the accounting variables are expected to be value relevant and hence their coefficients in the model to be statistically significant and positive in all. In addition, the coefficient $\alpha_1$ on financial is expected to have values close to the unity as suggested by theory. It is also expected that changes in the exchange rate are value

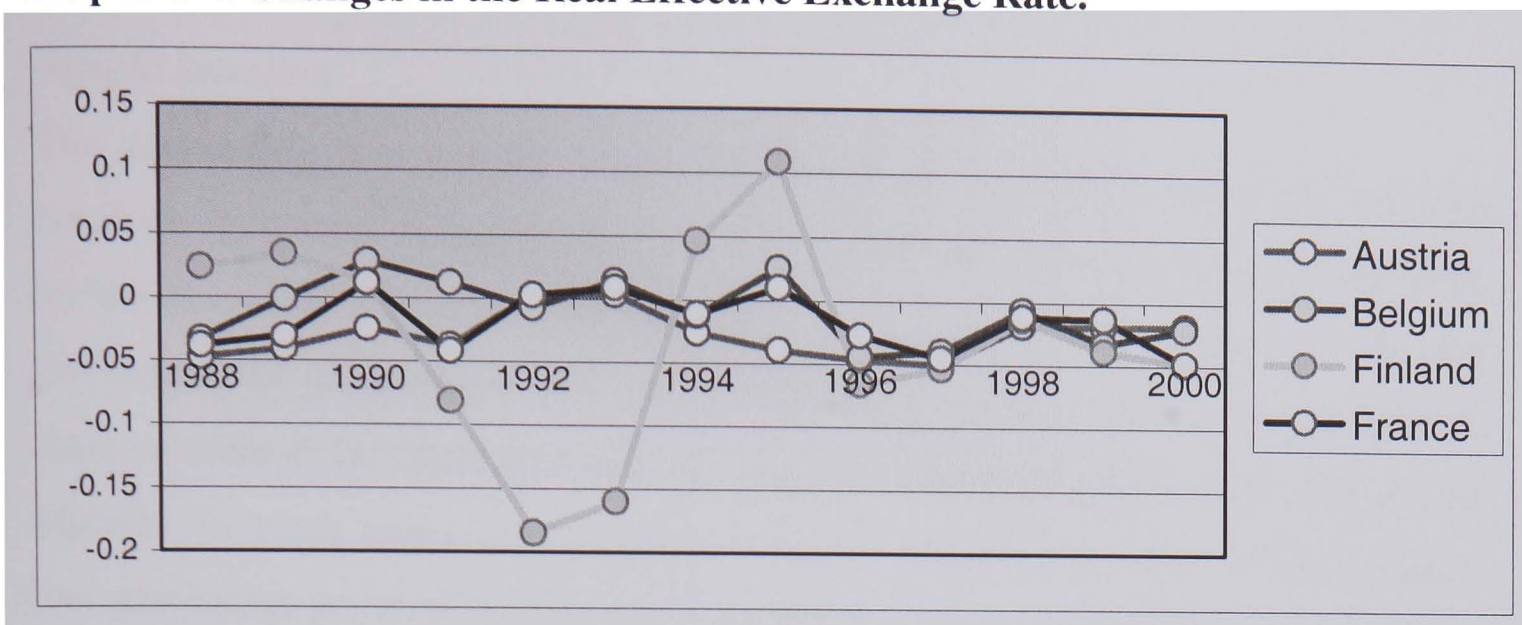
relevant especially in the countries that face unstable exchange rates. To identify such countries, the Graphs 2-4 have been drawn below and describe the changes of the Real Effective Exchange Rate index for all countries in the sample. Observing the Graphs 2 to 4, one can notice that the countries with more flexible exchange rates are Finland, Italy and the UK. The exchange rates of these three countries reach changes up to ±20% when the rest of the countries seem to experience exchange rate changes up to ±5%. Henceforth it is expected that the exchange rate changes are more important in influencing the share prices for these three countries leading to significant coefficients $\beta_1$ on the exchange rate variable.

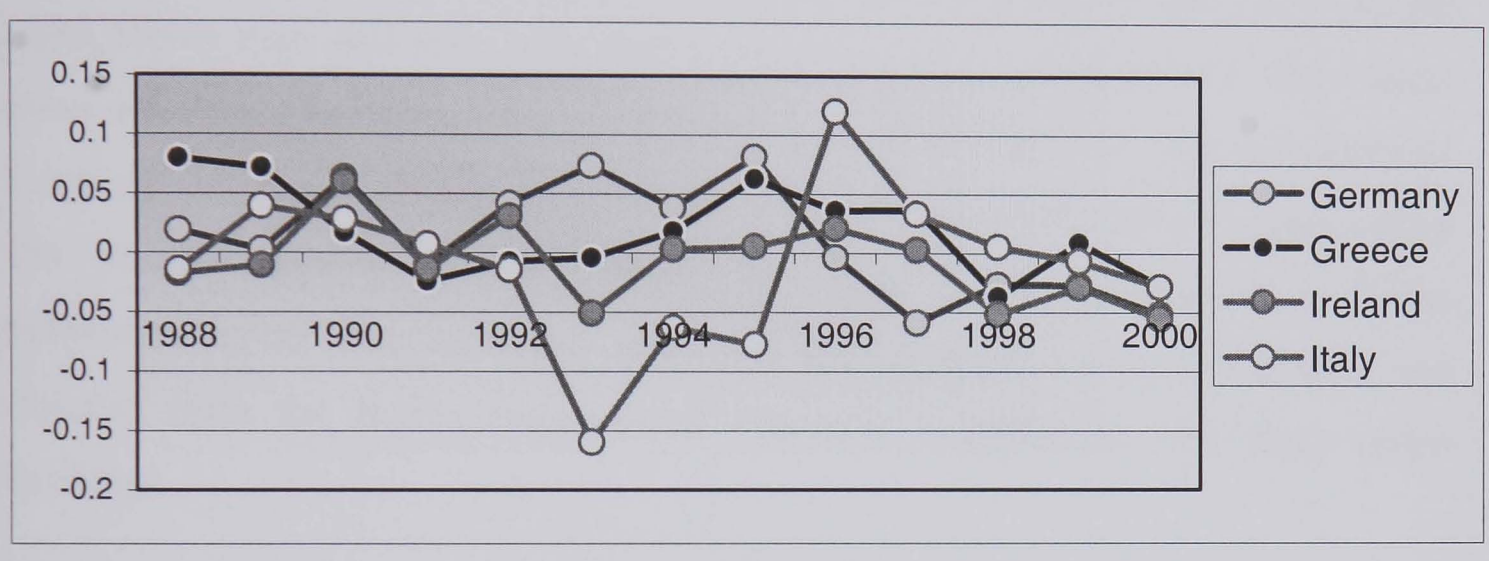
Overall, it is argued that changes in exchange rate are value relevant especially in countries that face unstable exchange rates. Therefore, an important contribution of this empirical study lies on the importance of exchange rate movements to the market value of the European firm and the interaction with accounting numbers. The analysis is based in all firms and not only to those with a direct international involvement since it is argued that both direct and indirect, and short run and long run effects influence the relationship between stock prices and exchange rates.

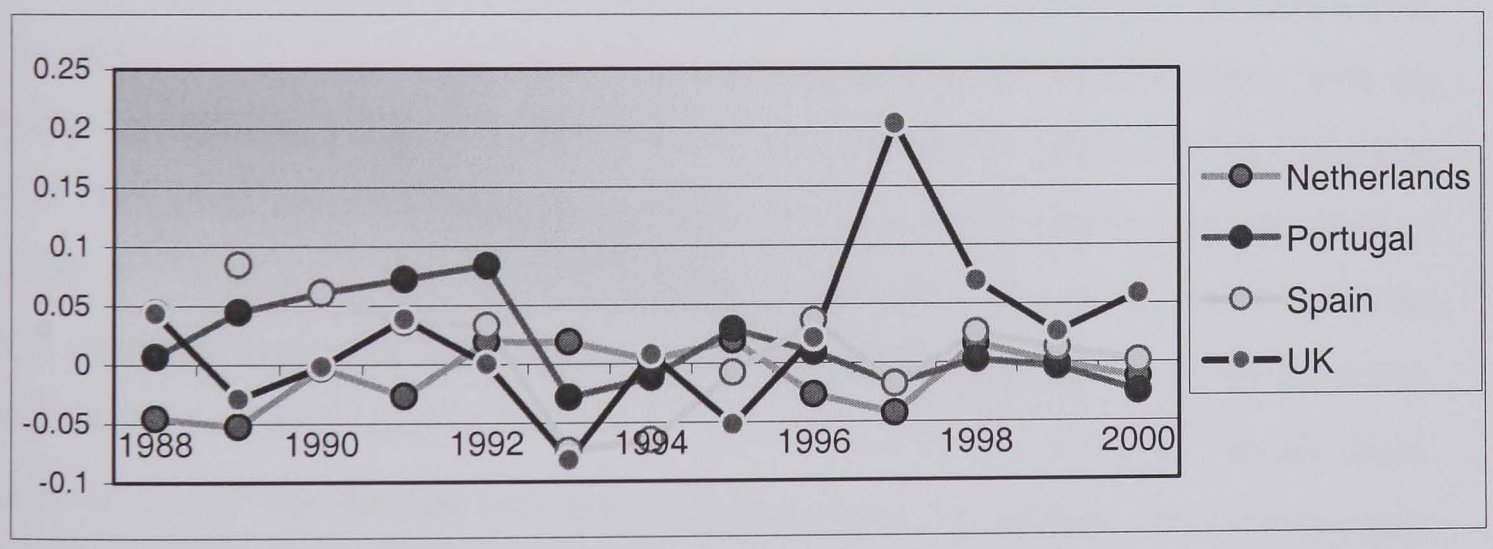
In the Euro-zone the such research question obtains even more importance after the decision of twelve EU Member States to drop their currencies in favour of a common European currency. In order to assess the effects of the adoption of the Euro, tests are performed to two Euro-zone equally weighted samples formed with regard to the date of the 'locking' of all currencies to the Euro (1/1/1999).[54] This result is going to be compared with evidence from similar UK samples.

[54] In the case of Greece the 'locking' of the Greek Drachma parity to the Euro occurred on January 2001 but since January 1999 the Greek authorities maintained the Greek Drachma /Euro rate virtually stable (with a small revaluation on January 2000 to account for inflationary risks).

**Graphs 2-4. Changes in the Real Effective Exchange Rate.**




Source: IMF International Financial Statistics (2001).

*Sample Selection*

The accounting and market data is collected by the Extel Company Analysis Database for a time period of thirteen years (1988-2000), for all non-financial firms for the Euro-zone countries plus the UK. Luxemburg was excluded due to the very low number of observations. All data for all variables are in local currencies and per share in order to be consistent with the previous empirical studies. All variables are adjusted for stock splits and dividends using the adjustment factor of the database. One percentage point of outliers has been removed from the upper and lower part in value of the samples of all variables. The Net Operating Assets are defined as current assets minus cash and near cash plus fixed assets plus advances plus other assets minus other long liabilities minus creditors minus other liabilities. The Net Financial Assets are defined as financial assets plus cash and near cash minus deposits minus debt minus minority interest minus contingencies and commitments minus preference shares. The exchange rates and the one-year Treasury bill rates are collected from the IMF's International Financial Statistics for the years under discussion.

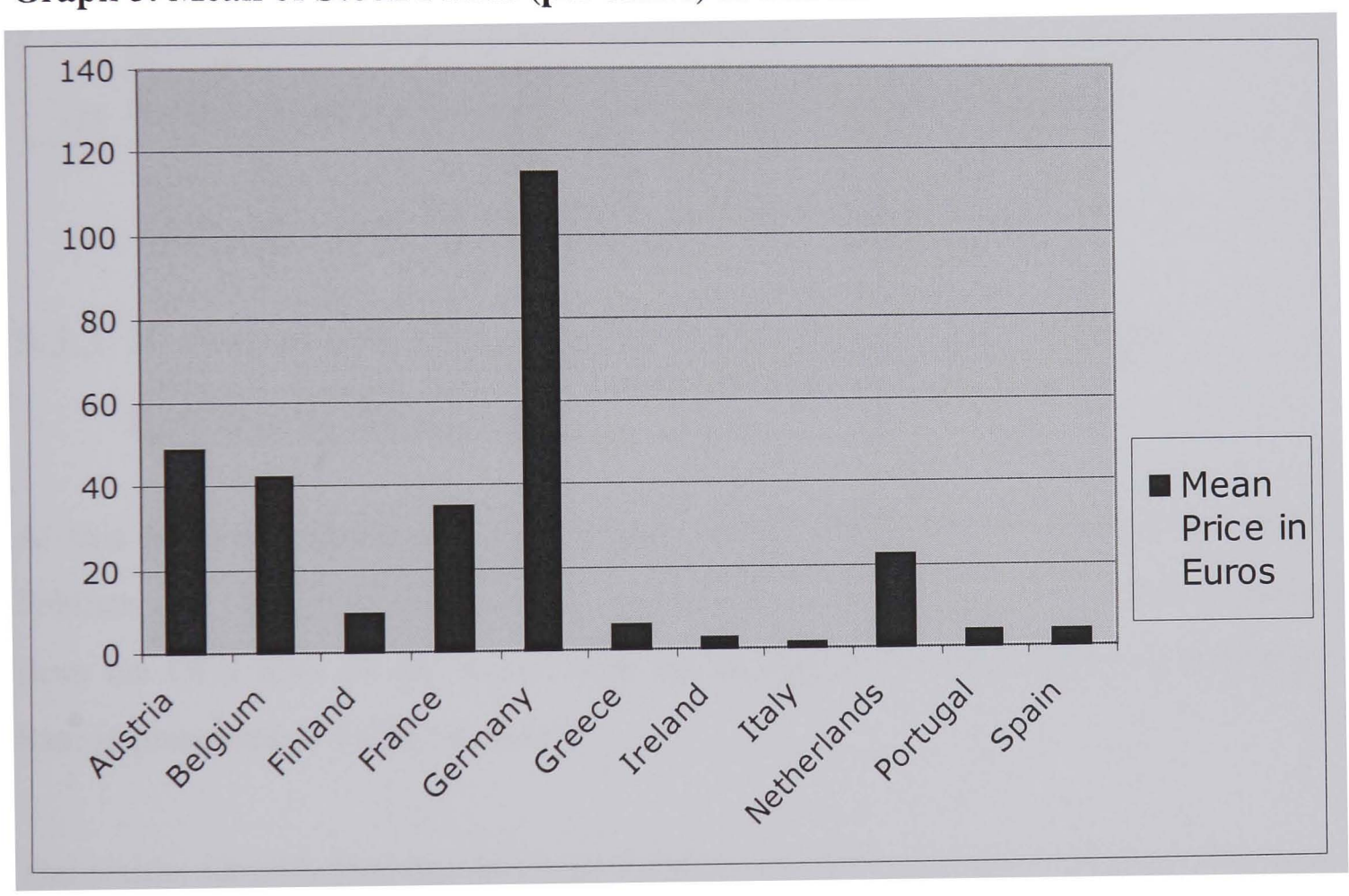
The descriptive statistics of the variables for all countries are reported in Tables C3a-l in Appendix C. There are high differences regarding the sample sizes, with the smaller sample for Portugal with 113 observations and the largest for the UK with 4640. The local currency of most countries has in average depreciated in terms of REER except of the cases of Germany, Spain and the UK. On the other hand, the local currency exchange rate towards the US dollar has depreciated in all countries, with the largest depreciation in Greece and the smallest in the UK.[55] In all cases, prices are positively skewed with the mean exceeding the median while the opposite happens for the abnormal operating earnings which appear to be negatively skewed for all countries.

Among the countries the descriptive statistics can not compared directly (except of exchange rate variables) since in all cases the local currencies have been used.

[55] The reader should notice that an increase in the rate of REER means an appreciation of the currency while an increase in the exchange rate of the local currency towards the US Dollar means a depreciation of the currency.

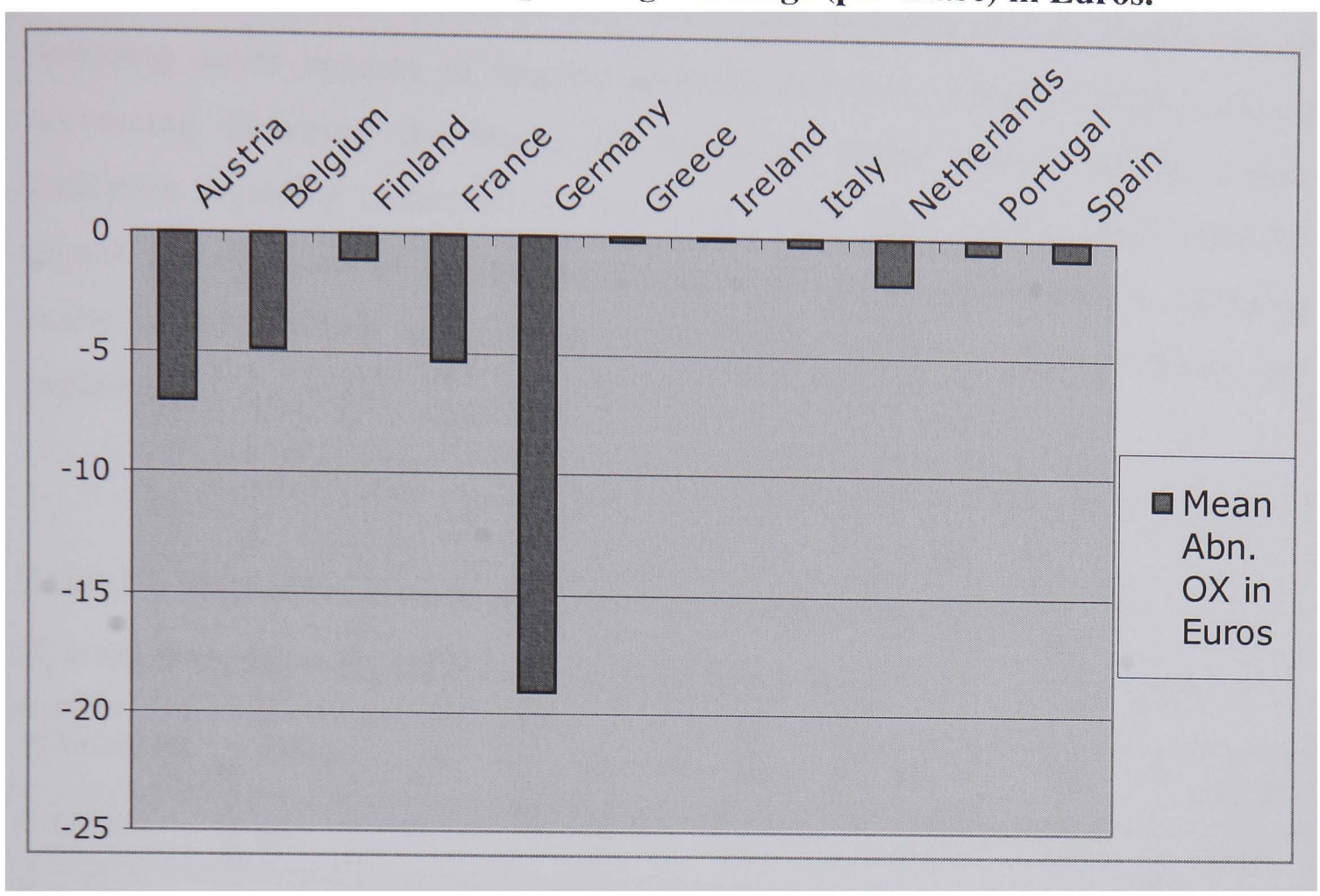
Therefore, for comparison reasons, the means of the share prices and of the abnormal operating earnings for the Euro-zone countries have been translated into Euros and the results are presented in Graphs 5-6.[56] The highest price mean is found for German share prices (at 115 Euros), while the lowest is found for Italian shares (at 1.5 Euros). Firms in all countries appear to have in average abnormal operating losses, even though many (Greece, Italy, Ireland, Portugal and Spain, as well as the UK) approach a break even point. The highest average abnormal operating losses appear in the case of Germany (at 19 Euros for every share) and the lowest in Ireland (at 0.13 Euros per share).

**Graph 5. Mean of Stock Prices (per share) in Euros.**




[56] All the currencies, except of the British pound, are 'locked' to the Euro and thus the translation was easier while the Euro/GBP rate changes continuously. As a reference one could multiply the pound numbers with approximately 1.5 (the Euro-Pound rate in 1999) in order to compare the British descriptive statistics with the rest.

**Graph 6. Mean of Abnormal Operating Earnings (per share) in Euros.**




### 5.3.3 Feltham and Ohlson (1995) with Exchange Rates: Empirical Results

At this point the discussion concentrates on the results of the regressions on the Feltham and Ohslon (1995) with the incorporation of exchange rates. The evidence from the OLS tests on the model with the change in the Real Effective Exchange Rate is presented in Table 14, below.

The results identify that the intercept for most countries (except of Ireland, Portugal and Spain) is positive and statistically significant indicating the existence of other factors that might influence share prices and that they are not included in this model.

Furthermore, for the majority of the countries the coefficient $\alpha_1$ on financial assets seems to roughly approach the unity as specified by theory. The There are exceptions in the cases of Belgium, where $\alpha_1$ is low and statistically significant only at a 10% level and Ireland, where $\alpha_1$ is statistically insignificant. These results are consistent

with the ones presented in the previous empirical study on Taxation where an Ohlson (1995) model is used (Section 5.2). For some countries the coefficient $\alpha_3$ on operating assets appears to roughly approach the unity which implies unbiased accounting. However, the results are in general mixed without giving a clear indication regarding conservatism. Stromann (2000) finds similar results and she argues that the issue of conservatism with regard to the coefficient on operating assets in the Feltham and Ohlson (1995) model should be better defined and explained.

**Table 14. Regression Results of FO95 with change in the REER**

$$P_t = \alpha_0 + \alpha_1 fa_t + \alpha_2 ox^a_t + \alpha_3 oa_t + \beta_1 xr_t + u_t \qquad (33)$$

| Countries | Obs. | $\alpha_0$ | $\alpha_1$ | $\alpha_2$ | $\alpha_3$ | $\beta_1$ | Adj. $R^2$ |
|---|---|---|---|---|---|---|---|
| **Austria** | *446* | **295.7**** | **0.753**** | **-0.292**** | **0.567**** | 539.5 | **60.7** |
| **Belgium** | *624* | **349.4**** | **0.056*** | **1.012**** | **0.727**** | 1452 | **72.2** |
| **Finland** | *386* | **18.62**** | **0.894**** | **0.210*** | **0.864**** | **-65.80**** | **57.3** |
| **France** | *3189* | **100.7**** | **0.218**** | **0.412**** | **0.609**** | **353.5*** | **52.3** |
| **Germany** | *2045* | **115.6**** | **0.527**** | **0.387**** | **0.595**** | **626.1**** | **39.5** |
| **Greece** | *144* | **459.5*** | **2.168**** | **1.974*** | **2.662**** | 1248 | **43.5** |
| **Ireland** | *213* | -0.005 | -0.125 | **3.465**** | **1.369**** | -0.073 | **77.7** |
| **Italy** | *1068* | **740.4**** | **0.291**** | **1.223**** | **0.799**** | **2966**** | **57.3** |
| **Netherlands** | *1088* | **20.34**** | **1.110**** | **0.739**** | **0.968**** | **-118.3**** | **67.8** |
| **Portugal** | *113* | 63.92 | **0.564**** | **0.537**** | **0.954**** | -1949 | **83.6** |
| **Spain** | *920* | 21.39 | **0.666**** | **0.789**** | **0.976**** | 453.6 | **76.3** |
| **UK** | *4640* | **0.963**** | **0.302**** | **1.720**** | **0.973**** | **0.545*** | **33.8** |

Note: ** and * denote statistical significance at a 5% and 10% levels respectively. $P_t$ denotes the market value of equity, $fa_t$ the net financial assets, $ox^a_t$ the abnormal operating earnings (operating earnings minus the beginning period net operating assets times the 1-year Treasury bill rate plus 4%), $oa_t$ the net operating assets, $xr_t$ the change of the Real Effective Exchange Rate (REER) index and $u_t$ is an error term. Adjusted $R^2$ is in percentage.

The coefficient on abnormal operating earnings appears to be significant for all cases, even though its negative value in the case of Austria was not anticipated. The latter may be related to the definition of the 'abnormal' operating earnings and that in cases like Austria the market pays also attention on 'normal' earnings. However, the result of Austria appears to have similarities with the previous empirical study, where the coefficient on abnormal earnings is the only statistically insignificant from the same coefficients of 12 countries. The coefficient on abnormal operating earnings is higher for Ireland, the UK and Italy, indicating the higher influence that earnings play on the stock prices in these countries. On the contrary, the lowest coefficients on abnormal operating earnings are met for Finland, France and Germany. For the latter case, despite the consistency with the relevant result of the previous empirical study, the coefficient appears to be low even though German firms have the highest amount of abnormal operating losses (Graph 6) from all the countries in the sample when the means are compared.

The results are not consistent with the suggestion by Joos (1997) that book value is more value relevant in France than in Germany and the UK. In terms of $R^2$ the findings are consistent with Joos (1997), since $R^2$ is higher for the French case than in Germany and the UK. Abnormal operating earnings appear to be more value relevant, providing a higher coefficient, than financial and operating assets for the case of the UK, coinciding with the relevant finding by Arce and Mora (2002).

Different results are observed across countries regarding the influence of exchange rate changes as indicated by coefficient $\beta_1$. Overall, the predictions regarding the importance of the exchange rate movements in the countries which faced more fluctuations in their exchange rates are verified. The coefficient on the change in the REER is significant for Finland, Italy and the UK. In addition, it is identified that the exchange rate changes are important for the more developed capital markets, since the $\beta_1$ coefficient is statistically significant for France, Germany and the Netherlands. On the contrary, for Austria, Belgium, Greece, Ireland, Portugal and Spain the exchange rate changes do not appear to be important. These results are influenced heavily by country-specific characteristics and therefore a closer attention should be paid in specific national circumstances.

For Finland the coefficient on the changes in the REER variable is negative and comparatively high, indicating that appreciations of the local currency influence negatively the Finnish share prices. The influence of exporting companies is important in this result in the light that many exporters are listed in the Finnish capital market. The most important determinant of this finding is attributed to the fact that the Helsinki Stock Market is dominated by Nokia, a major exporter, with its share price directly affected by fluctuations in the Finish Markka (Euro after 1/1/99). Next to Nokia, the largest and most important companies listed in the Finish market are exporting firms such as Sonera, the major competitor of Nokia, and a number of large Timber companies. Thus, when the local currency depreciates, the price of Finnish goods abroad becomes cheaper and henceforth the earnings and future earnings of exporting firms are favourably affected, influencing positively their share prices. The reverse effects appear for appreciations of the local currency and while hedging can face the losses related to transaction exposure, the losses from operating exposure are more difficult to avoid, as discussed previously. Therefore, changes in the exchange rate influence significantly the market value of the Finnish firms, as far as exporting firms dominate the Helsinki Stock Exchange,.

A similar result is reported for the Netherlands, where the coefficient on the exchange rate variable is statistically significant and negative. The importance of large firms with foreign activities like the Royal Dutch, Philips, Akzo, Unilever, and KLM appears to be significant. In addition, the Amsterdam stock market is one of the most developed in the European Union (participating in the EuroNext stock exchange – a merger between the Paris, Amsterdam and Brussels markets) and there are several international investors trading shares of Dutch-based companies. Based on the above, a depreciation of the local currency makes Dutch shares cheaper, attracting capital inflows from foreign investors, leading to increases in prices.

In the previous literature, Dominguez and Tesar (2001) indicate that the Netherlands and Italy are the European countries with the higher exchange rate exposure in their sample. In addition, Doidge et al (2002) find that there is a higher percentage of Dutch firms with negative coefficients on the exchange rate variable than with positive, giving support, in a way, to the above discussed result. In addition, Ajayi

and Mougoue (1996), using cointegration methodology, argue that in long run (using high frequency data) depreciation in the Dutch currency lead to increases in Dutch share prices. Finally, Solnik (1987) identifies the same nature in the relation between stock returns and changes in the exchange rate for the Dutch case.

Changes in the exchange rate influence directly the market prices of Italian listed companies. The sign of the exchange rate change variable is positive, meaning that an appreciation of the Italian Lira (the currency in the longer period of our sample) would lead to increases in the stock prices. Such result was expected since the Italian exchange rate is one of the most volatile in the sample. A relevant explanation may lie on the behaviour of the importing companies and their possible driving of the results. However, it is argued that the main driving reasons for such result are different. The Italian Lira during the years faced various depreciations being in general very unstable. The Italian currency seems here to play the role of barometer of the Italian economy, meaning that appreciations of the Lira would indicate good news for the Italian economy and consequently for the Italian companies by that driving their share prices upwards.

This result is consistent with the findings of Doidge et al (2002) that show Italian firms with positive coefficients on the exchange rate variable than negative. In addition, Dominguez and Tesar (2001) identify the high importance of foreign exchange exposure for the case of Italy as mentioned above,. Finally, consistent findings are reported by Ajayi and Mougoue (1996), where appreciations of the Italian currency lead to increases in share prices of Italian firms.

The results of countries with the most developed capital markets in the sample, namely the UK, Germany and France, are of a particular importance. In all three countries exchange rate movements affect positively stock prices, with British and French results statistically significant only at a 10% level. The British result was expected since the British Pound fluctuated more than most of the other European currencies moving within a range of -5% to +20% (see Graph 4). Some relevant indications also appeared for the German case, with the German currency fluctuating, though to a lesser extent, between -6% to +8% (see Graph 3). However, in the case of France the REER appears to be stable with a range of fluctuations just between -

5% to +1%.[57] Moreover, the sign of the coefficient on the change on the REER is important, while in these three countries is positive. This indicates that increases in the exchange rate REER (appreciations of the currency) have positive effects on share prices in France, Germany and the UK. In these countries, the exchange rate is regarded as indicator of the strength of the economy and therefore appreciations of the local currency can signal the improvement of the local economy and hence attract more investors for local equity.

An additional explanation is given by Ajayi and Mougoue (1996) when similar results are identified for the same countries. The authors argue that "*for an economy with a significant import sector, the unfavourable effects of a currency depreciation on imports may induce a bearish stock market in the long run*". Moreover, Doidge et al (2002) report similar results for France and the UK, where they find more companies with positive exchange rate coefficients than negative, while the opposite is identified in their sample for German companies. Finally, the results of this study appear to be inconsistent with those provided by Solnik (1987), however, the difference may be related to the fact that the time period considered in the latter (1973-1983) is very different from the time period of the present empirical study (1988-2000).

Next, the impact of the adoption of the Euro for the share prices of the firms of the Euro-zone is going to be examined. In addition, potential differences in the value relevance of accounting numbers for European countries in these two time periods (before and after the creation of the Euro) are assessed. Furthermore, the same relations are tested for same in size British samples. The importance of exchange rate for the market value of British firms can be a significant argument in the ongoing debate regarding the adoption of the Euro in the UK. The results for the Euro-zone and the UK for equally-weighted, randomly selected, samples both in terms of country observations (for the Euro-zone 44 per country per period) and time period observations (484 each period) are presented in table 15 below.

[57] The low level of significance (just 10%) may be an indication of the importance of the latter result.

**Table 15. Regression Results of the FO95 with the change of the REER: the Impact of the Euro**

$$P_t = \alpha_0 + \alpha_1 fa_t + \alpha_2 ox^a_t + \alpha_3 oa_t + \beta_1 xr_t + u_t \qquad (33)$$

| Countries | Obs. | $\alpha_0$ | $\alpha_1$ | $\alpha_2$ | $\alpha_3$ | $\beta_1$ | Adj. $R^2$ |
|---|---|---|---|---|---|---|---|
| **Euro** (88-98) | *484* | **335.4**** | **0.077**** | **1.251**** | **0.662**** | **2371**** | **75.8** |
| **Euro** (99-00) | *484* | **483**** | **0.371**** | 0.005 | **0.902**** | 8813 | **60.7** |
| **UK** (88-98) | *484* | **0.737**** | 0.075 | **1.629**** | **1.010**** | 0.208 | **37.3** |
| **UK** (99-00) | *484* | **2.006**** | 0.268 | **1.565**** | **0.808**** | **-15.38**** | **21.4** |

Note: ** denotes statistical significance at a 5% level or above. $P_t$ denotes the market value of equity, $fa_t$ the net financial assets, $ox^a_t$ the abnormal operating earnings (operating earnings minus the beginning period net operating assets times the 1-year treasury bill rate plus 4%), $oa_t$ the net operating assets and $xr_t$ the change of the Real Effective Exchange Rate (REER) index and $u_t$ is an error term. Adjusted $R^2$ is in percentage.

In the case of the Euro-zone, in the period from 1988 to 1998 all independent variables appear to be value relevant. One issue arises from the very low coefficient on financial assets which does not approach the unity suggested by theory. In addition, the coefficient on abnormal earnings is statistically significant and positive as for all countries (but Austria) in the previous table. In the whole of Euro-zone exchange rate changes appear to be important for firms' share prices since the coefficient appears to be significant. Finally, one could highlight the existence of a high adjusted $R^2$ percentage. For the recent period of 1999-2000 the situation seems to change, while abnormal earnings appear to lose significance for firms in the Euro-zone. In addition, the coefficients on financial and operating assets are higher which bring them closer to the theoretical value of the unity comparing to the previous time period.

There are two very important results to be given more attention: First, the adjusted $R^2$ percentage falls, while the value of the intercept rises, both implying the existence of

possible omitted variables from the model, which were not as significant in the previous time period. One possible omitted variable can be the international financial environment as it has been indicated previously in the literature (one of the first studies to discuss it was the one by Ma and Kao (1990)), since the integration of the world's capital markets has been accelerating in recent years. Such high integration of the international financial environment was not as important at the end of the 1980s and in the beginning of the 1990s but it has been very evident in the last years.

Secondly, very important is the result regarding the exchange rate changes. Exchange rate movements appear to not play an important role for the market value of companies of the Euro-zone after the adoption of the Euro from the twelve countries. This result indicates that the exchange rate risk (mainly related with the operating exposure of firms) has diminished significantly after the Euro-zone was officially formed. Such evidence provides additional support to the advocates of the single European currency and highlights the importance of participation in the Euro-zone for European countries that faced problems with fluctuations in their exchange rates and especially for several of the Eastern European candidates.

The above mentioned result is reinforced from the results of the British samples. While the coefficients on the accounting numbers of the model appear to remain rather stable in the two time periods, two relevant conclusions also appear for the UK. Firstly, the intercept rises and the adjusted $R^2$ percentage falls giving further support to the previous discussion regarding the increasing importance of the integration of international capital markets. Secondly, the British results indicate that, in the first time period (1988-1998), the exchange rate changes were not important for the equity of British companies. However, in the second time period (1999-2000), exchange rate changes appear to be significant for firms in the UK. Therefore, participation in EMU appears to indicate potential benefits for UK firms since in the Euro-zone the exchange rate risk appears to diminish while the contrary occurs in the UK during the last years.

In the empirical study of earnings conservatism (Section 5.1), it has been argued that the ERM exchange rate crisis of the year 1992 was responsible for the change in the level of earnings conservatism for the case of Spain. If this is the case then the

exchange rates change of this specific period has to be value relevant for Spanish firms. Therefore, equation (33) is tested for the important years of 1992 and 1993, the years affected more from this crisis. The results of the test indicate in Table 16 below, that exchange rate changes appear to be statistically significant for this year despite the fact that for the overall sample (Table 14) seem to not affect the market value of Spanish firms, verifying the conclusions of the empirical study on earnings conservatism. In addition, such result is consistent with the findings of Martinez-Solano (1998) when for the time period 1992-1997 he suggests the existence of exchange rate risk exposure in Spain.

**Table 16. Regression Results of the FO95 with the change in the REER for the years 1992-93**

$$P_t = \alpha_0 + \alpha_1 fa_t + \alpha_2 ox^a_t + \alpha_3 oa_t + \beta_1 xr_t + u_t$$

| Countries | Obs. | $\alpha_0$ | $\alpha_1$ | $\alpha_2$ | $\alpha_3$ | $\beta_1$ | Adj. $R^2$ |
|---|---|---|---|---|---|---|---|
| **Spain** | *172* | -88.76 | **0.384**** | **0.573**** | **0.875**** | **-2703**** | **73.4** |

Note: ** and * denote statistical significance at a 5% and 10% levels respectively. $P_t$ denotes the market value of equity, $fa_t$ the net financial assets, $ox^a_t$ the abnormal operating earnings (operating earnings minus the beginning period net operating assets times the 1-year treasury bill rate plus 4%), $oa_t$ the net operating assets and $xr_t$ the change of the Real Effective Exchange Rate (REER) index and $u_t$ is an error term. Adjusted $R^2$ is in percentage.

While the main focus of the study was on the effort to identify the influence of the exchange rate to market value of firms with removing as many irrelevant effects as possible, hence the use of the REER index, tests with other possible exchange rate variables are also presented. Thus, at this point the discussion is directed in the discussion of results of tests on equation (34), where the exchange rate variable consists of the change in the exchange rate of the local currency towards the US dollar (note that increases in the rate imply depreciation of the local currency).

**Table 17. Regression Results of the FO95 with the change in the local exchange rate towards the US Dollar.**

$$P_t = \alpha_0 + \alpha_1 fa_t + \alpha_2 ox^a{}_t + \alpha_3 oa_t + \beta_1 us_t + u_t \qquad (34)$$

| Countries | Obs. | $\alpha_0$ | $\alpha_1$ | $\alpha_2$ | $\alpha_3$ | $\beta_1$ | Adj. $R^2$ |
|---|---|---|---|---|---|---|---|
| **Austria** | *446* | **321.8**** | **0.751**** | **-0.259**** | **0.564**** | **-1259**** | **62.1** |
| **Belgium** | *624* | **347.3**** | **0.057*** | **1.008**** | **0.727**** | -446.1 | **72.2** |
| **Finland** | *386* | **19.09**** | **0.887**** | **0.205*** | **0.864**** | **34.29*** | **57.2** |
| **France** | *3189* | **96.96**** | **0.217**** | **0.412**** | **0.609**** | **-92.97**** | **52.4** |
| **Germany** | *2045* | **122.3**** | **0.528**** | **0.382**** | **0.613**** | **-229.7**** | **38.9** |
| **Greece** | *144* | -279.7 | **2.089**** | **1.989*** | **2.607**** | **7862**** | **45.6** |
| **Ireland** | *213* | -0.026 | -0.111 | **3.445**** | **1.373**** | 0.810 | **77.8** |
| **Italy** | *1068* | **750.0**** | **0.285**** | **1.243**** | **0.798**** | -806.4 | **57.2** |
| **Netherlands** | *1088* | **20.46**** | **1.117**** | **0.734**** | **0.973**** | 16.34 | **67.7** |
| **Portugal** | *113* | 79.82 | **0.551**** | **0.565**** | **0.948**** | -135.5 | **83.5** |
| **Spain** | *920* | 15.86 | **0.665**** | **0.795**** | **0.977**** | 161.9 | **76.2** |
| **UK** | *4640* | **0.978**** | **0.304**** | **1.724**** | **0.973**** | 0.063 | **33.7** |

Note: ** and * denote statistical significance at a 5% and 10% levels respectively. $P_t$ denotes the market value of equity, $fa_t$ the net financial assets, $ox^a{}_t$ the abnormal operating earnings (operating earnings minus the beginning period net operating assets times the 1-year Treasury bill rate plus 4%), $oa_t$ the net operating assets, the $us_t$ is the change of the exchange rate of the local currency towards the US dollar and $u_t$ is an error term. Adjusted $R^2$ is in percentage.

The results indicate the similarity of the nature of the relationship identified before for Finland, France and Germany, where currency depreciations in the first country and appreciations in the other two, have positive effects on stock prices. For Italy, the Netherlands and the UK it seems that the exchange rate towards the US dollar is not the appropriate choice in the effort to identify a potential relationship. In addition, the local currency towards the US Dollar exchange rate change appears to be important for the market value of Austrian and Greek firms. In the first case the exchange rate acts as an indicator of the state of the Austrian economy, while in the latter, and

consistent with Grambovas (2003) for the same definition of the exchange rate variable, the depreciation of the Greek drachma (and the Euro recently) towards the US Dollar seems to attract foreign investors since it makes Greek equity cheaper, which in turn increases the demand for Greek shares increasing their prices.

Finally, it could be suggested the use of the value of the REER index instead of the change in order to assess the influence of exchange rates to share prices. To address that tests are conducted for equation (35) of the analysis and the results can be seen in Table 18, below.

**Table 18. Regression Results of the FO95 with the absolute value of the REER**

$$P_t = \alpha_0 + \alpha_1 fa_t + \alpha_2 ox^a{}_t + \alpha_3 oa_t + \beta_1 xr^v{}_t + u_t \qquad (35)$$

| Countries | Obs. | $\alpha_0$ | $\alpha_1$ | $\alpha_2$ | $\alpha_3$ | $\beta_1$ | Adj. $R^2$ |
|---|---|---|---|---|---|---|---|
| **Austria** | *446* | **-1432**** | **0.721**** | **-0.201**** | **0.557**** | **17.51**** | **63.1** |
| **Belgium** | *624* | -2545 | **0.056*** | **1.014**** | **0.726**** | 30.45 | **72.3** |
| **Finland** | *386* | **69.88**** | **0.870**** | 0.142 | **0.872**** | **-0.53**** | **58.0** |
| **France** | *3189* | **-343.9**** | **0.211**** | **0.434**** | **0.602**** | **4.601**** | **52.8** |
| **Germany** | *2045* | **135.5**** | **0.533**** | **0.397**** | **0.631**** | -0.236 | **37.9** |
| **Greece** | *144* | -2359 | **2.166**** | **1.974*** | **2.659**** | 27.15 | **43.5** |
| **Ireland** | *213* | -1.842 | -0.136 | **3.506**** | **1.370**** | 0.019 | **77.8** |
| **Italy** | *1068* | **-1953**** | **0.273**** | **1.291**** | **0.798**** | **22.33**** | **57.5** |
| **Netherlands** | *1088* | **96.46*** | **1.119**** | **0.733**** | **0.974**** | -0.786 | **67.7** |
| **Portugal** | *113* | -3285 | **0.571**** | **0.501*** | **0.956**** | 33.94 | **83.6** |
| **Spain** | *920* | **1316**** | **0.670**** | **0.749**** | **0.975**** | **-12.3**** | **76.4** |
| **UK** | *4640* | **0.647**** | **0.304**** | **1.724**** | **0.973**** | 0.003 | **33.8** |

Note: ** and * denote statistical significance at a 5% and 10% levels respectively. $P_t$ denotes the market value of equity, $fa_t$ the net financial assets, $ox^a{}_t$ the abnormal operating earnings (operating earnings minus the beginning period net operating assets times the 1-year Treasury bill rate plus 4%), $oa_t$ the net operating assets, $xr^v{}_t$ the Real Effective Exchange Rate (REER) index and $u_t$ is an error term. Adjusted $R^2$ is in percentage.

The results indicate that Finland, France and Italy continue having statistically significant coefficients on the exchange rate variable and also of the same sign as in the main results of Table 14.In addition, it is important to highlight that for Finland and France the exchange rate variable is important for the market value of firm in all cases irrespectively on the variable used, indicating the strong influence of exchange rates on Finnish and French stock prices.

Finally, Austria has consistent result both in significance and nature (sign) with the previous table when the US dollar exchange rate change was used, while in Spain the value of the REER index appears to affect Spanish share prices (as in the case of the change for some years in Table 16). Such result appears to be consistent with Martinez-Solano (1998) where evidence was reported of exchange rate risk exposure for a number of Spanish companies for the period between 1992 and 1997.

### 5.3.5 THE FELTHAM AND OHLSON (1995) AND EXCHANGE RATES: CONCLUSIONS

Evidence presented in the present empirical study indicates the value relevance of financial and operating assets as well as of abnormal operating earnings for twelve European Union countries (Euro-zone plus the UK). In the best knowledge of the author such evidence appear for first time for most countries in this sample and therefore they can be significant for investors and markets. The differences among countries ought to be important for international investors who seek to diversify their portfolios and invest in several markets. Even more important for such reasons appear to be the evidence presented for smaller European Union markets and less important for the well-discussed large EU Member States.

In addition, the results show the value relevance of changes in exchange rate for most countries of the Euro-zone and the UK. The movements of exchange rates affect the market value of firms, in particular, in countries that face more volatile exchange rates, as well as, in countries with more developed capital markets. While for the first group exchange rate changes seem to affect the operating activities of exporters and

importers, in the latter group one of the most important influences appears to be related to the behaviour of the stock market as an indicator of the strength of the economy that can attract foreign and local investors. An important issue arises regarding the choice of the most appropriate exchange rate variable while one would expect that firms with different international activities may be influenced by different exchange rates. By conducting the tests using different exchange rate variables this empirical study has assessed such differences in a country level.

Finally, findings regarding the impact of the adoption of the single currency for Euro-zone countries are very important. The evidence indicates that exchange rate changes were important for the market value of the firms in the Euro-zone countries. However, after the adoption of the Euro it seems that the fluctuations in the exchange rate seize to have significant effects for firms' share prices in the same region. Such results are very significant for countries where there is an ongoing debate on their entrance in the Euro-zone area, abandoning their national currencies, such the remaining EU non-Euro-zone countries and the candidates for the EU eastward enlargement. This empirical study provides evidence for the case of the United Kingdom where, according to the results, the exchange rate changes become significant for the market value of British firms after the creation of the Euro-zone. These results combined with relevant reported findings for the whole of Euro-zone seem to indicate that a potential UK participation to the single European currency would be beneficial for British companies, while the exchange rate risk would be minimised.

# CHAPTER 6: SYNTHESIS AND CONCLUSIONS

## *Synthesis*

The process of creating a single set of international accounting standards by the IASB has been one of the most important recent developments in the area of accounting. This process has gained momentum since the European Union countries decided to oblige all listed firms with a domicile within the EU to present their accounts in accordance with IAS rules by 2005 (Section 3.1). Such accounting harmonisation should have certain beneficial effects for the capital markets, individual investors and the companies themselves, since it will enhance greater comparability of company accounts, improving market efficiency and reducing costs when companies seek capital abroad.

The aforementioned decision on the part of the European authorities is part of an ongoing attempt to remove differences within Europe in an effort to create a unified financial environment for all European firms, with a single currency, a similar cost of capital, and an efficient and integrated capital market, in order to improve the competitiveness of European firms and to attract further investment. One outcome of European accounting harmonisation will be to bring about convergence in the properties of accounting information. Thus, with greater harmonisation, the valuation of European firms can be based on a more comparable set of accounting figures. The three empirical studies reported in the previous chapter attempt to throw some light on the progress that has been made in this respect.

In terms of conservatism, which is a fundamental property of accounting, the principle traditionally was described as reporting the lowest possible value of assets and income and the highest possible value of liabilities and costs (Section 2.3.1). Thus, the traditional form of conservatism implies a pessimistic sense of financial reporting through the application of appropriate (lawful) accounting techniques. It can be argued that the cautious approach to income recognition usually required by national standard setters is a consequence of this conservative notion. Although the

application of traditionally conservative accounting techniques has been diminishing over the years in most countries, it is still the case that continental European countries are perceived to be more conservative than the UK and the US (Joos and Lang (1994)).

While traditional conservatism appears to be diminishing, earnings' conservatism has been increasing (Pope and Walker (1999)). The notion of earnings' conservatism is due to Basu (1997) and implies that 'bad news' regarding economic income in the form of stock price falls will be reported in earnings on a much timelier basis than 'good news' in the form of stock price increases (Section 2.3). This 'asymmetric timeliness' of earnings has been documented in the US (Basu (1997) and in the UK (Pope and Walker (1999)), as well as some continental European countries (Ball, Kothari and Robin (2000)), and dissimilarities between countries have been found (Section 2.3.2).

Several reasons have been cited for the existence of earnings' conservatism and for the differences that appear to exist among countries. Basu (1997) suggests the importance of managers' and auditors' exposure to legal liability when reporting 'bad news'. Ball, Kothari and Robin (1999) compare the level of earnings' conservatism in companies from different countries and base their discussion on the disclosure requirements, the differences in regulation and differences in practice. Based on the latter, Pope and Walker (1999), show that UK firms are more conservative in reporting their earnings than US firms, since they tend to smooth ordinary earnings through the use of extraordinary items.

In this thesis, the level of earnings' conservatism is tested for the Euro-Zone countries and the UK (Section 5.1). The 'reverse regression' (Beaver, Lambert and Morse (1980)) proposed by Basu (1997) is utilised to estimate the degree of within country earnings' conservatism and to compare results among countries, taking account not only of contemporaneous news but also of prior period news (Pope and Walker (1999)). Furthermore, given the process of harmonisation that is under way, the hypothesis that the asymmetric timeliness of earnings in reporting market news has increased over recent years is tested for all countries, and inferences are also

drawn about the evolution of traditional conservatism, following Giner and Rees (2001)..

With respect to the valuation of European companies, this will also be affected by the programme of accounting harmonisation since firm values can be explained by a more comparable set of financial accounting information, as mentioned above. Even in the most basic valuation models, where market equity is equal to the present value of expected future dividends, accounting variables may be used, in this case as proxies of future dividends instead of dividends in what Penman (1992) describes as the 'dividend conundrum'. Recent theoretical developments, however, have outdated the dividend discounting model by proposing a better articulated framework based on the valuation of residual income. Indeed, Ohlson (1995) and Feltham and Ohlson (1995) have created an entirely new framework where the market value of the firm equals the book value when this is adjusted for profitability and other 'non-accounting' information that affects the prediction of future profitability (see Section 2.2.2). A number of empirical applications of the Ohlson (1995) and Feltham and Ohlson (1995) models attempt to identify the empirical validity of the models and their importance for describing the market value of the firm (Section 2.2.5). However, there is a relevant scarcity of evidence from a European perspective, and the aim of this thesis is to contribute to the understanding of the *relationship* between market values and accounting information when influenced by the process of economic convergence and accounting harmonisation.

In this thesis, in order to build a research design that captures the economic environment in which European firms operate, two key economic factors are introduced into the modelling framework. These are the recent introduction of a single currency and the much slower movement towards tax harmonisation, which is still the subject of ongoing policy deliberations. In the case of foreign exchange, the specific developments in Feltham and Ohlson (1995) are utilised by aligning exchange rate fluctuations with the operating activities of the firm that produce abnormal operating earnings. In the case of taxation, the Ohlson (1995) model has been modified (see Section 4.1) in order to provide a methodology that allows for the examination of tax effects on the market value of European firms.

Corporate taxation is a significant burden for all companies and is expected therefore to have a significant effect on the market value of the firm (Section 3.2)..A direct influence arises from the reduction of earnings by the statutory tax rate that is imposed, which may differ among countries and thus may have different market relevance in different fiscal regimes. However, this is not the only taxation effect on current and future earnings (Section 3.2.1). The different levels of corporate taxation can drive investment in and out of the countries involved, affecting the value of firms which are engaged in outward investment and local companies which are partners in inward investment projects. In addition, taxes affect the internal investment planning of companies and their debt financing and through these the future profitability of firms. Moreover, taxation is an important source of government revenue affecting general economic activity (through government spending, joint public-private projects, etc.). Therefore, one can argue that both direct and indirect tax effects influence the market value of the firm, and that the complexity of such tax effects must be allowed for in the research design.

Henceforth, the disaggregation of income taxes from the abnormal earnings figure (in the Tax Modified Ohlson model that was derived in Section 4.1) attempts to capture these effects. More precisely, the hypothesis that corporate taxation affects the market value of the firm through more channels than current earnings is examined. In addition, the differences in taxation effects among countries are discussed based on the assumption that lower taxation is more relevant to the value of European firms. Furthermore, the hypotheses are tested for small and medium firms by comparison with large companies for all of the countries under discussion in order to assess whether taxes affect firms differently according to size. Differences in tax effect according to industry are also tested by dividing the sample with regard to industries with low, medium and high market to book value ratios.

In contrast to taxation, exchange rate fluctuations can be modelled as an effect solely on the operating activities of the firm through its operating exposure. That is to say, the firm's financial activities do not generate abnormal earnings since its transaction exposure involves short term currency risk, which may be hedged (Section 3.3.1). The Feltham and Ohlson (1995) framework allows for such a distinction and is

therefore adopted for the empirical study of the value relevance of exchange rate changes without further modification.

There is a lack of empirical work assessing the accounting valuation of the firm with reference to exchange rate movements. However, in those studies where the effects of exchange rates have been investigated, both with regard to the market value of firms exposed through their own international activities and the wider impact on all firms in the capital market, the evidence suggests that both the direct and indirect influences of exchange rate movements should be taken into consideration.

In this thesis, therefore, direct and indirect effects of currency fluctuations on the value of the firm are considered by employing a sample that includes all available firms with or without international activities. It is further argued that currency fluctuations will be more important for countries that face more unstable exchange rates. In addition, the impact of the adoption of the Euro on the value relevance of the exchange rate is tested by dividing the research period into two phases: pre-Euro and post-Euro, and the result for the Euro-zone is also compared with the UK using equivalent samples. Furthermore, different proxies for exchange rate risk are utilised in order to assess the validity of the results.

Having set out the theoretical background and the main research questions of the study, the next section summarises the main findings and sets out the conclusions of the thesis.

### *Findings and Conclusions*

The initial findings of this thesis indicate the importance of stock market movements to the information provided in the accounts of European firms. In fact, this depends on the direction of market movements, since falls in stock prices, which are taken to indicate a lower level of economic income, seem to be reported on a more timely basis in the accounting earnings of European firms than increases in share prices. The evidence confirms the existence of earnings' conservatism for firms in all European countries in the sample examined. In addition, the results show that share

prices for firms from all Euro-zone countries and the UK are associated to a significant extent with accounting variables. Indeed, book values and abnormal earnings are significant determinants of firm valuation for most of the countries in the sample.

Developments in the European environment during recent years seem to be important for the results of this study. The implementation of the 4th and the 7th Directives by all EU countries by 1992, and the convergence of macroeconomic variables that followed the Maastricht Treaty that was signed in 1992,, as well as the accelerating integration of the world's capital markets throughout the 1990s, are associated with a degree of convergence in earnings properties across the different countries involved in this study. More specifically, earnings conservatism is evident in all countries in the second period examined (1993-2000), whereas the results are mixed in the first period (1988-1992). Moreover, the implementation of EMU on the adoption of the Euro (1/1/1999), which marked the fulfilment of the Maastricht Treaty criteria, is also significant for companies in the Euro-zone, since the exchange rate effect on firm value that is detected for the pre-Euro (pre-1999) period seems to disappear after the introduction of the Euro. Overall, the accounting, financial and economic developments taking place in the European Union appear to be significant determinants of the results.

*Conservatism*

In terms of earnings conservatism, the results indicate that 'bad news' is reported on a more timely basis than good news in all countries with the exception of Austria. While Spain, Ireland and the UK seem to be the more conservative, Italy, the Netherlands and Finland are the least conservative.. Spain appears to be a special case that demonstrates clearly the importance of allowing for economic conditions, since the high level of conservatism can be explained in the light of the monetary crisis of 1992 that greatly affected the Spanish economy and the Spanish capital market. In fact, when this specific year is taken out of the sample, earnings conservatism in Spain falls to the level of the other continental European countries.

Such a result raises concerns over the determinants of earnings' conservatism, which need to be more clearly specified.

The results also confirm the hypothesis that 'good news' tends to be reflected in earnings in the years following its market recognition. In terms of traditional (or pervasive) conservatism, the results indicate that continental European countries seem to be more conservative in the traditional form than the UK, a result which is again confirmed when old news is introduced in the analysis. In brief, the Euro-zone countries show pervasive pessimism while the UK shows pervasive optimism.

In general, differences in asymmetric timeliness of earnings can be due to differences in the legal liability exposure for managers and auditors about reporting of 'bad news' among countries (Basu (1997)). In addition, it can be argued that different accounting systems and regulations also play an important role in determining the differences in the level of conservatism (Ball, Kothari and Robin (2000)). Finally, the differences in the development of capital markets and the different levels of market efficiency in the European countries can explain some of the differences reported (Basu (1999)).

*Taxation*

The results of the study indicate the value relevance of income taxes for all countries (with the exception of Finland and Greece). Taxation has a negative influence on the share prices of European firms, with the exception of the Irish case. A major contribution of the study lies on the findings that show taxes affecting the market value of the firm through more channels than current earnings. In addition, the suggestion that taxes are more important for the valuation of European firms in the countries with lower taxation is verified.

Furthermore, evidence is provided to show that, in general, taxation is a particularly important determinant of firm value for large corporations, while the market value of small and medium enterprises is driven mainly by abnormal earnings. When the sample is divided according to industry, the findings suggest that both abnormal

earnings and taxes are important in industries which experience high market to book value ratios, which may be due to the greater involvement of investors in assessing the range of factors affecting the firm's performance.

*Exchange Rates*

The results indicate the value relevance of fluctuations in the exchange rate for firms in countries with more unstable currencies. In addition, market specific factors may play an important role, since markets dominated by exporting companies (e.g. the Helsinki Stock Exchange) show greater sensitivity to exchange rate movements. Furthermore, the exchange rate seems to be significant for the more developed capital markets in the sample, which may be due to the behaviour of international investors and the capital flows generated.

A significant issue is the choice of the exchange rate variable since different firms may be influenced by different exchange rates. Indeed, it is clear that firms with international activities in the US will be more affected by the exchange rate of the local currency towards the US dollar than firms with no US connection. By conducting the tests using different exchange rate variables, this study has assessed such differences at the country level. The results indicate some differences while the core of the findings remains unchanged.

The evidence presented in this thesis relative to the value relevance of exchange rate changes takes on more importance in light of the adoption of a common currency by twelve European countries. The diminishing exchange rate exposure for the Euro-zone firms after the introduction of the new currency is very significant, especially for the EU countries that still remain outside the EMU and the new member states in the EU (from May 2004). The comparison of the Euro-zone result with the situation in the UK, where exchange rate risk has been increasing in recent years, could suggest the potential benefits for companies in case of participation in the EMU.

In general, the evidence presented in this study of the capital market implications of accounting in Europe should be of significance not only to the European Commission but also to accounting standard setters, and to the IASB in particular, in the effort to provide a global set of accounting rules. Overall, while inside the European Union much dissimilarity appears to have been harmonised, several differences remain and appear to influence the capital markets in various ways. The evidence presented above on the properties of accounting numbers and their effects on the value of the firm, on the influence of corporate taxation and on the importance of currency fluctuations for European firms, are areas with great significance for EU policy makers. The importance of the findings regarding corporate taxation should be highlighted, given the differences that have been shown to exist among countries regarding tax effects on the market value of firms, especially in the light of the ongoing debate on tax harmonisation versus tax competition inside the European Union.

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# APPENDIX B: EMPIRICAL STUDIES REVIEW

**Table B1: Empirical Studies in Value Relevance (O95 and FO95 models).**

| Authors | Countries | Data Period – No of Obs. | Methodological Issues | Conclusions - Comments |
|---|---|---|---|---|
| Bernard (1995) | USA | 1978-1993, 670 & 712 firm-year observations. | Compare the DDM and the O95 models. | The O95 provides better results based on $R^2$s. |
| Collins, Maydew and Weiss (1997) | USA | 1953-1993 | Decompose explanatory power of earnings and book value into common and incremental (separate) | During time earnings become less value relevant and book value more. |
| Joos (1997) | France, Germany, the UK and the USA. | 1985-1995, 8,568 for Europeans & 46,195 firm-year obs. for USA | O95 model without the other information variable. | Higher coefficient of Book Value for France. Earnings have similar effects to prices in all countries. |
| Frankel and Lee (1998) | USA | 1975-1993, 18,162 firm-year observations. | Test the LID. Utilise IBES analysts' forecasts for the 'firm fundamental value' calculation. | The 'firm fundamental value' explains changes in stock prices. |
| Hand and Landsman (1998) | USA | 1974-1996, 105,510 firm-year observations | Test O95 models with and without the $v_t$ other information. | Conflicting results regarding the use of $v_t$. Suggest the absence of dividends responsible, due to profitability signalling. |
| Dechow, Hutton and Sloan (1999) | USA | 1976-1995, 50,133 firm-year observations | IBES analysts' forecasts as a proxy for the 'other information' variable | Results that support the LID. Analysts' forecasts significant for firm value. |

| | | | | |
|---|---|---|---|---|
| Myers (1999) | USA | 1975-1996, 44,980 firm-year obs. | Tests four versions of the O95 and FO95 to assess the LIM. | The inclusion of the LIM does not provide better results. |
| Brief and Zarowin (1999) | USA | 1978-1997, 113,491 firm-year observations | Compare a dividend-model with the O95 model. | Suggest that they are equally good for firm valuation. The dividend model appears to be better in the existence of transitory earnings. |
| Bartholdy, Peare and Willett (2000) | USA | 1962-1997 | Test the linearity of the model. Long-run estimation. | The model is linear only in the very long term (10 years). |
| Stromann (2000) | Germany and USA. | 1987-1999 | Includes IBES earnings' forecasts in the FO95. Examines violations of the Clean Surplus Relationship. | Violations of the CSR not significantly strong in any of the two countries. |
| McCrae and Nilsson (2001) | Sweden | 1987-1997, 1,339 firm-year observations. | IBES analysts' forecasts in place of the other information of O95. | The model with forecasts has stronger explanatory power. |
| Karathanassis and Spilioti (2001) | Greece | 1993-1998 | Compare the 'traditional' framework with the Ohlson one. | The Ohlson (1995) model provides slightly better estimations. |
| Arce and Mora (2002) | Belgium, France, Germany, Italy, Netherlands, Spain, Switzerland, UK. | 1990-1998, 22,436 firm-year observations. | Test the O95 model without the other information variable. | Earnings more value relevant and book value less relevant for the Netherlands and the UK when comparing with the rest. |
| Ota (2002) | Japan | 1965-1998, 21,986 firm-year observations | Develop six alternative LIMs. | The last version of the LIMs provides better estimations. |

Note: All studies employ OLS regression techniques except of Frankel and Lee (1998) that use Spearman's rank correlation and Monte Carlo simulation, and Bartholdy et al (2001) that utilise cointegration methodology.

**Table B2: Empirical Studies in Earnings' Conservatism.**

| Authors | Countries | Data Period – No of Obs. | Methodological Issues | Conclusions - Comments |
|---|---|---|---|---|
| Basu (1997) | USA | 1963-1990, 43,321 Observations. | Uses the 'reverse regression' and test short and long run effects. Divides returns to positive and negative. | 'Bad news' are reflected to the earnings figures faster than 'good news'. |
| Ball, Kothari and Robin (2000) | Australia, Canada, France, Germany, Japan, the UK, and the USA. | 1985-1995 | Divide the countries in the sample into common law and code law. | Common law countries more earnings conservative than code law. |
| Pope and Walker (1999) | UK and USA. | 1976-1996, 7,189 & 18,380 Observations. | Test earnings after extraordinary items. Examine the recognition of prior period news in earnings. | After the modification 'bad news' are reported more timely in the UK than in US. |
| Giner and Rees (2001) | France, Germany and the UK | 1990-1998, 8,838 Observations. | Interconnection between traditional conservatism, reflected in the intercept, and earnings' conservatism | Higher traditional conservatism in Germany. Small firms more earnings' conservative than large. |
| Givoly and Hayn (2000) | USA | 1950-1998 | Examine four different forms of conservatism. | After 1985 'bad news' reported more timely and 'good news' less timely. |
| Ball, Robin and Wu (2000) | Hong Kong, Malaysia, Singapore and Thailand | 1984-1996 | Brand the asymmetric timeliness of earnings as 'transparency'. | Conflicting results with insignificant coefficients. |
| Garcia and Mora (2001) | Belgium, France, Germany, Italy, Netherlands, Spain, Switzerland and UK. | 1988-2000, 12,060 Observations. | Different definition of 'news' excluding market wide effects. | Suggest that the new definition has reduced the bias in their results. Higher conservatism in common-law |

| | | | | |
|---|---|---|---|---|
| Raonic, McLeay & Asimakopoulos (2001) | European Interlisted Firms. | 1987-1999, 3,724 Observations. | Include in the model the influence of the level of disclosure and the degree of enforcement. | Increasing trend in conservatism in the recent years. Important influence of institutional factors. |
| Coppens, Buijink and Peek (2002) | European Union (15 countries). | 1994-1998, 5,600 & 18,468 Observations. | Develop a model only with accounting data defining conservatism as the asymmetric persistence of earnings changes. | Public firms report earnings more conservatively than private, especially in investor-oriented countries. |
| Dargenidou (2001) | Italy and the UK. | 1995-1999, 623 Observations. | Employ the reverse regression for selected Italian and UK firms. | Suggests that differences maybe due to other factors |
| Lubberink and Huijgen (1999) | The Netherlands. | 1983-1995, 1019 Observations. | Divide sample depending on managers' compensation preferences. | Degree of conservatism related to the wealth of managers. |
| Beekes, Pope and Young (2001) | UK | 1992-1995, 676 Observations. | Divide the sample according to the existence of non-executive directors. | Relate earnings conservatism with earnings management. |
| Pope and Walker (2001) | USA | 1985-1999, 48,885 Observations. | Define ex ante conservatism as the imposition of higher amortisation rates and ex post as the earnings conservatism. | Positive relation between ex post and ex ante conservatism. |
| Garrod and Valentincic (2001) | UK | 1968-2001, 24,854 Observations. | Use loss-making companies and check the influence of the 'abandonment option'. | Asymmetric timeliness heavily affected by the existence of loss-making firms. |
| Muller and Riedl (2001) | USA | 1951-1997 | Examine the existence of sample-variance-ratio and sample truncation biases | Provide evidence that the results are heavily biased. |

Note: All studies utilise the 'reverse regression' and test it with OLS estimation techniques.

**Table B3: Empirical Studies in Taxation.**

| Authors | Countries | Data Period – No of Obs. | Methodological Issues | Conclusions - Comments |
|---|---|---|---|---|
| Beaver and Dukes (1972) | USA | N/A | Unexpected returns – unexpected earnings model. Inclusion of tax deferrals in earnings. | The tax deferrals incorporation make the relationship stronger. |
| Lipe (1986) | USA | N/A | Price – Earnings regression. Decomposes six items including income taxes. | Identifies low but significant value relevance of taxes. |
| Ohlson and Penman (1992) | USA | N/A | Returns – Earnings model. Decompose tax expense and tax deferrals among other items. | Conflicting results depending on the time period. |
| Giner and Reverte (1999) | Spain | 1991-1995 | Ohlson (1995) model. Decompose taxes and other items. | Taxes are value relevant for Spanish companies. |
| Ayers (1998) | USA | 988 & 498 observations. | Price – Earnings model. Decompose tax deferrals from book value. | The introduction of SFAS 109 made deferred taxes more value relevant. |
| Amir, Kirschenheiter and Willard (1997) | USA | 1992-1994, 1,114 observations. | Employ the Feltham and Ohlson (1995) model. Disaggregate deferred taxes from operating assets. | Deferred taxes are important in firm valuation. |
| Zeng (2001) | Canada | 1995-1998, 1,136 observations. | Feltham and Ohlson (1995) model. Defines 'abnormal financial earnings'. | Tax deduction and interest expense produce abnormal financial earnings. |
| Harris and Kemsley (1999) | USA | 1875-1994, 27,647 obs. | Use the Ohlson (1995) model and include taxes on dividends. Retained earnings proxy of future dividends. | Suggest the importance of dividend taxation. |

| | | | | |
|---|---|---|---|---|
| Collins and Kemsley (2000) | USA | N/A | Utilise the Ohlson (1995) model. Retained earnings used as proxy of future dividends. | Share prices are discounted for taxes on dividends. |
| Harris, Hubbard and Kemsley (2001) | Australia, Japan, France, Germany UK and USA. | USA: 1975-1997, 72,620 obs. Other:1984-1994, 14,525 obs. | Employ the Ohlson (1995) model following Harris and Kemsley (1999) in the definition of the variables. | An important part of the dividends is capitalised in all countries tested. |
| Landsman and Shackelford (1995) | USA | Single Case | Case study of RJR Nabisco. Access to confidential shareholders' reports. | In the existence of long-term capital gains investors will request compensation for accelerating the sale of shares. |
| Blouin, Smith Raedy and Shackelford (2000) | USA | 1983-1997, 97,478 firm-quarter | Short window model of abnormal stock returns to abnormal earnings. | Share price changes influenced by capital gain taxes. |
| Bergstresser and Poterba (2002) | USA | 1993-1999, 7,798 fund-years. | Tax-adjusted returns – dividends model. | Fund inflows and outflows are negatively affected from very high capital gains taxation. |

Note: All studies utilise tests with OLS estimation techniques. All data observations are firm-year observations except if it is differently denoted.

**Table B4: Empirical Studies in the Relation of Stock Prices and Exchange Rates.**

| Authors | Countries | Data Period Frequency | Methodological Issues | Conclusions - Comments |
|---|---|---|---|---|
| *First line: International Trade Effects* | | | | |
| Jorion (1990) | USA | 1971-1987 Annual | Stock returns – change in exchange rate model. OLS regression techniques. | Some evidence that exchange rate affects the equity of multinationals. |
| Bartov and Bodnar (1994) | USA | 1973-1989 Annual | Stock returns – change in exchange rate model. Include lags. OLS regression techniques. | Exchange rates do not explain stock returns. Improved results with lags. |
| Chow, Lee and Sholt (1997) | USA | 1977-1989 Monthly | Fama and French framework. They test longer horizons. (OLS) | Evidence of a long-term relationship. One to two years response delay. |
| Dominguez and Tesar (2001) | Chile, France, Germany, Italy, Japan, Netherlands, Thailand and UK. | 1980-1999 Weekly | Market model with returns as dependent and exchange rate changes and market returns as independent variables. (OLS) | The best estimates with higher exposure when a one-year horizon is employed. |
| Martinez-Solano (1998) | Spain | 1992-1997 Monthly | Market model (similar to Dominguez and Tesar (2001)). Generalised Method of Moments used. | Existence of exchange rate exposure for Spanish firms. |
| Choi (2001) | South Korea | 1985-1995 Annual | Stock returns – change in earnings model with change in exchange rates. (OLS) | Korean multinationals exposed to exchange rate risk. |
| Di Iorio and Faff (2001) | Australia | 1990-1998 Daily-Monthly | Fama and French framework. They test short and long horizons. They use OLS techniques. | Strong evidence of exchange rate exposure for the daily sample. |
| Doukas, Hall and Lang (2001) | Japan | 1975-1995 Monthly | Stock returns – unexpected change in the exchange rate model. (OLS) | Stock prices influenced by exchange rate changes. Currency risk priced. |

| | | | | |
|---|---|---|---|---|
| Ihrig (2001) | USA | 1995-1999 Monthly | The model of Jorion (1990). More accurate exchange rate basket. (OLS) | Greater evidence of exchange rate exposure due to the modifications. |
| Doidge, Griffin and Williamson (2002) | 18 Countries (See Section 3.3.3) | 1975-1999 Monthly | Two-factor (market returns – exchange rate returns) augmented market model. | Exchange rate exposure related to foreign activities and size. |
| Bartram, Karolyi and Kleimeier (2002) | 21 Countries (See Section 3.3.3) | 1973-2001 Monthly | Market model with dummies for three time periods (pre-EMS, pre-Euro, post-Euro). (OLS) | Market risk reduced in the third period for firms with European activities. |
| *Second Line: Market Effects* | | | | |
| Solnik (1987) | Canada, France, W. Germany, Japan, Netherlands, Switzerland,UK,USA | 1973-1983 Monthly | Exchange rate change – stock returns model. Utilises OLS regression techniques. | Weak evidence of a relationship between exchange rate change and returns. |
| Ma and Kao (1990) | Canada, France, W. Germany, Japan, Italy, UK and USA. | 1973-1983 Monthly | Employ a market model with stock returns as dependent and exchange rate change and market return as independent variables. (OLS) | Association between currency depreciation and boom in stock prices. |
| Frennberg (1994) | Sweden | 1977-1992 4 Cases | Cross-sectional tests of four Swedish currency depreciations. (OLS) | Positive market response to devaluations. |
| Qiao (1996) | Japan, Hong Kong and Singapore. | 1983-1994 Daily | Granger causality (short run - SR) and Engle and Granger cointegration (long run - LR) tests. | SR relation in Japan and Honk Kong. LR relation in all countries. |
| Ajayi and Mougoue (1996) | Canada, France, W. Germany, Japan, Italy, Netherlands, UK and USA. | 1985-1991 Daily | Engle and Granger two-step cointegration procedure. | Exchange rate fall has a negative effect in the stock markets under discussion both in SR and LR. |

| | | | | |
|---|---|---|---|---|
| Abdalla and Murinde (1997) | India, S. Korea, Pakistan and the Philippines. | 1985-1994 Monthly | Granger causality (SR) and Engle and Granger cointegration (LR) tests. | LR relationship between exchange rates and stock prices in India and the Philippines. |
| Bahmani-Oskooee and Domac (1997) | Turkey | 1986-1994 Monthly | Engle and Granger and Johansen-Juselious cointegration (LR) tests. | Inflation and exchange rates affect the Turkish stock prices. |
| Phylaktis and Ravazzolo (1999) | Hong Kong, Indonesia, Malaysia, Singapore, Thailand and the Philippines | 1980-1998 Monthly | Granger causality (SR) and Johansen-Juselious cointegration (LR) tests. Include the NYSE as proxy of world financial environment. | Long run relationship between stock prices and exchange rates affected by the NYSE stock index. |
| Granger, Huang and Yang (2000) | Hong Kong, Indonesia, Japan, Malaysia, Singapore, S. Korea, Thailand, Taiwan, Philippines | 1986-1998 Daily | Granger causality and cointegration tests with structural break to address the 1997 East Asian financial crisis. | Changes in the stock prices in the markets under discussion lead changes in the exchange rates of these countries. |
| Wu (2000) | Singapore | N/A | Johansen-Juselious cointegration (LR) tests. | Exchange rate (to USD) negatively related to stock prices. |
| Wu (2001) | Singapore | N/A | Johansen-Juselious cointegration (LR) tests. | Fall in the exchange rate (to Yen) leads to boom in stock prices. |
| Nieh and Lee (2001) | Canada, France, Germany, Italy, Japan, UK, USA. | 1993-1996 Daily | Engle and Granger and Johansen multivariate maximum likelihood cointegration tests. | No LR relationship identified. Some evidence of SR relation. |
| Grambovas (2003) | Czech Republic, Greece, Hungary. | 1994-2000 Weekly | Granger causality and Johansen-Juselious cointegration tests. With NYSE & Frankfurt SE. | LR relationship in Greece and Hungary. SR relation in all three countries. |

# APPENDIX C: DESCRIPTIVE STATISTICS

**Table C1. Descriptive Statistics of the Study in Conservatism.**

| Country | Obs. | $X_t/P_{t-1}$ | | | | | $(P_t-P_{t-1})/P_{t-1}$ | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Median | Max | Min | St. Dev. | Mean | Median | Max | Min | St. Dev. |
| Austria | 435 | 0.0405 | 0.0438 | 0.4116 | -0.4676 | 0.1031 | 0.0565 | -0.0185 | 4.4419 | -0.7417 | 0.4727 |
| Belgium | 529 | 0.0655 | 0.0668 | 0.5559 | -0.4127 | 0.1008 | 0.1219 | 0.0495 | 1.6845 | -0.5343 | 0.3427 |
| Finland | 337 | 0.0784 | 0.0768 | 0.5029 | -0.4550 | 0.1141 | 0.2139 | 0.0859 | 3.6932 | -0.7980 | 0.6362 |
| France | 2518 | 0.0498 | 0.0591 | 0.4733 | -0.7050 | 0.1115 | 0.1236 | 0.0476 | 1.9913 | -0.6701 | 0.4199 |
| Germany | 2404 | 0.0291 | 0.0392 | 0.4985 | -0.6262 | 0.1082 | 0.0635 | 0.0052 | 1.6553 | -0.6433 | 0.3322 |
| Ireland | 428 | 0.0128 | 0.0660 | 0.3667 | -1.5890 | 0.2012 | 0.1608 | 0.0706 | 4.4411 | -0.8714 | 0.5912 |
| Italy | 781 | 0.0456 | 0.0577 | 0.4717 | -0.7111 | 0.1253 | 0.1200 | 0.0527 | 2.4269 | -0.6022 | 0.4106 |
| Netherlands | 1002 | 0.0819 | 0.0878 | 0.5679 | -0.4819 | 0.0916 | 0.1498 | 0.0819 | 2.3478 | -0.6393 | 0.3923 |
| Spain | 674 | 0.0347 | 0.0684 | 1.0334 | -1.9811 | 0.2428 | 0.1765 | 0.0806 | 3.4366 | -0.9045 | 0.5527 |
| UK | 8578 | 0.0397 | 0.0660 | 0.3939 | -0.8969 | 0.1346 | 0.0996 | 0.0208 | 2.9839 | -0.8000 | 0.4955 |
| ***UK*** | ***3033*** | ***0.0381*** | ***0.0664*** | ***0.3873*** | ***-1.1058*** | ***0.1464*** | ***0.0988*** | ***0.0183*** | ***3.0476*** | ***-0.7833*** | ***0.5068*** |
| ***Euro-zone*** | ***3033*** | ***0.0523*** | ***0.0637*** | ***0.8065*** | ***-1.9811*** | ***0.1240*** | ***0.1095*** | ***0.0439*** | ***4.4411*** | ***-0.8714*** | ***0.4035*** |

$X_t$ is the earnings per share figure in the time period t, $P_t$ is the price per share in time period t, and $P_{t-1}$ is the price per share in the previous time period (t-1). Prices per share are adjusted for capitalization changes.

## TABLES C2A-C2L. DESCRIPTIVE STATISTICS OF THE STUDY ON THE TMO MODEL.

**Table C2a. Austria.**

| | Obs. | Mean | Median | Max | Min | St. Dev. |
|---|---|---|---|---|---|---|
| **Market Value of Equity** | 545 | 752.5 | 290 | 7070 | 7.413 | 1230 |
| **Book Value** | 545 | 481.7 | 194.3 | 5868 | 5.754 | 818.7 |
| **Adjusted Abnormal Earnings** | 545 | 12.96 | 2.426 | 940.1 | -386 | 101.6 |
| **Income Taxes** | 545 | -15.53 | -1.791 | 5.241 | -279.1 | 36.90 |

**Table C2b. Belgium.**

| | Obs. | Mean | Median | Max | Min | St. Dev. |
|---|---|---|---|---|---|---|
| **Market Value of Equity** | 680 | 1640 | 145.5 | 29700 | 9.250 | 3925.4 |
| **Book Value** | 680 | 1421 | 85.55 | 28097 | 3.695 | 3925.2 |
| **Adjusted Abnormal Earnings** | 680 | 7.547 | 3.313 | 2693 | -2672 | 377.6 |
| **Income Taxes** | 680 | -53.40 | -3.305 | 5.674 | -1447 | 160 |

**Table C2c. Finland.**

| | Obs. | Mean | Median | Max | Min | St. Dev. |
|---|---|---|---|---|---|---|
| **Market Value of Equity** | 421 | 40.45 | 21.36 | 420 | 1.346 | 55.10 |
| **Book Value** | 421 | 26.96 | 14.17 | 339.5 | 0.965 | 38.35 |
| **Adjusted Abnormal Earnings** | 421 | 1.867 | 1.014 | 63.79 | -30.19 | 7.252 |
| **Income Taxes** | 421 | -1.232 | -0.612 | 1.191 | -18.92 | 2.066 |

**Table C2d. France.**

| | Obs. | Mean | Median | Max | Min | St. Dev. |
|---|---|---|---|---|---|---|
| **Market Value of Equity** | 3659 | 195.2 | 86.13 | 1995 | 3.369 | 281.4 |
| **Book Value** | 3659 | 136.6 | 53.83 | 1396 | 1.688 | 205.8 |
| **Adjusted Abnormal Earnings** | 3659 | 8.001 | 3.386 | 250.3 | -153.5 | 31.99 |
| **Income Taxes** | 3659 | -7.570 | -2.603 | 10.65 | -112.3 | 13.85 |

**Table C2e. Germany.**

| | Obs. | Mean | Median | Max | Min | St. Dev. |
|---|---|---|---|---|---|---|
| **Market Value of Equity** | 2796 | 236.2 | 173.0 | 1955 | 5.798 | 234.9 |
| **Book Value** | 2796 | 103.8 | 89.00 | 582.3 | 2.360 | 86.98 |
| **Adjusted Abnormal Earnings** | 2796 | 7.407 | 4.129 | 144.2 | -124.1 | 27.49 |
| **Income Taxes** | 2796 | -8.184 | -3.571 | 11.71 | -77.92 | 12.11 |

**Table C2f. Greece.**

| | Obs. | Mean | Median | Max | Min | St. Dev. |
|---|---|---|---|---|---|---|
| **Market Value of Equity** | 133 | 2029 | 88.60 | 20310 | 3.921 | 3372 |
| **Book Value** | 133 | 614.0 | 107.2 | 4758 | 0.832 | 804.8 |
| **Adjusted Abnormal Earnings** | 133 | 34.70 | 1.106 | 351.9 | -214.7 | 85.26 |
| **Income Taxes** | 133 | -28.10 | -1.736 | -0.044 | -202.6 | 40.56 |

**Table C2g. Ireland.**

| | Obs. | Mean | Median | Max | Min | St. Dev. |
|---|---|---|---|---|---|---|
| **Market Value of Equity** | 431 | 2.991 | 1.397 | 50.87 | 0.0168 | 5.741 |
| **Book Value** | 431 | 1.547 | 0.873 | 16.51 | 0.005 | 1.909 |
| **Adjusted Abnormal Earnings** | 431 | 0.106 | 0.064 | 1.445 | -0.941 | 0.273 |
| **Income Taxes** | 431 | -0.055 | -0.028 | 0.022 | -0.467 | 0.071 |

**Table C2h. Italy.**

| | Obs. | Mean | Median | Max | Min | St. Dev. |
|---|---|---|---|---|---|---|
| **Market Value of Equity** | 1105 | 1606 | 4.488 | 24500 | 0.216 | 3400 |
| **Book Value** | 1105 | 1497 | 2.799 | 20128 | 0.180 | 3180 |
| **Adjusted Abnormal Earnings** | 1105 | 2.185 | 0.050 | 2188 | -3273 | 444.0 |
| **Income Taxes** | 1105 | -87.29 | -0.181 | 20.20 | -1450 | 220.7 |

**Table C2i. The Netherlands.**

| | Obs. | Mean | Median | Max | Min | St. Dev. |
|---|---|---|---|---|---|---|
| **Market Value of Equity** | 1229 | 47.48 | 29.70 | 794.1 | 1.670 | 68.13 |
| **Book Value** | 1229 | 29.50 | 14.87 | 520.7 | 0.451 | 48.78 |
| **Adjusted Abnormal Earnings** | 1229 | 3.211 | 2.156 | 58.01 | -24.31 | 6.159 |
| **Income Taxes** | 1229 | -1.852 | -0.938 | 2.846 | -34.15 | 3.169 |

**Table C2j. Portugal.**

| | Obs. | Mean | Median | Max | Min | St. Dev. |
|---|---|---|---|---|---|---|
| **Market Value of Equity** | 116 | 140.8 | 16.25 | 5125 | 1.200 | 615.1 |
| **Book Value** | 116 | 123.5 | 9.345 | 2975 | 0.956 | 543.1 |
| **Adjusted Abnormal Earnings** | 116 | -0.616 | 0.559 | 39.48 | -85.35 | 10.62 |
| **Income Taxes** | 116 | -3.323 | -0.327 | 0.058 | -179.9 | 18.22 |

**Table C2k. Spain.**

| | Obs. | Mean | Median | Max | Min | St. Dev. |
|---|---|---|---|---|---|---|
| **Market Value of Equity** | 887 | 732.2 | 25.24 | 13500 | 0.571 | 1849 |
| **Book Value** | 887 | 615.2 | 18.87 | 8305 | 0.521 | 1335 |
| **Adjusted Abnormal Earnings** | 887 | -8.596 | 0.413 | 1044 | -1125 | 150.6 |
| **Income Taxes** | 887 | -18.87 | -0.568 | 86.40 | -468.1 | 59.68 |

**Table C2l. The United Kingdom.**

| | Obs. | Mean | Median | Max | Min | St. Dev. |
|---|---|---|---|---|---|---|
| **Market Value of Equity** | 10687 | 2.144 | 1.460 | 14.95 | 0.043 | 2.141 |
| **Book Value** | 10687 | 1.124 | 0.755 | 11.38 | 0.012 | 1.220 |
| **Adjusted Abnormal Earnings** | 10687 | 0.080 | 0.063 | 1.068 | -1.011 | 0.212 |
| **Income Taxes** | 10687 | -0.065 | -0.046 | 0.047 | -0.594 | 0.074 |

## TABLES C3A-C3L. DESCRIPTIVE STATISTICS OF THE FO95 MODEL WITH EXCHANGE RATES.

**Table C3a. Austria.**

| | Market Value of Equity | Operating Assets | Financial Assets | Change in REER | Abn.Operating Earnings | Real Effective Exchange Rate | Local Currency/USD |
|---|---|---|---|---|---|---|---|
| **Mean** | 672.3 | 984.6 | -259.4 | -0.027 | -97.06 | 98.41 | 0.028 |
| **Median** | 299.5 | 337.2 | -50.36 | -0.026 | -20.26 | 100.0 | 0.062 |
| **Maximum** | 7010 | 10973 | 1793 | 0.004 | 1009 | 117.8 | 0.166 |
| **Minimum** | 7.485 | 0.532 | -4668 | -0.050 | -3613 | 85.50 | -0.096 |
| **St. Deviation** | 1012 | 1800 | 801.8 | 0.018 | 324.6 | 9.091 | 0.094 |
| **Observations** | 446 | 446 | 446 | 446 | 446 | 446 | 446 |

**Table C3b. Belgium.**

| | Market Value of Equity | Operating Assets | Financial Assets | Change in REER | Abn.Operating Earnings | Real Effective Exchange Rate | Local Currency/USD |
|---|---|---|---|---|---|---|---|
| **Mean** | 1697 | 2219 | -965.4 | -0.008 | -196.9 | 94.74 | 0.023 |
| **Median** | 143.8 | 140.2 | -52.55 | -0.007 | -8.799 | 96.20 | 0.061 |
| **Maximum** | 34600 | 33142 | 2411 | 0.028 | 1476 | 100.0 | 0.161 |
| **Minimum** | 8.527 | -3.002 | -34977 | -0.044 | -5983 | 86.30 | -0.134 |
| **St. Deviation** | 4242 | 5584 | 3802 | 0.023 | 738.8 | 4.126 | 0.098 |
| **Observations** | 624 | 624 | 624 | 624 | 624 | 624 | 624 |

**Table C3c. Finland.**

| | Market Value of Equity | Operating Assets | Financial Assets | Change in REER | Abn.Operating Earnings | Real Effective Exchange Rate | Local Currency/USD |
|---|---|---|---|---|---|---|---|
| **Mean** | 53.11 | 60.20 | -20.47 | -0.036 | -7.606 | 95.13 | 0.050 |
| **Median** | 24.30 | 30.21 | -8.587 | -0.049 | -1.277 | 88.40 | 0.079 |
| **Maximum** | 460.0 | 718.2 | 59.97 | 0.109 | 34.24 | 137.0 | 0.269 |
| **Minimum** | 1.345 | 1.257 | -405.9 | -0.185 | -251.6 | 79.70 | -0.180 |
| **St. Deviation** | 73.59 | 84.18 | 44.45 | 0.075 | 24.47 | 15.71 | 0.122 |
| **Observations** | 386 | 386 | 386 | 386 | 386 | 386 | 386 |

**Table C3d. France.**

| | Market Value of Equity | Operating Assets | Financial Assets | Change in REER | Abn.Operating Earnings | Real Effective Exchange Rate | Local Currency/USD |
|---|---|---|---|---|---|---|---|
| **Mean** | 231.3 | 296.6 | -134.9 | -0.018 | -34.81 | 95.72 | 0.026 |
| **Median** | 103.0 | 111.4 | -35.86 | -0.013 | -6.737 | 97.30 | 0.063 |
| **Maximum** | 2233 | 5007 | 238.7 | 0.012 | 124.6 | 105.2 | 0.161 |
| **Minimum** | 3.506 | 1.973 | -3393 | -0.048 | -948.4 | 86.20 | -0.114 |
| **St. Deviation** | 321.8 | 493.8 | 324.9 | 0.021 | 90.76 | 5.016 | 0.094 |
| **Observations** | 3189 | 3189 | 3189 | 3189 | 3189 | 3189 | 3189 |

**Table C3e. Germany.**

| | Market Value of Equity | Operating Assets | Financial Assets | Change in REER | Abn.Operating Earnings | Real Effective Exchange Rate | Local Currency/USD |
|---|---|---|---|---|---|---|---|
| **Mean** | 224.5 | 257.4 | -70.53 | 0.012 | -37.45 | 88.55 | 0.018 |
| **Median** | 168.0 | 202.2 | -27.19 | -0.004 | -16.56 | 88.70 | 0.065 |
| **Maximum** | 1680 | 1527 | 444.6 | 0.081 | 85.30 | 100.0 | 0.164 |
| **Minimum** | 5.510 | -3.535 | -940.4 | -0.052 | -587.3 | 75.50 | -0.120 |
| **St. Deviation** | 204.8 | 242.2 | 157.9 | 0.043 | 71.00 | 7.457 | 0.091 |
| **Observations** | 2045 | 2045 | 2045 | 2045 | 2045 | 2045 | 2045 |

**Table C3f. Greece.**

| | Market Value of Equity | Operating Assets | Financial Assets | Change in REER | Abn.Operating Earnings | Real Effective Exchange Rate | Local Currency/USD |
|---|---|---|---|---|---|---|---|
| **Mean** | 1948 | 735.3 | -135.1 | -0.003 | -86.83 | 103.7 | 0.097 |
| **Median** | 114.1 | 75.76 | -2.050 | 0.009 | -1.677 | 103.5 | 0.113 |
| **Maximum** | 20310 | 6247 | 1182 | 0.063 | 178.5 | 107.4 | 0.162 |
| **Minimum** | 3.921 | 1.251 | -3987 | -0.037 | -2226 | 100.0 | -0.013 |
| **St. Deviation** | 3342 | 1126 | 610.6 | 0.030 | 246.2 | 2.049 | 0.062 |
| **Observations** | 144 | 144 | 144 | 144 | 144 | 144 | 144 |

**Table C3g. Ireland.**

| | Market Value of Equity | Operating Assets | Financial Assets | Change in REER | Abn.Operating Earnings | Real Effective Exchange Rate | Local Currency/USD |
|---|---|---|---|---|---|---|---|
| **Mean** | 2.146 | 1.776 | -0.763 | -0.009 | -0.109 | 98.84 | 0.031 |
| **Median** | 1.142 | 1.097 | -0.296 | -0.010 | -0.026 | 99.44 | 0.015 |
| **Maximum** | 21.40 | 14.83 | 0.505 | 0.059 | 0.641 | 104.5 | 0.175 |
| **Minimum** | 0.009 | -0.0002 | -8.158 | -0.055 | -1.837 | 88.97 | -0.124 |
| **St. Deviation** | 3.195 | 2.023 | 1.162 | 0.033 | 0.299 | 4.239 | 0.098 |
| **Observations** | 213 | 213 | 213 | 213 | 213 | 213 | 213 |

**Table C3h. Italy.**

| | Market Value of Equity | Operating Assets | Financial Assets | Change in REER | Abn.Operating Earnings | Real Effective Exchange Rate | Local Currency/USD |
|---|---|---|---|---|---|---|---|
| **Mean** | 2936 | 4491 | -2108 | -0.011 | -610.1 | 119.6 | 0.048 |
| **Median** | 232.5 | 261.9 | -7.476 | -0.007 | -1.741 | 115.7 | 0.018 |
| **Maximum** | 41050 | 38712 | 5319 | 0.120 | 968.9 | 139.7 | 0.278 |
| **Minimum** | 0.250 | 0.381 | -50063 | -0.159 | -11363 | 100.0 | -0.110 |
| **St. Deviation** | 5050 | 7062 | 4893 | 0.067 | 1305 | 12.63 | 0.112 |
| **Observations** | 1068 | 1068 | 1068 | 1068 | 1068 | 1068 | 1068 |

**Table C3i. The Netherlands.**

| | Market Value of Equity | Operating Assets | Financial Assets | Change in REER | Abn.Operating Earnings | Real Effective Exchange Rate | Local Currency/USD |
|---|---|---|---|---|---|---|---|
| **Mean** | 49.124 | 47.15 | -13.13 | -0.006 | -4.127 | 96.07 | 0.030 |
| **Median** | 28.55 | 24.49 | -6.961 | -0.001 | -0.194 | 96.00 | 0.060 |
| **Maximum** | 840.0 | 992.9 | 118.3 | 0.019 | 41.23 | 102.5 | 0.161 |
| **Minimum** | 1.679 | 0.058 | -267.2 | -0.052 | -237.6 | 93.10 | -0.117 |
| **St. Deviation** | 78.50 | 74.69 | 29.52 | 0.023 | 17.60 | 2.304 | 0.095 |
| **Observations** | 1088 | 1088 | 1088 | 1088 | 1088 | 1088 | 1088 |

**Table C3j. Portugal.**

| | Market Value of Equity | Operating Assets | Financial Assets | Change in REER | Abn.Operating Earnings | Real Effective Exchange Rate | Local Currency/USD |
|---|---|---|---|---|---|---|---|
| **Mean** | 760.5 | 1170 | -634.7 | -0.002 | -124.7 | 98.74 | 0.066 |
| **Median** | 21.28 | 20.54 | -15.00 | -0.004 | -2.304 | 99.10 | 0.079 |
| **Maximum** | 5430 | 8895 | -0.242 | 0.083 | 50.92 | 101.3 | 0.204 |
| **Minimum** | 1.200 | 2.490 | -6724 | -0.028 | -1453 | 93.50 | -0.100 |
| **St. Deviation** | 1460 | 2217 | 1306 | 0.024 | 309.2 | 1.584 | 0.097 |
| **Observations** | 113 | 113 | 113 | 113 | 113 | 113 | 113 |

**Table C3k. Spain.**

| | Market Value of Equity | Operating Assets | Financial Assets | Change in REER | Abn.Operating Earnings | Real Effective Exchange Rate | Local Currency/USD |
|---|---|---|---|---|---|---|---|
| **Mean** | 629.6 | 896.3 | -246.4 | 0.006 | -133.1 | 105.7 | 0.051 |
| **Median** | 23.83 | 25.00 | -5.917 | 0.012 | -2.597 | 104.3 | 0.079 |
| **Maximum** | 14100 | 12460 | 1529 | 0.085 | 394.1 | 116.4 | 0.240 |
| **Minimum** | 0.516 | 0.539 | -6171 | -0.073 | -2684 | 94.60 | -0.116 |
| **St. Deviation** | 1620 | 1857 | 740.9 | 0.043 | 325.6 | 5.099 | 0.115 |
| **Observations** | 920 | 920 | 920 | 920 | 920 | 920 | 920 |

**Table C3l. The United Kingdom.**

| | Market Value of Equity | Operating Assets | Financial Assets | Change in REER | Abn.Operating Earnings | Real Effective Exchange Rate | Local Currency/USD |
|---|---|---|---|---|---|---|---|
| **Mean** | 1.936 | 1.326 | -0.423 | 0.027 | -0.119 | 116.1 | 0.017 |
| **Median** | 1.280 | 0.928 | -0.232 | 0.021 | -0.038 | 114.0 | 0.020 |
| **Maximum** | 14.00 | 11.06 | 1.355 | 0.203 | 0.697 | 142.5 | 0.237 |
| **Minimum** | 0.022 | -0.189 | -4.894 | -0.081 | -2.553 | 100.0 | -0.167 |
| **St. Deviation** | 2.014 | 1.392 | 0.702 | 0.070 | 0.332 | 13.34 | 0.093 |
| **Observations** | 4640 | 4640 | 4640 | 4640 | 4640 | 4640 | 4640 |

# APPENDIX D: DEFLATED RESULTS

Below the results of the tax modified Ohlson (1995) model and the Feltham and Ohlson (1995) model with exchange rates with all variables deflated by different deflators are presented in order to mitigate potential problems from scale effects. Also some discussion is provided in comparing these results with the results when the variables were in a per-share basis, in Chapter 5.

**Table D1. Regression results of the TMO model (Variables deflated by $P_{t-1}$)**

$$P_t = \beta_0 + \beta_1 y_t + \beta_2 ax^a_t + \beta_3 ta_t + u_t \qquad (31)$$

| Countries | Obs. | $\beta_0$ | $\beta_1$ | $\beta_2$ | $\beta_3$ | Adj. $R^2$ |
|---|---|---|---|---|---|---|
| Austria | 549 | **0.932**** | **0.137**** | **0.592**** | -1.123 | **4.38** |
| Belgium | 671 | **0.951**** | **0.117**** | **0.619**** | **-1.24**** | **11.0** |
| Finland | 421 | **0.847**** | **0.386**** | **0.793**** | 0.194 | **12.2** |
| France | 3648 | **0.970**** | **0.133**** | **0.803**** | **-0.60**** | **12.3** |
| Germany | 2770 | **0.940**** | **0.151**** | **0.467**** | **-0.66**** | **8.87** |
| Greece | 137 | **0.739**** | **1.272**** | **8.707**** | -1.632 | **16.5** |
| Ireland | 431 | **0.912**** | **0.277**** | **0.460**** | -0.789 | **14.6** |
| Italy | 1101 | **0.933**** | **0.171**** | **0.475**** | **-0.496*** | **10.8** |
| Netherlands | 1221 | **0.955**** | **0.153**** | **1.506**** | **0.919*** | **13.2** |
| Portugal | 115 | **0.962**** | 0.264 | **2.817**** | 0.943 | **8.94** |
| Spain | 887 | **0.934**** | **0.175**** | **0.668**** | **-1.58**** | **10.7** |
| UK | 10619 | **0.891**** | **0.165**** | **0.787**** | **-2.27**** | **13.6** |

Note: ** and * denote statistical significance at a 5% and 10% levels respectively. $P_t$ denotes share prices, $y_t$ is the book value, $ax^a_t$ denotes the adjusted abnormal earnings, $ta_t$ is taxation and $u_t$ is an error term. Adjusted $R^2$ is in percentage.

**Table D2. Regression results of the TMO model (Variables deflated by $y_{t-1}$)**

$$P_t = \beta_0 + \beta_1 y_t + \beta_2 ax^a_t + \beta_3 ta_t + u_t \qquad (31)$$

| Countries | Obs. | $\beta_0$ | $\beta_1$ | $\beta_2$ | $\beta_3$ | Adj. $R^2$ |
|---|---|---|---|---|---|---|
| Austria | 565 | 0.193 | **1.612**** | **1.256**** | **-5.927**** | **49.9** |
| Belgium | 689 | 0.177 | **1.136**** | **2.743**** | **-8.333**** | **52.5** |
| Finland | 450 | **-1.241**** | **1.242**** | **3.442**** | **-30.39**** | **49.4** |
| France | 3886 | **-0.543**** | **2.002**** | **1.751**** | **-8.197**** | **40.5** |
| Germany | 2871 | **0.645**** | **1.541**** | **0.688**** | **-6.026**** | **53.4** |
| Greece | 145 | -1.834 | **2.311**** | **19.27**** | -19.08 | **59.9** |
| Ireland | 466 | **-2.082**** | **3.281**** | **2.320**** | **-11.79**** | **57.0** |
| Italy | 1137 | **-0.369**** | **1.650**** | **1.792**** | **-3.946**** | **32.2** |
| Netherlands | 1263 | **0.554**** | **0.308*** | **13.24**** | **4.724**** | **64.7** |
| Portugal | 124 | **1.896**** | **0.779**** | **13.11**** | **15.17*** | **53.7** |
| Spain | 905 | -0.161 | **1.693**** | **6.748**** | 1.877 | **50.1** |
| UK | 11294 | **-1.405**** | **2.264**** | **0.500**** | **-22.18**** | **52.3** |

Note: ** and * denote statistical significance at a 5% and 10% levels respectively. $P_t$ denotes share prices, $y_t$ is the book value, $ax^a_t$ denotes the adjusted abnormal earnings, $ta_t$ is taxation and $u_t$ is an error term. Adjusted $R^2$ is in percentage.

The deflated results of the tax modified Ohlson (1995) model above appear to be consistent to the analysis in Section 5.2.5 of Chapter 5. For most of the countries, in both tables, taxation seems to be a significant factor that influences share prices. The adjusted abnormal earnings appear to play an important role as well. I would suggest that the previous period price is probably not the best deflator in this case since the dependent variable transforms to 'returns' which can not be explained by the variables in levels of the right hand-side of the model, and thus producing very low adjusted $R^2$s. The use of the beginning period book value seems to be better in tackling concerns of possible scale effects.

The deflated results of the Feltham and Ohlson (1995) model are presented below when the exchange rate was used as a proxy for the 'other information' variable.

**Table D3. Regression Results of FO95 with the change in the REER (Variables deflated by $oa_{t-1}$).**

$$P_t = \alpha_0 + \alpha_1 fa_t + \alpha_2 ox^a_t + \alpha_3 oa_t + \beta_1 xr_t + u_t \qquad (33)$$

| Countries | Obs. | $\alpha_0$ | $\alpha_1$ | $\alpha_2$ | $\alpha_3$ | $\beta_1$ | Adj. $R^2$ |
|---|---|---|---|---|---|---|---|
| **Austria** | *446* | **0.457**** | **1.336**** | -0.126 | **0.849**** | -186.8 | **64.9** |
| **Belgium** | *620* | **0.635**** | **1.776**** | **-1.411**** | **1.626**** | **-382.3**** | **58.5** |
| **Finland** | *383* | 0.339 | **1.565**** | **3.616**** | **1.541**** | **-87.45**** | **20.1** |
| **France** | *3168* | **0.880**** | **0.238**** | **4.182**** | **0.764**** | **-472.9**** | **29.4** |
| **Germany** | *2033* | **1.717**** | **2.777**** | **0.893**** | **0.273**** | **-285.8**** | **67.7** |
| **Greece** | *143* | **2.595**** | **-2.55**** | **19.42**** | **2.175**** | 70.44 | **27.9** |
| **Ireland** | *211* | **-1.88**** | **1.054**** | **-4.170**** | **3.320**** | **-0.170**** | **89.7** |
| **Italy** | *1061* | **0.303**** | **0.593**** | **-0.805**** | **1.004**** | **4.034**** | **95.9** |
| **Netherlands** | *1082* | **-0.64**** | **1.575**** | **7.961**** | **3.176**** | **-363.3**** | **85.4** |
| **Portugal** | *112* | 1.278 | -1.102 | **16.95**** | 0.622 | -187.0 | **22.1** |
| **Spain** | *916* | **0.836**** | **0.378**** | **3.738**** | **0.805**** | **41.61**** | **41.1** |
| **UK** | *4611* | -1.113 | **-1.97**** | **-3.895**** | **2.446**** | **-15.52**** | **86.9** |

Note: ** and * denote statistical significance at a 5% and 10% levels respectively. $P_t$ denotes the market value of equity, $fa_t$ the net financial assets, $ox^a_t$ the abnormal operating earnings (operating earnings minus the beginning period net operating assets times the 1-year treasury bill rate plus 4%), $oa_t$ the net operating assets, $xr_t$ the change of the Real Effective Exchange Rate (REER) index and $u_t$ is an error term. Adjusted $R^2$ is in percentage.

Comparing the above results with those in Section 5.3.4 of Chapter 5 one can suggest that for all previous cases where significant coefficients of the exchange rate variable have been existed one can suggest the consistency of results. In the deflated results as well in the cases of Finland, France, Germany, Italy, the Netherlands and the UK the exchange rate fluctuations are value relevant. There are three more cases where now

the exchange rate movements are significant, namely those of Belgium, Ireland and Spain. The Brussels stock market has a considerable level of internationalisation, participates in the EuroNext stock exchange and appears to have similar characteristics with the Amsterdam stock exchange. The Irish result can be attributed to the state of the Irish economy and the Dublin stock market during the 90s. Both faced a continuous boom attracting large amounts of foreign investment. This foreign investment would be even higher when the Punt was facing a depreciation, boosting by that the share prices of the firms. Finally, the instability of the Spanish peseta until 1998 (Graph 3 – ranging from -7.5% to +8.5%) may be an explanation for the Spanish result in particular after the evidence presented in Table 4 and discussed previously.

The results of the statistical significance of the exchange rates variable for the aforementioned countries deserve some further attention. It appears that while for Finland, Italy and the Netherlands the nature of the relationship retains the previously discussed characteristics, the same can not be said for the cases of France, Germany and the UK where the sign of the coefficient of the exchange rate variable changes. An explanation can lie to the different influence that large firms may have to the relation in comparison to small firms. In the deflated results an appreciation of the local currency has negative effects to stock prices and that can be due to the fact that now that the heavy influence of the large companies has been lifted (with deflating) the unhedged exposure of medium and small exporting companies is shown in the relationship. However, in general, such changes are at large unexplainable and further research is needed relative to the scale effects and to the best approach to mitigate such problem if it exists.

# APPENDIX E: TAXATION IN EUROPE

**Table E1. Taxation in Europe**

| Countries | Effective Tax Rate (%) | | | Definition of Taxable Income | *Carry-forward* | *Carry-back* | Other Information |
|---|---|---|---|---|---|---|---|
| | *CTR* | *Other* | *Total* | | | | |
| Austria | 34 | - | **34** | Based on the Profit or Loss shown on the financial statements prepared according to Austrian GAAP. | No Limit | No | Minimum Tax |
| Belgium | 39 | 3% of CTR | **40.2** | Based on Income reported on the annual financial statements. | No Limit | No | Temporary surtax on the CTR |
| Finland | 29 | - | **29** | Very closely tied to the income on the statutory accounts. Tax law sets general definitions. | 10 years | No | Imputation System |
| France | 33.3 | 6.3% of CTR | **35.43** | Based on financial statements prepared according to the French GAAP. | No Limit | 3 years | Surtax + Social Security – Imputation system |
| Germany | 25 | 14.4 | **39.4** | Based on financial statements prepared according to German GAAP subject to tax adjustments. | No Limit | 1 year | Surtax + Local (up to 20.5) taxes |
| Greece | 35 | - | **35** | Based on annual gross income, less allowable deductions. | 5 years | No | Dividends no subject to tax |
| Ireland | 16 | - | **16** | Based on company's accounts prepared according to Irish GAAP and adjusted for taxes. | No Limit | 1 year | From 2003 onwards tax falls to 12.5% |

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| Countries | Effective Tax Rate (%) | | | Definition of Taxable Income | *Carry-forward* | *Carry-back* | Other Information |
|---|---|---|---|---|---|---|---|
| | *CTR* | *Other* | *Total* | | | | |
| Italy | 36 | 4.25 | **40.25** | Profits disclosed in the financial statements adjusted for profits, exceptions and deductions. | 5 years | No | Local tax between 4.25% and 8.5% |
| Netherlands | 34.5 | - | **34.5** | Fiscal profit not necessarily calculated from the financial accounts. All commercial accounting methods have to be reviewed to confirm they are acceptable under fiscal law. | No Limit | 3 years | Surtax for "excessive dividend distributions" |
| Portugal | 30 | 10% of CTR | **33** | The net accounting profit calculated in accordance to Portuguese GAAP as adjusted by the tax code. | 5-6 years | No | From 2003 the CTR falls to 28% |
| Spain | 35 | - | **35** | Company's gross income from the annual financial statements (according to Spanish GAAP), less certain deductions due to tax provisions. | 15 years | No | Few Autonomous Communities have a different tax rate |
| UK | 30 | - | **30** | Based on financial statements prepared according to the UK GAAP, subject to certain adjustments and provisions. | No Limit | 1 year | SME's can claim certain allowances and lower tax rate |

*Source: Ernst & Young, Worldwide Corporate Tax Guide, January 2002*

Note: CTR stands for Corporate Tax Rate.