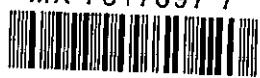MX 7317897 7

The Usefulness of Earnings and Cash flows in Valuing Security Returns: Empirical Evidence for the U.K, U.S.A and France

by

Melita Stephanou

Degree Awarded by
Middlesex University
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Ph.D Dissertation

Submitted in partial fulfilment of the Ph.d requirements

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ABSTRACT

In this dissertation, I proposed to examine and test empirically six major hypotheses that relate to the role of financial information, namely earnings and cash flows, in three major capital markets, two Anglo-Saxon, the UK and the USA and one code law country, France. A theoretical framework is developed to set the groundwork for building up my research hypotheses. I hypothesize that the homogeneity across firms may not hold, due to firm-specific, industry-specific, and country specific differences across firms. The dataset consists of 36,695 USA, 4,234 UK and 1,181 French firm-year observations over the period 1990-98. Multivariate statistical regression analysis is undertaken to test the major research hypotheses.

The major conclusions drawn from the empirical results are summarized as follows. First, results indicate that indeed both earnings and cash flows are taken into consideration by investors in their investment decisions. Second, given cash flows, results show that earnings are always very important to investors and financial analysts for investment purposes; given earnings though results show that cash flows are more important to investors in the Anglo-Saxon countries, possibly due to the lower importance that investors place on the manipulated earnings in these less conservative countries. As far as France is concerned, results reveal that investors place much more attention to earnings and less attention to cash flows. Third, results show that the value relevance of earnings and cash flows is industry specific. Fourth, evidence shows that investors pay more attention to longer-run earnings and cash flows rather than to shorter-run financial information. Fifth, when earnings are transitory (not stable), investors pay more attention to cash flows and less attention to earnings, a result indicating that investors penalize firms with unstable earnings. Sixth, results show that the value relevance of earnings and cash flows is country specific. Specifically, results indicate that earnings are valued more in France and less in the Anglo-Saxon countries, due to the fact that the financial reporting in the Anglo-Saxon countries is much more liberal (less conservative) and managers may manipulate easier financial information. Moreover, as hypothesized, results show that cash flows are the most (least) value relevant in the USA and the UK (France).

In summary, the evidence provided in this dissertation supports that indeed there are substantial differences in the way investors and financial analysts perceive financial information such as earnings and cash flows in the UK, France and the USA. The results of this dissertation should be of great importance to the major stakeholders such as investors, creditors, financial analysts, especially after the latest financial scandals and collapses of giant organizations worldwide. Furthermore, these results support that fundamental analysis does play a very important role in the capital markets and it should be taken more seriously into consideration by the stakeholders for investing, credit, financing and valuation analysis purposes.

The Usefulness of Earnings and Cash flows in Valuing Security Returns: Empirical Evidence for the UK, the USA and France

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CHAPTER I

INTRODUCTION

One of the major objectives of financial reporting is to provide useful information to the

capital market participants for investing, credit and managerial decisions. Empirical capital

markets research examined extensively the type of financial information that could be useful in

explaining security returns. The evaluation of earnings usefulness in the capital markets has

been among the primary empirical questions raised in several studies in the past three decades.

The value relevance of earnings has also been examined recently in conjunction with cash flows

(Cheng and Yang; 2003: Ball et al, 2003; Bartov et al., 2001; Ball et al., 2000; Dechow, 1994;

Alford, et. al., 1993; among others). Empirical research provided evidence to support that

earnings are more useful than cash flows in the capital markets. Existing evidence on the

association of operating cash flows beyond earnings in explaining security returns has been

inconclusive. Furthermore, to date comparative international research on the value relevance of

cash flows has been limited. Ali and Pope (1995), Board and Day (1989) used U.K. data to

examine the usefulness of cash flows in the marketplace. The results of these U.K. studies

showed that cash flows are not associated with security returns, given earnings. Moreover, the

explanatory power of their models was not that strong. These researchers included in their

models working capital from operations, a variable shown in prior studies to be highly correlated

with operating earnings (Bartov, 2001). Furthermore, Lev (1989) among others, argues that

when researchers use aggregate data, they assume that the relationship between earnings and cash flows with security returns is homogeneous across firms. It should be noted that this assumption that investors react identically to earnings and cash flows of all firms is not that pragmatic.

Indeed, earnings are considered the dominant variable in the marketplace, especially for security valuation, in executive compensation contracts, in debt covenants, for bond ratings, in credit and investment decisions (Ball et al. 2003; Lev, 1989). Although earnings are considered the dominant measure in the marketplace, the existence of information asymmetries between management and the suppliers of capital created a demand by these parties for other measures of performance, especially cash flows. Earnings, cash flows and other measures can be used as a source of information to the suppliers of capital on the firm's ability to generate cash a) for debt repayment, b) for payment of dividends, c) for investing activities, and d) to evaluate management. Since all performance measures are subjective, the suppliers of capital have difficulties assessing the reliability of signals produced by management. Earnings can be criticized because they are affected by arbitrary allocations. Management has some discretion over the recognition of accruals. This discretion can be used by management to signal their private information or to manipulate earnings. If management uses their discretion to manipulate earnings, then earnings will become a less reliable measure of performance and cash flows could be preferable. The question that arises is: Why are cash flows used less often for security valuation purposes? Proponents of cash flows support that cash flows are not affected by arbitrary allocations and are not manipulated by management. On the other hand, cash flows cannot be reported alone because they are influenced by timing and matching problems that cause them to be a noisy measure of firm performance (Dechow, 1994). Dechow states that the revenue recognition and matching principles mitigate the timing and matching problems inherent

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in cash flows. Unfortunately, due to inherent limitations, neither of these two measures of performance can be used in isolation for security valuation purposes. Empirical research thus far provided evidence to support that earnings dominate cash flows in the marketplace. Existing evidence though on the incremental information content of cash flows beyond earnings has been inconclusive. The inconclusive results in prior studies, and the limited research on this issue provide motivation for this study.

Furthermore, since earnings have inherent limitations, the UK Accounting Standards Board (ASB) issued in 1991 the Financial Reporting Standard (FRS) # 1 entitled "Cash Flow Statements". The objective of this standard is to provide cash flow information to investors a) to assess the firm's ability to meet its obligations, b) to assess the firm's ability to predict the amount, timing and uncertainty of future cash flows; and c) to assess the reasons for differences between earnings and cash flows. It is also supported by the UK Accounting Standards Board that the cash flow information should be complementary to the profitability information when making an assessment of the organization's future cash flows.

This research study differs from prior studies in the following respects. First, it examines not only the value relevance of operating cash flows beyond earnings, but it also examines the role of cash flows in the capital markets after considering the industrial effects on the relative usefulness of operating earnings and cash flows in explaining security returns. Second, it examines the value relevance of earnings and cash flows when the measurement interval increases. Third, the above major research questions are examined empirically using data from UK and USA (Anglo-Saxon countries) and France (a code law country) in order to determine whether the valuation role of financial information differs in these countries. Fourth, this study examines comparatively the valuation of financial information such as earnings and cash flows, over longer measurement intervals for the UK, USA and France. Thus far, no other study has

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examined the above issues using comparative statistics for the U.K, US and France. Since there are several financial reporting, economic and social differences between the above countries, it is expected that this study will provide new insight regarding the effect, if any of these differences, on the value relevance of earnings and cash flows in these countries.

The present study hypothesizes that the homogeneity across firms may not hold, due to firm-specific, industry-specific, and country specific differences across firms. More specifically, it is hypothesized that the association of operating cash flows and earnings with security returns is affected by the industry and the country the organization belongs to. Regression models will be employed to examine the value relevance of earnings and cash flows in the capital markets for the period 1990-1998. The sample firms will be collected from the Global Vantage and Compustat Databases. The aggregate data will be broken into three industries, according to the Standards and Poors Industrial classification. Standards and Poors classifies organizations into the following three major industrial groups: i) manufacturing; ii) retail; and iii) services.

Statistical analysis was undertaken in this dissertation to test the major hypotheses. A sample of 36695 USA, 4234 UK and 1181 French firm year observations was used to test the research hypotheses. The major conclusions of the empirical results are summarized as follows.

First, regarding hypothesis one which stated that earnings and cash flows are associated with stock prices in USA, UK and France, results indicate that indeed both earnings and cash flows are taken into consideration by investors in their investment decisions.

Second, regarding hypothesis two, which stated that earnings are valued by investors beyond cash flows and moreover, cash flows are valued by investors beyond earnings, my statistical analysis revealed the following: given cash flows, earnings are always very important to investors and financial analysts for investment purposes; given earnings though results show that cash flows are important to investors in the Anglo-Saxon countries USA and UK possibly

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due to the lower importance that investors place on the manipulated earnings in these less conservative countries. As far as France is concerned, results reveal that investors in that conservative country they place much more attention to earnings and little or no attention to cash flows.

Third, As far as hypothesis three is concerned, which states that investors place different attention to financial information such as earnings and cash flows, depending on the industry they analyze, results of this dissertation support this hypothesis. Specifically results indicate that consistent with my hypothesis and my expectations, the statistical results indicate that earnings and cash flow information is industry specific, that is investors and financial analysts pay different attention to earnings and cash flows depending on the industry they analyze. Specifically, investors value more the earnings in the service industry, partly because in that industry the manipulation of earnings is the least because there exist the least accruals (i.e., depreciation, amortization, inventories, etc). As far as the cash flow information is concerned, results indicate that investors value cash flow more in the manufacturing industry. This is not surprising, because in that industry investors and financial analysts expect greater manipulation of earnings due to much higher accruals (i.e., depreciation, amortization, inventories, etc), and thus analysts pay less attention to earnings and consequently pay more attention to cash flows.

Fourth, as far as hypothesis four is concerned, which states that investors pay more attention to longer-run earnings and cash flows rather than to shorter-run financial information, my statistical results for the three countries support this hypothesis.

Fifth, as far as hypothesis five is concerned, which states that when earnings are transitory (not stable), investors are expected to pay more attention to cash flows and less attention to earnings, the statistical results of this dissertation support this hypothesis. Specifically results show that investors penalize firms with unstable earnings and simultaneously these investors

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pay more attention to cash flows in making their investment decisions in all three countries.

Sixth, as far as hypothesis six is concerned, which states that investors and financial analysts pay different attention to financial information, such as earnings and cash flows, depending on the country their investment decision relates to, my statistical results support this hypothesis. I hypothesized that the value relevance of earnings will be the highest in France since it has the most conservative financial reporting system. On the other hand, I expect that the value relevance of earnings will be the lowest in the UK and USA because they have the least conservative financial reporting system. Hence, I expect that cash flows will be the most (least) value relevant in the USA and UK (France). Specifically results related to this hypothesis support the following:

i) univariate results indicate that even though earnings and cash flows are important to investors and financial analysts in all three countries, the level of earnings is considered somewhat more important to French investors than to investors in the USA and UK,

ii) univariate results support my hypothesis that cash flows are valued in all three countries but they are valued more by the investors in Anglo–Saxon countries than in non Anglo-Saxon countries like France,

iii) multivariate results support again my hypothesis that the investors in these countries value differently financial information such as earnings and cash flows due to the financial reporting differences in these countries. Specifically, results indicate that earnings are valued more in France and less in the Anglo- Saxon countries. This result may be due to the fact that the financial reporting in the Anglo- Saxon countries is much more liberal (less conservative) and managers may manipulate easier the financial statements,

iv) multivariate results support again my hypothesis that the investors in these countries value differently cash flows due to the financial reporting differences in these countries.

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Specifically, results indicate that total cash flow is valued by investors in all three countries, but results show that cash flows are valued more in the Anglo-Saxon countries and less in France. These results may be due to the fact that the financial reporting in the Anglo-Saxon countries is much more liberal (less conservative) and managers may manipulate easier the financial statements, and since earnings are expected to be of lower quality in these countries, financial analysts and investors are expected to pay more attention to cash flows.

v) when earnings and cash flows are taken together by investors and financial analysts, these stakeholders pay more attention to earnings in France and less attention to cash flows in France. The opposite happens in the Anglo-Saxon countries USA and UK. These results are consistent with the previous discussion. As far as the importance of cash flows is concerned, when earnings are considered, results are consistent with my expectations that is, cash flows are more important in the Anglo-Saxon countries USA and UK than in France, when earnings and cash flow information is evaluated simultaneously by investors it is perceived more important in France rather than in Anglo-Saxon countries. These results are possibly due to the fact that in Anglo- Saxon countries, there are greater manipulations of financial information by managers,

vi) regarding industry differences within a country, my statistical results supported that earnings and cash flows are industry specific and moreover these results were also shown to be country specific. Specifically, results showed that in all industries the French model had the highest explanatory power as measured by the well known R^2. This result was mostly due to the more usefulness of earnings to investors in France. Also, as expected, results indicate that the cash flow information is more useful to UK and USA investors than to French investors in all industries examined, and more importantly in the manufacturing and retail industries where more discretion and manipulation exists in their financial reporting systems;

vii) when I examined the importance of earnings and cash flows in all three countries

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over a longer period of time (more than a year and up to five years), my results again supported

the hypothesis that investors in these three countries perceive earnings and cash flows differently.

Interestingly, the importance of earnings and cash flows from one to five years, as measured by

the R^2, increases the highest in the USA (almost quadruples, 7% to 27.8%), whereas increases

the least in France (almost triples, 11.4% for the annual and 32% for the five year interval).

These results are not that surprising that in Anglo-Saxon countries such as the US and UK the

increase is greater than in a code law country such as France. This is due to the fact that in the

shorter run there is a greater manipulation of financial information in Anglo-Saxon countries

than in more conservative countries such as France,

viii) when I examined the importance of earnings and cash flows to investors and

financial analysts in cases where the earnings information is transitory (ie., non stable or with

very high variability), my results indicate that earnings and cash flows are perceived differently

by investors, depending on the country they belong to. Specifically, when earnings are transitory,

investors in Anglo-Saxon countries penalize more these firms because the effect of earnings on

stock returns is much more negative;

ix) as hypothesised, results support that when earnings are transitory, investors and

security analysts in the UK and USA pay more attention to cash flows. These results are very

interesting because they show that in Anglo-Saxon countries such as the USA and UK, investors

pay additional attention to cash flows because they know that earnings are of lower value when

they are unstable. On the other hand, consistent with my expectations, French analysts and

investors do pay more attention to earnings because their code law system makes financial

reporting in France much more conservative, and thus the variability of earnings is not that high

as the variability of earnings in the UK and USA.

In summary, evidence provided in this study supports that indeed there are substantial

differences in the way investors and financial analysts perceive financial information such as earnings and cash flows in UK, France and USA.

The dissertation proceeds as follows: Chapter II critically evaluates the capital markets literature related to earnings and cash flows and it also examines the major differences in financial reporting between UK, USA and France. Chapter III provides a critical review of the International financial reporting literature. Chapter IV discusses the theoretical framework, motivates this study and develops the research hypotheses. Chapter V describes the sources of data, measurement of financial and market variables, the statistical models used to test the research hypotheses of the study, and it also discusses the state of the art methodology and techniques applied. The empirical results (aggregate, by industry, and by country) are discussed in Chapter VI. The conclusions will be presented in Chapter VII.

CHAPTER II

CRITICAL REVIEW OF THE VALUE RELEVANCE

LITERATURE

2.1   Introduction

This chapter critically evaluates the literature that relates to the value relevance of financial information (earnings and cash flows). Specifically, it provides an in depth discussion of the significance of earnings and cash flows in the capital markets, In addition, it discusses and critically evaluates the existing empirical studies that were undertaken worldwide which examine the association between earnings, cash flows and security returns.

More specifically, the following subsections follow:

1. The role of financial information in the capital markets: The value relevance of earnings and cash flows

2. The role of earnings in the capital markets

3. Empirical evidence on the usefulness of earnings and cash flows in the capital markets.

4. The use of contextual factors in improving the association between financial information and security returns

2.2 The value relevance of earnings and cash flows

Financial theory suggests that security prices relate to future expected cash flows. Since the aforementioned cash flows are ex-ante, there is controversy in the finance and accounting literature regarding the usefulness of two of the major financial variables, namely earnings and cash flows, in signalling these future cash flows (Dechow, 1994). Researchers examined several empirical questions regarding value relevance of earnings and cash flows in the marketplace, among those the following: i) Do accruals explain differences across firms in the market value of equity, given operating earnings?[1], ii) Do accruals explain differences across firms in the market value of equity, given operating cash flows?, iii) Do accruals and cash flows provide the same information to the market about future expected cash flows? Though evidence exists to support the association between earnings and stock prices, financial analysts and researchers have questioned the relevance and reliability of earnings mainly because i) of their accrual components, and ii) they are manipulated by managers (Xue, 2004; Dechow et al. 2003; Lara et al. 2005).

Earnings are of primary importance to managers, because managerial executive compensation contracts are usually based on earnings. Managers select financial reporting methods to maximize the value of their bonus awards through incentives created by bonus schemes. In addition, managers indulge in income smoothing, that is, taking actions to dampen fluctuations in their organization's earnings, as investors pay more for a firm with a smoother income stream (Dechow et al. 2003; Barth et al. 2005).

Regulatory bodies in Anglo-Saxon countries, such as United Kingdom, Australia, New Zealand, U.S.A. and Canada, and the International Accounting Standards Committee issued cash

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1 Accruals are defined as the sum of a) non-cash expenses/revenues and b) changes in working capital (receivables, inventory, payables), except for changes in cash and cash

flow reporting statements, which support the view that cash flows, in addition to earnings, is useful for security valuation purposes. Even though there has been increased support for the possible usefulness of cash flows in the marketplace, earnings is considered the primary financial measure of performance (Dechow, 1994). For example, the financial press (e.g., Wall Street Journal, Financial Times, etc) publishes earnings prior to cash flow information, an indication that the demand for information about earnings may be greater than the demand for cash flow information. There has been also a greater demand from the investors and financial analysts for earnings forecasts than cash flow forecasts.

Furthermore, research studies emphasized the differential usefulness of earnings and cash flows in explaining stock returns. Literature offers the following explanations.

1.   Quality of earnings: according to the quality of earnings explanation, accruals are expected to have a smaller impact on security returns than operating cash flows because accruals represent indirect links to future cash flows. Moreover, there exists empirical evidence which supports that accruals are subject to managerial manipulation (Xue, 2004; Dechow et al. 2003; Barth et al. 2005; Dechow, 1994; Ali and Pope, 1991).

2.   Macroeconomic conditions:

a. Economic downturn: differential stock market reactions of accruals and cash flows may be due to how well organizations anticipate and adjust to changing economic conditions.

b. Economic expansion: markets may react favourably to accruals when management uses cash to increase non-cash working capital. The reverse is true for recessionary periods.

Even though earnings are considered the dominant financial variable in the marketplace, there exists evidence that earnings are manipulated by managers, because earnings are used in executive compensation contracts, and that managers believe that investors pay more for a firm

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equivalents.

with a smoother income stream.

The inconclusive empirical evidence regarding the usefulness of cash flow and accrual measures for valuing the firm, as well as the increasing interest in cash flow reporting, provide motivation for research in this area.

2.3   The role of earnings in the capital markets

Since the seminal work of Ball and Brown (1968) earnings have been the dominant financial measure in the capital markets. Assessing the usefulness of earnings to investors is important, since earnings are widely believed to be the premier information item provided in financial statements (Lev, 1989). Equity valuation models use expected earnings as an explanatory variable, financial analysts express their beliefs about future outcomes of securities in the form of earnings forecasts, management decisions and their compensation are often stated in terms of earnings objectives.

Earnings' usefulness can be derived from the estimation of correlation between stock returns and earnings. If the information contribution of earnings to investors is *significant*, earnings are powerful, otherwise not. This points to the consideration of the returns/earnings correlation, or the R^2 of the regression, as a measure of the information contribution of earnings to investors. It was found that the returns/earnings R^2 is not a complete measure of the usefulness of earnings due to differences in the returns/earnings relation (Lev, 1989). Even though, it captures a very important attribute of earnings — their ability to facilitate the prediction of future security returns.

In the early 1980s, a line of research introduced firm characteristics to explain cross-sectional differences in the returns/earnings relation. The factors examined by these studies

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include size (Atiase, 1985), predictability of earnings (Pincus, 1983) , stock exchange market (Grant, 1980) , and prior information disclosure environment (McNichols and Manegold, 1983). Although these studies contributed to our understanding of the differences in the returns/earnings relation across firms, they were not in general based on a theoretical formulation of the returns/earnings relation.

Lev (1989) summarized various relevant characteristics and findings of a sample of studies for the period 1980-88. Lev analyzed several issues in order to evaluate the usefulness of earnings: return window, profitability ratios, incorporate earnings-related items (cash-flow components, sales, expenses). This line of research uses unexpected earnings (quarterly and annual) rather than reported earnings: stock prices reflect expectations about future earnings before earnings are announced so, it seems reasonable to correlate the change in price (return) with unexpected earnings (new information), rather than with reported earnings. This methodology is expected to increase the power of the returns/earnings analysis. Initially, Lev critically analyzed studies that used cross-sectional analysis to determine the value relevance of earnings. The R^2 was found to be very low: only 2-5% of the cross-sectional variability of returns could be ascribed to the unexpected earnings information. Then Lev regressed quarterly earnings of 194 firms listed on the quarterly Compustat tape for the period of 1980-87. Time-series' returns/earnings regressions have the same results as the cross-sectional regressions. Even though these prior studies established an association between earnings and security returns, the explanatory power of earnings was found to be relatively low.

In the late 1980s, in the 1990s and in the early 2000s, studies have progressed into a new research arena. These studies are divided into theoretical and empirical. The theoretical studies are divided into two subgroups: studies that assumed joint normality of cash flows and those based on time-series process of earnings. Assuming joint normality of cash flows, the

researchers run linear regressions where x is the future cash flows and y the earnings signal. The slope coefficient β is the theoretical earnings response coefficient (ERC). ERC is defined as the effect of a dollar of unexpected earnings on stock returns, and is measured as a slope coefficient in the regression of abnormal stock returns on the appropriately scale unexpected earnings. Two theoretical conclusions derived from joint normality are: the larger the future uncertainty, the larger the ERC and the noisier the firm's reporting system, the smaller the ERC (Cho and Jung, 1991). Assuming time-series based valuation and based on the Beaver, Lambert, and Morse (BLM), (1980) study, the observed earnings y_t are taken as a mixture of ungarbled earnings x_t and earnings with no pricing implication ε_t. They have made the valuation assumption for each security and derived the relationship that the percentage change in price equals the percentage change in expected ungarbled earnings. Combining BLM specifications with other expressions and functions such as expected dividends and earnings multiplier λ, the major conclusions derived are: "ERC is a function of the earnings multiplier λ and the expected rate of return used to discount earnings. Since the expected rate of return is expressed as a function of systematic risk (β) and the risk-free interest rate under CAPM, ERC is a decreasing function of systematic risk and interest rate" (Cho and Jung, 1991, p.85).

Concerning the empirical studies that were undertaken thus far, they are classified into two major groups: studies on ERC determinants and studies on the informativeness of earnings. The main objective of ERC determinant studies is to identify factors that affect ERC over a long-term window. Earnings informativeness studies examine the effect of a certain event on the change in ERC over a short-term window. In the literature, the determinants studies are generally referred to as *association studies* and the informativeness studies are referred to as *event studies*. Although most association studies use a long return window, while event studies use a short window, there is no theoretical reason why they should not use alternative return windows. The

results of some studies are not consistent with each other when their length of return window is different (Easton, Harris and Ohslon, 1992; Dechow, 1994).

Researchers concluded that the ERC related studies have some limitations: 1) theoretical studies are based on strong assumptions and it is not clear how the parameters of the models will be changed when these assumptions are relaxed[2], 2) empirical tests also have various limitations. Most of the studies focus on uncertainty of future earnings or earnings' quality. It is difficult to find approximate proxies because the two factors are related to each other. No studies have attempted to segregate the effect of each component, 3) Another limitation is that it is not clear yet which of the two models, information economics based model or time-series based model, better describes reality. Researchers support that these models will be more refined when we know more about the links between earnings and dividends and current and future earnings.

Regarding the association studies, several researchers examined the relationship between earnings and security returns, among those Alford et al (1993), Board and Day (1989), Easton and Harris (1991) and Freeman (1987). Easton and Harris (1991) first introduced in their models changes in earnings. They supported that in multiple regression of security returns, on both the current earnings levels and earnings change variables, both coefficients are generally significantly different from zero. This result suggests that both earnings variables play a role in security valuation. Ohlson and Shroff (1992) corroborated their results. The study of Alford et al (1993) compares and contrasts the information content and timeliness of accounting earnings for several non-US countries using matched US samples as the benchmark. The results presented a considerable variation in explanatory power of earnings across countries. In addition the findings of Lev's (1989) study support that the returns/earnings relation shows considerable

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2 For example, theoretical models are based on economic earnings or expected future cash flows, where as

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instability over time, meaning that the usefulness of quarterly and annual earnings to investors is very limited. This evidence is also supported by the low correlation between earnings and returns. Lev shows that earnings have low information content because of the discretion of managers regarding the valuation principles, the accounting measurement, and the manipulation of earnings. Table 1 also presents a summary of major results of selected prior studies.

The aforementioned studies emphasize earnings usefulness. On the other hand researchers criticized earnings because there is evidence that they are manipulated (Cheung et al, 1996). Therefore, additional studies examined the usefulness of other measures of firm performance, mainly cash flows. These studies are discussed and analyzed in the section that follows.

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empirical models proxy these variables with accounting earnings andoperating cash flows.

TABLE 1 : Review of the literature: Major results of selected prior empirical studies (in alphabetical order)

Authors	Results
Alford et al (1993)	• This study compares the information content of accounting Earnings for several non-US countries using matched US samples as the benchmark. The results presented a considerable variation in explanatory power of Earnings across countries. • Accounting Earnings prepared in accordance with the domestic GAAP of Australia, France, Netherlands and UK are more timely or more value relevant than accounting Earnings prepared in accordance with US GAAP. • The results for Belgium, Canada, Hong Kong, Ireland, Japan, Norway, South Africa and Switzerland are not conclusive. • Accounting Earnings for Denmark, Germany, Italy, are either less timely or less value relevant than US GAAP Earnings.
Ali and Zarowin (1992)	• For firms with permanent Earnings in the previous period, the incremental explanatory power and the increase in ERC are small when the Earnings level variable is included in the model. • For firms with transitory Earnings in the previous period, the incremental explanatory power and the increase in ERC from the inclusion of Earnings level variable are much larger.
Ali (1994)	• Used a model that allows non-linearity between Returns and Earnings, WCFO and CFO. The results indicate that these three variables have incremental information content. • The incremental information content of Earnings, WCFO and CFO declines as the absolute value of changes in these variables increases.
Ali and Hwang (2000) Ali and Pope (1995)	• Their results show that the degree of association between security returns and earnings is lower in code law countries as opposed to common law countries. More precisely, earnings in code law countries like France seemed more conservative and consequently less timely than those in common law countries, such as USA and UK. • Earnings, Funds Flows and Cash Flows have explanatory power for returns individually and the response coefficient of their unexpected components is positive. • Earnings have value relevant information content beyond Funds Flows and Cash Flows. • The inclusion of both levels and changes of Earnings and the use of time varying coefficients and non-linear models, increase the explanatory power of the Earnings/ Returns model. • The power of the model is decreased when they used Funds Flows and even more when they used Cash Flows from Operations.
Ball, Kothari and Robin (2000)	• Results indicated that earnings in code law countries, such as France, is less timely and less conservative than common law income as reported in UK and USA. Comparing the UK and USA evidence, results indicate that there is less asymmetric conservatism in the UK earnings.
Bartov et al (2001)	• Their results indicated that earnings in Anglo-Saxon common law countries have more explanatory power than cash flows. Conversely, in the two code law countries (Japan and Germany), earnings are not superior to cash flows in explaining security returns.
Bernard and Stober (1989)	• Their goal was to assess the generality of Wilson's results by contacting the same tests over 32 quarters. Their research showed that Wilson's results don't robust over larger time frames. • They investigated the effect of firm size on the relation between Returns and Cash Flows. No obvious pattern in the results across the different firm sizes since they didn't find enough evidence to support that information about unexpected Cash Flows/ Accruals was more likely to be impounded in market prices for small and medium size firms than for large size firms.

TABLE 1 (continued)

Authors	Results
Board and Day (1989)	• There is considerable evidence of a consistent information content both in the traditional return on investment measure and in the working capital based measure of Cash Flow. • There is no evidence of information content in the net cash assets Earnings figures. • There is some evidence that the Return on investment figures yield more information than either the working capital based measure of Cash Flow and the net cash assets Earnings figures. • There is little evidence that the information content of any of the Earnings figures is substantially influenced by inflation. • There is some evidence of a time effect on the information content of Earnings measure and this does not appear to be wholly caused by inflation.
Bowen et al (1987)	• Cash Flows have incremental information after controlling for the association between Security Returns and Cash Flows. • Cash Flow data have incremental information content conditional on both Earnings and WCFO. • There is little evidence that WCFO has incremental information content relative to that contained in Earnings.
Chan and Seow (1996)	• They reported stronger association for Returns / Earnings relations using foreign GAAP Earnings than for those using Earnings adjusted to US GAAP.
Chan et al (1991)	• The findings reveal a significant relationship between Earnings yield, size, book to market ratio and cash flow yield and Expected Return in the Japanese market. • Of the four variables the book to market ratio and Cash Flow yield have the most significant positive income on Expected Returns. • Small firms in our sample tend to outperform larger firms, after adjusting for market risk and the other fundamental variables. • Of the four variables considered, it is hardest to disentangle the effect of the Earnings yield variable.
Charitou (1997)	• Operating Cash Flows have information content beyond Earnings in explaining security Returns. • Cash Flows play a more important role in the market place, the smaller the absolute magnitude of accruals, the longer the measurement interval and the shorter the firms Operating Cycle.
Cheng et al (1996)	• Transitory Earnings have smaller marginal impact on security Returns. • The incremental information content of accounting Earnings decreases, and the incremental information content of CFO increases with a decrease in the permanence of Earnings.
Club (1995)	• Accounting Earnings data possesses information content beyond Cash Flow data indicating that unexpected working capital from operations and unexpected long-term accruals both have incremental information content beyond operating, investment and financing Cash Flows.

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TABLE 1 (continued)

Authors	Results
Collins, Kothari and Rayburn (1987)	• Their study helps to explain the inverse relation between firm size and the strength of association between unexpected annual Earnings and contemporaneous security price changes. • Their empirical results showed that price-based Earnings would outperform univariate time series forecasts by a greater margin for larger firms than for smaller firms.
Collins and Kothari (1989)	• ERC increases in growth and/ or persistence and decreases in interests rates and risk. • They also demonstrated empirically that Earnings/ Returns relation varies with firm size, where size is a proxy for information environment differences.
Dechow (1994)	• She showed that over short measurement intervals Earnings are more strongly associated with Returns than Cash Flows. • The results indicate that the explanatory power of Cash Flows increases over long measurement intervals. • Earnings have a higher association with stock Returns than Cash Flows in firms experiencing large changes in their Working Capital requirements and their investment and financing activities. • Although accruals improve Earnings association with stock Returns, long-term accruals play a less important role in minimising the timing and matching problems of Cash Flows. • Earnings better reflects firm performance than CFO for firms in industries with long Operating Cycles.
Easton and Zmijewski (1989)	• Their results indicated a positive association between ERC and firm size. • ERCs are negatively correlated with systematic risk. • They provided evidence that ERCs vary cross-sectionally and in a predictable manner.
Easton and Harris (1991)	• The coefficients of levels and changes of Earnings are generally significantly different from zero. Both Earnings variables play a role in security valuation.
Easton et al (1992)	• The longer the interval over which Earnings are aggregated, the higher the cross-sectional correlation between Earnings and Returns.
Freeman (1987)	• Security prices of large firms reflect information about Earnings earlier than the prices of small firms. • The magnitude of abnormal Returns associated with good or bad news from a common class of signals (Earnings) is inversely related to firm size.
Freeman and Tse (1992)	• Present evidence that the marginal response of stock price to Unexpected Earnings declines as the absolute magnitude of Unexpected Earnings increases.
Hall et al (1994)	• Their results are consistent with the perception that Japanese investors utilize accounting information particularly Earnings, less in their pricing of companies than do US investors. • The increased associations derived with the inclusion of 1991 prices suggest that the current fall in prices is consistent with a Return to more emphasise on fundamental values.

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TABLE 1 (continued)

Authors	Results
Kothari (1992)	• The average and median explanatory power of firm-specific time-series regressions is higher when returns are regressed on the earnings deflated by price variable compared to the earnings change deflated by price variable. • Price outperforms earnings as a deflator.
Livnat and Zarowin (1990)	• The separation of Net Income into Operating Cash Flows and Accruals does not improve the relation with Returns. • When Cash Flows are disaggregated the association with Returns improves substantially. • Individual components of Cash Flows are differentially associated with security Returns.
Ohlson and Shroff (1992)	• Given unpredictable returns, the Earnings levels variable correlates more with returns than the Earnings change variable if the levels variable has smaller sample variance. • The Earnings levels variable is the best explanatory variable for Returns if neither Returns nor Earnings levels are predictable.
Pope and Walker (1999)	• UK GAAP earnings are significantly more timely in the recognition of bad news than US GAAP earnings. UK firms recognize bad news faster than US firms, but they classify the bad news differently.
Rayburn (1986)	• The results support the association of both operating Cash Flow and aggregate accruals with abnormal Returns. • The results for the components of accruals are less consistent. • All of the components of accruals are significant when a random walk process is assumed to generate the time series of each component.
Teets and Wasley (1996)	• Using random samples of firms we find that the mean of the firm-specific coefficients is on average 13 times larger than the corresponding coefficient estimated with a pooled cross-sectional regression methodology. • The average of the firm-specific coefficients is always larger than the corresponding Earnings response coefficients estimated from pooled time-series regressions.
Warfield and Wild (1992)	• Revealed an inverse relation between Earnings explanatory power for Returns and the length of the reporting period. • Future period Earnings are significantly related to Current Returns and are often of greater explanatory power for Current Returns compared with Current Earnings. • Earnings explanatory power is substantially greater for companies whose Earnings measurements are predictably less sensitive to accounting recognition criteria.
Wilson (1986)	• Cash and Total Accruals components of Earnings have incremental information content beyond Earnings themselves. • Total Accruals components of Earnings has incremental information content beyond the Cash component.

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2.4 The role of cash flows in the capital markets

Several researchers examined the association between earnings, cash flows and security returns. Ball and Brown (1968), Beaver and Landsman (1983) among others found that the association between security returns and operating earnings is higher than that between security returns and cash flows, where cash flows were defined as:

1.   either net income + depreciation

2.   working capital (earnings plus non-cash expenses/revenues).

Though the two financial variables (cash flows and working capital) were believed to be highly correlated, research does not support this view. Research, however, suggests that the use of working capital variable is inadequate in studying the properties of cash flows (Bernard and Stober, 1989, Wilson, 1987, Rayburn, 1986; Lev, 1989).

Empirical studies by Ball et al. (2003), Bartov, (2001), Livnat and Zarowin (1990), Charitou and Ketz (1991), Wilson (1986, 1987), Rayburn (1986), Bowen (1987), employed more refined cash flow measures, namely operating cash flows to examine the stock market reaction to accruals and cash flows measures. The results provided by these studies are inconclusive and the explanatory power of these statistical models is weak (i.e., very low R^2).

Table 1 presents a brief discussion of the major results of selected prior studies that relate to this issue. More specifically, the empirical evidence provided thus far regarding the quality of the accrual and cash flow measures has been mixed and inconclusive (Cheng and Yang, 2003, Bartov et al., 2001, Livnat and Zarowin; 1990). An early study by Wilson (1987) provided evidence that cash flows are valued more than current accruals in the marketplace. On the other hand, Bernard and Stober (1989), showed that accruals and cash flows have the same informativeness in explaining security returns, that is investors value equally cash flows and earnings in the capital markets. Bowen (1987) showed that accruals and cash flows are valued

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differently in the marketplace. These results as well as results provided by Rayburn (1986) were inconclusive with regards to the role of accruals in explaining security returns.

Since prior studies provided inconclusive and mixed results regarding the usefulness of earnings and cash flows in the marketplace, some other researchers provided some explanation as to why financial markets or investors value cash flows and earnings differently. Under the quality of the earnings explanation, earnings are expected to have a smaller impact on stock prices than operating cash flows, because earnings represent only indirect link to expected cash flows (Neill et al, 1991). Earnings may also manipulated by managers. Moreover, during a period of economic downturn the differential stock price reaction to accruals and cash flows are attributable to how well organizations anticipate and adjust to changing economic conditions. During recessionary periods, the market is expected to react favourably when management liquidates non-cash working capital, which would manifest itself as a preference for cash flow over short term accruals (Bernard and Stober, 1989). Stock markets are also expected to react more favourably to cash flows than accruals because high liquidity is a signal of a smaller likelihood of financial distress (Sharma and Iselin, 2003; Uhrig-Homgurg, 2005).

Furthermore, stock markets are expected to respond more favourably to operating cash flows than to accruals, because there is a belief that accruals are subject to arbitrary allocations and managerial manipulation. Earnings are manipulated because a) they are used in executive compensation contracts and b) there is a belief that investors pay more for a firm with a smoother income stream.

Indeed, in the past two decades there has been increased attention in cash flow reporting, since there exists evidence that earnings show the profitability and not the cash flow ability of the organization. In the mid-1980s and in early 1990s, standard setting bodies in the USA, Canada UK, Australia and the International Accounting Standards Committee issued reporting

standards that require the Statement of Cash Flows as one of the three major financial statements.

Several researchers have examined the usefulness of cash flows in the capital markets, beyond the earnings information. In the mid-1980s, US studies by Rayburn (1986), Wilson (1986, 1987), Bowen et al. (1987), Bernard and Stober (1989), and Livnat and Zarowin (1990) provided evidence that operating cash flows are associated with security returns but provided limited support for the incremental information content of cash flows beyond earnings. Livnat and Zarowin (1990) and Bernard and Stober (1989) showed that the decomposition of earnings into operating cash flow and accruals does not improve the association with returns, although their finding of a differential return response to the components of operating cash flow suggests incremental information content for this disaggregated operating cash flow data beyond accounting earnings. In the UK, a study by Board and Day (1989) did not find incremental information content for operating cash flow beyond accounting earnings.

While early studies on the value relevance of cash flows provided inconclusive results, more recent research in the past decade has further extended the variety of approaches to analyzing the relative information content of earnings and cash flow data and has provided further evidence in favour of the incremental information content of cash flows than the earlier research considered above. Like the earlier research, most of the more recent research might be regarded as concerned with the contemporaneous relationship between annual accounting data and annual security returns (Ali 1994; Ali and Pope 1995; Cheng et al. 1996; Clubb 1995; McLeay et al., 1997; Garrod and Hadi 1998; Charitou 1997; Charitou et al. 2000; Pfeiffer at al., 1998, 1999; Green 1999; Ball et al. 2000, 2003; Bartov et al. 2001), but there has been a greater emphasis on addressing more directly further methodological advancements. The modelling of contextual factors possibly affecting the incremental information content of cash flows, improved measurement of accounting variables and an interest in the possible non-

contemporaneous relationship between security returns and cash flows have had an increasing effect on the design of empirical research. The discussion below emphasizes research concerned with the contemporaneous relationship between annual accounting data and annual security returns, before considering other research findings focusing on long return windows and possible non-contemporaneous relationships between return and accounting data.

As far as the contemporaneous relationship between annual returns and cash flows is concerned, empirical evidence in the 1990s by Ali (1994), Ali and Pope (1995), and Cheng et al. (1996) provided positive evidence of the incremental information content of operating cash flows beyond earnings using more elaborate cross-sectional models of the relationship between security returns and earnings/cash flows than previously employed. Freeman and Tse (1992), Ali (1994) and Ali and Pope (1995) extended prior cash flow research by estimating non-linear models of the relationship between abnormal returns and unexpected earnings, unexpected funds flow and unexpected operating cash flow.

In these studies the marginal security return response to accounting innovations declines with the absolute size of the innovation. The indicator variable approach of Ali (1994) based on US data provides evidence of an earnings response coefficient in excess of 2.0 for firms with below median absolute earnings changes and statistically significant additional positive security return response to operating cash flows (CFO) for firms with below median absolute changes in CFO. There is no evidence of incremental information content for cash flows in the simple linear model, possibly due to the effect of extreme cash flow realisations which, according to Ali's findings, have no incremental information content.

Regarding the empirical evidence of the UK study by Ali and Pope (1995), their results show that there exists incremental information content for cash flow from operations in a pooled analysis with time varying coefficients. Cheng et al (1996) use a dummy variable approach to

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estimate a non-linear contextual model of a different form where the security return response to unexpected operating cash flow is permitted to vary with the absolute size of accounting earnings changes. Their study provided evidence of an earnings response coefficient greater than 4.0 for firms with below median absolute changes in earnings, together with evidence that CFO has a positive additional impact on security returns beyond earnings both for the sample as a whole and particularly for firms with above median absolute earnings changes.

The use of both levels and changes of earnings and cash flows as explanatory variables helps to explain the higher ERCs reported by Cheng el al and the strength of their findings in relation to the incremental information content for cash flow beyond earnings even for the 'non-contextual' simple linear model. An interesting feature of this study is the strength of their findings of incremental information content in the simple non-contextual model. These results support incremental information content even for a random walk model for cash flow but the results are stronger when both levels and changes are used and clearly indicate the greater importance of the cash flow level variable over the change variable as an explanatory variable for returns.

A common feature in the aforementioned studies is the incorporation of cross-sectional differences in earnings and cash flow persistence into their analysis by estimating a non-linear model where the marginal security return response is permitted to vary but where, nevertheless, earnings and cash flow variables are measured in a standardised way across sample observations i.e. either as the first difference of the variable or as a combination of the level and the first difference of the variable.

By contrast, following Rayburn (1986), the UK studies by Clubb (1995) and McLeay et al (1996) use firm-specific forecast models to estimate innovations in accounting variables. More specifically, the study by Clubb (1995) uses the dividend valuation model to motivate a time

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series analysis of the incremental information content of accounting earnings and operating, investment and financing cash flows, whereas the study by McLeay (1995) focuses on the relative information content of earnings and operating cash flows using both time series and pooled cross-sectional approaches. Clubb (1995) finds support incremental information content of operating, investment and financing cash flows beyond earnings but cannot reject the hypothesis that operating, financing and investment cash flows (defined to sum to net equity dividends as change in cash are included as part of investment) provide no incremental information content beyond both earnings and dividends. McLeay et al (1972), using a similar dataset to Ali and Pope (1995), find support for incremental information content of operating cash flow, obtaining a similar R^2 for the incremental information model to results reported by Ali and Pope.

While the use of firm-specific forecast models to estimate earnings and cash flow innovations may have advantages over an approach that uses a standard measurement approach for all firm-year accounting variable observations, measurement error in the estimation of the forecast model is likely to affect the findings. The relatively low earnings response coefficients reported by McLeay et al (less than 1.0 compared with approximately 2.0 in Ali and Pope, 1995) suggests that measurement error may have affected the reported regression coefficients.

Furthermore, Biddle et al (1995) have suggested that industry analysis may be the most appropriate way to accommodate cross-sectional differences between firms when examining incremental information content. While they do not report earnings and cash flow response coefficients, they find that cash flows provide incremental information content beyond net income in 22 (11) industries for one-lag (random walk) estimation, out of a total of 40 industries, in contrast to the mixed findings in the earlier studies on incremental information content of cash flows.

In addition to the aforementioned contemporaneous analysis of the value relevance of cash flows, some of the more recent research examined non-contemporaneous relationships between security returns and earnings/cash flow data. This kind of empirical research emphasises the potential usefulness of cash flow data in predicting future returns, although work adopting the long return interval approach (Dechow 1994) first used by Easton et al (1992) to analyze earnings data alone, incorporates the possibility of earnings/cash flow data having predictive and/or lagged associations with security returns in addition to a contemporaneous relationship. Chan et al. (1991) find that cash flow yield (where cash flow is the traditional definition, earnings plus depreciation) provides incremental information content for future security returns beyond earnings yield, book-to-market and log of market capitalisation, using Japanese data over the period 1971-88. They suggest that the highly significant positive coefficient for cash flow yield (together with book-to-market) and the counter-intuitive negative coefficient for earnings yield may be due to use of conservative depreciation policies by Japanese companies to reduce tax. Interestingly, Sloan (1996) using US data for the period 1962-91 provides evidence that accruals have incremental information content for security returns beyond earnings yield, book-to-market and log of market capitalisation, implying that cash flow from operation is significantly positively related to future returns in a US setting.

More generally, Sloan presents extensive findings suggesting that security returns and investor earnings forecasts do not immediately reflect the higher persistence of the cash flow component of earnings over the accruals component. In the UK, evidence by Charitou et al. (2000) also suggests a significantly positive relationship between security returns and previous year cash flow from operations after controlling for contemporaneous earnings and cash flow, previous year earnings and previous year market-to-book and equity market value variables. In summary, there is growing evidence that cash flow data can be useful in predicting future

security returns, a result which possibly indicates a degree of market inefficiency in relation to the reflection by security prices of the relative persistence of cash flow and accrual components of earnings.

The study by Dechow (1994) based on US data and Charitou et al. (2000) based on UK data provide evidence based on US and UK data respectively that earnings and cash flow measures become more closely correlated with share returns as the return interval is expanded and accounting variables are aggregated over periods up to four years. The study by Dechow (1994) focuses on the relative information content of earnings and two cash flow measures, cash flow from operations and change in cash balance, and finds that, while the relative superiority of earnings over cash flow narrows as the return interval is expanded, earnings are superior relative to cash flows over all intervals.

In addition to broadly corroborating Dechow's findings based on UK data, Charitou et al. (2000) findings suggest that the incremental information content of operating cash flow a range of operating, investing and financing cash flows beyond earnings persists over long intervals. The use of long-return intervals and earnings/cash flows aggregated over several years may result in an improved association vis-à-vis annual intervals either if security prices anticipate future accounting numbers and/or if accounting numbers anticipate future returns. The analysis of Dechow (1994) emphasizes the confirmatory role of earnings and cash flow numbers, the explanatory power of both accounting earnings data and cash flow data for security returns increasing due to reduced measurement error resulting from accounting policy choices in the case of earnings and reduced measurement error due to omission of current accruals in the case of cash flow data.

Furthermore, the UK evidence of continued incremental information content of cash flows beyond earnings as the return interval increases may suggest that such measurement error in accrual earnings is still substantial over longer horizons and that cash flow data is required to provide an

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accurate picture of actual economic outcomes. It is also possible, however, that the expansion of the return interval (with simultaneous intertemporal aggregation of accounting numbers) results in incremental information content for cash flows over earnings because of the additional predictive power of annual cash flow data in relation to future returns, as suggested by the findings of Sloan (1996).

Furthermore, a more recent study by Bartov, et al. (2001) examined the value relevance of cash flows beyond earnings in five countries, namely, USA, UK, Germany, Japan and Canada. Their results indicated that cash flows and earnings play a very important role in the capital markets. Specifically, their results showed that earnings developed in the three Anglo-Saxon countries, namely USA, UK and Canada, where capital is traditionally raised in public markets, to have greater explanatory power for stock returns than operating cash flows. On the other hand, in the two common law countries, Germany and Japan, where capital is traditionally raised from private sources, earnings are generally not superior to operating cash flows for equity valuation. As it was expected, the results of this study showed that in all countries examined, earnings have incremental information content over cash flows in explaining security returns. In summary, the findings of this study provide the following contributions. First, prior US findings are generalized by showing that earnings are more important than cash flows for equity valuation in other Anglo-Saxon countries. Second, results showed that the superiority of earnings over cash flows is not universal but it depends on the national reporting regime and on the institutional factors.

In addition to the aforementioned earnings and cash flow variables, researchers used additional explanatory variables to explain security returns, among those, growth (book to market), size and risk (Banz, 1981; Fama and French, 1992; Jaffe et al., 1989; Pae et al., 2005; Ball et al., 2001, 2003; Chambers, 2004; Chan et al., 2006; among others). More specifically, Banz (1981) documents a strong negative relation between average return and size. Basu (1983)

shows that the earnings/price ratio can be used to explain cross sectional differences of average returns on US stocks in tests that also include size and market beta. Chen et al. (1992) found that the book to market ratio and cash flow are positively associated with security returns in Japan. Fama and French (1992) show that size and book to market ratio provide a simple and powerful characterization of the cross section of average returns for the 1963-90 period in the US. Black, Jensen and Scholes (1972) and Fama and MacBeth (1973) find that there is a positive simple relation between average returns and beta.

A detailed discussion of the empirical studies that employed earnings, cash flows and other contextual factors such as measurement interval, size, growth, operating cycle etc, follows.

2.5 The use of contextual factors in improving the association between financial information and security returns.

Since prior studies of the association of earnings with security returns provided conclusive but relatively weak relationship, researchers employed additional contextual factors in order to strengthen the relationship between financial information and security returns. The major contextual factors employed in the capital markets literature are:

i.   Measurement interval

ii. Earnings persistence

iii. Firm's growth

iv. Firm's size

v.   Operating cycle

vi. Aggregate accruals

Table 2 summarizes the major contextual factors employed in prior selected studies.

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Different types of methodological issues employed in each study are also presented. A discussion

of the major contextual factors/ issues related to these studies follows.

TABLE 2: LITERATURE REVIEW: Summary of major methodological issues of selected prior studies

Authors	Country	Sample Period	Sample Size	Sample Description	ReturnWindow	Return Variable	Independent Variables	Deflator	Tests examined
Alford et al (1993)	USA as benchmark and 16 more countries.	1983 - 1990	98	Industrial firms SIC Codes 2000-3999 or 5000-5999	15- month	Adjusted Returns	• Annual Net Income • Change in Annual Net Income	Market Value at the beginning of fiscal year	Timelines
Ali and Zarowin (1992)	USA	1969-1985	58	-------	12-month	Abnormal returns	• Earnings • Change in Earnings	Beginning of period stock price	Permanence
Ali (1994)	USA	1974-1988	8820	December fiscal year end firms	12-month	Raw Returns	• Δearnings • ΔWCFO • ΔCFO	Beginning of period market value of equity	• Earnings persistence • Non linear model
Ali and Pope (1995)	UK	1984-1990	1160	December fiscal year end firms	12-month	Abnormal Returns	• Unexpected Earnings • Unexpected Funds Flows • Unexpected Cash Flows	Beginning of fiscal year Market value of equity	----
Bernard and Stober (1989)	USA	1977-1984	170	Firms that field querterly and annual reports with the SEC from 1976	9 days surrounding the release of annual report	• Abnormal Returns • Market adjusted Return	• Unexpected CFO • Unexpected WCFO • Unexpected Accruals (Inventory, Receivables, Payables)	Total Assets	• Firm size • Macroeconomi c conditions
Board and Day (1989)	UK	1961-1977	39	Firms should: • be publicly quoted and be in the first 800 of The Times top 1000 UK firms • have an accounting year end of Dec 31 • be in the manufacturing, non-oil sector • have a full set of accounting data for the year 1961-1977 • have not more than 10 missing share returns over the period	12-month	Cumulative abnormal Returns	• Three measures of Earnings: -ROI: Historical Cost based rate of Return -WCAP: Working Capital based rate of Return -NETQ: Quick (cash) asset based rate of Return	Opening net book value of shareholders' funds	• Time series tests • Time series direct tests

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Table 2 (continued)

Authors	Country	Sample Period	Sample Size	Sample Description	Return window	Return Variable	Independent Variables	Deflator	Tests examined
Bowen et al (1987)	USA	1972-1981	98	-------	12-month	Unexpected Returns	• Unexpected Earnings • Unexpected WCFO • Unexpected CFO • Unexpected Cash Flow after investment		-------
Chan et el (1991)	Japan	1971-1988	1570 (1130 for the first section)	Firms listed on Tokyo Stock Exchange	12-month (RET 093)	Monthly Returns	• Earnings Yield • Size (Market Capitalization of Equity) • Book to Market Ratio • Cash Flow Yield		• Size Effect
Chan and Seow (1996)	USA Vs foreign countries	1988-1992		------	12-month 15-month	• Raw Returns • Market adjusted Returns	• Earnings of year t • Earnings of year t-1	Beginning of fiscal year stock price	------
Charitou (1997)	UK	1985-1992	2894	Industrial firms	• 15-month • Intervals: 1-year 4-year 5-year	Security Returns	WCFO and levels and changes of Operating Income and CFO	Security price at the beginning of the fiscal year	• Aggregate Accruals • Operating Cycle • Long intervals
Charitou and Ketz (1990)	USA	1980-1983	70	Retail Industry (SIC : 5211-5999)	12- months	Market Value of the firm	• Operating Cah Flows • Operating Earnings • Working Capital from Operations • Operating Earnings plus depreciation	Book Value of Total Assets	---------
Cheng et al (1996)	USA	1988-1992	1479	Firms with no changes in FYE	12-month	Abnormal Returns	Levels and changes of Earnings and Cash Flows	Beginning of period price	• Persistence
Colin Clubb (1995)	UK	1955-1984	48	Firms which have either December 31st or March 31st accounting year ends	12-month	Unexpected Returns	• Earnings • Cash flow • Funds flow	Beginning of fiscal year price	Persistence

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Table 2 (continued)

Authors	Country	Sample Period	Sample Size	Sample Description	Return Window	Return Variable	Independent Variables	Deflator	Tests examined
Collins, Kothari and Rayburn (1987)	USA	1968-1980	630-1051	December fiscal year end firms and a minimum of 6 prior years of Earnings data		Cumulative Abnormal Returns • Unexpected Returns • Size adjusted return	• Earnings per share • Earnings changes		• Firm size • Earnings forecast
Collins and Kothari (1989)	USA	1968-1982	9776	December 31 FYE firms	• 12 months • 15 months	Raw Returns	Change in Earnings per share	Share price at the end of year t-1	• Firm size • Growth • Persistence • Risk • Interests Rates
Dechow (1994)	USA	1960-1989	30489	NYSE firms with available data	• Quarterly • Annually • 4-yearly	Abnormal Returns	• Earnings • Cash Flows from Operations	Pt-1	• Aggregate accruals • Operating Cycle • Long Intervals
Easton and Zmijewski (1989)	USA	1975-1980	212	• Availability of 1960-1980 quarterly EPS • Same FYE between 1960-1980	2 days forecast holding period	Abnormal Returns	Forecast error for quarter Earnings	----------	• Persistence • Firm size • Systematic risk
Easton and Harris (1991)	USA	1969-1986	20188	• Availability of security price , monthly returns and EPS	12 months	• Raw Returns • Cumulative Abnormal Returns	Levels and changes of Earnings	Pt-1	-----------
Easton, Harris and Ohlson (1992)	USA	1968-1986	1293	• Availability of Data • Large number of observations	1,2,5,10-year	Raw Returns (RET 093)	Levels and Changes of Earnings	-------------	• Long Return Intervals
Freeman (1987)	USA	1966-1982	2263	December 31 FYE NYSE firms	12 months	• Abnormal Returns • Cumulative average Abnormal Returns	Earnings	Average Total Assets	• Firm size • Timing hypothesis

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Table 2 (continued)

Authors	Country	Sample Period	Sample Size	Sample Description	Return Window	Return Variable	Independent Variables	Deflator	Tests examined
Freeman and Tsa (1992)	USA	1984-1987	12381	Firms with • Earnings announcement date for the current and previous quarters • Price per share at the end of the previous quarter • Earnings pre share • Daily returns	Daily returns from 3 days after the prior quarter's earnings announcement through 2 days after the current announcement	Abnormal Returns	Unexpected Earnings	Price at the beginning of the current fiscal quarter	Non linear model
Hall et al (1994)	Japan / USA	Japan: 1984-1991 USA: 1983-1990	US: 262 Japan: 364	• US sample is selected matching the Japan sample on the basis of 1990 MV of equity and 4-digit SIC code • Financial institutions were excluded (Japan)	• 1-year • 4-year • 7-year • 20-year	Annual Returns at varying intervals	• Earnings • Change in Earnings		• Long intervals • Depreciation • Parent and consolidated samples
Kormandi and Lipe (1987)	USA	1947-1980	145	All firms reporting on a calendar year basis	April – March	Abnormal Return	Residual EPS over market index		Persistence
Livnant and Zarowin (1990)	USA	1973-1986	345	December 31 FYE firms	12 months	Cumulative Abnormal Returns	• Aggregate Cash Flows • Accruals Net Income Cash Flows from: • Operating activities • Financing activities • Investing activities	Market value of equity at the end of year t-1	-------------
Ohlson and Shroff (1992)	USA	1971-1988		------	----	-----	• Levels and Changes of Earnings	Beginning of period price	
Raybum (1986)	USA	1963-1982	175	• December 31st year-end • Nonbank and nonutility industry membership	12 months	Abnormal Returns	• Earnings • Cash Flows Changes in • Working Capital • Deferred Taxes • Depreciation	Beginning of year equity market value	

Authors	Country	Sample Period	Sample Size	Sample Description	Return Window	Return Variable	Independent Variables	Deflator	Tests examined
Teets and Wasley (1996)	US	1971-1990	75	• Nonbank and nonutility industry membership • Dec 31st year - end		Abnormal Returns	Unexpected Earnings		
					•				
Warfield and Wild (1992)	US	1983-1986	24150	Availability of: • Earnings per share • Earnings announcement dates • Dividends • Common Stock Prices • Stock Returns	• Quarterly • Semi-annual • Annual • 2-year • 4-year	Raw Returns	Current and Future Earnings	Pt-1	Industry effects, Long term intervals
Wilson (1986)	US	1981-1982	322	SIC code between 1000 and 4800	2 days around earnings announcement plus 9 days around F.S. release	Average market model residuals	• Cash Flows • Total Accruals • Earnings • current / non-current accruals	Total assets	----------

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2.5.1 The effect of the measurement interval

Capital market studies use both short (e.g. 2 day) and long windows extended from 60 days to several years. A short window is preferable if a large portion of uncertainty about the firm's performance is resolved at the time of the annual reports release. The justification for using short windows is that they reduce the effects of confounding information. On the other hand, a long window is preferable when the uncertainty about the firm's performance is resolved gradually over an extended period of time (Cho and Jung, 1991). Given that the primary interest of this paper is the value relevance of the released information, one of its important features will be a focus on the effect of long returns intervals (greater than one year) where the timing of information dissemination is less of an issue (Harris et al. 1994).

Most prior studies investigated the information content of accounting earnings over short return intervals (Easton and Harris, 1991). Very few studies used long windows to examine the role of earnings in the marketplace (Easton et al., 1992; Warfield and Wild, 1992) and only a couple of studies extended the long return interval analysis for cash flows (Dechow, 1994; Charitou, 1997). Easton et al. (1992) and Warfield and Wild (1992) examined only the association of earnings with security returns and showed that this association improves over longer measurement intervals. Easton et al. (1992) showed that the R^2 is increased from 5% for one year interval to 63% for the 10 year interval. Finally, Hall et al. (1994) using Japanese data showed that the R^2 is improved over long return intervals but the explanatory power is much lower compared to the US data. See also Table 2 for a detailed presentation of the major characteristics of these studies.

As far as the value relevance of cash flows in longer windows is concerned, Dechow (1994) and Charitou (1997) did not consider multivariate analysis of cash flows or their

incremental information beyond earnings, but used only univariate regression models. Dechow (1994) and Charitou (1997) show that there is a relative increase in the explanatory power of operating measurement intervals. More specifically Dechow (1994) shows that the ratio of $R^2_{CFO}/R^2_{Earnings}$ increases from 0.003 for quarterly data to 0.27 for the four year measurement interval[3]. Charitou (1997) shows similar results, with $R^2_{CFO}/R^2_{Earnings}$ increase from 0.06 for one year to 0.26 for the 5-year measurement interval.

2.5.2 The effect of earnings persistence

Earnings persistence studies consistently report that earnings persistence is significantly positively associated with ERC (Easton and Zmijewski, 1989; Donnelly and Walker, 1995; Ali and Zarowin, 1992; Chambers, 2004). Cheng et al. (1996) extended prior studies on this topic and added cash flow variables in their models. They found that the incremental information content of cash flow from operations(CFO) should increase with a decrease in the permanence of earnings. Furthermore, Ali (1994) using non-linear models concluded that earnings, cash flows and working capital from operations(WCFO) have incremental information, which increases the lower are the absolute changes in earnings, cash flows and WCFO respectively. Finally, Ali and Zarowin (1992) show that the more transitory the previous period's earnings are, the greater the increase in the ERC and the expected incremental explanatory power from inclusion of the level variable. According to Cho and Chung (1991) the persistence measure used in those studies has 3 limitations: first, although persistence is changing over time, a constant parameter assumption is made which is problematic, especially when estimations are based on annual data for several year time series. Second, a measurement error problem exists, from using time-series reported earnings. Easton and Zmijewski (1989) use revision coefficient avoiding to some extend the

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3 Where CFO is cash flow from operations

latter problem. The third limitation is that persistence as measured by the time series of earnings is a crude proxy for the construct because it contains little economic content.

Researchers also extended prior studies in order to examine the value relevance of the permanent and transitory earnings. Cheng et al (1996), Ali (1994), Ali and Zarowin (1992) and Easton and Zmijewski (1989) among others examine the impact of permanent and transitory earnings on the relations between returns and earnings or between returns and cash flows. Ali and Zarowin (1992) concluded that for firms with permanent earnings in the previous period, when the earnings level variable is included in the model, the incremental explanatory power and the increase in Earnings Response Coefficient (ERC) are small. Cheng et al. (1996) investigated whether the incremental information content of cash flows increases when earnings are transitory. Transitory earnings have smaller marginal impact on security returns. Moreover, their results showed that the incremental information content of accounting earnings decreases, and the incremental information content of cash flows increases with a decrease in the permanence of earnings. See also Table 2 for a detailed presentation of the major characteristics of these studies.

2.5.3 The effect of firm's growth

Collins and Kothari (1989) note that future earnings are affected from current growth opportunities, and therefore the earnings response coefficients (ERC) are affected as well. They included in their reverse regressions the Market Value to Book Value ratio (as a measure of growth) and concluded that it has positive incremental information content beyond persistence. However, Cho and Jung (1991) argue that time series analysis cannot reflect current growth opportunities, because they are not " fully and accurately captured by time series persistence estimates " (p. 85).

Chan et al. (1991) also used a measure of growth (Book to Market Value ratio) in their

Seemingly Unrelated Model (SUR), together with earnings cash flow yield, and size (measured by log of MV of Equity). Their findings suggest that BV/MV is the most important variable of the four used, while cash flow yield has positive incremental information content. However, cash (flow) yield variable was defined as earnings plus depreciation.

Finally, Fama and French (1992) also support the conclusion that among the variables considered in their study (size, leverage, earnings price ratios, market β) book to market equity is consistently the most powerful for explaining the cross section of average stock returns. In addition Fama and French suggest that the combination of size and book to market equity absorbs the apparent roles of leverage and E/P in average stock returns. However book to market equity does not replace size in explaining average returns. Table 2 also presents detailed methodological issues associated with prior studies, including contextual factors that relate to growth.

2.5.4 The effect of firm's size

According to Freeman (1987) there are reasons to expect private information production to increase with firm size. Regulatory bodies in many countries distinguish between large and small firms, and demand more Flow Statement releases with more information from larger firms. In addition, the financial press and financial analysts have incentives to focus on large firms because they are more widely held and attract the interest of more readers and investors. Another reasonable explanation is that large firms make more transactions so there are more to report about them.

Of course, larger corporations have very complicated Flow Statement and in general their structure and operations differ dramatically compared to smaller ones. So the cost of analysing their financial data becomes very expensive. For that reason many large firms maintain public

relations departments staffed by professionals - analysts to answer telephone and written inquiries. According to Freeman (1987), if marginal search costs increase with firm size, but at a lower rate than marginal trading profits, a large firm's securities are less likely to be mispriced than a small firm's.

Many studies examine the relation between firm size and accounting measures, especially earnings. Easton and Zmijewski (1989) investigated the correlation between firm size and ERC. The coefficient was not significant in every case they examined. Additionally, Donelly and Walker (1995) show positive correlation of firm size with earnings changes, and to a lesser extent with earnings levels. In contrast, Freeman (1986) concluded that the impact of abnormal returns associated with accounting earnings is negatively related to firm size. In the next section (Hypothesis 6) a possible explanation is given, for the difference in results of the above studies. Finally, Fama and French (1992) find that size (ln of market equity) helps explain the cross-section of average stock returns. This reliable negative relation persists no matter which other explanatory variables are in the regressions. Although part of the size effect in the univariate regressions is due to the fact that the small market equity stocks are likely to have high book to market ratios, Fama and French argue that we should not exaggerate the links between size and book to market equity. The correlation between these two variables is not extreme (r=-0.26) and the average slopes in the bivariate regressions show that are both needed to explain the cross section on average returns.

Regarding the size effect on cash flows/returns relation, the only study that examined this issue is the one by Bernard and Stober (1989). Their results did not provide evidence that information about unexpected cash flows was more likely to be impounded in market prices for small firms than for large firms. Table 2 presents a summary of the major characteristics of prior selected studies that employed firm size.

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2.5.5 The effect of operating cycle length

Dechow (1994) and Charitou (1997) using US and UK data respectively, investigated how the size of firm' s operating cycle might affect the association between returns and cash flows. Dechow (1994) and Charitou (1997) found that in industries where the operating cycle is long, securities returns are associated more with earnings than with cash flows because working capital requirements are more volatile. Charitou(1997) found that when the operating cycle is increased, the R^2 adj. of earnings increases from 15.8% to 23.7%, while the R^2 adj. of cash flows is decreased from 3.5% to 1.1%. Dechow (1994) shows that there is a negative correlation (r= - 0.483) between the length of operating cycle and the R^2 from the cash flows regressions. However no obvious decline in the R^2 of earnings was observed as the length of the operating cycle increases. This suggests that accruals play a relatively more important role for firms in industries with long operating cycles.

Both studies investigated the information content of earnings and cash flows separately, by performing univariate regression models only. This thesis extends this work and also tests whether the incremental information of cash flows is greater in industries with smaller operating cycle by performing multivariate regression models.

2.5.6 The effect of aggregate accruals

When accruals are small in magnitude, cash flows have a higher association with security returns, because their timing and matching problems are minimized. On the other hand, cash flows' timing and matching problems are increased when accruals are large and when firms are not in a steady state. Dechow (1994) considers an example for a ship building firm with long - term contracts, and in which earnings will reflect better the contract's value and the firm's

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performance. Accrual process is most important for firms with large changes in their non cash accounts balances, for example big construction firms where their annual cash flows are very volatile (Dechow, 1994).

Dechow (1994) and Charitou (1997) showed that cash flows play a more important role in the market place, the smaller the absolute value of accruals. Dechow used quarterly, annually and 4-year periods while Charitou used only yearly data. Both studies test for possible association of cash flows with security returns, and conclude that while R^2 adj. of firms with high accruals was below 1%, the R^2 adjusted of firms with small accruals exceeded 15 %. Concerning the association of earnings with security returns, the two studies have different results: Dechow shows that the R^2 adj. of firms with high accruals is 20.47% while the R^2 adj. of firms with low accruals is only 15.8%. On the other hand Charitou shows that the R^2 adj. of earnings decreases the higher the absolute value of accruals (the R^2 adj. is 17.5% for firms with low accruals and only 11.5% for firms with high accruals). Again none of the two studies investigated the incremental information content of cash flows beyond earnings. This hypothesis will be tested in this study by performing a multivariate regression model.

2.6 Summary of the critical review of the value relevance literature

In this chapter I critically evaluated the literature that relates to the value relevance of earnings and cash flows. Specifically, 1 provided an in depth discussion of the significance of earnings and cash flows in the capital markets and 1 also critically evaluated the existing value relevance empirical studies that were undertaken worldwide. In summary, empirical research thus far provided evidence to support that both earnings and cash flows are valued in the marketplace, but earnings do dominate cash flows in the capital markets. On the to other hand earnings have been criticized because it was shown in prior studies that they are manipulated by managers.

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Moreover, prior evidence showed that the explanatory power of earnings (as measured by the R^2)

has been relatively low. As far as the evidence on the value relevance of cash flows beyond

earnings, it has also been shown inconclusive. These inconclusive results motivated researchers

to examine further this issue by investigating in more depth the circumstances under which

earnings and cash flows can play a more important role in the marketplace. Specifically,

researchers examined the effect of the measurement interval on the value relevance of earnings

and cash flows, the value relevance of cash flows when earnings are transitory, and the role of

earnings and cash flows after controlling for growth, size, operating cycle and accruals. Even

though researchers found that the value relevance of earnings and cash flows improves after

considering for the aforementioned factors, these studies were limited in the sense that

researchers examined mainly one of those factors at a time in a single capital market, and mainly

in the US market.

Based on the critical discussion and analysis presented in this chapter, it is concluded that

this research study differs from prior studies in the following respects. First, it examines not only

the value relevance of operating cash flows beyond earnings, but it also examines the role of

cash flows in the capital markets after considering the industrial effects in both Anglo-Saxon and

code law countries on the relative usefulness of operating earnings and cash flows in explaining

security returns. Second, it examines the value relevance of earnings and cash flows when the

measurement interval increases. Third, the above major research questions are examined

empirically using data from UK and USA (Anglo-Saxon countries) and France (a code law

country) in order to determine whether the valuation role of financial information differs in these

countries. Fourth, this study examines comparatively the valuation of financial information such

as earnings and cash flows, over longer measurement intervals for the UK, USA and France.

Thus far, no other study has examined the above issues using comparative statistics for the U.K,

US and France. Since there are several financial reporting, economic and social differences between the above countries, it is expected that this study will provide new insight regarding the effect, if any of these differences, on the value relevance of earnings and cash flows in these countries.

In the next section, I go a step further by critically evaluating the international financial reporting literature and especially the financial reporting systems in Anglo-Saxon and code law countries. Specifically, I provide comparative analysis of the financial reporting systems in two Anglo-Saxon countries, namely the UK and the USA, and in one code law country, namely, France.

CHAPTER III

CRITICAL REVIEW OF THE INTERNATIONAL FINANCIAL REPORTING LITERATURE

3.1 Introduction

This chapter critically evaluates the international financial reporting literature. Specifically, it provides an in depth discussion of the comparativeness of the financial reporting systems in Anglo-Saxon countries (UK and USA) and Code law countries (France). It also evaluates the different financial reporting systems as they relate to the standards issued in different countries (the UK Accounting Standards Board statement entitled 'Cash flows Statements,' FRS #1; the US reporting Standard #95). In addition, it discusses existing empirical studies that were undertaken worldwide which examine the association between earnings, cash flows and security returns.

More specifically, the following sub-sections follow:

1. International classification of financial reporting systems;

2. Financial reporting in France, UK, USA:

   a. Financial reporting in France;

   b. Financial reporting in UK;

   c. Financial reporting in the USA.

3. Comparative analysis of the financial reporting systems in the UK, USA and France;

4. Differences in the value relevance of earnings and cash flows between Anglo-Saxon

countries (UK, USA) and France;

5. Financial reporting in the UK: the statement of cash flows (Financial Reporting Standard No. 1).

A discussion and critical evaluation of the above issues follows.

3.2.1 International classsification of financial reporting systems

There are major international differences in financial reporting practices. Some countries have a legal system which relies upon a limited amount of statute law, which is then interpreted by courts, which build up large amounts of case law to supplement the statutes. Such a 'common law' system was formed in England primarily by post-Conquest judges acting on the king's behalf. It is less abstract than codified law; a common law rule seeks to provide an answer to a specific case rather than to formulate a general rule for the future. Although this common law system originated in England, it may be found in similar forms in many countries influenced by England. Thus, the federal law of the United States, the laws of Ireland, Australia and so on, are to a greater or lesser extent modelled on English common law. This naturally influences company law, which traditionally does not prescribe a large number of detailed rules to cover the behaviour of companies and how they should publish their financial statements. To a large extent, financial reporting within such a context is not dependent upon law (Lee et al. 2005, Nobes and Parker, 2004; Weetman et al. 2005).

Other countries have a system of law which is based on the Roman *jus civile*. In these countries, the rules are linked to ideas of justice and morality. The word 'codified' may be associated with such a system. This difference has the important effect that company law or commercial codes need to establish rules in detail for financial reporting. Both the nature of regulation and the type of detailed rules to be found in a country are affected.

Moreover, the prevalent type of business organization and ownership also differ. In France and Italy, capital provided by the state or by banks is very significant, as are small family business. In code-law countries the banks or the state will, in many cases, nominate directors and thus be able to obtain information and affect decisions. If this is the case, the need for published information is less clear. This also applies to audit, because it is designed to check up on the managers in cases where the owners are 'outsiders' (Haskins et al. 2000; Weetman et al. 2005).

Although it is increasingly the case that shares in common-law countries are held by institutional investors rather than by individual shareholders, the increased importance of institutional investors is perhaps a reinforcement for the following hypothesis: "in countries with a widespread ownership of companies by shareholders who do not have access to internal information there will be a pressure for disclosure, audit and «fair» information" (Ball et al, 2000, p. 3). Institutional investors hold larger blocks of shares and may be better organized than private shareholders. So, they should increase this pressure, although they may also be able to successfully press for more detailed information than it is generally available to public.

In other words, common-law countries have evolved the presumption that contracting occurs between parties who are unrelated. There is no presumed contact between a company's manager and its investors. In contrast, contracting in code-law countries tends to be conducted by a small number of representative groups, such as major banks. This system requires close working relations between contracting parties. Common-law facilitates large, open, public debt markets in which long-term debt is supplied by parties who are unrelated between them and hence rely on public information. In code-law countries, debt is provided primarily by intermediaries which have close bonds with the corporate borrower and receive large private information.

The similarities of company financial reporting in the major Anglo-Saxon countries are

well known and, indeed, the differences between these countries must be emphasized (Haskins et al., 2000; Walton et al. 2003; Nobes and Parker, 2004, Lee et al. 2005). There are several ways in which company financial reporting can be regulated. Three limiting and ideal cases are: through the 'market', the 'state' and the 'community'. If the process is left entirely to market forces each company chooses its own rules, influenced only by pressures from the capital market. At another extreme the whole process can be in the hands of the 'state', an organ of which decrees which practices to be followed and provides an enforcement mechanism. The third ideal case is the emergence of rules through the 'spontaneous solidarity'of the community.

Within these three extremes, Puxty et al. (1987) usefully distinguish what they and others term 'liberalism', 'associationism', 'corporatism' and 'legalism'.

Market   **State**

Liberalism   Legalism

                                          Corporatism

        Associationism

                    Community
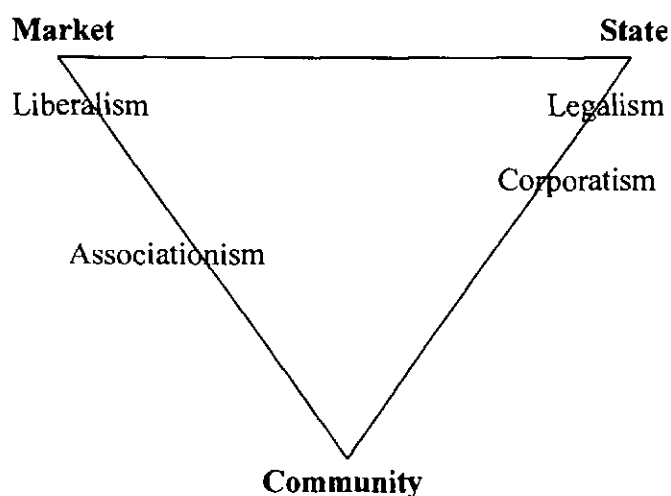
At one extreme is liberalism, whereby regulation is provided exclusively by the discipline of the market principles, while companies provide information only if it is demanded commercially. At the other extreme is legalism, which relies upon the unreserved application of state principles. Financial reporting practices are expected to follow the letter of the law, which is enforced by the state's monopoly of the means of coercion.

Within these two extremes are associationism and corporatism, both of which combine

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liberalism and legalism with a small dose of community influence. In associationism, regulation is accomplished through the development of the organisations that are formed to represent and advance the interests of their members. These members form part of the community, but do not represent it as a whole. Corporatism involves a greater reliance upon the state principle of hierarchical control. The state does not simply license the existense of organized interest groups, but incorporates them into its own centralized, hierarchical system of regulation. The basic difference between corporatism and associationism is the extent to which the state 'leans' on interest groupings to achieve public as contrasted with private purposes.

In the United Kingdom, company legislation has long been the prime mode of accounting regulation. The legislation has generally owed much to the prior initiative of the accountancy profession. In the United States financial reporting was almost unregulated until the establishment of the Securities and Exchange Commission in the 1930s. Throughout its existence the SEC has generally limited itself to a supervisory role, but it has not hesitated, on occasion, to intervene directly in the standard-setting process.

Tables 3-6 provide information regarding a) the financial reporting and principles in these countries (Table 3); b) the financial reporting requirements in the USA, the UK and France (Table 6); c) the financial reporting standards in the UK, the USA and France (Table 5); and d) the major differences and expectations between Anglo-Saxon and code law countries (Table 4). A presentation and critical analysis of each of the major issues presented in the aforementioned tables in shown in the sections that follow.

Table 3

Financial Reporting Requirements and Principles in France, the UK and the USA

Country	Accounting Requirements	Accounting Principles
France	Format Balance Sheet and Format Income Statement Notes Directors Report	Matching Consistency Disclosure of Assets and Equities Prudence Going Concern
UK	Balance Sheet Profit and Loss Cash Flow Statement for large firms Notes Directors Report Auditors Report Statement of total recognised gains and losses In the case of a parent or holding company a Consolidated profit and Loss and its own Balance Sheet	Going Concern Consistency Prudence Matching Separate valuation of individual
USA	Balance Sheet Income Statement Statement of Cash Flow 3 year information for Income Statement A statement of changes in Stockholders Equity Statement of Retained Earnings Notes to Financial Statement	Going Concern Consistency Prudence Matching Separate valuation of individual

Source: Walton et al. 2003; Haskins et al. (2000); Nobes and Parker (2004).

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3.3 Financial reporting in France, the UK and the USA

The three countries to be examined in the present study are the UK, the USA and France. The UK was selected because there is a controversy in the UK financial reporting literature regarding the value relevance of earning and cash flows. UK studies provided inconclusive results in the past regarding the information content of earnings and cash flows. As far as the USA is concerned, it was selected to be used as a benchmark because the majority of research undertaken thus far examined US firms. However, USA studies examined only certain issues that relate to the value relevance of earnings and cash flows and the present study will provide a comprehensive analysis regarding the value relevance of financial information. As far as France is concerned, this country was selected because, contrary to the common law system followed in the UK and the USA, the French financial reporting system is based on code law. Preliminary evidence in the literature thus far, indicates that the value relevance of earnings and cash flows depends on whether the firms examined are under a common law or under a code law system. Thus far, studies have not examined empirically these issues.

A discussion of the financial reporting systems in the three countries (France, the UK, and the USA) that are examined in the present study, follows.

3.3.1 Financial Reporting in France

French accounting was introduced as a compulsory aspect of French business by *Ordonnance* of Colbert in 1673. This law, also called Savary law, was incorporated in the Commercial code of 1807 as part of the reorganization of French laws into codes during the period of rule of Napoleon. Company law was further reformed in 1867 covering matters which included the creation of *Societe Anonyme* as a form of business organization. It also provided for a form of auditing for this type of corporation (Weetman et al. 2005; Nobes and Parker, 2004).

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The development of financial reporting practice in France has taken place largely within a political setting of a republic operating as a democracy. Swings in political power within that democracy may have slowed the pace of change in financial reporting practice compared with that of some other member states of the EU. On the other hand, the relative freedom of choice in the preparation of group accounts has provided new opportunities for flexibility of practice and opened financial reporting thinking to new concepts and practices. French financial reporting practice is based on a tradition of a code set by law. Tax law has developed separately from accounting law, but has been highly influential on the choice of financial reporting practice within the accounting law. Being a founder member of the EU gave an opportunity for France to influence the financial reporting practice of individual companies, through the Fourth Directive. France was in turn itself influenced, in the widespread adoption of consolidated accounting, by the Seventh Directive.

Comparing the French financial reporting with the Anglo-Saxon financial reporting, it is observed that the French reporting differs in a number of ways as a result of the approaches taken toward financial reporting standardization and outcomes achieved with the national accounting code or general accounting plan, namely the Plan Comptable General (PCG). The PCG is at the heart of financial reporting and accounting. It is issued under the authority of the French national accounting council (CNC). The code is revised at relatively infrequent intervals with amendments and additions occurring more frequently. There are two central objectives of the PCG: standardizing the organization of the accounting system of the enterprise and standardizing the presentation of financial results and position. Taken together, these ensure that the accounting records are maintained in a form which permits production of the required form of financial statements (Walton et al. 2003; Haskins et al. 2000; Nobes and Parker, 2004; Weetman et al., 2005).

Empirical studies classified France as a uniform system where accounting was seen as a means of governmental control. Nobes and Parker (2004) classified the French accounting system as tax based and macro-uniform, grouped with Italy, Belgium and Spain. Moreover, France was classified with the main body of European countries on the basis of measurement but with Belgium, Italy and Spain on the basis of disclosure.

The financial reporting in France is characterized by marginal professionalism, strong uniformity, strong conservatism and marginal secrecy. The political and legal institutions provide a basis of statutory control for financial reporting within accounting. Uniformity is influenced by the Fourth and Seventh Directives, but it is particularly strong in relation to the application of the chart of accounts. As far as conservatism is concerned evidence shows that the French accounting practice is placed at the highly conservative end of a spectrum, clustered with Japan and with other more developed Latin American countries. Conservatism is seen in the financial reporting treatment of provisions, long term contracts, inventories, asset valuation and contingencies and is influenced by the interaction of accounting and tax law. As far as secrecy is concerned, it is less prevalent in French financial reporting practice compared with some other EU countries, and there are extensive disclosures required by regulation (Nobes and Parker, 2004; Weetman et al. 2005; Walton et al. 2003).

As far as the relationship between company and tax law is concerned, the accounting law in France has been shaped by fiscal policy as enacted in tax law. Tax law has been concentrated on the construction of the balance sheet to ensure that the recording of transactions is carried out without the exercise of discretion over matters such as end-of-period adjustments. There is a general rule that expenses are tax deductible only if treated as expenses in the annual financial reports.

As far as the French capital markets are concerned, relatively few listed French firms

have widely dispersed shareholdings. Historically, French firms have not generally used the stock market as a source of financing, but in recent years there has been an increase in new equity financing. Firm growth and capital gains are the major factors taken into consideration by French investors in firm valuation. In contrast, French investors have a conservative view of expectations from dividends.

Concerning the influence of EU on French financial reporting, the Fourth directive reflects the French practice as contained in the Plan Comptable General (PCG) and reflects in particular the preference for financial statement formats. Implementation of the Fourth Directive required a major revision of the PCG in 1982 but this had the effect of confirming the uniformity of presentation in the firm's financial statements. A recent addition to the Fourth directive was the requirement for the true and fair view, translated into French as *image fidele*. This was dealt with in a manner similar to that of Germany in declaring that the true and fair view is established by reading the balance sheet, profit and loss account and notes taken together. Uniformity in the financial statements was thus preserved in the context of potential flexibility in the notes to the financial statements (Ball et al., 2000; Weetman, 2005; Walton et al. 2003; Nobes and Parker, 2004).

3.3.2   Financial reporting in the UK

Contrary to the financial reporting in France, the financial reporting practice in the UK has a strong tradition of professionalism. Statute law and financial reporting standards set general bounds on requirements but the professional accountant determines the detail of practice. The accounting profession is well established and there is a relatively wide requirement for audit of company accounts. Tax law has developed separately from accounting law and there is no requirement that accounting profit must be calculated under fiscal rules to be an acceptable base

for taxable profit. Membership of the EU, and the adoption of the Fourth and Seventh Directives, brought more specific requirements in the shape of accounting formats not hitherto known. Group accounting, and in particular consolidated accounting, was well established from 1948 onwards. Company law concentrates primarily on protection of shareholders and creditors. Other sources of authority indicate a concern with wider stake-holders. From time to time there have been concerns to ensure that the needs of employees are addressed and that the public interest is taken into account. This depends to some extent on the political views of the government. The current approach to standard setting places particularly strong emphasis on the needs of users, although there is no clear statement of their needs (Nobes and Parker, 2004; Weetman et al., 2005; Walton et al. 2003, Lee et al. 2005).

Using the scores developed by Hofstede (1984), Gray's (1988) method of analysis may be used to predict that the financial reporting system in the U.K will be characterized by strong professionalism, strong flexibility, strong optimism and strong transparency. The profession has a long history of development in the U.K and has traditionally operated in a framework where statutory control is limited to prescribing minimum standards only. Flexibility has been consistent with this professional approach, uniformity in matters such as presentation of formats being a relatively new feature caused by implementation of directives. Optimism, rather than conservatism, is seen in the use of alternative valuation rules to historical cost accounting. Transparency is seen in the extensive disclosures required of companies by way of footnotes to major financial statements (Weetman et al., 2005, Walton et al. 2003).

3.3.3 Financial reporting in the U.S.A

Similar to the UK financial reporting, but contrary to the French reporting, the USA financial reporting is based on common law. The accounting principles and practices of the USA are

influential beyond the country's national boundary and have, of themselves, provided a means of harmonization for those other countries and business enterprises choosing to follow the USA lead. They act also as a block to harmonization where the USA regulators will not accept any practices other than those conforming to USA standards without a statement of reconciliation of the differences. The source of the widespread influence of USA financial reporting lies in its worldwide political and economic dominance and in the importance of its capital market. The market is closely regulated by an agency of the federal government, the Securities and Exchange Commission (SEC). Those companies which seek a listing of their shares must comply with SEC regulations.

Within this framework of close regulation, there is considerable scope for application of professional judgment in financial reporting matters. Financial reporting standards are greater in volume and more detailed than those of almost any other country in the world, but they are set by an independent standard setting body rather than by statute law. The standard setting body has been well supported financially, and has therefore researched issues to an extent not feasible in other countries. The entirety of USA financial reporting principles and practices is referred to as "US GAAP", short for "US generally accepted accounting principles" (FASB, 1997, p.1). The concept of such a set of written principles originates in the USA, although the abbreviation is used in reference to other countries also. Accounting disclosure is characterized by openness and financial reporting measurement by general conservatism and historical cost. Such conservatism originated in the stock market crash of 1929, modified by business pragmatism and flexibility in response to events of more recent years (Weetman, 2005; Walton et al. 2003; Nobes and Parker, 2004).

Using the scores developed by Hofstede (1984), Gray's method of analysis may be used to predict that the financial reporting system in the USA will be characterized by strong

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professionalism, strong flexibility, strong conservatism and strong transparency. The strong professionalism is embedded in the historical development of the accounting profession and the responsibility taken by the profession for setting financial reporting standards. Statutory control is a reserve power but is rarely implemented in practice. Flexibility is seen in the lack of prescribed formats of presentation and the separate existence of tax law and accounting law. Insistence on historical cost would place the USA in a highly conservative category, but other aspects of detail in practice give glimpses of practices which are not always directed towards conservatism. Transparency is seen in the very extensive disclosures required by law and practice, particularly in the basic information package required by the Securities and Exchange Commission (SEC) of all listed US firms (Land and Lang, 2005; Weetman et al., 2005, Walton et al. 2003).

3.4 Comparative analysis of the financial reporting systems in the UK, USA and France

Since the main purpose of this study is to provide evidence regarding the value relevance of operating earnings and cash flows in the US, UK and French capital markets, it is important to take into consideration the financial reporting differences between theses countries and determine how they may affect the value relevance of earnings and cash flows. Tables 3-6 show the financial reporting requirements and the accounting standards and practices used in these countries. Evidence shows that there are significant financial reporting differences between these countries despite the efforts to be minimised through the adoption of either the International Accounting Standards or even the European Union Directives. Financial reporting in the UK and the US has several similarities due to the fact that it is based on the Anglo-Saxon system. On the other hand, the UK and the French financial reporting systems have fewer similarities even though both countries follow the EU accounting directives. More specifically, in France firms give the same

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reports for financial reporting and tax purposes. Consequently, France is more conservative in the preparation of financial statements and tax rules override accounting rules. This affects the accounting treatment of discretionary items and causes differences between this country and the others that give different reports. A difference that arises between countries that give the same reports for tax purposes and for financial reporting like France and those that are not is that deferred taxation generally does not arise for the first one. In the US and UK deferred taxation exists because the income calculated for tax purposes differs from the income for financial reporting. Another difference is the use of accelerated methods of depreciation in France, which leads to lower income. Main providers of capital in France are the government and banks. The accounting profession has limited power (see Table 4) (Bartov et al. 2001; Weetman, 2005; Walton et al. 2003).

Table 4

Summary of major differences and expectations between Anglo-Saxon
and code law countries

Major Differences	Anglo-Saxon Countries	Code Law Countries
Drivers of Influence	• Capital Markets	• State • Financial Institutions
Main Providers of Funds	• Small Investors • Organizations	• Banks • Government
General Environment	• Liberal	• Conservative
Alignment of Financial and Tax Accounting	• Low Level	• High Level
Expectations	• Higher R^2 • High Quality of Earnings • CFFO Importance	• Lower R^2 • Low Quality of Earnings • CFFO Importance

There are several similarities between USA and UK financial reporting. However, USA is more conservative as indicated in the following analysis and this affects its accounting practices. SEC has the authority to set detailed rules for Financial Statements. Contrary to the USA financial reporting system, the UK accounting system focuses on the information needs of investors, it is more flexible and less conservative to measurement techniques. In the UK there is not such legal power as the SEC in the USA. There are certain laws and established practices that must be followed. Security markets have significant influence on accounting practice but do not dominate the process of accounting regulation. The accounting profession is influential in the accounting regulatory process (Nobes and Parker, 2004; Bartov et al. 2001; Weetman, 2005; Walton et al. 2003).

TABLE 5

Summary of financial reporting standards in the USA, the UK and France

Type of difference	USA	UK	FRANCE
Reports/Differences between Taxation and Accounting Rules	Different reports for tax purposes and financial reporting. Taxation rules differ from the accounting rules. Accounting Income higher than income for tax purposes	Different reports for tax purposes and financial reporting. Taxation rules differ from the accounting rules	Same reports for tax purposes and financial reporting for legal entities. This does not apply for consolidated financial statements. Accounting rules are almost similar with tax rules
Effect on Earnings/ Sign of conservatism [4]	0 / N	0 / N	- / Y
Goodwill	As per FASB 142, goodwill is no longer amortized. But during the period covered by empirical tests, the maximum period of amortization was 40 years	Write-off directly against reserves. Capitalization is permitted	Is calculated on the basis of fair value or on the basis of book values. No period of time is required for amortization (PCG 2103). But during the period of empirical tests the usual period of amortization was 20 years
Effect on Earnings/ Sign of conservatism	+/ N	Depends on the method used	+ / N
R&D Expenditures [5]	Expensed immediately (except software Development Costs). R&D is capitalized for the Oil industry.	Research must be written-off as incurred but development costs may often be capitalized	May be capitalized and amortized over a period of not more than 5 years. Generally expensed as incurred
Effect on Earnings/ Sign of conservatism	- / Y	- / N	- / Y
Depreciation	Straight-line method but accelerated methods are acceptable	Straight-line method. Accelerated methods also permitted	Straight line and accelerated methods. Rates are determined by the tax authorities only in fiscal accelerated method.
Effect on Earnings/ Sign of conservatism	Depends on the method	Depends on the method	- / Y
Leases	Capitalized	Capitalized	Have to be capitalized in consolidated financial statements. But capitalization not allowed in the statement of the legal entity
Effect on Earnings/ Sign of conservatism	0	0	0
Major influences	Security Market	Company Law. Security Market. Accounting profession. Stock Exchange. European Union	Company Law. Taxation. European Union

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[4] + : positive effect ; - : negative effect; 0: no effect; Y: conservatism; N: no conservatism

[5] + : positive effect ; - : negative effect; 0: no effect; Y: conservatism; N: no conservatism

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Table 5 (continued)

Type of difference	USA	UK	FRANCE
Method of Consolidation	Equity method (20-50% ownership) Purchase method (51-100 % ownership). Pooling of interest method not allowed after 2001 (FASB 141)	Equity method (20-50% ownership) Purchase method and Pooling of interest (51-100 % ownership)	Purchase method, equity method, and proportional integration methods are allowed. The pooling of interest method has been allowed since 1999.
Inventory Valuation	Lower of cost and Market (Replacement Value) FIFO, LIFO, weighted average and specific identification are permitted. LIFO is the most frequently used method.	Lower of cost and Net Realizable Value LIFO is not permitted.	Lower of cost and market value. LIFO is not permitted for tax purposes. Allowed in financial statements (but not used in practice).
Effect on Earnings/ Sign of conservatism[6]	- / Y	+ / N	+ / N
Valuation of fixed assets	Historical cost but write-downs to market value are permitted when necessary	Historical cost but replacement values are permitted (current cost)	Historical Cost
Effect on Earnings/ Sign of conservatism[*]	- / Y	Depends on the method	- / Y
Long-term contracts	Both completed contract and percentage-of-completion methods are allowed. % of completion method is recommended.	Percentage-of-completion	Both completed contract and percentage-of-completion methods are allowed. % of completion method is recommended.
Effect on Earnings/ Sign of conservatism[*]	0	0	- / Y
Deferred taxation	Liability method (comprehensive allocation)	Liability method (partial allocation)	Generally does not arise Deferral method or Liability
Foreign currency translation	At the closing rate	At the closing rate	Current rate and closing rate methods are allowed and used.
Major influences	Security Market	Company Law Security Market Accounting profession Stock Exchange European Union	Company Law Taxation European Union

Sources: Walton et al. 2003; Haskins et al. (2000); Nobes and Parker (2004).

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[6] + : positive effect; - : negative effect; 0: no effect; Y: conservatism; N: no conservatism

Specific financial reporting differences among the three countries follow (see also Table 5) (Weetman, 2005; Haskins et al., 2000; Walton et al. 2003; Nobes and Parker, 2004, Lee et al. 2005).

Financial reporting vs tax rules:

In UK and USA there exist different reports for tax purposes and financial reporting purposes. In contrast, in France there exist same reports for both financial reporting and tax purposes for legal entities (consolidated financial statements are out of the scope of tax regulations, so much more freedom is allowed. However, consolidated financial statements are the aggregation of the financial statements of legal entities, so because the legal entities have to refer to tax rules, the consolidated financial statement are highly influenced by tax regulation). This requirement in France makes parent firms be more conservative in their reporting. Thus, on average earnings for financial reporting purposes in France are expected to be underestimated, whereas in UK and USA earnings are expected to be overestimated.

Goodwill

In the USA and France today and under the International Financial Reporting Standards (IFRS) goodwill is capitalized but not amortized. During the period of the study this was not the case: amortization of goodwill was the usual procedure. In the UK goodwill is generally written off against reserves, although capitalization is permitted.

Treatment of Research and Development (R&D)

Research and Development expenses are capitalized and amortized in France over a five year period. In the USA R&D is expensed immediately with the only exception the software development costs and research in the oil industry. In France although capitalization is permitted generally this cost is expensed as incurred. This makes USA and France more conservative. This financial reporting policy leads to lower earnings in France and in USA. As far as UK is

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concerned, research cost must be written off as incurred but development costs may often be capitalized.

Depreciation

The depreciation method most frequently used in all countries is the straight-line method. However, in the USA, UK and France accelerated methods are also permitted. In France the straight line method is the most frequently used method. Accelerated methods of depreciation are also used because of the conservatism that exists in the country due to the fact that companies give the same reports for tax and financial reporting purposes. This leads to lower level of earnings for these firms.

Leases

Leases can be classified as operating or capital. Operating leases must be expensed, whereas capital leases are capitalized. In USA and UK leases can be classified as either operating or capital, whereas in France leases have to be capitalized in consolidated financial statements (capitalization not allowed in the financial statements of the legal entity).

Method of consolidation

In the USA and UK the same methods apply for ownership in third companies. More specifically, the cost method applies for ownership up to 20%, the equity method applies for ownership between 20% and 50%, whereas the purchase method applies for ownership more than 50%. As far as France is concerned the purchase method, the equity method and the proportional integration methods are allowed. The pooling of interest method has been allowed since 1999.

Inventory Valuation

The LIFO method for inventory valuation is also permitted in the USA, which results in lower profits during inflationary periods. In contrast, in the UK and France LIFO is not permitted for tax purposes. Furthermore, in the USA the lower of cost and replacement value are used whereas in the

UK the lower of cost and net realizable value methods are used. Thus, this inventory valuation

standard leads to more conservatism in the US and to less conservatism in France and in the UK.

Asset Valuation

Revaluation of fixed assets is permitted in the UK. In the USA write-downs to market value are

allowed when necessary. In France historical cost is used and even if re-evaluation is allowed it is

never used (except when there is no tax effect which was the case in 1976 and 1978). Thus, the

USA and French financial reporting systems are more conservative with regards to the valuation of

fixed assets.

Deferred Taxation

Deferred taxes arise when taxation rules differ from accounting rules. Consequently, this occurs in

countries that allow different reports for tax and financial reporting purposes. Thus, USA and UK,

which allow different reports, deferred taxation exists and it is treated under the liability method.

On the contrary, in France companies give the same reports for tax and financial reporting purposes

and deferred taxation generally does not arise.

Statement of Cash Flows

In Anglo-Saxon countries (UK and USA) the preparation of the Cash Flow Statement along with

the other financial statements (Income Statement and Balance Sheet) is required. In France, the

cash flow statement has been mandatory since 1999 (regulation 99-02-426). Prior to 1999, the

cash flow statement was highly recommended (OECCA, rec n° 1-22 and OEC 30-1997). In other

Code Law countries the preparation of cash flow statements is not required with the exception of

Japan, where it is required only for the parent company. As it can be seen, the absence of the

need to provide investors with public information in most Code Law countries have not stressed

the need of preparation of Cash Flow Statement.

Finally, from the above analysis we can derive some conclusions regarding the

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conservatism of each country and the effect of these accounting practices on the importance of earnings for investors. The financial reporting in the USA and France seems to be more conservative than the financial reporting in the UK. The conservatism of France is reinforced by the link between financial reporting and tax law. Specifically, in France historical cost is used for the valuation of the fixed assets. USA and France expense R&D costs as incurred. French firms, in addition to the straight line method, also use accelerated methods of depreciation and these methods are also acceptable in the USA. LIFO method for the valuation of inventory is acceptable in the USA.

Furthermore, these financial reporting practices affect earnings and their usefulness to investors (Chan et al., 1991; Heston et al., 1995; Pae et al. 2005; Nobes and Parker, 2004). Conservative accounting methods and measurements result in lower earnings. USA and France are expected to have lower earnings compared to UK. Moreover, investors would characterize French earnings less reliable because of their conservative system. Hence, we expect cash flows to be more value relevant in France. Table 3 presents the major requirements regarding the financial reporting requirements that firms must follow as well as the accounting principles that they have to obey in order to prepare their financial statements. As it can be seen, UK and USA have more financial reporting requirements than France. This is partly due to the fact that the major influences in financial reporting in both USA and UK come from the capital markets whereas in France financial reporting is based mainly on law derived from taxation and code law.

Table 6 presents further reporting requirements that relate to the sources of generally accounting principles (GAAP), interim financial reporting, and annual reporting requirements. In the USA, the GAAP are based on the Financial Accounting Standards Board (FASB). In the UK, the source of GAAP is the 1985 Companies Act and the Accounting Standards Board. In France the source of GAAP is the Commercial Code, Plan Comptable General. As far as the

governmental agency that regulates the public firms is concerned. USA firms are subject to the Securities and Exchange Commission (SEC), UK firms are subject to the Registrar of Companies, whereas French firms are subject to the Commission des Operations de Bourse (Weetman, 2005; Haskins et al., 2000; Walton et al. 2003; Nobes and Parker, 2004, Lee et al. 2005).

Table 6: Financial Reporting Requirements in the USA, the UK and France

Type of difference	USA	UK	FRANCE
Source of GAAP	Financial Accounting Standard Board Securities and Exchange Commission	Company Act 1985, amended Companies Act 1989 Accounting Stendards Board ISEs Continuing Obligations	Commercial Code Plan Comptable General
Interim reporting requirements	Quarterly	Semi-annual	Semi-annual Quarterly revenues
Reporting Lags for interim reports from FPE	45 days	4 months	4 months Revenues 45 days
Annual reporting requirements from FYE	90 days of FYE	6 months of FYE	45 days after annual meeting which must be held within 6 months of FYE but a preliminary report published within 4 months of FYE and 15 days before annual meeting
Governmental Agency Regulating Public Companies	Securities and Exchange Commission	Registrar of Companies	Commission des Operations de Bourse
Alignment of Financial and Tax Accounting	Low level	Low level	High level
GAAP required for Financial Accounting	US GAAP	UK GAAP	French GAAP IAS GAAP

Source: Haskins et al (2000); Nobes and Parker (2004); Alford et al. (1993); Gonzalo and Gallizo (1992).

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As far as annual reporting requirements from fiscal year end is concerned, USA firms must file their annual reports 90 days after the fiscal year end, whereas UK firms must file annual reports up to six months after the fiscal year end. As far as French firms is concerned, they have to file their annual reports 45 days after annual meeting which must be held within 6 months after the fiscal year end but a preliminary report should be published within four months after the fiscal year end and 15 days before the annual meeting. Thus, US firms file their financial reports much earlier than UK and French firms (Lee et al. 2005; Walton et al. 2003; Nobes and Parker, 2004).

3.5 Differences in the value relevance of earnings between Anglo-Saxon countries (USA and UK) and France.

In the previous sections of the study, the major financial reporting differences between Anglo-Saxon countries and France were critically evaluated. These differences in financial reporting are expected to have an effect on the earnings figures reported by each firm. One of the major research questions raised in prior studies and in the present study is whether these earnings differences play an important role in the valuation of securities. One would expect the association of earnings with security returns to be higher in Anglo-Saxon countries (USA and UK) than in France for the following reasons. First, in Anglo-Saxon countries, where financial reporting is basically influenced by common law, accounting practices traditionally rely on professional judgment. This permits discretion in the preparation of financial statements as long as they provide a 'true and fair view' of firm's position. In contrast, in France, because of the influence of the code law system, accounting rules are provided by a national accounting plan defined by governmental committees. This implies a high level of standardized practices that can be in opposition with the true and fair view approach. To the extent that the adoption of this approach is expected to provide more value relevant

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financial reporting figures, the association between earnings and security returns is expected to be higher in Anglo-Saxon or code law countries (USA and UK) than in code law countries (i.e. France).

Secondly, the tax system has a strong influence on financial reporting rules and practices in France since the figures in the financial reports form the basis for those in the tax accounts. In contrast, the alignment of financial reporting with tax reporting is relatively low in Anglo-Saxon counties (USA and UK). This difference might tend to lead firms to systematically adopt tax minimizing reporting techniques so that earnings may not reflect economic reality, which is supposed to weaken the association of earnings with security returns (Haskins et al. 2000; Weetman, 2005).

Thirdly, because firm financing is mainly provided by widely dispersed small shareholders in the USA or in the UK, the financial reporting systems strongly focus on earnings measures. In France, ownership being largely in the hands of banks or family members that have direct access to internal financial information and firms relying heavily on debt financing, the accounting principles mostly focus on reporting to creditors. Thus, this may reduce the relevance of accounting numbers for shareholders and their association with security returns (Dumontier, 1998; Frylender and Pham, 1996; Nobes and Parker, 2004).

3.6 Financial reporting in the UK: Financial Reporting Standard No. 1 (FRS # 1) and the Statement of Cash flows

The FRS No 1. "Cash Flow Statement" was introduced in 1991 to replace the SSAP No 10 entitled 'Statement of Source and Application of Funds'. This statement establishes standards for cash flow reporting. It has been effective in respect of financial statement relating to accounting periods ending on or after 23 March 1992. This cash flow statement was issued by the

UK Accounting Standard Board due to the changing economic environment which had led to increasing sophistication in the requirements of users of financial information. Moreover, there has been a widespread belief that the profit presented in the traditional financial statements does not always give a comprehensive picture of the company's operations, firm's liquidity, solvency, and financial flexibility (Nobes and Parker, 2004).

According to the FRS #1, the cash flow information i) may assist users of financial statements in making judgements on the amount, timing and degree of certainty of future cash flows; ii) gives an indication of the relationship between profitability and cash generating ability. Cash flow information, together with balance sheet data, provides information on the firm's liquidity, viability and financial adaptability. Balance sheet data provide information about an entity's financial position at a particular point in time, including assets, liabilities and shareholder's equity. However, it does not provide complete information on liquidity, since it is drawn up at a particular point in time. On the other hand, a cash flow statement shows information about the reporting entity's cash flows in the reporting period, but this information is incomplete for assessing future cash flows, since only part of the current cash flows is expected to result in future cash flows. Therefore, cash flows should be used in conjunction with profitability and Walton et al. 2003).

Prior to the issuance of this cash flow statement standard, emphasis was given to the working capital concept. The following are some of the advantages of cash flow statements over funds flow (working capital based) statements:

i)   Funds flow data can hide movements relevant to the liquidity and viability of an entity. For example, a significant decrease in cash availability be masked by an increase in stock or debtors. Entities may, therefore, run out of cash while reporting increases in working capital.

ii) Cash flow monitoring is not a specialized accounting technique and is therefore a more widely understood concept than are the changes in working capital.

iii) Cash flow can be a direct input into a business valuation model, therefore historical cash flow may be relevant in a way not possible for funds flow data.

iv) The funds flow statements is based largely on the difference between two balance sheets and it does not provide new data. The cash flow statement and the notes to it, may include additional data.

v) Cash flow is more comprehensive than profit which is dependent on accounting convention and concepts.

vi) Creditors are more interested in an entity's ability to repay them than in its profitability. Whereas "profits" might indicate that cash is likely to be available, cash flow accounting is more direct with its message.

vii) Cash flow reporting provides a better means of comparing the results of different companies than traditional profit reporting.

viii) Cash flow reporting satisfies the needs of all users better:

    a) Creditors mentioned above

    b) for management, it provides the sort of information on which decisions should be taken (in management accounting), relevant costs to a decision are future cash flows

    c) for shareholders and auditors, it provides a satisfactory basis for stewardship accounting.

ix) Cash flow reporting should be both retrospective, and also include a forecast for the future. This is of great information value to all users.

Even though cash flow information has certain advantages, it is not without its

limitations. A cash flow statement is a record of historical facts. It will record expenditure upon additional plant and machinery, for example, but it can express no opinion on whether the expenditure was necessary or will be profitable. Similarly, it may show an expansion of inventory, but it will not show whether this was due to poor inventory control, or to the organization's inability to sell the finished product. Moreover, the cash flows will show how new capital was raised, but not whether it was raised in the best way nor whether it was really needed to be raised at all. In addition, a cash flow statement may highlight a deteriorating situation, but it does not show how close a company is to the limit of its facilities or whether the company has liquidity or solvency problems. Finally, the cash flow statement shows only the cash flows for the year which ended very recently (some months ago), but unfortunately liquidity problems can arise very quickly. Therefore, even though the newly established cash flow statement has several advantages, it should be used in conjunction with the other financial statements (such as balance sheet and profit and loss). Indeed, the cash flow information can signal liquidity and solvency problems that could be very useful to creditors, investors and management so they can take action to prevent future organizational and financial problems (Uhrig-Homgurg, 2005).

3.7 Comparative analysis of the empirical evidence on the value relevance of earnings and cash flows in the UK, the USA and France

In this section I provide a critical review and a comparative analysis of the empirical studies that have been undertaken regarding the value relevance of earnings and cash flows in the three countries under examination, namely, UK, USA and France. As it can be seen in the discussion that follows the majority of the studies undertaken thus far relate to the USA empirical evidence.

Furthermore, the value relevance of cash flows has been examined more extensively only in the past decade. Earlier studies examined mainly the value relevance of earnings.

The discussion that follows is broken down originally by country and thereafter I discuss in more depth the studies that examined more than one country. Specifically the following issues will be discussed: i) Empirical Evidence on the value relevance of earnings and cash flows in the USA, ii) Empirical Evidence on the value relevance of earnings and cash flows in the UK, iii) Empirical Evidence on the value relevance of earnings and cash flows in France, iv) Comparative analysis of the empirical evidence on the value relevance of earnings and cash flows in the UK, USA and France. A discussion of the above issues follows.

3.7.1 Empirical evidence on the value relevance of earnings and cash flows in the USA

Since the seminal study of Ball and Brown (1968), several studies have indicated that earnings possess information content, which appears to be robust across time periods, statistical methodologies and stock exchanges in which shares are traded (Barth et al. 2005; Land and Lang, 2005; Kothari, 2001; Barth, Beaver and Landsman, 2001; Lev and Ohlson, 1982). Even though empirical studies have shown that earnings is the dominant measure for explaining security returns, researchers have maintained that the accrual process is subject to significant manipulation. Moreover, the model's explanatory power as explained by the adjusted R^2 is relatively low. Therefore, researchers have examined not only the value relevance of earnings, but also the value relevance of cash flows beyond earnings.

Among the first researchers who examined the value relevance of earnings and cash flows in the USA capital markets were Wilson (1986, 1987), Rayburn (1986), Bernard and Stober (1989) and Livnat and Zarowin (1990). The results of all those studies were robust with regards to the value relevance of earnings and mixed and inconclusive regarding the value relevance of cash flows

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beyond earnings. The results of the studies by Rayburn (1986), Wilson (1986,1987), Bowen et al. (1987) showed that cash flows provided some explanatory power beyond earnings in explaining security returns. Studies by Bernard and Stober (1989) and Livnat and Zarowin (1990) who extended prior cash flow studies showed that the separation of earnings into cash flows and accruals does not improve significantly the value relevance beyond that explained by earnings alone.

Since early studies on the value relevance of earnings and cash flows did not provide conclusive results regarding the value relevance of cash flows in explaining security returns beyond earnings, possibly due to the fact that these studies are based upon the pooled data of many firms, under the assumption that the returns-earnings/cash flows relation is homogeneous across firms. Empirical studies in the past decade have progressed into a new arena, which relaxes the assumption of the homogeneity of returns earnings/cash flows relation, and assumes that the value relevance of earnings and cash flows is based on certain contextual factors, such as a) the return window or interval of earnings and cash flow measurement, b) the transitoriness or permanence of earnings and cash flows, c) other contextual factors such as the level of the operating cycle and the industry that the firm belongs to. A discussion of the studies that relate to those contextual factor follows.

3.7.1.1 Empirical evidence on the value relevance of earnings and cash flows when long return intervals or windows are considered.

Since one of the major problems of most earnings-returns studies was the low explanatory power of the models, Easton, Harris and Ohlson (1992) extended this type of research by taking into consideration longer windows for the return and earnings variables. By doing that, one of the major problems associated with earnings that has to do with accruals management is mitigated to a great

extent as the measurement interval increases. Easton, Harris and Ohlson (1992) and Warfield and Wild (1992) used USA data to examine the association of earnings with security returns. The results of these studies provided evidence that the association of earnings with security returns improves over longer measurement intervals. Easton et. al., showed that for a five-year return interval the R^2 is equal to 33%. For the annual return interval the R^2 is only 5%. These researchers examined only the value relevance of earnings over longer return intervals.

In contrast, Dechow (1994) examined also the value relevance of cash flows over longer return intervals. Dechow hypothesized that over longer measurement intervals, cash flows will suffer from fewer timing and matching problems, the importance of accruals will diminish, and therefore, earnings and cash flows are expected to converge as measures of firm performance. Cash flows suffer more from timing and matching problems over short measurement intervals because they have no accrual adjustments and the accruals associated with cash flows are long term in nature and they do not reverse in the short-run (Dechow, 1994).

On the other hand, the explanatory power of earnings compared to cash flows is expected to be the highest over short measurement intervals, because earnings include current and noncurrent accruals that mitigate the timing and matching problems related to the organization's operating, investing and financing cash flows. Moreover, Generally accepted accounting principles trade off relevance and reliability so that accruals do not completely mitigate all short term timing and matching problems in realized cash flows. Dechow (1994) used US data. Results show that there is a relative increase in the explanatory power of cash flows compared to earnings over longer measurement intervals. More specifically, Dechow examined the value relevance of earnings and cash flows over a quarterly, annual and a four year period. The explanatory power of the earnings models as measured by the adjusted R^2 was as follows: 3.24% over the quarterly period, 16.20% over the annual period and 40.26% over the four year return interval. As far as

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the cash flow models is concerned, the explanatory power of these models as measured by the adjusted R^2 was as follows: 0.01% over the quarterly period, 3.18% over the annual period and 10.88% over the four year return interval. The following conclusions can be drawn from this study: a) that the explanatory power of earnings is greater in all three intervals tested, b) the explanatory power of both earnings and cash flows increases as the measurement interval increases, and c) the explanatory power of the cash flow models compared to the explanatory power of the earnings model increases at a higher rate as the measurement interval increases. It was less than 1% (R^2 of earnings model divided by the R^2 of the cash flow model) in the quarterly interval and it reached 27% in the four year interval.

In summary, these studies provide evidence that as the measurement interval increases, the value relevance of both earnings and cash flows improves. However, none of those studies used multivariate analysis to examine the value relevance of both earnings and cash flows. These studies used univariate analysis (Chambers, 2004).

3.7.1.2 Empirical evidence on the value relevance of earnings and cash flows when transitoriness or permanence of earnings is considered.

In the previous part I discussed the contextual factor that relates to the value relevance of earnings and cash flows when the measurement interval increases to more than one year. In this part I discuss the empirical evidence that relates to the value relevance of earnings and cash flows when earnings are transitory. Both contextual factors have a common objective. To identify specific circumstances where the value relevance of earnings and cash flows is altered (improves or deteriorates). Using USA data, Freeman and Tse (1992) and Ali (1994) showed that transitory earnings have smaller marginal impact on security returns. Cheng et al (1996) extended these studies by hypothesizing that when earnings are transitory, the value relevance of earnings

diminishes, whereas the value relevance of cash flows is expected to increase. Earnings transitoriness was measured as the earnings change scaled by the beginning of period price and also by the earnings to price ratio. Extreme values of these measures could be considered as an indication of earnings transitoriness. Transitory items are expected to have limited valuation implications. Examples of transitory items in earnings include current and long-term accruals such as losses due to restructuring, current recognition through asset sales of previous periods' increases in market values, one time impact on income from changes in accounting standards. The results of the Cheng et al. (1996) study indicated that a) when level and changes in earnings and cash flows are included in the model, all are value relevant in the marketplace, and b) when earnings are transitory the value relevance of earnings diminishes substantially, and simultaneously the value relevance of cash flows increases.

In summary, these results are indeed of great importance since earlier studies assumed that the earnings returns relation is homogeneous across firms. These studies, however, disprove this assumption and indeed show that the value relevance of earnings and cash flows depends on the permanence or transitoriness of these measures.

3.7.1.3 Empirical evidence that examined other contextual factors such as the level of the operating cycle and the industry that the firm belongs to.·

In addition to the aforementioned contextual factors that relate to the long-windows effect and to the earnings permanence, researchers tested additional factors in order to determine the value relevance of earnings and cash flows. Additional contextual factors examined were a) the level of the operating cycle; b) the size of accruals; and c) industry factors.

Specifically, Dechow (1994) examined whether the level of accruals and the size of the operating cycle play an important role in explaining security returns. The results indicated that both the

operating cycle and the size of accruals are important determinants in explaining security returns. Specifically, Dechow hypothesized that earnings (cash flows) are expected to outperform cash flows (earnings) in the marketplace when a) accruals are large (small), and b) when firms are not in a steady state (steady state) [eg., firms that belong in the construction industry and thus have long term contracts and volatile annual cash flows]. Dechow showed that cash flows are associated more with security returns when cash flows and earnings are most similar., ie., when the magnitude of the absolute accruals is relatively small.

As far as the operating cycle is concerned, Dechow showed that in industries where the operating cycle is long, working capital requirements are more volatile and earnings better reflect firm's performance than cash flows. Additional studies that examined the value relevance of earnings in different industries include Biddle and Seaw (1995). Their results indicated that the value relevance of earnings is industry specific.

In summary, USA results provided evidence that earnings permanence, the level of the return window and industry classification play an important role in explaining security returns. However, more research remains to be conducted to provide more robust results on the value relevance of cash flows beyond earnings.

3.7.2 Empirical evidence on the value relevance of earnings and cash flows in the UK

The association between earnings and cash flows with contemporaneous security returns has also been analyzed with UK data. In general , results show that, in UK, like in the USA this association is not that robust, as this association is measured by the adjusted R^2. These results suggest that reported earnings and cash flows do not provide a strong summary measure of the value-relevant events that have been incorporated in security returns during the reporting period. Specifically, one of the early UK studies by Board and Day (1989) failed to find incremental information content

for operating cash flow beyond accounting earnings. Moreover, Strong (1993) examined the association of earnings with security returns for UK firms. His results showed that the average adjusted R^2 of the models tested was about 10%. This relatively low association observed between earnings and security returns suggests that earnings capture only a weak proportion of the information incorporated in security prices. It is often argued that information included in stock prices is richer than the one reflected by earnings alone because investors focuses on all events that affect expected future cash flows, while earnings incorporate only those that have met the conditions for accounting recognition. Since relevant events that are not captured in contemporaneous earnings would normally be captured in subsequent periods, there should be a lag in the inclusion of new information into earnings, and stock prices should be more prompt than earnings in reflecting new information. This recognition lag causes both an errors-in-variable problem and an omitted variable problem because earnings do not reflect some information captured in current returns, whereas they reflect some information that was captured in prior returns (Dumontier and Raffournier, 2002; Nobes and Parker, 2004; Walton et al. 2003).

Moreover, Alford et al. (1993) showed that UK earnings are valued in the marketplace. UK earnings were shown to be more value relevant and timely than US earnings. Furthermore, Ali and Pope (1995) provide evidence that the absolute size of unexpected operating cash flows conditions the security response to this accounting variable and that, while operating cash flow cannot be shown to have incremental information content beyond accounting earnings in simple cross-sectional regressions, evidence in support of incremental information content is only provided when the cash flow response coefficient is allowed to decline as the absolute size of unexpected cash flow increases.

McLeay et al. (1996) used firm-specific forecast models to estimate innovations in accounting variables, focusing on the relative information content of earnings and operating cash

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flows using both time series and pooled cross-sectional approaches. McLeay et al. (1972), using a similar dataset to Ali and Pope (1995), find support for incremental information content of operating cash flow, obtaining a similar R^2 for the incremental information model to results reported by Ali and Pope. While the use of firm-specific forecast models to estimate earnings and cash flow innovations may have advantages over an approach that uses a standard measurement approach for all firm-year accounting variable observations (such as first difference or first difference and level of variable), measurement error in the estimation of the forecast model is likely to affect the findings. The relatively low earnings response coefficients reported by McLeay et al. (1992) (less than 1.0 compared with approximately 2.0 in Ali and Pope, 1997) suggests that measurement error may have affected the reported regression coefficients.

Furthermore, Clubb (1995) showed that cash flows from operations, accruals and earnings are all positively related to stock returns, but accruals adjustments seem to possess information content beyond that reflected by cash flows and earnings. In addition, Green (1999) showed that the value relevance of UK cash flows was unsurprisingly related to the correlation between accounting earnings and operating cash flows, results consistent with those provided by Charitou (1997).

In summary, empirical evidence in the UK shows that earnings are valued in the marketplace beyond cash flows but the explanatory power of earnings, as measured by the R^2 is not that robust. As far as the value relevance of cash flows is concerned, results have been mixed and inconclusive.

3.7.3 Empirical evidence on the value relevance of earnings and cash flows in France

As far as the empirical evidence on the value relevance of earnings and cash flows in explaining security returns, French evidence has been limited. In general, results on the value relevance of

earnings show that earnings play an important role in explaining security returns. Researchers who examined the value relevance of earnings in France, include among others, Dumontier and Labelle (1998), Ball, Kothari and Robin (2000), Alford et al, 1993, Joos and Lang (1994), Ali and Hwang (2000).

Alford et al (1993) examined the value relevance of earnings in France. They showed that earnings in France are value relevant and even more relevant and timely than US earnings. Joos and Lang (1994) provided similar reconfirm the results of Alford et al. They showed that earnings in France are value relevant and are valued more than common law countries, such as UK. In contrast, Ali and Hwang (2000) provided opposite results. They regressed stock returns with scaled earnings to explore the impact of French earnings on security returns. Their results showed that even though earnings are value relevant, French earnings were less value relevant than US earnings.

Furthermore, Dumontier and Labelle (1998) examined the association of earnings with security returns. Their results indicated that earnings are valued in the marketplace. The variability of their results were however very high and yearly dependent. Their R^2s ranged from 1% to 49%. Dumontier and Labelle (1998) extended their study to examine the effect on earnings on security returns over long return windows. Their results indicated that the correlation between earnings and returns improves with increases in the time interval under consideration. They obtained R^2s ranging from 15% for the one year interval and to 39% for the five year interval.

In addition, a study by Ball et al (2000) showed that earnings in France are value relevant but earnings are less timely and less conservative compared to USA earnings. They hypothesized, though, that income reported in France is more smoothed and less timely in incorporating current period changes in market value compared to a common law country, such as USA.

In addition to the aforementioned studies, researchers also examined the market response to

French earnings. Results in general support the hypothesis that positive unexpected earnings lead to positive abnormal returns (Gajewski and Quere, 2001).

In summary, even though research on the value relevance of earnings in France has been limited, existing empirical evidence indicates that earnings are valued in the marketplace. As far as the value relevance of cash flows in France is concerned, researchers have not examined the value relevance of cash flows beyond earnings.

In concluding, due to the very limited research on French earnings and cash flows, much more research is needed in France on the value relevance of earnings and cash flows.

3.7.4 Comparative analysis of the empirical evidence on the value relevance of earnings and cash flows in the UK, the USA and France.

In this section, I will discuss those empirical studies that compared and contrasted the value relevance of earnings or cash flows or both in a comparative way in at least two of the three countries utilized for this study. More specifically, the following comparative studies were undertaken that will be discussed in this section: Alford et al (1993), Joos and Lang (1994), Pope and Walker (1999), Ali and Hwang (2000), Ball, Kothari and Robin (2000) and Bartov, Goldberg and Kim (2001).

A discussion and critical evaluation of the results of these studies follows.

Alford et al (1993) were among the first researchers who examined the value relevance of earnings in different countries. They observed considerable variation in the explanatory power of earnings in explaining security returns in the countries under investigation. Regarding USA, UK and France, results indicated that earnings from France and UK are more value relevant and timely than USA earnings.

Joos and Lang (1994) tried to verify some of the results provided by Alford et al. They

focused on financial reporting practices in France, Germany and UK. They found evidence of significant differences in the value relevance of earnings. Results indicated that UK earnings were less value relevant than in UK and Germany. The R^2s of the models tested were greater in France and smaller in the UK.

Pope and Walker (1999) provided further evidence beyond the results provided by Alford et al. (1993). They examined differences in the timeliness and conservatism of income recognition between the USA and UK GAAP financial reporting regimes. Building on the Basu (1997) study, they focused on the links between current reported earnings and current and past stock prices. Their results indicated that the degree of conservatism displayed by earnings before extraordinary items under USA GAAP was higher than under UK GAAP. Results were opposite for earnings after extraordinary items. Thus, UK GAAP earnings are significantly more timely in the recognition of bad news than USA GAAP earnings. UK firms recognize bad news faster than USA firms, but they classify the bad news differently.

Furthermore, Ali and Hwang (2000) regressed market returns with scaled earnings to explore the impact of several country specific factors on the value relevance of financial information. Their results show that the degree of association between security returns and earnings is lower in code law countries as opposed to common law countries. More precisely, earnings in code law countries like France seemed more conservative and consequently less timely than those in common law countries, such as USA and UK.

Ball et al (2000) extended prior studies and examined the international differences in the demand for earnings predictably affect the way it incorporates economic earnings over time. They show that differences in the demand for earnings in different institutional contexts cause its properties to vary internationally. The properties examined were similar to those examined by Pope and Walker (1999), Ali and Hwang (2000), namely, timeliness and conservatism. They examined

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more than 40000 firm year observations over the period 1985-1995 for 7 countries, among those USA, UK and France. Their results indicated that earnings in code law countries, such as France, is less timely and less conservative than common law income as reported in UK and USA. Comparing the UK and USA evidence, results indicate that there is less asymmetric conservatism in the UK earnings.

Finally, Bartov et al. (2001) investigated the value relevance of earnings and cash flows in five countries, two code law (not including France) and three common law countries, among those USA and UK for the period 1988-96. Their results indicated that earnings in Anglo-Saxon common law countries have more explanatory power than cash flows. Conversely, in the two code law countries (Japan and Germany), earnings are not superior to cash flows in explaining security returns. As expected, in all countries earnings had incremental information content beyond cash flows. In summary, results show that the superiority of earnings is not universal, but it depends on the financial reporting system under investigation, namely, code law versus common law.

In summary, results of comparative international studies indicate clearly that earnings are valued in the marketplace, but it is not clear if earnings in code or common law countries are valued more. As far as the value relevance of cash flows is concerned in different countries, evidence has been very limited. The major objective of my dissertation is to extend prior studies by examining in more depth the value relevance of both earnings and cash flows in code law and common law countries. Furthermore, in order to get more robust results I will use several methodologies, among those level and changes of earnings and cash flows, earnings permanence, long-return intervals and industry effects. It should be stressed that in all the aforementioned studies only one of the methodologies just alluded to is used and even some of them examined only earnings and not cash flows.

3.8   Summary of the critical literature review

In this chapter, the literature that relates to the value relevance of financial information (earnings and cash flows) was critically evaluated. Specifically, in this chapter an in depth discussion of two major issues was provided: a) the role of financial information in capital markets and b) comparative international financial reporting. As far as the first issue is concerned, an in depth critical evaluation was provided that related to i) the value relevance of earnings and cash flows, ii) the role of earnings in the capital markets, iii) the empirical evidence on the usefulness of earnings and cash flows in the marketplace, and iv) the use of contextual factors in improving the association between financial information and security returns. As far as the comparative international financial reporting is concerned the emphasis on the critical literature review was placed on i) the international classification of financial reporting, ii) the financial reporting in the three countries that will be examined empirically in the present study, i.e., France, UK, USA; iii) the comparative analysis of the financial reporting systems of those three countries, and iv) the critical evaluation of the major differences of the value relevance of earnings and cash flows between Anglo-Saxon countries and France.

Based on the critical discussion and analysis presented in this chapter, it is concluded that the value relevance of earnings and cash flows is still an open research question. Are earnings or cash flows valued more in Anglo-Saxon or code law countries? Are earnings or cash flows valued more in the service or manufacturing or retail industries? When the measurement interval increases, in which system, Anglo-Saxon or code law system, is there a greater increase in the value relevance of earnings and cash flows? When earnings are transitory, in which system, Anglo-Saxon or code law system, is there a greater increase in the value relevance cash flows?

These are some unanswered research questions in the capital markets literature. In this

dissertation 1 attempt to provide answers to the aforementioned questions. Specifically, this research study differs from prior studies in the following respects. First, it examines not only the value relevance of operating cash flows beyond earnings, but it also examines the role of cash flows in the capital markets after considering the industrial effects in both Anglo-Saxon and code law countries on the relative usefulness of operating earnings and cash flows in explaining security returns. Second, it examines the value relevance of earnings and cash flows when the measurement interval increases. Third, the above major research questions are examined empirically using data from UK and USA (Anglo-Saxon countries) and France (a code law country) in order to determine whether the valuation role of financial information differs in these countries. Fourth, this study examines comparatively the valuation of financial information such as earnings and cash flows, over longer measurement intervals for the UK, USA and France. Thus far, no other study has examined the above issues using comparative statistics for the U.K, US and France. Since there are several financial reporting, economic and social differences between the above countries, it is expected that this study will provide new insight regarding the effect, if any of these differences, on the value relevance of earnings and cash flows in these countries.

The critical literature review of this section will provide a groundwork for the chapters that follow, which relate to the theoretical framework, the motivation for the study/development of hypotheses, the methodology/research design and for the empirical analysis.

CHAPTER IV:

THEORETICAL FRAMEWORK AND DEVELOPMENT OF THE RESEARCH HYPOTHESES

This chapter discusses a) the theoretical framework, and b) the development of the research hypotheses.

4.1 Theoretical framework on the value relevance of earnings and cash flows

The theoretical relation between market prices and earnings draws on the classical dividend capitalization model. The market price (P) of an equity security at time t equals the present value of the expected dividend stream of discounted at risk-adjusted discount rate plus the expected liquidating dividend upon dissolution of the firm (Miller and Modigliani, 1961).

$$P_t = \Sigma \ (\text{ Expected dividend } / \ 1{+}r)^t \ ) \qquad\qquad [1]^7$$

A liquidating dividend occurs because a firm generates cash flows each period that it does not fully distribute to shareholders as dividends. As long as a firm generates a return on the retained cash flows equal to the discount rate, or cost of equity capital, the firm's dividend policy has no effect on the market price of the common stock . This is the Miller and Modigliani (1961) dividend irrelevance proposition.

The source of cash flows for dividends is the cash flows generated by the firm . Cash flows received by the firm represent the generation of economic value; dividends merely represent the periodic distribution of this economic value to shareholders. Therefore,

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7 Notation for all variables included in all the equations in this chapter is presented in alphabetical order at the end of this chapter.

$$P_t = \Sigma \, (\text{Expected cash flows} / 1{+}r)^t) \qquad [2]$$

When a firm's expected leveraged free cash flows are projected to remain constant into perpetuity, a no growth scenario exists as follow:

$$P_t = \Sigma \, (\text{Expected cash flows} / r) \qquad [3]$$

When leveraged free cash flows are projected to grow at a constant rate, g, then equation [3] becomes

$$P_t = \Sigma \, (\text{Expected cash flows}_{t+1} * (1 / (r{-}g))) \qquad [4]$$

The next step in the theoretical formulation of the price to earnings relationship substitutes a firm's expected earnings for its expected leveraged free cash flows in the preceding formulation of market price. This substitution of earnings for cash flows rests on the following:

a. over sufficiently long time periods, net income equals leveraged free cash flows. The effect of year-end accruals to convert cash flows to earnings lessens as the measurement interval increases (Easton et al., 1991)

b. For a no growth firm, net income equals leveraged free cash flow. For a firm experiencing a constant rate of growth, earnings is a constant multiple of leveraged free cash flows.

c. Accrual based earnings reflect changes in economic values more accurately than do free cash flows.

By substituting expected earnings for expected cash flows in the cash flows market based equation, then the market price (P) equals

$$P_t = \Sigma \, (\text{Expected earnings} / 1{+}r)^t) \qquad [5]$$

The final link in the chain relating market prices (P) to earnings substitutes actual earnings of the

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most recent period for expected permanent earnings (no growth state)

$$P_t = \text{Actual earnings} / r \qquad\qquad [6]$$

Possible justifications for using actual earnings in period t as surrogate for expected earnings in period t+1 are:

a. actual earnings represent the permanent earnings level for the firm, and

b. earnings follow a random walk, so the actual earnings of the current period are the best

predictor of future earnings (Stickney, 1996).

Furthermore, Ohlson (1989) demonstrates that the Miller and Modigliani (1961) dividend irrelevance proposition becomes

$$P_t + DIV_t = \rho\, E_t + e \qquad\qquad [7]$$

When a dividend is paid on security j at time t, where:

P = security price

DIV= dividend

E_t= expected (permanent) earnings

ρ = coefficient

e = error term

Furthermore, Feltham and Ohlson (1995), point out that measurements of operating accounting earnings focus on cash flows adjusted for accruals, and the use of accounting conventions for accruals generally leads to differences between the firm's market value and book value.

In an attempt to acquire an insight into the theoretical grounding of the relation between financial information and security prices, the determinants that lead to changes in the firm's market value and book value should be analyzed.

The theoretical framework developed in this study draws also from the clean surplus

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relation (CSR), which implies that all changes in book value are reported as either income or dividends:

$$BV_t = BV_{t-1} + E_t - DlVt \qquad [CSR] \qquad [8]$$

Where: BV_t = book value of the firm's equity at date t.

E_t = earnings for period (t-1, t)

$DlVt$ = dividends, net of capital contributions at date t.

The following net interest relation (NIR) is assumed (Feltham and Ohlson, 1995) :

$$I_t = (R_F - 1)FA_{t-1} \qquad [NIR] \qquad [9]$$

Where: FA_{t-1} = financial assets, net of financial obligations, date t-1.

I_t = interest revenues, net of interest expenses, (t-1, t).

R_F = one plus the risk free interest rate.

The financial assets relation (FAR) is depicted as:

$$FA_t = FA_{t-1} + R_t - (DlVt - CF_t) \qquad [FAR] \qquad [10]$$

Where: CF_t = cash flows realized from operating activities, net of investments in those activities, date t.

Financial activities take place during the period (t-1, t), with a stock of financial assets FA_{t-1} which in the said time period earns interest I_t. Dividends minus cash flows reduce the total financial assets at the end of the period, but do not affect the interest gained during the period.

Operating assets, include all assets that do not generate interest earnings in the manner depicted by the [NIR] relation (e.g. cash held for operating purposes, accounts receivable, inventory, property, plant and equipment net of depreciation, accounts payable and accrued wages). Thus, operating earnings consist of all non-interest items (e.g. sales, cost of goods sold, selling and administration expenses, etc).

$$OA_t = OA_{t-1} + Eop_t - CF_t \qquad [OAR] \qquad [11]$$

Where: OA_t= operating assets, net of operating liabilities, date t.

Eop$_t$= operating earnings for period (t-1, t)

OAR: Operating assets relation

The OAR and FAR taken together, describe the firm's overall activity.

The analysis as presented above, describes a setting in which the accounting variables depict the firm's contemporaneous activity i.e. the accounting information generating process resulting from the wealth generating process.

However, in order to investigate the relation of this financial information with the firm's market value, a framework describing the arguments of the firm's market value function, must also be constructed.

The standard neoclassical models of security valuation described earlier assert that the market value of the firm's equity is determined by the net present value of the expected dividends that will be distributed to equity holders. Consistent with Feltham and Ohlson (1995), and Ohlson (1995), this is described as the basic market value relation. In this model, Ohlson (1995) assumes an economy with neutrality and homogeneous beliefs. Under those assumptions, the market value of the firm equals the present value of future expected dividends. Given further that the interest rates satisfy a nonstochastic and flat term structure, the aforementioned assumption reduces to the following model[8].

$$P_t = \sum_{\tau=1}^{\infty} R_F^{-\tau} E_t[D_{t+\tau}] \qquad \text{[PVR]} \qquad [12]$$

where: PVR: present value relation

The above expression represents the current value of wealth that will be distributed from

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8 Later on in this section we relax the aforementioned assumptions and we take into consideration risk factors.

the firm to its shareholders via the firm's dividends. The wealth generating relations are given by

FAR, OAR, and NIR. Since the distribution of wealth encompasses its creation then by

combining PVR, FAR, OAR, and NIR we should derive the relationship that underlies the firm's

market value with its financial information.

From NIR: $I_t=(R_F -1)$ FA_{t-1}, interest revenues (i.e. I_t) from undistributed cash flows

(i.e. FA_{t-1}), add to financial assets since from FAR:

$$FA_t= FA_{t-1}+R_t- (DIVt -CF_t).$$ [13]

Combining the two we get:

$$DIVt= CF_t+ R_F \cdot (FA_{t-1}- FA_t)$$ [14]

Where the left hand side is the wealth distributed and the right hand side is the wealth created at

time t.

As $R_F=(1+ r_f)$ => $R_F FA_{t-1}= FA_{t-1}+ r_f FA_{t-1}= FA_{t-1}+ FA_t$

[15]

Thus,

$$DIVt= CF_t+ FA_{t-1}$$ [16]

Hence, provided that $R_F E_t[FA_{t+\tau}]\rightarrow 0$, as $\tau\rightarrow \infty$ 9 , then:

$$\sum_{\tau=1}^{\infty} R_F^{-\tau} E_t[D_{t+\tau}] = FA_t + \sum_{\tau=1}^{\infty} R_F^{-\tau} E_t[CF_{t+\tau}]$$ [17]

Thus, using the NIR equation [9] and the FAR in equation [10], it is derived that the PV of

expected dividends equals the PV of financial assets plus the PV of the expected cash flows from

operations.

In order to analyse the determinants of the book value of operating assets, the clean surplus

relation (CSR equation 8) is reconsidered. According to the CSR equation 8, incorporating a

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9 If the firm has a finite life span i.e. T, then at $t\geq T$, $FA_t=0$, and at $t>T$, $D_t= CF_t=0$.

measure of future expected profitability bridges the gap between the book and market values. CSR implies:

$$BV_t = BV_{t-1} + E_t - DIVt \Rightarrow DIVt = E_t + BV_{t-1} - BV_t \qquad [18]$$

Defining abnormal earnings as: $AEt = E_t - (R_F - 1) BV_{t-1}$, where $(R_F - 1) BV_{t-1}$ measures the normal earnings for period (t-1,t). Then the CSR becomes:

$$DIVt = AEt + R_F BV_{t-1} - BV_t \qquad [19]$$

Considering the future sequence of dividends, we get:

$$\sum_{r=1}^{\infty} R_F^{-r} E_t [D_{t+r}] = BV_t + \sum_{r=1}^{\infty} R_F^{-r} E_t [AE_{t+r}] \qquad [20]$$

provided that $R_F E_t[BV_{t+\tau}] \to 0$, as $\tau \to \infty$. Thus the PV of the expected dividends equals the book value of the firm's asset plus the PV of the expected abnormal earnings (Feltham and Ohlson, 1995, Fama and French, 1998).

Using the same principles, by firstly defining abnormal operating earnings, I can model the relation between financial and operating activities. Abnormal operating earnings are defined as:

$$AEop_t = Eop_t - (R_F - 1) OA_{t-1} \Rightarrow Eop_t = AEop_t + (R_F - 1) OA_{t-1} \qquad [21]$$

and since OAR is: $OA_t = OA_{t-1} + Eop_t - CF_t \Rightarrow CF_t = OA_{t-1} + Eop_t - OA_t \qquad [22]$

combining the two equation [21] and [22] we get:

$$CF_t = AEop_t + R_F OA_{t-1} - OA_t \qquad [23]$$

and considering the discounted future sequence of cash flows, operating earnings and operating assets it follows that:

$$\sum_{r=1}^{\infty} R_F^{-r} E_t [CF_{t+r}] = OA_t + \sum_{r=1}^{\infty} R_F^{-r} E_t [AEop_{t+r}] \qquad [24]$$

provided that $R_F E_t[OA_{t+\tau}] \to 0$, as $\tau \to \infty$.

By definition we know that $BV_t = FA_t + OA_t$. Thus adding FA_t to both sides of [24] we get:

$$\sum_{\tau=1}^{\infty} R_F^{-\tau} E_t[CF_{t+\tau}] + FA_t = OA_t + FA_t + \sum_{\tau=1}^{\infty} R_F^{-\tau} E_t[AEop_{t+\tau}]$$

[25]

$$\Rightarrow \sum_{\tau=1}^{\infty} R_F^{-\tau} E_t[CF_{t+\tau}] + FA_t = BVt + \sum_{\tau=1}^{\infty} R_F^{-\tau} E_t[AEop_{t+\tau}]$$

and substituting into [17]:

$$\sum_{\tau=1}^{\infty} R_F^{-\tau} E_t[D_{t+\tau}] = FBV_t + \sum_{\tau=1}^{\infty} R_F^{-\tau} E_t[AEop_{t+\tau}]$$

[26]

Thus assuming financial relations CSR, NIR, FAR, and OAR we get equations [17], [20] and [26]. Since by PVR:

$$P_t = \sum_{\tau=1}^{\infty} R_F^{-\tau} E_t[D_{t+\tau}]$$

[27]

then from [17], [20] and [26] we finally get:

$$P_t = FA_t + \sum_{\tau=1}^{\infty} R_F^{-\tau} E_t[CF_{t+\tau}]$$

[28]

$$P_t = BV_t + \sum_{\tau=1}^{\infty} R_F^{-\tau} E_t[AE_{t+\tau}]$$

[29]

$$P_t = BV_t + \sum_{\tau=1}^{\infty} R_F^{-\tau} E_t[AEop_{t+\tau}]$$

[30]

Equation [28] states that the value of equity can be expressed as a function of its earnings and its book value. Collins, Maydew and Weiss (1997) use this theoretical framework in order to investigate the systematic relevance of earnings and book values over time. In order to test empirically the relation described by equation [28] they conduct regression analysis using the model:

$$P_{it} = a_0 + a_1 EPSit + a_2 BV_{it} + e_{it}$$

[31]

where P_{it} is the price of a share of firm i three months after year end t; EPS_{it} is the earnings per

share of firm i during the year t; BV_{it} is the book value per share of firm i at the end of year t; and e_{it} is the other value relevant information of firm i for year t orthogonal to earnings and book value.

Taking equation [29] and rearranging, we get:

$$P_t - BV_t = \sum_{\tau=1}^{\infty} R_F^{-\tau} E_t[AE_{t+\tau}]$$
[32]

This expression as discussed earlier, tells us that the difference between a firm's market price and its book value must reflect expectations about the future profitability of the firm.

In order to get the above expression [32] we considered an economy with risk neutrality and homogeneous beliefs (see Ohlson, 1995). However, in order to allow for risk we can replace the discount factor R_f with some factor r, which adjusts R_f for risk. That is, $r = R_f +$ risk premium. A firm's cost of equity capital or the expected market return, determines the parameter r. For example, CAPM implies that $r = R_f +$ beta * [expected return on the market portfolio $-R_f$] [see Ohlson, 1995].

$$P_t - BV_t = \sum_{\tau=1}^{\infty} r^{-\tau} E_t[AE_{t+\tau}]$$
[33]

Thus, the aforementioned relation can be expressed in a form suitable in order to enable us to use it for regression analysis purposes. That is:

$$P_t - BV_t = e \Rightarrow P_t = BV_t + e$$
[34]

The present theoretical framework proceeds from the above expression (see also Easton and Harris, 1991). For an individual firm j, its book value (BV_j) and market value (P_j) indicate the level of wealth of the firm's equity holders. Thus, both these variables measure the stock value of the shareholders equity. Expressing this relationship for a single period t we have:

$$P_{jt} = BV_{jt} + e_{jt} \qquad\qquad [35]$$

The difference between the two variables (i.e. e_{jt}) in the above equation may arise as a result of certain information not incorporated in the accounting variables but reflected in the firm's share price, i.e the future profitability of the firm.

Over time, the dynamic processes of the above mentioned variables solely depend on how the firm's earnings and market prices will evolve over time. As in a single period the firm's book value and market values are related, it follows that the single period earnings (divided by beginning of period price) should be associated with stock returns. For a single period, the deviation of the firm's book value from the previous period is a function of that period's earnings and dividends i.e.

$$\Delta BV_{jt} = E_{jt} - DIV_{jt} \qquad\qquad [36]$$

and since

$$\Delta P_{jt} = \Delta BV_{jt} + e'_{jt} \qquad\qquad [37]$$

It follows that

$$\Delta P_{jt} + DIV_{jt} = E_{jt} + e'_{jt} \qquad\qquad [38]$$

and dividing by the price at the beginning of the return period I get:

$$(\Delta P_{jt} + DIVjt) / P_{jt-1} = Ejt/ P_{jt-1} + e''_{jt} \qquad\qquad [39]$$

Prices for empirical valuation purposes are expressed as a multiple of earnings, i.e.

$$P_{jt} = aE_{jt} + e_{jt} \qquad\qquad [40]$$

The above expression is an earnings based valuation model in a form that can be empirically tested. The value of the coefficient 'a' would be the outcome of a regression using

data for firm's or firms' prices and earnings for different time periods. The coefficient 'a' is the so called 'earnings response coefficient' assuming that the stock price levels are linearly related to the earnings levels.

Following the theoretical framework Ohlson (1995) and Ohlson and Feltham (1995) if a dividend is paid on security j at the time t, then equation [40] transforms to equation [41] (where all the variables are also divided by the prices at the beginning of the period):

$$P_{jt} + DIVjt = aEjt + e_{jt} \qquad\qquad [41]$$

Taking changes instead of levels I get:

$$\Delta P_{jt} + DIV_{jt} = a\Delta E_{jt} + e''_{jt} \qquad\qquad [42]$$

Note that in equation [41] it is assumed implicitly that at t-1 no dividends have been paid. Hence from [40] I get:

$$(P_{jt} + DIVjt) / P_{jt-1} = a(Ejt/ P_{jt-1}) + e'_{jt} \qquad\qquad [43]$$

Equation [43] tells us that from an earnings valuation perspective, earnings level will be associated with returns. The returned variable $(\Delta P_{jt} + DIVjt) / P_{jt-1}$ can be obtained from equation [43] by subtracting 1 from each side:

$$(P_{jt} + DIVjt) / P_{jt-1} - 1 = a(E_{jt}/ P_{jt-1}) - 1 + e''_{jt}$$

$$\Rightarrow (P_{jt} + DIVjt - P_{jt-1}) / P_{jt-1} = a(E_{jt}/ P_{jt-1}) - 1 + e''_{jt}$$

$$(\Delta P_{jt} + DIVjt) / P_{jt-1} = (aE_{jt} - P_{jt-1}) / P_{jt-1} + e'''_{jt}$$

$$(\Delta P_{jt} + DIVjt) / P_{jt-1} = E_{jt} / P_{jt-1} + e'''_{jt} \qquad\qquad [44]$$

Equation [44] holds, if

$$E_{jt}=(a-1)^{-1}P_{jt-1}$$

$$\Rightarrow aE_{jt}-P_{jt-1}= E_{jt} \qquad [45]$$

From [42] we get:

$$(\Delta P_{jt} + DIVjt) / P_{jt-1} = a(\Delta Ejt/ P_{jt-1})+ e''_{jt} \qquad [46]$$

Combining equation [44] and [46] we get:

$$(\Delta P_{jt} + DIVjt) / P_{jt-1} = k\ a(\Delta Ejt/ P_{jt-1})+ (1-k)(Ejt/ P_{jt-1})+ e_{jt} \qquad [47$$

where k is a factor for weighting the contribution of change in earnings versus earnings levels in

the explanation of stock returns.

In the empirical part I will examine the value relevance of both earnings levels and

changes. The models that I will test are based on the theoretical framework that results in

equation [44] (for the case of levels), equation [42] (for the case of changes), and equation [47]

(for the case of levels and changes). Thus the corresponding regressions are of the form:

$$R_{jt}= a_0+a_1(Ejt/ P_{jt-1})+ u_{it} \qquad [48]$$

$$R_{jt}= b_0+b_1(\Delta Ejt/ P_{jt-1})+ u'_{it} \qquad [49]$$

$$R_{jt}=c_0+ c_1(Ejt/ P_{jt-1})+c_2(\Delta Ejt/ P_{jt-1})+ u''_{it} \qquad [50]$$

where

$$R_{jt} =(\Delta P_{jt} + DIVjt) / P_{jt-1}.$$

When the above models will be tested both levels and changes are hypothesized to have

significant power in explaining security prices even when they were considered together (i.e.

equation [50]).

4.1.1 Theoretical framework for modeling contextual factors

4.1.1.1 Permanent versus transitory earnings.

The theoretical framework developed in the previous section suggests that both earnings levels and changes have explanatory power when they are included simultaneously in explaining stock returns (see, also, Easton and Harris, 1991; Fama and French, 1995, 1998). Ali and Zarowin (1992), also point out that many financial studies used earning changes as a proxy for unexpected earnings, following the assumption that earnings follow a random walk.

Based on these arguments, in developing the theoretical framework on the transitoriness of earnings, it is proposed that annual earnings follow an Integrated Moving Average, IMA (1,1) process, which includes both levels and changes, i.e. permits for both transitory and permanent components.[10] IMA was chosen because prior theoretical and empirical evidence shows that annual earnings follow a random walk (Cheng et al., 1996; Easton and Harris, 1991). A detailed discussion that illustrates the theoretical framework for modelling contextual factors follows. The following model is estimated:

$$AR_{jt} = b_{0t} + b_{1t}(E_{jt} - E_{jt-1})/ P_{jt-1} + b_{2t}(E_{jt}/ P_{jt-1}) + u_{it} \qquad [51]$$

AR_{jt} is the abnormal return (i.e. the difference of the market value of the stock price with its book value at year t minus the difference of the market value of the stock price with its book value at year t-1 divided by the difference at t-1, assuming no dividends).

Two assumptions are made in order for [51] to be valid (Ali and Zarowin, 1992, Fama and French, 2000):

1. Abnormal returns are a linear function of unexpected earnings UE_{jt}:

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10 For more information about Integrated Moving Averages (IMA), see Mills (1999) and Cheng et al. (1996).

$$AR_{jt} = a_{0t} + a_{1t} UE_{jt} / P_{jt-1} + e_{it}$$ [52]

where a_{1t} is the earnings response coefficient.

2. Annual earnings follow an IMA(1,1) process of the form:

$$E_{jt} = E_{jt-1} + UE_{jt} - pUE_{t-1}$$ [53]

where p is the moving average parameter.

If earnings follow an IMA(1,1) process then unexpected earnings can be modelled as:

$$UE_{jt} / P_{jt-1} = Ejt / P_{jt-1} - (1-p) Ejt_{-1} / P_{jt-1} - p(1-p) Ejt_{-2} / P_{jt-1} - ...$$ [54]

When p=0 then $UE_{jt} / P_{jt-1} = (Ejt - Ejt_{-1}) / P_{jt-1}$, thus the IMA(1,1) process is a random walk.

When p=1 then $UE_{jt} / P_{jt-1} = Ejt / P_{jt-1}$, and earnings are purely transitory.

Generally p is 1<p<0 and the closer p is to zero, the more permanent are earnings and the IMA(1,1) process.

For 1<p<0, and taking only the first lag the model becomes:

$$UE_{jt} / P_{jt-1} = (1-p) (Ejt - Ejt_{-1}) / P_{jt-1} - pEjt / P_{jt-1}$$ [55]

Thus, in this theoretical framework the level and change quantities approximately define unexpected earnings. Hence, as p increases, the weight on the change variable (i.e. 1-p in equation [55]) decreases. Also as p increases, the weight on the change variable (i.e. p in equation [55]) increases.

If the change variable alone is used for as an approximation for the unexpected earnings the more transitory earnings are the more the higher p will be, and thus, the greater the measurement error will be as the measurement error can be viewed as:

$$UE_{jt} / P_{jt-1} - (1-p) (Ejt - Ejt_{-1}) / P_{jt-1} = pEjt / P_{jt-1} + w_{jt-1}$$ [56]

As a result in equation $AR_{jt} = a_{0t} + a_{1t} UE_{jt} / P_{jt-1} + e_{it}$, the inclusion of both levels and changes is expected to increase the explanatory power of the earnings response coefficient a_{1t} if the previous year earnings are transitory. If the previous year earnings are permanent (i.e. p is

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near or equal to zero) then the inclusion of levels in the modelling of unexpected earnings will not significantly increase the explanatory power of the ERC and of the model.

4.1.1.2 Framework on the earnings transitoriness and the role of the cash flows.

The issue of the time permanence of earnings has raised the stimulus in this thesis in examining also the role of operating cash flows when earnings are transitory. As Cheng, Liu and Schafer (1996) argue, earnings may contain transitory items with limited valuation implications. For example, transitory items that may be included may be current and long term accruals such as losses due to restructuring, current recognition (through asset sales) of previous (or current period's) increases in market value, one-time impact on income from changes in accounting standards, etc.

Moreover, because of compensation contracts and debt covenants are often based on reported accounting income, incentives exist for managers to introduce transitory elements in earnings. Dechow (1994) also argues that because management has some discretion over the recognition of accruals, this can be used to manipulate earnings.

Following Ali and Zarowin [1992] and Cheng, Liu and Schafer (1996), in my theoretical framework, I included both levels and changes in order to characterise the unexpected components of earnings, whereas they also include levels and changes of cash flows from operations. This is done in order to test the hypothesis that when earnings are transitory the earnings response coefficients (ERCs) on both levels and changes will have reduced significance in explaining security returns. In this situation the importance of cash flows from operations will be greater.

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Thus, extending equation [51] to capture cash flows both in levels and in changes (and omitting the beginning of period price deflator for exposition purposes) I get:

$$AR_{jt}=b_{0t}+b_{1t}\Delta E_{jt}+b_{2t}Ejt+b_{3t}\Delta CF_{jt}+b_{4t}CF_{jt}+u_{it} \qquad [57]$$

However, since the model needs to capture the incremental information of cash flows over earnings where earnings are transitory, equation [57] is modified as:

$$AR_{jt}=c_{0t}+c_{1t}\Delta Ejt+c_{2t}Ejt+c_{3t}\Delta CF_{jt}+c_{4t}CF_{jt}+c_{5t}\Delta Ejt\ D_{jt}+c_{6t}Ejt\ D_{jt}$$

$$c_{7t}\Delta CF_{jt}\ D_{jt}+c_{8t}CF_{jt}\ D_{jt}+w_{it} \qquad [58]$$

where D_{jt} is a dummy variable equal to zero when $\Delta Ejt/\ P_{jt-1}$ is less than its yearly cross-sectional median and the value of one (1) when it is greater. Thus, the change in earnings to price ratio is used in order to measure the presence of transitory elements contained in the change in earnings variable.

As in Freeman and Tse (1992) and Ali (1994) transitory elements are more likely to be present when unexpected earning values are large relative to price. Hence the coefficients $c_{1t}+c_{2t}$ and $c_{3t}+c_{4t}$ represent the estimates of the earnings and cash flow response coefficients when earnings are mainly permanent. The coefficients $c_{5t}+c_{6t}$ and $c_{7t}+c_{8t}$ capture the additional information content of earnings and cash flows for firms with predominantly transitory earnings. It is expected $c_{5t}+c_{6t}$ to be negative and $c_{7t}+c_{8t}$ to be positive.

In the present study, following the aforementioned theoretical framework, I hypothesize that the incremental information content of cash flows from operations is expected to increase as the permanence of earnings decreases (see, also, Freeman and Tse, 1992; and Ali, 1994; and Cheng, Liu and Schafer, 1996). This is due to the fact that earnings may contain transitory items with limited valuation implications. Transitory items that may be included are current and long-term accruals such as losses due to restructuring, current recognition (through asset sales) of increases in market value previously (or currently), one-time impact on income from changes in

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accounting standards etc. Moreover, because of compensation contracts and debt covenants are often based on reported accounting income, incentives exist for managers to introduce transitory elements in earnings.

4.1.1.3 Theoretical framework for long-return intervals

In this framework, the market return variable is considered a function of an aggregate earnings (levels) variable. A model is developed that reflects the intuition behind the hypothesized relation (Easton, Harris and Ohlson, 1992). The following notation is used to develop a model that relates a firm's earnings to its market performance for a general return interval, *(O. T)*:

P_t = the firm's market value at date *t*.
d_t = dividends paid at date *t*.
R_t = $(P_t + d_t - P_t-1)/P_t,-1$ = market return for the *(t - 1,t)* period,
E_t = earnings for the (*t* – 1, *t*) time period. and
Rf = one plus the risk-free rate of return.

The dates run from *t* = 1 to *t* = τ. The dependent variable measures the firm's market performance. This poses no problems for an interval *(t, t* + 1), provided that no dividends are paid between these two dates. The firm's market performance, OT return, is then determined by $Rt+1$. Extending this concept to a (0, *T)* interval requires an assumption concerning the use of the dividends paid at dates *t* = ι, . . . , τ - 1. It is assumed that these dividends are invested in the risk-free asset. In that case the market return (dependent variable) is:

$$y_T^1 \equiv [P_T + FVS (d_1.......d_T) - P_0]/ P_0 \tag{59}$$

where

$$FVS (d_1..........d_T) \equiv d_1(R_F^{T-1}) + d_2(R_F^{T-2}) + ... + d_{T-1}(R_F) + d_T$$

$$\equiv FVS_T \tag{60}$$

FV in FVS denotes future value and the S denotes a stock of value. Hence, FVS_T is the total amount an investor can withdraw at date T due to the payment and subsequent investment of dividends in the risk-free asset, and $(P_T + FVS_T)$ represents the total amount that can be withdrawn at date T. By relating this quantity to the initial market price (Po) one obtains the market return variable Y.

The construction of the independent (earnings) variable requires an adjustment for dividends to make it consistent with the dependent (market return) variable y_T^1. The earnings variable consists of two parts, aggregate earnings over (0,T) and the earnings due to the presumed investment of the dividends in the risk-free asset:

$$= y_T^1 \equiv [AE_T + FVF(d_1.........d_T)]/P_0,$$

where

$$AE_T \equiv \sum_{t=1}^{T} x_t.$$

and

$$FVF(d_1...........d_T) \equiv d_1(R_F^{T-1} - 1) + d_2(R_F^{T-2} - 1)$$
$$+ ....+ d_{T-1}(R_F - 1) \equiv FVF_T.$$

[61]

FVF_T represents the earnings due to investment of dividends, FV still denotes value and an F has been appended to FV to indicate the (earnings) flow concept. $(AE_T + F V F_T)$ is the earnings that would have been earned by the firm had it not paid any dividends and instead retained this cash to invest in the risk-free asset.

The use of aggregate earnings AE_T is a central feature of the earnings variable $Z\dfrac{1}{T}$. Intertemporal earnings aggregation is intrinsic and standard financial accounting embeds this attribute. (For example, four quarterly earnings add up to annual earnings, and so forth.) The

aggregation attribute of earnings has important implications. The variable AE_T measures the outcome of a firm's economic activity in terms of generally accepted accounting practice (GAAP). Though firms vary in their choice of GAAP revenue-expense rules, the argument that AX_T should be relatively insensitive to such choices for large T seems quite reasonable. For example aggregate cost of goods sold under different inventory valuation methods, i.e., FIFO and LIFO are unlikely to differ materially for, say, a ten-year interval. This aspect of GAAP and aggregation is a special case of the more general idea that most value-relevant events occurring during $(0, T)$ should be part of earnings for that period. Further, the intertemporal aggregation property of earnings makes it irrelevant in which subperiod of $(0, T)$ the value-relevant events are recognized as earnings. Of course, in reality the abstract notion of value-relevant events and their explicit accounting recognition cannot be observed separately. But this differentiation plays no role as long as, to an increasing degree, accounting earnings incorporate the events implicit in the change in market value as the return interval (T) lengthens.

Furthermore, the difference between the market value of equity at date t and the book value of equity at date t, BV_t. is called 'goodwill' g_t Thus.

$$P_T - P_0 = \{BV_T - BV_0\} + \{g_T - g_0\} \tag{62}$$

where g_T = goodwill = $P_T - BV_T$ and g_0 = goodwill at the current period 0.

But in general

$$BV_1 - BV_{t-1} = E_1 - d_t \tag{63}$$

This comprehensive income or clean surplus relation that was also discussed at the beginning of this chapter, implies

$$\{BV_T - BV_0\} = \sum_{t=1}^{T} E_t - \sum_{t=1}^{T} d_t = AE_T - \{FVS_T - FVF_T\} \tag{64}$$

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Combining the relations, yields

$$\{P_T - P_0\}/P_0 + FVS_T/P_0 = \{AE_T + FVF_T\}/P_0 + \nabla g_T/P_0 \qquad [65]$$

which reduces to

$$Y_{1/T} = Z_{1/T} + g_T^* \qquad [66]$$

where

$$g_T^* \equiv \Delta g_T / P_0$$

Within this framework the *change* in goodwill captures the 'measurement error' in aggregate earnings, and, for long return intervals, it is hypothesized that the variation in the earnings variable overwhelms the variation in the earnings' error variable (g_t^*). Specifically, the correlation between Y and Z approaches one if the variance of g_t^* divided by the variance of Z approaches zero as *T gets closer to x*.

The basic cross-sectional regression model to be used in the present study that follows from the aforementioned theoretical framework can e expressed as in (67):

$$[M1] \quad y\frac{1}{Tj} = x\frac{1}{T} + \beta\frac{1}{T}z\frac{1}{Tj} + \varepsilon\frac{1}{Tj}, \qquad [67]$$

where j denotes firm j and $\varepsilon\dfrac{1}{Tj}$ captures omitted factors. The subscript T emphasizes that the regression coefficients may depend on the return interval. The basic empirical analysis evaluates the hypothesis that the R^2 for M1 increases as T increases. Moreover, the model suggests that $\beta = 1$. This serves as a useful theoretical benchmark in the following sense: a dollar of additional earnings yields a dollar of additional value (Easton, Harris and Ohlson, 1992).

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4.1.2 Summary on the theoretical framework

In this section I developed the theoretical framework on the value relevance of earnings and cash flows. This theoretical framework has been developed in order to be able to build up my research hypotheses. Specifically, initially I developed the theoretical framework that relates earnings and cash flows to security prices. Thereafter, I went a step further to develop a theoretical framework that ties together the level and changes of both earnings and cash flows with security returns. Since prior studies showed that the explanatory power of earnings and cash flows has been relatively low, I developed a theoretical framework for modeling contextual factors that can be used to improve further the value relevance of earnings and cash flows. Specifically, I developed a theoretical framework that relates cash flows to security prices when earnings are transitory and another framework for long-return intervals. These theoretical frameworks will be used in the next section and in the next chapter for building up my research hypotheses.

4.2 Research Hypotheses

Empirical research thus far provided evidence to support that earnings dominate cash flows in the marketplace. Existing evidence though on the incremental information content of cash flows beyond earnings has been inconclusive. The inconclusive results in prior studies, and the limited research on this issue provide motivation for this study. The research hypotheses to be tested are:

H1:   There exists a positive association between operating earnings (cash flows) and security returns in the UK, the USA and France.

H2:   Operating earnings (cash flows) are associated with security returns, given operating cash flows (earnings) in the UK, the USA and France.

H3:   The relative informativeness of operating earnings and cash flows is industry specific in the U.K, the USA and France.

H4:   The value relevance of earnings and cash flows improves as the measurement interval increases.

H5:   The value relevance of earnings and cash flows depends on the transitoriness of earnings.

H6:   The value relevance of earnings and cash flows is country specific.

A discussion on each of the above hypotheses follows.

4.2.1 Hypothesis 1: There exists a positive association between operating earnings (cash flows) and security returns in the UK, USA and France.

This research hypothesis tests the theoretical model [48] developed in this chapter. As it has already been discussed in the previous section of this chapter, the theoretical relation between earnings and cash flows with stock prices draws on the classical dividend capitalization model

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and from the clean surplus relation, which implies that changes in book value are reported as either income or dividends.

As it has already been discussed in previous chapters, prior studies provided inconclusive results regarding the value relevance of earnings and cash flows (Easton and Harris, 1991; Dechow, 1994; Rayburn, 1986; Livnat and Zarowin, 1990, Bartov et al. 2001). This hypothesis predicts that operating earnings and operating cash flows are associated with security returns. In general, the following conclusions could be drawn from prior USA studies: there exists a positive association between operating earnings, operating cash flows and security returns (Charitou and Ketz, 1991). The association between operating earnings and security returns is usually greater than the association between operating cash flows and security returns (Livnat and Zarowin, 1990; Bartov et al. 2001; Charitou, 1997). Prior studies emphasized the levels of earnings and cash flows (Livnat and Zarowin, 1990; Wilson 1986, 1987; Rayburn, 1986). The present study examines both the levels and changes of operating earnings and cash flows. Regarding the empirical evidence from UK regarding this hypothesis, it is indeed very limited, with inconclusive results. More specifically, Board and Day (1989) examined the association of the levels of earnings and cash flows with security returns. The results of this UK study were weak and inconclusive regarding the usefulness of cash flows in explaining security returns. Moreover, the results from USA studies were very weak as well. The R^2 in all studies was very low.

4.2.2   Hypothesis 2: Operating cash flows (earnings) are associated with security returns, given operating earnings (cash flows) in the UK, USA, and France.

This research hypothesis tests some of the theoretical aspects of the model [50] developed in this chapter. The theoretical relation between earnings and cash flows with stock prices draws on the classical dividend capitalization model and from the clean surplus relation, which implies that

changes in book value are reported as either income or dividends. This theoretical framework was extended to take into consideration the relation between the level of stock prices and the level of book value of equity. The difference between market value and book value can result from many factors including the choice of conservative accounting practices and other information incorporated in price but not yet reflected in accounting values. The relation between the flow variables – accounting earnings and security returns – can be obtained by taking first differences in stock prices and book value of equity. By combining a book value model and an earnings model, I proposed a valuation relation in which price is a weighted function of book value, earnings and cash flows.

As it has already been discussed in previous chapters, prior studies provided inconclusive results regarding the value relevance of the level and changes in earnings and cash flows (Bartov et al., 2001; Easton and Harris, 1991; Dechow, 1994; Rayburn, 1986; Livnat and Zarowin, 1990; Charitou and Ketz, 1991). This hypothesis predicts that the levels and changes of operating earnings (cash flows) are associated with stock returns given operating cash flows (earnings). The objective of this hypothesis is: i) to provide empirical support for the propositions made by all international standard setting bodies that both earnings and cash flows play a very important role in explaining stock returns, and ii) to provide further evidence regarding the relative informativeness of operating cash flows (levels and changes) in explaining security returns, given operating earnings and thus strengthen the evidence provided by prior studies regarding the usefulness of operating cash flows. This hypothesis was tested in prior studies using USA data, with mixed and inconclusive results (Wilson, 1986; Rayburn, 1986; Bernard and Stober, 1989; Livnat and Zarowin, 1990; Charitou and Ketz, 1991. Inconclusive was also the evidence provided by those researchers who used UK data to examine the information content of cash flows beyond earnings (Board and Day, 1989; and Ali and Pope,1995). Moreover, it should be

stressed that the explanatory power of these earnings and cash flow models was very low (Lev, 1989; Strong and Walker, 1993). In summary, the results of all prior studies are consistent with the existence of statistical association of earnings and stock returns, given operating cash flows. The empirical evidence on the association of operating cash flows beyond earnings is inconclusive.

4.2.3 Hypothesis 3: The relative informativeness of the levels and changes of operating earnings and operating cash flows is industry specific.

This research hypothesis tests some of the theoretical aspects of the model [50] developed in this chapter by taking into consideration industry specific factors. The theoretical relation between earnings and cash flows with stock prices draws on the classical dividend capitalization model and from the clean surplus relation developed in the previous section of this dissertation.

The inconclusive results of prior studies, the weak explanatory power of prior models, as well as the instability of the earnings and cash flow response coefficients led researchers to a further examination of this issue. This hypothesis predicts that operating earnings and operating cash flows are associated with security returns. Prior empirical studies which examined the usefulness of earnings and cash flows used mainly aggregate data [Bartov et al. 2001; Charitou, 1997; Livnat and Zarowin, 1990; Rayburn, 1986}. According to Lev (1989) and Cho and Jung (1991) one of the major problems of all prior studies that examined the association of operating earnings and cash flows with security returns is that they assumed that the earnings and cash flow response coefficients are constant (i.e. identical for all firms regardless of their firm-specific and industry-specific characteristics). Lev supports that the assumption made in prior studies that the response coefficients are constant, it is unrealistic. This study extends prior studies by examining the contention made by Lev and by other researchers that industry specific earnings and cash

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flow information play a very important role in the marketplace. More specifically, this study hypothesizes that the relative informativeness of the levels and changes of operating earnings and cash flows is industry specific.

4.2.4 Hypothesis 4: The value relevance of earnings and cash flows improves as the measurement interval increases.

This research hypothesis tests the theoretical model [67] developed in this chapter. In this theoretical framework, the market return variable is considered a function of an aggregate earnings (levels) variable. In this framework, the difference between the market value of equity and the book value of equity at time t is called goodwill. Within this framework the change in goodwill captures the 'measurement error' in aggregate earnings, and, for long return intervals, it is hypothesized that the variation in the earnings variable overwhelms the variation in the earnings' error variable.

Thus far, there has been limited research on the value relevance i) of cash flows over long measurement intervals, and ii) of earnings and cash flows in the USA, the UK and France. Studies by Easton et al. (1992), Dechow (1994), Charitou (1997), Warfield and Wild (1992) examined the value relevance of earnings over long return intervals in the US and UK but these studies failed to examine the value relevance issue for a) both earnings and cash flows and b) for common law and code law countries.

This hypothesis predicts that the value relevance of earnings and cash flows improves in all three countries as the measurement interval is increased. Over longer measurement intervals, cash flows will suffer from fewer timing and matching problems, the importance of accruals will diminish, and therefore, earnings and cash flows are expected to converge as measures of firm performance (Dechow, 1994; Easton, Harris and Ohlson, 1992, Charitou, 1997). Cash flows

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suffer more from timing and matching problems over short measurement intervals because they have no accrual adjustments and the accruals associated with cash flows are long term in nature and they do not reverse in the short-run (Dechow, 1994). On the other hand, the explanatory power of earnings compared to cash flows is expected to be the highest over short measurement intervals, because earnings include current and noncurrent accruals that mitigate the timing and matching problems related to the organization's operating, investing and financing cash flows. Prior USA and UK studies showed that there is a relative increase in the explanatory power of earnings over longer measurement intervals (Easton, et al., 1992; Charitou, 1997; Dechow, 1994).

4.2.5 Hypothesis 5: The value relevance of cash flows improves when earnings are transitory, whereas the value relevance of earnings decreases when earnings are transitory.

This research hypothesis tests the theoretical model [58] developed in this chapter. The theoretical framework developed in the previous section suggests that both earnings levels and changes have explanatory power when they are included simultaneously in explaining stock returns. Earning changes are used as a proxy for unexpected earnings, following the assumption that earnings follow a random walk. Based on these arguments, in developing the theoretical framework on the transitoriness of earnings, it is proposed that annual earnings follow an Integrated Moving Average, IMA (1,1) process, which includes both levels and changes, i.e. permits for both transitory and permanent components. IMA was chosen because prior theoretical and empirical evidence shows that annual earnings follow a random walk (Cheng et al., 1996; Easton and Harris, 1991).

This hypothesis predicts that the value relevance of earnings decreases when earnings are transitory and therefore, the value relevance of cash flows improves in all three countries when

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earnings are transitory. The issue of the time permanence of earnings has raised the stimulus in the present study in examining the role of operating cash flows when earnings are transitory. As Cheng, Liu and Schafer (1996) argue, earnings may contain transitory items with limited valuation implications. For example, transitory items that may be included are current and long-term accruals such as losses due to restructuring, current recognition (through asset sales) of increases in market value previously (or currently), one-time impact on income from changes in accounting standards etc. Moreover, because of compensation contracts and debt covenants are often based on reported accounting income, incentives exist for managers to introduce transitory elements in earnings. Dechow (1994) also argues that because management has some discretion over the recognition of accruals, this can be used to manipulate earnings.

Following Ali and Zarowin (1992) and Cheng, Liu and Schafer (1996), included in the theoretical framework, both levels and changes in order to characterise the unexpected components of earnings, whereas they also include levels and changes of cash flows from operations. This is done in order to test the hypothesis that when earnings are transitory the earnings response coefficients (ERCs) on both levels and changes will have reduced significance in explaining security returns. In this situation the importance of cash flows from operations will be greater. As in Freeman and Tse (1992) and Ali (1994) transitory elements are more likely to be present when unexpected earning values are large relative to price. Hence in the model [58], the coefficients $c_{1t} + c_{2t}$ and $c_{3t} + c_{4t}$ represent the estimates of the earnings and cash flow response coefficients when earnings are mainly permanent. The coefficients $c_{5t} + c_{6t}$ and $c_{7t} + c_{8t}$ capture the additional information content of earnings and cash flows for firms with predominantly transitory earnings. It is expected $c_{5t} + c_{6t}$ to be negative and $c_{7t} + c_{8t}$ to be positive. In summary, following the aforementioned theoretical framework, I hypothesize that the incremental information content of cash flows from operations is expected to increase as the permanence of earnings decreases

(see also Freeman and Tse, 1992; Ali, 1994; and Cheng, Liu and Schafer, 1996.

Prior studies that examined earnings transitoriness include Cheng et al (1996) for the USA and Charitou et al (2000) for the UK. Prior studies have not examined the role of the cash flows when earnings are transitory in both Anglo-Saxon and code law countries.

4.2.6 Hypothesis 6: The relative informativeness of earnings and cash flows is country specific.

This research hypothesis tests the theoretical model 49 and aspects of 48 and 50 developed in this chapter, by taking into consideration country specific factors. The theoretical relation between earnings and cash flows with stock prices draws on the classical dividend capitalization model and from the clean surplus relation, which implies that changes in book value are reported as either income or dividends.

As it has already been discussed in previous chapters, prior studies provided inconclusive results regarding the value relevance of earnings and cash flows (Bartov et al. 2001; Easton and Harris, 1991; Dechow, 1994; Rayburn, 1986; Livnat and Zarowin, 1990). Furthermore, there has been very limited research examining the value relevance of earnings and cash flows in both Anglo-Saxon and code law countries. Thus, the issue of the value relevance of earnings and cash flows is still an open research question. Are earnings or cash flows valued more in Anglo-Saxon or code law countries? Are earnings or cash flows valued more in the service or manufacturing or retail industries? When the measurement interval increases, in which system, Anglo-Saxon or code law system, is there a greater increase in the value relevance of earnings and cash flows? When earnings are transitory, in which system, Anglo-Saxon or code law system, is there a greater increase in the value relevance cash flows? These research questions have not been examined in previous studies and they are still unanswered research questions in the capital

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markets literature.

This hypothesis predicts that operating earnings and operating cash flows are associated with security returns. Prior studies have not examined the relative informativeness of earnings and cash flows in France, the UK and the USA. Since we showed earlier in this study that there are significant financial reporting differences between these counties, we expect that these differences will affect the value relevance of earnings and cash flows in these countries. We hypothesize that the value relevance of earnings will be the highest in France since it has the most conservative financial reporting system. On the other hand, we expect that the value relevance of earnings will be the lowest in the UK because it has the least conservative financial reporting system. Hence, we expect that cash flows will be the most value relevant in the UK and in the USA and the least value relevant in France.

4.2.7 Summary of the research hypotheses

In this section, the six major hypotheses that will be tested in this study were motivated. The first hypothesis tests whether there exists a positive association between operating earnings (cash flows) and security returns in the UK, the USA and France. The second hypothesis extends the first one by testing the value relevance of cash flows (earnings) beyond earnings (cash flows) in the UK, the USA and France. The objective of this hypothesis has been threefold: first to provide empirical support for the propositions made by all international standard setting bodies that both earnings and cash flows play an important role in the marketplace; second, to strengthen the evidence provided thus far regarding the value relevance of earnings and cash flows; and third, to provide evidence in both Anglo-Saxon and code law countries regarding the value relevance of earnings and cash flows.

The other three hypotheses, hypotheses three, four and five, test the value relevance of

earnings and cash flows by taking into consideration various contextual factors, namely, industry, measurement interval and transitoriness of earnings. The third hypothesis predicts that the value relevance of earnings is industry specific, whereas hypothesis four predicts that the value relevance and thus the explanatory power of earnings and cash flows improves as the measurement interval increases. Hypothesis five complements prior hypotheses by predicting that the value relevance of cash flows improves when earnings are transitory and vice versa. Finally, hypothesis six predicts that the value relevance of earnings and cash flows is country specific. Specifically, it is hypothesized that the value relevance of earnings will be the highest (lowest) in France (UK) since it has the most (least) conservative financial reporting system. Thus, we expect that cash flows will be the most value relevant in the two Anglo-Saxon countries and the least value relevant in the code law country, namely, France. The methodology discussed in the next chapter will be used to empirically test the six research hypotheses that were motivated in this chapter.

4.3 Notation of all variables included in the equations in the chapter

(in alphabetical order)

a = slope coefficient of a regression model

AE_t = abnormal earnings at time t

$AEop_t$ = abnormal operating earnings

AR_{jt} =the abnormal return (i.e. the difference of the market value of the stock price with its book value at year t minus the difference of the market value of the stock price with its book value at year t-1 divided by the difference at t-1, assuming no dividends).

b = slope coefficient of a regression model

BV_t = book value of the firm's equity at date t.

c = slope coefficient of a regression model

CF_t = cash flows at time t

CFO_t = operating cash flows at time t

DIV_t = dividends, net of capital contributions at date t.

d_t = dividends paid at date t.

D_{jt} = dummy or binary variable that takes the value of either 1 or 0.

e = error term

E_t = expected (permanent) earnings or earnings or operating earnings at time t

ERC = earnings response coefficient

Eop_t = operating earnings for period (t-1, t)

FA_{t-1}= financial assets, net of financial obligations, date t-1.

FVS_T _ is the total amount an investor can withdraw at date T due to the payment and subsequent investment of dividends in the riskfree asset,

g = growth

I_t = interest revenues, net of interest expenses, (t-1, t).

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k   = a factor for weighting the contribution of change in earnings versus earnings levels in the explanation of stock returns.

OA_t = operating assets, net of operating liabilities, date t.

OAR   = Operating assets relation

PVR   = present value relation

P_t = market value of equity at time t or stock price at year t

r   = risk-adjusted discount rate

R_t = security returns for year t.

R_F = one plus the risk free interest rate.

r_f = risk free rate of interest at time t

u_{it} = disturbance or error term in a regression model

UE   = unexpected earnings

Greek Notation (in alphabetical order):

ΔCF_{jt} = change in cash flows of firm j, in year t.

ΔCFO_{jt} = change in operating cash flows of firm j, in year t.

ΔE_{jt} = change in earnings of firm j, in year t.

Δg_T = change in goodwill

ΔP_{jt} = change in security price or market value of the firm j, in year t.

ρ = coefficient

CHAPTER V

STATE OF THE ART METHODOLOGIES AND

TECHNIQUES EMPLOYED

This chapter discusses in more depth the following issues: a) sources of data, b) measurement of financial and market variables, c) empirical models, d) state of the art methodologies employed, and e) econometric issues.

5.1   Sources of data

The UK and French sample firms were selected from the Global Vantage research database (Standards and Poors), whereas the USA sample firms were collected from the Compustat Database (Standards and Poors). All industrial firms that have available monthly data for security returns, and available annual data for operating earnings, operating cash flows and market value of equity for the period 1987-98 will be included in the sample.

All firms included in these databases are categorized by industry (industry code is called Standard Industrial Classification, SIC). Each firm has its own code, called Global Vantage Key (GV Key) for UK and French firms, and CUSIP firm-specific code for USA firms.

TABLE 7

INDUSTRY CLASSIFICATION

Firms in all three countries are separated by industry using the Standard Industrial Classification (SIC) codes defined by Standards and Poors. The SIC categories below apply to the following industries:

SIC   CODE & INDUSTRY

MANUFACTURING:

1000-1999   Mining, construction, Oil

2000-2999   Light manufacturing industry (food products, furniture, clothing, wood products, printing, publishing)

3000-3999   Manufacturing (primary metals industry, industrial machinery, electronic equip)

RETAIL:

5000-5999   Merchandising or Retail

SERVICE:

7000-8999   Service

All industrial firms that belong in the Manufacturing Industry (SIC 100-4299, 4400-4799), Retail Industry (SIC 5000-5999) and Service Industry (SIC 7000-8999) were selected. Firms belonging in the Utilities and Financial or Banking sector were not included in the dataset due to the major laws and regulations that apply in these industries that differ substantially from other industrial firms. Industrial firms that had all the information available for the computation of operating cash flows, operating earnings and security returns were included in the sample, resulting in the following firm-year observations for the period 1987-1998: USA =36695, UK =4234 and France = 1181. Consistent with prior empirical studies, observations that were regarded as outliers were excluded from the sample, i.e. observations with absolute change in earnings/market value, absolute change in cash flows/market value, earnings/market value and cash flow/market value greater than 150%. Also observations that were in excess of three absolute studentized residuals were considered outliers and were excluded from the sample. These restrictions resulted in approximate reduction of the sample size of about 2%, which is consistent with prior empirical studies (Easton and Harris, 1991). Therefore, the final sample size used for regression analysis purposes equals to 35872 firm-year observations for the USA sample, 4178 firm-year observations for the UK sample and 1165 firm-year observations for the French sample.

TABLE 8
Dataset of all firms tested by year for each country examined: USA, UK and France

PANEL A: USA SAMPLE OF FIRMS BY YEAR

	Frequency	Percent	Valid Percent	Cumulative %
1987	1893	5.16	5.16	5.16
1988	2052	5.59	5.59	10.75
1989	2165	5.90	5.90	16.65
1990	2255	6.15	6.15	22.80
1991	2337	6.37	6.37	29.16
1992	2535	6.91	6.91	36.07
1993	2799	7.63	7.63	43.70
1994	3228	8.80	8.80	52.50
1995	3582	9.76	9.76	62.26
1996	4169	11.36	11.36	73.62
1997	4777	13.02	13.02	86.64
1998	4903	13.36	13.36	100.00
Total	36695	100	100	

PANEL B: UK SAMPLE OF FIRMS BY YEAR

	Frequency	Percent	Valid Percent	Cumulative%
1990	160	3.78	3.78	3.78
1991	394	9.31	9.31	13.08
1992	425	10.04	10.04	23.12
1993	443	10.46	10.46	33.59
1994	470	11.10	11.10	44.69
1995	513	12.12	12.12	56.80
1996	527	12.45	12.45	69.25
1997	564	13.32	13.32	82.57
1998	738	17.43	17.43	100.00
Total	4234	100	100	

PANEL C: FRENCH SAMPLE OF FIRMS BY YEAR

	Frequency	Percent	Valid Percent	Cumulative %
1990	1	0.08	0.08	0.08
1991	75	6.35	6.35	6.44
1992	89	7.54	7.54	13.97
1993	92	7.79	7.79	21.76
1994	107	9.06	9.06	30.82
1995	135	11.43	11.43	42.25
1996	199	16.85	16.85	59.10
1997	218	18.46	18.46	77.56
1998	265	22.44	22.44	100.00
Total	1181	100	100	

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Table 8 presents detailed data information for each country on an annual basis. For the USA sample there exist data from 1987 till 1998 to estimate regression models. In the latest year, 1998, there exist 4,903 firms with available data to be included in the regression models for analysis. For the period 1987-98, there exist 36,695 firm-year observations to be included in the dataset. All these firms are relatively large and belong in the major USA stock exchanges, such as New York Stock Exchange (NYSE) and American Stock Exchange (AMEX). A partial list of USA firms included in the sample is presented in the Appendix D. In addition to the names of the firms, in this appendix I present additional information for each firm such as: identification code of each firm called Global Vantage (GV) key; the industry where each firm belongs to which is identified by the Standard Industrial Classification (SIC) code; and two size measures, the market value of equity and the book value of total assets of the firm.

As far as the UK sample of firms is concerned, there are data available for earnings and ' cash flows from 1990 to 1998 to be used to estimate the regression models. To be able to calculate earnings and cash flow variables for the first year, i.e. 1990 data were required for the two preceding years 1988-89 since a) all earnings and cash flow variables are deflated by the market value of equity of the previous year, b) changes in variables (earnings and cash flows) require data from the prior year to be estimated, and c) the estimation of cash flow variable requires changes in working capital data, i.e. prior year's data. Table 8, presents also the number of UK firms with complete data per year for the period 1990-98. Results show that during the latest year, 1998, there are 738 firms with complete data to be included in the regression models. The total number of firm year observations for the period 1990-98 are 4234. The UK firms available in the Global Vantage are relatively large. Appendix B presents the names of all UK firms included in the sample. Moreover, in Appendix B the following information is presented for each firm: identification code of each firm called Global Vantage (GV) key; the industry

where each firm belongs to which is identified by the Standard Industrial Classification (SIC) code; and two size measures, the market value of equity and the book value of total assets of the firm. All these UK firms are included in the London Stock Exchange.

As far as the French sample of firms is concerned, there are data available to run regressions for the eight year period 1991-1998. There are 1181 firm year observations for the period 1990-98. There are 265 French firms in the Global Vantage database during the most recent year 1998. Appendix C also presents all French firms included in the sample. In this Appendix, the names of all French firms are presented together with the GV identification code of each firm, the industry where it belongs to (SIC), and two major size measures, the market value of equity and the book value of total assets.

5.2 Measurement of financial and market variables

The financial and market variables presented here were derived from the theoretical models presented in the previous chapter. To test the aforementioned models, empirical models were constructed and the model variables were selected from the Global Vantage database. They are defined as follows:

- Stock Returns (RET_{it}): The return for security i in year t was defined as cash dividends (DIV), plus capital gains (losses), divided by the market value of equity at the beginning of the fiscal year.

$$RET_{it} = (P_t - P_{t-1} + DIV_t) / P_{t-1}$$

where:

P_t = security price of the firm at the end of the fiscal year t

DIV_t = Cash dividends for the year t

Stock Returns were calculated for the 12 month period, ending three months after the

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fiscal year-end.

Since the theoretical variable 'permanent earnings' is ex-ante and unobservable, it will be

replaced with ex-post and observable asset flow measures. The following earnings and cash flow

variables are used in the present and prior studies to proxy the theoretical variable:

Operating Earnings (E): Net profit before extraordinary items, discontinued operations,

special and non-operating items.

Cash flow from operations (CFO): Operating earnings plus all non-cash expenses and

revenues (non-current accruals) plus net changes in all working capital accounts related

to operations, except for changes in cash, marketable securities, and debt in current

liabilities (current accruals).

The difference between earnings (E) and cash flow from operations (CFO) each period is equal

to all operating accruals (OA). These OA can be decomposed into long term operating accruals,

i.,e depreciation, amortization, deferred taxes, equity earnings, and the change in working capital

($\Delta WC = \Delta NCA - \Delta CL$), where: ΔNCA: current non-cash assets, ΔCL: change in current

liabilities (Dechow, 1994).

All independent financial variables (levels and changes of earnings and cash flows) used

in the statistical models are deflated by the market value of equity of the firm (P) at the beginning

of the fiscal-year.[11]

5.3   The Empirical Models

The theoretical models [48], [49], [50], [58] and [67] presented in the previous chapter will be

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11 . The deflation of all independent variables is common in all cross sectional valuation studies.
All prior similar studies deflated the cash flow and earnings variables with the market value of
the firm at the beginning of the fiscal year in order to avoid heteroscedasticity problems (see,
amongst others, Ali and Pope, 1995; Belsley, Kuh and Welch; 1980, Livnat and Zarowin, 1990).

tested empirically. In the empirical models, the relationship between the levels and changes of

earnings (E, ΔE) and levels and changes of cash flows (CFO, ΔCFO) with stock returns will be

tested using the following statistical models:

a. Univariate Analysis

b. Multivariate Analysis

5.3.1 Univariate analysis

In order to examine whether investors in UK, USA and France take into consideration in their

investment decisions the levels and changes of earnings and cash flows, independent of each

other, the following univariate regression model will be used:

Univariate (Simple Regression) Model:

$$RET_{it} = b_0 + b_i X_i + e_1 \qquad (1)$$

where:

X_i: is replaced by:

      E: Operating Earnings

      ΔE: Change in operating-earnings

      CFO: Operating cash flows

      ΔCFO: Change in operating cash flows.

      RET_{it}: stock return for firm i measured over a 12-month return interval ending three

      months after the fiscal-year-end.

b_0:   the intercept term

b_i: slope coefficient

e_i: error term

      Therefore, four different simple regression models will be run for each country (USA,

UK and France) for at least during the period 1990-98. These simple regression models will be run by year for each country as well as for the aggregate data (time series - cross sectional analysis, pooled model). Furthermore, these regression models will also be run separately for each one of the five industry groups (manufacturing, retail and service industries).

Since we expect a positive association between security returns and the levels and changes of earnings and cash flows, the coefficients of these independent variables are expected to be positive and statistically significant in all three countries. However, it is not expected that the value relevance of earnings and cash flows be equal due to the financial reporting differences between the countries. There are also differences in the level of conservatism among these countries that will affect the level of significance of earnings mainly.

5.3.2 Multivariate regression models.

In order to test whether a) both the levels and changes of earnings are valued in the capital markets, b) cash flows are valued in the capital markets by investors beyond earnings, and c) both the levels and changes of cash flows are valued by investors in the market place in the UK, USA and France, the following multivariate regression models will be used:

Multivariate (multiple regression) models:

$$RET_{it} = b_0 + b_i E + b_2 \Delta E + e_i \qquad (2)$$

$$RET_{it} = b_0 + b_i E \qquad + b_3 CFO + e_i \qquad (3)$$

$$RET_{it} = b_0 + \qquad b_2 \Delta E \qquad + b_4 \Delta CFO + e_i \qquad (4)$$

$$RET_{it} = b_0 \qquad + b_3 CFO + b_4 \Delta CFO + e_i \qquad (5)$$

$$RET_{it} = b_0 + b_i E + b_2 \Delta E + b_3 CFO + b_4 \Delta CFO + e_i \qquad (6)$$

where:

E: Operating Earnings

ΔE: Change in operating-earnings

CFO: Operating cash flows

ΔCFO: Change in operating cash flows.

RET_{it}: stock return for firm i measured over a 12-month return interval ending three months after the fiscal-year-end.

Model 2 tests the value relevance of both the levels and changes of earnings in the marketplace. According to Easton and Harris (1991) and Alford et al. (1993) the sum of the coefficients of the levels and changes of earnings reflects the true permanent earnings of the firm. According to these researchers, the levels of earnings may reflect growth prospects of the firm, whereas the changes in earnings may relate to the riskiness of the firm.

Since financial reporting in the Anglo-Saxon countries is capital market oriented compared to the French system which is much more conservative and code law oriented, it is expected that the sum of the coefficients of earnings for the Anglo-Saxon countries be greater than the sum of these earnings coefficients for the French firms.

Models 3 and 4 test the incremental information content of cash flows (earnings) beyond the earnings (cash flows). More specifically, model 3 relates to the information content of the levels of earnings and cash flows, whereas model 4 relates to the value relevance of the changes in earnings and cash flows. The value relevance of earnings has been established since the seminal study of Ball and Brown (1968). Since then, several researchers questioned the reliability of earnings partly because earnings are manipulated and are based on arbitrary allocations. In the past decade standard setting bodies worldwide and researchers paid more attention to cash flows, partly because cash flows cannot be manipulated by management and are not affected by arbitrary allocations. Moreover, cash flow advocates support that since organizations cannot survive without generating cash from their operations, cash flows should be valued in the

marketplace beyond earnings and thus cash flows should complement earnings in measuring firm performance. If cash flows are valued in the marketplace beyond earnings, then the coefficient of cash flows in model 2 above is expected to be positive and significant. The stronger the association of earnings with security returns, the lower the significance of cash flows will be expected. Since in Anglo-Saxon countries capital market participants pay substantial attention to earnings, other things being equal, cash flows are expected to be more value relevant in countries that have much more conservative systems, such as France. In contrast though, in France cash flow statements are not required and this may affect negatively the value relevance of cash flows in the capital markets partly because this measure is not as known to capital market participants as it is in Anglo-Saxon countries.

Model 5 tests the value relevance of the levels and changes in cash flows. It is expected that the coefficients of the levels and changes of cash flows be positive and statistically significant if they are valued by investors in the marketplace. In all three countries, it is expected that cash flows will be valued in the marketplace.

Model 6 includes all four independent variables (both levels and changes of earnings and cash flows). This model tests whether the level and changes of earnings (cash flows) are valued beyond cash flows (earnings) in the marketplace. Prior studies in the USA and in the UK established an association between earnings and security returns, but the results regarding the value relevance of cash flows beyond earnings have been inconclusive. As far as the value relevance of cash flows beyond earnings in France is concerned, there has been no empirical evidence thus far. If cash flows (earnings) are valued by investors beyond earnings (cash flows) then the coefficients of these variables are expected to be positive and statistically significant.

Since additional hypotheses will tested in the present study that relate to industry-differences, permanent vs transitory earnings and long windows, the above models will be

examined further. Specifically, in order to test for industry differences, the firms will be broken

down into homogeneous groups according to their standard industrial classification (SIC code).

Specifically, firms in all three countries will be classified by industry using the Standard

Industrial Classification (SIC) codes as defined by Standards and Poors.

The SIC categories below apply to the following industries:

SIC

1000-1999   Mining, construction, Oil

2000-2999   Light manufacturing industry (food products, furniture, clothing, wood products,

printing, publishing)

3000-3999   Manufacturing (primary metals industry, industrial machinery, electronic equip)

5000-5999   Merchandising or Retail

7000-8999   Services

5.3.3   Permanent vs transitory earnings models

The theoretical model [58] that was developed in the previous chapter is empirically tested in the

present study. Thus, in order to investigate the role of permanence of earnings, the basic

regression model that was empirically tested in the previous section will be extended to include

additional dummy variables.

The following model will be tested:

$RET_{it} = c_0 + c_1 E_{it} + c_2 \Delta E_{it} + c_3 CFO_{it} + c_4 \Delta CFO_{it} + c_5 E_{it}*D + c_6 \Delta E_{it}*D + c_7 CFO_{it}*D + c_8 \Delta CFO_{it}*D + e_{it}$

where RET_{it}= Security returns for the year,

E_{it} = operating earnings

CFO_{it} = operating cash flows for firm i in period t,

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Δ denotes the change in a variable,

e_{it} is the error term for firm i in period t

D is a dummy variable taking a value of one when earnings are transitory and zero otherwise.

Consistent with Cheng et al. (1996), two alternative definitions are used to determine D. Under one approach, D equals 1 (0) when $| \Delta E_{it}/ P_{it-1} |$ is greater than (less than) its yearly cross-sectional median (Ali, 1994). Under the second approach, firms are ranked each year according to their E_{it}/ P_{it-1}, placing firms with positive E_{it}/ P_{it-1} into the first nine groups with equal number of firms per group and firms with negative earnings in the tenth group. Earnings are classified in the bottom two and top two groups as transitory (D=1) and earnings in the middle six groups as permanent (D=0) (Ali and Zarowin, 1992).

5.3.4 Long windows empirical models

The theoretical model [67] that was developed in the previous chapter will be empirically tested in order to examine the value relevance of earnings and cash flows when earnings are transitory. In order to test the research hypothesis which relates to the long return intervals, the dependent and explanatory variables of the following model will be re-estimated.

$RET_{it} = b_0 + b_i E + b_2 CFO + e_1$

Where:

- E: operating earnings

- CFO: Cash flow from operations

- Security Returns (RET_{it}): The return for security i in year t is defined as cash dividends (DIV), plus capital gains, divided by security price at the beginning of the fiscal year.

$$RET_t = (P_t - P_{t-1} + DIV_t) / P_{t-1}$$

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where:

P_t = security price of the firm at the end of the fiscal year t

DIV_t = cash dividends for the year t

Returns will be calculated for the 12 months ending 3 months after the fiscal year-end

(Easton and Harris, 1992)

More specifically, for longer measurement intervals a) the RET is the product of the annual returns over the relevant period, and b) the level of earnings and cash flows is the sum of the deflated earnings and cash flows over the relevant period.

For longer return intervals where the year T is greater than one (T>1 year), the RET is the sum of the annual returns over the relevant period:

$$RET(t,T) = \sum_{i=0}^{T-1} RET_{t-i}$$

where T=return interval; t=current period.

For example, the 2-year return will be estimated as follows:

$RET(2\text{-year})=((1+RET_t) * (1+RET_{t-1}))-1$.

The 3-year return will be estimated as follows:

$RET(3\text{-year})=((1+RET_t) * (1+RET_{t-1})*(1+RET_{t-2}))-1$.

For longer than three-year return intervals, the above procedure will be followed.

5.4   State of the art methodologies employed.

One of the major advantages of this dissertation is that it combines the state of the art methodologies and techniques with international capital market research in order to examine the value relevance of earnings and cash flows. More specifically, it examines the value relevance of earnings and cash flows in both common law (USA and UK) and Code law (France) countries by

taking into consideration the following methodologies and techniques: a) Level versus changes of earnings and cash flows (Easton and Harris, 1991), b) Long windows (Easton, Harris and Ohlson, 1992), and c) permanence of earnings and the role of cash flows (Cheng, Liau and Schafer, 1996). In this dissertation, I draw on prior studies by extending and combining their contributions in different financial reporting environments. To the best of my knowledge, no previous studies have attempted to do these extensions in order to examine in that depth the role of earnings and cash flows in explaining security returns.

Since in my dissertation I extended and use various methodologies simultaneously, I expect my results to be robust with regards to the value relevance of earnings and cash flows. Namely, the methodologies employed are: a) levels versus changes of earnings and cash flows, b) long return windows, c) earnings permanence, and d) industry effects. All above methodologies were applied to two sets of financial reporting systems, namely, common law and code law. A more in depth discussion and critical evaluation of the aforementioned methodologies, and a critical evaluation of the results of prior studies for each methodology follows:

5.4.1   Methodological technique based on the level and   changes of earnings and cash flows.

This methodological framework which is based on the level and changes of earnings and cash flows relates these financial variables with security returns. Collins, Maydew and Weiss (1997) used this theoretical framework in order to investigate the systematic relevance of earnings and book values over time. They conduct empirical analysis using the model:

$$P_{it} = a_0 + a_1 EPSit + a_2 BV_{it} + e_{it} \qquad [31]$$

where P_{it} is the price of a share of firm i three months after year end t; EPS_{it} is the earnings per share of firm i during the year t; BV_{it} is the book value per share of firm i at the end of year t;

and e_{it} is the other value relevant information of firm i for year t orthogonal to earnings and book value.

Taking equation [29] and rearranging, and taking into consideration risk, we get:

$$P_t - BV_t = \sum_{\tau=1}^{\infty} r_F^{-\tau} E_t[NA_{t+\tau}]$$

[33]

This expression as it has already explained in the chapter where I develop the theoretical framework, it tells us that the difference between a firm's market price and its book value must reflect expectations about the future profitability of the firm. This relation can be expressed in a form suitable in order to enable us to use it for regression analysis purposes. That is:

$$P_t - BV_t = et \Rightarrow P_t = BV_t + et$$

[34]

The theoretical framework developed in the previous chapter to test the value relevance of earnings and cash flows proceeds from the above expression by taking into consideration the methodological improvements of Easton and Harris, 1991; Ohlson, 1995; and Ohlson and Feltham, 1995. Thus, using the aforementioned methodology, I will examine prices as a function of earnings level, earnings changes and levels and changes together. The models that I will test are based on the theoretical framework that results in equation [44] (for the case of levels), equation [42] (for the case of changes), and equation [47] (for the case of levels and changes). Thus the corresponding regressions are of the form:

$$R_{jt} = a_0 + a_1(Ejt/ P_{jt-1}) + u_{it}$$

[48]

$$R_{jt} = b_0 + b_1(\Delta Ejt/ P_{jt-1}) + u'_{it}$$

[49]

$$R_{jt} = c_0 + c_1(Ejt/ P_{jt-1}) + c_2(\Delta Ejt/ P_{jt-1}) + u''_{it}$$

[50]

where

$R_{jt} = (\Delta P_{jt} + DIVjt) / P_{jt-1}$.

When the above models will be tested both levels and changes are hypothesized to have significant power in explaining security prices even when they were considered together (i.e. equation [50]).

Prior studies examined the aforementioned models. Specifically, Easton and Harris (1991) used a sample of USA firms over a nineteen year period. Their results indicated that both the level and changes of earnings, taken together, are valued in the marketplace. However, results indicated that the level of earnings play a more important role in explaining security returns. According to Alford et al, level and changes in earnings reflect firm growth and risk, respectively. This kind of methodology was also extended by other researchers. More recently, Bartov et al (2001) tested this model for a sample of firms in code law and common law countries. Their results indicated that the level and changes of earnings and cash flows is dependent on the financial reporting system of each country. My study extends the Easton and Harris and the other similar studies in that it examines also cash flows beyond earnings in common law and code law countries. It also extends the Bartov et al (1991) study by taking into consideration not only level and changes of earnings and cash flows, but I consider the earnings permanence effect as well as the long window effect.

In summary, one of the major advantages of this kind of methodology is that it takes into consideration not only the level but also the changes of earnings and cash flows in explaining security returns. By doing that, I take into consideration the expected permanent earnings and the expected permanent cash flows in my model. As per Easton and Harris (1991), the sum of the coefficients of the level and changes of earnings approximate the expected permanent earnings of the firm that are used for valuation purposes. Even though this methodology is theoretically sound, it does not take into consideration other contextual factors, such as earnings permanence

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and long window effects. That's why in my study, I start from this theoretically sound methodology and build on that in order to apply as well earnings permanence and long windows in order to get more robust results and thus verify my results.

5.4.2 Framework for modeling contextual factors related to the permanence and transitoriness of earnings.

The framework developed in the previous section suggests that both earnings levels and changes have explanatory power when they are included simultaneously in explaining stock returns (see also Easton and Harris, 1991, Fama and French, 1995, 1998). Ali and Zarowin (1992), also point out that many financial studies used earning changes as a proxy for unexpected earnings, following the assumption that earnings follow a random walk. Based on these arguments, in developing the theoretical framework on the transitoriness of earnings, I propose that annual earnings follow an IMA (1,1) process, which includes both levels and changes, i.e. permits for both transitory and permanent components.

The following model is estimated:

$$AR_{jt} = b_{0t} + b_{1t}(Ejt - Ejt_{-1})/ P_{jt-1} + b_{2t}(Ejt/ P_{jt-1}) + u_{it} \qquad [51]$$

AR_{jt} is the abnormal return (i.e. the difference of the market value of the stock price with its book value at year t minus the difference of the market value of the stock price with its book value at year t-1 divided by the difference at t-1, assuming no dividends).

In the previous chapter I extend the above model and I provide a theoretical framework. Furthermore, extending equation [51] to capture cash flows both levels and changes (and omitting the beginning of period price deflator for exposition purposes) I get:

$$AR_{jt} = b_{0t} + b_{1t}\Delta Ejt + b_{2t}Ejt + b_{3t}\Delta CF_{jt} + b_{4t}CF_{jt} + u_{it} \qquad [57]$$

However, since the model needs to capture the incremental information of cash flows over earnings

where earnings are transitory, equation [57] is modified as:

$$AR_{jt}=c_{0t}+c_{1t}\Delta Ejt +c_{2t}Ejt+c_{3t}\Delta CF_{jt}+c_{4t}CF_{jt}+c_{5t}\Delta Ejt\ D_{jt}+c_{6t}Ejt\ D_{jt}$$

$$c_{7t}\Delta CF_{jt}\ D_{jt}+c_{8t}CF_{jt}\ D_{jt}+w_{it} \qquad [58]$$

where D_{jt} is a dummy variable equal to zero when $\Delta Ejt/P_{jt-1}$ is less than its yearly cross-sectional median and the value of one (1) when it is greater. Thus, the change in earnings to price ratio is used in order to measure the presence of transitory elements contained in the change in earnings variable.

As in Freeman and Tse (1992) and Ali (1994) transitory elements are more likely to be present when unexpected earning values are large relative to price. Hence the coefficients $c_{1t}+c_{2t}$ and $c_{3t}+c_{4t}$ represent the estimates of the earnings and cash flow response coefficients when earnings are mainly permanent. The coefficients $c_{5t}+c_{6t}$ and $c_{7t}+c_{8t}$ capture the additional information content of earnings and cash flows for firms with predominantly transitory earnings. It is expected $c_{5t}+c_{6t}$ to be negative and $c_{7t}+c_{8t}$ to be positive.

In the present study, following the aforementioned theoretical framework, 1 propose that the incremental information content of cash flows from operations is expected to increase as the permanence of earnings decreases (see also Freeman and Tse (1992) and Ali (1994), and Cheng, Liu and Schafer, 1996.The issue of the time permanence of earnings has raised the stimulus in the present study in examining the role of operating cash flows when earnings are transitory. As Cheng, Liu and Schafer (1996) argue, earnings may contain transitory items with limited valuation implications. For example, transitory items that may be included are current and long term accruals such as losses due to restructuring, current recognition (through asset sales) of previous' (or current period's) increases in market value, one-time impact on income from changes in accounting standards etc. Moreover, because of compensation contracts and debt covenants are often based on reported accounting income, incentives exist for managers to

introduce transitory elements in earnings. Dechow (1994) also argues that because management

has some discretion over the recognition of accruals, this can be used to manipulate earnings.

Following Ali and Zarowin [1992] and Cheng, Liu and Schafer (1996), in my theoretical

framework, I included both levels and changes in order to characterise the unexpected

components of earnings, whereas they also include levels and changes of cash flows from

operations. This is done in order to test the hypothesis that when earnings are transitory the

earnings response coefficients (ERCs) on both levels and changes will have reduced significance

in explaining security returns. In this situation the importance of cash flows from operations will

be greater. As in Freeman and Tse (1992) and Ali (1994) transitory elements are more likely to

be present when unexpected earning values are large relative to price. Hence in the model [58],

the coefficients $c_{1t} + c_{2t}$ and $c_{3t} + c_{4t}$ represent the estimates of the earnings and cash flow response

coefficients when earnings are mainly permanent. The coefficients $c_{5t} + c_{6t}$ and $c_{7t} + c_{8t}$ capture the

additional information content of earnings and cash flows for firms with predominantly transitory

earnings. It is expected $c_{5t} + c_{6t}$ to be negative and $c_{7t} + c_{8t}$ to be positive.   Prior studies that

tested the earnings permanence hypothesis showed that cash flows play a more important role

when earnings are transitory and vice versa (see Cheng, Liao and Schaefer, 1996). These

researchers used only USA firms to test their model. Since prior studies support that the

informativeness of earnings and cash flows may be country specific due to differences in

financial reporting and level of conservatism, I extend all prior studies by examining not only

USA but also UK and France. France is considered a code law country and UK a common law

country with different levels of conservatism (as per Ball et al, 2000). Moreover, I extend these

studies in the following respect. I propose an alternative methodology to verify my results,

which relates to the long window effect of the earnings and cash flows. This methodology was

not combined in prior studies.

5.4.3 Methodology for the long return intervals

In order to get more robust results with regards to the earnings and cash flow variables, I extend the aforementioned technique by examining the effect of earnings and cash flows over long return intervals.

Why apply this technique?

Prior studies provided several explanations for the poor earnings returns association and why the estimated earnings coefficients seemed relatively small (Easton and Zmiaewski, 1991 and Easton and Harris, 1991). Although the various explanations given relate to each other, distinctions are relevant because they affect motivations for improving this kind of research designs.

The framework and methodology developed here is based on two fundamental attributes of the financial reporting process that did not received the necessary attention in prior literature, a) earnings and cash flows aggregate over time, and b) errors in aggregate earnings and cash flows are likely to become relatively less important for longer periods of aggregation.

More specifically, three streams of thought of how to improve estimations of earnings-returns relations can be identified. The first deals with the earnings expectations model (Easton and Harris, 1991, Brown 1987). The second approach views earnings as a measure of true earnings plus an error (Collins and Kothari, 1989). The third approach allows imperfect earnings because not all value relevant events observed by the market will be recognized as part of earnings during the return period, and conversely, earnings include the effects of events observed by the market prior to the return period.

The approach followed in the present study tries to minimize the effects of these three problems by focusing on fundamental attributes. Since I use the level of earnings and the level of cash flows as explanatory variables for returns, measurement of earnings and cash flow

expectations is unnecessary. Most value relevant events occurring during a specific time interval should be part of the concurrent earnings and cash flows, provided that the interval is sufficiently long, since earnings aggregate over time periods, it makes no difference in which subperiod of the interval under consideration the value relevant events are recognized as earnings. Thus, of concern are only two types of errors, 1) value relevant events occurring during the return interval which are recognized in earnings of subsequent periods and ii) value relevant events occurring prior to the return interval which are recognized in earnings during the interval. But, for long intervals, the two error sources should be unimportant. A simple theoretical framework is a firm whose life matches the event window perfectly, in which case no errors are present in lifetime earnings or cash flows.

To deal with the aforementioned issues, the methodology, framework and research design presented here views earnings as a measure of value changes (Easton et al, 1992). Under this framework, the market return variable is considered a function of an aggregate earnings (levels) variable. A theoretical model is developed in the previous chapter that reflects the intuition behind the hypothesized relation (see equations [59] to [67]).

The basic cross-sectional regression model to be used in the present study that follows from the aforementioned theoretical framework can be expressed as in equation [67]

$$[MI] \quad y\frac{1}{Tj} = x\frac{1}{T} + \beta\frac{1}{T}z\frac{1}{Tj} + \varepsilon\frac{1}{Tj}, \qquad [67]$$

where j denotes firm j and $\varepsilon\dfrac{1}{Tj}$ captures omitted factors. The subscript T emphasizes that the regression coefficients may depend on the return interval. The basic empirical analysis evaluates the hypothesis that the R^2 for M1 increases as T increases. Moreover, the model suggests that $\beta =$

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1. This serves as a useful theoretical benchmark in the following sense: a dollar of additional earnings yields a dollar of additional value (Easton, Harris and Ohlson, 1992)[12].

Prior studies tested the aforementioned long return interval model, among those Easton, Harris and Ohlson (1992), Dechow (1994). The results of these studies indicated that earnings over long return intervals have a much greater explanatory power. However, Easton et al tested only earnings over long return intervals for the USA. Dechow also tested cash flows over the one and four year period only for the USA. The present study extends the aforementioned studies in the following respects: First, it employs long return intervals for both level of earnings and cash flows. Second, it examines not only USA firms but also firms from different financial reporting systems, namely UK and France. As per Ball et al (2000) and Bartov et al (2001), these countries differ substantially from the USA financial reporting due to differences in conservatism and timeliness. Also, France is a code law country whereas UK and USA are common law countries. Third, 1 employ, in addition to the long window methodology, the earnings permanence methodology, in order to test for the robustness of my results. To the best of my knowledge, this combination of methodologies was not done in any of the previous studies.

In summary, by testing this methodology 1 expect to show that the value relevance of earnings and cash flows improves in all three countries as the measurement interval is increased. Over longer measurement intervals, cash flows will suffer from fewer timing and matching problems, the importance of accruals will diminish, and therefore, earnings and cash flows are expected to converge as measures of firm performance. Cash flows are expected to suffer more from timing and matching problems over short measurement intervals because they have no accrual adjustments and the accruals associated with cash flows are long term in nature and they do not

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12 For a full discussion of this framework see The theoretical framework chapter of this study and Easton et al (1992).

reverse in the short-run (Dechow, 1994). On the other hand, the explanatory power of earnings compared to cash flows is expected to be the highest over short measurement intervals, because earnings include current and noncurrent accruals that mitigate the timing and matching problems related to the organization's operating, investing and financing cash flows. To sum up, even though prior USA and UK studies showed that there is a relative increase in the explanatory power of earnings over longer measurement intervals (Easton, et al, 1992; Charitou, 1997; Dechow, 1994), there is no comparative research on the value relevance i) of cash flows over long measurement intervals, ii) of earnings and cash flows in the USA, the UK and France.

5.5   Econometric issues and statistical tests

In this section, I will discuss the major statistical tests applied in this study as well as the major econometric tests. Initially, the major statistical tests will be discussed and thereafter the major econometric tests, namely, multicollinearity and heteroskedasticity will be discussed.

A discussion of the major statistical tests applied in the study follows.

5.5.1   Statistical tests applied

5.5.1.1 Correlation (r) and coefficient of determination (R^2)

The Pearson product moment coefficient of correlation is a measure of the linear relationship between two variables x and y. It is computed (for a sample of n measurements on x and y) as follows:

$r = SS_{xy} / $ (Square Root of $SS_{xx} * SS_{yy}$)

where SS = error sum of squares.

A value of r near or equal to zero implies little or no linear relationship between y and x. In contrast, the closer r is to 1 or –1, all the points fall exactly on the least squares line. The value of r is always between –1 and +1, no matter what the units of x and y are.

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Another way to measure the contribution of x in predicting y is to consider how much

the errors of prediction of y were reduced by using the information provided by x. This is called

the coefficient of determination R^2. The R^2 represents the proportion of the sum of squares of

deviations of the y values about the mean values that can be attributed to a linear relation

between y and x. Note that R^2 is always between 0 and 1, because r is between -1 and +1

(Kennedy, 2003; Sincich and Mendehall, 2003, Gujarati, 2003).

5.5.1.2 The t-test.

A t-test is used to test any single linear constraint.

Suppose $y = a + b_1 + b_2 + e$ and we wish to test $b_1 + b_2 = 1$. A t-test is formulated by

rewriting the constraint so that it is equal to zero, in this case as $b_1 + b_2 - 1 = 0$, estimating the

left hand side as $b_1^{BOLS} + b_2^{BOLS} - 1$ and dividing this by the square root of its estimated

variance to form a t statistic with degrees of freedom equal to the sample size minus the

number of parameters estimated in the regression (Kutner et al. 2003; Kennedy, 2003;

Sincich and Mendehall, 2003, Gujarati, 2003).

The t-statistic is estimated as follows:

$t = b_i / S_{bi}$

Where: b_i = coefficient of the regression model

S_{bi} = standard deviation of the beta coefficient.

5.5.1.3 The F-diagnostic

Conducting t-tests on each b parameter in a model is not a good way to determine whether a

model is contributing information for the prediction of the y variable (where y is the

dependent variable and x is the independent variable). If we were to conduct a series of t tests

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to determine whether the independent variables are contributing to the predictive relationship, we would be very likely to make one or more errors in deciding which terms to retain and which to exclude. So, if we want to test the utility of a multiple regression model, we will need a global test (one that encompasses all the b parameters). This global test is called the F-statistic and indicates that the second order model $y = b_0 + b_1 X + b_2 X^2 + e$ is useful in explaining the dependent variable y.

The F-statistic tests the following hypothesis:

H_0: $b1 = b2 = ... = bn = 0$

H_a: at least one of the parameters $b1, b2, ... bn$ is nonzero.

The F-statistic tests the global utility of the model. The statistic used to test this null hypothesis with k variables is:

F-statistic = $[(R^2 / k) / (1+R^2)/(n-(k+1))]$

Where n is the number of data points, R^2 is the coefficient of determination and k is the number of parameters in the model, not including b_0. Thus, when Ho is true, this F test statistic will have an F probability distribution with k degrees of freedom in the numerator and [n-k+1] degrees of freedom in the denominator. The F test statistic becomes large as the coefficient of determination R^2 becomes large (Kutner et al. 2003; Kennedy, 2003; Sincich and Mendehall, 2003, Gujarati, 2003).

5.5.1.4 Statistical diagnostic for estimating the t-values of the sum of coefficients used for the earnings permanence models.

The t-values of the sum of coefficients used for the earnings permanence models were computed by using the formula:

$$t = (b_i + b_{ii}) / [Var(b_i) + Var(b_{ii}) + 2Cov(b_i, b_{ii})]^{1/2}$$

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Where b_i and b_{ii} are the coefficients of the variables in the model, $Var(b_i)$ and $Var(b_{ii})$ are

the variances of the coefficients and $Cov(b_i, b_{ii})$ is their covariance. The sum of coefficients is

statistically significant if $t > t_{a, n-1}$, where a is the level of significance and n is the number of

observations. (Cheng et al., 1996, Kutner et al. 2003; Kennedy, 2003; Gujarati, 2003).

5.5.1.5 The Vuong z-statistic

The Vuong z-statistic is computed by using the formula (Dechow, 1994):

$$z_1 = \left(1 / \sqrt{T}\right) \sum_{j=1}^{T} \left(t_j \sqrt{k_j / k_j - 2}\right)$$

Where t_j is t-statistic for industry j, k_j is degrees of freedom, and T is the number of

industries (Dechow, 1994, Cheng et al., 1996, Kutner et al. 2003; Kennedy, 2003; Gujarati,

2003).

z_2 = mean t-statistic / standard deviation of t-statistics / $\sqrt{T-1}$.

z_1 assumes residual independence; z_2 relaxes this assumption.

5.5.1.6 Statistical diagnostic for calculating means for each model.

When running cross sectional regressions for each year, then for each year there is a slope

coefficient for each variable used in the model. Since in the present study there were several

years of data, the mean coefficient for the whole period, for each model was calculated as

follows:

Used the sum of the coefficients (b_i) of each model for each year and it was divided by

the years used (eg., b_i/n). The result is the mean b_i for each coefficient. The t-statistic is given in

the SPSS output from compare mean, one sample t-test (Dechow, 1994, Cheng et al., 1996,

Kutner et al. 2003; Kennedy, 2003; Gujarati, 2003).

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5.5.2 Multicollinearity

One of the assumptions of the classical linear regression model is that there is no multicollinearity among the explanatory variables included in the model. Multicollinearity refers to the high correlation between the independent variables of the regression model. Why does the classical linear regression model assume there is no multicollinearity among the independent variables? The reasoning is: If multicollinearity is perfect, then the regression coefficients of the independent variables X are indeterminate and their standard errors are infinite. If multicollinearity is less than perfect, then the regression coefficients, although determinate, possess large standard errors, which means the coefficients cannot be estimated with great precision or accuracy.

Which are the practical consequences of the regression models if there exists multicollinearity? If collinearity exists, then the following consequences ensue: a) Even though the ordinary least square estimators are obtainable, their standard errors tend to be large as the degree of collinearity between the variables increases, b) because of the large standard errors, the confidence intervals for the relevant population parameters tend to be larger, hence the probability of accepting a false hypothesis increases, c) if multicollinearity is high, one may obtain high R^2s, but none or very few estimated coefficients are statistically significant (ie. t-statistics tend to be insignificant).

The question that it can be raised now is: How do we test if we have multicollinearity in our regression models? One common statistical test used to check for multicollinearity is the Variance Inflation Factors (VIF) test.

where

$$VIF = 1 / (1-R^{2*}),$$

$R^{2}*$: is the R^2 we get when we regress one independent variable on another

independent variable in a single linear regression model.

If the VIFs are relatively high, mainly greater than 10, then there exists a multicollinearity

problem (Kutner et al. 2003; Gujarati, 2003; Mills, 1999; Fama and French, 1995, 2000; Ball,

Kothari and Robin, 2000).

In this dissertation, 1 applied this econometric test on all regression models. Evidence showed

that my regression models do not have collinearity problems.

5.5.3 Heteroskedasticity

Another assumption of the classical linear regression model is that the disturbance term (error

term) u_i is homoskedastic. Thus, when the variance of the error term u is not constant, then we

have the heteroskedasticity problem. When heteroskedasticity is present, the Ordinary least

square (OLS) estimates are still unbiased and consistent, but they are no longer efficient in small

as well as large samples. In other words, in repeated sampling the OLS estimators on the average

are equal to their true population values, and as the sample size increases indefinitely they

converge to their true values but their variances are no longer minimum even if the sample size

increases indefinitely.

Which are the practical consequences of heteroskedasticity in our regression models? a)

when heteroskedasticity is present the model coefficients are not the conventional estimators of

the beta coefficients, b) the variance of the beta coefficients is no longer minimum and thus the

confidence intervals for the beta coefficients are wide and the tests of significance are less

powerful, and c) the t-test and F-test give misleading conclusions.

How does one detect heteroskedasticity? One method of detecting heteroskedastic

disturbances is to look for patterns in the residuals obtained from fitted equations. Although

heteroskedasticity is a property of the disturbances, since the disturbances are unknown, we have to treat residuals estimates of the disturbances and examine their patterns. If in two variables regression we observe a scatter of points about a sample regression line with dispersion of residuals increasing as the independent variable (X) increases, we would strongly suspect heteroskedastic disturbances with the variance of the residuals, Var(e), increasing with X. Therefore, we test for heteroskedasticity using plots of our variables for each model with their residuals (squares).

Another way to test for heteroskedasticity is to use the White test of heteroskedasticity which tests if the variances of the error term are homoskedastic.

In the present study, consistent with prior empirical studies, I deflated all my dependent and independent variables with the market value of equity. By doing that, we try to avoid the problem of non-constant variances. Furthermore, the plots and the statistical tests showed that my models do not have heteroskedasticity problem. (Kutner et al. 2003; Gujarati, 2003; Mills, 1999; Fama and French, 1995, 2000; Ball, Kothari and Robin, 2000).

5.6   Summary of the methodology employed

In this chapter I discussed in depth the methodology to be employed in this dissertation in order to test the research hypotheses developed in the previous chapter. Initially, I discussed the major sources of data and the measurement of financial and market variables. Thereafter, I developed the empirical models to be used to test the major research hypotheses. These empirical models were based on the theoretical models developed in the previous chapter. Both univariate and multivariate models were developed. Thereafter, these models were extended to take into consideration the major contextual factors used in the dissertation, namely, measurement interval, transitoriness of earnings, industry and country factors. Since in order to draw the right

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conclusions from these models, the estimators of the models must be best linear unbiased estimators (BLUE), I conducted various statistical and econometric tests, among those, heteroskedasticity and multicollinearity tests. The empirical results that will be discussed in the next chapter will be based on the methodology discussed in this chapter.

CHAPTER VI

EMPIRICAL RESULTS

6.1 Introduction

The research hypotheses discussed earlier in Chapter IV are tested in what follows empirically.

More specifically, the following empirical results are presented:

a. Regression Diagnostics:

1. Descriptive Statistics

2. Correlation Analysis

b. Regression Analysis:

1. Empirical results of the value relevance of Earnings and cash flows

(Research hypotheses 1 and 2):

Univariate Analysis for the UK, the USA and France;

Multivariate Analysis for the UK, the USA and France.

2. Industry specific empirical results of the value relevance of Earnings

and cash flows (Research hypothesis 3).

3. Empirical results of the value relevance of Earnings and cash flows, i.e.

the case of long measurement intervals (Research hypothesis 4).

4. Empirical results of the value relevance of Earnings and cash flows when

earnings are transitory (Research hypothesis 5).

5. Country specific empirical results of the value relevance of Earnings

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and cash flows in the UK, the USA and France (Research hypothesis 6).

Table 8 (already presented earlier in chapter V) cites the dataset of all firms to be used for each country examined. Specifically, Panel A presents the annual dataset for the USA firms. All the data available in the Compustat database were collected for the USA. The total number of observations for the period 1987-98 were 36,695 firm year observations. Panel B presents the annual dataset for the UK firms. All data available in the Global Vantage Database by Standards and Poors for the UK were 4,234 firm year observations for the period 1990-98. Finally, panel C presents the annual dataset for the French firms. All data available in the Global Vantage Database by Standards and Poor for France were 1,181 firm year observations for the period 1990-98.

Statistical analysis for the above datasets was conducted in this study. A critical analysis and discussion of all models tested is presented in this chapter.

TABLE 9
Descriptive statistics for all years tested for all firms for the USA, UK and France

COUNTRY	VARIABLE	MEAN	MEDIAN	STANDARD DEVIATION	LOWER QUARTILE	UPPER QUARTILE	MINIMUM	MAXIMUM	N
USA	E	-0.008	0.038	0.192	-0.052	0.077	-1.485	1.437	35873
	ΔE	0.007	0.051	0.187	-0.038	0.038	-1.477	1.499	35873
	CFO	0.057	0.078	0.226	-0.035	0.142	-1.496	1.488	35873
	ΔCFO	0.009	0.005	0.245	-0.059	0.071	-1.479	1.499	35873
	RET	0.080	0.005	0.562	-0.285	0.335	-0.998	3.778	35873
UK	E	0.057	0.072	0.144	0.046	0.098	-1.416	1.375	4178
	ΔE	0.005	0.008	0.157	-0.017	0.028	-1.497	1.481	4178
	CFO	0.123	0.107	0.204	0.054	0.175	-1.397	1.479	4178
	ΔCFO	0.002	0.007	0.245	-0.054	0.069	-1.487	1.356	4178
	RET	0.092	0.073	0.372	-0.154	0.305	-0.957	1.699	4178
FRANCE	E	0.037	0.058	0.135	0.028	0.087	-1.000	0.582	1165
	ΔE	0.008	0.005	0.144	-0.019	0.025	-1.114	1.092	1165
	CFO	0.184	0.134	0.237	0.058	0.261	-0.989	1.455	1165
	ΔCFO	0.006	0.005	0.269	-0.080	0.096	-1.335	1.224	1165
	RET	0.055	0.030	0.318	-0.150	0.250	-0.820	1.160	1165

E: operating earnings, ΔE: Changes in earnings, CFO: Operating cash flows, ΔCFO: changes in Operating Cash flows; RET: annual security returns

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6.2   Regression diagnostics

In this part I discuss, analyse and critically evaluate the descriptive statistics and correlation analysis results.

6.2.1   Descriptive statistics

Table 9 presents descriptive statistics for all the earnings, cash flows and security returns variables examined in the study for all three countries (USA, UK and France) for the period 1987-1998. Results show that 35873, 4178 and 1165 firm-year observations were available to be used in the analysis for the USA, the UK, and the French dataset, respectively. Consistent with prior studies, extreme observations of each of the earnings and cash flow variables were excluded from the analysis.

As it has already been hypothesized earlier in this dissertation, I expect differences in the value relevance of earnings and cash flows with security returns. These descriptive analysis results will provide an indication as to whether there exist differences in financial reporting among countries. As discussed earlier in the study, we expect differences in the level of earnings due to the fact that there are financial reporting differences between these countries, which is also reflected in the different level of conservatism that exists in each countries' system. More specifically, the results indicate the following: a) the mean security return for UK and USA is the highest (0.092 and 0.08, respectively), whereas in France is somewhat lower, 0.055, b) the mean earnings level is higher for UK (0.057) and lowest for USA. For the French dataset the mean of earnings levels is 0.037; c) the mean of the cash flow levels is shown to be the highest for the French dataset (0.184) and lower for UK and USA (0.123 and 0.057, respectively); d) as expected the standard deviation of the levels and changes of cash flows is always higher than the level and changes of earnings in all three countries. These results are consistent with the results

provided in prior empirical studies.

6.2.2 Correlation analysis

Table 10 presents Pearson correlation results for all dependent and independent variables used in the study, namely, security returns (RET), levels and changes of earnings (E and ΔE) and levels and changes of cash flows (CFO and ΔCFO). As it has been hypothesized, I expect differences in the value relevance of earnings and cash flows in different countries. Research questions like the following have been unanswered in the literature and this correlation analysis is expected to provide an initial indication as to the value relevance of earnings and cash flows. Are earnings or cash flows valued more in Anglo-Saxon or code law countries? Are earnings or cash flows valued more in the service or manufacturing or retail industries? When the measurement interval increases, in which system, Anglo-Saxon or code law system, is there a greater increase in the value relevance of earnings and cash flows? When earnings are transitory, in which system, Anglo-Saxon or code law system, is there a greater increase in the value relevance cash flows?

The results show the following: a) as expected the correlation between the level and changes of earnings and security returns is higher than the correlation between cash flows and security returns. This is partly due to the fact that security analysts, investors and creditors have traditionally emphasized earnings, b) as expected, the correlation between earnings and cash flows is higher in the UK and the USA than in France. This is due to the fact that the French financial reporting system is more closely aligned to the tax system, c) the correlation between security returns and the levels of earnings is the highest in all three countries, whereas the correlation between security returns and changes in cash flows is again consistently the lowest in all three countries.

TABLE 10

Correlation analysis (Pearson) for all years tested for all
firms for the USA, the UK and France

PANEL A: USA	E	ΔE	CFO	ΔCFO	RET
E	1	0.458 *	0.516 *	0.184 *	0.321 *
ΔE		1	0.265 *	0.412 *	0.267 *
CFO			1	0.565 *	0.238 *
ΔCFO				1	0.100 *
RET					1

PANEL B: UK	E	ΔE	CFO	ΔCFO	RET
E	1	0.560 *	0.501 *	0.153 *	0.297 *
ΔE		1	0.371 *	0.393 *	0.257 *
CFO			1	0.564 *	0.247 *
ΔCFO				1	0.133 *
RET					1

PANEL C: FRANCE	E	ΔE	CFO	ΔCFO	RET
E	1	0.429 *	0.290 *	0.108 *	0.336 *
ΔE		1	0.261 *	0.266 *	0.303 *
CFO			1	0.507 *	0.147 *
ΔCFO				1	0.061 **
RET					1

*, **, ***, significant at alpha level = 0.01, 0.05, 0.10 level,
respectively

Where E: operating earnings, ΔE: Changes in earnings,
CFO: Operating cash flows, ΔCFO: changes in Operating Cash
flows; RET: annual security returns

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TABLE 11

Univariate Regression results for all years tested for all firms for USA, UK and France
Model: RET = a0 + a1 Xi, where Xi is the independent variable E, ΔE, CFO, or ΔCFO

Xi	USA	UK	FRANCE
E			
Coefficient	0.759 *	0.767 *	0.793 *
t-statistic	50.864	20.128	12.179
P-value	0.000	0.000	0.000
N	35873	4178	1165
F-value	2587.17 *	405.13 *	148.33 *
R^2 Adj	6.70%	8.80%	11.20%
ΔE			
Coefficient	0.701 *	0.612 *	0.669 *
t-statistic	45.442	17.205	10.86
P-value	0.000	0.000	0.000
N	35873	4178	1165
F-value	2064.98	296.00 *	117.94 *
R^2 Adj	5.40%	6.60%	9.10%
CFO			
Coefficient	0.447 *	0.451 *	0.197 *
t-statistic	34.617	16.46	5.061
P-value	0.000	0.000	0.000
N	35873	4178	1165
F-value	1198.31 *	270.94 *	25.61 *
R^2 Adj	3.20%	6.10%	2.10%
ΔCFO			
Coefficient	0.196 *	0.202 *	0.072 **
t-statistic	16.274	8.686	2.09
P-value	0.000	0.000	0.037
N	35873	4178	1165
F-value	264.84 *	75.45 *	4.36 **
R^2 Adj	0.70%	1.80%	0.30%

*, **, *** Statistically significant at a=1%, 5% and 10% respectively

Where E: operating earnings, ΔE: Changes in earnings, CFO: Operating cash flows, ΔCFO: changes in Operating Cash flows; RET: annual security returns. All Independent variables (E, ΔE, CFO, ΔCFO) are deflated by the market value of the firm at fiscal year end of the previous year.

6.3   Regression analysis results

In this part regression analysis results that relate to the test of all research hypotheses are presented, analysed and critically evaluated.

6.3.1   Univariate and multivariate regression analysis results on the value relevance of earnings and cash flows for the USA, UK and France.

Research hypothesis 1 predicts that there exists a positive association between operating earnings (cash flows) and security returns in the UK, the USA and France. Thus, I expect differences in the value relevance of earnings and cash flows between Anglo-Saxon and code law countries. More specifically, it was hypothesized that a) earnings and cash flows are value relevant in all countries and b) earnings will be more value relevant than cash flows in all countries. The univariate results presented in Table 11 in this section do support the above hypotheses. Specifically, these univariate results indicate the following. First, as far as the value relevance of earnings is concerned, as expected, the results indicate that both the levels and changes in earnings are positive and statistically significant in all three countries. Interestingly, the size of the levels of earnings and the size of the changes in earnings is approximately equal in all three countries, in spite of the fact that the French financial reporting system is much more conservative. Specifically, the coefficients of the level of earnings are 0.759, 0.767 and 0.793 for the USA, the UK, and France, respectively. The coefficients of the changes in earnings are 0.701, 0.612 and 0.669, for the US, UK and France, respectively. As far as the R^2 is concerned, results indicate that French earnings (levels and changes) are more value relevant than the earnings in the USA and the UK, even though the financial reporting system in France in more conservative. The R^2 for the level of earnings is 11.20%, 8.80% and 6.70% for France, the UK and the USA. The same ranking applies to the changes in earnings, although the R^2 is somewhat lower,

indicating that the level of earnings is more value relevant than the changes in earnings.

As far as the value relevance of cash flows is concerned, as expected, results indicate that cash flows are value relevant in all three countries. All the coefficients of the levels and changes in cash flows are positive and statistically significant. The size of the coefficients of cash flows as well as the magnitude of the R^2 are somewhat higher in the Anglo-Saxon countries, suggesting that cash flows could be less value relevant in France. Moreover, as it was expected the size of the earnings coefficients and the magnitude of the R^2 are relatively higher than the equivalent cash flow statistics. These results are consistent with my hypotheses, expectations and consistent with prior empirical evidence. This is due to the fact that earnings are considered more value relevant in the stock markets.

Table 12
Multivariate analysis regression results for all years tested for all firms for the USA, UK and France.
MODELS WITH TWO VARIABLES
Model a: Level and changes of earnings: $RET = a + b1\ E + b2\ \Delta E$
Model b: Level and changes of cash flows: $RET = a + b1\ CFO + b3\ \Delta CFO$

COUNTRY	Intercept A	E b1	ΔE b2	CFO b3	ΔCFO b4	E+ΔE b1+b2	CFO+ΔCFO b3+b4	N	F-VALUE	VIF	R²adj
USA (a)	0.0807 * (28.374)	0.566* (34.143)	0.438* (25.746)			1.004* 57.088		35873	1648.893 * [0.000]	1.257	8.40%
(b)	0.05256 * (17.341)			0.480* (30.674)	-0.054* (-3.729)		0.426* 30.295	35873	606.324 * [0.000]	1.469	3.30%
UK (a)	0.0578 * (9.621)	0.576* (12.601)	0.314* (7.453)			0.890* 21.548		4178	232.985 * [0.000]	1.458	10.00%
(b)	0.0358 * (5.191)			0.460* (13.865)	-0.013 (-0.487)		0.447* 15.509	4178	135.566 * [0.000]	1.467	6.10%
FRANCE (a)	0.0297 * (3.314)	0.596* (8.410)	0.430* 6.492			1.026* 13.980		1165	97.869 * [0.000]	1.226	14.30%
(b)	0.017 (1.353)			0.209* (4.630)	-0.021 (-0.532)		0.188* 4.424	1165	12.940 * [0.000]	1.347	2.00%

*, **, *** Statistically significant at a=1%, 5% and 10% respectively; ( ), Figures in parentheses represent t-statistic; [], Figures represent p-value

Where E: operating earnings, ΔE: Changes in earnings, CFO: Operating cash flows, ΔCFO: changes in Operating Cash flows; RET: annual security returns. All Independent variables (E, ΔE, CFO, ΔCFO) are deflated by the market value of the firm at fiscal year end of the previous year.

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6.3.1.1 Results related to the level and changes in earnings.

Table 12 (model a) tests the value relevance of both the level and changes of earnings. I expect

the coefficients of these variables to be positive and statistically significant. Moreover, the sum

of these coefficients is expected to be close to unity and to approximate the true coefficient of

the permanent earnings (Easton and Harris, 1991). If these earnings coefficients are positive, it

means that investors perceive increases in operating earnings as good news and any increases in

the firm's earnings are expected to increase stock prices.

Consistent with my hypothesis, all the coefficients of the levels and changes in earnings

are positive and statistically significant. The sum of these coefficients is positive and statistically

significant and it is close to unity for all three countries. As far as the R^2 is concerned, it is

relatively higher in France (14.3% vs 10% and 8.4% in the UK and in the USA, respectively)

even though financial reporting in France is code-law oriented and it is more conservative.

Moreover, the F-value of all models in the USA, the UK and France is relatively high and

statistically significant as it is supported by the p-value of the models (p-value in all models is

0.000, supporting strong statistical significance).

6.3.1.2 Results related to the level and changes in cash flows.

As far as the value relevance of the levels and changes in cash flows is concerned (model b, table

12), it is expected that the coefficients be positive and statistically significant. If these

coefficients are positive, it means that investors perceive increases in operating cash flows as

good news and any increases in the firm's cash flows are expected to increase stock prices. The

results indicate that the sum of these coefficients is indeed positive and statistically significant,

indicating that cash flows are valued positively in the marketplace by investors. The R^2 of the

models is higher in the UK and lowest in France, indicating that cash flows are not valued as

much in France as they are valued in the UK. Moreover, the F-value of all models in the USA, the UK and France is relatively high and statistically significant as it is supported by the p-value of the models (p-value in all models is 0.000, supporting strong statistical significance).

Furthermore, as it was expected both the size of the cash flow coefficients and the model's R^2s are relatively lower than the equivalent earnings statistics presented in the same table (model a). These results, thus indicate that taken independently, earnings are valued more in the marketplace than cash flows. Again, these results are consistent with the expectations and with prior empirical evidence.

In summary, the aforementioned univariate and multivariate analysis results presented in Tables 11 and 12 are consistent with my Hypothesis 1, i.e., that the level and changes of earnings and cash flow variables are value relevant in all three countries, USA, UK and France. From the practitioner point of view, these results support that financial analysts, investors and creditors consider both earnings and cash flows in making their decisions.

Thus far, in univariate and multivariate analysis, earnings and cash flow variables were examined alone in the models. In order to examine whether investors, analysts and creditors take into consideration simultaneously both earnings and cash flows, multivariate regression analysis will be undertaken that includes all level and changes of earnings and cash flows. This analysis follows.

6.3.2 Multivariate regression analysis results on the value relevance of earnings and cash flows for the USA, the UK and France.

Research hypothesis 2 predicts that the levels and changes of operating earnings (cash flows) are associated with stock returns given operating cash flows (earnings). The objective of this hypothesis is: i) to provide empirical support for the propositions made by all international

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standard setting bodies that both earnings and cash flows play a very important role in explaining stock returns, and ii) to provide further evidence regarding the relative informativeness of operating cash flows (levels and changes) in explaining security returns, given operating earnings and thus strengthen the evidence provided by prior studies regarding the usefulness of operating cash flows. This hypothesis was tested in previous studies using USA and UK data, with mixed and inconclusive results.

The multivariate regression model results presented in tables 13 to 17 are used to provide support for the research hypothesis 2. The critical analysis and discussion of the multivariate regression models tested which follows relates to: i) value relevance of cash flows (earnings) beyond earnings (cash flows) [Table 13], ii) value relevance of both levels and changes of cash flows (earnings) beyond earnings (cash flows) [Tables 13-17]. Both pooled results as well as annual results are presented in this analysis.

Table 13

Multivariate analysis regression results for all years tested for all firms for the USA, the UK and France.

MODELS WITH TWO VARIABLES

Model a: Level of earnings and cash flows: RET = a0 + b1 E + b3 CFO

Model b: Changes of earnings and cash flows: RET = a0 + b2 ΔE + b4 ΔCFO

COUNTRY	Constant	E	ΔE	CFO	ΔCFO	N	VIF	F - value	R adj
USA	0.0759 *	0.666 *		0.152 *				1350.2 *	
(a)	(25.267)	(38.126)		(10.281)		35873	1.372	[0.000]	7.00%
	0.0746 *		0.716 *		-0.0291 **			1035.1 *	
(b)	(25.859)		(42.335)		(-2.255)	35873	1.205	[0.000]	5.50%
UK	0.0288 *	0.598 *		0.239 *				235.1 *	
(a)	(4.491)	(13.685)		(7.713)		4178	1.334	[0.000]	10.10%
	0.0892 *		0.576 *		0.0574 **			164.3***	
(b)	(16.031)		(14.909)		(2.328)	4178	1.183	[0.000]	7.40%
FRANCE	0.014	0.7566 *		0.0723 ***				76.0*	
(a)	(1.231)	(11.128)		(1.867)		1165	1.092	[0.000]	11.40%
	0.0502 *		0.6818 *		-0.025			59.2 *	
(b)	(5.637)		(10.660)		(-0.728)	1165	1.076	[0.000]	9.10%

*, **, *** Statistically significant at a=1%, 5% and 10% respectively; ( ), Figures in parentheses represent t-statistic; [], Figures represent p-value

Where E: operating earnings, ΔE: Changes in earnings, CFO: Operating cash flows, ΔCFO: changes in Operating Cash flows; RET: annual security returns. All Independent variables (E, ΔE, CFO, ΔCFO) are deflated by the market value of the firm at fiscal year end of the previous year.

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Thus far, in previous models, only the earnings or cash flow variables alone were entered

in the models. In order to test the value relevance of cash flows (earnings) beyond earnings (cash

flows), models (a) and (b) in table 13 were tested. Since the value relevance of earnings has been

established in previous studies, I hypothesize that the coefficients of the earnings variables to be

positive and statistically significant. On the other hand, although the coefficient of cash flows is

expected to be again positive and significant, it is still remained an empirical question to be

tested, since thus far previous studies provided inconclusive results.

As I hypothesized, all the coefficients of the levels and changes of earnings variables

presented in Table 13 are positive and statistically significant. The size of the level of earnings

coefficients ranges from 0.576 to 0.756. Similar results are also provided for the changes in

earnings coefficients in model (b). Thus, I conclude that the value relevance of earnings in all

three countries is similar., i.e. investors in all three countries pay similar attention to the earnings

information in making investment decisions. As far as the incremental information content of

cash flows is concerned, again all coefficients of the level of cash flow variable in model (a) are

positive and statistically significant. Specifically, the coefficient of the level of cash flows is

0.072, 0.152 and 0.239 for France, the USA and the UK respectively. As it can be seen, investors

and security analysts in the UK pay more attention on the operating cash flows than the investors

do in France and in the USA. In contrast, investors in France pay the least attention on operating

cash flows in making investment decisions. As far as model (b) is concerned, which tests the

changes of cash flows, results indicate that investors in the UK pay significant attention on the

changes of cash flows in making investment decisions. In summary, in UK all cash flow

coefficients are positive and significant whereas in the USA and France the coefficient of the

changes in cash flows are negative, indicating that lag cash flows are statistically significant in

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explaining security returns. As far as the models' R^2s is concerned, it is shown that in France it is the highest and in the USA it is the lowest. Regarding the importance of the models is concerned, the F-values are relatively high and statistically significant in all three countries. The p-value of all three models is 0.000, indicating very high statistical significance. Moreover, as far as the correlation between the variables included in the model is concerned, the Variance Inflation Factors (VIF) show that the VIFs are as expected, relatively low, indicating that the models tested do not have any collinearity problems.

Thus far, all models tested in Table 13 included two variables at a time, one earnings and one cash flow variable. In order to test how investors perceive simultaneously in their investment decisions all four variables, I will include in the model both the level and changes of earnings and cash flows. The results of the value relevance of both the levels and changes of cash flows (earnings) beyond earnings (cash flows) are presented in Table 14. It is hypothesized that the coefficients of the earnings variables be positive and statistically significant. Also the coefficients of the cash flow variables are expected to be positive and statistically significant due to the increased attention to cash flow reporting in recent years and due to the importance of cash flows in the capital markets.

Consistent with my research hypothesis, results in Table 14 indicate clearly that the levels and changes in earnings are valued by investors beyond cash flows. All the coefficients of earnings are consistent with the expectations, i.e. positive and statistically significant. The sum of the coefficients of earnings is close to unity (as expected) in all three countries. Specifically the sum of the earnings coefficients (b1+b2) is 1.01, 0.933, and 0.725 in France, the USA and the UK respectively. These results indicate that investors in France pay more attention on earnings in making investment decisions, compared to investors in the USA and UK. In contrast, results indicate that investors in the UK pay much less attention on earnings in making investment

decisions. This may be due to the fact that earnings in a common law country, such as the UK, are much easier to be manipulated than in a code law conservative country such as France.

Table 14
Multivariate analysis regression results for all years tested for all firms for the USA, UK and France.
MODEL WITH FOUR VARIABLES

Results for the level and changes of earnings and cash flow model: $RET = a0 + b1\ E + b2\ \Delta E + b3\ CFO + b4\ \Delta CFO$

COUNTRY		Constant	E	ΔE	CFO	ΔCFO	b1+b2	b3+b4	N	F - value	R2 adj
USA	Coefficient	0.066 *	0.419*	0.514*	0.248*	-0.157*	0.933*	0.091*	35873	876.9 *	8.90%
	t-statistic	21.87	21.198	27.341	13.663	-10.005	46.832	5.865			
	VIF's		1.793	1.541	2.098	1.84	0.020	0.016			
UK	Coefficient	0.038 *	0.439*	0.286*	0.223*	-0.014	0.725*	0.209*	4178	129.5 *	11.00%
	t-statistic	(5.862)	(8.395)	(6.271)	(5.913)	(-0.467)	15.237	6.529		[0.000]	
	VIF's		1.930	1.721	2.003	1.762	0.048	0.032			
FRANCE	Coefficient	0.019 ***	0.572*	0.438*	0.061	-0.048	1.010*	0.013	1165	49.5 *	17.90%
	t-statistic	(1.693)	(7.842)	(6.401)	(1.390)	(-1.273)	12.986	0.307		[0.000]	
	VIF's		1.297	1.306	1.459	1.403	0.078	0.042			

*, **, *** Statistically significant at a=1%, 5% and 10% respectively; ( ), Figures in parentheses represent t-statistic; [], Figures represent p-value

Where E: operating earnings, ΔE: Changes in earnings, CFO: Operating cash flows, ΔCFO: changes in Operating Cash flows; RET: annual security returns. All Independent variables (E, ΔE, CFO, ΔCFO) are deflated by the market value of the firm at fiscal year end of the previous year.

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Regarding the importance of cash flows is concerned, results in Table 14 indicate that the cash flow variables are taken into consideration for investment decisions in the UK and the USA. The sum of the cash flow coefficients b_3+b_4 are 0.209, 0.091 and 0.013 in the UK, the USA and France, respectively. As it can be seen, again in the UK investors pay much more attention on cash flows compared to the investors in France. As far as the significance of the models is concerned, results indicate that the model is statistically significant as it is shown by the F-values and p-values. Specifically, the F-values of the models are 876.9, 129.5 and 49.5, for the USA, the UK and France, respectively. In all three countries, the models are highly statistically significant at p=0.000. As far as the explanatory importance of the models is concerned, the models' R^2 is the highest in France, and this is mainly due to the significance of earnings. Specifically, the R^2s are 17.90%, 11.0% and 8.90% in France, the UK and the USA, respectively. These results indicate that French capital market participants take more into consideration the earnings information in making investment decision, whereas investors in the UK and in the USA do take into consideration both earnings and cash flows, but the UK and the USA markets do not value this earnings and cash flow information as the French market.

In summary, the results presented thus far in this section do support my research hypothesis 2. Specifically, the following conclusions can be drawn by testing hypothesis 2: a) that earnings are valued by investors in all three countries, b) earnings are valued more by French investors and the least by USA investors, c) cash flows are valued by investors in the UK and the USA only, given earnings, d) cash flows are valued mostly by UK investors, given earnings, e) all models in all three countries are highly statistically significant as shown by the p-value of the models, f) variability in stock prices is affected mostly in France by the variables included in the model, as it is shown by the high R^2 (17.9%). In contrast, the lowest variability in stock prices

is shown in the USA (R^2 is 8.9%), g) the models are not affected by any collinearity problems since in all three countries the Variance Inflation factors (VIF) are relatively low.

The aforementioned discussion related to all year results for all three countries. Results in Tables 15, 16 and 17 extend the results provided in Table 14. Yearly results are presented for all 3 countries for at least a nine-year period. These results confirm the evidence provided in Table 14, i.e. that earnings are strongly valued by the investors in all three countries, the USA, the UK and France. In all countries, in all years, earnings were positive and statistically significant. More specifically, as hypothesised, results in Table 15 indicate that the sum of the coefficients of the level and changes in earnings is positive and statistically significant. The average sum of those coefficients is 0.725, which means that for every sterling of increase in the earnings in the UK, it is expected that the stock price will increase by 72.5 pence. As far as the role of cash flows is concerned, results indicate that in most years tested the sum of the coefficients of cash flows b_3+b_4 is positive and statistically significant in four years. However, if we take into consideration all years together, the sum of the coefficients of cash flows is positive and statistically significant, i.e. $b_3+b_4=0.2093$. These results indicate that investors in the UK do take into consideration cash flows, in addition to earnings in their investment decisions. Specifically, for every one sterling increase in cash flows for a firm, it is expected that on average the stock price will go up by about 20 pence. Furthermore, results indicate that the UK models are statistically significant in all years tested as it is shown by the high F-values and the p-values of the model. Moreover, the mean R^2 for all years is 11% and in all years it ranges from 8.2% to 21%. As expected, these results indicate that in the UK the variation of security prices is affected by the earnings and cash flow variables. In summary, the UK results presented in Table 15 indicate that a) the level and changes of earnings are important to UK investors for investment decisions, b) cash flows are important as well to UK investors for investment decisions, c) earnings are at least

three times as important than the cash flows ($b_1+b_2= 0.725$ vs $b_3+b_4= 0.209$), and d) the earnings

and cash flow model is statistically significant in all years tested.

TABLE 15
Annual multivariate analysis regression results for all years tested for all firms for the UK

UK

Model : RET = a0+ b1 E +b2ΔE +b3 CFO + b4 ΔCFO

YEAR	Intercept	E	ΔE	CFO	ΔCFO	E+ΔE	CFO+ΔCFO	N	F-VALUE	R² adj
	ao	b1	b2	b3	b4	b1+b2	B3+b4			
1990	-0.1140*	1.8620*	0.7750*	-0.1480	0.0785	2.6370*	-0.0695	160	11.559 *	21.00%
t-value	-2.7260	4.4080	2.7350	-0.5620	-0.3740	6.4952	-0.5307		[0.000]	
Std error						0.4060	0.1309			
1991	0.1150*	0.8560*	0.9350*	0.1820	-0.1300	1.7910*	0.0520	392	22.790 *	18.20%
t-value	3.7970	3.1580	3.8540	1.3130	-1.2920	8.5470	0.4957		[0.000]	
Std error						0.2095	0.1049			
1992	0.0371**	0.4440*	0.2120**	0.0853	0.0508	0.6560*	0.1360***	421	16.458 *	12.80%
t-value	-1.9710	3.9600	1.9900	1.0720	0.8420	6.4506	1.8631		[0.000]	
Std error						0.1017	0.0730			
1993	0.1950*	0.1960	0.4380*	0.3620*	0.0435	0.6340*	0.4055*	434	24.563 *	17.90%
t-value	8.8280	1.3620	4.1410	3.8600	0.5860	3.1034	4.6150		[0.000]	
Std error						0.2043	0.0879			
1994	0.0311***	0.3780*	0.3360*	0.2080**	-0.2170*	0.7140*	-0.0090	468	12.032 *	8.60%
t-value	1.8970	2.7660	2.9790	2.4220	-3.3080	4.7236	-0.1074		[0.000]	
Std error						0.1512	0.0838			
1995	0.1620*	0.0060	0.4100**	0.2730**	0.0087	0.4160*	0.2817*	500	15.753 *	10.60%
t-value	9.3170	0.0330	2.4630	2.3110	0.0980	3.3444	3.1124		[0.000]	
Std error						0.1244	0.0905			
1996	0.1060*	0.7850*	-0.2310	0.0534	0.1370	0.5540*	0.1904	518	12.507 *	8.20%
t-value	6.1400	4.2790	-1.6690	0.3980	1.2960	3.7436	1.7454		[0.000]	
Std error						0.1480	0.1091			
1997	0.0329***	0.5440*	0.3040**	0.3990*	-0.2330***	0.8480*	0.1660	557	21.485 *	12.80%
t-value	1.7460	3.3740	2.0450	2.7040	-1.7840	5.6940	1.6116		[0.000]	
Std error						0.1489	0.1030			
1998	-0.1460*	0.4950*	0.1320	0.1000	0.1370***	0.6270*	0.2370*	728	23.071 *	10.80%
t-value	-9.4270	4.0700	1.2060	0.9790	1.7590	6.6276	3.0941		[0.000]	
Std error						0.0946	0.0766			
ALL YEARS	0.0384*	0.4390*	0.2860*	0.2230*	-0.0137	0.7250*	0.2093*	4178	129.594 *	11.00%
t-value	5.6620	8.3950	6.2710	5.9130	-0.4670	15.2370	6.5273			
VIF's		1.9300	1.7210	2.0030	1.7620					

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As far as the importance of earnings and cash flows on an annual basis for the USA is concerned the results are presented in Table 16. More specifically, as it was hypothesized, results indicate that the sum of the coefficients of the level and changes in earnings is positive and statistically significant in all years from 1987-98. The average sum of those coefficients is 0.933, which means that for every dollar of increase in the earnings in the USA, it is expected that the stock price will increase by about 93 cents. As far as the role of cash flows is concerned, results indicate that in most years tested the sum of the coefficients of cash flows b_3+b_4 is positive and statistically significant in five years. However, if we take into consideration all years together the sum of the coefficients of cash flows is positive and statistically significant, i.e. $b_3+b_4=0.091$. These results indicate that investors in the USA take into consideration cash flows, in addition to earnings in their investment decisions. Specifically, for every one dollar increase in cash flows for a firm, it is expected that on average the stock price will go up by about 9 cents. Furthermore, results indicate that the USA models are statistically significant in all years tested as it is shown by the high F-values and the p-values of the model. Moreover, the mean R^2 for all years is 8.9% and in all years it ranges from 5.3% to 15%. As expected, these results indicate that in the USA the variation in security prices is affected by the earnings and cash flow variables.

In summary, these USA results presented in Table 16 do support my research hypothesis. Specifically, results indicate that a) the level and changes of earnings are important to USA investors for investment decisions, b) cash flows are important as well to USA investors for investment decisions, c) earnings are at least nine times as important than the cash flows (b1+b2= 0.933 vs b3+b4= 0.091), d) the earnings and cash flow model is statistically significant in all years tested as it is shown by the F-statistic and p-values.

TABLE 16
Annual multivariate analysis regression results for all years tested for all firms for the USA

USA   Model : RET = a0+ b1 E +b2ΔE +b3 CFO + b4ΔCFO

YEAR	Intercept	E	ΔE	CFO	ΔCFO	E+UE	CFO+ΔCFO	N	F-VALUE	R² adj
	ao	b1	b2	b3	b4	b1+b2	b3+b4			
1987	-0.1060*	0.3870*	0.5490*	0.3720*	-0.2230*	0.9360*	0.1490*	1837	63.244 *	11.90%
t-value	-9.9590	5.0720	7.9810	5.7780	-3.9770	12.2387	2.7940		[0.000]	
Stand. error						0.0765	0.0533			
1988	0.0693*	0.7040*	0.4460*	0.1270*	-0.0676	1.1500*	0.0594	2000	89.354 *	15.00%
t-value	6.7600	9.9400	6.6140	2.1590	-1.3620	15.8942	1.1918		[0.000]	
						0.0724	0.0498			
1989	0.0425*	0.6380*	0.4450*	0.2220*	-0.0772	1.0830*	0.1448*	2122	84.471 *	13.60%
t-value	3.9700	9.1940	6.8810	3.5600	-1.5060	15.0986	3.0043		[0.000]	
						0.0717	0.0482			
1990	0.0019	0.5300*	0.4530*	-0.0216	0.0044	0.9830*	-0.0171	2219	50.214 *	8.10%
t-value	1.5430	7.2720	6.3640	-0.3210	0.0820	13.0742	-0.3065		[0.000]	
						0.0752	0.0559			
1991	0.2770*	0.2630*	0.6350*	0.1190***	-0.1180**	0.8980*	0.0010	2246	48.374 *	7.80%
t-value	18.9590	3.7650	9.3010	1.8850	-2.1460	12.2361	0.0167		[0.000]	
						0.0734	0.0597			
1992	0.0960*	0.3180*	0.7310*	0.3560*	-0.0856***	1.0490*	0.2704*	2427	92.690 *	13.10%
t-value	8.0850	4.2210	10.6040	5.4890	-1.5720	14.1602	4.7076		[0.000]	
						0.0741	0.0574			
1993	0.1340*	0.2730*	0.6840*	0.2190*	-0.1100***	0.9570*	0.1090***	2726	71.957 *	9.40%
t-value	12.5510	3.7830	9.6190	3.3660	-1.8650	13.4615	1.9132		[0.000]	
						0.0711	0.0570			
1994	0.0073*	0.3560*	0.5870*	0.3890*	-0.2180*	0.9430*	0.1710*	3172	87.012 *	9.80%
t-value	0.8230	5.1810	9.0900	6.1230	-4.0090	13.0833	3.1473		[0.000]	
						0.0721	0.0543			
1995	0.2440*	0.4010*	0.6260*	0.0070	-0.0498	1.0270*	-0.0428	3495	63.829 *	6.70%
t-value	22.8690	5.6470	8.9770	0.1040	-0.8420	13.9166	-0.7398		[0.000]	
						0.0738	0.0579			
1996	0.0422*	0.6150*	0.3310*	0.2480*	-0.2170*	0.9460*	0.0310	4114	143.834 *	12.20%
t-value	5.0890	11.1280	6.5920	4.8840	-4.8530	17.6277	0.7192		[0.000]	

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1997	.0.1920*	0.5230*	0.4720*	0.3330*	-0.2690*	0.9950*	0.0640	4698	134.942 *	10.20%
t-value	21.5850	8.7670	8.1920	5.7690	-5.4210	17.2867	1.3799		[0.000]	
1998	-0.1720*	0.2580*	0.4530*	0.0932***	-0.9767***	0.7110*	-0.8835	4815	68.754 *	5.30%
t-value	-22.1910	4.8990	9.3670	1.7770	-2.2100	13.8615	-20.311		[0.000]	
ALL YEARS	0.0663*	0.419*	0.514*	0.248*	-0.157*	0.9330*	0.0910*	35873	876.991 *	8.90%
t-value	21.87	21.198	27.341	13.663	-10.005	46.8318	5.8655		[0.000]	
VIF's		1.793	1.541	2.098	1.84					

Finally, as far as the importance of earnings and cash flows on an annual basis for France is concerned the results are presented in Table 17. More specifically, as it was hypothesized, results indicate that the sum of the coefficients of the level and changes in earnings is positive and statistically significant in all years from 1990-98. The average sum of those coefficients is 1.01, which means that for every Euro of increase in the earnings in France, it is expected that the stock price will increase by about one Euro. As far as the role of cash flows is concerned, results indicate that the sum of the coefficients of cash flows $b3+b4$ is not statistically significant. However, if we take into consideration all years together the sum of the coefficients of cash flows is positive and statistically insignificant, i.e. $b3+b4=0.0129$. These results indicate that investors in France may not take into consideration cash flows, in addition to earnings in their investment decisions. Furthermore, results indicate that the French models are statistically significant in all years tested as it is shown by the high F-values and the p-values of the model. Moreover, the mean R^2 for all years is 17.9% and in all years it ranges from 15.9% to 27.8%. As expected, these results indicate that in France the variation of the securities prices is affected mainly by the earnings variables.

In summary, the French results presented in Table 17 do support my research hypothesis. Specifically, results indicate that a) the level and changes of earnings are important to French investors for investment decisions, b) cash flows are not that important to French investors for investment decisions, beyond earnings information , c) earnings are considered far more important than cash flows $(b1+b2=1.01$ vs $b3+b4=0.0129)$, d) the earnings and cash flow model is statistically significant in all years tested as it is shown by the F-statistic and p-values.

TABLE 17

Annual multivariate analysis regression results for all years tested for all firms for France

FRANCE   Model : RET = a0+ b1 E +b2ΔE +b3 CFO + b4 ΔCFO

YEAR	Intercept	E	UΔE	CFO	ΔCFO	E+ΔE	CFO+ΔCFO	N	F-VALUE	R^2 adj
	ao	b1	b2	b3	b4	B1+b2	b3+b4			
1991	0.1640*	0.1820	0.9430*	-0.0163	-0.0705	1.1250*	-0.0868	75	4.590 *	16.30%
t-value	3.2710	0.4740	3.4600	-0.0650	-0.4010	2.7554	-0.4195		[0.002]	
Std error						0.4083	0.2069			
1992	-0.0058	1.0950*	0.3020	-0.0510	-0.0813	1.3970*	-0.1323	88	8.766 *	26.30%
t-value	-0.1430	3.6770	1.5280	-0.3210	-0.5970	5.6752	-0.8228		[0.000]	
Std error						0.2462	0.1608			
1993	0.1260*	0.9400*	0.0926	0.3640*	0.0368	1.0326*	0.4008*	87	9.270 *	27.80%
t-value	3.1480	4.3410	0.4020	3.4350	0.3910	3.5535	3.1661		[0.000]	
Std error						0.2906	0.1266			
1994	-0.0065	2.2570*	1.0400*	-0.268***	0.1150	3.2970*	-0.1530	107	8.998 *	23.20%
t-value	-0.1760	5.7810	4.0000	-1.9910	0.8660	9.1410	-1.1480		[0.000]	
Std error						0.3607	0.1333			
1995	0.0437	0.5890*	0.3180***	-0.0050	-0.202***	0.9070*	-0.2070	135	7.761 *	16.80%
t-value	1.4950	3.3470	1.5750	-0.0320	-1.6970	5.0019	-1.2404		[0.000]	
Std error						0.1813	0.1669			
1996	0.0591**	0.8140*	0.2930***	-0.0879	-0.0808	1.1070*	-0.1686	195	11.469 *	17.80%
t-value	2.1820	4.8770	1.8860	-0.6910	-0.6380	6.2934	-1.8222		[0.000]	
Std error						0.1759	0.0925			
1997	0.0423	0.9920*	0.2930***	0.0379	-0.0712	1.2850*	-0.0333	215	12.134 *	17.20%
t-value	1.4670	5.4520	1.7030	0.4110	-0.9000	6.2737	-0.3616		[0.000]	
Std error						0.2048	0.0921			
1998	-0.0867*	0.2300	0.7810*	-0.0266	0.0185	1.0110*	-0.0082	262	13.329 *	15.90%
t-value	-3.5790	1.5270	5.0510	-0.2710	0.2310	6.6223	-0.0827		[0.000]	
Std error						0.1527	0.0987			
ALL YEARS	0.020***	0.572*	0.438*	0.061	-0.048	1.0100*	0.0129	1165	49.553 *	17.90%
t-value	1.693	7.842	6.401	1.390	-1.273	12.986	0.3069		[0.000]	
VIF's		1.297	1.306	1.459	1.403					

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*, **, *** Statistically significant at a=1%, 5% and 10% respectively; ( ), Figures in parentheses represent t-statistic; [], Figures represent p-value

Where E: operating earnings, ΔE: Changes in earnings, CFO: Operating cash flows, ΔCFO: changes in Operating Cash flows; RET: annual security returns. All Independent variables (E, ΔE, CFO, ΔCFO) are deflated by the market value of the firm at fiscal year end of the previous year.

In summary, the results presented in Tables 14-17 are consistent with my expectations and they do support my research hypothesis 2. The following conclusions can be drawn: a) that earnings are valued by investors in all three countries, the USA, the UK, and France, b) earnings are valued more by French investors and the least by USA investors, c) cash flows are valued by investors in Anglo-Saxon countries (the UK and the USA) only, given earnings, but cash flows do not seem to be valued by French investors d) cash flows are valued mostly by the UK investors, given earnings, e) all models in all three countries are highly statistically significant as it is shown by the p-value of the models, f) variability in the stock prices is affected mostly in France by the variables included in the model, as it is shown by the high R^2 (17.9%). In contrast, the lowest variability in the stock prices from these variables is shown in the USA (R^2 is 8.9%).

Even though the above results strongly support the usefulness of earnings and cash flows in investment decisions, the results should be interpreted with caution since by using aggregate data, it may be inferred that the relationship between earnings and cash flows with stock prices is homogeneous across firms. It should be noted that the assumption that investors react identically to earnings and cash flows by all firms may not be realistic. Thus, in what follows the above models are extended to take into consideration further relevant factors.

6.3.3 Statistical analysis results related to the contextual factors.

In this section, 1 will extend the previous results related to the valuation of earnings and cash flows by taking into consideration additional factors that investors and security analysts may take into consideration in making investment decisions. Specifically, 1 will examine the following factors:

a. Industry analysis for each country (Hypothesis 3)

b. Analysis for longer return windows for each country (Hypothesis 4)

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c. Analysing the usefulness of earnings and cash flows for each country when earnings are

transitory (Hypothesis 5)

d. Analyzing the valuation of financial information (earnings and cash flows) by country

(Hypothesis 6).

A discussion, analysis and critical evaluation of the results related to each one of the above

factors tested follows.

6.3.3.1 Multivariate analysis regression results for testing the relative valuation of earnings and cash flows by industry effects for each country.

Hypothesis 3 predicts that investors in making investment decisions pay different attention to

earnings and cash flows, and this depends on the industry. The inconclusive results of previous

studies, their weak explanatory power, as well as the instability of the earnings and cash flow

coefficients, led researchers and myself to a further examination of this issue.

This research hypothesis tests the theoretical model [50] developed in the previous chapters

by taking into consideration industry specific factors. This hypothesis predicts that operating

earnings and operating cash flows are associated with security returns, but the relationship is

industry specific. Prior empirical studies which examined the usefulness of earnings and cash

flows used mainly aggregate data. One of the major problems of previous studies that examined

the association of operating earnings and cash flows with stock prices is that researchers assumed

that the earnings and cash flow coefficients are the same for all firms regardless of the industry

they belong to. However, researchers support that the assumption made in previous studies that

investors are not affected by industry factors, it may not be that realistic. The results that follow

extend previous studies by examining the contention made by researchers that earnings and cash

flow information is industry specific. More specifically, hypothesis 3 supports that the relative

valuation of the levels and changes of operating earnings and cash flows is industry specific.

Table 18 presents results for all years for all three countries for three major industrial sectors. These industrial sectors are: a) manufacturing, b) retail, and c) service. As per Standards and Poors, firms are classified by industry by taking into consideration a Standard Industrial Classification (SIC) code. Firms with SIC code from 100 to 4999 are classified as manufacturing, firms with SIC code from 5000 to 5999 are classified as retail, and finally, firms with SIC code from 7000 to 8999 are classified as service organizations. Clearly, these type of industries have different financial characteristics. For example, manufacturing firms are more capital intensive compared to retail and service organizations. Capital intensiveness may lead to a greater need for cash flows for reinvestment purposes. Moreover, manufacturing firms have greater depreciation expenses and thus the difference between earnings and cash flows in manufacturing firms may be greater when compared to the retail and service firms. Furthermore, manufacturing and retail firms are expected to maintain higher inventory levels compared to service organizations. This difference in the inventory levels may lead to greater differences between earnings and cash flows in these two industries if there are great variations in inventory levels from year to year. For example, great increases in inventory levels in one year, assuming cash was used to manufacture or acquire this inventory, will lead to a reduction in cash flows.

TABLE 18

Multivariate analysis regression results by Industry for all years tested for all firms for the UK, USA and France

Model : RET = a0+ b1 E +b2ΔE +b3 CFO + b4ΔCFO

COUNTRY	INDUSTRY	Constant a_o	E b_1	ΔE b_2	CFO b_3	ΔCFO b_4	R^2	F-value	Model Signif	Number of firms
		(First line the slope coefficient, Second line the t-value)					%			
UK	Manufacturing	0.027	0.39	0.27	0.25	-0.006	11.3	88.8	0.00*	2761
		(3.34)*	(6.57)*	(5.38)*	(5.45)*	(-0.17)				
	Retail	0.04	0.63	0.33	0.14	-0.07	12.3	32.1	0.00*	886
		(2.59)**	(4.82)*	(2.69)*	(1.83)***	(-1.06)				
	Service	0.09	0.479	0.185	0.165	0.09	8	12.5	0.00*	531
		(4.17)*	(2.45)**	(0.98)	(1.23)	(0.66)				4178
USA	Manufacturing	0.06	0.388	0.554	0.266	-0.176	9.4	679.9	0.00*	26168
		(17.9)*	(16.5)*	(25.3)*	(12.2)*	(-9.5)*				
	Retail	0.067	0.512	0.4	0.184	-0.112	8.6	120.9	0.00*	5114
		(9.0)*	(10.8)*	(8.2)*	(4.8)*	(-3,2)*				
	Service	0.08	0.452	0.433	0.265	-0.125	7.2	90.4	0.00*	4591
		(8.0)*	(7.2)*	(7.6)*	(4.3)*	(-2.3)**				35873
FRANCE	Manufacturing	0.006	0.498	0.443	0.06	-0.06	14.4	37.1	0.00*	860
		(0.42)	(6.48)*	(5.90)*	(1.32)	(-1.35)				
	Retail	0.02	1.27	0.195	0.167	-0.146	18.5	10.6	0.00*	170
		(0.66)	(4.7)*	(1.06)	(1.34)	(-1.31)				
	Service	0.06	1.05	0.89	-0.06	0.11	13,1	6	0.00*	134
		(1.79)***	(2.27)**	(2.04)**	(-0.32)	(0.52)				1164

*, **, *** Statistically significant at a=1%, 5% and 10% respectively; ( ), Figures in parentheses represent t-statistic;

Where E: operating earnings, ΔE: Changes in earnings, CFO: Operating cash flows, ΔCFO: changes in Operating Cash flows; RET: annual security returns.

All Independent variables (E, ΔE, CFO, ΔCFO) are deflated by the market value of the firm at fiscal year end of the previous year.

Specifically results in Table 18 indicate the following. First, as hypothesized, the level of earnings variables is statistically significant in all industries in all countries. In all three countries, the earnings coefficient is the highest in the retail industry (0.63, 0.512. and 1.27 for the UK, the USA and France, respectively). As far as the changes in earnings is concerned, results indicate that it is always statistically significant in the manufacturing industry. In the service and retail industry it is not significant in the UK and France, respectively. Second, as far as the role of the cash flows is concerned, results indicate that there exist industry differences that were not observed when the previous hypotheses were tested. Specifically, the level of cash flows seems to be more important to investors in the manufacturing industry. In the Anglo-Saxon countries, the UK and the USA, it is positive and statistically significant (0.25 and 0.266). Results in these Anglo-Saxon countries also indicate that the level of cash flows plays more important role to investors compared to the service industry. These results are consistent with my expectations since firms in the manufacturing have much more accruals due to higher levels of property, plant, equipment and inventory. Since these type of firms have much higher accruals, earnings can be manipulated more in these industries and thus investors and analysts pay more attention to cash flows.

As far as the French results in Table 18 are concerned, they indicate that there is no statistically significant difference among the industries. These results are again consistent with the expectations since in code law countries there is less manipulation in financial reports. Third, as far as the model significance is concerned, in all three industries the models are highly statistically significant as it is shown by the p-values and the F-values of the model (always p-value = 0.000). The F-value is shown to be the highest in the manufacturing industry in all countries examined, and it is shown to be the lowest in the service industry. Fourth, in all countries examined the lowest R^2 is shown in the service industry. In two countries, the UK and

France, the highest overall R^2 is shown in the retail industry. These results indicate that the variability of the stock prices is the lowest in the service industry, when taking into consideration financial information, such as earnings and cash flows.

In summary, consistent with my hypothesis and my expectations, these results indicate that earnings and cash flow information is industry specific, that is investors and financial analysts pay different attention to earnings and cash flows depending on the industry they analyze. Specifically, investors value more the earnings in the service industry, partly because in that industry the manipulation of earnings is the least because there exist the least accruals (i.e. depreciation, amortization, inventories, etc). As far as the cash flow information is concerned, results indicate that investors value cash flow more in the manufacturing industry. This is not surprising, because as I have already argued in this industry investors and financial analysts expect greater manipulation of earnings due to much higher accruals (i.e. depreciation, amortization, inventories, etc), and thus analysts pay less attention to earnings and consequently pay more attention to cash flows.

Table 19

Multivariate Regressions over Longer Return Interval

Model : Ret = a + b_1 E + b_2 CFO

(First line is the slope coefficient, 2nd line is t-statistic)

Country		Constant	E	CFO	R^2 Adj %
FRANCE	Annual	0.014 (1.23)	0.756 (11.13')*	0.072 (1.87')***	11.4%
	2 Years	0.040 (2.3)**	1.050 (15.6)*	0.090 (3.22)*	20.3%
	3 Years	0.090 (3.5)*	0.820 (14.4)*	0.120 (4.2)*	26.5%
	4 Years	0.063 (1.83)***	0.920 (13.9)*	0.170 (5.76)*	30.6%
	5 Years	0.100 (1.89)***	0.640 (10.3)*	0.230 (6.7)*	32.0%
UK	Annual	0.029 (4.49')*	0.598 (13.68')*	0.239 (7.71)*	10.1%
	2 Years	0.110 (14.8)*	0.730 (24.3)*	0.060 (2.8)*	15.2%
	3 Years	0.160 (14.6)*	0.720 (23.4)*	0.120 (5.4)*	19.4%
	4 Years	0.170 (10.8)	0.940 (26.3)	0.146 (6.8)	24.5%
	5 Years	8.500 (8.2)*	1.130 (29.5)*	0.070 (1.68)***	35.2%
USA	Annual	0.076 (25.27)*	0.666 (38.13)*	0.152 (10.28)*	7.0%
	2 Years	0.260 (43.6)*	0.570 (35.5)*	0.110 (7.4)*	9.8%
	3 Years	0.450 (44.8)*	0.600 (32.6)*	0.090 (5.9)*	13.6%
	4 Years	0.570 (44.3)*	0.620 (38.5)*	0.150 (9.4)*	21.4%
	5 Years	0.680 (43.7)*	0.750 (41.3)*	0.160 (9.53)*	27.8%

where E: operating earnings, CFO: operating cash flows, RET: security returns
*, **, *** Statistically significant at a= 0.01, 0.05 and 0.10 respectively
see Chapter IV, methodology, for the estimation of each variable.

6.3.3.2 Multivariate regression analysis results for examining the valuation of earnings and cash flows when the measurement interval increases.

Hypothesis 4 predicts that the value relevance of earnings and cash flows improves as the measurement interval increases. Results shown in Table 19 provide support for the research hypothesis that tests the theoretical model [67] developed in chapter III. It is argued that over longer measurement intervals, the importance of accruals will diminish because manipulation by managers will not affect longer run earnings and cash flows and therefore the association between security returns and earnings and cash flows is expected to improve. Cash flows suffer more from timing and matching problems over short measurement intervals because they have no accrual adjustments and the accruals associated with cash flows are long-term in nature and they do not reverse in the short-run (Dechow, 1994). On the other hand, the explanatory power of earnings compared to cash flows is expected to be the highest over short measurement intervals, because earnings include accruals that mitigate the timing and matching problems related to the organization's operating, investing and financing cash flows. Previous USA and UK studies showed that there is a relative increase in the explanatory power of earnings over longer measurement intervals (Easton et al., 1992; Charitou, 1997; Dechow, 1994). Thus far, there has been limited research on the value relevance i) of cash flows over long measurement intervals, and ii) of earnings and cash flows in the USA, the UK and France.

Results in Table 19 provide multivariate regression results over longer-return intervals. Thus far, results were presented using annual return windows. That means that all returns, earnings and cash flow variables included in the model were measured on an annual basis, i.e. the way they are reported in the annual reports of the firms. Results in this table are presented for measurement intervals of 1, 2, 3, 4 and 5 years, for each country. For example, to test the five year model all variables included in the model, returns, earnings and cash flows were measured

over a five year period., i.e. for the earnings variable the earnings of a five year period were added together. The same applies to cash flows and returns. Results in table 19 indicate the following: first, as expected, for all countries, the five-year models have the highest R^2, compared to the other one to four year models. For example, for the one year models, the R^2 is 11.4%, 10.1% and 7%, for France, the UK and the USA respectively, whereas the five year model R^2 results are 32%, 35.2% and 27.8%, for France, the UK and the USA, respectively.

As it can be seen, by increasing the measurement interval from one year to five years, the explanatory power of the regression model increases about three times. From the practitioner point of view, it means that the annual earnings and cash flows explain about 11.4% of the variability of the security returns in France, but in a five-year period the same earnings and cash flows explain about 32% of the variability of stock returns. Second, again as hypothesized, in all countries, the explanatory power of the model increases when 1 increase the measurement interval. For example, in the UK, the R^2 is only 10.1% in the one year interval, and it goes up to 15.2%, 19.4%, 24.5% and finally to 35.2% when 1 increase the interval to two, three, four and five years. Third, in all models tested for all countries for all measurement intervals, the earnings variable is positive and statistically significant, as it was expected. Fourth, similar to the earnings variable, the cash flow variable is positive and statistically significant in all models tested in all three countries. Fifth, interestingly, the explanatory power of the model from one to five years increases the highest in the USA (almost quadruples, 7% to 27.8%), whereas increases the least in France (almost triples, 11.4% for the annual and 32% for the five year interval). These results are not that surprising and they are consistent with my expectation. These results are due to the fact that in the shorter run there is a greater manipulation of financial information in Anglo-Saxon countries than in more conservative countries such as France. Thus, in Anglo-Saxon countries, such as the USA and the UK, the increase in the value relevance of financial

information over longer-return windows is greater than in a code law country, such as France.

In summary, results in Table 19 provide support in favor of my research hypothesis 4 which states that as the measurement interval increases the role of both earnings and cash flows in explaining stock returns improves. This is due to the fact that in the longer run any manipulation by managers of any type of financial information is cancelled out, and thus earnings and cash flows are becoming smoother.

6.3.3.3 Multivariate regression analysis results for examining the valuation of earnings and cash flows when the earnings are transitory.

Hypothesis 5 predicts that the value relevance of earnings decreases when earnings are transitory and thus, the value relevance of cash flows is expected to improve in all three countries when earnings are transitory. This research hypothesis tests the theoretical model [58] developed earlier in this study in chapter III.

The issue of the earnings permanence has raised the stimulus in the present study in examining the role of operating cash flows when earnings are transitory. As Cheng, Liu and Schafer (1996) argue, earnings may contain transitory items with limited valuation implications. For example, transitory items that may be included are accruals such as losses due to restructuring, current recognition through sale of assets of previous' period's, increases in market value, one-time impact on income from changes in accounting standards etc. Moreover, because of compensation contracts and debt covenants are usually based on profit, incentives exist for managers to introduce transitory elements in earnings and thus manipulate earnings.

Results in Table 20 provide evidence to support hypothesis 5, that is, when earnings are transitory the role of earnings in stock markets decreases and the role of cash flows improves.

Consistent with prior studies and with my theoretical framework, I included in my multivariate regression model in Table 20 both the level and changes of earnings and cash flows (Cheng, Liu and Schafer, 1996), in order to characterise the unexpected components of earnings and the unexpected components of cash flows from operations. This is done in order to test the hypothesis that when earnings are transitory the earnings response coefficients on both levels and changes will have reduced significance in explaining security returns. In this situation the importance of cash flows from operations will be greater. Therefore, in the model in Table 20 and in the theoretical model [58] presented in a previous chapter, the coefficients $c_{1t} + c_{2t}$ and $c_{3t} + c_{4t}$ represent the estimates of the earnings and cash flow response coefficients when earnings are mainly permanent. The coefficients $c_{5t} + c_{6t}$ and $c_{7t} + c_{8t}$ capture the additional information content of earnings and cash flows for firms with predominantly transitory earnings. It is expected that $c_{5t} + c_{6t}$ to be negative and $c_{7t} + c_{8t}$ to be positive.

TABLE 20

Multivariate regression analysis results for all years for all firms for the UK, USA and France when earnings are transitory.

$$\text{MODEL } RET_{it} = c_0 + c_1 E_{it} + c_2 \Delta E_{it} + c_3 CFO_{it} + c_4 \Delta CFO_{it} + c_5 E_{it}*D + c_6 \Delta E_{it}*D + c_7 CFO_{it}*D + c_8 \Delta CFO_{it}*D + e_{it}$$

COUNTRY	Constant c_0	E c_1	ΔE c_2	CFO c_3	ΔCFO c_4	D*E c_5	D*ΔE c_6	D*CFO c_7	D*ΔCFO c_8	E+ΔE c_1+c_2	CFO+ΔCFO c_3+c_4	D*E+D*ΔE c_5+c_6	D*CFO+D*ΔCFO c_7+c_8	R^2 %
UK	0.068 (8.9)*	0.25 (2.2)**	5.4 (8.65)*	0.27 (3.54)*	-0.12 (-1.97)**	-0.073 (-0.6)	-4.86 (-7.7)*	0.06 (1.72)***	-0.03 (-0.46)	5.65 (9.5)*	0.15 (2.6)*	-4.933 (-7.9)*	0.03 (1.79)	15.6
USA	0.095 (22.3)*	0.35 (5.2)*	5.53 (22.7)*	0.15 (3.53)*	-0.055 (-1.45)	0.16 (2.17)**	-4.96 (-20.7)*	0.132 (2.76)*	-0.112 (-0.73)	5.88 (24.1)*	0.095 (2.63)*	-4.8 (-21.2)*	0.02 (1.68)	12.8
FRANCE	0.01 (0.63)	1.23 (4.72)*	4.43 (4.36)*	0.12 (1.41)	0.06 (0.73)	-0.41 (-1.6)*	-4.1 (-3.88)*	0.06 (0.6)	-0.07 (-0.1)	5.66 (5.72)*	0.18 (2.01)**	-4.51 (-4.56)*	-0.01 (-0.64)	17.2

Earnings are transitory as defined in Chapter IV, methodology. Transitory if $\Delta E / P_{t-1}$ is above median, and permanent if $\Delta E / P_{t-1}$ is below median

where E: operating earnings, ΔE: change in earnings, CFO: operating cash flows, ΔCFO= change in operating earnings, RET= security returns

D: dummy variable that takes the value of 1 if earnings are transitory and it takes the value of zero if earnings are permanent.

*, **, *** Statistically significant at a= 0.01, 0.05 and 0.10 respectively

Specifically, results in Table 20 indicate the following. First, as expected, the sum of the coefficients of earnings (c_3+c_4) are positive and statistically significant in all three countries, the USA, the UK and France. These results indicate that in all three countries, the earnings are taken into consideration in the valuation of stock prices by security analysts and investors. Second, as expected, the sum of the coefficients of cash flows is positive and statistically significant in all three countries. Again, these results show that cash flows are important to security analysts and investors in the USA, the UK and France for stock valuation purposes. These results are consistent with the results provided thus far in all previous models. Third, the sum of the coefficients of earnings c_5+c_6 is negative and statistically significant in all three countries, the UK, the USA and France. These results are consistent with my expectations and with my hypothesis. These results mean that when earnings are transitory, i.e. when the variation of the earnings compare to stock prices is relatively high (in the present study above its median), then the stock market does not perceive this information as good news and the relative importance of earnings on stock prices decreases. This is measured by the sum of the coefficients of ($c1+c2$) + ($c5+c6$). To give an example to make things clearer, let us assume that earnings are stable, not transitory. In that case the effect of earnings on stock prices in the UK will be 5.65 (sum of coefficients of earnings $c1+c2$). In contrast, when earnings are transitory for a firm in the UK, the effect of earnings on stock prices will not be 5.65 as above, but it will be 5.65 minus 4.933 ($b5+b6$), which is 0.68 only. So for, stable or permanent earnings firms in the UK the effect of earnings on stock prices is 5.65 whereas for transitory earnings firms the effect of earnings on stock prices in the UK is only 0.68.

As far as the USA and France is concerned the results are consistent with the UK results just discussed. Specifically, in the USA results indicate that when earnings are permanent the effect of earnings on stock prices is 5.88 ($c1+c2$), but when earnings are transitory (not

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permanent), then the effect of earnings on stock prices is only 1.08 (i.e. 5.88 minus 4.8 or c_1+c_2 minus c_5+c_6). Results in France also support the results of the UK and the USA. French results in Table 20 indicate that when earnings are permanent, the effect of earnings on stock prices is 5.66 (c_1+c_2), but when earnings are transitory (not permanent), then the effect of earnings on stock prices is only 1.15 (ie., 5.66 minus 4.51 or c_1+c_2 minus c_5+c_6).

Fourth, as hypothesised, results in Table 20 support that the cash flow variables are taken into consideration by investors in investment decisions. Specifically, the sum of the coefficients of cash flows c_3+c_4 is positive and statistically significant in all three countries. For example, in the UK it is 0.15, in the USA it is 0.095 and in France is 0.18. These results are consistent with the results provided thus far in all previous models and hypotheses.

Fifth, as hypothesised, results in Table 20 support that when earnings are transitory, investors and security analysts in the UK and the USA pay more attention to cash flows. This is evidenced by the sum of the coefficients of cash flows c_7+c_8. For example, in the UK when earnings are transitory, stock prices are affected more by 0.03 (c_7+c_8) from changes in cash flows. Similarly, in the USA, when earnings are transitory, stock prices are affected by 0.02 more from changes in cash flows. These results are very interesting because they show that in Anglo-Saxon countries such as the USA and the UK, investors do pay additional attention to cash flows because they do know that earnings are of lower value when they are transitory. On the other hand, consistent with prior evidence in previous models and tables of this study, French analysts and investors pay more attention to earnings because their code law system make financial reporting in France much more conservative, and thus the variability of earnings is not that high as the variability of earnings in the UK and the USA.

Sixth, in all countries examined, results support that the model is statistically significant and the variation of stock returns as explained by the R^2 is 15.6 in the UK, 12.8 in the USA and

17.2% in France.

In summary, results presented in Table 20 support my hypothesis that when earnings are transitory (not permanent), investors pay less attention to earnings and more attention to cash flows.

6.3.3.4 Multivariate Analysis regression results to test whether the valuation of earnings and cash flows is country specific.

Hypothesis 6 predicts that operating earnings and operating cash flows are associated with security returns, but the valuation of earnings and cash flows is expected to differ in these countries because their financial reporting systems differ. In the UK and in the USA the financial reporting system is less conservative, common law oriented, whereas in the non Anglo-Saxon country France, the financial reporting system is much more conservative and code law oriented.

Previous studies have not examined how earnings and cash flows are valued in France, the UK and the USA. Since I showed earlier in this study that there are significant financial reporting differences between these counties, I expect that these differences will affect the value relevance of earnings and cash flows in these countries. I hypothesized that the value relevance of earnings will be the highest in France since it has the most conservative financial reporting system. On the other hand, I expect that the value relevance of earnings will be the lowest in the UK and in the USA because they have the least conservative financial reporting system. Hence, I expect that cash flows will be the most (least) value relevant in the USA and the UK (France).

Statistical regression results presented in the present study support my hypothesis that earnings and cash flows are country specific, i.e. that they differ depending on the country.

Specifically, first, univariate results in Table 11 indicate that even though earnings and cash flows are important to investors and financial analysts in all three countries, the level of

earnings is considered somewhat more important to French investors (0.793) than to investors in the USA (0.759) and the UK (0.767).

Second, univariate results in Table 11 support my hypothesis that cash flows are valued in all three countries but they are valued more by the investors in Anglo–Saxon countries than in non Anglo-Saxon countries like France. For example, in the UK and the USA the coefficient of the level of cash flows is 0.451 and 0.447, respectively, whereas in France the coefficient of cash flows is only 0.197. Similar results are provided for the coefficient of the changes in cash flows. In the UK and the USA the coefficient of the changes of cash flows is 0.202 and 0.196, respectively, whereas in France the coefficient of cash flows is only 0.072.

Third, multivariate results presented in Tables 12 to 17 support again my hypothesis that the investors in these countries value differently financial information such as earnings and cash flows due to the financial reporting differences in these countries. Specifically, results in Table 12 indicate that total earnings, as measured by the sum of the level and changes of earnings (b1+b2), is valued by investors in all three countries, but results show that earnings are valued more in France and less in the Anglo-Saxon countries. Specifically, b1+b2 in France is 1.026 whereas in the USA and the UK is 1.004 and 0.89 respectively. These results are also supported by the R^2 of the models in each country. As it can me seen in Table 12 the highest R^2 is in the French model (14.3%), whereas in the UK and the USA is lower (10% and 8.4%, respectively). As already discussed, these results are due to the fact that the financial reporting in the Anglo-Saxon countries is much more liberal (less conservative) and managers may manipulate easier the financial statements.

Fourth, multivariate results presented in Table 12 support again my hypothesis that investors in these countries value differently cash flows due to the financial reporting differences in these countries. Specifically, results indicate that total cash flows, as measured by the sum of

the level and changes of cash flows (b3+b4), is valued by investors in all three countries, but results show that cash flows are valued more in the Anglo-Saxon countries and less in France. Specifically, the sum of the coefficients b3+b4 in France is 0.188 whereas in the USA and the UK it is 0.426 and 0.447, respectively. These results are also supported by the R^2 of the models in each country. As it can be seen in Table 12 the lowest R^2 is in the French model (2%), whereas in the UK and in the USA is higher (6.1% and 3,3%, respectively). As it has already been discussed, these results are due to the fact that the financial reporting in the Anglo-Saxon countries is much more liberal (less conservative) and managers may manipulate easier the financial statements, and since earnings are expected to be of lower quality in these countries, financial analysts and investors are expected to pay more attention to cash flows.

Fifth, results in Tables 13 to 17 support the hypothesis that when earnings and cash flows are taken together by investors and financial analysts, these stakeholders pay more attention to earnings but less attention to cash flows in France. The opposite happens in the Anglo-Saxon countries, namely, the USA and the UK. These results are consistent with the previous discussion. Specifically, results in Table 14 indicate that the earnings coefficient is the highest in France (b1+b2 = 1.01), whereas the earnings coefficient for the USA and the UK is 0.933 and 0.725, respectively. As far as the importance of cash flows is concerned, when earnings are considered, results are consistent with my expectations that is, cash flows are more important in the Anglo- Saxon countries USA and UK than in France. Specifically, the cash flow coefficients are low and insignificant in France (b3+b4=0.013), whereas the cash flow variable is valued highly by investors in the UK and USA (b3+b4 is 0.209 and 0.091 in UK and USA respectively).

Sixth, results in Tables 14 to 17 show that when taken together the earnings and cash flow information is perceived more important in France rather than in the Anglo-Saxon countries. This contention is supported by the R^2s presented in Table 14. As it can be seen the

French model has the highest R^2 (17.90%) whereas the UK and the USA models have R^2 of 11% and 8.90%, respectively. These results are possibly due to the fact that in Anglo-Saxon countries there is greater manipulation of financial information by managers.

Seventh, when I proceeded further to examine additional factors that may affect the importance of earnings and cash flows in these countries, one of the factors I took into consideration was the industry the firm belongs to. For example, I argued that industries have different financial characteristics. Manufacturing firms, for example, are more capital intensive compared to retail and service organizations. Capital intensiveness may lead to greater need for cash flows for reinvestment purposes. Moreover, manufacturing firms have greater depreciation expenses and thus the differences between earnings and cash flows in manufacturing firms may be greater, compared to the retail and service firms. Furthermore, manufacturing and retail firms are expected to maintain higher inventory levels compared to service organizations. This difference in the inventory levels may lead to greater differences between earnings and cash flows in these two industries if there are great variations in inventory levels from year to year. For example, great increases in inventory levels in one year, assuming cash was used to manufacture or acquire this inventory will lead to a reduction in cash flows. My results in Table 18 support the above arguments and moreover support that earnings and cash flows are industry specific and moreover these results were also shown to be country specific. Specifically, the results show that in all industries the French model has the highest explanatory power as measured by the R^2. This result is mostly due to the more usefulness of earnings to investors in France (see the coefficients of earnings b1 and b2). Also, as expected, results indicate that the cash flow information is more useful to the UK and the USA investors than to French investors in all industries examined, and more importantly in the manufacturing and retail industries where more discretion and manipulation exists in their financial reporting systems. For example, in the

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manufacturing industry the coefficient of the level of cash flows is 0.266 and 0.25 for the USA and the UK respectively, whereas it is only 0.06 in the French model.

Eighth, when I examined the importance of earnings and cash flows in all three countries over a longer period of time (more than a year and up to five years), my results again support the hypothesis that investors in these three countries perceive earnings and cash flows differently. Interestingly, the importance of earnings and cash flows from one to five years, as measured by the R^2, increases the highest in the USA (almost quadruples, 7% to 27.8%), whereas increases the least in France (almost triples, 11.4% for the annual and 32% for the five year interval). These results are not that surprising in that in Anglo-Saxon countries such as the USA and the UK the increase is greater than in a code law country such as France. This is due to the fact that in the shorter run there is a greater manipulation of financial information in Anglo-Saxon countries than in more conservative countries such as France.

Nine, when I examine the importance of earnings and cash flows to investors and financial analysts in cases where the earnings information is transitory (not permanent or non stable or with very high variability), my results indicate that earnings and cash flows are perceived differently by investors, depending on the country to which they belong. Specifically, when earnings are transitory, investors in Anglo-Saxon countries penalize more these firms because the effect of earnings on stock returns is much more negative (c_5+c_6= -4.933 and -4.8 for UK and USA, respectively, whereas it is only -4.51 for France).

Tenth, as hypothesised, results in Table 20 support the proposition that when earnings are transitory, investors and security analysts in the UK and the USA pay more attention to cash flows. This is evidenced by the sum of the coefficients of cash flows c_7+c_8. For example, in the UK when earnings are transitory, stock prices are affected more, by 0.03 (c_7+c_8) from changes in cash flows. Similarly, in the USA, when earnings are transitory, stock prices are affected by 0.02

more from changes in cash flows. These results are very interesting because they show that in Anglo-Saxon countries such as the USA and the UK, investors do pay additional attention to cash flows because they do know that earnings are of lower value when they are transitory. On the other hand, consistent with previous evidence and with evidence offered earlier in this study, French analysts and investors do pay more attention to earnings because their code law system makes financial reporting in France much more conservative, and thus the variability of earnings is not that high as the variability of earnings in the UK and the USA.

6.4   Summary of the empirical results

In summary, evidence provided in this study supports that indeed there are substantial differences in the way investors and financial analysts perceive financial information such as earnings and cash flows in the UK, France and the USA. These results are consistent with the six hypotheses proposed in this dissertation. Specifically, first results indicate that indeed both earnings and cash flows are taken into consideration by investors in their investment decisions. Second, given cash flows, results show that earnings are always very important to investors and financial analysts for investment purposes; given earnings though results show that cash flows are more important to investors in the Anglo-Saxon countries, possibly due to the lower importance that investors place on the manipulated earnings in these less conservative countries. As far as France is concerned, results reveal that investors place much more attention to earnings and little or no attention to cash flows. Third, results show that the value relevance of earnings and cash flows is industry specific. Fourth, evidence shows that investors pay more attention to longer-run earnings and cash flows rather than to shorter-run financial information. Fifth, results support that when earnings are transitory (not stable), investors pay more attention to cash flows and less attention to earnings. Sixth, results show that the value relevance of earnings and cash flows is

country specific. Specifically, results indicate that earnings are valued more in France and less in the Anglo-Saxon countries, due to the fact that the financial reporting in the Anglo-Saxon countries is much more liberal (less conservative) and managers may manipulate easier financial information. Moreover, as hypothesized, results show that cash flows are the most (least) value relevant in the USA and the UK (France).

CHAPTER VII

CONCLUSIONS

In this dissertation I have examined and tested theoretically and empirically six major hypotheses that relate to the role of financial information, and especially earnings and cash flows in three countries, two Anglo-Saxon, the UK and the USA and one code law country, France. A theoretical framework has been developed in this study in order to be able to build up my research hypotheses.

The results of this study have practical implications as well and should be of great importance to the major stakeholders such as investors, creditors, financial analysts, especially with the latest events that are taking place, and the major collapses of giant organizations worldwide such as Enron, Kmart, Vivendi, Parmalat and Worldcom among others. Regulatory bodies, investors, financial analysts and the financial press, blamed among others, the possible manipulation of financial information supplied to the investors by these organizations. The question raised, is whether this type of information is taken into consideration by investors in their investment decisions.

Statistical multiple and simple regression analysis was undertaken in this dissertation to test the major hypotheses of the study. A sample of 36,695 USA, 4,234 UK and 1.181 French firm-year observations were used to test the research hypotheses.

The empirical results presented in this dissertation support the proposed research hypotheses. More specifically, the major conclusions of the empirical results are summarized as

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follows. First, empirical evidence in this dissertation confirms previous empirical evidence that both earnings and cash flows are associated with stock returns in all countries examined, namely, the USA, the UK and France. These results are also consistent with real world practice that financial analysts do take into consideration these financial variables in their investment decisions. Second, even though empirical evidence shows that both earnings and cash flows are valued in the capital markets, the question of interest is whether both earnings and cash flows are valued equally by financial analysts and investors. Empirical evidence in this dissertation reconfirmed previous USA evidence that earnings are valued more than cash flows in the marketplace. UK results were also consistent with USA results. In contrast, French evidence showed that investors in French capital markets pay little or no attention to cash flows, beyond earnings.

In order to test the robustness of my results I proceeded to examine whether the value relevance of earnings and cash flows depends on some contextual factors, such as a) the industry to which the firm belongs, b) the return window, and c) the transitoriness of earnings.

As far as the first issue is concerned, the research question raised is whether the value relevance of earnings depends on the industry to which the organization belongs. That is, do investors value more earnings and cash flows if the firm belongs in the retail, manufacturing or in the service industry? My empirical results showed that investors value more the earnings in the service industry, partly because in that industry the manipulation of earnings is the least because there exist the least accruals (i.e. depreciation, inventories, etc). As far as the cash flow information is concerned, results indicate that investors value cash flow more in the manufacturing industry. This is not surprising, because in that industry investors and financial analysts expect greater manipulation of earnings due to much higher accruals (i.e. depreciation, inventories, etc), and thus analysts pay less attention to earnings and consequently pay more

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attention to cash flows.

Beyond the industry factor, I proceeded a step further to test whether investors pay more attention to the aggregate (long-time horizon) earnings and cash flows rather than to shorter-run (annual) financial information. As hypothesized, my statistical results for the three countries support that earnings and cash flows are more value relevant over the longer horizon. These results are due to the fact that both earnings and cash flows have timing and matching problems over the shorter run and thus earnings can be manipulated easier over a shorter horizon. On the other hand, over a longer-time horizon manipulation problems of earnings are mitigated. As far as cash flows are concerned, over a longer horizon are becoming smoother and thus they are more value relevant.

In addition to the aforementioned industry and long-horizon contextual factors, I also tested whether investors value earnings more (less) when this measure is permanent (transitory). If indeed investors do not pay that much attention to transitory earnings, do they pay more attention to cash flows when earnings are transitory? Results show that in all three countries, the USA, the UK and France, investors penalize firms with transitory earnings and pay more attention to cash flows in making their investment decisions. These results are not surprising because very high variability in earnings makes it very difficult for investors to rely on that financial measure and thus investors pay more attention to a relatively more permanent figure, namely cash flows.

Furthermore, one of the major objectives of this study was to examine whether earnings and cash flows are valued equally in the three countries under investigation. In a previous section of this dissertation I hypothesized that the value relevance of earnings will be the highest in code law countries, such as France since it has the most conservative financial reporting system. On the other hand, I hypothesized that the value relevance of earnings will be the lowest in common

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law countries, namely in the UK and the USA, because they have the least conservative financial reporting system. Hence, I expect that cash flows will be the most (least) value relevant in the USA and the UK (France). Empirical results in this study supported the aforementioned hypotheses. Specifically, empirical results support the following:

First, multivariate results indicate that earnings are valued more in France and less in the Anglo-Saxon countries. These results may be due to the fact that the financial reporting in the Anglo-Saxon countries is much more liberal (less conservative) and managers may manipulate more the financial statements.

Second, multivariate results indicate that cash flows are valued by investors in all three countries, but results show that cash flows are valued more in the Anglo-Saxon countries (e.g. the USA and the UK) and less in France. As it has already been discussed, these results may be due to the fact that in Anglo-Saxon countries managers may manipulate more earnings, and thus financial analysts and investors pay more attention to cash flows because earnings are perceived to be of lower quality in these countries. Third, regarding industry differences within each country, results show that in all industries, the French model had the highest explanatory power, i.e. R^2. These results may be due to the fact that French investors perceive of higher quality earnings measures. Also, as expected, results indicate that the cash flow information is more useful to the UK and the USA investors than to French investors in all industries examined, and more importantly in the manufacturing and retail industries where more discretion and manipulation exists in their financial reporting systems.

Fourth, when I examined the importance of earnings and cash flows in all three countries over a longer period of time (more than a year and up to five years), my results again supported the hypothesis that investors in these three countries perceive earnings and cash flows differently. Interestingly, the importance of earnings and cash flows from one to five years, as measured by

the R^2, increases the highest in the USA, whereas increases the least in France. This evidence is consistent with my previous results that showed that in the shorter run there is a greater manipulation of financial information in Anglo-Saxon countries than in more conservative countries such as France. Fifth, when I examined the importance of earnings and cash flows to investors and financial analysts in cases where the earnings information is transitory, results indicated that investors in Anglo-Saxon countries penalize more the firms with non-permanent earnings, because the effect of earnings on stock returns is much more negative.

Furthermore, as hypothesized, results support that when earnings are transitory, investors and security analysts in the UK and the USA pay more attention to cash flows because they know that earnings are of lower quality when they are transitory. On the other hand, consistent with my expectations, French analysts and investors pay more attention to their earnings because their conservative code law system makes earnings smoother.

Moreover, the results of this study have important practical implications as well. Since the evidence in this dissertation supports that there are substantial differences in the way capital market participants perceive financial information, such as earnings and cash flows in the UK, France and the USA, investors, financial and credit analysts should be very cautious when making investment or credit decisions. Thus, these capital market participants should take seriously into consideration, among others, the relevant factors examined in this study, such as how earnings and cash flow information is perceived in different industries, how earnings and cash flows are valued when earnings is transitory and how financial information improves in quality when it is evaluated on a longer basis. Furthermore, investors, financial analysts and credit analysts should be very cautious in their decision making when the earnings are transitory, since evidence shows that capital market participants penalize those kind of firms and instead they pay much more attention to cash flow information.

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APPENDIX A

LIST OF UK SAMPLE FIRMS

UK SAMPLE OF FIRMS

COMPANY NAME	GVKEY	SIC	MKT VALUE OF EQUITY	TOTAL ASSETS
10 GROUP PLC	100944	7310	6.093	3.984
600 GROUP PLC (THE)	100059	3540	200.315	66.033
A & C BLACK PLC	220682	2731	11.966	10.627
ABACUS GROUP PLC	210836	5731	78.184	56.752
ABBEYCREST PLC	200011	3911	56.807	39.352
ABBOT GROUP PLC	209300	1381	174.987	425.168
ACAL PLC	200025	5065	119.374	140.663
ACATOS & HUTCHESON PLC	101133	2070	.	108.836
ACCESS PLUS PLC	205999	7389	12.014	48.986
ACTION COMPUTER SUPP HLDGS	24630	5045	110.374	111.283
ADMIRAL PLC	200056	7370	133.784	1,238.92
ADSCENE GROUP PLC	200059	2711	.	78.118
ADVANCED MEDICAL SOL GRP PLC	211983	2820	29.614	40.553
AEGIS GROUP PLC	14222	7310	1,362.32	1,394.49
AFA SYSTEMS PLC	207320	7371	2.018	22.708
AFRICAN LAKES CORP PLC	210440	3711	49.453	37.094
AGGREGATE INDUSTRIES PLC	220814	3272	2,017.36	.
AGGREGATE INDUSTRIES PLC	220814	3272	2,017.36	1,409.12
AGGREKO PLC	207519	7359	398.314	796.383
AIR PARTNER PLC	200090	4522	21.255	54.189
AIRFLOW STREAMLINES PLC	200093	3713	62.207	17.586
AIRSPRUNG FURNITURE GROUP	200095	2510	69.313	36.829
AIRTOURS PLC	103190	4700	2,037.75	2,843.54
AIT GROUP PLC	215660	7370	19.412	117.622
ALBA PLC	104851	3600	152.868	214.398
ALBEMARLE & BOND HLDGS PLC	207321	5900	16.792	48.937
ALBION PLC	220651	2300	16.127	3.378
ALEXANDER RUSSELL PLC	207176	1400	113.548	28.44
ALEXANDERS HOLDINGS PLC	100421	5500	.	10.308
ALEXANDRA PLC	100938	5961	76.186	60.854
ALEXON GROUP PLC	100934	2300	118.789	161.392
ALLDAYS PLC	100943	5411	409.469	162.283
ALLDERS	200125	5311	393.831	137.934
ALLEN PLC	200126	1520	303.829	213.559
ALLIANCE UNICHEM PLC	103007	5122	3,308.30	2,730.42

ALLIED CARPETS GROUP PLC	212714	5700	188.083	116.999
ALLIED DOMECQ PLC	100011	2084	8,344.03	8,845.78
ALLIED LEISURE PLC	200131	7900	88.354	49.597
ALLIED TEXTILE COMPANIES PLC	100693	2211	278.532	97.111
ALPHA AIRPORTS GROUP PLC	200140	5940	293.897	107.378
ALPHAMERIC PLC	220657	7370	17.864	40.516
ALUMASC GROUP PLC	104822	3540	147.544	129.877
ALVIS PLC	100492	3711	324.113	347.128
AMBERLEY GROUP PLC	210846	1400	93.741	56.345
AMEC PLC	100363	1600	2,225.50	618.611
AMEY PLC	210809	1600	296.309	301.261
AMSTRAD PLC	220678	3661	27.844	54.429
ANDREWS SYKES GROUP PLC	220687	1700	159.941	230.677
ANGLIAN GROUP	104897	2430	188.274	442.652
ANGLO SIBERIAN OIL CO PLC	218439	1311	24.273	58.266
ANGLO-EASTERN PLANTATIONS	204320	2070	100.464	30.968
ANITE PLC	100277	7370	204.666	174.146
ANN STREET GROUP LTD	212280	2080	206.051	.
ANTOFAGASTA HOLDINGS PLC	200189	1000	1,669.29	561.707
API GROUP PLC	100701	3490	251.977	197.028
APOLLO METALS PLC	200200	3334	99.573	44.711
APPLIED HOLOGRAPHICS PLC	200203	2670	24.189	82.719
AQUARIUS GROUP PLC	207339	2510	35.813	47.282
ARCADIA GROUP PLC	17644	5600	1,509.23	1,001.13
ARCOLECTRIC HOLDINGS PLC	204324	3679	23.944	8.069
ARENA LEISURE PLC	210670	7948	.	37.939
ARJO WIGGINS APPLETON PLC	102578	2621	4,822.86	1,543.88
ARLEN PLC	204325	3600	47.681	30.964
ARM HOLDINGS PLC	109179	3674	102.53	1,003.54
ARMOUR TRUST PLC	200230	5900	17.751	6.813
ARRIVA PLC	101033	4100	2,169.93	1,411.50
ARTHUR SHAW & CO PLC	204527	3442	.	0.566
ASCOT PLC	200253	3585	611.612	330.535
ASDA GROUP PLC	100018	5399	.	10,183.63
ASH & LACY PLC	220661	3440	134.42	64.297
ASHTEAD GROUP PLC	200264	7359	875.411	1,177.87
ASK CENTRAL PLC	206120	5812	48.623	132.247
ASSOC BRITISH PORTS HLDG PLC	100459	4400	2,880.54	1,694.98
ASSOCIATED BRITISH ENGR PLC	210849	5040	41.065	3.18
ASSOCIATED BRITISH FOODS PLC	17404	2000	6,721.44	7,758.11
ASTON VILLA PLC	206157	7941	.	89.027
ASTRAZENECA PLC	28272	2834	9,001.15	41,451.63
ASW HOLDINGS PLC	101717	3300	556.874	25.686
AUSTIN REED GROUP PLC	100244	5600	154.04	38.418
AUTOLOGIC HOLDINGS PLC	216820	7389	108.388	84.143
AVESCO PLC	200357	3663	.	.

AVESCO PLC	200357	3663	.	.
AVIS EUROPE PLC	100427	7510	1,628.68	2,447.18
AVIS EUROPE PLC	100427	7510	1,628.68	.
AVON RUBBER PLC	100730	3050	317.868	193.126
AXIS-SHIELD PLC	204754	3841	.	131.199
AYRSHIRE METAL PRODUCTS PLC	210852	3300	23.142	6.239
AZLAN GROUP PLC	223171	5045	193.651	127.11
BAA PLC	101240	4581	11,317.86	11,847.38
BAA PLC	101240	4581	11,317.86	.
BABCOCK INTERNATIONAL GROUP	102566	3730	570.18	237.8
BAGGERIDGE BRICK PLC	101626	3250	108.877	51.324
BAIRD (WILLIAM) PLC	100078	2300	418.738	195.059
BALTIMORE TECHNOLOGIES PLC	207383	7373	.	145.4
BANDT PLC	100358	1700	116.226	79.536
BANNER CHEMICALS PLC	203764	2860	.	20.683
BARR (AG) PLC	200606	2086	.	147.582
BARRATT DEVELOPMENTS PLC	100171	1520	1,286.75	1,030.33
BARRY WEHMILLER INTL PLC	102103	3560	104.413	65.521
BASS PLC	20067	2082	11,848.22	9,536.69
BAYNES (CHARLES) PLC	103111	5084	250.901	135.046
BBA GROUP PLC	100376	2200	2,220.51	2,649.39
BCO TECHNOLOGIES PLC	216821	3674	10.735	27.185
BEALE PLC	206228	5311	56.732	42.711
BEATTIE (JAMES) PLC	100963	5311	97.715	110.502
BEAUFORD PLC	220671	3290	42.029	4.379
BEAZER HOMES PLC	210806	1520	1,015.28	871.368
BELGO GROUP PLC	204755	5810	20.925	170.933
BELHAVEN BREWERY GROUP PLC	212780	2082	86.848	63.911
BELLWAY PLC	100728	1520	747.588	516.042
BEMROSE CORP PLC	100911	2750	249.793	173.478
BENSONS CRISPS PLC	200702	2090	38.556	30.833
BENTALLS PLC	100994	5311	198.958	43.68
BERADIN HOLDINGS PLC	220676	800	13.046	8.771
BERISFORD PLC	101936	3550	574.397	416.521
BERKELEY GROUP PLC	101009	1520	1,440.95	1,515.49
BERTAM HOLDINGS PLC	200717	3060	68.886	30.772
BESPAK PLC	101024	3829	141.529	353.675
BETT BROTHERS PLC	200727	1531	89.082	31.569
BICC PLC	100390	1623	2,994.84	493.824
BILLITON PLC	105595	3334	8,663.00	.
BILLITON PLC	105595	3334	8,663.00	4,334.27
BILSTON & BATTERSEA ENAMELS	204375	3260	5.494	5.684
BIOCOMPATIBLES INTL PLC	64574	3851	78.362	141.436
BIRMINGHAM CITY PLC	213450	7941	24.588	27.629
BIRSE GROUP PLC	102580	1540	.	27.79
BLACK ARROW GROUP PLC	200778	2520	36.628	40.962

BLACKS LEISURE GROUP PLC	200780	5600	107.273	109.552
BLAGDEN PLC	100263	2800	251.73	158.78
BLICK PLC	103349	7380	120.221	186.421
BLOCKLEYS PLC	200783	3270	43.956	16.83
BLP GROUP PLC	204380	2430	82.163	13.614
BLUE CIRCLE INDUSTRIES PLC	100047	3241	5,043.81	4,016.34
BNB RESOURCES PLC	100987	7361	65.437	30.116
BOC GROUP PLC	1945	2810	7,553.15	6,068.83
BODY SHOP INTERNATIONAL PLC	101050	2844	321.521	303.085
BODYCOTE INTERNATIONAL PLC	101474	3390	915.544	1,423.69
BOGOD GROUP PLC	220684	5064	9.153	1.564
BOOKER PLC	100674	5141	1,868.88	238.244
BOOSEY & HAWKES PLC	200797	3931	251.766	115.069
BOOT (HENRY) PLC	100962	1540	196.446	74.374
BOOTH INDUSTRIES PLC	220685	3442	17.449	7.931
BOOTS CO PLC	100587	5912	5,210.31	13,215.41
BOSTROM PLC	209906	2531	118.16	46.779
BOUSTEAD PLC	209908	1500	.	.
BOVIS HOMES GROUP PLC	214779	1520	570.107	403.497
BOWTHORPE PLC	100401	3570	710.109	0.122
BOXMORE INTERNATIONAL PLC	209911	3080	183.03	182.634
BP AMOCO PLC	2410	2911	84,500.00	144,592.48
BPB INDUSTRIES PLC	100298	3270	2,522.99	2,069.03
BRAIME (TF & JH) HOLDINGS	211689	3530	10.595	3.594
BRAKE BROS PLC	101064	5140	590.316	646.204
BRAMMER PLC	100148	5080	290.163	272.099
BRANDON HIRE PLC	222386	7350	41.359	34.068
BRANDS HATCH LEISURE PLC	213082	7900	77.333	56.316
BREEDON PLC	209931	1400	35.039	44.781
BRENT INTERNATIONAL PLC	220688	2810	107.981	92.184
BRIDGEND GROUP PLC	102602	5070	21.49	4.997
BRIDPORT PLC	204389	2390	35.414	30.29
BRISTOL UNITED PRESS PLC	104869	2711	137.014	124.764
BRITAX INTERNATIONAL PLC	100278	3231	589.389	520.491
BRITISH AEROSPACE PLC	63477	3721	15,057.38	14,953.53
BRITISH AIRWAYS PLC	13145	4512	20,701.78	7,440.72
BRITISH BIOTECH PLC	104904	2834	211.414	172.942
BRITISH POLYTHENE INDS PLC	103353	2670	412.586	199.594
BRITISH STEEL PLC	15103	3312	11,576.14	4,086.91
BRITISH STEEL PLC	15103	3312	11,576.14	.
BRITISH VITA GROUP PLC	100399	2821	1,223.72	790.908
BRITISH-BORNEO OIL & GAS	104650	1311	1,755.81	8,217.79
BRITISH-BORNEO OIL & GAS	104650	1311	1,755.81	.
BROOKS SERVICE GROUP PLC	200843	7200	34.938	17.842
BROWN & JACKSON PLC	100380	5600	238.31	145.088
BROWN (N) GROUP PLC	101101	5961	454.897	727.852

BRYANT GROUP PLC	100446	1520	884.38	674.427
BSS GROUP PLC	100596	5070	226.819	170.287
BTP PLC	101078	2800	894.968	.
BTP PLC	101078	2800	894.968	.
BTP PLC	101078	2800	894.968	989.51
BUDGENS PLC	100146	5411	.	175.531
BULGIN (AF) & CO PLC	220699	3679	16.187	3.154
BULLOUGH PLC	100448	3585	209.143	154.967
BULMER (HP) HOLDINGS PLC	100364	2080	324.913	308.616
BUNZL PLC	100095	5110	1,229.05	1,778.01
BURMAH CASTROL PLC	17611	2890	3,373.52	3,053.47
BURNDEN LEISURE PLC	200819	7941	65.602	32.878
BURNDENE INVESTMENTS PLC	200871	3790	92.002	.
BURTONWOOD BREWERY PLC	101104	2082	187.073	52.388
BUSINESS POST LTD	223503	4513	93.529	424.293
CADBURY SCHWEPPES PLC	2597	2060	7,641.83	17,360.91
CADCENTRE GROUP PLC	213083	7371	27.041	49.641
CAFFYNS PLC	100417	5500	.	15.667
CAIRN ENERGY PLC	102623	1311	586.854	251.114
CAKEBREAD ROBEY & CO PLC	220704	5200	15.422	2.309
CALA PLC	201003	1520	126.584	92.058
CALDERBURN PLC	201004	2520	37.484	22.114
CALDWELL INVESTMENTS PLC	204625	2200	12.239	5.689
CALLUNA PLC	206230	3572	22.55	42.416
CAMELLIA PLC	201011	100	768.079	.
CAMELLIA PLC	201011	100	768.079	.
CAMMELL LAIRD HOLDINGS PLC	206213	3730	162.678	359.976
CANNONS GROUP PLC	209390	7990	277.708	304.741
CANTAB PHARMACEUTICALS PLC	25458	2836	70.34	140.221
CAPE PLC	220705	1700	233.098	75.474
CAPITAL CORP PLC	101917	7990	181.308	104.872
CARADON PLC	100125	3430	1,636.68	.
CARADON PLC	100125	3430	1,636.68	785.503
CARBO PLC	100079	3290	114.12	15.601
CARCLO ENGINEERING GROUP PLC	101122	3714	251.038	102.383
CARD CLEAR PLC	206222	7389	75.693	93.997
CARLTON COMMUNICATIONS PLC	14396	7819	2,490.13	4,067.15
CARPETRIGHT PLC	201044	5700	167.578	492.992
CASSIDY BROTHERS PLC	204494	3944	9.044	3.202
CASTINGS PLC	201056	3320	100.824	117.097
CATHAY INTL HLDGS PLC	201065	7011	521.87	17.522
CAVERDALE GROUP PLC	210863	5500	86.584	59.497
CEDAR GROUP PLC	204648	5045	54.794	62.612
CELLTECH CHIROSCIENCE PLC	201088	2834	83.271	346.38
CELSIS INTERNATIONAL PLC	210639	3823	24.821	34.775
CELTIC PLC	212789	7941	.	113.708

CFS GROUP PLC	221445	7371	30.584	26.289
CH BAILEY PLC	220666	3730	.	.
CHAMBERLIN & HILL PLC	201153	3320	30.623	20.22
CHANNEL HOLDINGS PLC	220715	3600	.	7.07
CHAPELTHORPE PLC	100591	2200	199.632	118.434
CHARACTER GROUP PLC	206389	5090	46.606	104.881
CHARLTON ATHLETIC PLC	213497	7941	39.065	28.813
CHARTER PLC	101082	3540	1,421.22	.
CHARTER PLC	101082	3540	1,421.22	519.493
CHELSEA VILLAGE PLC	213183	7941	313.229	188.952
CHEMRING GROUP PLC	201178	2890	110.254	48.191
CHINA SCI-TECH HLDGS LTD	222341	3663	.	.
CHIROSCIENCE GROUP	221423	2834	128.641	407.852
CHLORIDE GROUP PLC	17887	3612	183.454	267.934
CHRYSALIS GROUP PLC	101183	3652	146.045	374.409
CHURCH & CO PLC	100633	3140	107.373	51.776
CIRQUAL PLC	207421	3670	51.889	105.768
CITY CENTRE RESTAURANTS PLC	101095	5812	242.041	231.073
CITY TECHNOLOGY HOLDINGS PLC	212458	3826	15.963	170.497
CLINTON CARDS PLC	220831	5940	197.32	157.931
CLUBHAUS PLC	212137	7997	241.312	95.51
CLYDEPORT PLC	206232	4400	100.723	134.959
CMG PLC	211883	7373	340.154	3,108.54
CML MICROSYSTEMS PLC	200896	3669	.	21.457
COATS VIYELLA PLC	100106	2200	2,764.24	316.085
COBHAM PLC	100794	3728	694.636	1,123.56
COCA-COLA BEVERAGES PLC (UK)	227256	2086	3,531.75	1,864.05
COLEFAX AND FOWLER GROUP PLC	200909	2211	49.423	36.156
COLUMBUS GROUP PLC	204664	2721	42.789	78.44
COMINO PLC	206304	7372	25.107	56.346
COMPASS GROUP PLC	102260	5812	1,928.31	6,362.76
COMPEL GROUP PLC	206234	7373	126.259	214.147
COMPUTACENTER PLC	217799	7373	784.067	.
COMPUTERLAND UK PLC	207345	7370	.	10.707
COOKSON GROUP PLC	100280	3672	2,198.21	1,495.67
CORDIANT COMMUNICATIONS GRP	9343	7310	643.391	401.45
CORE GROUP PLC	215663	2834	34.68	19.595
CORNWELL PARKER PLC	102997	2510	109.723	81.973
CORPORATE SERVICES GROUP PLC	200987	7363	746.267	591.888
CORTECS PLC	25546	2834	77.585	.
CORTECS PLC	25546	2834	77.585	.
COSALT PLC	200992	3711	90.101	.
COSTAIN GROUP PLC	100088	1600	364.206	98.162
COUNTRY GARDENS PLC	210649	5200	134.613	74.117
COURTAULDS TEXTILES PLC	102582	2300	1,054.35	271.143
COURTS PLC	100201	5700	.	308.926

CRANSWICK PLC	201323	2011	70.08	73.163
CREIGHTON'S NATURALLY PLC	201330	2840	.	3.289
CREST NICHOLSON PLC	100468	1520	781.582	178.304
CRITCHLEY GROUP PLC	201340	3600	95.922	92.867
CRODA INTERNATIONAL PLC	100223	2860	604.624	480.655
D C COOK HLDGS PLC	200971	5500	.	14.065
DAILY MAIL & GENERAL TRUST	102730	2711	1,928.99	199.679
DAIRY CREST GROUP PLC	212716	5140	.	476.645
DANA PETROLEUM PLC	218440	1311	167.265	0.858
DANIELS (S) PLC	220739	2000	63.095	63.624
DANKA BUSINESS SYSTEMS PLC	102617	5040	.	282.78
DARBY GROUP PLC	201563	3220	30.331	15.863
DART GROUP PLC	201566	4731	102.718	104.671
DATRONTECH GROUP PLC	206237	5045	105.588	20.272
DAVID S SMITH HOLDINGS PLC	101004	2631	.	686.554
DAVIS SERVICE GROUP PLC	100432	7200	582.852	795.608
DAWSON GROUP PLC	201581	7350	284.578	122.488
DAWSON HOLDINGS PLC	206360	5190	192.542	111.804
DAWSON INTERNATIONAL PLC	100202	2250	295.824	39.461
DCS GROUP PLC	220025	7373	110.661	205.557
DE LA RUE PLC	100190	3578	1,012.65	820.166
DEANES HOLDINGS PLC	204644	2520	.	3.544
DEBENHAMS PLC	215620	5311	1,533.67	2,040.22
DELTA PLC	100348	3600	1,250.51	279.375
DELTRON ELECTRONICS PLC	213225	3679	31.017	41.974
DELYN GROUP PLC	204683	1520	.	12.204
DENCORA PLC	201598	1531	209.572	54.085
DENMANS ELECTRICAL PLC	201603	5063	56.733	31.963
DENSITRON INTERNATIONAL PLC	220818	3670	32.759	6.943
DESIRE PETROLEUM PLC	217539	1311	15.568	14.166
DEVRO INTERNATIONAL PLC	201617	2013	426.352	457.944
DEWHIRST GROUP PLC	100984	2300	300.062	146.879
DFS FURNITURE CO PLC	201619	5712	218.381	362.342
DIAGEO PLC	18636	2085	28,788.30	42.339
DIAGONAL PLC	206325	7370	48.143	307.01
DIALOG CORP PLC	61599	7370	182.256	146.166
DINKIE HEEL PLC	220819	3060	12.929	4.792
DIPLOMA PLC	100951	5065	220.752	144.116
DIXON MOTORS PLC	201645	5500	397.124	53.055
DIXONS GROUP PLC	13964	5731	2,959.85	9,278.38
DOLPHIN PACKAGING PLC	201656	3089	66.604	84.21
DOMINO PRINTING SCIENCES PLC	101139	3555	158.559	154.992
DOMNICK HUNTER GRP	210592	3560	69.291	117.573
DORLING KINDERSLEY HLDGS PLC	104921	2731	193.367	252.338
DOWDING & MILLS PL	101433	7600	134.573	145.198
DREW SCIENTIFIC GROUP PLC	204651	3826	5.811	45.635

DRUCK HOLDINGS PLC	104863	3823	105.803	265.004
DRUMMOND GROUP PLC	201684	2200	47.956	3.434
EADIE HOLDINGS PLC	210889	3530	32.479	9.669
EAGLES PLC	207347	7941	0.965	6.083
EASYNET GROUP PLC	206411	7373	16.144	64.66
ED&F MAN GROUP PLC	223489	5140	3,167.58	1,303.06
EDINBURGH OIL & GAS PLC	210666	1311	20.325	7.269
EIDOS PLC	220748	7372	.	562.08
ELBIEF PLC	220749	3990	.	3.787
ELECO PLC	101201	1700	24.145	18.047
ELECTROCOMPONENTS PLC	100909	5065	.	3,216.03
ELECTRONIC DATA PROCESSING	220750	7370	39.559	33.11
ELECTRONICS BOUTIQUE PLC	207094	5734	94.908	350.546
ELEMENTIS PLC	100240	2800	1,344.35	595.829
ELIZA TINSLEY GROUP PLC	222347	3523	96.534	28.531
ELLIS & EVERARD PLC	100841	5160	516.681	347.675
EMAP PLC	101052	2721	.	4,273.25
EMERALD ENERGY PLC	204690	1311	36.141	54.082
EMESS PLC	101152	3640	247.074	36.031
EMI GROUP PLC	19641	7389	.	.
ENERGY TECHNIQUE PLC	200701	3585	15.859	11.642
ENNSTONE PLC	204314	3281	92.725	32.767
ENSOR HOLDINGS PLC	204691	3270	16.551	4.934
ENTERPRISE INNS PLC	211599	5810	522.686	283.582
ENTERPRISE OIL PLC	100571	1311	4,465.80	2,443.60
EPWIN GROUP PLC	202045	3089	92.293	44.401
ERA GROUP PLC	202053	5090	22.771	13.608
EUROCOPY PLC	102161	5040	26.546	14.725
EURODIS ELECTRON PLC	201789	5045	244.275	82.632
EUROMONEY INSTITUTION INVEST	102583	2700	119.541	606.671
EUROPEAN COLOUR PLC	220812	2810	30.447	44.556
EUROPEAN MOTOR HLDGS PLC	221874	5500	192.829	57.299
EUROPEAN TELECOM PLC	213226	5065	69.638	74.61
EUROPOWER PLC	209925	3060	37.193	15.818
EVE GROUP PLC	202089	1731	69.584	37.789
EXPAMET INTERNATIONAL PLC	101032	3448	142.836	124.33
EXPRESS DAIRIES PLC	216879	2020	507.858	549.514
EXPRO INTERNATIONAL GRP PLC	206243	1389	212.498	252.381
F I GROUP PLC	212324	7370	.	1,034.69
F W THORPE PLC	209036	3640	40.331	30.175
FAIREY GROUP PLC	102569	3577	242.459	404.381
FALKLAND ISLANDS HLDGS PLC	228076	5000	.	5.277
FEEDBACK PLC	204697	7371	10.298	2.296
FENNER PLC	100262	3560	376.364	211.675
FERGUSON INTERNATIONAL HLDG	100567	2750	51.629	32.118
FERRARIS GROUP PLC	210202	3841	30.873	33.65

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FIBERNET GROUP PLC	206495	7373	28.919	228.972
FII GROUP PLC	103122	3021	37.847	9.854
FILTRONIC PLC	206245	3663	.	.
FINE ART DEVELOPMENTS PLC	100892	5961	263.612	114.905
FINELIST GROUP PLC	223506	5013	602.535	420.809
FINLAY (JAMES) PLC	100154	2090	347.007	120.623
FIRST CHOICE HOLIDAYS PLC	101494	4700	734.691	575.521
FIRST LEISURE CORP PLC	100183	5810	651.96	510.966
FIRST TECHNOLOGY PLC	210567	3714	.	280.626
FIRSTGROUP PLC	201650	4100	1,382.81	2,287.25
FIRTH HOLDINGS PLC	202222	3312	.	23.237
FIRTH RIXSON PLC	100887	3310	216.125	224.563
FISHER (ALBERT) GROUP PLC	101030	5140	888.489	147.713
FISHER (JAMES) AND SONS PLC	100669	4412	212.214	56.218
FITNESS FIRST PLC	206496	7990	89.575	142.384
FKI PLC	101163	3530	1,745.34	1,444.78
FLARE GROUP PLC	220788	3250	62.978	7.403
FOLKES GROUP PLC	100313	3300	134.756	11.041
FOLKES GROUP PLC	100313	3300	134.756	20.067
FORMINSTER PLC	202267	5651	22.35	22.089
FORTH PORTS PLC	202278	4400	412.849	454.457
FORTNUM & MASON PLC	202279	5400	44.489	99.693
FORTUNE OIL PLC	210676	5171	105.056	68.243
FRANK USHER HOLDINGS PLC	204780	2330	.	12.185
FREDERICK COOPER PLC	220759	3470	46.438	12.276
FREEPORT LEISURE PLC	204701	1540	207.264	235.962
FRENCH CONNECTION GROUP PLC	211976	5600	97.494	90.446
FRENCH PLC	202303	2390	20.235	7.239
FRIENDLY HOTELS PLC	202309	7011	363.048	37.906
FULMAR PLC	212325	2750	69.4	34.043
GALEN HOLDINGS PLC	205950	2834	154.613	901.605
GALLAHER GROUP PLC	220762	2100	3,695.63	4,618.72
GALLIFORD PLC	100900	1500	149.888	38.072
GAMES WORKSHOP GROUP PLC	206248	3944	60.42	187.303
GARTON ENGINEERING PLC	220764	3540	33.422	9.806
GASKELL PLC	202504	3990	57.216	31.853
GB RAILWAYS GROUP PLC	206760	4011	40.477	24.154
GEARHOUSE GROUP PLC	211905	7359	103.918	62.166
GEEST PLC	100112	2000	387.665	487.057
GEI INTERNATIONAL PLC	100556	3560	.	23.671
GENERAL ELECTRIC CO PLC	100114	3812	16,301.20	24,138.23
GIBBS AND DANDY PLC	220769	5211	33.033	3.88
GIEVES GROUP PLC (THE)	202560	5600	28.01	17.377
GKN PLC	18474	3714	4,329.21	9,445.10
GLAXO WELLCOME PLC	5180	2834	15,549.87	124,750.65
GLEESON (MJ) GROUP PLC	100654	1500	331.221	172.243

GLENCHEWTON PLC	220737	5020	27.165	28.057
GLOBAL GROUP PLC	202577	5140	70.61	28.348
GLYNWED INTERNATIONAL PLC	100623	3080	1,414.40	669.486
GO-AHEAD GROUP PLC	210614	4100	340.669	580.892
GOLF CLUB HLDGS PLC	207796	7997	35.637	16.21
GOODHEAD GROUP PLC	202607	2750	.	19.759
GOWRINGS PLC	210888	5500	51.04	15.205
GRAHAM GROUP PLC	221238	5063	454.051	281.387
GRAMPIAN HOLDINGS PLC	100979	5940	245.431	172.812
GRANADA GROUP PLC	100651	7812	9,832.73	11,407.35
GREAT UNIVERSAL STORES PLC	101688	5961	9,333.40	10,959.40
GREENALLS GROUP PLC	100099	5810	3,527.98	1,462.11
GREENE KING PLC	100506	2082	885.555	551.56
GREENWICH RESOURCES PLC	202658	1000	24.157	29.052
GREGGS PLC	101008	5400	210.198	476.652
GRESHAM COMPUTING PLC	202659	7373	19.209	48.872
GROUPE CHEZ GERARD PLC	204608	5812	34.955	104.829
GUITON GROUP LTD	208343	5190	91.802	61.324
GYRUS GROUP PLC	215667	3845	22.571	82.734
HADEN MACLELLAN HOLDINGS PLC	101508	1700	381.509	100.762
HADLEIGH IND GROUP PLC	204504	3443	.	15.371
HALMA PLC	100174	3690	288.824	545.32
HAMLEYS PLC	210616	5945	30.97	43.308
HAMPDEN GROUP PLC	204609	5200	35.424	11.087
HAMPSON INDUSTRIES PLC	202721	3990	148.01	85.163
HAMPSON INDUSTRIES PLC	202721	3990	148.01	9.943
HANOVER INTL PLC	208130	7011	108.441	28.567
HANSON PLC	12826	3270	7,472.12	5,175.03
HARDYS & HANSONS PLC	104853	2082	163.035	71.545
HARTSTONE GRP PLC (THE)	103093	3100	75.488	29.761
HARVEY NASH GROUP PLC	206903	7361	65.167	140.079
HARVEY NICHOLS GROUP PLC	212436	5651	.	154.932
HARVEYS FURNISHING PLC	201021	5712	178.782	162.734
HAVELOCK EUROPA PLC	203013	3990	68.301	15.159
HAWTIN PLC	203016	3949	74.257	34.238
HAY & ROBERTSON PLC	220785	2300	21.536	29.003
HAYNES PUBLISHING GROUP PLC	203020	2731	.	.
HAYS PLC	102576	4200	1,502.98	7,177.86
HAYS PLC	102576	4200	1,502.98	.
HAZLEWOOD FOODS PLC	100614	2030	693.342	492.49
HEADLAM GROUP PLC	203025	5020	299.775	276.196
HEAL'S PLC	207354	5712	26.455	32.102
HEAVITREE BREWERY PLC	203028	5810	52.232	15.146
HELICAL BAR PLC	203036	1540	.	137.75
HELPHIRE GROUP PLC	207009	7510	79.717	234.36
HENLYS GROUP PLC	102233	3713	299.387	374.307

HEPWORTH PLC	100152	3433	718.262	648.279
HERITAGE BATHROOMS PLC	211601	3260	.	61.817
HEWDEN STUART PLC	100303	7350	512.717	528.688
HEYWOOD WILLIAMS GROUP PLC	100878	3211	451.306	28.025
HEYWOOD WILLIAMS GROUP PLC	100878	3211	451.306	296.966
HI-TEC SPORTS PLC	103753	3021	.	.
HICKING PENTECOST PLC	203060	2200	.	52.003
HICKSON INTERNATIONAL PLC	100649	3250	346.403	136.14
HIGHLAND DISTILLERS PLC	100085	2085	867.726	521.979
HILL & SMITH HOLDINGS PLC	203068	3312	89.948	30.252
HILL HIRE PLC	206253	7510	152.874	72.618
HILLSDOWN HOLDINGS PLC	18686	2000	1,801.73	462.331
HILTON GROUP	18766	7990	5,402.36	4,813.53
HOGG ROBINSON PLC	101188	4700	367.886	278.331
HOLDERS TECHNOLOGY PLC	221270	5084	8.796	6.825
HOLIDAYBREAK PLC	103346	7000	157.123	130.276
HOLMES PLACE PLC	215039	7990	141.112	260.212
HONEYSUCKLE GROUP PLC	204709	2330	.	1.882
HORACE CLARKSON PLC	220801	4412	27.877	18.283
HORACE SMALL APPAREL PLC	220082	2320	59.965	46.556
HORNBY GROUP	203163	3944	29.677	28.33
HOUSE OF FRASER PLC	210583	5311	864.605	315.871
HR OWEN PLC	223131	5500	148.198	40.787
HUNTING PLC	101861	2911	727.246	206.687
HUNTLEIGH TECHNOLOGY PLC	104930	3842	132.899	194.741
ICELAND GROUP PLC	100199	5411	1,145.53	717.761
ICI-IMPERIAL CHEM INDS PLC	5894	2800	15,029.10	6,310.59
ILION GROUP PLC	204731	5045	141.032	23.411
IMAGINATION TECHNOLOGIES GRP	210884	3674	21.125	143.368
IMI PLC	100057	3350	1,468.30	1,383.82
IMPERIAL TOBACCO	212773	2100	1,830.25	5,510.02
INCEPTA GROUP PLC	204619	7310	122.159	102.563
INCH KENNETH KAJANG RUBBER	203268	100	9.074	.
INCHCAPE PLC	101449	5010	3,786.14	1,133.36
INDL CONTROL SVCS GROUP PLC	203298	3690	64.78	49.194
INFORMA GROUP PLC	220601	2721	155.811	547.335
INN BUSINESS GROUP PLC	206285	5810	171.476	57.113
INNER WORKINGS GROUP PLC	208396	7372	.	6.633
INTELEK PLC	210439	3679	39.547	10.727
INTELLIGENT ENVIRONMENTS	207357	7370	6.101	22.868
INTERCARE GROUP PLC (THE)	203329	3842	59.318	29.238
INTEREUROPE TECHNOLOGY SERVI	203332	7389	13.672	8.972
INTERNATIONAL GREETINGS PLC	207358	2670	82.118	131.712
INTERNET TECHNOLOGY GROUP	207178	7370	36.287	54.558
INTERX PLC	223527	5045	116.167	81.482
INVENSYS PLC	19348	3822	13,832.94	16.872

INVERESK PLC	203363	2621	119.342	22.229
ISA INTERNATIONAL PLC	203381	5110	221.776	39.837
ITE GROUP PLC	204495	7389	71.813	74.865
ITNET PLC	222373	7374	86.288	.
J & J DYSON PLC	220789	3250	66.104	25.917
JACOBS HOLDINGS PLC	203428	4400	201.839	87.399
JACQUES VERT PLC	220790	2330	18.172	8.849
JAMES CROPPER PLC	201342	2621	75.247	19.364
JAMES HALSTEAD GROUP PLC	104860	3089	108.366	10.67
JARVIS HOTEL PLC	212449	7011	.	434.659
JARVIS PORTER PLC	202757	2750	127.729	68.141
JBA HOLDINGS PLC	64677	7371	234.371	113.037
JENNINGS BROTHERS PLC	208437	2082	65.131	38.539
JJB SPORTS PLC	206260	5940	1,049.93	744.703
JKX OIL & GAS PLC	206412	1311	50.866	23.426
JOHN DAVID SPORTS PLC	213095	5600	96.945	94.957
JOHN LUSTY GROUP PLC	204631	5140	42.8	14.939
JOHN MANSFIELD GROUP PLC	204511	2400	17.111	29.158
JOHN TAMS GROUP PLC	203875	3260	.	7.753
JOHNSON MATTHEY PLC	100774	3341	1,997.05	1,643.20
JOHNSON SERVICE GROUP PLC	100232	7200	280.528	215.881
JOHNSTON GROUP PLC	100391	3711	137.15	54.1
JOHNSTON PRESS PLC	103182	2711	508.893	700.466
JONES STROUD HOLDINGS	202795	3600	.	37.785
JOSEPH HOLT PLC	101175	2082	113.632	62.487
JOURDAN PLC	204716	3580	22.69	33.218
KALAMAZOO PLC	220792	7370	.	47.954
KBC ADVANCED TECHNOLOGIES	207210	1389	42.518	186.911
KELSEY INDUSTRIES PLC	202885	3540	61.913	14.381
KENWOOD APPLIANCES PLC	104896	3630	163.722	56.264
KEWILL SYSTEMS PLC	202905	7373	112.999	330.565
KIER GROUP PLC	213491	1540	544.098	130.451
KINGFISHER LEISURE PLC	207441	5810	.	21.382
KINGFISHER PLC	100760	5399	10,075.12	13,951.42
KS BIOMEDIX HOLDINGS PLC	213512	2834	.	286.126
KUNICK PLC	102208	7996	189.519	89.77
L GARDNER GROUP	211895	3510	82.349	.
LAING (JOHN) PLC	100484	1500	1,298.93	191.359
LAIRD GROUP PLC	100107	3570	1,166.99	390.226
LAMBERT HOWARTH GROUP PLC	203548	3140	59.04	33.981
LAMBERT SMITH HAMPTON PLC	203055	7389	44.497	41.702
LAMONT HOLDINGS PLC	101177	2200	164.911	25.278
LAPORTE PLC	101012	2800	2,654.76	1,511.89
LASMO PLC	18756	1311	4,585.43	1,607.17
LATCHWAYS PLC	215671	3531	9.645	60.508
LAURA ASHLEY HOLDINGS PLC	100094	5621	174.958	135.631

LAVENDON GROUP PLC	213228	7359	139.897	115.501
LAWRENCE PLC	208526	2870	.	41.128
LAWRIE GROUP PLC	102117	100	753.981	138.231
LE RICHE GROUP LTD	208565	5411	153.886	129.363
LEEDS GROUP PLC	104954	2200	128.798	24.879
LEEDS SPORTING PLC	203697	7941	71.687	79.377
LENDU HOLDINGS PLC	220007	100	.	11.092
LESLIE WISE GROUP PLC	203595	2330	12.099	5.198
LEX SERVICE PLC	13636	5500	1,314.07	730.653
LIBERFABRICA PLC	206226	2732	114.907	43.206
LIBERTY PLC	100521	5600	104.87	62.364
LIBERTY PLC	100521	5600	104.87	.
LILLESHALL PLC	203609	5072	81.564	31.68
LIMELIGHT GROUP PLC	213089	2430	91.562	51.578
LINCAT GROUP PLC	204722	3630	25.767	58.619
LINDEN PLC	215673	1520	110.195	45.421
LINTON PARK PLC	101444	5140	363.349	98.625
LINX PRINTING TECHNOLOGIES	203617	3577	24.489	34.466
LITHO SUPPLIES PLC	200386	5084	73.487	49.165
LOGICA PLC	100967	7371	394.372	2,385.81
LONDON BRIDGE SOFTWARE HLDGS	207232	7371	57.869	634.695
LONDON CLUBS INTL	210820	7990	446.64	359.278
LONDON CREMATION CO PLC	220014	7200	.	.
LONDON INTERNATIONAL GROUP	18811	3060	427.305	872.321
LONMIN PLC	100147	1000	1,612.73	825.075
LONRHO AFRICA PLC	217399	5010	717.996	171.378
LOOKERS PLC	101056	5500	277.481	42.26
LOW & BONAR PLC	100929	2670	633.409	269.274
LOWE (ROBERT H) PLC	220017	3949	28.894	8.775
LPA GROUP PLC	204633	3640	11.541	9.583
LUMINAR PLC	212783	5810	113.556	280.66
LYNX GROUP PLC	221175	7370	128.638	320.254
MACDONALD HOTELS PLC	212331	7011	202.866	168.808
MACFARLANE GROUP (CLANSMAN)	101080	2670	217.929	135.05
MACRO 4 PLC	101198	7373	49.201	152.711
MAIDEN GROUP PLC	212377	7310	86.579	197.832
MAISHA PLC	221773	5122	0.909	2.895
MAJESTIC WINE PLC	208682	5900	45.844	90.772
MALLETT PLC	200472	5990	38.856	20.09
MANCHESTER UNITED PLC	200480	7941	229.554	701.222
MANGANESE BRONZE HLDGS PLC	200487	3711	128.74	121.779
MANSFIELD BREWERY PLC	100544	5810	519.766	224.892
MARCHPOLE HOLDINGS PLC	216829	7389	34.931	23.85
MARKS & SPENCER PLC	18860	5311	12,598.96	18,906.91
MARSHALLS PLC	100921	3250	382.288	278.599
MARTIN INTERNATIONAL HLDGS	221186	2300	98.76	18.7

MARTIN SHELTON GROUP PLC	204585	2780	12.349	3.926
MATALAN PLC	217872	5399	178.193	497.866
MATTHEWS (BERNARD) PLC	100914	2015	348.799	243.43
MAYBORN GROUP	205058	3060	51.786	22.34
MAYFLOWER CORP PLC	205060	3711	1,124.40	556.734
MCALPINE (ALFRED) PLC	101094	1531	901.247	274.729
MCBRIDE PLC	206413	2840	495.544	503.932
MCCARTHY & STONE PLC	101092	1520	312.294	209.509
MCKECHNIE PLC	100510	3080	647.365	701.344
MCLEOD RUSSELL HLDGS PLC	101215	3470	149.201	
MCLEOD RUSSELL HLDGS PLC	101215	3470	149.201	107.169
MDIS GROUP PLC	210593	7373	156.7	162.85
MEDEVA PLC	24454	2834	592.479	597.746
MEDISYS PLC	204376	3826	24.271	63.445
MEGGITT PLC	101207	3674	456.693	462.5
MENTMORE ABBEY PLC	208523	4220	90.629	190.866
MENZIES (JOHN) PLC	100536	5190	562.569	322.306
MERANT PLC	102690	7371	.	151.337
MERCHANT RETAIL GROUP PLC	101065	5311	.	.
MERISTEM PLC	101227	2800	47.661	22.536
MERRYDOWN PLC	205122	2080	28.941	11.112
MERSEY DOCKS & HARBOUR CO	103002	4400	766.963	725.724
METAL BULLETIN PLC	205126	2741	45.896	198.689
METALRAX GROUP PLC	103037	3540	114.033	184.286
METROLINE PLC	207362	4100	106.551	167.523
MEYER INTERNATIONAL PLC	100474	5211	1,072.22	1,023.39
MFI FURNITURE PLC	104898	2510	1,084.72	426.237
MICE GROUP PLC	206267	7389	38.826	58.208
MICROGEN PLC	101210	7370	70.054	99.083
MID-STATES PLC	31450	5013	72.666	23.412
MIDDLESEX HLDGS PLC	205158	3312	58.035	16.854
MILLENNIUM& COPTHORNE HOTELS	212437	7011	1,649.16	859.579
MIRROR GROUP PLC	103221	7310	1,272.81	1,135.58
MISYS PLC	101928	7373	338.136	4,724.22
MITIE GROUP PLC	205210	7340	159.13	371.083
ML LABORATORIES PLC	103095	3841	32.408	155.194
MMT COMPUTING PLC	205234	7370	39.481	183.694
MOLINS PLC	100533	3559	230.935	63.629
MONEY CONTROLS PLC	222007	3990	64.106	139.864
MONSOON PLC	216606	5621	84.406	273.575
MORGAN CRUCIBLE CO PLC	100292	3290	1,565.64	1,069.89
MORGAN SINDALL PLC	222281	1540	198.985	114.531
MORLAND PLC	101218	2082	417.057	197.394
MORRISON (WM) SUPERMARKETS	100132	5411	2,167.66	3,838.49
MORRISON CONSTRUCTION GROUP	202508	1540	.	351.507
MOSS BROS GROUP PLC	205277	5600	155.989	201.688

MOWLEM (JOHN) & CO PLC	100804	1540	1,096.61	273.977
MSB INTERNATIONAL PLC	213091	7361	81.044	78.557
MTL INSTRUMENTS	104849	3829	62.259	53.222
MY HOLDINGS PLC	205311	2650	126.276	162.134
NATIONAL EXPRESS GROUP PLC	104967	4100	915.256	2,118.29
NETWORK TECHNOLOGY PLC	213515	7373	.	30.074
NEW LOOK GROUP PLC	220632	5621	214.218	611.819
NEWARTHILL PLC	101219	1500	532.832	81.464
NEWCASTLE UNITED PLC	213496	7941	117.062	178.096
NEWS COMMUNICATIONS & MEDIA	205696	2711	192.715	341.785
NEXT PLC	100149	5651	1,401.47	3,927.13
NFC PLC	15179	4210	2,075.82	1,227.70
NICHOLS JN (VIMTO) PLC	101224	2086	86.221	87.629
NIGHTFREIGHT PLC	210825	4210	54.995	15.962
NMT GROUP PLC	210225	3841	14.573	33.654
NORBAIN PLC	223534	3669	.	39.296
NORCOR HOLDINGS PLC	222014	2650	52.366	24.388
NORCROS PLC	100123	3250	360.796	225.228
NORMAN HAY PLC	220028	3470	19.154	10.856
NORTHAMBER PLC	101625	5045	99.681	124.333
NORTHERN FOODS PLC	100470	2000	.	1,069.75
NORTHERN LEISURE PLC	222017	5810	237.694	213.782
NORTHERN RECRUITMENT GROUP	215679	7361	12.415	46.427
NORTHGATE PLC	102641	7510	579.021	468.361
NOVARA PLC	210597	5040	77.45	65.193
NXT PLC	209404	3651	49.131	436.446
NYCOMED AMERSHAM PLC	100423	2835	.	4,348.18
NYCOMED AMERSHAM PLC	100423	2835	.	.
OASIS STORES PLC	206383	2330	76.39	132.712
OCEAN GROUP PLC	100598	4731	1,387.11	1,803.44
OLD ENGLISH INNS PLC	207365	7011	224.338	91.86
OLIVER GROUP PLC	205372	5661	.	7.644
ORBIS PLC	204729	7380	122.052	54.868
ORIENTAL RESTAURANT GROUP	213229	5812	13.633	20.895
OSBORNE & LITTLE PLC	204515	2670	33.05	39.983
OTTAKAR'S PLC	220633	5940	46.662	74.673
OXFORD INSTRUMENTS PLC	100508	3826	248.061	179.308
PACE MICRO TECHNOLOGY PLC	212717	3663	152.887	624.073
PACIFIC MEDIA PLC	221496	7812	20.124	21.21
PADANG SENANG HOLDINGS PLC	220035	800	7.249	4.118
PALADIN RESOURCES PLC	104934	1311	110.06	93.496
PALADIN RESOURCES PLC	104934	1311	110.06	.
PARITY GROUP PLC	223130	7370	128.557	470.204
PARK GROUP PLC	104855	5961	52.55	68.192
PATERSON ZOCHONIS PLC	100575	2840	.	260.149
PEARSON PLC	100572	2711	8,846.42	12,099.13

PEGASUS GROUP PLC	208424	7372	19.164	35.05
PENDRAGON PLC	104796	5500	800.088	155.698
PENTLAND GROUP PLC	102457	5130	788.807	554.071
PEPTIDE THERAPEUTICS GRP PLC	211897	2834	33.286	49.601
PERKINS FOODS PLC	102452	2030	353.724	293.017
PERRY GROUP PLC	100456	5500	306.282	53.441
PERSIMMON PLC	101232	1520	1,040.00	483.22
PETER BLACK HOLDINGS PLC	101019	3100	176.9	261.055
PHONELINK PLC	208496	7372	39.875	30.507
PHOTO-ME INTERNATIONAL PLC	101233	7200	.	640.769
PHOTOBITION GROUP PLC	206271	7829	72.061	345.479
PHYTOPHARM PLC	213092	2833	6.238	68.941
PIC INTERNATIONAL GROUP PLC	100663	200	445.489	.
PIC INTERNATIONAL GROUP PLC	100663	200	445.489	1,088.70
PIFCO HOLDINGS PLC	208502	3634	.	26.769
PILKINGTON PLC	100111	3211	4,663.71	1,454.27
PILKINGTON'S TILES GROUP PLC	204570	3250	48.434	35.133
PITTARDS PLC	101229	3100	63.775	11.787
PIZZAEXPRESS PLC	208518	5812	136.343	947.655
PLANIT HOLDINGS PLC	200833	7372	16.22	50.476
PLANTATION & GENL INVT PLC	201203	3523	80.581	35.755
PLYSU PLC	101231	3089	216.962	105.55
POCHIN'S PLC	208529	1540	.	36.183
POLYDOC PLC	210608	7372	2.569	44.723
POLYMASC PHARMACEUTICALS PLC	212165	2834	3.592	20.464
POLYPIPE PLC	101249	3080	393.265	407.848
PORTMEIRION POTTERIES HLDGS	208551	3260	47.3	24.199
PORTSMOUTH & SUNDERLAND NEWS	104906	5412	182.435	323.825
PORVAIR PLC	208553	3290	74.678	66.344
POWDERJECT PHARMACEUTICALS	207242	2834	145.151	1,071.45
POWELL DUFFRYN PLC	100501	3560	743.708	602.469
POWERSCREEN INTERNATIONL PLC	101234	3531	249.81	224.311
PPL THERAPEUTICS PLC	212785	2834	75.29	68.118
PRECOAT INTERNATIONAL PLC	206272	3470	51.571	30.62
PREMIER FARNELL PLC	62631	5961	703.611	903.553
PREMIER OIL PLC	101924	1311	1,085.30	272.344
PREMISYS GROUP PLC	209505	1540	5.614	16.72
PRESSAC HOLDINGS PLC	208575	3600	364.398	217.929
PRISM RAIL PLC	213528	4011	242.581	177.604
PROTHERICS PLC	104850	7373	15.586	54.949
PROWTING PLC	208617	1531	270.784	131.456
PSION PLC	208621	3571	221.989	738.168
PTS GROUP PLC	206274	5070	60.366	36.429
QS GROUP PLC	102818	5651	49.085	13.953
QUALITY SOFTWARE PRODUCTS	207012	7372	93.986	80.328

QUARTO GROUP INC (THE)	220041	2731	118.772	18.798
QUEENS MOAT HOUSES PLC	100497	7011	1,591.26	122.931
QUEENSBOROUGH HOLDINGS PLC	210674	7996	121.886	38.491
QUICKS GROUP PLC	100387	5500	286.283	47.425
RACAL ELECTRONICS PLC	19595	3576	1,822.22	1,870.25
RAGE SOFTWARE PLC	206227	7990	8.056	48.993
RAMCO ENERGY PLC	221631	1381	108.372	100.708
RAMSDEN S (HARRY) PLC	220042	5812	34.965	28.615
RANK GROUP PLC	19613	7819	5,149.46	2,979.67
RCO HOLDINGS PLC	207057	7340	29.576	33.699
REAL TIME CONTROL PLC	204639	7370	31.405	53.882
RECKITT & COLMAN PLC	221858	2842	4,471.46	5,399.70
REDROW GROUP PLC	223036	1520	489.526	559.555
REED EXECUTIVE PLC	101523	7361	111.007	56.351
REGAL HOTEL GROUP PLC	220044	7011	575.886	154.432
REGENT INNS PLC	201370	5810	175.433	282.077
RELIANCE SECURITY GROUP PLC	207075	7381	51.335	75.844
RELYON GROUP PLC	207076	2510	78.258	102.604
RENISHAW PLC	100498	3829	161.469	529.501
RENOLD PLC	100613	3530	262.162	190.443
RENTOKIL INITIAL PLC	100091	7340	2,931.78	21,593.62
REUTERS GROUP PLC	9098	7380	4,500.58	14,924.77
REXAM PLC	2338	2650	2,743.61	1,114.02
RICHARDS PLC	221766	2273	.	6.766
RIO TINTO PLC	19565	1000	16,162.15	12,335.43
RIO TINTO PLC	19565	1000	16,162.15	
RIO TINTO PLC	19565	1000	16,162.15	.
RIVA GROUP PLC	220046	7370	49.461	18.14
RJB MINING PLC	207128	1220	1,786.77	.
RJB MINING PLC	207128	1220	1,786.77	177.142
RM PLC	211922	7373	136.421	586.432
RMC GROUP PLC	100071	3270	6,647.21	3,570.34
ROLFE & NOLAN PLC	207141	7372	.	42.881
ROLLS-ROYCE PLC	100499	3724	7,954.62	6,234.96
RONSON PLC	221248	5190	12.312	19.938
ROSEBYS PLC	207147	5700	199.023	59.439
ROTORK PLC	101241	3590	150.429	551.653
ROWE EVANS INVESTMENTS PLC	207159	800	77.992	43.013
ROXBORO GROUP PLC	207161	3823	101.132	214.994
ROXSPUR PLC	221889	3823	67.242	85.203
ROYAL DOULTON PLC	207163	3260	295.381	72.81
ROYALBLUE GROUP PLC	207249	7372	47.127	155.613
RPC GROUP PLC	207167	3080	320.079	250.075
RUBEROID PLC	100568	2950	152.085	68.205
RUBEROID PLC	100568	2950	152.085	.
RUGBY GROUP PLC (THE)	100494	2430	1,284.12	1,015.96

RYLAND GROUP PLC	206278	5500	226.704	34.969
SAATCHI & SAATCHI PLC	66036	7311	646.219	510.041
SAFEWAY PLC	100360	5411	7,201.71	4,332.18
SAGE GROUP PLC	104643	7371	187.496	2,529.05
SAINSBURY (J) PLC	19579	5411	.	10,987.33
SALTIRE PLC	101419	5065	103.116	4.527
SANCTUARY GROUP PLC	204539	7389	32.078	43.968
SANDERSON BRAMALL MOTOR GRP	208781	5500	420.073	83.534
SANDERSON GROUP PLC	208782	7373	67.696	90.926
SAVE GROUP PLC	104842	5500	363.845	92.797
SAVILLS PLC	208831	7389	148.762	141.13
SCAPA GROUP PLC	100580	3550	813.123	453.512
SCOOT.COM PLC	204378	7370	23.009	157.707
SCOTIA HOLDINGS PLC	210624	2834	136.132	82.185
SCOTTISH & NEWCASTLE PLC	101301	2082	6,568.89	7,789.01
SCOTTISH HIGHLANDS HOTEL PLC	212915	7011	83.984	48.705
SCS UPHOLSTERY PLC	215700	5712	25.906	42.716
SEACON HOLDINGS PLC	220055	4400	33.638	17.283
SECURICOR GROUP PLC	100350	4731	1,200.97	3,900.34
SECURICOR GROUP PLC	100350	4731	1,200.97	.
SEDGEMOOR PLC	101498	5065	.	114.217
SELECT APPOINTMENTS	208297	7361	508.582	1,083.86
SELFRIDGES PLC	220164	5311	781.644	550.757
SEMA GROUP PLC	101117	7373	1,123.73	4,530.54
SEMARA HLDGS PLC	100990	7200	.	62.59
SEP INDUSTRIAL HLDGS PLC	208313	3452	83.407	22.917
SEVERFIELD-ROWEN PLC	220057	3440	101.68	86.777
SFI GROUP PLC	207369	5810	124.918	192.325
SHANI GROUP PLC	208354	2330	28.292	12.463
SHARPE & FISHER PLC	100218	5070	84.406	65.079
SHEFFIELD UNITED PLC	204542	7941	42.001	22.773
SHELL TRANSPORT AND TRADING	9655	2911	23,820.78	59,558.40
SHELL TRANSPORT AND TRADING	9655	2911	23,820.78	.
SHERWOOD GROUP PLC	102861	2250	236.762	69.219
SHERWOOD INTERNATIONAL LTD	208369	7373	64.888	211.4
SHILOH PLC	202972	2200	46.732	13.714
SHIRE PHARMACEUTICALS GROUP	212340	2834	110.619	906.13
SIBIR ENERGY PLC	207252	1311	201.265	44.797
SIDNEY C BANKS PLC	100726	5150	102.369	33.23
SIG PLC	208361	5030	456.099	277.149
SIGNET GROUP PLC	15520	5944	1,259.57	1,073.06
SILENTNIGHT HOLDINGS PLC	100073	2510	197.064	142.398
SIMON GROUP PLC	100044	4400	350.396	110.772
SINGAPORE PARA RUBBER ESTATE	220060	800	11.131	14.763
SIRDAR PLC	101275	2273	83.415	53.94
SKD MEDIA PLC	221704	7812	3.827	20.037

SKILLSGROUP PLC	101664	5045	151.36	233.655
SKYEPHARMA PLC	112408	2834	114.561	543.613
SLUG & LETTUCE GROUP PLC	204503	5810	49.003	34.947
SMART (J) & CO CONTRACTORS	208122	1500	76.18	43.297
SMITH & NEPHEW PLC	101317	3842	1,506.24	3,466.83
SMITHS INDUSTRIES PLC	100045	3812	1,303.89	3,590.84
SOCO INTERNATIONAL PLC	207254	1311	141.93	44.837
SOLVERA PLC	101220	3829	.	.
SOMERFIELD HOLDINGS LTD	212700	5411	.	2,659.17
SOUNDTRACS	204643	3651	6.427	3.893
SOUTH AFRICAN BREWERIES LTD	100472	2082	.	.
SOUTH AFRICAN BREWERIES LTD	100472	2082	.	5,174.34
SOUTHAMPTON LEISURE HLDGS	204583	7941	.	17.653
SOUTHNEWS PLC	208199	2711	139.34	171.552
SPIRAX-SARCO ENGINEERING PLC	100619	3500	427.199	685.575
SPRING GROUP PLC	104799	7361	201.646	296.99
SPRINGWOOD PLC	211708	5810	35.461	27.433
SSL INTERNATIONAL PLC	104640	2834	496.829	1,447.30
ST IVES PLC	100968	2750	499.497	811.946
STADIUM GROUP PLC	212342	3089	91.832	52.6
STAFFWARE PLC	207255	7372	31.329	56.345
STAGECOACH HOLDINGS PLC	203652	4100	4,222.00	4,669.06
STANLEY LEISURE PLC	103028	7990	546.342	452.905
STAT-PLUS GROUP PLC	103222	5940	21.416	36.793
STAVELEY INDUSTRIES PLC	100038	1731	297.677	130.569
STERLING INDUSTRIES PLC	203673	3590	84.207	115.219
STERLING PUBLISHING GRP PLC	203675	2731	27.132	29.214
STIRLING GROUP PLC	203690	2300	85.458	30.45
STODDARD INTERNATIONAL PLC	203693	2273	45.478	4.548
STOREHOUSE PLC	100031	5600	1,610.43	968.716
STOVES GROUP PLC	206398	3630	83.479	33.108
STRATAGEM GROUP PLC	203698	3585	119.69	47.102
STYLE HOLDINGS PLC	207381	5600	22.096	32.403
STYLO PLC	100482	5661	275.33	38.664
SUNDERLAND PLC	213131	7941	85.332	61.088
SURGICAL INNOVATIONS GRP PLC	202708	3841	3.928	5.94
SUTTON HARBOUR HLDGS PLC	207371	4400	41.176	19.655
SWALLOW GROUP PLC	100960	7011	1,127.89	523.891
SWALLOWFIELD PLC	203770	3990	42.698	11.237
SWAN HILL GROUP PLC	100483	1540	224.738	42.083
SWP GROUP PLC	204768	2452	16.945	9.694
SYLTONE PLC	203779	3711	100.143	39.049
SYMONDS PLC	204769	3672	.	34.746
SYSTEMS INTL GROUP PLC	60988	7380	6.687	41.122
T & S STORES PLC	102467	5411	330.767	350.742
TANJONG PLC	203882	7990	419.732	.

TARMAC PLC	100322	1540	4,484.60	1,827.97
TARPAN PLC	204761	2200	2.744	3.474
TARSUS GROUP PLC	222374	7330	22.341	20.377
TATE & LYLE PLC	100135	2060	5,289.72	2,504.86
TAYLOR WOODROW PLC	100816	1540	2,401.03	1,008.67
TBI PLC	205015	1531	738.277	619.01
TED BAKER PLC	215703	2300	25.462	77.959
TELEMETRIX PLC	104951	3576	99.059	79.644
TELEVISION CORPORATION PLC	203743	7819	.	104.783
TELSPEC PLC	210958	3661	45.987	17.788
TEMPUS GROUP PLC	210552	7311	507.785	196.636
TESCO PLC	100131	5411	13,935.79	19,197.15
TGI PLC	203970	3651	28.018	14.334
THISTLE HOTELS PLC	100211	7011	2,807.16	.
THISTLE HOTELS PLC	100211	7011	2,807.16	950.516
THOMAS WALKER PLC	204781	3960	5.438	3.751
THOMSON TRAVEL GROUP PLC	217421	4700	2,178.25	2,745.27
THORNTONS PLC	101528	2060	209.579	294.636
TI GROUP PLC	19449	3050	3,493.98	2,592.01
TIBBETT & BRITTEN GROUP PLC	101257	4731	718.154	308.596
TILBURY DOUGLAS PLC	101051	1540	632.41	330.151
TIME PRODUCTS PLC	100621	5094	129.963	61.757
TITON HOLDINGS PLC	209050	3634	23.224	14.51
TJ HUGHES PLC	220067	5311	80.446	74.792
TLG-THORN LIGHTING GROUP PLC	204961	3640	.	528.714
TOMKINSONS PLC	209131	2273	43.953	14.743
TOPPS TILES PLC	207261	5030	40.293	143.483
TORDAY & CARLISLE PLC	209151	3510	38.728	18.05
TOREX HIRE PLC	220072	7373	47.039	47.752
TOROTRAK PLC	220409	3714	80.224	233.066
TOTTENHAM HOTSPUR PLC	209167	7941	115.772	106.301
TRACE COMPUTERS PLC	204531	7371	.	28.646
TRAFFICMASTER PLC	204532	2741	52.628	260.651
TRANSPORT DEVELOPMENT GROUP	19666	4213	590.993	306.799
TRANSTEC PLC	100252	3460	445.346	98.797
TRAVIS PERKINS PLC	100060	5211	564.176	.
TRAVIS PERKINS PLC	100060	5211	564.176	691.103
TREATT PLC	209217	2890	29.668	19.439
TRIAD GROUP PLC	212345	7370	31.963	238.455
TRIFAST PLC	210628	3600	.	183.069
TRINITY MIRROR PLC	100250	2711	938.585	922.817
TRY GROUP PLC	209238	1540	119.928	15.256
TT GROUP PLC	102638	3600	691.309	590.971
TUDOR PLC	209257	3990	12.177	10.41
UCM GROUP PLC	204779	3250	53.726	34.11
ULSTER TELEVISION PLC	209291	3663	64.519	152.995

ULTIMA NETWORKS PLC	205153	3577	12.217	8.59
ULTRA ELECTRONICS HLDGS PLC	212787	3728	159.352	380.177
UMECO PLC	204777	5080	53.725	72.952
UNIGATE PLC	100355	5140	2,189.48	1,708.45
UNILEVER PLC	10845	2000	6,938.04	36,781.94
UNITED BISCUITS HOLDINGS PLC	29224	2052	1,907.71	1,856.09
UNITED ENERGY PLC	220081	1311	23.881	6.471
UNITED INDUSTRIES PLC	221869	3089	87.963	33.512
UNITED NEWS & MEDIA PLC	14611	2721	3,865.67	4,384.78
UNITED OVERSEAS GROUP PLC	207262	5090	145.933	41.899
UNIVERSAL SALVAGE PLC	208238	5500	.	25.342
UNO PLC	207382	5712	.	15.707
UTILITEC PLC	222106	3823	.	20.947
VARDY (REG) PLC	104792	5010	595.312	282.352
VDC PLC	205697	2834	.	35.514
VEGA GROUP PLC	210922	7373	30.305	145.238
VHE HOLDINGS PLC	204600	1600	47.221	10.624
VIBROPLANT PLC	101630	7359	125.341	37.291
VICKERS PLC	100867	3711	1,188.12	690.775
VICTORIA CARPET HOLDINGS PLC	209411	2273	.	11.076
VICTORY CORP PLC	207264	5600	50.187	33.092
VICTREX PLC	212128	2821	66.382	187.192
VIGLEN TECHNOLOGY PLC	100026	3577	450.276	50.909
VITEC GROUP PLC	101261	3861	223.235	476.771
VOCALIS GROUP PLC	213238	3669	7.879	44.952
VOLEX GROUP PLC	100864	3600	206.383	182.018
VOSPER THORNYCROFT HLDGS PLC	102597	3730	377.188	472.094
VTR PLC	210915	7812	39.133	17.397
WACE GROUP PLC	101300	2750	137.515	71.121
WADDINGTON (JOHN) PLC	100538	3080	458.169	311.478
WAGON PLC	100678	3460	421.655	214.155
WALKER GREENBANK PLC	101270	2670	95.956	47,013.61
WARD HOLDINGS PLC	101278	1531	51.479	25.973
WARDLE STOREYS PLC	101269	3081	153.247	150.192
WASSALL PLC	102321	3357	1,462.31	581.078
WATERFALL HOLDINGS PLC	207448	5810	66.557	38.908
WEIR GROUP PLC	100650	3561	797.762	663.071
WELLINGTON HLDGS PLC	210907	3060	67.86	36.776
WEMBLEY PLC	101280	7948	534.006	281.756
WENSUM CO PLC	204536	2300	14.811	8.844
WESCOL GROUP PLC	210905	1700	59.953	51.342
WESTBURY PLC	101298	1520	715.28	402.86
WETHERSPOON (JD) PLC	209503	5810	592.74	811.833
WF ELECTRICAL PLC	101283	5063	148.171	116.361
WHATMAN PLC	101279	3569	161.866	313.264
WHITBREAD PLC	19904	5810	6,766.68	7,047.62

WHITECROFT PLC	100779	3640	101.548	46.011
WHITEHEAD MANN GROUP PLC	207265	7361	19.983	44.861
WHITTARD OF CHELSEA PLC	207266	5810	18.096	42.755
WICKES PLC	101282	5211	267.156	314.705
WILLIAM JACKS PLC	204549	5500	57.679	11.565
WILLIAM SINCLAIR HLDGS PLC	103223	2870	72.261	65.943
WILLIAMS PLC	100966	7380	2,905.49	.
WILLIAMS PLC	100966	7380	2,905.49	4,027.12
WILLIAMSON TEA HOLDINGS PLC	100682	100	130.563	31.814
WILMINGTON GROUP PLC	211904	2721	52.786	226.086
WILSHAW PLC	209514	3490	57.693	67.953
WILSON BOWDEN PLC	101333	1520	963.007	790.752
WILSON CONNOLLY HLDGS PLC	101036	1520	781.32	356.501
WIMPEY (GEORGE) PLC	101105	1520	1,749.15	660.805
WOLSELEY PLC	100644	5070	3,921.16	3,279.85
WOLSTENHOLME RINK PLC	209536	2890	110.403	60.967
WOLVERHAMPTON & DUDLEY BREW	100659	2082	1,055.16	379.453
WORKPLACE TECHNOLOGIES PLC	215705	7373	111.133	94.912
WORTHINGTON GROUP PLC	204786	2200	.	13.28
WPP GROUP PLC	14605	7311	4,080.47	4,664.42
WT FOODS PLC	210903	2030	137.107	143.684
WYEVALE GARDEN CENTERS PLC	104852	5200	218.204	214.792
WYKO GROUP PLC	209552	5080	.	113.592
WYNDEHAM PRESS GROUP PLC	204787	2750	114.365	160.817
XENOVA GROUP PLC	30645	2834	26.824	26.829
YATES BROS WINE LODGES PLC	223545	5810	283.967	454.815
YJL PLC	100734	1520	194.593	16.272
YORKSHIRE GROUP PLC	102628	2860	187.196	89.582
YOUNG & CO S BREWERY PLC	209598	2082	295.159	46.796
YOUNG (H) HOLDINGS PLC	209597	5000	94.429	42.833
YULE CATTO & CO PLC	101302	2860	895.7	640.895
ZOTEFOAMS PLC	206290	3086	61.141	48.258

.

APPENDIX B

LIST OF **FRENCH** SAMPLE FIRMS

FRENCH SAMPLE OF FIRMS

COMPANY NAME	GVKEY	SIC	MARKET VALUE OF EQUITY	TOTAL ASSETS
ACCOR SA	100001.00	7011.00	11066.06	7828.61
ACIAL SA	219594.00	2590.00	.	4.59
ADA SA	211380.00	7510.00	81.80	119.90
AIR LIQUIDE SA	101202.00	2810.00	10708.02	15215.73
AIRFEU SA	220835.00	2520.00	63.57	48.16
ALAIN MANOUKIAN SA	220987.00	2330.00	141.95	59.24
ALBERT SA	220836.00	2300.00	.	6.31
ANDRE TRIGANO	210518.00	7000.00	42.11	29.85
APEM SA	211474.00	3613.00	48.09	79.61
ARBEL SA	100496.00	3743.00	78.37	2.35
ARKOPHARMA LABORAT PHARMACEU	219596.00	2833.00	.	262.05
ARUS SA	210450.00	5051.00	.	.
ASSYSTEM	212295.00	2810.00	239.07	117.85
ATOS	200363.00	7370.00	1059.80	1886.27
ATOS	200363.00	7370.00	1059.80	.
AUGROS COSMETIC PACKAGING	216024.00	7389.00	53.80	.
AUSSEDAT-REY	101226.00	2621.00	.	.
AVIATION LATECOERE	211497.00	3728.00	181.05	130.56
BACCARAT	103323.00	3911.00	.	67.40
BAZAR DEL HOTEL DE VILLE	101414.00	5311.00	409.53	250.23
BELVEDERE SA	216026.00	2085.00	.	119.85
BENETEAU SA	220851.00	3730.00	155.90	199.30
BERTHET-BONDET SA	219597.00	3851.00	17.73	9.62
BERTRAND FAURE SA	102299.00	2531.00	.	1336.05
BIC SOCIETE	100013.00	3950.00	1669.08	3068.70
BIJOUX ALTESSE SA	222270.00	3911.00	.	.
BIS SA	102284.00	7361.00	.	472.99
BISCUITS GARDEIL SA	219599.00	2052.00	.	2.74
BL-BERGER-LEVRAULT SA	220853.00	2741.00	108.98	40.14
BOIRON SA	200789.00	2833.00	208.53	379.14
BOISSET SA	219600.00	2084.00	250.57	117.30
BOLLORE TECHNOLOGIES SA	103141.00	4731.00	2918.78	1239.66
BONDUELLE	225016.00	2030.00	795.55	183.32
BONGRAIN SA	101281.00	2020.00	1900.22	947.01

BOURGEOIS SA	220855.00	5040.00	18.63	3.15
BOUYGUES SA	101096.00	1600.00	.	.
BOUYGUES SA	101096.00	1600.00	.	5273.92
BP FRANCE SA	100777.00	2911.00	.	.
BRICORAMA SA	219602.00	5200.00	282.08	334.22
BRIOCHE PASQUIER SA	220857.00	2050.00	170.77	384.60
BURELLE SA	103257.00	2820.00	1488.15	115.31
CAMBODGE CIE DU	220881.00	800.00	1236.24	329.09
CAP GEMINI	101944.00	7371.00	4331.72	11101.06
CARREFOUR SUPERMARCHE SA	100346.00	5411.00	20412.28	29338.89
CASCADES SA	220864.00	2631.00	271.05	28.60
CASINO GUICHARD-PERRACHON SA	101173.00	5411.00	9056.21	7804.70
CASINO MUNICIPAL DE CANNE	103666.00	7011.00	166.66	121.31
CASTORAMA DUBOIS INVESTISSEM	103634.00	5200.00	3260.02	8700.40
CEE-CONTINENT D'EQUIP ELECTR	221099.00	3612.00	24.30	16.20
CEGEDIM	211479.00	7374.00	140.68	96.62
CEGID SA	103390.00	7370.00	137.41	257.21
CERG FINANCE SA	216032.00	7372.00	.	113.83
CFC-CIE FINANCIERE CARDANS	220872.00	3312.00	.	.
CFF-CIE FRANCAISE FERRAILLES	101435.00	3320.00	375.23	210.91
CGIP-CIE GEN D'INUST ET PART	103177.00	3290.00	3283.14	3705.48
CHAINE ET TRAME SA	211385.00	2200.00	51.74	17.53
CHARGEURS INTERNATIONAL SA	101170.00	2200.00	1585.57	426.55
CHARLATTE SA	211481.00	3559.00	31.45	9.12
CHRISTIAN DALLOZ SA	210545.00	3842.00	214.45	232.44
CHRISTIAN DIOR SA	201260.00	2844.00	25155.93	4991.35
CIE AGRICOLE DE LA CRAU SA	217199.00	100.00	29.23	20.15
CIE DE FIVES-LILLE SA	101267.00	3500.00	818.55	223.01
CIE FERM L'ETABL THERM VICHY	212545.00	2086.00	48.15	110.98
CIE GENERALE DE GEOPHYSIQUE	102983.00	1382.00	.	295.15
CLARINS SA	103687.00	2844.00	869.43	1153.03
CLAYEUX SA	219604.00	5130.00	.	3.47
CLUB MEDITERRANEE SA	101228.00	7011.00	1610.62	1161.22
CMM INDUSTRIES SA	200897.00	3670.00	23.38	7.53
COBRA	220612.00	3100.00	.	1.71
COFIXEL	220888.00	3822.00	496.08	57.82
COFLEXIP STENA OFFSHORE	29235.00	3317.00	1313.90	1075.12

COLAS	101500.00	1600.00	.	1542.32
COM 1 SA	222238.00	3672.00	33.29	18.80
COMPAGNIE DES ALPES	211387.00	7990.00	.	117.65
CONFLANDEY SA	103261.00	3300.00	99.75	27.29
COPAREX INTERNATIONAL SA	102668.00	1311.00	271.22	150.11
COSTIMEX	220892.00	2040.00	16.96	5.84
CROMETAL SA	220897.00	3440.00	333.83	115.05
CSEE-CIE DE SIGNAUX & D EQUI	102707.00	3812.00	.	368.38
DAMART SA	101436.00	2300.00	713.93	601.58
DANONE (GROUPE)	17452.00	2020.00	17523.72	21174.37
DASSAULT AVIATION SA	100517.00	3721.00	.	2066.53
DASSAULT SYSTEMS SA	63169.00	7373.00	548.12	5313.87
DAUPHIN-OTA	103171.00	7310.00	.	290.52
DE DIETRICH ET CIE	101638.00	1600.00	634.94	329.17
DELACHAUX SA	220904.00	3310.00	155.52	74.38
DELMON INDUSTRIE	216035.00	3060.00	56.41	58.86
DESQUENNE & GIRAL SA	211485.00	1600.00	151.00	19.39
DEVEAUX SA	211392.00	2211.00	110.88	173.47
DEVERNOIS SA	220906.00	2330.00	59.04	16.27
DEVILLE	220907.00	3433.00	51.69	11.57
DIDOT-BOTTIN	102942.00	2531.00	141.22	46.33
DIGIGRAM SA	216037.00	3571.00	119.09	60.15
DISTRIBORG	220908.00	5411.00	137.03	93.86
DMC DOLLFUS MIEG ET CIE	101158.00	2200.00	755.10	90.83
DU PAREIL AU MEME SA	219620.00	5600.00	75.71	190.91
DUCROS SERVICES RAPIDES	220912.00	4210.00	96.47	32.27
DYNACTION SA	201713.00	3600.00	373.54	99.44
ECIA SA	102320.00	3714.00	3431.08	773.00
EIFFAGE	222307.00	1540.00	5135.53	991.30
ELECTRICITE & EAUX MADAGASCA	221876.00	1311.00	.	74.79
ELF AQUITAINE SA	19364.00	2911.00	42833.35	31843.77
EMIN LEYDIER SA	220922.00	2650.00	233.30	69.71
ENGRENAGES & REDUCTEURS SA	102971.00	3560.00	.	11.26
ENTRELEC GROUP SA	205689.00	3600.00	.	181.68
ERAMET	223520.00	1000.00	1924.28	468.44
ERIDANIA BEGHIN-SAY SA	100810.00	2070.00	9425.71	4413.65
ESSILOR INTERNATIONAL SA	101248.00	3851.00	1891.55	4004.98
ESSO SAF	101251.00	2911.00	1552.76	1011.30
ETABLISSEMENTS MAUREL & PROM	211498.00	1311.00	86.84	61.07
ETAM DEVELOPPEMENT SCA	215159.00	5621.00	653.84	603.27
EURO DISNEYLAND SCA	102758.00	7996.00	2862.18	1129.73
EURODIRECT MARKETING	219622.00	7311.00	68.57	19.77

EUROP EXTINCTEURS	211393.00	3990.00	.	193.40
EUROPE AUTO INDUSTRIE SA	219623.00	5010.00	37.97	38.37
EUROPEENNE DE·CASINOS	216060.00	7011.00	172.81	143.16
EXACOMPTA-CLAIREFONTAINE SA	210462.00	2621.00	474.18	129.38
EXEL INDUSTRIES	216359.00	3523.00	112.68	258.43
FAIVELEY SA	211394.00	3743.00	.	55.66
FIAT FRANCE SA	220930.00	3711.00	.	86.49
FICHET-BAUCHE SA	101685.00	3490.00	.	43.64
FILIPACCHI MEDIAS	210476.00	2721.00	2507.47	1860.67
FIMALAC SA	103316.00	3341.00	1601.30	732.05
FINANCIERE DE L'ODET SA	205343.00	4400.00	4905.84	353.40
FINATIS SA	202183.00	5140.00	11390.80	402.54
FININFO SA	211489.00	7374.00	85.19	244.93
FLAMMARION SA	219625.00	2731.00	170.77	58.75
FONCIERE EURIS	220935.00	5940.00	11198.00	860.78
FOOD PARTNER GROUPE	212546.00	5140.00	.	3.61
FORGES STEPHANOISES SA	219626.00	3420.00	107.64	21.98
FORGEVAL-FORGES DE VALENCIEN	220938.00	3312.00	13.54	1.91
FRAIKIN SA	211418.00	7510.00	753.67	513.36
FROMAGERIES BEL SA	101260.00	2020.00	1221.83	1158.53
GALERIES LAFAYETTE SA	101456.00	5311.00	3450.22	1404.94
GARAGES SOUTERRAINS DE METZ	222284.00	7500.00	86.08	68.02
GASCOGNE SA	103695.00	2670.00	492.88	168.01
GAUMONT SA	102552.00	7812.00	672.07	270.75
GAUTIER FRANCE SA	222170.00	2590.00	120.70	150.86
GEA-GRENOBL D'ELECR & D'AUTO	211514.00	7373.00	32.09	22.05
GEL 2000 SA	220945.00	5140.00	.	3.43
GEODIS	103263.00	4513.00	.	273.23
GEVELOT SA	220947.00	3560.00	179.54	57.25
GFI INDUSTRIES SA	220949.00	3452.00	448.57	365.15
GFI INFORMATIQUE SA	225296.00	7373.00	185.93	504.90
GIFRER BARBEZAT SA	220951.00	2834.00	31.38	18.20
GLM SA	204823.00	5961.00	81.64	26.63
GO SPORT SA	211490.00	5940.00	222.53	220.25
GPRI SA	220956.00	3300.00	70.60	13.07
GRANDE PAROISSE	102729.00	2870.00	571.20	94.35
GRANDS VINS JEAN-CLAUDE BOIS	219629.00	2084.00	.	.
GRANDVISION SA	221239.00	5040.00	583.94	645.14
GRAVOGRAPH INDUSTRIE INTL	103262.00	3555.00	78.29	50.02
GROUPE ANDRE SA	103239.00	5661.00	1026.81	767.95
GROUPE BULL	101406.00	7373.00	3147.66	.

GROUPE BULL	101406.00	7373.00	3147.66	1239.40
GROUPE DIFFUSION PLUS	211491.00	7330.00	.	23.19
GROUPE FLO SA	225160.00	5810.00	167.47	196.63
GROUPE FOCAL	216065.00	7373.00	62.36	120.18
GROUPE GUILLIN	219630.00	3089.00	136.34	53.78
GROUPE LAPEYRE	105070.00	2430.00	914.40	1566.43
GROUPE LDC	212134.00	2015.00	.	428.24
GROUPE ONET	210452.00	7340.00	302.55	98.53
GROUPE PANTIN SA	213392.00	100.00	235.92	56.86
GROUPE PASQUIER	222262.00	3021.00	48.97	5.76
GROUPE PCAS	211500.00	2833.00	91.71	158.93
GROUPE POLIET SA	104922.00	2400.00	.	2581.83
GROUPE PRIMAGAZ	101624.00	5900.00	2031.15	.
GROUPE PSB INDUSTRIES	222263.00	2670.00	145.40	72.37
GROUPE SIACO SA	211506.00	2750.00	31.71	12.34
GROUPE SOCAMEL-RESCASET	219658.00	2590.00	59.66	20.74
GUERBET SA	202680.00	2834.00	255.94	60.47
GUILBERT SA	103140.00	5110.00	.	1204.89
GUILLARD MUSIQUES	220960.00	5099.00	.	30.70
GUY DEGRENNE	216067.00	3260.00	147.33	124.97
GUYENNE ET GASCOGNE SA	101518.00	5400.00	571.38	607.43
GUYOMARCH NA	201820.00	2040.00	237.47	186.59
HAVAS ADVERTISING	101206.00	7310.00	2445.69	1203.82
HBS TECHNOLOGIE	212551.00	3080.00	90.82	61.97
HENRI MAIRE SA	220962.00	2084.00	45.32	16.80
HERMES INTERNATIONAL	203053.00	5600.00	1101.09	2985.13
HIGH CO SA	212552.00	3571.00	.	50.88
HOTELIERE LUTETIA CONCORDE	216070.00	7011.00	72.66	102.07
HOTELS ET CASINO DEAUVILLE	203167.00	7011.00	.	192.09
HUREL-DUBOIS	220963.00	3724.00	267.21	96.58
HYPARLO SA	219631.00	5400.00	375.81	291.35
ICBT GROUPE	211398.00	1540.00	270.58	28.56
ICOM INFORMATIQUE	219632.00	7371.00	.	22.15
IMETAL SA	102765.00	3250.00	2598.36	1605.91
IMMOBILIERE HOTELIERE GROUP	203257.00	5990.00	.	22.20
IMS-INTL METAL SERVICE SA	103158.00	5051.00	445.91	171.45
INDUS ET FINANC D'ENTREPRISE	220884.00	1500.00	85.77	19.65
INFO REALITE	219636.00	3669.00	111.55	228.02
INFOGRAMES ENTERTAINMENT	211399.00	7372.00	184.55	.
INFOPOINT SA	219637.00	5045.00	.	18.98
INFRA PLUS SA	212556.00	3661.00	.	36.45

INGENICO SA	102858.00	3577.00	106.93	240.28
INSTALLUX (GROUPE)	220967.00	3442.00	45.71	29.39
INTER PARFUMS SA	219677.00	2844.00	58.98	69.99
INTERNATIONAL COMPUTER SA	211493.00	5045.00	14.17	5.00
INTERTECHNIQUE SA	102136.00	3812.00	383.01	354.85
ISIS SA	215180.00	1382.00	.	331.79
JACQUES BOGART	220968.00	2844.00	133.16	33.02
JEANJEAN SA	211494.00	5180.00	62.93	44.03
JULLIEN	220971.00	2300.00	.	7.77
KINDY SA	211401.00	2250.00	68.44	29.93
L'OREAL SA	100581.00	2844.00	12375.82	48895.14
LA CARBONIQUE SA	201036.00	2020.00	1274.54	841.43
LA CONTINENTALE D'ENTREPRISE	220891.00	1400.00	1041.82	140.39
LA ROCHETTE	101440.00	2670.00	558.61	74.28
LABINAL SA	102152.00	3560.00	2473.63	877.34
LACIE GROUP SA	212543.00	3572.00	78.40	150.59
LACROIX	222107.00	3669.00	120.42	45.32
LAFARGE SA	100046.00	3241.00	18740.78	9770.84
LAGARDERE (GROUPE)	220997.00	2700.00	11479.54	5100.34
LBD-LA BROSSE & DUPONT	220976.00	3990.00	104.29	140.40
LE BOURGET SA	219674.00	2250.00	.	9.70
LE CARBONE-LORRAINE	103305.00	3620.00	715.09	511.69
LE GROUPE REP	216085.00	3559.00	60.13	51.96
LECTRA SYSTEMES SA	220977.00	7373.00	138.70	189.99
LEGRAND SA	100116.00	3612.00	3630.86	5447.57
LEGRIS INDUSTRIES	104120.00	3530.00	619.25	430.71
LEON DE BRUXELLES	214321.00	5812.00	78.36	159.77
LOUIS DREYFUS CITRUS SA	213043.00	2030.00	580.33	355.25
LOUVRE (STE DU)	101521.00	7011.00	1183.77	850.83
LVMH-M HENNESY-L VUITTON	14447.00	2084.00	19132.83	17618.19
MACC (LA)	220981.00	3460.00	19.46	16.07
MALTERIES FRANCO-BELGES	220984.00	2080.00	78.40	69.57
MANITOU B F	220986.00	3530.00	409.16	359.39
MANUFACTURE LANDAISE DE PROD	220996.00	2820.00	36.47	15.09
MANUTAN INTERNATIONAL SA	205006.00	5961.00	240.93	470.90
MARC ORIAN	216081.00	5944.00	.	138.78
MARIE BRIZARD & ROGER INTL	220988.00	2080.00	244.19	41.57
MARINE-WENDEL SA	103172.00	2670.00	.	1801.43
MAROCAINE (COMPAGNIE)	220883.00	100.00	12.17	3.81
MAXI-LIVRES/PROFRANCE SA	211402.00	5940.00	.	.
MB ELECTRONIQUE	205062.00	3825.00	22.42	49.04

MECATHERM SA	211403.00	3550.00	61.06	115.29
MECELEC	220992.00	3640.00	87.20	12.80
MEDASYS DIGITAL SYSTEMS	220969.00	3577.00	23.74	13.47
MEDIASCIENCE SA	211499.00	3821.00	38.56	33.92
MERIBEL ALPINA SA	219672.00	7990.00	38.82	33.80
METALEUROP (PENARROYA)	101451.00	3341.00	562.11	96.61
MGI COUTIER	204723.00	3714.00	346.03	141.22
MICHEL THIERRY SA	211404.00	2250.00	.	140.64
MINES DE KALI SAINTE THERESE	202831.00	3569.00	434.72	317.21
MONNERET JOUETS SA	220999.00	3944.00		12.38
MONOPRIX SA	210544.00	5400.00	1694.49	.
MONOPRIX SA	210544.00	5400.00	1694.49	1104.54
MONTUPET SA	210443.00	3360.00	314.55	387.78
MORS SA	210444.00	3661.00	32.05	8.47
MOSSLEY BADIN SA	220848.00	2200.00	.	8.66
MOULINEX SA	101200.00	3634.00	957.98	371.30
MRM SA	210446.00	2221.00	103.24	26.62
NAF NAF SA	205321.00	5130.00	263.07	80.73
NATIONALE DE NAVIGATION	102974.00	4412.00	520.11	106.15
NORBERT DENTRESSANGLE	223565.00	4200.00	563.48	344.39
NORD EST SA	101197.00	3080.00	675.22	349.09
NORDON ET CIE	204197.00	3443.00	93.88	30.59
NORTENE SA	212557.00	3089.00	25.54	10.44
NOVATEC SA	210449.00	7389.00	24.19	14.26
NSC GROUPE SA	204839.00	3550.00	211.75	74.11
OLITEC SA	217875.00	3661.00	48.05	67.94
OPTORG CIE	102003.00	3530.00	313.42	80.97
PARC ASTERIX SA	216082.00	7996.00	.	83.41
PARIS EXPO	216083.00	7990.00	221.31	76.33
PARTOUCHE	211397.00	7011.00	329.80	435.44
PATHE	210468.00	7812.00	1065.94	.
PAUL PREDAULT SA	210474.00	2011.00	113.87	85.76
PENAUILLE POLYSERVICES CO	211407.00	7340.00	283.86	345.18
PERNOD RICARD	101396.00	2080.00	4617.44	3664.25
PETIT BOY SA	211502.00	2300.00	.	11.74
PHYTO-LIERAC SA	213475.00	2844.00	132.17	132.50
PICOGIGA	212559.00	2860.00	14.32	31.04
PIER IMPORT EUROPE	220902.00	5020.00	.	46.92
PINAULT- PRINTEMPS- REDOUTE	222379.00	5311.00	14809.35	22453.24
PISCINES DESJOYAUX SA	222243.00	1700.00	34.35	55.49
PLASTIC OMNIUM SA	103264.00	2820.00	1385.39	297.86
POCHET SA	208528.00	3221.00	373.18	4535.34
POUJOULAT SA	219667.00	3490.00	45.41	12.68

PRECIA SA	210473.00	3590.00	50.13	7.80
PRIMISTERES REYNOIRD	211408.00	5411.00	216.35	44.08
PRODEF SA	210475.00	7340.00	63.91	11.01
PROMODES SA	101285.00	5411.00	12311.31	13927.16
PSA-PEUGEOT CITROEN SA	101276.00	3711.00	40280.70	7759.76
PUBLICIS SA	101292.00	7310.00	1882.24	1607.23
RACLET SA	211409.00	3790.00	77.06	27.23
RALLYE	210828.00	5411.00	11112.60	2009.55
REGIONAL AIRLINES	214324.00	4512.00	93.57	58.06
REMY COINTREAU	103895.00	2084.00	.	619.66
RENAULT	210479.00	3711.00	44770.14	10700.75
REXEL GROUP	103260.00	5063.00	3411.67	4530.61
REYNOLDS SA	219666.00	3950.00	102.38	110.28
RHODIA	112040.00	2800.00	9126.30	2658.97
RIGHINI SPA	219664.00	2430.00	17.25	6.36
ROBERTET SA	210481.00	2080.00	132.45	81.03
ROCAMAT SA	210482.00	3281.00	49.51	6.23
ROQUEFORT	102800.00	2020.00	.	.
ROUGIER SA	210484.00	2400.00	152.14	22.98
ROULEAU GUICHARD	211504.00	2200.00	108.37	22.14
ROYAL CANIN SA	202514.00	2040.00	207.73	631.77
RUBIS & CIE	23508.00	5171.00	422.95	130.55
SABATE SA	219663.00	2421.00	94.17	106.38
SABETON SA	211410.00	100.00	106.50	51.57
SAFAA-SA FRANCAISE DES APPAR	210486.00	5040.00	.	.
SAFIC ALCAN & CIE	102961.00	5160.00	153.44	41.01
SAGA SA	220048.00	4731.00	509.92	280.37
SAGEM	101305.00	3661.00	2577.17	2128.20
SAINT-GOBAIN (CIE DE)	101811.00	3221.00	26048.34	12753.95
SAMSE	103310.00	5200.00	189.34	66.29
SANOFI-SYNTHELABO	101204.00	2834.00	7205.16	18438.54
SASA INDUSTRIE SA	216089.00	3350.00	34.66	28.38
SAT-SA DE TELECOMMUNICATIONS	101323.00	3661.00	.	.
SAUPIQUET	208827.00	2090.00	273.60	83.13
SCBV-SOC COM MNLS BASN VICHY	102931.00	2086.00	69.30	80.56
SCHAEFFER-DUFOUR	103320.00	2200.00	148.28	18.39
SEAE	211505.00	1731.00	19.44	10.97
SEB SA	101327.00	3634.00	1751.64	1283.20
SECURIDEV SA	204842.00	3420.00	121.29	37.28
SEDIVER SA	221745.00	3220.00	178.51	28.38
SEITA SA	210487.00	2100.00	4060.03	3264.16
SERF SA	212683.00	3842.00	10.99	6.27
SERIBO-STE ETUDE & REAL IND	211411.00	2421.00	149.35	28.96

SERVICES ET TRANSPORTS SA	219661.00	4412.00	186.97	55.36
SFIM-SOC FABRIC INSTR MESURE	102329.00	3812.00	330.86	65.96
SGE-SOC GENERL D'ENTREPRISES	102296.00	1600.00	7676.05	1945.91
SIDEL (GROUPE)	210633.00	3560.00	772.78	2858.51
SIDERGIE (GROUPE) SA	210491.00	7361.00	216.36	138.73
SIGNAUX GIROD	219659.00	3669.00	93.42	19.61
SIPH SOC INTERNTONALE DE PLA	210492.00	800.00	59.97	8.14
SKIS ROSSIGNOL SA	101342.00	3949.00	.	157.90
SLIGOS	100698.00	7370.00	.	.
SMOBY SA	210493.00	3944.00	.	51.44
SOCIETE AIR FRANCE	101475.00	4512.00	.	3280.75
SODEXHO SA	102089.00	5812.00	5989.53	5945.74
SODICE EXPANSION SA	210798.00	5311.00	78.53	117.78
SOFCO	222056.00	5500.00	37.63	1.63
SOGEPAG	211508.00	7500.00	.	71.22
SOGEPARC (FINANCIERE)	220933.00	7500.00	514.41	496.42
SOGERIS	221701.00	7370.00	25.07	36.69
SOMMER ALLIBERT SA	101348.00	5013.00	3225.34	583.68
SOPRA	211415.00	7373.00	218.67	651.49
SPIR COMMUNICATION SA	208213.00	7310.00	231.50	344.07
SR TELEPERFORMANCE	211503.00	7310.00	304.77	394.74
ST DUPONT	221638.00	3911.00	.	52.74
STEDIM SA	211509.00	3842.00	27.48	47.87
STEPHANE KELIAN	220972.00	3140.00	40.37	13.00
STMB-SOC TOURIST DU MONT BLA	210503.00	7990.00	46.64	60.71
STMICROELECTRONICS NV	31142.00	3670.00	6434.03	11222.76
STRAFOR FACOM SA	102755.00	2520.00	1651.05	769.11
SUPRA SA	211510.00	3433.00	31.99	8.26
SYLEA SA	210969.00	3714.00	1005.35	312.54
SYNCHRONY LOGISTIQUE SA	216094.00	4213.00	45.28	39.25
SYNTHELABO SA	101511.00	2834.00	2196.08	10226.62
TAITTINGER-COMP COMMERCIALE	101908.00	5180.00	1373.20	544.64
TANNERIES DE FRANCE SA	103337.00	1520.00	38.43	6.55
TECHNIP	30923.00	2911.00	5274.62	1485.53
TECHNOFAN SA	210506.00	3728.00	27.80	23.59
TEISSEIRE FRANCE	219653.00	2080.00	78.49	30.89
TELEFLEX LIONEL-DUPONT SA	210508.00	3812.00	.	51.36
TETE DANS LES NUAGES SA	216095.00	7990.00	.	15.25
THERMADOR HOLDING SA	210511.00	5070.00	83.80	85.78
THOMSON-CSF SA	13556.00	3812.00	11718.58	7206.53
TIPIAK SA	219652.00	2030.00	80.87	40.58

TITUS INTERACTIVE SA	223281.00	7372.00	.	131.62
TIVOLY (GROUPE)	210515.00	3541.00	72.52	12.52
TOTAL FINA SA	24625.00	2911.00	27202.47	24803.08
TOUAX SA	211512.00	4400.00	126.33	86.83
TRANSICIEL SA	216983.00	7373.00	116.62	467.48
TRANSPORTS AUTOMOBILES CITRM	210517.00	4100.00	.	27.93
TROUVAY & CAUVIN SA	222265.00	3490.00	238.60	37.08
UBI SOFT ENTERTAINMENT SA	212596.00	7372.00	199.90	262.36
UNILOG SA	211513.00	7373.00	214.38	466.15
USINOR SA	206488.00	3320.00	.	2701.70
VALEO SA	102523.00	3714.00	6719.51	.
VALEO SA	102523.00	3714.00	6719.51	.
VALEO SA	102523.00	3714.00	6719.51	6502.40
VALLOUREC SA	101467.00	3317.00	1950.04	361.69
VEV SA	101295.00	5130.00	223.05	37.06
VIA GEN TRANSPORT & D'IND	102985.00	4100.00	620.55	242.96
VICAT SA	102980.00	3241.00	1270.12	697.73
VILMORIN CLAUSE & CIE SA	210918.00	100.00	452.63	.
VIRAX SA	210525.00	3541.00	32.04	13.84
VM MATERIAUX SA	210527.00	5030.00	117.62	24.80
VRANKEN MONOPOLE SA	227816.00	5180.00	354.30	.
VULCANIC SA	219650.00	3559.00	36.54	47.57
WAELES SA	222377.00	3312.00	.	28.58
WALTER SA	216097.00	3350.00	42.52	128.95
ZANNIER (GROUPE)	210529.00	2300.00	303.11	127.63
ZODIAC (GROUPE)	103302.00	3728.00	822.36	1118.94

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APPENDIX C

US SAMPLE FIRMS

(selected)

LIST OF US SAMPLE FIRMS

USA SAMPLE OF FIRMS

COMPANY NAME	CUSIP	SIC	MKT VALUE OF EQUITY	TOTAL ASSETS
1-800 CONTACTS INC	681977104	5961	115.56	18.016
1MAGE SOFTWARE INC	45244M102	7373	1.124	1.71
24/7 MEDIA INC	901314104	7370	440.132	62.716
3COM CORP	885535104	3576	9,767.18	4,495.39
3D IMAGE TECHNOLOGY INC	88554F101	3861	.	.
3D LABS INC LTD	G8846W103	3674	59.99	38.214
3D SYS CORP/DE	88554D205	3559	85.417	95.103
3DFX INTERACTIVE INC	88553X103	3674	197.846	184.121
3DO COMPANY	88553W105	7372	136.486	40.488
3DX TECHNOLOGIES INC	88554G109	1311	3.226	13.501
3SI HOLDINGS INC	88575P104	7373	11.877	8.177
4FRONT TECHNOLOGIES INC	351042106	7373	106.28	146.272
7-ELEVEN INC	817826100	5412	781.313	2,415.84
800 JR CIGAR INC	282491109	5961	293.81	104.672
800 TRAVEL SYSTEMS INC	282506104	4700	93.063	9.591
8X8 INC	282912104	3674	59.298	28.709
99 CENTS ONLY STORES	65440K106	5331	1,215.40	198.123
A & A INTL INDS INC	21303	2020	0.806	10.657
A C MOORE ARTS & CRAFTS INC	00086T103	5945	45.356	82.357
A C S ELECTRONICS LTD	M01770102	7373	6.345	.
A CONSULTING TEAM INC	881102	7370	38.395	28.772
A R T INTL INC	00207G105	3990	.	0.36
A S V INC	1963107	3531	153.761	29.533
A-FEM MEDICAL CORP	00105V105	2670	17.173	1.889
AAON INC	360206	3585	57.911	50.506
AAR CORP	361105	5080	540.775	726.63
AARON RENTS INC	2535201	7359	310.804	272.174
AAVID THERMAL TECHNOLOGIES	2539104	3679	156.111	129.084
AB ELECTROLUX -ADR	10198208	3630	6,385.09	10,277.86
ABACAN RESOURCE CORP	2919108	1311	39.344	95.809
ABACUS DIRECT CORP	2553105	7370	448.539	43.32
ABATIX CORP	2564102	5047	6.873	10.596
ABAXIS INC	2567105	3845	25.113	12.914
ABBOTT LABORATORIES	2824100	2834	74,287.09	13,216.21
ABC DISPENSING TECHNOLOGIES	573105	7600	3.193	2.622
ABC-NACO INC	752105	3460	127.908	295.341
ABER RESOURCES LTD	2916104	1400	309.001	142.165
ABERCROMBIE & FITCH -CL A	2896207	5651	3,945.49	319.161
ABGENIX INC	00339B107	2836	180.7	24.22
ABIOMED INC	3654100	3841	108.138	32.982
ABITIBI CONSOLIDATED INC	3924107	2621	1,773.94	4,445.48
ABLE ENERGY INC	3709102	5900	.	3.74
ABLE TELCOM HOLDING CORP	3712304	1731	80.915	290.76
ABM INDUSTRIES INC	957100	7340	604.828	501.363
ABOUT.COM INC	3736105	7370	.	15.658
ABOVENET COMMUNICATIONS INC	3743101	7370	.	13.693
ABRAMS INDUSTRIES INC	3788106	1540	11.377	126.133
ABRAXAS PETROLEUM CORP/NV	3830106	1311	27.694	291.498
ACCELER8 TECHNOLOGY CORP	4304200	7372	33.65	13.975
ACCENT COLOR SCIENCES INC	4305108	3577	8.835	6.86
ACCESS PHARMACEUTICALS INC	00431M209	2834	7.715	2.351
ACCESS SOLUTIONS INTL INC	4317103	3572	0.991	1.124
ACCLAIM ENMNT INC	4325205	7372	299.638	160.407
ACCOM INC	4334108	3861	2.502	8.093
ACCREDO HEALTH INC	00437V104	2834	.	114.049

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ACCUMED INTERNATIONAL INC	4383303	3826	7.14	17.574
ACE COMM CORP	4404109	7373	49.539	24.593
ACETO CORP	4446100	5160	108.859	84.379
ACI TELECENTRICS INC	981100	7389	2.149	7.342
ACKERLEY GROUP INC	4527107	7310	577.211	316.126
ACLN LTD	M01764105	4731	63.55	49.118
ACME ELECTRIC CORP	4644100	3620	24.305	45.495
ACME METALS INC	4724100	3490	3.503	737.088
ACME UNITED CORP	4816104	3420	7.598	28.896
ACORN PRODUCTS INC	4857108	3420	33.128	112.633
ACR GROUP INC	00087B101	5070	14.656	45.103
ACRES GAMING INC	4936100	3577	44.1	17.194
ACRODYNE COMMUNICATIONS INC	5.00E+106	3663	20.997	11.973
ACSYS INC	00087X103	7363	56.001	86.363
ACT MANUFACTURING INC	973107	3672	129.652	145.369
ACT NETWORKS INC	975102	3576	80.395	80.838
ACTEL CORP	4934105	3674	423.64	179.708
ACTION INDUSTRIES INC	5041108	5020	3.811	.
ACTION PERFORMANCE COS INC	4933107	5090	443.421	305.934
ACTION PRODUCTS INTL INC	4920104	3944	7.313	5.016
ACTIVE APPAREL GROUP	00504P105	2330	21.068	6.602
ACTIVE VOICE CORP	4938106	3661	44.102	38.582
ACTIVISION INC	4930202	7372	279.737	283.612
ACTUATE CORP	00508B102	7372	272.135	39.798
ACTV INC	8.80E+105	7372	113.441	13.606
ACUSON CORP	5113105	3845	396.162	395.072
ACX TECHNOLOGIES INC	5123104	2650	376.499	961.205
ACXIOM CORP	5125109	7374	2,079.22	879.327
ADAC LABORATORIES	5313200	3844	486.072	243.809
ADAIR INTL OIL & GAS INC	5408109	1311	2.126	3.029
ADAM.COM INC	00547M101	7372	24.415	8.97
ADAMS GOLF INC	6228100	3949	92.029	96.906
ADAMS RESOURCES & ENERGY INC	6351308	5172	24.253	122.334
ADAPTEC INC	00651F108	3576	2,406.83	1,173.07
ADAPTIVE BROADBAND CORP	00650M104	3663	268.52	201.705
ADAPTIVE SOLUTIONS INC	00650P305	3576	0.015	.
ADC TELECOMMUNICATIONS INC	886101	3661	3,102.63	1,300.59
ADDVANTAGE MEDIA GROUP INC	6743306	7310	1.662	3.089
ADE CORP/MA	00089C107	3825	113.939	153.43
ADECCO S A -SPON ADR	6754105	7363	7,893.10	4,082.46
ADEPT TECHNOLOGY INC	6854103	7372	65.963	67.958
ADFLEX SOLUTIONS INC	6866107	3678	61.942	108.304
ADM TRONICS UNLIMITED INC/DE	1004100	2891	24.165	3.344
ADMINISTAFF INC	7094105	7363	362.925	142.799
ADOBE SYSTEMS INC	00724F101	7372	2,724.87	767.331
ADRENALIN INTERACTIVE INC	7246200	7372	11.136	5.588
ADRIAN RESOURCES LTD	00733P108	1000	5.532	23.955
ADRIEN ARPEL INC	7361108	2844	19.451	3.666
ADTRAN INC	00738A106	3661	701.771	301.711
ADV AERODYNMC&STRCT -CL A	00750B107	3721	48.587	23.588
ADV MACHINE VISION CP -CL A	00753B104	3823	12.735	29.839
ADV NEUROMODULATION SYS INC	00757T101	3845	48.192	45.485
ADV TECHNICAL PRODUCTS INC	7548100	3460	47.815	106.876
ADVANCE DISPLAY TECH NC	7422306	3651	5.035	0.204
ADVANCED DEPOSITION TECH INC	7521107	3490	5.729	.
ADVANCED DIGITAL INFO CORP	7525108	3572	127.563	112.407
ADVANCED ELECTR SUPPORT PDS	7534100	3576	4.044	12.415
ADVANCED ENERGY INDS INC	7973100	3679	668.125	101.035
ADVANCED ENVIR RECYCL -CL A	7947104	2430	17.684	
ADVANCED FIBRE COMM INC	00754A105	3661	828.182	307.883
ADVANCED LIGHTING TECH INC	00753C102	3640	469.371	328.569
ADVANCED MAGNETICS INC	00753P103	2835	50.753	34.115
ADVANCED MARKETING SERVICES	00753T105	5190	110.448	238.396
ADVANCED MATERIALS GROUP INC	00753U102	3086	12.002	12.682
ADVANCED MEDICAL PRODS	00753W207	3845	0.596	1.1
ADVANCED MICRO DEVICES	7903107	3674	4,218.83	4,252.97
ADVANCED OXYGEN TECHNOLOGY	00754B103	7819	5.928	1.12
ADVANCED PHOTONIX INC -CL A	7.54E+109	3674	7.511	6.328
ADVANCED POLYMER SYSTEMS	00754G102	2821	104.624	23.081

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ADVANCED TISSUE SCI -CL A	00755F103	2836	104.678	53.985
ADVANTAGE LEARNING SYS INC	00757K100	7372	1,112.36	67.996
ADVANTAGE LIFE PRODUCTS	00755M603	5712	.	.
ADVANTAGE MARKETING SYS INC	00756G209	5122	8.539	10.717
ADVANTICA RESTAURANT GP INC	00758B109	5812	247.582	1,986.21
ADVENT SOFTWARE INC	7974108	7372	386.853	87.21
ADVO INC	7585102	7331	543.403	219.206
AEGIS COMMUNICATIONS GROUP	00760B105	7389	42.183	180.544
AEHR TEST SYSTEMS	00760J108	3825	27.024	41.187
AEP INDUSTRIES INC	1031103	3081	156.477	596.198
AERO SERVICES INTERNATIONAL	7913106	5172	0.175	9.574
AEROCENTURY CORP	7737109	7359	13.484	26.562
AEROFLEX INC	7768104	3674	180.286	124.101
AEROSONIC CORP	8015307	3812	47.857	20.417
AEROVOX INC	00808M105	3620	11.46	70.571
AETRIUM INC	00817R103	3825	104.192	72.444
AFA PROTECTIVE SYSTEMS INC	1038108	7380	35.604	29.283
AFC CABLE SYSTEMS INC	950105	3357	427.945	241.547
AFFILIATED COMP SVCS -CL A	8190100	7374	1,857.16	949.798
AFFINITY TECHNOLOGY GRP INC	00826M103	3578	18.438	24.197
AFFYMETRIX INC	00826T108	3845	561.039	136.428
AFP IMAGING CORP	1058106	3861	8.547	18.661
AFTERMARKET TECHNOLOGY CORP	8318107	3714	159.39	531.905
AG ARMENO MINES & MNRLS	938100	1000	1.672	0.127
AG CHEM EQUIPMENT INC	8363103	3523	118.09	188.194
AG SERVICES OF AMERICA	1250109	5190	74.937	134.644
AG-BAG INTL LTD	1077106	3089	5.283	13.82
AGCO CORP	1084102	3523	468.846	2,750.40
AGNICO EAGLE MINES LTD	8474108	1040	219.495	279.983
AGRIBIOTECH INC	8494106	5190	1,030.08	264.531
AGRIBRANDS INTERNATIONAL INC	00849R105	2040	310.735	578.4
AGRITOPE INC	00855D107	100	5.569	14.39
AGRIUM INC	8916108	2870	999.12	1,821.00
AHL SERVICES INC	1296102	4581	441.25	365.833
AHT CORP	00130R103	7372	17.973	44.634
AID AUTO STORES INC	8709107	5013	0.158	.
AIR CANADA -CL A	8911307	4512	611.445	4,176.87
AIR EXPRESS INTERNATIONAL CP	9104100	4731	735.389	675.478
AIR METHODS CORP	9128307	4522	22.125	60.776
AIR PRODUCTS & CHEMICALS INC	9158106	2810	6,291.23	7,489.60
AIR T INC	9207101	4513	10.023	20.852
AIRBORNE FREIGHT CORP	9266107	4513	1,742.55	1,501.58
AIRGAS INC	9363102	5084	595.195	1,698.47
AIRNET SYSTEMS INC	9417106	4513	163.559	122.962
AIRONET WIRELESS COMM	00943A107	3576	.	27.198
AIRPORT SYSTEMS INTL INC	00949N103	3812	4.6	12.324
AIRTECH INTERNATIONAL GROUP	00950F205	7900	4.953	30.172
AIRTRAN HOLDINGS INC	00949P108	4512	170.357	376.406
AJAY SPORTS INC	9704404	5090	3.712	13.083
AK STEEL HOLDING CORP	1547108	3312	1,387.04	3,306.30
AKORN INC	9728106	2834	88.345	61.416
AKSYS LTD	10196103	3845	63.641	25.942
AKZO NOBEL NV -ADR	10199305	2800	12,732.41	14,043.54
ALADDIN KNOWLEDGE SYS LTD	M0392N101	7373	102.726	59.884
ALAMO GROUP INC	11311107	3523	111.36	161.638
ALANCO ENVIRON RESOURCES CP	11612405	3564	6.945	9.658
ALARIS MEDICAL INC	11637105	3841	345.262	651.033
ALASKA AIR GROUP INC	11659109	4512	1,160.41	1,731.80
ALBA-WALDENSIAN INC	12041109	2250	59.91	46.779
ALBANY INTL CORP -CL A	12348108	2221	561.076	866.366
ALBEMARLE CORP	12653101	2890	1,116.44	937.797
ALBERTA ENERGY CO LTD	12873105	1311	2,666.67	3,811.15
ALBERTO-CULVER CO -CL B	13068101	2844	1,337.28	1,068.18
ALBERTSONS INC	13104104	5411	14,987.52	6,233.97
ALCAN ALUMINIUM LTD	13716105	3350	6,116.09	9,901.00
ALCATEL -ADR	13904305	3661	19,300.40	.
ALCIDE CORP	13742507	2870	47.736	.
ALCOA INC	13817101	3350	13,675.04	17,462.50
ALCOHOL SENSORS INTL LTD	13876107	3829	0.659	.

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ALDILA INC	14384101	3949	38.655	117.034
ALEXANDER & BALDWIN INC	14482103	4400	1,023.65	1,605.64
ALEXION PHARMACEUTICALS INC	15351109	2836	108.041	42.085
ALFA INTERNATIONAL CORP	15389307	2300	1.505	
ALFA RESOURCES INC	15396104	1311		0.865
ALFACELL CORP	15404106	2836	12.93	5.517
ALGOMA STEEL INC	01566M105	3312	72.37	989.258
ALGOS PHARMACEUTICAL CORP	15869100	2834	442.754	52.43
ALICO INC	16230104	100	123.868	130.554
ALIGN-RITE INTERNATIONAL INC	16251100	3220	52.491	80.292
ALKERMES INC	01642T108	2834	680.76	213.452
ALL AMERICAN SEMICONDUCTOR	16557407	5065	15.994	118.957
ALL AMERICAN SPORTPARK INC	01643P105	7990	3.375	28.693
ALL AMERN FOOD GROUP INC	16435307	5812	0.011	
ALLAIRE CORP	16714107	7372		9.953
ALLEGHENY TELEDYNE INC	17415100	3312	3,982.81	3,175.50
ALLEN ORGAN CO -CL B	17753104	3931	44.498	61.99
ALLEN TELECOM INC	18091108	3663	183.739	465.585
ALLERGAN INC	18490102	2834	4,281.08	1,334.40
ALLERGAN SPCLTY THERAPEUTICS	18494104	2834	30.487	165.137
ALLIANCE ATLANTS COMM -CL B	1.85E+207	7812	375.354	917.936
ALLIANCE FOREST PRODS INC	01859J108	2621	357.9	1,152.38
ALLIANCE GAMING CORP	01859P609	3990	128.488	366.837
ALLIANCE PHARMACEUTICAL CP	18773101	2835	133.991	93.677
ALLIANCE SEMICONDUCTOR CORP	01877H100	3674	104.023	193.557
ALLIANT TECHSYSTEMS INC	18804104	3480	799.021	894.318
ALLIED DEVICES CORP	19120104	3452	7.729	22.974
ALLIED HEALTHCARE PRODS INC	19222108	3842	38.059	80.18
ALLIED HOLDINGS INC	19223106	4213	113.246	621.627
ALLIED PRODUCTS	19411107	3523	74.602	275.804
ALLIED RESEARCH CORP	19483106	3480	39.245	113.076
ALLIEDSIGNAL INC	19512102	3720	24,746.75	15,560.00
ALLIN CORP	19924109	7373	20.08	
ALLIS-CHALMERS CORP	19645407	7600	4.764	2.566
ALLOU HEALTH & BEAUTY -CL A	19782101	5122	69.889	219.907
ALLOY ONLINE INC	19855105	5961		7.407
ALLSCRIPTS INC	19886100	5122		18.92
ALLSTAR SYSTEMS INC	19892108	5045	7.935	51.028
ALLTRISTA CORP	20040101	3080	162.336	165.831
ALPHA 1 BIOMEDICALS INC	20910105	2834	0.072	
ALPHA BETA TECHNOLOGY INC	02071K105	2834	14.032	
ALPHA HOSPITALITY CORP	20732103	7990	22.774	10.196
ALPHA INDUSTRIES INC	20753109	3674	293.798	106.681
ALPHA MICROSYSTEMS	20903100	3571	46.88	26.431
ALPHA TECHNOLOGIES GROUP INC	20781100	3443	11.701	38.675
ALPHANET SOLUTIONS INC	20787107	5045	23.478	61.894
ALPHARMA INC -CL A	20813101	2834	952.647	908.936
ALPINE GROUP INC	20825105	3357	210.525	2,109.03
ALPNET INC	21089107	7389	40.219	22.423
ALSTOM S A -ADR	21244108	1600		
ALTA GOLD CO	21271101	1040	51.255	74.492
ALTAIR INTERNATIONAL INC	02136W102	1040	102.431	8.712
ALTEON INC	02144G107	2834	14.695	27.652
ALTEON WEBSYSTEMS INC	02145A109	3576		19.542
ALTERA CORP	21441100	3674	5,943.63	1,093.33
ALTERNATE MKTG NETWORKS INC	02145P106	4210	2.665	6.513
ALTERNATIVE RESOURCES CORP	02145R102	7363	166.717	137.955
ALTERNATIVE TECHNOLOGY RES	02145H104	7371	26.93	0.837
ALTEX INDUSTRIES INC	21454103	1311	1.262	2.034
ALTOS HORNOS DE MEXICO -ADR	22069306	3312	264.097	
ALTRIS SOFTWARE INC	22091102	7373	3.365	11.366
ALYN CORP	22611107	3290	47.209	26.961
ALYSIS TECHNOLOGIES INC	02261D101	7372	7.346	10.01
ALZA CORP	22615108	2834	4,561.43	1,576.30
AM COMMUNICATIONS INC	1674100	3663	5.593	3.228
AMARILLO BIOSCIENCES INC	02301P106	2836	6.768	4.986
AMARILLO MESQUITE GRILL INC	23014103	5812	12.425	8.782
AMAZON.COM INC	23135106	5961	17,054.95	648.46
AMBASSADOR FOOD SVC CP	22909105	5812	0.649	

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AMBASSADORS NTERNATIONL INC	23178106	4700	146.261	127.732
AMBER RESOURCES CO	23184203	1311	.	5.508
AMBI INC	00163N102	2834	29.383	20.735
AMC ENTERTAINMENT INC	1669100	7830	360.836	975.73
AMCAST INDL CORP	23395106	3714	140.978	563.45
AMCOL INTERNATIONAL CORP	02341W103	1400	265.331	357.864
AMCON DISTRIBUTING CO	023410106	5190	15.346	39.644
AMCOR LTD -ADR	02341R302	2650	2,766.80	4,457.47
AMDOCS LTD	G02602103	7372	2,226.20	239.966
AMER AIRCARRIERS SUPPORT INC	23758105	5080	70.103	44.279
AMER BIOGENETIC SCI -CL A	24611105	2835	28.92	6.514
AMER INTL PETROLEUM CORP	26909408	2911	68.038	60.861
AMER ISRAELI PAPER MLS -ORD	27069509	2621	142.635	366.917
AMER ITALIAN PASTA CO -CL A	27070101	2090	474.784	259.381
AMERADA HESS CORP	23551104	2911	4,495.26	7,882.98
AMERALIA INC	23559206	1400	6.977	3.5
AMERCO	23586100	7510	486.201	3,087.50
AMERICA ONLINE INC	02364J104	7370	23,089.54	2,214.00
AMERICA WEST HLDG CP -CL B	23657208	4512	662.864	1,525.03
AMERICAN AXLE & MFG HLDGS	24061103	3714	.	1,226.23
AMERICAN BANKNOTE CORP	24490104	2750	29.988	.
AMERICAN BILTRITE INC	24591109	3089	74.764	336.039
AMERICAN BIO MEDICA CORP	24600108	2835	27.891	4.435
AMERICAN BIOMED INC	02461T104	3841	6.203	1.615
AMERICAN BK NT HOLOGRAPHICS	24377103	2670	238.63	.
AMERICAN BUSINESS FRODS/GA	24763104	2670	362.135	301.244
AMERICAN CHAMPION ENTMT INC	25119108	7812	6.405	6.08
AMERICAN CLASSIC VOYAGES CO	24928103	4400	251.033	212.792
AMERICAN COIN MERCHNDSNG INC	02516B108	7990	38.041	111.782
AMERICAN CONSOLIDATED GROWTH	25227208	7363	0.195	.
AMERICAN CRAFT BREWING INTL	G02702101	5180	.	.
AMERICAN DENTAL TECHNOL INC	25352204	3845	27.361	41.855
AMERICAN ECO CORP	02553G101	7600	43.22	250.383
AMERICAN EDUCATIONAL PRODUCT	02553T202	2741	10.46	11.202
AMERICAN ELECTROMEDICS CORP	25569203	3845	26.468	11.458
AMERICAN FILM TECHNOLOGIES	26038307	7819	4.988	0.327
AMERICAN FREIGHTWAYS CORP	02629V108	4213	365.302	642.061
AMERICAN GREETINGS -CL A	26375105	2771	1,636.68	2,419.33
AMERICAN HOME PRODUCTS CORP	26609107	2834	73,986.50	21,079.07
AMERICAN HOMESTAR CORP	26651109	2452	127.403	439.316
AMERICAN LOCKER GROUP INC	27284108	2540	61.181	13.47
AMERICAN MANAGEMENT SYSTEMS	27352103	7370	1,681.08	537.6
AMERICAN MEDICAL ALERT CORP	27904101	7380	25.022	9.924
AMERICAN MILLENIUM CORP	27530104	7373	15.906	0.192
AMERICAN NATL CAN GROUP INC	27714104	3411	.	3,927.22
AMERICAN PACIFIC CORP	28740108	2810	65.736	130.759
AMERICAN PAD & PAPER CO	28816106	2670	43.305	517.837
AMERICAN PHARMACEUTICAL CO	28866101	5122	.	.
AMERICAN PRECISION INDS	29069101	3621	77.134	169.265
AMERICAN PWR CNVRSION	29066107	3620	4,642.69	871.983
AMERICAN RESOURCES OFFSHORE	29280104	1311	3.136	76.224
AMERICAN RESTAURNT -LP	29316106	5812	.	30.703
AMERICAN RISK MNGMT GROUP	02931R100	3440	12.132	7.375
AMERICAN RIVERS OIL CO	29328101	1311	0.423	0.101
AMERICAN SCIENCE ENGINEERING	29429107	3844	34.756	30.204
AMERICAN SKIING CO	29654308	7990	299.074	780.899
AMERICAN SOFTWARE -CL A	29683109	7372	59.494	107.358
AMERICAN STANDARD COS INC	29712106	3585	2,517.30	4,156.16
AMERICAN TECH CERAMICS CORP	30137103	3670	36.345	42.329
AMERICAN TECHNOLOGIES GROUP	30143101	3714	24.134	7.111
AMERICAN TECHNOLOGY CORP	30145205	3651	62.458	1.684
AMERICAN UNITED GLOBAL INC	30344105	5082	7.992	146.904
AMERICAN VANGUARD CORP	30371108	2870	14.641	58.847
AMERICAN WAGERING INC	30405104	7990	51.348	11.766
AMERICAN WOODMARK CORP	30506109	2430	304.766	140.609
AMERICAN XTAL TECHNOLOGY INC	30514103	3674	147.068	75.023
AMERICANA GLD&DIAMOND HLDGS	30557102	1040	.	.
AMERIGAS PARTNERS -LP	30975106	5900	1,000.08	1,217.22
AMERIHOST PROPERTIES	03070D209	7011	23.215	115.281

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AMERIQUEST TECHNOLOGIES INC	03070P103	5045	7.023	12.955
AMERISOURCE HEALTH CP -CL A	03071P102	5122	1,391.05	1,552.28
AMERISTAR CASINOS INC	03070Q101	7990	45.81	351.737
AMERISTEEL CORP	03071V109	3312		545.783
AMERN ARCHITECTURAL PDS INC	23857105	3442	28.758	187.059
AMERN BINGO & GAMING CORP	24596108	7990	14.727	18.982
AMERN EAGLE OUTFITTERS INC	2.55E+109	5651	1,576.41	210.948
AMERON INTERNATIONAL INC	30710107	3270	148.103	500.219
AMES DEPT STORES INC	30789507	5331	733.172	1,483.39
AMETEK INC	31100100	3621	716.014	699.825
AMF BOWLING INC	03113V109	7900	306.209	1,979.97
AMGEN INC	31162100	2836	26,621.49	3,672.20
AMISTAR CORP	31535107	3559	6.274	21.759
AMKOR TECHNOLOGY INC	31652100	3674	1,275.82	1,003.60
AML COMMUNICATIONS INC	1733104	3663	7.043	11.946
AMPACE CORP	32007106	4213	0.094	
AMPCO-PITTSBURGH CORP	32037103	3460	104.161	211.811
AMPEX CORP/DE -CL A	32092108	3572	52.87	116.001
AMPHENOL CORP	32095101	3678	539.218	807.401
AMPLICON INC	32101107	7377	153.803	512.605
AMPLIDYNE INC	32103103	3663	5.291	1.783
AMR CORP/DE	1765106	4512	9,580.22	22,303.00
AMREP CORP	32159105	1531	42.372	217.777
AMTECH SYSTEMS INC	32332504	3559	3.166	9.325
AMTRAN INC	03234G106	4522	330.41	594.549
AMTROL INC	03234A109	3443		300.667
AMWAY ASIA PACIFIC LTD	G0352M108	5122	525.588	387.073
AMWAY JAPAN LTD -ADR	03234J100	5122	1,332.24	826.826
AMYLIN PHARMACEUTICALS INC	32346108	2834	18.363	18.823
ANACOMP INC	32371106	3861	187.215	421.153
ANADARKO PETROLEUM CORP	32511107	1311	3,697.96	3,632.99
ANADIGICS INC	32515108	3674	168.573	154.098
ANALOG DEVICES	32654105	3674	3,186.16	1,861.73
ANALOGIC CORP	32657207	3825	515.365	302.957
ANALOGY INC	32659104	7372	33.323	21.218
ANALYSTS INTERNATONAL CORP	32681108	7371	636.735	132.661
ANALYTICAL SURVEYS INC	32683302	7389	156.519	94.54
ANANGEL AMER SHIPHLDGS -ADR	32721201	4412	81.913	462.035
ANAREN MICROWAVE INC	32744104	3679	83.445	50.903
ANCHOR GAMING	33037102	7990	977.532	245.134
ANCHOR GLASS CONTAINER CORP	33038209	3221	0.408	640.962
ANCOR COMMUNICATIONS INC	03332K108	3576	93.064	12.738
ANDATCO INC -CL A	33490103	3572	17.864	25.682
ANDERSEN GROUP INC	33501107	3640	7.712	37.119
ANDERSONS INC	34164103	5150	94.115	360.823
ANDREA ELECTRONICS CORP	34393108	3663	129.617	50.682
ANDREW CORP	34425108	3357	1,119.73	682.903
ANDRX CORP	34551101	5122	777.616	121.198
ANESTA CORP	34603100	2834	347.589	85.129
ANGEION CORPORATION	03462H305	3845	42.436	22.893
ANGELICA CORP	34663104	7200	130.065	339.09
ANGLO SWISS RESOURCES INC	34919100	1040		
ANGLOGOLO LTD -ADR	35128206	1040		
ANHEUSER-BUSCH COS INC	35229103	2082	31,276.88	12,484.30
ANICOM INC	35250109	5063	230.463	353.221
ANIKA THERAPEUTICS INC	35255108	2836	51.853	32.393
ANIXTER INTL NC	35290105	5063	850.626	1,321.80
ANNTAYLOR STORES CORP	36115103	5621	1,008.20	775.417
ANSALDO SIGNAL NV	N05515106	3669	63.903	472.592
ANSOFT CORP	36384105	7372	85.313	52.63
ANSWERTHINK CONSLTNG GRP INC	36916104	7370	909.719	89.064
ANSYS INC	03662Q105	7372	180.356	67.998
ANTEC CORP	03664P105	3663	720.475	532.645
ANTENNA PRODUCTS INC	36728103	3663	3.26	6.869
ANTEX BIOLOGICS INC	03672W100	2836	9.57	6.184
AO TATNEFT - SPONS ADR	03737P306	1311	1,039.59	
APA OPTICS INC	1853100	3827	59.584	6.805
APAC CUSTOMER SERVICES INC	1.85E+108	7389	178.785	267.502
APACHE CORP	37411105	1311	2,474.73	3,996.06

APACHE MEDICAL SYSTEMS INC	3.75E+105	7373	2.749	12.142
APCO ARGENTINA INC	37489101	1311	145.36	62.274
APEX INC	37548104	3576	391.054	73.398
APEX SILVER MINES LTD	G04074103	1044	218.633	62.347
APHTON CORP	03759P101	2836	225.516	19.499
APOGEE ENTERPRISES INC	37598109	3231	241.701	471.191
APOLLO INTL DEL INC	37613106	3825	1.778	.
APPAREL AMERICA INC	37792108	2330	2.47	.
APPAREL TECHNOLOGIES INC	37797107	5040	.	.
APPLE COMPUTER INC	37833100	3571	5,154.23	4,289.00
APPLEBEES INTL INC	37899101	5812	609.263	510.904
APPLETREE COMPANIES INC	03814E307	2030	.	.
APPLEWOODS INC	03814C202	2844	1.324	.
APPLIANCE RECYCLING CTR AMER	03814F205	5700	0.928	8.843
APPLIED BIOMETRICS INC	03814L103	3845	35.78	3.297
APPLIED CARBON TECHNOLOGY	37930104	1400	0.343	19.498
APPLIED COMPUTER TECH INC	38153102	5045	2.122	.
APPLIED DIGITAL ACCESS INC	38181103	3825	33.886	34.272
APPLIED DIGITAL SOLUTIONS	38188108	5045	126.725	124.116
APPLIED EXTRUSION TECH	38196101	3081	105.469	370.726
APPLIED FILMS CORP	38197109	3231	18.233	28.697
APPLIED GRAPHICS TECHNGS INC	37937109	7330	369.253	712.543
APPLIED IMAGING CORP	03820G106	3826	24.501	18.808
APPLIED INDUSTRIAL TECH INC	03820C105	5080	454.461	606.091
APPLIED INNOVATION INC	37916103	3661	54.272	39.77
APPLIED MAGNETICS CORP	38213104	3679	101.885	299.518
APPLIED MATERIALS INC	38222105	3559	12,760.47	4,929.69
APPLIED MICRO CIRCUITS CORP	03822W109	3674	1,137.66	150.655
APPLIED MICROSYSTEMS CORP	37935103	7372	25.889	33.29
APPLIED POWER -CL A	38225108	2522	958.388	1,174.72
APPLIED SCI & TECH	38236105	3559	68.848	51.293
APPLIED SIGNAL TECHNOLOGY	38237103	3663	94.953	72.463
APPLIEDTHEORY CORP	03828R104	7370	.	10.518
APPLIX INC	38316105	7372	39.808	45.613
APS HOLDING CORP -CL A	1937101	5013	1.379	.
APTARGROUP INC	38336103	3089	1,013.04	714.673
AQUA CARE SYSTEMS INC	38373304	3580	3.326	14.567
AQUILA BIOPHARM INC	03839F107	2836	27.067	24.628
ARABIAN SHIELD DEVELOPMENT	38465100	2911	30.276	46.683
ARACRUZ CELULOSE SA -SP ADR	38496204	2611	363.928	.
ARADIGM CORP	38505103	3841	152.05	44.949
ARAMARK CORP -CL B	2034932	5812	.	2,741.30
ARAMEX INTERNATIONAL LTD	G04450105	4513	56.362	41.32
ARC INTERNATIONAL CORP	1905108	5065	22.304	91.927
ARCH CHEMICALS INC	03937R102	2800	.	721.6
ARCH COAL INC	39380100	1220	674.246	2,918.22
ARCHER-DANIELS-MIDLAND CO	39483102	2070	11,057.25	13,833.53
ARCTIC CAT INC	39670104	3790	262.254	240.146
ARDEN GROUP INC -CL A	39762109	5411	143.4	93.126
ARDENT SOFTWARE INC	39794102	7372	355.695	82.804
AREL COMMUNICATIONS & SFTWRE	M14925107	7373	27	.
AREMISSOFT CORP/DE	40026106	7372	.	27.952
ARGENT CAPITAL CORP	39921101	7372	1.128	0.246
ARGOSY GAMING CORP	40228108	7990	69.431	562.752
ARGUSS HOLDINGS INC	40282105	1731	203.419	158.542
ARI NETWORK SERVICES	1930205	7370	10.354	12.808
ARIAD PHARMACEUTICALS INC	04033A100	2836	37.033	30.786
ARIBA INC	04033V104	7372	.	19.242
ARIEL CORP	04033M104	3672	33.555	33.682
ARIELY ADVERTISING LTD	M14950105	7311	.	.
ARIS CORP/WA	04040A101	7370	134.529	69.481
ARIZONA INSTRUMENT CORP	40903205	3823	5.073	9.779
ARK RESTAURANTS CORP	40712101	5812	38.211	43.102
ARKANSAS BEST CORP	40790107	4213	114.601	710.604
ARM HOLDINGS LTD	42068106	3674	948.183	102.468
ARMANINO FOODS DIST INC	42166702	2030	5.575	11.043
ARMATRON INTERNATIONAL INC	42167106	3524	0.77	7.33
ARMCO INC	42170100	3312	472.097	1,893.80
ARMOR HOLDINGS INC	42260109	7381	185.604	94.353

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ARMSTRONG WORLD INDS INC	42476101	3089	2,413.81	4,273.20
ARNOLD INDUSTRIES INC	42595108	4213	400.206	320.111
ARONEX PHARMACEUTICALS INC	42666206	2834	32.758	23.045
ARQULE INC	4.27E+110	2835	60.1	60.48
ARRHYTHMIA RESH TECH	42698308	3845	4.638	9.99
ARROW AUTOMOTIVE INDUSTRIES	42727107	3690	6.286	.
ARROW ELECTRONICS INC	42735100	5065	2,552.12	3,839.87
ARROW INTERNATIONAL	42764100	3841	629.951	322.881
ARROW MAGNOLIA INTL INC	42768101	2851	12.883	6.984
ART TECHNOLOGY GROUP INC	04289L107	7371	.	7.766
ARTESYN TECHNOLOGIES INC	43127109	3679	530.348	325.392
ARTHROCARE CORP	43136100	3845	195.141	27.76
ARTHUR TREACHERS INC	42901306	5812	34.379	7.313
ARTIFICIAL LIFE INC	04314Q105	7372	127.476	12.885
ARTISAN COMPONENTS INC	42923102	3674	98.589	59.489
ARTISOFT INC	04314L106	7372	40.315	25.508
ARTS WAY MFG INC	43168103	3523	7.32	16.995
ARVIDA JMB PARTNERS -LP	43287101	1531	.	316.031
ARVIN INDUSTRIES INC	43339100	3714	1,005.14	1,646.50
ARZAN INTERNATIONAL	M15015106	5150	.	.
ASA INTL LTD	1912203	7373	8.162	19.732
ASAHI/AMERICA INC	04338D106	5070	10.146	48.224
ASANTE TECHNOLOGIES INC	43412105	3576	16.196	30.359
ASARCO INC	43413103	3330	599.737	4,023.81
ASCENT PEDIATRICS INC	04362X200	2834	30.081	16.301
ASCHE TRANSN SVCS INC	04362T100	4213	18.784	88.278
ASD GROUP INC	1988104	3670	2.103	10.788
ASECO CORP	43659101	3825	6.945	15.324
ASHANTI GOLDFIELDS LTD -ADR	43743202	1040	1,020.02	1,489.30
ASHLAND INC	44204105	5160	3,515.00	6,082.00
ASHTON TECHNOLOGY GROUP INC	45084100	7370	75.2	5.654
ASHWORTH INC	04516H101	2320	89.76	81.634
ASI SOLUTIONS INC	00206F108	7389	51.216	50.54
ASIA ELECTRONICS HLDG INC	04516K104	3679	5.359	.
ASIA PAC RES INTL HLD -CL A	G05345106	2611	219.128	.
ASIA PACIFIC WIRE&CABLE CORP	G0535E106	3357	42.932	.
ASIA PULP&PAPER LTD -SP ADR	04516V100	2621	1,978.56	.
ASIA RESOURCES HOLDINGS LTD	04516W108	4700	0.327	.
ASIA-PACIFIC RESOURCES LTD	44902104	1400	94.233	53.858
ASK JEEVES INC	45174109	7370	.	6.808
ASM INTERNATIONAL N V	N07045102	3559	181.34	332.222
ASM LITHOGRAPHY HOLDING NV	N07059111	3559	4,209.00	.
ASPEC TECHNOLOGY INC	45233103	3674	62.137	70.463
ASPECT DEVELOPMENT INC	45234101	7372	1,362.68	114.782
ASPECT TELECOMMUNICATIONS	45237104	3661	850.58	560.659
ASPEN EXPLORATION CORP	45295300	1311	6.145	1.585
ASPEN TECHNOLOGY INC	45327103	7372	1,237.20	342.882
ASSOCIATED MATERIALS INC	45709102	3089	98.7	189.319
ASTEA INTERNATIONAL INC	4.62E+112	7372	22.856	63.613
ASTEC INDUSTRIES INC	46224101	3531	527.538	249.164
ASTRAZENECA PLC -SPON ADR	46353108	2834	42,631.25	8,995.75
ASTREX INC	46357208	5065	1.407	7.246
ASTRO COMMUNICATIONS INC	46376109	3640	6.334	8.59
ASTRO-MED INC	04638F108	3829	26.326	41.754
ASTROCOM CORP	46390100	3576	4.215	1.711
ASTRONICS CORP	46433108	2650	53.602	43.707
ASTROPOWER INC	04644A101	3674	82.505	28.366
ASTROSYSTEMS INC	46465100	3823	.	24.127
ASYMETRIX LEARNINGSYS INC	45927100	7372	61.022	43.622
ASYST TECHNOLOGIES INC	04648X107	3559	158.524	119.766
AT & T CAPITAL CORP	00206J100	7359	.	.
AT HOME CORP	45919107	7370	9,153.02	780.631
AT PLASTICS INC	1947100	2821	104.346	328.856
ATCHISON CASTING CORP	46613105	3320	146.414	346.139
ATEC GROUP INC	00206X604	5045	49.42	26.634
ATHANOR GROUP INC	46831301	3451	4.742	8.226
ATHEY PRODUCTS CORP	47465109	3711	9.513	23.336
ATI TECHNOLOGIES INC	1941103	3577	.	379.287
ATLANTIC COAST AIRLINES HLDG	48396105	4512	483.725	227.626

ATLANTIC DATA SERVICES INC	48523104	7370	52.424	46.761
ATLANTIC PHARMACEUTICALS INC	48785109	2834	6.754	6.521
ATLANTIC PREMIUM BRANDS LTD	04878P105	5140	13.899	45.665
ATLANTIC RICHFIELD CO	46825103	2911	21,005.97	25,199.00
ATLANTIS PLASTICS INC	49156102	3081	59.648	159.232
ATLAS AIR INC	49164106	4522	1,098.01	1,988.87
ATLAS CORP	49267305	1040	1.926	38.038
ATLAS PACIFIC LTD -SPON ADR	49391105	900	4.239	.
ATMEL CORP	49513104	3674	1,526.35	1,962.74
ATMI INC	00207R101	2810	559.54	169.405
ATOMIC BURRITO INC	04961R109	5810	3.503	3.021
ATPLAN INC	04962Q100	7370	.	6.026
ATPOS.COM INC	04963A104	3578	8.177	10.202
ATRIX LABS INC	04962L101	2834	99.436	79.48
ATS MEDICAL INC	2083103	3842	124.768	58.431
ATS MONEY SYSTEMS INC	2084101	3578	5.485	6.101
ATWOOD OCEANICS	50095108	1381	283.564	281.737
AUDIOCODES LTD	M15342104	3661	.	8.713
AUDIOHIGHWAY.COM	50740109	7370	44.62	13.467
AUDIOVOX CORP -CL A	50757103	5065	122.457	279.679
AUGMENT SYSTEMS INC	51058105	3576	0.119	0.291
AULT INC	51503100	3679	42.09	33.303
AURA SYSTEMS INC	51526101	5045	40	.
AUREAL INC	05153Q106	3674	21.932	13.638
AURORA BIOSCIENCES CORP	51920106	3826	109.607	50.955
AURORA FOODS INC	05164B106	2090	1,327.72	1,433.88
AUSPEX SYSTEMS INC	52116100	3576	139.724	147.193
AUSTINS INTL INC	52481108	5812	.	.
AUSTINS STEAKS & SALOON INC	52482205	5812	1.247	4.094
AUTHENTIC FITNESS	52661105	2300	354.726	316.162
AUTO GRAPHICS INC	52725108	7372	2.66	7.573
AUTO-TROL TECHNOLOGY CORP	52754207	7373	15.806	9.737
AUTOBYTEL.COM INC	05275N106	7370	.	34.207
AUTOCAM CORP	52907102	3714	101.46	113.449
AUTODESK INC	52769106	7372	2,091.95	693.877
AUTOIMMUNE INC	52776101	2836	37.235	18.326
AUTOLIV INC	52800109	3714	3,802.92	3,668.10
AUTOLOGIC INFORMATION INTL	52803103	3555	25.323	56.254
AUTOMATIC DATA PROCESSING	53015103	7374	22,016.28	5,175.36
AUTONATION INC	05329W102	5500	6,814.68	13,925.80
AUTOTOTE CORP	53323101	3578	45.589	156.5
AUTOWEB.COM INC	53331104	7370	.	7.185
AUTOZONE INC	53332102	5531	3,944.81	2,748.11
AVADO BRANDS INC	05336P108	5812	262.402	670.597
AVALON HOLDINGS CORP	05343P109	4210	26.857	66.685
AVANIR PHARMACEUTCLS -CL A	05348P104	2834	44.846	7.654
AVANT CORP	53487104	7372	528.944	317.386
AVANT IMMUNOTHERAPEUTICS INC	53491106	2835	74.391	22.65
AVATAR HOLDINGS INC	53494100	1531	146.72	472.991
AVATEX CORP	05349F105	7011	13.005	117.22
AVAX TECHNOLOGIES INC	53495305	2836	25.017	11.144
AVENUE ENTERTAINMENT GRP INC	53577102	7812	8.732	4.313
AVERT INC	53596102	7370	15.784	10.908
AVERY DENNISON CORP	53611109	2670	4,507.55	2,142.60
AVI BIOPHARMA INC	2346104	2836	53.384	10.192
AVIALL INC	05366B102	5080	213.615	304.646
AVIATION DISTRIBUTORS INC	05366P101	5080	0.78	17.586
AVIATION GENERAL INC	05366T103	3721	21.843	10.148
AVIATION GROUP INC/TX	53667101	1700	12.568	11.6
AVIATION SALES CO	53672101	5080	508.462	599.377
AVID TECHNOLOGY INC	05367P100	3861	570.21	486.715
AVIGEN INC	53690103	2836	25.571	5.997
AVINO SILVER&GOLD MINES LTD	53906103	1000	.	4.219
AVIRON	53762100	2836	406.833	120.985
AVIS RENT A CAR INC	53790101	7510	804.299	4,505.06
AVITAR INC	53801106	3842	3.145	0.646
AVIVA PETE INC -DEP	05379P304	1311	3.643	11.422
AVNET INC	53807103	5065	1,994.09	2,733.70
AVON PRODUCTS	54303102	2844	11,616.55	2,433.50

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AVT CORP	2420107	7372	366.067	76.107
AVTEAM INC -CL A	54527205	5080	44.392	141.814
AVX CORP	2444107	3670	1,380.08	1,058.04
AW COMPUTER SYSTEMS -CL A	2448108	7373		
AWARE INC	05453N100	7373	568.528	40.162
AXCESS INC	54546106	3663	4.302	9.071
AXENT TECHNOLOGIES INC	05459C108	7372	778.108	161.263
AXIOHM TRANSACTION SOLUTIONS	54602107	3577	42.374	171.726
AXOGEN LTD -SP ADR	54614201	2836	383.525	.
AXSYS TECHNOLOGIES INC	54615109	3827	56.07	76.211
AXYS PHARMACEUTICALS INC	54635107	2834	177.625	107.262
AZCO MINING INC/DE	54774104	1000	17.668	19.487
AZTAR CORP	54802103	7990	229.501	1,077.70
AZTEC MANUFACTURING CO	54825104	3640	39.064	58.399
AZTEC TECHNOLOGY PRTNRS INC	05480L101	7373	79.815	260.519
AZUL HOLDINGS INC	05500Q106	7373	2.32	4.066
AZUREL LTD	55013106	2844	5.819	14.725
B & H OCEAN CARRIERS LTD	55090104	4400	17.795	.
BAAN COMPANY NV	N08044104	7372	2,151.30	823.151
BAB HOLDINGS INC	55176101	5400	6.012	14.445
BACK YARD BURGERS INC	05635W101	5812	8.907	16.948
BACKWEB TECHNOLOGIES LTD	M15633106	7372	.	12.701
BACOU USA INC	56439102	3851	378.615	293.77
BADGER METER INC	56525108	3824	129.889	96.945
BADGER PAPER MILLS INC	56543101	2621	15.688	47.999
BAIRNCO CORP	57097107	2821	59.016	118.555
BAKER (J) INC	57232100	5661	83.518	324.035
BAKER-HUGHES INC	57224107	3533	5,765.14	7,810.80
BALANCE BAR CO	57623100	2060	121.894	26.981
BALCHEM CORP -CL B	57665200	2810	26.208	22.648
BALDOR ELECTRIC	57741100	3621	742.709	411.926
BALDWIN PIANO & ORGAN CO	58246109	3931	33.235	137.25
BALDWIN TECHNOLOGY -CL A	58264102	3555	100.844	175.028
BALL CORP	58498106	3411	1,393.32	2,854.80
BALLANTYNE OF OMAHA INC	58516105	3861	106.166	56.553

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VANTIVE CORP	922091103	7372	211.32	184.268
VARCO INTERNATIONAL	922126107	3533	500.975	546.92
VARI-L COMPANY INC	922150107	3679	41.319	50.671
VARI-LITE INTERNATIONAL INC	922152103	7359	21.45	114.627
VARIAN INC	922206107	3826	.	404.099
VARIAN MEDICAL SYTEMS INC	92220P105	3844	1,048.44	1,218.30
VARIAN SEMICONDUCTOR EQUIPMT	922207105	3559	.	224.626
VARIFLEX INC	922242102	3949	31.631	44.755
VASOMEDICAL INC	922321104	3845	64.566	5.198
VASTAR RESOURCES LTD	922380100	1311	4,206.64	2,574.00
VAXCEL INC	922389101	2836	0.693	0.976
VAXGEN INC	922390208	2836	.	21.472
VCAMPUS CORP	92240C100	2741	23.693	14.871
VDI MULTIMEDIA	917916108	7819	92.872	64.849
VEBA AG -ADR	92239H102	1311	30,105.03	50,532.58
VECTOR AEROMOTIVE CORP	92239C608	3711	3.015	.
VEECO INSTRUMENTS INC	922417100	3559	788.428	172.837
VELCRO INDUSTRIES N V	922571104	3960	358.978	251.713
VENATOR GROUP INC	922944103	5661	695.129	2,876.00
VENGOLD INC	92267K100	1040	89.377	329.402
VENTANA MEDICAL SYSTEM INC	92276H106	2835	289.386	56.28
VENTURE SEISMIC LTD	92327K108	1382	7.216	.
VENTURE STORES INC	923275101	5331	.	.
VENTURIAN CORP	923304109	5080	9.392	22.48
VENUS EXPLORATION INC	923333108	1311	15.085	7.396

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VERAMARK TECHNOLOGIES INC	923351100	3661	43.441	15.183
VERDANT BRANDS INC	923366207	2870	27.531	58.928
VEREX LABORATORIES INC	923406201	2834	2.909	0.171
VERILINK CORP	923432108	3576	86.369	63.828
VERIO INC	923433106	7370	741.675	933.712
VERISIGN INC	9.23E+106	7372	1,365.00	64.295
VERITAS DGC INC	92343P107	1382	705.864	478.49
VERITAS SOFTWARE CO	923436109	7372	2,854.79	349.117
VERITEC INC	923437305	3679	0.309	.
VERITY INC	92343C106	7372	425.006	65.026
VERMONT PURE HLDG LTD	924234107	5140	31.991	26.174
VERMONT TEDDY BEAR INC	92427X109	3942	5.832	14.487
VERONEX TECHNOLOGIES INC	924905102	7373	28.027	
VERSANT CORP	925284101	7372	22.208	20.669
VERSUS TECHNOLOGY INC	925313108	3669	9.974	5.543
VERTEL CORP	924907108	7372	42.124	28.317
VERTEX CMP CABLE&PRODS INC	92532D204	3679	4.049	2.89
VERTEX COMMUNICATIONS CORP	925320103	3663	94.043	110.771
VERTEX INDUSTRIES INC	925322109	3590	6.758	3.228
VERTEX PHARMACEUTICALS INC	92532F100	2834	754.43	266.346
VERTICALNET INC	92532L107	7370		12.343
VESTCOM INTERNATIONAL INC	924904105	2750	79.101	142.544
VETERINARY CENTERS OF AMER	925514101	700	410.503	392.883
VF CORP	918204108	2300	5,599.97	3,836.67
VI TECHNOLOGIES INC	917920100	2836	128.225	75.225
VIACOM INC -CL B	925524308	7812	25,715.00	23,613.10
VIAD CORP	92552R109	5810	3,019.12	4,802.77
VIALINK CO	92552Q101	7373	28.623	4.597
VIALOG CORP	92552X106	7389	.	69.266
VIANT CORP	92553N107	7370	.	29.753
VIASAT INC	92552V100	3663	71.808	50.016
VIASOFT INC	92552U102	7372	312.768	162.377
VICAL INC	925602104	2836	225.121	44.844
VICON FIBER OPTICS CORP	925809105	3843	5.971	4.02
VICON INDUSTRIES INC	925811101	3669	31.863	44.386
VICOR CORP	925815102	3679	375.444	249.551
VICORP RESTAURANTS INC	925817108	5812	128.085	199.67
VICTORMAXX TECHNOLOGIES INC	92640P107	3944	.	.
VIDAMED INC	926530106	3841	56.035	14.132
VIDEO CITY INC	92653W106	7841	19.412	38.253
VIDEO DISPLAY CORP	926555103	5065	21.56	51.641
VIDEO NETWORK COMMUNICATIONS	92656N103	3661	12.738	9.623
VIDEO SERVICES CORP	92656U107	7819	39.792	81.86
VIDEO UPDATE INC -CL A	92657V104	7841	21.051	207.208
VIDEOLABS INC	92657R103	3861	4.038	4.785
VIDEONICS INC	92657Q105	3861	3.661	9.164
VIDEOSERVER INC	926918103	3576	245.894	80.132
VIDIKRON TECHNOLOGIES GROUP	92659F107	3651	1.249	.
VIEW TECH INC	926707100	5065	18.34	26.246
VIEWCAST.COM INC	926713108	3663	30.423	13.612
VIGNETTE CORP	926734104	7372		22.781
VIISAGE TECHNOLOGY INC	92675K106	7373	10.479	46.444
VIKONICS INC	926859109	3669	0.293	.
VILLAGE GREEN BOOKSTORE INC	927077206	5940	.	.
VILLAGE SUPER MARKET -CL A	927107409	5411	44.55	138.508
VINA CONCHA Y TORO SA -ADR	927191106	2084	372.16	247.796
VINTAGE PETROLEUM INC	927460105	1311	458.048	1,014.18
VION PHARMACEUTICALS	927624106	2836	69.765	9.269
VIRAGEN EUROPE LTD	927637207	2836	22.238	5.053
VIRAGEN INC	927638106	2836	99.021	15.895
VIRBAC CORP	927649103	2834	13.015	28.043
VIRCO MANUFACTURING	927651109	2531	171.177	151.38
VIRGIN EXPRESS HLDGS -ADR	92765K107	4522	.	.
VIRGINIA GAS CO	927814103	1311	18.579	60.462
VIROPHARMA INC	928241108	2834	107.246	23.657
VIRTUALFUND.COM INC	92825A107	3861	69.247	33.12
VIRTUALSELLERS.COM INC	92825Y105	7389	20.816	0.218
VISHAY INTRTECHNOLOGY	928298108	3670	981.2	2,462.74
VISIBLE GENETICS INC	92829S104	3845	105.196	27.783

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VISIO CORP	927914101	7372	726.456	159.377
VISION TEN INC	92831F306	3844	0.092	.
VISION-SCIENCES INC	927912105	3845	26.416	7.882
VISKASE COMPANIES INC	92831R102	3089	63.151	531.069
VISTA ENERGY RES INC	928350107	1311	34.663	59.743
VISTA EYECARE INC	928352103	5990	113.773	229.097
VISTA GOLD CORP	927926105	1040	14.152	80.878
VISTA INFO SOLUTIONS INC	928365204	7389	92.628	17.585
VISTA MED TECHNOLOGIES INC	928369107	3845	39.875	16.605
VISTANA INC	92839P108	1531	297.136	471.42
VISUAL DATA CORP	928428200	7812	9.797	6.394
VISUAL EDGE SYSTEMS INC	928430107	7812	9.402	6.136
VISUAL NETWORKS INC	928444108	7373	753.562	66.848
VISX INC/DE	92844S105	3845	1,346.51	176.619
VITA FOOD PRODUCTS INC	928450105	2090	3.242	11.054
VITAFORT INTERNATIONAL CP	928467307	2060	4.943	3.388
VITAL SIGNS INC	928469105	3841	209.145	138.186
VITALCOM INC	927917104	7373	21.428	24.223
VITECH AMERICA INC	928489103	3571	226.858	195.667
VITESSE SEMICONDUCTOR CORP	928497106	3674	1,743.17	368.411
VITRAN CORP INC -CL A	9.29E+111	4213	49.39	135.453
VITRIA TECHNOLOGY	92849Q104	7372	.	20
VITRO DIAGNOSTICS INC	928501303	2836	0.962	0.765
VITRO SOCIEDAD ANONIMA -ADR	928502301	3211	477.149	3,116.82
VIVID TECHNOLOGIES INC	928538107	3844	70.266	45.924
VIVUS INC	928551100	3841	82.723	54.108
VIZACOM INC	9.29E+106	7372	5.559	10.313
VLASIC FOODS INTERNATIONAL	928559103	2030	798.86	959.273
VOCALTEC COMMUNICATIONS LTD	M97601104	7372	128.396	59.945
VODAVI TECHNOLOGY INC	92857V102	3661	11.941	22.842
VOICE IT WORLDWIDE INC	92861K100	3651	2.425	4.844
VOICE POWERED TECH INTL INC	92861H107	3679	2.707	0.909
VOLT INFO SCIENCES INC	928703107	7363	359.214	469.326
VOLVO AB SWE -ADR	928856400	3711	10,292.74	25,228.43
VOXEL	928935105	3845	.	.
VOXWARE INC	92906L105	7372	29.085	15.557
VOYAGER.NET INC	92906W101	7370	.	41.725
VSI ENTERPRISES INC	91832B884	3663	12.3	10.961
VTEL CORP	918333105	3663	130.652	129.289
VULCAN INTL CORP	929136109	3060	39.226	95.012
VULCAN MATERIALS CO	929160109	1400	4,411.54	1,658.61
VYREX CORP	9.29E+105	2834	1.158	0.217
VYSIS INC	928961101	2835	52.611	35.043
W3 GROUP INC	92934W107	5130	0.144	3.598
WABASH NATIONAL CORP	929566107	3715	465.246	704.486
WACKENHUT CORP -SER A	929794105	7381	376.482	453
WACOAL CORP -ADR	930004205	2340	1,695.27	.
WAL-MART STORES	931142103	5331	191,264.00	49,996.00
WALGREEN CO	931422109	5912	19,120.61	4,902.00
WALKER (B.B.) CO	931514103	3140	.	20.08
WALKER INTERACTIVE SYSTEMS	931664106	7372	95.411	95.097
WALKER INTL INDS INC	931655104	7384	0.777	1.405
WALL DATA INC	932045107	7372	158.609	126.795
WALL ST DELI INC	931904106	5812	13.134	19.863
WALLACE COMPUTER SVCS INC	932270101	2761	843.726	1,257.46
WALTER INDUSTRIES INC	93317Q105	3320	660.345	3,362.03
WARNACO GROUP INC -CL A	934390105	2340	1,491.90	1,783.13
WARNER CHILCOTT PLC -ADR	934435207	2834	83.477	157.017
WARNER-LAMBERT CO	934488107	2834	61,770.86	9,230.60
WARP 10 TECHNOLOGIES INC	934900101	7372	48.803	3.365
WARRANTECH CORP	934648304	7389	42.557	.
WASHINGTON HOMES INC	938864105	1531	44.179	145.972
WASHINGTON POST -CL B	939640108	2711	5,833.13	2,729.66
WASTE TECHNOLOGY CORP	940901200	3569	2.758	6.784
WATER CHEF INC	940907108	3580	.	.
WATERFORD WEDGWOOD PLC -ADR	941513301	3260	662.256	763.68
WATERLINK INC	94155N105	3580	33.621	183.561
WATERMARC FOOD MGMT CO	941832107	5810	4.519	12.683
WATERS CORP	941848103	3826	2,643.41	577.701

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WATERS INSTRUMENT INC	941850109	3612	7.702	8.146
WATKINS-JOHNSON	942486101	3663	133.415	245.478
WATSCO INC	942622200	5070	469.536	532.018
WATSON PHARMACEUTICALS INC	942683103	2834	5,627.82	1,070.04
WATTS INDUSTRIES -CL A	942749102	3490	564.794	665.82
WAUSAU-MOSINEE PAPER CORP	943315101	2621	951.631	900.149
WAVE SYSTEMS CORP -CL A	943526103	3577	117.308	2.058
WAVE TECHNOLOGIES INTL INC	94352Q109	2731	19.198	21.789
WAVECOM S A -SP ADR	943531103	3663	.	17.123
WAVETECH INTERNATIONAL INC	944019207	7373	4.249	2.542
WAVO CORP	944027101	7370	229.494	52.986
WAXMAN INDUSTRIES	944124106	5070	45.21	105.743
WCM CAPITAL INC	92924P104	1040	1.606	4.943
WD-40 CO	929236107	2890	324.385	70.945
WEATHERFORD INTL INC	947074100	3533	1,887.20	2,831.72
WEB PRESS CORP	947330106	3555	1.748	6.981
WEBB (DEL E) CORP	947423109	1531	469.685	1,310.46
WEBB INTERACTIVE SVCS INC	94748P104	7370	60.939	3.385
WEBCO INDUSTRIES INC	947621108	3317	56.004	111.758
WEBHIRE INC	94768W104	7372	30.218	31.431
WEBTRENDS CORP	94844D104	7372	.	3.362
WEGENER CORP	948585104	3663	17.934	25.905
WEIDER NUTRITION INTL -CL A	948603105	2834	131.36	256.029
WEINERS STORES INC	948704101	5331	4.619	83.317
WEIRTON STEEL CORP	948774104	3312	64.347	1,195.70
WEIS MARKETS INC	948849104	5411	1,623.27	1,029.20
WEITZER HOMEBUILDERS -CL A	949049100	1531	2.292	43.1
WELCOME HOME INC	949116107	5700	0.969	17.777
WELDOTRON CORP	949391106	3560	0.046	.
WELLCO ENTERPRISES	949476105	3140	12.502	16.02
WELLINGTON HALL LTD	949535207	2511	0.254	5.099
WELLMAN INC	949702104	2820	319.047	1,493.48
WELLS-GARDNER ELECTRONICS	949765101	3575	11.521	19.671
WENDY'S INTERNATIONAL INC	950590109	5812	2,704.80	1,837.95
WERNER ENTERPRISES INC	950755108	4213	836.802	769.196
WESCAST INDUSTRIES -CL A	950813105	3714	382.324	182.351
WESCO INTL INC	95082P105	5063	.	950.522
WESLEY JESSEN VISIONCARE INC	951018100	3851	443.861	204.518
WEST COAST ENTMT CORP	952182103	7841	17.179	165.68
WEST MARINE INC	954235107	5500	167.727	279.545
WEST PHARMACEUTICAL SVSC INC	955306105	3060	536.248	505.6
WEST TELESERVICES CORP	956188106	7389	617.468	326.139
WESTAFF INC	957070105	7363	136.62	197.145
WESTAMERICA CORP	95709H304	1311	.	.
WESTELL TECH INC -CL A	957541105	3661	160.625	64.407
WESTERBEKE CORP	957547102	3621	5.754	14.67
WESTERN BEEF INC	957781107	5411	37.641	86.357
WESTERN DIGITAL CORP	958102105	3572	1,042.92	1,442.69
WESTERN PACIFIC AIRLINES INC	959080102	4512	.	.
WESTERN PWR & EQUIP CORP	959221102	5082	18.992	138.766
WESTERN STANDARD CORP	959588203	7011	0.309	8.951
WESTINGHOUSE AIR BRAKE CO	960386100	3743	828.326	596.184
WESTMORELAND COAL CO	960878106	1220	26.558	215.606
WESTOWER CORP	9.61E+105	1540	132.635	.
WESTPOINT STEVENS INC	961238102	2390	1,776.47	1,391.21
WESTRN STAR TRUCKS HLDGS LTD	95960H100	3711	242.25	532.133
WESTVACO CORP	961548104	2621	2,489.29	5,008.67
WESTWOOD CORP	961748209	3621	4.742	19.683
WESTWOOD GROUP INC	961754108	7948	.	13.369
WESTWOOD ONE INC	961815107	7900	874.343	345.279
WET SEAL INC -CL A	961840105	5621	462.449	197.49
WEYCO GROUP INC	962149100	3140	112.259	92.782
WEYERHAEUSER CO	962166104	2400	10,112.05	12,834.00
WHIRLPOOL CORP	963320106	3630	4,213.43	7,935.00
WHITE CAP INDUSTRIES INC	963505102	5072	117.92	173.192
WHITE ELECTRIC DESIGNS CORP	963801105	3674	7.509	14.898
WHITE PINE SOFTWARE INC	964347108	7372	24.843	15.996
WHITEHALL JEWELLERS INC	965063100	5944	168.069	169.606
WHITEWING LABS INC	966245102	5961	2.559	1.952

WHITMAN CORP	96647R107	2086	2,562.72	1,569.30
WHOLE FOODS MARKET INC	966837106	5411	1,116.31	544.808
WHX CORP	929248102	3312	176.538	2,712.08
WICHITA RIVER OIL	967352105	1311	.	
WICKES INC	967446105	5211	34.88	292.183
WIDECOM GROUP INC	967575200	3661	4.912	4.278
WILD OATS MARKETS INC	96808B107	5411	411.957	198.84
WILEY (JOHN) & SONS -CL A	968223206	2731	1,261.30	528.552
WILLAMETTE INDUSTRIES	969133107	2621	3,717.86	4,697.67
WILLAMETTE VALLEY VINEYARDS	969136100	2084	8.204	14.391
WILLBROS GROUP INC	969199108	1623	78.669	159.939
WILLIAMS CONTROLS INC	969465103	3714	43.18	66.359
WILLIAMS INDUSTRIES INC	969493204	1700	15.645	29.113
WILLIAMS-SONOMA INC	969904101	5700	1,934.62	576.245
WILLIS LEASE FINANCE CORP	970646105	5080	115.936	360.005
WILMAR INDUSTRIES INC	971426101	5070	271.978	121.696
WILSHIRE TECHNOLOGIES INC	972000103	2842	4.854	6.011
WILSON BROTHERS	972091102	3231	.	
WILSONS LEATHER EXPERTS INC	972463103	5600	121.2	248.778
WINCO PETROLEUM CORP	973135106	1311		0.541
WIND RIVER SYSTEMS INC	973149107	7371	893.343	326.776
WINDMERE-DURABLE HOLDINGS	973411101	3634	171.205	742.737
WINDSOR ENERGY CORP	973906100	1311	.	.
WINLAND ELECTRONICS INC	974241101	3829	7.307	11.631
WINN-DIXIE STORES INC	974280109	5411	7,575.08	3,068.71
WINNEBAGO INDUSTRIES	974637100	3716	239.536	230.612
WINSTON RESOURCES INC	975661109	7363	11.701	12.919
WINTER SPORTS INC	976072108	7990	9.954	17.827
WIRELESS TELECOM GROUP INC	976524108	3825	32.919	24.122
WISCONSIN CENTRAL TRANSPORTN	976592105	4011	879.046	1,016.04
WISER OIL CO	977284108	1311	19.023	231.81
WITCO CORP	977385103	2860	918.348	2,338.87
WIZ TECHNOLOGY INC	977501105	5045	0.13	.
WIZTEC SOLUTIONS LTD	M98105105	7371	95.291	28.442
WLR FOODS INC	929286102	2015	108.65	381.742
WMC LTD -ADR	928947100	3330	3,362.72	.
WMS INDUSTRIES INC	929297109	3990	117.184	207.522
WOLF (HOWARD B) INC	977725100	2330	4.356	5.49
WOLOHAN LUMBER CO	977865104	5211	72.124	157.511
WOLVERINE TUBE INC	978093102	3350	280.623	549.418
WOLVERINE WORLD WIDE	978097103	3140	540.136	521.478
WOMEN FIRST HEALTHCARE	978150100	5122		12.504
WOODHEAD INDUSTRIES INC	979438108	3640	115.836	155.941
WOODROAST SYSTEMS INC	979899309	5812	.	.
WOODWARD GOVERNOR CO	980745103	3620	259.831	563.435
WORK RECOVERY INC	981370307	3845	0.809	.
WORKFLOW MGMT INC	98137N109	5110	125.08	238.572
WORKGROUP TECHNOLOGY CORP	980903108	7372	14.04	25.397
WORKSAFE INDUSTRIES INC	98138R109	3842	3.997	17.685
WORLD ACCESS INC	98141A101	3661	943.407	613.812
WORLD AIRWAYS INC	98142H105	4522	7	116.437
WORLD COLOR PRESS INC	981443104	2750	1,175.49	2,433.89
WORLD FUEL SERVICES CORP	981475106	5172	141.685	165.934
WORLD HEART CORP	980905103	3845	91.627	10.721
WORLD OF SCIENCE INC	981500101	5990	10.712	26.164
WORLDCORP INC	981904105	4522	2.166	.
WORLDGATE COMMUNICATIONS INC	98156L307	7370	.	5.621
WORLDTALK COMMUNICATIONS CP	98155G101	7372	40.735	11.146
WORLDTEX CORP	981907108	2200	49.948	324.12
WORLDWIDE ENTMT & SPORTS CP	98157N104	7900	13.295	1.015
WORTHINGTON FOODS INC	981809106	2090	234.764	120.949
WORTHINGTON INDUSTRIES	981811102	3310	1,152.43	1,686.95
WPI GROUP INC	92930K107	3571	39.935	110.123
WPP GROUP PLC -ADR	929309300	7311	4,733.14	4,080.40
WRIGLEY (WM) JR CO	982526105	2060	10,399.04	1,520.86
WRITER CORP	982554107	1531	13.937	44.478
WRP CORP	929317105	3842	39.293	35.8
WSI INDUSTRIES INC	92932Q102	3540	16.225	13.615
WTC INDUSTRIES INC	929341204	3580	2.636	0.882

WYANT CORP	982855108	2670	11.723	42.54
WYMAN-GORDON CO	983085101	3460	688.183	581.71
WYNN'S INTERNATIONAL INC	983195108	3050	415.994	225.596
X-RITE INC	983857103	3861	126.953	95.444
XATA CORP	983882309	3571	9.97	6.986
XCL LTD	983701103	1311	43.834	114.673
XDOGS.COM INC	983888108	3949	.	.
XECHEM INTERNATIONAL INC	983895103	2836	7.192	.
XEIKON N V -ADR	984003103	3577	670.385	124.643
XENOMETRIX INC	984109108	2835	0.737	1.738
XENOVA GROUP PLC -SPON ADR	984111104	2836	24.167	26.808
XEROX CORP	984121103	3577	38,750.49	30,024.00
XETA CORP	983909102	3661	35.891	18.292
XETEL CORP	983942103	3672	20.716	52.601
XICOR INC	984903104	3674	28.308	78.862
XILINX INC	983919101	3674	6,337.53	1,070.25
XIONICS DOCUMENT TECHNOLGIES	98412X103	7372	59.439	33.933
XIOX CORP	983905100	7372	28.593	11.408
XIRCOM INC	983922105	3576	565.484	195.224
XOMA LTD	G9825R107	2836	149.932	37.304
XOMED SURGICAL PRODS	98412V107	3842	388.48	141.996
XOOM.COM INC	98413F101	7370	452.1	66.874
XOX CORP	98412Y101	7372	3.073	1.43
XTRA CORP	984138107	7359	715.798	1,575.00
XXSYS TECHNOLOGIES INC	983858101	1600	5.928	3.981
XYBERNAUT CORP	984149104	3571	96.12	4.412
YAHOO INC	984332106	7370	23,577.70	621.884
YANKEE CANDLE INC	984757104	3990	.	275.345
YANZHOU COAL MNG CO LTD	984846105	1220	.	.
YELLOW CORP	985509108	4213	491.092	1,105.69
YES CLOTHING CO	985832104	2330	.	.
YES ENTERTAINMENT CORP	985834100	3944	0.932	.
YIELDUP INTL CORP	985837103	3559	14.448	6.127
YOCREAM INTERNATIONAL INC	986001105	2024	11.9	6.556
YORK GROUP INC	986632107	3990	84.844	209.264
YORK INTL	986670107	3585	1,632.28	2,106.54
YORK RESEARCH CORP	987048105	5172	67.028	401.092
YOUBET.COM INC	987413101	7370	89.059	4.653
YOUNG & RUBICAM INC	987425105	7311	2,148.89	1,635.26
YOUNG INNOVATIONS INC	987520103	3843	88.371	54.744
YPF SOCIEDAD ANONIMA -ADR	984245100	2911	9,862.11	13,146.00
ZALE CORP	988858106	5944	1,128.40	1,445.93
ZAMBA CORP	988881108	7370	56.229	13.941
ZANY BRAINY INC	98906Q101	5945	.	82.141
ZAPATA CORP	989070503	2070	231.32	334.006
ZAPWORLD.COM	98912M102	3751	7.83	1.76
ZARING NATIONAL CORP	989136106	1531	40.171	162.356
ZAXIS INTL INC	98919P108	2835	2.179	0.432
ZDNET	989511209	7370	.	97.686
ZEBRA TECHNOLOGIES CP -CL A	989207105	3560	898.61	310.002
ZEGARELLI GROUP INTL INC	989270103	2844	.	.
ZEMEX CDA CORP	988910105	3390	54.425	148.866
ZENITH ELECTRONICS CORP	989349105	3651	17.556	350
ZERO CORP/DE	989484100	3460	.	.
ZEVEX INTERNATIONAL INC	98950E400	3845	16.207	33.761
ZI CORP	988918108	7372	46.946	2.444
ZIFF-DAVIS INC	989511100	2721	1,581.20	3,433.80
ZILA INCORPORATED	989513205	5047	217.15	69.864
ZILOG INC	989524103	3674	.	297.071
ZINDART LTD -SP ADR	989597109	3990	45.827	90.911
ZING TECHNOLOGIES INC	989601109	3674	21.216	36.171
ZIONS CO-OPERATIVE MERCANTIL	989705108	5311	32.13	132.414
ZIPLINK INC	989741103	7370	.	11.174
ZITEL CORP	989913108	7372	68.231	18.07
ZMAX CORP	98974T201	7370	47.549	17.446
ZOLL MEDICAL CORP	989922109	3845	46.824	45.288
ZOLTEK COS INC	98975W104	2820	188.511	147.209
ZOMAX INC	989929104	3652	116.821	65.424
ZONAGEN INC	98975L108	2834	214.315	58.642

ZONIC CORP	989906102	3829	0.761	0.569
ZOOM TELEPHONICS INC	9.90E+107	3661	29.9	43.56
ZORAN CORP	98975F101	3674	178.728	49.17
ZYDECO ENERGY INC	989854104	1311	5.821	6.69
ZYGO CORP	989855101	3827	163.08	91.005
ZYMETX INC	989859103	2835	38.992	21.686

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