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MV	Company's market value six-month after the financial year-end
TA	Total Assets
TL	Total Liabilities
TIA	Total Intangible Assets
G	Goodwill
DC	Development Cost
L	Licences
B&P	Brands and Patents
CS	Computer Software
OIA	Other Intangible Assets
TTA	Total Tangible Assets
NETTA	Net Tangible Assets (Total Tangible Assets - Total Liabilities)
NI	Net Income Available for Common Shareholders
Difrs	Dummy Variable (0-UK GAAP, 1-IFRS/IAS)
Age	The number of years in operation from the incorporation year to the current fiscal year
Aud	Sub-sampling group (0-non big 4 audit company, 1-big 4 audit firm)
Lev otherwise)	Sub-sampling group (0-average total debt to equity ratio < median, 1-
Loss	Sub-sampling group (0- net income <0, 1-otherwise)
Negative BV	Sub-sampling group (0- book value <0, 1-otherwise)
Growth	Sub-sampling group (0-growth in tangible assets < or =0, 1-otherwise)
Market Cap. otherwise)	Sub-sampling group (0-average market capitalisation < median, 1-
CHS otherwise)	Sub-sampling group – (0 - closely held shares < median, 1 –
IFRS	International Financial Reporting Standards (including International Accounting Standards or IAS)
AIM	Alternative Investment Market

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CHAPTER 1
INTRODUCTION

1.1. Introduction

International financial reporting standards (IFRS/IAS) have been mandatory for all listed companies in the European Union since 1 January 2005 (EC 1606/2002)[1]. However, IFRS adoption is not expected to pose any major new measurement and disclosure requirement for U.K. listed companies (Li, 2010) due to among other reasons, the Accounting Standard Board (ASB) has been involved in convergence projects with the International Accounting Standard Board (IASB). IFRS and U.K. GAAP share common features such as both are designed for equity market and common law countries. Nevertheless, the IASB's decision to prioritise reporting for decision-usefulness as the primary objective of financial reporting and its greater emphasis on a balance sheet and fair value accounting can affect accounting information and are likely to produce undesirable effects on attributes of financial information (Whittington, 2008a). So far, the empirical evidence of the undesirable effects on the quality of financial information, particularly from the U.K. is still limited.

U.K. listed companies have adopted IFRS for more than seven years now. Hence, new studies can examine whether the early evidence on its effects (e.g. Horton and Serafeim, 2009) also occurs in a longer term. The need to focus on the effects of IFRS is highlighted by the IASB in its article entitled 'Europe and IFRSs: six years on'.

'With the great age of expansion and acceptance of IFRSs coming to an end, a greater emphasis will need to be placed on the effects of the standards'[2]

[1] See Regulation (EC) 1606/2002 for further information.
[2] http://www.ifrs.org/Features/Europe+and+IFRSs.htm

This study responds to this call and aims to investigate how IFRS has affected accounting information, financial reporting approach and accounting information attributes. Accounting information refers to earnings and intangible assets. Earnings are considered the most important output from financial reporting (Graham, et al., 2005) and current reporting of intangible assets is criticised as very inadequate and is in urgent need of reform (Skinner, 2008). The IASB's conceptual framework is much influenced by the U.S.'s conceptual framework (Penman, 2007) where the two standard setters are involved in a joint project. The U.S. evidence indicates that the financial reporting approach has been further shifted away from a matching approach towards a valuation approach (Dichev, 2008; Paananen and Parmar, 2008). This phenomenon is manifested in a declining matching of expenses against revenue (Dichev and Tang, 2008). Consequently, these changes are likely to affect the attributes of accounting information. This study shall focus on two of the attributes, namely earnings persistence and value relevance.

This chapter introduces the current study and is organised in the following manner; Section 1.2 provides an overview of the study, Section 1.3 explains the research importance and motivation, Section 1.4 describes the research objectives and key research design and methods of investigation, Section 1.5 discusses the main research findings, Section 1.6 reports research contributions and Section 1.7 outlines the structure of the thesis.

1.2. Overview of the Study

The key research theme in this study is the impact of IFRS on the quality of financial information. It is measured by earnings persistence and value relevance, including informational and predictive values of intangible assets. The study was conducted in four research stages.

At the first stage, it explored the effects of IFRS on earnings, intangible assets and several indicators of a balance sheet approach to financial reporting. Compared to existing studies, this study examines differences in five different profit levels

between pre- and post-IFRS. Therefore, it substantiates findings from prior studies that earnings under IFRS are significantly higher (Gaston, et al., 2010; Horton and Serafeim, 2010) and documents whether this effect persists over time. Financial reporting of intangible assets has been criticised as poor and needing immediate reform (Lev, 2001; Skinner, 2008). In addition, financial reporting of different classes of intangible assets other than goodwill is very rare in the U.K. prior to 2005 (Stark, 2008). IFRS brings a few changes to accounting for intangible assets such as a broader definition of intangible assets (Horton and Serafeim, 2006), removal of an option to capitalise development costs that meet the recognition condition (Wyatt, 2008) and replacing amortisation of goodwill to impairment (Sahut et al., 2011; Paanamen, 2008). Hence, this study will examine if IFRS improves current reporting of intangible assets.

The IASB follows a balance sheet approach (Barker, 2004; Penman, 2007) because the board is in the opinion that it provides a more standardised conceptual basis for financial accounting and reporting (ICAEW, 2009; Dichev, 2008; Fox et al., 2003). In addition, the board believes that a balance sheet approach is more conducive to produce information for decision-usefulness. Current financial reporting in the U.K. is still based on mixed approaches (Fox, et al., 2003) which may convey misleading information to investors (Barker, 2004). However, choosing a balance sheet approach will move the financial reporting model further away from a matching approach (Dichev, 2008). A matching approach, i.e. an income statement approach, is an essential basis for reporting for stewardship and it better reflects existing accounting practices (ICAEW, 2009). It is anticipated that a shift to a balance sheet approach produces undesirable effects on the quality of financial information. For example, it is likely to increase earnings volatility and reduce earnings persistence (Dichev and Tang, 2009).

At the second stage, this study examined the impact of IFRS on earnings persistence and earnings' ability to measure the underlying business reality. Previous studies (e.g. Dichev and Tang, 2008; 2009) have not directly factored in a mandatory change in accounting regime from local accounting standards to IFRS. This study would test

the generalisability of their findings and link them with IFRS adoption. Earnings persistence is important to investors (Nichols and Wahlen, 2004). Investors need to estimate recurring profits to forecast future profits. Since the U.S. and the U.K. share common features and they have been involved in several convergence projects, this study proposed that the same trends, i.e., declining earnings persistence would be observed in the U.K. In addition, earnings are very useful to investors if they reflect company's underlying business reality (Barker, 2004). Therefore, this study also examined changes in a relation between earnings volatility and cash earnings volatility as cash earnings are assumed to better reflect company's underlying business reality (Jayaraman, 2007).

At the third stage, this study investigated how IFRS had affected the value relevance of intangible assets and different classes of intangible assets. Existing researchers focus a bit more on the value relevance of earnings and book value of equity (e.g. Hung and Subramanyam, 2007; Soderstrom and Sun, 2007; Agostino et al., 2011; Clarkson et al., 2011;). However, concerns about the impact on the value relevance of other financial information is growing (see for example, Wyatt, 2008 and Jermakowicz and Gornick-Tomaszewski, 2006). Despite its importance in the current business environment, reporting of intangible assets is still considered lagging behind tangible assets (Skinner, 2008). This might lead to a wider gap between the book value of equity and the market value of equity (Kohlbeck and Warfield, 2007). Thus, this study attempted to determine whether IFRS had improved the quality of intangible assets reporting measured by value relevance which would supplement findings related to reporting levels of intangible assets and different classes of intangible assets (1^{st} research stage) and substantiate evidence from existing literature (e.g. Sahut et al. 2011).

At the fourth and final stage, this study further assessed how IFRS affected two primary qualities of relevance, informative and predictive values. A balance sheet approach to financial reporting requires more up-to-date valuation of assets and liabilities via fair value rules which the IASB argues that this approach and fair value accounting (Ball, 2006) are expected to significantly improve the informative and

predictive values of accounting information. This part of the study focuses on intangible assets as an extension to the 3rd research stage.

Decision useful accounting information is essential to the equity market as it is vital for accurate equity valuation. An established equity market is an ideal research setting for this study. This study chose U.K. listed companies because not only the U.K.'s equity market is very established, its accounting regime prior to IFRS is considered to be high quality with strong monitoring systems. Existing evidence suggests that IFRS produces more pronounced benefits in such environments (Daske et al., 2008). In addition, the U.K. provides a clean research setting as voluntary adoption of IFRS prior to 2005 is legally not permitted (Lee et al., 2008). This study could also counter argue claims that the accounting regime change would not bring significant effects on the quality of accounting information in the U.K. (e.g. Li, 2010).

Overall, this study chooses to focus on earnings persistence and value relevance of accounting information instead of other accounting information attributes in order to test whether IFRS has produced decision-useful information. Producing decision useful accounting information is the key reason why the IASB focuses more on a balance sheet approach to financial accounting and reporting. However, it may have a cost as it might contribute to the declining informative value of accounting information in reflecting business reality, i.e., reporting for stewardship.

This study differs from prior studies in several aspects. It is the first study to the researcher's knowledge that attempts to link changes in financial reporting approach to changes in earnings attributes and value relevance of accounting information. To be consistent with a balance sheet approach to financial reporting, this study employed a balance sheet based identity model to examine changes in the value relevance of accounting information. This study focuses on the value relevance of intangible assets and various classes of intangible assets in the U.K. Recent studies (e.g. Sahut et al. 2011) only examine the impact of IFRS on the value relevance of two categories of intangible assets; goodwill and other intangible assets. To provide

more robust findings, two other models were used; an informational and a predictive model. In addition, total assets and total liabilities were netted off and both were replaced by net assets. Net assets were further decomposed into net tangible and intangible assets. These steps minimise multicollinearity effects on the test results. In terms of sampling, rather than excluding financial companies, this study provided separate analysis for financial and nonfinancial companies. Hence, the research findings are more representative for U.K. listed companies at large.

1.3. Research Importance and Motivation

More countries are expected to adopt IFRS due to, among other factors, globalisation and access to foreign funds. IFRS will soon become a prominent global set of accounting standards (Negash, 2007). Thus, it is crucial to gather more empirical evidence on the effects of IFRS. New research findings are very useful for post-IFRS implementation reviews (Bruce, 2011) because existing empirical evidence is limited to evidence from the transitional years (e.g. Gjerde et al., 2008; Horton and Serafeim, 2006), to voluntary adopters (e.g. Hung and Subramanyam, 2007) and to multi-countries research setting (e.g. Sahut et al. 2011; Clarkson et al. 2011). The impact of IFRS on financial reporting outcomes are influenced by country-specific factors such as reporting incentives, enforcement, ownership structure, and other market and legal forces (Holthausen, 2009). Therefore, controlling for these factors is crucial to examine the real effects of IFRS on accounting information attributes.

Studying how IFRS affects accounting information attributes, in particular earnings, is very important to both preparers and accounting regulators (e.g. the IASB) because earnings are the most important output of the financial accounting and reporting system (e.g. Graham et al. 2005). Opponents of a balance sheet approach to financial reporting argue that further shift from an income statement approach might cause earnings to be more volatile (Dichev, 2008; Barker 2009). Under a balance sheet approach, earnings are a ‘change in value concept’ (Dichev 2008), and would include more noise, e.g., income from asset revaluations (Barker, 2004). As the IASB Framework endorses ‘clean surplus’ accounting where every income and expense

item is included in the income statement (Cauwenberge and Beelde, 2007), IFRS is expected to cause earnings to be more volatile and less persistant. However, empirical evidence to support this concern has not been presented to date.

In addition, earnings are more useful if they measure changes in economic conditions as measured by cash from operations (Jayaraman, 2007). Cash from operations is also useful to measure the quality of earnings (Barker, 2009). Therefore, if earnings volatility is closely related to cash earnings volatility, earnings are capturing changes in the economic conditions of the companies and are better measurements of the business reality. So far, despite being the most important accounting information, evidence relating to how IFRS improves earnings ability to capture changes in the economic condition of the companies is still limited.

Despite providing a consistent conceptual foundation for the financial reporting, a balance sheet approach is 'not fit to all' types of businesses. Dichev (2008) provides a critical review of this approach and argues that it does not reflect business reality of advancing expenses to generate income as it is more driven by conceptual considerations. Hence, it will likely destroy the forward-looking usefulness of income. On one hand, this approach is appropriate for financial assets and liabilities because these assets and liabilities can be independently valued from the business entity. However, other assets and liabilities (e.g. operating assets, property, plant and equipment) are acquired to be used in the business where their value in use is more appropriate than value in exchange for the revaluation purposes (Barker, 2004; Fox et al., 2003). Intangible assets are even more unique to a particular company and their markets are usually very rare and illiquid (ICAEW, 2009). Therefore, a balance sheet approach is suitable for investment or securities companies but not for other business sectors. In the era of an intangible-based business environment, the adverse impact of this approach on the value relevance of intangible assets might be more severe. For example, an increase in the value relevance of net operating income under IFRS is contributed by changes in accounting rules for intangible assets (Gjerde, et al., 2008). Again, empirical evidence to confirm the magnitude of this effect is still sparse. Thus, investigating how IFRS has affected the indicators of a

balance sheet based approach to financial reporting would provide evidence to evaluate such critics.

Current critics on financial reporting of intangible assets (e.g. ICAEW 2009; Skinner, 2008; Stark, 2008; Lev, 2001) and too much focus on earnings and book value in existing value relevance studies (e.g. Hung & Subramanyam, 2007) is the key motivation to focus on intangible assets and different classes of intangible assets. Accounting for intangible assets remains challenging and their reporting is still insufficient (ICAEW 2009; Stark, 2008; Skinner, 2008; Lev, 2001; Blair and Wallman, 2001). However, this limitation does not lessen their importance in the current business environment. Users are interested to know the current value of a company. Unreported intangible assets can widen up book value and market value gap (ICAEW, 2009). Prior to IFRS, the most common and typical intangible asset on the balance sheet was purchased goodwill. But after IFRS adoption, reporting of other types of intangible assets in the financial statements is gradually increasing. Given the complexities in measuring and hence recognition of these intangible assets, it is critical that the benefits of reporting them exceeds the cost. The net benefits could be documented by an increase in their value relevance.

If this research provides sufficient empirical evidence to prove that IFRS is beneficial to users in the UK in terms of providing higher value relevance accounting information, companies in other countries where equity market is important but local accounting regime is of lesser quality than U.K. GAAP may expect a substantial impact on the value relevance of accounting information, particularly the value relevance of intangible assets.

1.4. Research Objectives and Hypotheses

The general objective of this research is to investigate the impact of IFRS in the U.K. on four areas, namely, the magnitude of earnings and intangible assets, indicators of a balance sheet approach to financial reporting, earnings persistence and value relevance of accounting information and the value relevance of IFRS.

First, this study hypothesises that IFRS would increase earnings, intangible assets and would indicate a further shift towards a valuation approach; increase impairment expenses, decrease accruals and reduce the degree of revenue/expense matching (Chapter 5). Despite many similarities, IFRS and UK GAAP differ in several ways which can affect earnings and the indicators of a valuation approach. For example, goodwill is no longer to be amortised but to be annually tested for impairment. IFRS also provides more detailed guidance pertaining to intangible assets which is very timely as investments in intangible assets are growing. Hence, more types of intangible assets are expected to be reported in the financial statements. However, this study is not able to make a conclusive inference that the trend in reported intangible assets is due to the adoption of IFRS or simply a result of the dynamic change in the business environment.

The second research objective is to test whether the adoption of IFRS has caused earnings to be less persistant but to be a better measure of company's business reality (Chapter 6). This study assumes cash earnings is the best measure of company's business reality (Jayaraman, 2007). Earnings volatility is expected to increase as a result of the fair value orientation of IFRS. For example, more assets and liabilities are subjected to valuations where their carrying values are compared against their recoverable values (lower of fair value or value in use). Any depletion in values is to be written off to the income statement. As fair values are exposed to the market values or to the estimates from valuation models, the carrying values of company's assets and liabilities are expected to be more volatile this will flow through to earnings. Higher earnings volatility is associated with lower earnings persistence (Dichev and Tang, 2009) where lower earnings persistence is less useful to investors. Two time series regression models were employed; a model that regressed current earnings on 1-year lagged earnings (earnings persistence model) (e.g. Dichev and Tang 2009) and a model that regressed earnings volatility on accrued earnings volatility (earnings volatility model) (e.g. Jayaraman, 2007) and cash earnings volatility.

The third research objective is to provide empirical evidence on the value relevance of IFRS and the impact of IFRS on the value relevance of accounting information (Chapter 7 and 8). The Enron case has sparked intense interest in corporate governance and the importance of greater corporate transparency (Gwilliam and Jackson, 2008). The length of annual reports under IFRS has increased which largely contributed by larger amount of disclosures (Li, 2010) as compared to under U.K. GAAP. On one hand, additional disclosures, the incorporation of more fair value rules such as via impairment of goodwill, is more likely to produce balance sheet values which are closely reflecting current values. Hence, IFRS is expected to improve the value relevance of intangible assets. On the other hand, accounting rules under a balance sheet approach and fair value accounting might inject more uncertainties into financial statements (Barth 2006), increasing earnings volatility and consequently reducing the value relevance of accounting information. Thus, this study is crucial in providing evidence that can support whether IFRS adoption is the right direction of future financial reporting for non-adopter countries.

1.5. Research Findings

Research findings are presented in accordance to the research objectives. The first hypothesis purports that earnings and intangible assets are higher under IFRS and IFRS has shifted financial reporting approach further away from a matching approach. Second, IFRS has significantly increased earnings volatility and has reduced earnings persistence but has improved its ability to measure changes in business reality, and third, IFRS has significantly affected the value relevance (including more informational and predictive) of accounting information.

First, based on two indicators of a balance sheet based financial reporting, the test results show that accruals and impairment expenses are not significantly lower and higher respectively during post-IFRS as compared to pre-IFRS period. Therefore, this study suggests that IFRS has not in reality significantly shifted financial reporting approach towards more balance sheet based. However, consistent with existing studies (e.g. Sahut et al., 2011; Gaston et al., 2010; Dunne et al., 2008; Hung

and Subramanyam 2007), earnings are significantly greater after IFRS. In addition, the presentation of different profit lines (operating income, operating income before depreciation and amortisation, earnings before interest and taxes, net income before taxes and preferred dividends and net income) among financial companies has become more standardised. Nevertheless, results for the third indicator supports Dichev (2008) that current expenses have become less matched against current revenue, and more significantly related to future expenses over time, suggesting that determination of earnings has shifted towards a valuation approach in practice. Nevertheless, this finding is only applied nonfinancial companies.

Second, this study finds earnings are significantly greater under IFRS among nonfinancial companies which supports evidence from the first research stage and prior literature (e.g. Hung and Subramanyam, 2007; Stenka 2008; Paananem 2008; Gaston et al. 2010). Greater emphasis on a valuation approach has both advantages and disadvantages. Earnings are higher but include more noise (e.g. gains from supplementary revaluation of assets) and earnings are more difficult to interpret (Barker, 2004). Consequently, an analysis of the company's performance for assessing its future profitability is less effective which would potentially either cause equity mispricing (Richardson, et al., 2005) or declining in users' confidence in the accounting earnings. On the other hand, it would improve earnings ability to measure and report the underlying economic reality.

Finding from this study indicates that earnings during the study period are becoming less persistant which is consistent with the U.S. evidence (Dichev and Tang, 2009; Dichev, 2008). It had declined from 0.65 in the year 1999 to 0.17 in 2008. However, comparing the pre- and post-IFRS results, this study suggests that earnings persistence has generally improved under IFRS for financial sectors. In addition, this study relies on existing studies to infer changes in earnings persistence via earnings volatility i.e. lower (higher) earnings volatility causes earnings to be more (less) persistence (e.g. Dichev and Tang, 2009). Results from the earnings volatility model suggest that earnings are more volatile (less volatile) under IFRS for financial (nonfinancial) companies. On one hand, this evidence corroborated findings from the

earnings persistence model that earnings are more persistent and less volatile under IFRS for nonfinancial companies. On the other hand, the inverse relation between earnings volatility and earnings persistence does not apply to the financial sample where the greater earnings persistence under IFRS is not associated with lower earnings volatility. The fair value rules and a valuation approach have probably caused earnings among financial companies to be more volatile. At the same time, these accounting rules and approach might have caused the remaining earnings to be a better indicator of recurring earnings. IFRS has effectively captured the effects of assets write off during the financial crisis (2007 and 2008) which effects flow through on earnings. This supports Barth and Landsman (2010) that fair value accounting is not to be blamed for the 2007's financial crisis. Instead, these rules are more likely to improve financial reporting transparency.

There are two key sources of earnings volatility; cash earnings volatility and accrued earnings volatility (Dichev and Tang, 2009; Jayaraman, 2007). This study finds that both are significant contributors to earnings volatility. Nevertheless, during post-IFRS, accrued earnings volatility had much greater explanatory power of the earnings volatility among nonfinancial companies. For financial companies, both cash earnings and accrued earnings volatility are equally strong contributors to earnings volatility.

Third, research findings on the value relevance of IFRS and intangible assets are based on three models; a balance sheet identity model, an informational model and a predictive model. Based on the balance sheet identity model, this study finds IFRS, as the disclosed accounting policy, is not value relevant in the U.K. High quality accounting regime prior to IFRS and no major measurement and disclosure based differences between U.K. GAAP and IFRS might explain why U.K. investors do not perceive the international accounting regime to produce significant improvement to the value relevance of financial information. Local accounting standards are probably more appropriate and value relevant to the local business and legal environment (Jermakowicz and Gornik-Tomaszewski, 2006). Similarly, this study suggests that the value relevance of intangible assets is not significantly affected by

the new accounting regime, i.e IFRS (Chalmers et al., 2008). However, several classes of intangible assets such as goodwill was more value relevant under IFRS. This study finds that computer software has significantly greater value relevance than goodwill post-IFRS. Nevertheless, the findings related to different classes of intangible are not applicable to the financial companies due to insufficient number of common time panels.

Results from the informational model suggest that IFRS has a negative relation with changes in market value. This supports findings from the balance sheet identity model that IFRS has added more noise to earnings, causing it to be less informative. This study suggests that earnings are more informative under local GAAP than under international GAAP. However, under IFRS, changes in earnings are more strongly related to changes in market value, suggesting that changes in earnings are more informative in explaining changes in the market of values of equity. This study also finds that changes in intangibles are not significant in explaining variation in market values and suggests that intangible assets are less informative post-IFRS. Investors may find intangible assets less reliable (ICAEW, 2009). This is consistent with the nature of intangible assets which are inherent with subjective measurement and their future benefits are expected to materialise in the longer term (Barth, 2006; Wyatt, 2008). Hence, investors might not be able to foresee the link between current investment in intangible assets on earnings and market value of equity in the short term (in the current year).

Nevertheless, results from the predictive model indicate that IFRS has significantly increased the predictive value of intangible assets. Intangible assets during post-IFRS have greater predictive values relating to predicting 1-year, 2-year and 3-year ahead cash flows from operation for nonfinancial companies. For financial companies, intangible assets under IFRS show greater predictive value only relating to predicting a 1-year ahead cash flows from operations. Its predictive values of beyond 1-year ahead cash flows are lower and insignificant during the post-IFRS. The future cash flows for the financial sector are probably more uncertain, especially during the financial crisis in the year 2007 and 2008. This supports the decision-useful approach

of IFRS as the provision of information under that helps investors to better predict future cash flows (Glautier and Underdown, 2001).

1.6. Research Contributions

This study contributes to at least eight areas.

First, it provides recent empirical evidence on the impact of IFRS on intangible assets and it documents new evidence on how IFRS has affected reporting of different classes of intangible assets, their value relevance, including informational values and predictive values. Existing value relevance studies focus on earnings and book values. Hence, this study provides evidence relating to intangible assets which is currently mixed and is still lacking. In addition, instead of employing one value relevance model, this study differs from prior studies by using two other models (informational and predictive models). Findings from these models provide futher evidence on which primary qualities of relevance as required by accounting regulators are significantly affected by IFRS.

Second, this study also provides empirical evidence on whether IFRS has improved the decision-usefulness of other key financial information such as earnings and net tangible assets and contributes to current debate relating to the main purpose of financial reporting, i.e. reporting for decision-usefulness versus reporting for stewardship.

Third, this study provides empirical evidence on whether a balance sheet approach to financial accounting and reporting reduces some properties of earnings such as matching and earnings persistence. This matter is very important to regain public confidence in financial reports since income or earnings is considered by many as the most important output from the financial reporting system.

Fourth, in terms of research design, this study is different from most of existing value relevance studies where financial companies are not excluded from the sample. It

provides evidence on the impact of IFRS on financial sectors which is still very limited. Findings for both nonfinancial and financial companies are derived from similar methods of investigations and similar data analysis. Thus, these findings represent the impact of IFRS on U.K. listed companies at large.

Fifth, recent studies on the impact of IFRS include multiple countries such European countries and they suggest a positive impact of IFRS on the value relevance of intangible assets in the U.K. (e.g., Sahut et al., 2011). However, interpretation of their research findings is limited to the influence of country-specific characteristics such as legal and business environments. This study complements such studies by utilising a clean research setting in the U.K., i.e., a single country setting, among mandatory adopters and in an established equity market.

Sixth, this study provides evidence relating to the value relevance of IFRS as a disclosed accounting policy which confirms existing evidence from other sources such as surveys and interviews (Jermakowicz and Gornik-Tomaszewski, 2006). Changes in accounting regulation are exclusively related to differences between U.K. GAAP and IFRS during the study period. Furthermore, evidence from this study can be used to counter existing claims that IFRS has not produced any significant impact in the U.K. (see for example, Li, 2010).

Seventh, this study contributes to the literature relating to intangible assets by documenting evidence that specific classification of intangible assets is value relevant. Broadly classified intangible assets such as other intangible assets are not value relevant because investors are unable to link them with their future benefits (Wyatt, 2005). Accounting regulators can improve decision-useful of assets that lack physical attributes such as intangible assets by encouraging companies to provide additional information relating to intangible assets voluntarily.

Last, this study also documents the impact of IFRS on different profit levels and on the presentation of financial reports, namely, the presentation of different profit lines.

1.7. The Structure of the Thesis

This thesis is organised in nine chapters. Chapter 1 introduces the current thesis; research importance and motivation, research objectives, key research findings and the outline of the thesis. Chapter 2 reviews related literature. Chapter 3 provides an overview of the accounting regulation in the UK and key differences with IFRS GAAP. Chapter 4 discusses the general features of the research methodology and methods. Chapter 5 reports research findings for the first research question, i.e. empirical evidence on the impact of IFRS on earnings, intangible assets and indicators of a balance sheet approach to financial reporting. Chapter 6 presents research findings for the second research question, i.e. trends in earnings persistence and the impact of IFRS on earnings persistence and volatility and earnings relation with cash earnings. Chapter 7 reports research findings for the third research objective, i.e. the impact of IFRS on the value relevance of intangible assets and different classes of intangible assets. Chapter 8 presents research findings on the impact of IFRS on the informational and predictive values of intangible assets. Chapter 9 summarises and concludes the study, it also describes the study limitations and provides suggestions for future research.

CHAPTER 2
LITERATURE REVIEW

2.1. Introduction

This chapter reviews related literature and provides general background of the current study. The review is organised in the following manner. Section 2.1 introduces this chapter. Section 2.2 provides an overview of the trends in financial reporting approaches and accounting views on earnings. Section 2.3 reviews existing studies related to reporting of intangible assets. Section 2.4 discusses prior studies related to earnings attributes. Section 2.5 reviews existing value relevance studies, definitions of key terms, related theories and models and evidence on the impact of IFRS on value relevance. Section 2.6 summarises and concludes the chapter.

2.2. Trends in Financial Reporting Approaches

Current financial reporting is still based on mixed approaches; a valuation and a matching approach (Fox et al., 2003). Different regulators and accounting practices may favour a particular approach. For example, the international accounting regime may be more inclined towards a valuation approach. Local accounting regime is likely to better cater for local business needs and local investors' information needs (Jermakowicz and Gornik-Tomaszewski, 2006). Chapter 3 compares and contrasts accounting regime in the U.K. with the international accounting regime. The international accounting regime is more inclined to shift financial reporting approach further towards a valuation approach (Dichev, 2008). Hence, earnings under IFRS are more likely to include more income from revaluation of assets and liabilities as compared to local GAAP.

Theoretically, there are two main financial approaches; a matching approach or a revenue/expense, which is also known as transaction-based or income statement

based approach and a valuation approach or an asset/liability, that is also known as a balance sheet based approach (Fox et al., 2003). Which approach is superior to meet users' information needs has been long debated (Dichev, 2008). However, some argue that IFRS is more balance sheet focus as evidenced by its wider application of fair value accounting (Barker, 2004) and by assuming reporting for stewardship is accomplished via reporting for decision-usefulness (Lennard, 2007). The following paragraphs describe an evolution of financial reporting approaches.

Historically, financial reporting was simply reporting financial position of a business entity to its owners. Before the 20th century, a business was owned by fewer owners who managed its day-to-day operations, a simple statement of financial position or the balance sheet, was an adequate report because the owners could directly obtain information about the business performance (Fox et al, 2003). However, as a business entity grew larger and larger, capital provider groups became bigger and their agents, the managers would manage the business for them. Separation of ownership and management requires both financial position and financial performance reports. The latter report is not only meant to assess the business performance but also as a yardstick to measure the managers' performance. The owners or are now more commonly known as the shareholders, appoint their representatives, the board of directors to monitor and to oversee the management. Therefore, during the 20th century, accounting practitioners reacted to changes in information needs by introducing a matching-based income statement as the primary financial statement and the balance sheet became the repository of unmatched costs (Dichev, 2008; Fox et al, 2003).

Reporting how well the business is managed is becoming more and more important because the growing number of business entities intensifies business competition. Financial reports help the stewards or the management to make right business decisions. Keeping shareholders happy and attracting new fund providers are crucial to the business survival. Therefore, reporting for stewardship is the main purpose of financial reporting at that time. Income, or earnings, the key business performance indicator is determined based on a transaction-based approach. This approach in the

determination of profit or income is also known as the income statement approach (Fox et al., 2003) which is more appropriate for existing accounting practices (ICAEW, 2009).

However, a transaction-based approach which relies heavily on a proper recognition of revenue and matching expenses against the revenue was criticized as enabling income smoothing (Barker, 2004). This issue shapes major arguments in the Solomon Reports which form the underlying basis behind the IASB's Conceptual Framework. Accounting regulators, academics and researchers then shift their focus to an alternative view under the articulated approach in the income determination; a balance sheet-based approach (Dichev, 2008). This approach starts to gain support from the accounting standard setters such as the FASB and the IASB since more than thirty years ago. Income under this approach is implied in the definition of assets and liabilities and is defined as *'increases in the economic benefits during the accounting period in the form of inflows or enhancements of* ***assets*** *or* ***liabilities*** *that results in an increase in equity, other than those relating to contributions from equity participants'* (International GAAP, 2008).

Fox et al. (2003) review existing literature relating to the theoretical bases underlying U.K. accounting standards and international standards. These bases are a matching approach and a valuation approach. A matching approach compares revenue with costs and deducts from the revenue any direct costs incurred to determine income for a particular period. On the other hand, a valuation approach determines income as an increase in the value of a company during an accounting period (Sterling, 1979) and it requires a proper identification and measurement of assets and liabilities (Samuelson, 1996). Based on a simplified scenario under a set of assumptions, Fox et al. (2003) show that U.K. and international accounting standards are based on both a matching approach and a valuation approach. Unless changes in equity under both approaches are constant over time, they argue that partial application of both approaches causes companies to report income with no defined meaning and this income could mislead users who interpret it with a single internal consistent approach. However, since the adoption of a valuation approach in the Statement of

Principles (Accounting Standard Board, 1999), a valuation approach is expected to be more consistently incorporated in UK accounting standards.

A greater emphasis on balance sheet by the accounting standard setters such as the IASB and the FASB, would have a profound effect on earnings properties (Barker, 2004) and a further shift from matching approach would have impaired the value relevance of earnings. Donelson et al. (2011) and Barker (2004) compare feedback and predictive properties of earnings and its components, namely, revenue and expenses, and finds those earnings' components are of higher value to the investors. Since accounting standard setters could not operationalise the concept of extraordinary items under current financial reporting, Barker (2004) proposes an alternative presentation of earnings, a comprehensive income that shows income from the business activities and income from the re-measurements of assets and liabilities. This presentation of financial performance is more useful to users as it facilitates the analysis of a company's financial performance, particularly for users to deal with the measurement subjectivity under the mixed financial reporting model. Furthermore, it can disaggregate the effects of the anticipated problems relating to a balance sheet based model such as practical problems in applying the fair value accounting.

In addition, less emphasis on matching concept under IFRS may reduce accruals and impair matching of expenses against revenue. Previous studies such as Dichev and Tang (2008), find evidence of poorer matching of expenses against revenue for the past 40 years in the U.S. and the same trend is likely to occur in the UK because the FASB to a certain degree has influenced IFRS via collaboration projects. The annual revaluation of assets and charging impairment or assets/liabilities write offs to the income statement and the accounting treatment for goodwill under IFRS are resulted from applying a valuation approach. Goodwill is amortised or immediately written off to the income statement under U.K. GAAP in contrast to the required annual test for impairment under IFRS (Roberts et al., 2008). Chalmers et al., (2008) argue that this change produces a higher incremental value of goodwill in Australia. Gjerde et al. (2008) suggest that impairment of goodwill produces more value relevance of

goodwill in Norway. Another example is accounting treatment for deferred tax. Application of timing differences in IAS 12 are more balance sheet orientated than *FRS 19 Deferred Tax* which uses 'temporary differences' to recognize deferred tax. IAS 12 is also more likely to increase deferred tax liability and the shareholders' equity due to its wider scope and the removal of discounting method (Horton and Serafeim, 2009).

2.3. Financial Accounting and Reporting of Intangible Assets

The current financial accounting and reporting of intangible assets has been criticised as still insufficient in reflecting a new economic model which is more intangible-based (Skinner, 2008). However, existing evidence from the literature to justify a reform of the financial reporting model is still inadequate (ICAEW 2009; Stark, 2008). Accounting and recognition of intangible assets are difficult because they are naturally difficult to measure (Barth, 2006; Barth and Landsman, 1995). Basu and Waymire (2008) critically assess this issue by discussing the nature of intangible assets and its link with socio-cultural worlds to rationalise how intangible assets enable people to achieve their goals. Lev (2001: 9), argues that fundamental changes related to intangible assets have greatly transformed the structure of business organisations and operations. Increase in global competition and changes in information technology shift the relative importance of intangible assets over time (Lev, 2001). However, many practitioners, consultants and regulators view that financial reporting is lagging behind in providing adequate information about intangible assets. Among other reasons, the balance sheet is still regarded as inadequate because it fails to report many types of intangible assets (e.g. Lev, 2001; Blair and Wallman, 2001).

Basu and Waymire (2008) provide three reasons to counter-argue critics on the inadequate level of reported intangible assets under current financial reporting. First, they argue that intangible assets are important even in a simple economy and not only unique to current and emerging economies because they are universal to any human economic interaction. Second, intangible assets are basically interrelated

ideas to generate complementarities and synergies, including ideas which are not exclusively owned by any particular business entity. Hence, valuing an individual idea separately from other related ideas is not feasible. Third, as intangible assets are built on ideas and those ideas are valuable only to the extent that they generate income. Too much focus on reporting the book value of intangible assets in itself will not likely to serve financial statements better than measuring the impact of intangible assets on the income. In a nutshell, Basu and Waymire (2008) argue expensing regime,i.e., expensing any cost related to intangible assets is better than disclosure regime, i.e., reporting the closing values of intangible assets in pursuit of providing decision-useful information to users.

Basu and Waymire (2008) also question the possibility of recognising more intangibles in the balance sheet because the value of intangibles is partially not separable from tangible assets. They argue that valuing intangible on a stand-alone basis is not technically achiveable as it requires heroic assumptions about separability and highly uncertain estimate of ambiguous future benefits and arbitrarily allocations of jointly produced income. In the U.K., companies have been allowed to use fair value accounting to measure identifiable non-goodwill intangible assets in business acquisition since 1980s (SSAP No. 14). After 1998, FRS 10 which replaces SSAP No. 22 removes different accounting treatments for goodwill and other intangible assets by not requiring amortisation on any kind of intangible assets if they have indefinite useful lives.

Unlike Basu and Waymire (2008) who question any positive impact of capitalising intangibles on value relevant of their balance sheet values, Stark (2008) focuses on U.K. evidence and weighs the existing evidence related to policy implication. He summarises the literature into two broad themes; accounting for intangibles and accounting policy implications for recognition and disclosure. Based on the literature, existing reasons to fundamentally amend current recognition practices are not strong enough to call for financial reporting reform (Stark, 2008).

Most discussions of the extant literature on intangibles either take a broad view of intangibles or limiting to the identifiable intangibles (Skinner, 2008). In a broad view, intangibles are those assets of economic value to the companies but lacking physical substance such as value related to human resource such as value of employee training, morale, loyalty, and knowledge, process-related capital such as intangibles related to information technology, and production processes and external relations such as customer satisfaction, customer loyalty, business relationships and other components of brand values. Identifiable assets are defined by accounting standard setters as nonmonetary asset without physical substance where an asset is a resource that is controlled by the entity as a result of past events and from which future economic benefits are expected to flow into the entity (International GAAP, 2008).

Thus, identifiability, control or power to obtain benefits from the asset, future economic benefits such as revenues or reduced future costs, are the three critical recognition criteria for an intangible asset (Ernst & Young, 2008). An intangible asset is identifiable when it is separable or capable of being separated and sold, transferred, licensed, rented, or exchanged, either individually or together with a related contract, or arises from contractual or other legal rights, regardless of whether those rights are transferable or separable from the entity or from other rights and obligations. Intangibles can be acquired by separate purchase, as part of a business combination, by a government grant, by exchange of assets or by self-creation or internally generated. Examples of intangible assets are computer software, patents, copyrights, motion picture films, customer lists, mortgage servicing rights, licenses, import quotas, franchises, customer and supplier relationships, and marketing rights. Examples of intangible assets for financial sectors are customer relationship related to deposit, lending, and asset management operations (Kohlbeck and Warfield., 2007). Their largest sources of intangible assets are usually core deposit, customer relationships, continued access to stable and cheap deposit base (Davies, 2008).

Kohlbeck and Warfield argue that unrecorded intangible assets could affect banks' abnormal earnings and equity valuation in the U.S. Using residual income valuation

model and 1,065 bank-year observations from 1992 to 1998, they find the persistence of bank abnormal earnings and consequently pricing multiples on bank earnings vary with the level of unrecorded intangible assets. Hence, understanding how unrecorded intangible assets are related to earnings persistence is important because of its potential impact on company valuation not only among banking industries but might also apply to other industries (Kohlbeck and Warfield, 2007).

Davison and Skerratt (2009) scrutinise annual reports to document and analyse the overall pattern of the reporting practice structure among major UK companies, including the style and content of how companies convey their intangible assets. They argue that the nature of accounting for intangible assets is very restrictive, preventing companies from recognising their intangible assets in the financial statements. Based on 2003's and 2004's annual reports, they find that companies with high intangible assets use discretionary word and pictures to communicate intangible aspects of their business including brands, history/reputation, customer relationship and product market share. They further reveal that companies with values of intangible assets are more likely to use such stylistic presentation in their annual reports. This study questions the adequacy of current financial reporting for intangibles as its findings indicate that companies are resorting to alternative ways to effectively report their intangibles to the stakeholders.

However, Skinner (2008) who reviews proposals to reform current accounting and disclosure practices related to intangibles agrees with Stark (2008) as he finds little evidence to blame current financial reporting for difficulties in financing innovative and high-technology projects. In addition, he argues that mandating additional disclosure for intangibles is not likely to be successful and expanding existing recognition criteria to include more intangible assets in the balance sheet is problematic. Among other reasons is the different nature and measurement of intangibles across industries. Hence, Skinner (2008) concludes that it is best to rely on private incentive to disclose information related to the management and valuation of intangibles while the regulators provide guidance as to the forms of the disclosures.

Chalmers et al. (2008) provide some evidence on how IFRS affects reported intangible assets. They investigate the impact of mandated IFRS on intangible assets in Australian. The situation in Australia is quite similar to the U.K. where IFRS was first mandated for all listed companies in 2005. Hence, the first financial statements prepared under IFRS provide comparative figures under the Australian accounting standards (AGAAP). In both Australia and the U.K., a drastic change in existing accounting rules is replacing the amortisation regime for goodwill with the impairment regime. This can affect its value relevance as investors differentially value the components of reported goodwill (Henning, 2000). In addition, the move to IFRS reduces or removes to some extent management's discretion to capitalise research and development expenditure (Wyatt, 2005). Using a modified balance sheet valuation model, Chalmers et al. (2008) suggest that goodwill under IFRS incrementally conveys significant useful information to investors. Nevertheless, they could not provide sufficient evidence to conclude that the aggregate identifiable intangible assets under IFRS convey information beyond what is reported under AGAAP.

Recently, Sahut et al. (2011) investigate the impact of IFRS on the value relevance of intangibles in nine European countries (UK, France, Sweden, Italy, Finland, Spain, Norway, Belgium and Luxembourg and Ireland). Their study period was from the year 2002 to 2004 (pre-IFRS) and 2005 to 2007 (post-IFRS) and U.K. companies form the majority of the sample (40.81 % or 757 companies). Based on univariate and multivariate tests, they suggest that total intangible assets were greater under IFRS, including an increase in other intangible assets of 31.01% and net income had increased by 79% in the U.K. For the value relevance test, they study the relation of accounting variables (net income, intangible assets, other intangible assets and goodwill) with share price and share return. Their models produce greater explanatory power for post-IFRS. Reported goodwill is positively and significantly value relevant but is less value relevant under IFRS. However, other intangible assets as well as earnings are more value relevant post-IFRS. They argue that the identified intangible assets are more value relevant than the unidentified intangible assets that

have been transferred into goodwill, except for Italian and Finnish investors. However, the interpretation and generalisation of their study are limited to the implication of comparing IFRS with multiple local GAAP, including code law accounting regimes.

Existing studies (e.g. Sahut et al., 2011) show that earnings are higher under IFRS. However, more evidence is needed to anticipate whether those higher earnings are more decision-usefulness to users. The fair value orientation of IFRS and less emphasis on a matching approach may cause earnings to be more volatile and thus less persistent. Cauwenberge and Beelde (2007) support Barker (2004) who argue that reporting two measures of incomes (net income and comprehensive income) will help users to factor in changes in income from fair value rules. Currently this dual income display is being examined by the IASB in the performance reporting project. Under a current single income display, the usefulness of earnings is measured by changes in earnings attributes such as value relevance, earnings persistence, timeliness, asymmetric timeliness/conservatism, accruals quality, and timely loss recognition (Francis et al., 2004). However, this study focused on earnings persistence and value relevance due to their direct relation with earnings volatility, fair value accounting and usefulness of accounting information to investors.

2.4. Earnings Attributes

Earnings or net income is the most important accounting information for investors to gauge corporate performance (Graham, et al., 2005). Accounting earnings are useful to investors if they indicate recurring profits (Dichev, 2008) and accounting standards are partly responsible to produce relevant accounting information (Holthausen, 2009). This section reviews the relevant literature, in particular extant literature on earnings attributes or properties of earnings.

Using survey and interviews, Graham et al. (2005) find that users of financial reports believe earnings are the most important accounting information, leading managers striving to produce smooth earnings and avoid earnings volatility (Graham et al.,

2005). In literature, earning persistence can be calculated without reference to the share price and returns and thus it possesses construct validity as indicators of financial reporting outcomes. Earnings persistence, predictability and value relevance are attributes of earnings which may lower risk premium and consequently reduce the cost of equity capital (Francis et al., 2004).

Dichev and Tang (2009) investigate the relationship between earnings volatility and earnings persistence to test the utility of previous findings (e.g. Dichev, 2008; Dechow and Ge, 2006; Graham et al., 2005). They document that earnings with low volatility have significantly high persistence and R^2 while high earnings volatility tend to be extreme earnings which revert to mean faster and thus are less persistence. This finding also shows that volatile earnings are more likely to include transitory items such as restructuring and assets write offs. Furthermore, using analysts' forecasts as a proxy for sophisticated users' expectation, they discover that users do not fully understand the implications of earnings volatility for future earnings.

Frankel and Litov (2009) retest Dichev and Tang (2009)'s findings and claim that the link between earnings volatility and earnings persistence is robust to the additional controls (loss companies, size and earnings growth) and to a correction for sampling bias, i.e., increase sample size by estimating earnings volatility using an industry-based measure. However, they argue that earnings volatility does not have predictive power for share returns. Transitory items are also known as special items and for low accrual companies, special items contribute to the low earnings persistence (Dechow and Ge, 2006). Accounting treatments for goodwill under IFRS are inherent with considerable ambiguity and subjectivity because they require numerous assumptions in estimating fair value, value in use and recoverable amounts (Wines et al, 2007) which can cause earnings to be more volatile.

Jermakowitctz et al. (2006) examine the implementation of IFRS by EU companies and their findings indicate that companies anticipate IFRS to increase volatility in financial results. Using fair value as the primary basis of asset/liability measurement will produce more relevant financial results (Whittington, 2008a) but it is expected to

contribute to more volatile accounting information (Jermakowicz and Gornik-Tomaszewski, 2006). However, IFRS can potentially improve the quality of financial reporting by reducing opportunities for income smoothing by managers (Barth et al. 2008). As accounting earnings consist largely of accrued earnings, investors sometimes misunderstood the implication of less reliable accruals on earnings persistence which may lead to significant shares mispricing (Richardson, et al., 2005). Therefore, the effects of changes in accounting regulation on earnings persistence can have serious impact on the market valuation of a company.

Existing studies that investigate possible reasons for smoother or more volatile earnings than cash flows suggest that this scenario may be due to either natural application of accounting rules and conventions, or manager behaviors (e.g. proactive discretionary choices) or both. Jayaraman (2007) investigates whether earnings that are either smoother or more volatile than cash flows provide or garble information to capital market participants. Provide information and garble information is defined by Jayaraman (2007) as 'public disclosures that ameliorates the adverse selection problem by partially or fully revealing to market makers information known by informed traders' and 'stimulate informed judgements among traders who possess public disclosures into private information' respectively. He determines accrued component of earnings volatility (ACEV) by deducting cash earnings volatility from earnings volatility and uses bid-ask spreads and informed trading probability as proxies for informed trading. Negative (positive) ACEV indicates smoother (more volatile) earnings than cash flows. Using large sample U.S. data and multivariate regression with control variables (company size, turnover, illiquidity, and the inverse of stock price), his results reveal that higher levels of informed trading are associated with more negative and positive values of ACEV and the lowest level of informed trading is when ACEV is close to zero.

2.5. Value Relevance Studies

Accounting information is defined to be value relevant if it is associated with equity market values in a predicted manner (Barth, et al., 2001) or significant association

between accounting information and investors' valuation of the company (Wyatt, 2008). This association is normally tested by value relevance studies between the information of interest and share price, share returns or financial ratios (Barth, et al., 2001; Wyatt, 2008). Information is relevant when it has predictive value and confirmatory value (FASB, 2006) and thus, it can affect users' economic decisions (Barth et al., 2001).

Theories in Value Relevance Studies

The relation between accounting information and proxies of capital market effects (share price, share returns, market values, trading volumes etc.) can be explained by existing theories in finance, accounting and economics. Several of these theories are as follows;

Information Asymmetry

Asymmetry refers to any absence of balance or equivalence between two things that are otherwise comparable. Hence, information asymmetric occurs when some people have more information than others. Information asymmetry influences the value relevance of corporate disclosures, either financial or non-financial or both. When information asymmetries occur among investors, it could cause misallocation of resources via adverse selection of investments (Richardson et al., 2005). However, adverse selection can be mitigated by disclosures (Verrechia, 2001).

For example, Platikanova and Nobes (2007) examine changes in bid-ask spread in fifteen European countries to determine if IFRS adoption improves information asymmetry, i.e. increase value relevance of corporate reports. Using 2003 and 2004 as pre-IFRS and 2005 as a post-IFRS period, they analyse bid-ask spreads of 3,907 companies by three different groups; legal origin, earnings management practice and disclosure scores. Information asymmetry scores are one of three components of the bid-ask spread and has been used as a proxy of how much investors are uncertain if their pricing decisions are due to less informative financial information. They find that the marginal effect of the spread size on information asymmetry is stronger for U.K. companies and U.K. companies have the highest information asymmetry

volatility. As the U.K. companies obtain the maximum score for corporate disclosures, this indicates a positive relation between information asymmetry volatility and corporate disclosures (Platikanova and Nobes, 2007).

Other empirical evidence suggests information asymmetry and liquidity proxies are related with companies' disclosures and accounting policies (Healy, 1999; Leuz and Verrecchia, 2000) where disclosures are expected to increase market liquidity, lower the cost of capital and increase a company's value. Moreover, higher reporting quality together with better disclosure will increase the efficiency of allocation of assets (Horton and Serafeim, 2010).

The Efficient Market Hypothesis (EMH)

This theory contends that the arrival of newly available information to the market is instantaneously reflected in the contemporaneous stock price. It comes with three definitions of 'available information'. First, the weak form or random-walk theory that argues prices reflects all information in past prices. Second, the semi-strong form that suggests prices reflects all publicly available information. Third, the strong form of available information implies prices reflect acquirable information. This shows that if the market is efficient, any relevant information disclosed would have been priced by the market (Horton and Serafeim, 2009).

Nevertheless, there is still a lack of connection between theory and accounting (Holthausen and Watts, 2001) to explain changes in share price. Capital market efficiency depends on how fast and accurate the share price to reflect new information (Cotter, 2012). Hence, effective and timely financial reporting plays an important role to ensure that the market share prices reflect the market value of equity.

Theory of Risk

There are two kinds of risks; non-diversifiable risk or market risk and diversifiable risk. Capital Assets Pricing Model (CAPM) offers a manageable approach to relate a required rate of returns to risk (Brealy, et al., 2009). Two key ideas behind this model

are first, investors generally do not like risks and thus demand a higher return to compensate for higher risk and second, the risk that matter to investors is the non-diversifiable risk or risk that investors cannot avoid. The required rate of return on company's shares increases in line with beta, the correlation coefficient between share premium (market returns over risk-free return) and company's required rate of return.

Agency Theory

Agency theory is a very old theory but is still very relevant to the current scenario. This theory argues that when a company is listed, control and ownership are separated. The existence of a company involves many stakeholders such as managers, employees, shareholders and bondholders whose pursuit of self-interest leads to conflict of interest between these parties. In a business context, agency theory rationalises the need for accounting (Lennard, 2007). A risk of self-serving behaviour by management might be controlled among other strategies, by requiring management to provide regular accounts to shareholders. In this case, a financial report is intended for stewardship purpose. However, the IFRS adoption would have affected this role of financial reporting because the IASB has stated 'decision usefulness' as the main objective of the financial reporting instead of stewardship. Dissenting members of this decision point out that focusing solely on decision usefulness might lead to too much emphasis of forecasting future cash flows of companies at the expense of reliability of current financial information (Lennard, 2007).

Reporting Incentive View

IFRS is expected to improve the quality of financial information, in terms of greater transparency and comparability. However, some companies are more committed to adopt IFRS for various reasons such as access to foreign capital and cross-listing. These companies are expected to derive greater benefits from IFRS than other companies with less incentive (Holthausen, 2009). Therefore, IFRS is most likely to produce winners and losers. This view is known as reporting incentive view. It arises from company's own incentive to switch from local GAAP to IFRS.

Under this theory, high quality accounting standards will not guarantee high quality financial reporting. Despite significant influence of high quality accounting standards (IAS, the U.K. and the U.S. GAAP) on accounting standards in four Asian countries, Ball et al. (2003) argue that the financial reporting quality in these countries is not better than under code law countries. The preparers' incentives play a significant contributing factor in the quality of financial reporting. Their financial reporting incentives are in turn influenced by the sources of demand for, and political influence on financial reporting. Companies with less reliance on capital market for funding as opposed to private funding such as bank loans, information asymmetry is addressed more by private communication than public disclosures. As a result, it reduces preparers' incentives for producing high quality financial reporting (e.g. timely loss recognition). Low managers and auditors' incentives would lead to low financial reporting quality (Ball, et al., 2003).

The reporting incentive view helps to explain why some studies show that IFRS has significantly benefited voluntary adopters and investors in the more established capital market. For example, Lee et al. (2008) find that IFRS has reduced the cost of equity capital in the U.K. Other capital market based studies on the benefits of IFRS in the Europe reveal that the benefits are heterogeneous (Christensen, et al., 2009; Hail and Leuz, 2007). Clarkson et al. (2011) who find the value relevance of earnings and book value in common law countries are lower under IFRS and argue that a research design that control different reporting incentives is important to better examine the effect of IFRS on accounting information.

Equity Valuation Models

Generally, these theories are very useful to explain expected relation between share price or market value and accounting information in the equity valuation models. Ohlson (1995) demonstrates that the company's market value can be expressed as a linear function of book value, earnings and other value-relevant information. In the existing literature, three valuation models are very commonly used by the

researchers, namely, the balance sheet or valuation model, the earnings model (return model) and the price model (Ohlson model) (Holthausen, 2001).

Theoretically, earnings are expected to contribute to changes in a company's market value based on three assumptions about the information contained in earnings and share prices (Nichols and Wahlen, 2004); earnings, or financial reports in general, provides new information to capital holders about company's current and future profitability; a company's current and expected future profitability feeds shareholders with information about the company's current and expected future dividends; and, the present value of expected future dividends shall equals share price. Nichols and Wahlen (2004) finalise the above assumptions after replicating and extending three classical studies to provide empirical evidence on how earnings (or accounting information) is related to share prices (and, share returns). Based on these assumptions, financial reporting contains relevant information if it provides investors with information that can change investors' expectations about a company's current and future wealth creation which consequently influence investors' market valuation of its equity. Therefore, to test whether accounting information is value relevant or not, researchers can examine the correlation coefficient between accounting information (e.g. earnings) and share prices (or market values).

Accounting regulators are concerned with achieving consistent accounting treatments for all elements of financial statements, including intangible assets (Skinner, 2008). In an established capital market, financial reporting should help investors evaluate current and future financial well being of the reporting entity (Brealy, et al., 2009). Earnings and book value are two accounting information that have been widely researched and are commonly tested using the Ohlson's or modified Ohlson's models. Empirical evidence indicates that they play an important role in market valuation of companies. Reported book value and liabilities, and the net book value explain 75-80 percent of the variation in market value of equity (Barth et al., 2001). Kallunki and Paakki, (2005) uses both share prices and returns equation models to examine the value relevance of cash flows reported under IFRS as compared to

earnings among 165 companies from 19 European countries. These companies were voluntary adopters of IFRS for the sample period 1998 to 2003. This study finds that changes in cash flows are more value relevant than earnings when both are regressed against share returns but cash flows do not contain incremental information if tested against share prices (Kallunki and Paakki, 2005).

However IFRS may produce different impact for smaller companies. Smaller companies have less business diversity to smooth their earnings. Thus, their earnings are more relevant than those of larger companies. Larger companies have more venues to smooth earnings and investors are more likely to switch to cash flows as their earnings are less useful in indicating permanent earnings (Hodgson and Stevenson-Clarke, 2000). Such findings might also be biased due to country differences (e.g. legal origin, investors' protection, disclosure levels, and earnings management practices). Furthermore, it only provides empirical evidence about reported cash flows under IAS 7 among voluntary adopters of IFRS. So, these findings might not apply to the impact of IFRS among mandatory adopters of IFRS.

2.5.1. Value relevance Studies: Earnings, Book Value and Other Accounting Items

The first empirical evidence that suggests a stock market reacts to new accounting information is by Ball and Brown in 1968. Since then, many capital market studies have investigated how share prices respond to new financial information with price-earnings relation being the most researched subject. Collins et al. (1997) use Ohlson (1995)'s model to investigate changes in the value relevance of earnings and book value over a long period (forty years) in the U.S. Their results contradict many claims that the value relevance of earnings and book values have declined. Instead, their tests show that book value is more value relevance than earnings for companies with negative earnings and with more one-off items (Collins, et al., 1997). In general, negative earnings, one-time items and companies with greater intangible intensity and company size contribute to changes in the value relevance of earnings and book

value. After controlling for these factors, earnings and book values were slightly increasing over the study period (1953 to 1992).

Ali and Hwang (2000) investigate how five country-specific factors (financial system, the involvement of private sectors in standard settings, Continental versus Anglo-Saxon/British Model country, tax rules dominance in accounting rules and external auditing service costs) affect the value relevance of earnings and book value in 16 countries. They find that value relevance is lower in countries with bank-oriented than market-oriented financial system, where private sectors are not involved in the standard setting process, Continental Model countries, tax-financial reporting conformity and where expenditure on external auditor services is lower (Ali and Hwang, 2000). This finding indicates that examining the value relevance of financial information in a single country might produce more credible results as the effects of these country-specific factors are controlled.

Based on evidence in the U.S., value relevance of earnings is declining (Goodwin and Ahmed, 2006) and lack of proper recognition of intangible assets might be one of the contributing factors to the deteriorating value relevance of earnings (Lev and Zarowin, 1999). Reported intangible assets may provide useful information to investors in assessing company's future cash flows and thus, relevant to the market valuation of companies. Goodwin and Ahmed (2006) analyse trends in the value relevance of earnings separately among companies that capitalised (capitalisers) and those that do not capitalise (non-capitalisers) intangible assets. In contrast to the general declining trend, their study indicates that the value relevance of earnings among the capitalisers has increased over time whereas no significant increase among the non-capitalisers.

Landsman (1986) was first to develop and to use a balance sheet based identity model to investigate a relation between pension funds and pension liabilities with the share price. He made a critical comparison between this model and earnings-based model used by previous researchers such as Daley (1982) who used a traditional cross-sectional valuation model. However, his study and the compared studies are

specifically designed to test the value relevance of pension assets and liabilities which at that time were mostly not yet required by the FASB to be reported on the balance sheet. He argues that the balance sheet model has a theoretical benchmark pension coefficient for the pension rights lie fully with the company. Using reported pension assets and liabilities as proxies for market values of pension rights and liabilities utilises on an accounting concept; shareholders' claims over a company or equity refer to residual assets (assets minus liabilities). He argues that reported assets and liabilities are better proxies for market values of assets and liabilities than using reported earnings as a proxy for economic earnings in the earnings based valuation models. His findings are consistent with the theory but the results must be interpret with due care because of econometric issues. However, Landsman (1986) finds that by deflating data using sales rather than one of the independent variables manage to minimise disturbances in the regression model.

For specific intangible asset, Amir et al., (1993) suggest that goodwill capitalisation is value relevant. In addition, goodwill impairment tests can provide capital market with more informative information on the management's reflection of the previous acquisition of businesses (Murdoch, 2011). Hayn and Hughes (2006) reveal that related information in the notes to the accounts is not adequate to gauge future values of goodwill. The goodwill write-offs or impairment is more likely to give investors sufficient information to predict future impairments of goodwill as it complements other disclosures in the notes to the accounts (Hayn and Hughes, 2006). Other studies support this view that information in the disclosures and not being recognised in the financial statements may not be fully valued by the market (Goodwin & Ahmed, 2006).

2.5.2. IFRS and Value Relevance Studies

IFRS serves to improve the functioning of global capital markets by providing decision-useful information (Barth, 2008). Thus, it is very important to gather more empirical evidence for preparers, regulators and investors to gain insights whether IFRS is a value relevance accounting regime. Existing studies investigate how

voluntary adoption of IFRS affects accounting information properties (Barth, et al., 2008; Christensen, et al., 2009; Lee, et al., 2008), lower the cost of equity capital (Lee et al., 2008), and affect the value relevance of accounting information (Horton and Serafeim, 2010; Hung and Subramanyam, 2007; Sahut, et al., 2011). In value relevance studies which use multiple regressions model, the residuals generated by the model represent investors' reliance on other information. Other information covers other accounting variables and other sources of information such as market wide and industry wide information (Bissessur and Hodgson, 2012). To substantiate empirical evidence gathered from the value relevance model, a separate test is taken to determine how IFRS has affected investors' reliance on market wide and industry wide information. A pioneer work which investigates the impact of IFRS on investors' reliance of such sources of information was undertaken by Bissessur and Hodgson (2012).

Empirical studies on whether IFRS improves the value relevance of accounting information in the Europe can be grouped under a few themes; law group (code-law countries, common law countries or comparison between code-law and common law countries), adopting basis (voluntary or mandatory) and research designs (quantitative methods, informational contents, event study, qualitative methods) and specific accounting items. Researchers who chose to study the impact of IFRS in code-law countries rely on higher differences between domestic accounting standards and IFRS where they anticipate much greater impact. However, their findings are mixed. Some studies do not find significant differences in the value relevance of accounting information such as earnings and book value of equity. In preliminary study, Kousenidis et al. (2010) argue that IFRS causes offsetting effects on the incremental content of book values of equity (decrease) and earnings (increase) in Greece. Gaston et al. (2010) compare the effects of IFRS on accounting numbers among first time adopters between Spain and the U.K. and find greater impact in the U.K. (common law country). In addition, they suggest that IFRS has a negative effect on the relevance of financial reporting in Spain but no significant impact in the U.K. Clarkson et al. (2011) examine the effects of IFRS on the value relevance of earnings and book value in three common law countries (the U.K., Ireland and Australia) and

twelve code law countries. They argue that the value relevance of earnings and book value decrease (increase) in common law countries (code law countries) but the impact is moderated by the non-linear variable (EPS * BVPS). Gjerde et al. (2008) examine the value relevance of financial statements under IFRS and find little evidence to suggest that IFRS increase the value relevance in Norway. They suggest that the impact of IFRS on the value relevance of the reconciliation adjustments is very marginal and is contributed by increased relevance of balance sheet and the normalised net operating profit[3]. However, finding from Clarkson et al. (2011) and Gjerde et al. (2008) are only limited to the 2004's fiscal year as they are based on the impact of IFRS on 2004's accounting information. Such finding may or may not prevail under longer time horizon which can only be provided by new studies with longer study periods.

Lantto (2007) conducts three surveys for financial analysts, managers and auditors in a code-law country (Finland) and investigates users' perception towards the impact of IFRS on the relevance and reliability of financial information. Measures of relevance and reliability are based on the IASB framework and respondents were required to answer 96 questions about the use and usefulness of financial statement analysis. All questions were closed-end questions and in 5-point Likert scale (degree of agree and disagree). This study finds that users perceive IFRS to produce greater value relevance information. However, positive perceptions towards the usefulness of information under IFRS among the respondents had not assisted them to reach a consensus on whether IFRS makes information more reliable (Lantto, 2007). Using surveys are useful to gain insights into users' perceptions of the impact of IFRS on the usefulness of accounting information but personal biases may cause the results to be misleading.

ElBakry (2010) compares the impact of IFRS on the value relevance of share performance and financial indicators of companies in Germany and the UK. He explores the impact of IFRS during an eight year period (2000 to 2007) on share

[3] Increase in the value relevance of normalised (deflated by opening share price) net operating profit is contributed by intangible-intensive companies (Gjerde et al., 2008). Norway is a mixed system country (a combination of both common law and civil law system).

prices, share trading volume and financial ratios, using multiple regression models (Ohlson and modified Ohlson models for value relevance), univariate and multivariate technique based on ANOVA tests (financial ratios) and (different logistic models changes in pattern of trading volume for pre and post-IFRS), he finds that IFRS has increased value relevance, financial ratios and shares trading volume in both countries with higher impact on relative value relevance in the UK, but higher impact on financial ratios and share trading volume in Germany.

Kontopolous et al. (2010) use a pre and post research design to examine the value relevance of accounting information during the transition to IFRS. Using 50 listed companies for each country (the U.K and the Netherlands – investor oriented accounting systems; Germany and France – creditor oriented accounting system), and Ohlson (1995) model, with dummy variables to control for negative earnings, they find that in overall, value relevance of accounting information has increased but the magnitude of changes differs by country. Value relevance of earnings and book value in the U.K has increased where the adjusted R^2 is 0.48 in 2003 to 0.613 in 2006 and significant at 5%. They also find that the incremental value relevance of earnings outperformed book value. However, after excluding outliers, earnings tend to have stable but lower value relevance and a clear trend towards the higher value relevance of book value (Kontopoulos, et al., 2010). Dunne et al. (2008) study the implementation of IFRS in the U.K. Italy and Ireland by contents analysis, analysis of the IFRS reconciliation statements and interviews and find that accounting rules[4] under IFRS has increased earnings and reduced book value of equity.

2.5.3. IFRS and the Value Relevance Studies: Specific International Accounting Standards

A few of prior value relevance studies focus on specific accounting items such as brands, goodwill, research and development. Kallapur and Kwan (2004) examine the

[4] Accounting standards that increase earnings are IFRS 3 Business Combination, IAS 10 Events after the Balance Sheet Date, IAS 38 Intangible Assets and IAS 40 Investment Properties and these IFRSs reduce earnings (IAS 12 Income Taxes, IFRS 2 Share-based Payment and IAS 39 Financial Instruments.

value relevance and reliability of brand assets recognised by U.K. companies. By regressing market values on brand assets by Ohlson (1995)'s model, they find that recognised brand assets of 33 brand-capitalising companies during 1984 to 1998 are value relevance. Examples of other items are goodwill, preference shares, financial instruments and development costs. These studies aim at investigating direct effects of adopting specific IFRS as well as its indirect effects. The indirect effects of IFRS are normally viewed as the economic consequences of IFRS. The economic consequences are defined by Zeff (1978, p. 56) as *'the impact of accounting reports on the decision-making behaviours of business, government, unions, investors and creditors'*. The focal point of this definition is that financial reports influence the actual decisions made by investors and other market players and not merely reflective of their decisions (Jong, et al., 2006).

Jong et al. (2006) study the impact of IAS 32 on preference shares in the Netherlands. Although, approximately 84% of company with preference shares in the Europe are British companies, they decide to study Netherlands' companies because IAS 32 does not change the classification of preference shares in the UK. British companies have discretion over dividend payment for preference shares and thus the shares still qualify to be classified as equity. However, companies in the Netherlands do not have such discretion and IAS 32 will force them to reclassify preference shares as liabilities. This change is expected to increase debt ratio, which is unfavourable to the companies for contracting purposes. They examine 2004's financial reports of 34 companies with preference shares, including 5 financial companies.

Their findings cover beyond the direct impact on the reported preference shares. They conclude that IAS 32 has on average increased debt ratio by 35%. The economic consequences of IAS 32 are 71% of the affected companies either buy back their preference shares or alter the specification of their preference shares so that the preference shares can still be classified as equity. In addition, IFRS has affected companies' real capital structure where companies reduce financial instrument that would have been added to companies' capital structure adversity.

Despite being limited by a small sample, Jong et al. (2009) study is a good example of how a particular international accounting standard has changed the behaviour of managers.

2.5.4. Other Research Designs in the Value Relevance Studies

The impact of IFRS can be examined by conducting a pre- and post-IFRS study (Armstrong, et al., 2008; Dargenidou and McLeay, 2010; Sahut, et al., 2011). Dargenidou and McLeay (2010) assess the impact of introducing future estimates into the financial reports on international comparability by examining the variation of earnings expectations across countries in the Europe. They argue that mandatory adoption of IFRS provides more relevant and timelier information in reflecting current economic conditions and up-to-date expectations of the future. Consequently, it helps users to better estimate future earnings. Using Penman (2007)'s analysis of the impact of the measurement basis on valuations, they argue that there is a 'cancelling balance sheet error' in that if the price of equity equals the book value of equity, earnings will equal stock return.

To test whether the country-specific coefficients are jointly different from zero, Dargenidou and McLeay (2010) regress earnings forecasts on market value changes and year, industry and jurisdictions or country's dummy variables as the control variables in fourteen (14) long-standing EU member states. They run the regression on three periods, 2000-2001 as a pre-IFRS, 2002-2003 as a transition and 2005-2006 as a post-IFRS period. However, using 2002-2003 as transition period is referring to preparers and users' perception of IFRS because IFRS become mandatory in 2002 but not yet applied by the companies until 1 January 2005. Dargenidou and McLeay rely on an assumption that companies were slowly embracing IFRS by including more future estimates and by increasing disclosures in their financial reports. However, they study the impact of IFRS based on the users' perspective and not the preparers' perspective. This research design is based on Amstrong et al. (2010)'s findings.

Amstrong et al. (2010) find that investors follow the development in accounting standard setting during this transition period and are positive towards events that increased the likelihood of IFRS adoption and negative towards opposing events. Their descriptive results indicate that the change in company value or the current year share price scaled by opening share price minus one for UK companies, was negative (-0.0980) during the pre-IFRS, positive (0.1412) during the transition period and higher positive (0.3849) during post-IFRS. They conclude that based on early evidence of the mandatory implementation of IFRS, efforts taken towards providing more value relevant and timely information have led to more comparable earnings expectations.

Among other factors, the positive effects on value relevance and comparability of financial reports can explain why IFRS could reduce the cost of equity capital (e.g. Daske et al. 2008; Lee et al. 2008; Li 2010). Li (2010) investigates the impact of both voluntary and mandatory IFRS on the cost of equity capital in 1,084 companies from 18 European countries (1995 to 2006). Using multivariate analysis and following Daske et al. (2008), this study finds that mandatory adopters experience significantly lower cost of equity capital than the voluntary adopters. However, this impact is only present in countries with strong legal enforcement. This study shows that increased disclosure and enhanced information comparability are among the key factors which contribute to the reduction in the cost of equity capital.

Exclusion of Financial Sector

Most of prior studies exclude financial companies from their sample due to their different nature of assets and liabilities and these companies are subject to additional regulation (Clarkson et al., 2011; Iatridis, 2010; Gaston et al., 2010; Kontopolous et al. 2010). Investing and acquiring intangible assets might not be very attractive to financial companies such as banks where intangible assets are not considered as part of their capital. Banking regulator views intangible assets are the least useful assets during financial distress (Davies, et al., 2007). Hence, capitalisation of intangible assets may be not as important as capitalisation of tangible assets for the financial

sector. However, IFRS is compulsory for all listed companies across industry. Therefore, empirical evidence from this sector is also vital to determine whether IFRS is beneficial to investors across sectors. Such evidence is also crucial for a fairer debate on the role of current financial reporting in the financial crisis. Barth and Landsman (2010) provide a detailed analysis of this role for the banking sector to counter-argue critics that fair value accounting is partly to be blamed for the crisis. They the impact of fair value rules in financial reporting regulation for three key areas namely, asset securitisation, derivatives and loan provisioning. Focusing on fair values, they conclude that fair value accounting plays little or no role in contributing to the pro-cyclical drop in the value of bank assets and share prices during the Financial Crisis.

As empirical evidence on the impact of IFRS among financial sectors is urgently in demand but is very often ignored by existing literature, this study chose not to exclude financial companies. Nevertheless, this study agrees with other literature that assets and liabilities of financial companies are not comparable to nonfinancial companies. This issue is addressed in this study by treating financial companies and nonfinancial companies as separate samples where the data analysis and findings are reported separately.

2.6. Summary and Conclusions

Existing literature shows that financial reporting has evolved over time from being based purely on reporting financial position to more emphasis on a transaction based, and currently is following a mixed-based model. A mixed model does not provide a consistent conceptual basis (Barker, 2004). Hence, accounting regulators, particularly the IASB intends to place greater emphasis on a balance sheet approach. However, this shift might produce an unfavourable impact on the quality of financial information. Existing studies suggest that a balance sheet approach dominates current financial reporting, particularly in the U.S. (Dichev, 2008) and it may cause earnings to be more volatile and less persistent (Dichev and Tang, 2008). As IFRS is much

influenced by the U.S. accounting regulation, a similar trend is expected to occur in the U.K.

However, U.K. GAAP is viewed by many as a high quality accounting regime (Haller, 2002). Many doubt IFRS will improve the quality of financial information in the U.K. For earnings, earnings quality can be measured by its attributes. As mentioned earlier, existing literature suggests that IFRS is expected to increase earnings (e.g., Sahut et al., 2011 and Dunne et al., 2008) but can cause earnings to be more volatile (Dichev, 2008; Jermakowitctz and Gornick-Tomaszewski, 2006). Earnings volatility is inversely related to earnings persistence (Frankel and Litov, 2009). Higher earnings persistence is more useful to investors in predicting a company's future cash flows. Prior studies focus on the implementation effects of IFRS on the magnitude of earnings which mostly based on the early evidence. Despite concerns that IFRS contributes to more volatile earnings, empirical evidence on how IFRS has affected earnings persistence in the U.K. is still not yet available.

The usefulness of accounting information can be measured via its relation with proxies of investors' economic decisions such as share prices, share returns and market values. However, existing value relevance studies tend to focus on earnings and book value of equity and excluding financial companies. Despite evidence suggesting intangible assets contribution towards the value relevance of earnings and book value, very few studies focus on intangible assets. Furthermore, most existing studies on intangible assets focus on goodwill and R&D (Stark, 2008). Moreover, current findings on how IFRS has affected the value relevance of intangible assets are mixed and contradicting; more value relevance (e.g. Sahut et al., 2011) but no significant impact on their value relevance (e.g. Chalmers et al. 2008). This study attempts to address these research issues by providing empirical evidence on whether IFRS has further shifted financial reporting towards more valuation based, has increased different levels of earnings and earnings volatility (reduced earnings persistence), has improved intangible assets reporting and their value relevance across sectors. In addition, it would also examine the impact of IFRS on the two key properties of relevance information, namely the informational and predictive values.

CHAPTER 3
ACCOUNTING REGULATION IN THE UK

3.1. Introduction

Accounting regulation is essential to ensure financial reports convey reliable accounting information and business entity is reasonably accountable to its stakeholders or users (Cotter, 2012). Misleading information can cause users to make poor economic decisions (Meville, 2011). Accounting regulation assures users that the preparers of financial reports do not manipulate the information to their needs and advantages (Dunn, 2010). However, accounting regulation cannot guarantee that such manipulation is totally prevented because it is impossible for the standard-setters, i.e. the regulators, to foresee every possible misleading or distorting accounting treatment. Nevertheless, accounting regulators strive to improve accounting rules and regulation in pursuit of better accounting practices and high quality financial reporting. Accounting regulation might change over time, due to among other factors, changes in legislation (e.g. EU regulation). Such changes are in the right direction if they improve accounting practices and the value relevance of financial reports.

This chapter provides an overview of the U.K. and international accounting regulations and key differences between U.K. GAAP and IFRS. It is organised into five sections. Section 3.1 introduces the chapter; Section 3.2 describes accounting regulation in the U.K.; Section 3.3 explains the international accounting regulation; Section 3.4 explains the regulation relating to the financial sector; Section 3.5 compares IFRS with U.K. GAAP relating to accounting for intangible assets and fair value rules, and Section 3.6 summarises and concludes the chapter.

3.2. Accounting Regulation in the UK

There are three sources of accounting regulation in the U.K.; company law, accounting standards and listing regulations (Finningham, 2010). This section will focus on the accounting standards. The Accounting Standard Steering Committee (ASSC) was responsible for the first set of mandatory accounting requirements. Its establishment in 1970 by the Institute of Chartered Accountants in England and Wales (ICAEW) was triggered by the GEC's (General Electric Company) takeover scandal of AEI (Amalgamated Electrical Industries) in 1967. Later, the Consultative Committee of Accounting Bodies (CCAB) joined the ASSC. The CCAB represents six main accounting bodies[5] in the UK. In 1976, the ASSC became the Accounting Standards Committee (ASC) which was effectively jointly owned by its members. The ASC's main role was to publish the Statements of Standard Accounting Practice (SSAPs) which attempted to standardise various accounting practices for a specific area. The committee had issued thirty accounting standards, both new and revised standards. However, being collectively owned by six accounting bodies hindered its fast response to an accounting issue because each SSAP must be accepted by all members before it could be formally published. Nevertheless, the ASC did contribute to early development of accounting regulation in the UK.

To provide more autonomous and better funded body for the accounting regulator, in 1990, the UK has established an independent entity, the Financial Reporting Council (FRC). Figure 1 depicts the structure of U.K.'s accounting standard settings. The Accounting Standard Board continues the ASC's function to issue accounting standards, which are known as the Financial Reporting Standard (FRS). The ASB reviews and revises some of the SSAPs. Several FRSs replaced SSAPs and the remaining FRSs are accounting standards for new topics. The ASB's fundamental aims are *'supporting investor, market and public confidence in the financial and governance stewardship of listed and other entities by pursuing its own aims of*

[5] The accounting professional bodies are the Institute of Chartered Accountants in England and Wales (ICAEW), the Institute Chartered Accountants in Scotland (ICAS), the Institute of Chartered Accountants in Ireland (ICAI), the Chartered Institute of Management Accountants (CIMA), the Association of Chartered Certified Accountants (ACCA), and the Chartered Institute of Public Finance and Accountancy (CIPFA).

establishing and improving standards of financial accounting and reporting, for the benefit of users, preparers, and auditors of financial information' http://www.frc.org.uk/asb/about/aims.cfm.

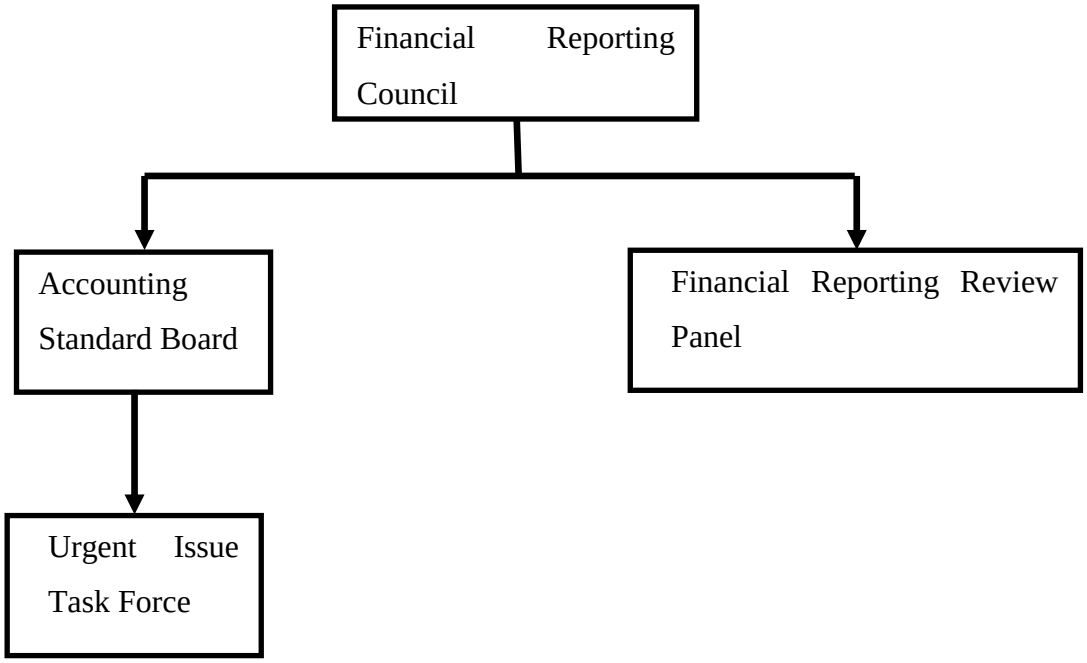

Figure 1: The Structure of Accounting Standard Settings in the UK

Source: Roberts, et al. (2008). *International Corporate Reporting: a comparative approach* (4th Ed.).

Before a specific FRS is formally issued, it is issued in the form of the Urgent Issue Task Force (UITF) Abstract to ensure any loophole or accounting problem is immediately tackled by the board. By giving rapid response to comments, feedbacks and suggestions from members and the public, the UITF prevents the proliferations of unsatisfactory or conflicting interpretations of law or accounting standards (Dunn, 2010). Furthermore, unlike the ASC, the ASB has an authority to issue new accounting standards without a need to get approval from any other professional body which speed up an issuance of new standards. To complete the accounting regulation process, the Financial Reporting Review Panel (FRRP) is authorised in the enforcement of the accounting rules and regulation by legally dealing with any erring

companies and to decide on an appropriate course of action in the case of a valid complaint.

The international accounting regulation is much influenced by the accounting regulation in the U.S. (the Financial Accounting Standard Board, or the FASB) (Cauwenberge and Beelde, 2007) but it may also share common features with the U.K. accounting regulation. The next section describes its structure and accounting standard setting process.

3.3. International Accounting Regulation

The International Accounting Standard Board is responsible to issue international financial reporting standards (IFRSs). The board was established in 2001, a full-time professional board and is designed to be an independent world standard-setter (Whittington, 2008b). It is a successor to the International Accounting Standard Committee (the IASC). The structure of the international standard setting process is illustrated by Figure 2.

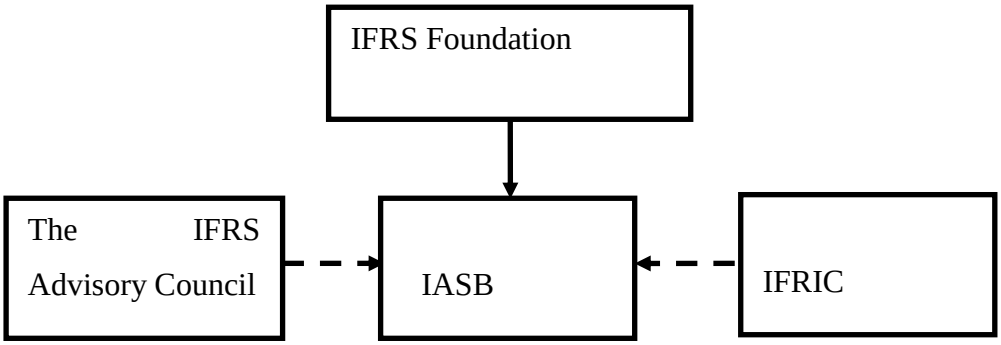

Figure 2: The Structure of the International Standard-Setting Process

The IASB is responsible to the trustees of the IASC (or IFRS) Foundation to issue and publish accounting standards for the global community. Its goal is to *'provide the world's integrating capital markets with a common language for financial reporting'*. The IASB has stated that the board main objective is '*to develop a single*

set of high quality, understandable, enforceable and globally accepted financial reporting standards based upon clearly articulated principles' (GAAP, 2008).

The Standard (or IFRS) Advisory Council provides a platform for interested organisations and individuals to participate in the standard setting process. The council members are very diverse and widespread who can offer suggestions and strategic directions that the IASB might consider. The IFRIC (or IFRS Interpretations Committee), deals with the interpretations of the international standards and to provide timely guidance on accounting matters which are not directly addressed in the standards (Melville, 2011).

International accounting standards (IASs) refer to those issued by the IASC whereas the international financial reporting standards (IFRSs) are issued by the IASB. Two years after the establishment of the IASB, the EU has mandated these international accounting standards for consolidated financial statements in the European countries effectively from 1 January 2005 (EC Regulation, 2002). U.K. companies can choose to apply IFRS for their individual financial statements (Dunne, et al., 2008). In 2006, the IASB took several steps to minimise the cost of adopting IFRS, including by allowing one year from the date of publication a wholly new IFRS or major amendments to existing IFRS. In addition, the IASB decides not to make new IFRS effective before 2008, that is applications of new IFRSs will not be effective until 1 July 2009 (Rodgers, 2007).

The IASB and the ASB may share many common features such as both are to serve the capital market participants. However, having heavily involved with the FASB since its initial establishment, the IASB and the ASB may differ in several aspects. Many argue that U.K. GAAP do not differ much from the international accounting standards (Li, 2010). The similarities in the two accounting regimes might be due to similarities in the standard setting structure and process. The role of the FRC is equivalent to the International Accounting Standard Committee (IASC) Foundation and the counterparts of the ASB and UITF are the International Accounting Standard Board (IASB) and the International Financial Reporting Interpretations Committee

(IFRIC) respectively. However, the international standard setting structure has a forum which is provided by the Standards Advisory Council (SAC) for individuals and representatives of organisations to provide input and advice to the IASB (refer Figure 2). The ASB continues to collaborate with the IASB to actively participate in the development of the international accounting standards and to ensure the development of international standards is considered in the development of UK accounting standards (www.frc.org.uk).

In addition, the IASB might be better fitted for a country where the capital market regulator (e.g. the Securities Exchange Commission in the U.S.) is having legal authority to enforce accounting rules and regulation (Whittington, 2008). Although, similar to the U.S., the U.K. is also considered as a common law country, such matter is regulated under the company law in the U.K. which explain why reporting for stewardship and proprietary perspective are crucial to its financial reporting regulation.

Under the proprietary perspective, existing shareholders have special information needs as compared to being at par with other users, in particular investors under the entity perspective (Whittington, 2008). Differences between the IASB's and the ASB's conceptual frameworks, such as reporting for decision-usefulness as the general purpose of financial reporting and the deletion of reliability as one of the required qualitative characteristics of financial information can affect the quality of financial information in the U.K.

3.4. Additional Regulation for Financial Sectors

While the role of financial reporting regulators such as the ASB and the IASB mentioned earlier is to provide information that is useful to present and potential investors, creditors and other stakeholders in making investment decisions, credit, and allocating resource decisions, financial sectors are subjected to additional regulation. For example, the banking regulator is mainly concerned with prudential objectives. In other words, banking regulation is intended primarily to reduce the risk

level to which creditors and depositors of banks are exposed to and to mitigate systemic financial risks (Barth and Landsman, 2010).

Banks are also subjected to additional disclosure requirements as compared to nonfinancial companies. The bank regulators may decide to use banks' financial reports but are not limited to this information source. International accounting standards for financial assets and liabilities such as *IAS 32 Financial Instruments: Disclosure and Presentation* which was replaced by the IFRS 7 in 2007 and *IAS 39 Financial Instruments: Recognition and Measurements* are directly affecting banks' financial reports. These accounting standards require banks to value financial assets and liabilities at fair values and to charge any changes in these fair values to the income statements which can increase earnings and earnings volatility. The IASB defines fair value as the price that would be received (paid) to sell an asset or transfer a liability in an orderly transaction between knowledgeable market participants at the measurement date (IAS 39). Although, part of these accounting standards has been carved out by the European Union (Schipper, 2005), the impact of IFRS on their reported accounting information and value relevance to investors are also crucial.

3.5. Differences between UK GAAP and IFRS

U.K. GAAP is more conservative than IFRS (Whittington, 2008). The guiding principles for the accounting standard setting are stated in the conceptual framework. A conceptual framework for financial reporting is supposedly to be a theory of accounting against which practical problems can be tested objectively (International GAAP, 2007, page 88). It describes the accounting model that the board uses as the conceptual basis for the accounting standards. Principles in the conceptual framework or statement of principles are translated into detailed rules within a particular accounting standard. These principles can also provide a strategic basis to move towards a specific type of measurement basis such as the current policy of the IASB relating to the use of fair values. Therefore, before discussing the differences between the two accounting regimes, UK GAAP and IFRS, it is worth to discuss differences between their conceptual frameworks.

Conceptual Frameworks

The Financial Accounting Standard Board (FASB) was the first accounting standard board that developed a conceptual framework, much of its contents were adapted from the True blood Report in the 1970s, organised in seven statement concepts. The FASB defines a conceptual framework as *'... a coherent system of interrelated objectives and fundamentals that can lead to consistent standards and that prescribes the nature, function and limits of financial accounting and financial statements'* (Roberts, et al., 2008). It is a body of theory that underpins the preparation of accounting standards (Cotter, 2012). The IASB conceptual framework was issued much later in 1989 which was based on the FASB's first six concept statements. However, the FASB's framework is more voluminous and detailed. The IASB's framework is divided into seven major sections.

In 2004, the IASB and the FASB collaborated to develop a single conceptual framework to replace the 1989's framework issued by the IASB (Benston, et al., 2007). One of the eight phases (Phase A to H, refer the Appendix 1) was completed and was published by the IASB in 2010. A few issues from this section relates to the current thesis. The omission of stewardship from the primary objective of the financial reporting in the conceptual framework can cause significant impact on the perceived usefulness of financial statements. U.K. GAAP focuses more on reporting for stewardship but IFRS is more geared towards valuation (Paananem, 2008). The board has decided that a primary objective of general purpose financial reporting is to provide financial information useful to existing and potential investors and lenders and other creditors for making decisions. The IASB assumes that this objective can also meet the objective of reporting for stewardship.

Stewardship is defined as *'the careful and responsible management of something entrusted to one's care'* (Cotter, 2012) and has been central to financial reporting purpose. Dissenting IASB's members argue that stewardship is at the heart of the financial reporting process in many jurisdictions. Stewardship has a strong link with

corporate reporting (Whittington, 2008) and implies accountability to the wider stakeholders (tax authorities, employees and others), beyond the existing shareholders (Lennard, 2007). Thus, its direct omission from the objectives of the financial reporting can cause significant impact in some countries (Whittington, 2008).

In the U.K. the statement of principles is published in the ASB (1999)'s *'Statement of Principles for Financial Reporting'* with inputs from the Corporate Report[6] (1975), the ICAS (1988)'s *'Making Corporate Reports Valuable'*, and Solomons (1989)'s *'Guidelines for Financial Reporting Standards'*. However, realising the importance of convergence towards a set of globally accepted standard, the ASB also develops the statement of principles based on the International Accounting Standards Committees' *'Framework for the Preparation and Presentation of Financial Statements'*. Therefore, the UK's conceptual framework is also influenced by the international conceptual framework. As a result, IFRS and U.K. GAAP share many similarities except for several inconsistencies.

Accounting Standards

Many countries benefit from adopting IFRS because of its greater disclosure requirements than domestic accounting standards such as in the code law countries. However, Li (2010) argues that IFRS does not pose any substantial new disclosure requirements in the U.K. For measurement, Li (2010) identifies fifteen inconsistencies between UK standards and IFRS without giving details of those inconsistencies. The number of differences was greater prior to 2010. For example, there are thirty-six divergences from IFRS/IAS in the 2001's U.K. GAAP (Ding et al., 2007). These differences are expected to be less over time as UK accounting standards are continuously being harmonised with IFRS. For example, the ASB has issued new standards to replace 'old' UK accounting standards (e.g. FRS 22 *Earnings per Share*) or provide direct equivalent standards (e.g. FRS 20 *share based payment*) that basically mirror the respective international standards. However, some

[6]fundamental aims of published financial reports and the means to achieve these aims.

measurement based differences still exist. The following paragraphs summarise measurement based differences relating to intangible assets.

Although this study does not aim at evaluating specific accounting standards, it is important to discuss these inconsistencies in order to predict the impact of IFRS in the UK. Differences in the disclosures and presentation requirements exist in accounting standards for a cash flow statement, income taxes, accounting for leases and segmental reporting whereas differences in measurement can be found in accounting for intangibles, asset impairment, investment properties, and tangible non-current assets (ElBakry, 2010; Stenka, 2008). Other international standards that might be problematic for U.K. companies are *IAS 39 Financial Instruments: Recognition and Measurement* (Dunne, 2003), *IAS 19 Employee Benefits* (Cairns, 2004), *IFRS 2 Share-based Payment* (Jermakowicz and Gornik-Tomaszewski, 2006), and *IAS 12 Income Taxes* (Finningham, 2010). Accounting for Deferred Tax under FRS 19 is based on an income statement or a matching approach and less of a fair value approach (Alexander and Britton, 2004). However, this study focuses on differences in accounting for intangible assets and impairment of assets.

Standardising accounting treatments for intangible assets is challenging (Basu and Waymire, 2008). Both the ASB and the IASB have their own preference on financial accounting and reporting concepts and terminologies. For example, *IAS 38 Intangible Assets* views intangible assets as identifiable when it is capable of being sold separately or arises from contractual or other legal rights whereas in *FRS 10 Goodwill and Intangible Assets*, they are identifiable if they are capable of being disposed of separately from the business. In SSAP 13, the predecessor of FRS 10, research and development expenditures (R&D) are mostly expensed off, with an option to capitalise and subsequently to amortise it over its useful lives. Companies are also required to disclose research and development expense and capitalised in the footnotes of their financial statements. However, no such disclosure is required for expenditure on advertising and capital development of human resource. IFRS is considered stricter in accounting for development costs as unlike FRS 10, IAS 38 requires compulsory capitalisation of development costs that meet the recognition

criteria (Dedman et al, 2009; Wyatt 2008). However, IFRS's interpretation of research and development is conceptually broader than UK GAAP where only pure and 'applied' research is expense off (Horton and Serafeim, 2006).

In the U.K., the majority of respondents of the exposure draft for SSAP 13 relating to research and development agreed to expense off research and development cost proposed by the Exposure Draft (ED) 16 (Hope and Gray, 1982). However, sufficient objections were received on *ED 17 Accounting for Research and Development* that lead to the inclusion of an option of capitalising any qualifying development cost in the SSAP 13. In practice, surveys show that company accountants do not consider expensing off R&D to adversely affect the company valuation and companies' ability to raise finance (Nixon, 1997). Furthermore, based on an experiment involving U.K. analysts, the analysts' attitudes towards expensing R&D is indifferent and this accounting treatment does not mislead analysts in estimating company mean market value (Goodacre and McGrath, 1997).

Analysts were against the capitalisation of R&D and their reasons were related to the reliability of the capitalised R&D because manager's discretion in capitalising decisions could lead to self-serving behaviour by managers. A later survey update from Jed Wrigley (2008) supports these findings. Some studies also indicate that the capitalisation of development cost was very rare in the U.K. (Oswald, 2008; Dixon, 1997) due to among other factors, high cost to keep track separate R&D projects (Dixon, 1997) and negative future impact on earnings resulted from its amortisation. (Wrigley, 2008). Nevertheless, allowing an option to capitalise qualifying development costs is more likely to improve the value relevance of accounting information (Wyatt, 2008) as managers usually decide on accounting treatment that best conveying the underlying economic performance (Oswald, 2008; Wyatt 2005).

Most intangible assets are internally developed. The accounting treatment for purchased intangibles under U.K. GAAP depends on their useful economic lives. If their useful economic lives are up to 20 years, which is a rebuttable presumption, intangible assets are to be amortised with a mandatory first year impairment review.

Subsequent impairment reviews are only required when events warrant such reviews. If their useful economic lives exceed 20 years, intangible assets must be amortised and annually tested for impairment. Lastly, for intangible assets with indefinite useful economic lives, they are only subjected to yearly impairment test. Purchased goodwill is the most common type of purchased intangible assets. Its determination is slightly different under IFRS. Purchased goodwill is determined as the residual of fair value of consideration given and fair value of assets, liabilities and **contingent liabilities** acquired (IAS 38) but under FRS 10, purchased goodwill is the difference between the fair of consideration given and the fair value of identifiable net assets acquired.

Furthermore, the accounting treatment for negative goodwill differs between IAS 38 and FRS 10. Negative goodwill is credited to the income statement in the year it occurs under IAS 38 but under FRS 10, negative goodwill is deducted from positive goodwill in the balance sheet and is credited or released to the income statement over the life of the associated assets. U.K. GAAP requires positive purchased goodwill to be amortised over its useful life (not exceeding 20 years) but *IFRS 3 Business Combination* does not permit amortisation of goodwill and requires goodwill to be tested for impairment on an annual basis.

Under IFRS, intangible assets, either purchased or internally generated are capitalised if they fulfil the recognition criteria. In addition, the probability of future economic benefits must be based on reasonable and supportable assumptions about conditions that will exist over the life of the asset. The probability recognition criterion is always considered to be satisfied for intangible assets that are acquired separately or in a business combination. Otherwise, IAS 38 requires the expenditure on this item to be recognised as an expense when it is incurred. On the other hand, FRS 10 is stricter as it permits capitalisation of internally generated intangibles only if an active market for them exist.

Although both *IAS 36 Impairment of Assets* and *FRS 11 Impairment of Fixed Assets* provide examples of indicators of impairment, the international standard includes

indicator relating to market capitalisation and requires companies to check for lack of synergy and potential impairment when the carrying value of net assets exceeds its market capitalisation. Whenever impairment occurs, U.K. GAAP allocates the impairment cost against assets in an income generating unit (IGU) in a priority order of goodwill, other intangible assets and tangible assets whereas IAS 36 uses cash generating unit (CGU) with goodwill and other intangible assets as a single class and then followed by tangible assets. In addition, IAS 36 does not permit reversal of impairment made to goodwill but FRS 11 may allow impairment reversal on intangible assets under restricted circumstances.

Fair Value Accounting

Fair value accounting was initially developed to deal with issues relating to what measures are appropriate to recognise assets and liabilities in the balance sheet and how to reflect changes resulted from their subsequent revaluations in the income statement. These issues were integral to financial reporting since the balance sheet oriented financial statements were first developed in the nineteenth century (Gwilliam and Jackson, 2008). Thereafter, various balance sheet valuation bases are employed in the U.K. and elsewhere (Herrmann et al., 2006; Richard, 2005). However, the historical cost convention still dominated the U.K., the U.S. and most other jurisdictions (Gwilliam and Jackson, 2008). In the twentieth century, influential work related to the valuation basis for assets and the most appropriate method to measure reported income or profit have substantially influenced the nature and practice of financial reporting (Gwilliam and Jackson, 2008). High inflation in the 1960s and 1970s, brought debates on the most appropriate methods of financial reporting in an environment of rapid price change in the UK. However, the fall of inflation in the 1980s waned the accounting development consequent to SSAP 16. Consequently, the accounting standard was later withdrawn. The only impact of inflation to accounting regulation is the inclusion of an alternative accounting rule in the 1981's U.K. Companies Act. Its inclusion legalises current cost accounting that permits different valuation bases for assets, including fair value.

Fair value rules in accounting for intangible assets are not new in the U.K. Companies in the U.K. are allowed to use fair value accounting to measure identifiable intangible assets other than goodwill in business acquisition since the 1980s (SSAP No. 14). Furthermore, under FRS 10, a successor of SSAP No. 22, different accounting treatments for goodwill and other intangible assets are eliminated by not requiring amortisation on either kind of intangible assets if it has an indefinite life. Application of fair value in revaluation of intangible assets is challenging as active markets are expected to be uncommon except for production quotas, fishing licenses and taxi licenses. In its published discussion paper in 2006, the IASB recommended adoption of a valuation hierarchy similar to the U.S.'s three level hierarchical classifications[7] (Barth, 2006; Gwilliam and Jackson, 2008). Theoretically, in the real world of imperfect information and of uncertainty, fair values shall improve the role of financial reporting in both backward looking or confirmatory (informational) value (e.g. stewardship, writing contracts, employment choices, consumptions and distribution of resources) and predictive ability or predictive value (e.g. amount, timing and likelihood of future cash flows). Both confirmatory and predictive values are key ingredients for value relevance. However, it is only appropriate when markets for assets and liabilities are sufficiently deep and supportable valuations are available with low transaction costs.

The Joint Working Group highlighted two most significant advantages of fair value (mark to market); the inclusion of more up-to-date and relevant information on the balance sheets, and enhanced value in both stewardship and predictive value of reported incomes[8]. The market value is the best value because this value is consistent to other market players (Barth, 2006). Mark to market model removes some of management discretion as to when to recognise gains and loss and the subjectivity inherent in using estimation models. However, in practice, most assets are unique for companies' needs where their market values are very rare. Thus, management usually has to resort to mark to model method (Level 3). But mark to model has

[7] SFAS 157 Fair Value Measurement (Level 1-quoted prices in active market for identical assets and liabilities; Level 2- quoted prices for similar assets and liabilities in active or inactive markets, and Level 3-estimations models)
[8] http://www.iasplus.com/agenda/jwg.htm

practical issues such as difficulties in forecasting future cash flows and in estimating the discount rate to use will affect the reliability of the valuation of assets and liabilities (Barth, 2006).

The application of fair value under IFRS is required for initial measurement applies to only very few accounting standards such as IAS 30 (Disclosures in Financial Statements of Banks and Similar Financial Institutions, superseded by *IFRS 7 Financial Instruments: Disclosures* effective 1 January 2007) and IAS 41 (Agriculture). However, for subsequent re-measurement, other than intangible assets, it can be applied to property, plant and equipment and investment properties where companies are allowed to choose either cost model or revaluation model (Cairns, 2006; Roberts, et al., 2008). Under the revaluation model, the revalued amount is the fair value at the revaluation date less any depreciation and subsequent accumulated impairment loss (para. 31, IAS 16) (Roberts et al, 2008). For intangible assets, particularly goodwill, fair value is most likely to play an important role in the impairment test where the carrying amount of an asset is compared against its recoverable amount. Its recoverable amount is the higher of net realisable value (fair value less any selling cost) or value in use. IAS 38 requires the recoverable amount of intangible assets to be measured at least every financial year end (IFRS GAAP 2008, page 914).

Despite, not being directly stated in the conceptual framework of major standard setting bodies as the valuation basis for assets and liabilities (e.g. IASB and FASB), the definition of fair value embedded to a concept already adopted by the standards, namely, the net realisable value. Nevertheless, the use of fair values is expected to increase because it provides consistency in the measurement basis and corresponds well with the spirit of the IASB Framework (Penman, 2007; Barth, 2006). Furthermore, application of fair value is expected to improve relevance, the required characteristics of accounting information by both the IASB and the ASB. Early evidence on the adoption of IFRS suggests that IFRS has significantly produced higher value relevant accounting information. However, the real impact of IFRS regime may not materialise much in the short term and more studies are essential to

test whether early evidence of its impact is sustainable in the long term. Recently, the IASB issued *IFRS 13 Fair Value Measurement* as part of the Memorandum of Understanding between the IASB and the U.S. national standard-setter, the Financial Accounting Standards Board (FASB). It provides a comprehensive framework for measuring and requiring disclosures of fair value, which is consistent between IFRS and US GAAP. However, IFRS 13 is to be effective from 1 January 2013[9]. Thus, the impact of fair value rules under this accounting standard will not be covered by this study.

3.6. Summary and Conclusions

Despite similar features in the structure of the accounting standard-setting process, the adoption of IFRS sets a new direction in the accounting regulation in the UK. The ASB can no longer directly regulate the preparation and presentation of consolidated financial statements in the UK because that role is now shouldered by the IASB. However, as a local accounting standard setter, this study purports that UK standards are superior in addressing accounting issues directly related to UK companies as compared to IFRS which primary function is to cater for the international community. A local GAAP is better fitted to local business and legal environment (Jermakowicz and Gornik-Tomaszewski, 2006). For example, for U.K. users, reporting for stewardship is as important as reporting for decision-usefulness and should be stated as primary purposes of financial reporting in the Conceptual Framework (Whittington, 2008). In fact Penman (2007) argues that U.K. GAAP tends to focus more on reporting for stewardship.

As part of the European Union, mandating IFRS for listed companies is unavoidable as the U.K. is subject to the European Union regulation. All listed companies in European countries must adopt IFRS since 1 January 2005 (EC Regulation, 2002) when preparing consolidated financial statements. They will be subjected to greater accounting and disclosure requirements as IFRS adoption would increase demand for more detailed guidance in the Europe (Schipper, 2005). Nevertheless, the ASB is

[9]http://www.ifrs.org

actively involved in the development of new and revised IFRS with a view that IFRS will gradually replace UK accounting standards. The board will gradually eliminate any inconsistencies with the national legislation, consider additional disclosures appropriate for the UK market and will give due consideration to small companies. Small companies are currently subjected to the Financial Reporting Standard for Smaller Entities (FRSSE) for which equivalent international standards are currently not yet available. Furthermore, the ASB continues to revise its accounting standards so that the accounting rules are aligned to the international standards (e.g. FRS 17 *Retirement Benefits*). However, few inconsistencies still remain such as in accounting for goodwill (i.e. amortisation versus impairment of goodwill) and other intangible assets (e.g., removal of an option to capitalise R&D). IFRS is also incorporating more fair value rules and a balance sheet approach as compared to the U.K. GAAP (Paananem, 2008; Penman, 2007). This calls for more studies to determine the effects of IFRS on accounting information in general and on intangible assets and their value relevance in specific.

CHAPTER 4:

RESEARCH METHODOLOGY AND RESEARCH METHOD

4.1. Introduction

This chapter discusses key features related to research methodology and research methods for the current study. It aims to set out the underlying assumptions underpinning the study as well as rationales for the research methods, research objectives and general features of the research design and methods of investigation.

It is organised in the following manner. Section 4.2 discusses the research methodology in accounting and finance and the positioning of a research methodology related to this study. Section 4.3 explains the research objectives and hypotheses. Section 4.4 describes key research designs; data and sampling, study period, and the methods of investigations. Further details of the research design and methods are discussed in the respective empirical chapters (Chapter 5, 6, 7 and 8). Section 4.5 discusses econometric issues and Section 4.5 summarises and concludes the chapter.

4.2. Research Methodology in Accounting and Finance

This section explains the research methodology, including the underlying assumptions related to the thesis which helps to define the type of its research findings and the limitations of those findings. As a body of knowledge, a research methodology enables researchers to explain and justify research methods; indicating their limitations and resources, identifying their presuppositions and consequences, and relating their potentialities to research advances (Miller, 1983) as well as underpins the types of research questions and the nature of the generated evidence (Clark, et al., 1984). The link between research paradigm, type of data, and collection methods has significant implications upon the research findings.

This study follows the mainstream accounting research conducted within the positivist paradigm. This paradigm requires a highly objective view of a common, single reality where reality is an externality, independent of human thought and perception (Bisman, 2010). It is also scientific, structured, has prior theoretical bases, aims to establish the nature of relationships and causes and effects, and employs empirical validation and statistical analysis to test and confirm existing theories (Bisman 2010). The positivist research literature presumes that the scientific approach is appropriate to the discovery, explanation and prediction of accounting phenomena based on the objective ontological view that the 'reality' of accounting is objective and the research hypotheses can be statistically tested to produce generalisable findings (Bisman 2010).

In addition, it focuses on objective and measurable variables as it investigated the impact of IFRS on published accounting information among mandatory adopters. There are four research areas; the magnitude of earnings and intangible assets, indicators of a balance sheet based financial reporting model, earnings persistence, and value relevance of accounting information. Positivism had dominated accounting research in 1970s. Hence, this study relied on existing theories, concepts and regression models established deductively through formal statistical testing hypotheses (Lincoln and Guba, 1985). These models were amended to accommodate the current research objectives.

Furthermore, this study seeks to investigate the quantifiable effects of IFRS and to examine these effects on users' economic decisions, i.e. company valuation. Neither the management's interpretation nor the detailed evaluation of the respective accounting standards were within the study scope. Accounting attributes represent desirable features of accounting information and thus favourable effects on accounting attributes are assumed to reflect the benefits of IFRS. Since the objective of financial reporting promulgated by the IASB and the ASB is to provide decision useful information, this study adopted an equity investors' and information perspective where it emphasised on the relationship between accounting numbers

and company valuation, and employed the most common research design to examine this association, which was a valuation approach (Barth, 2006).

Under a company valuation approach, it is assumed that the stock market is efficient in processing publicly available information, including both accounting and non-accounting information. Then, investors are assumed to rely on this information in assessing the value of the companies' equities. Although, in reality, the equity market may not be strongly efficient in processing the implications of the publicly available information, the equity market values are assumed to reflect the consensus beliefs of investors. Hence, this study used equity market value to infer investors' consensus assessment of the company value based on the published accounting information. Furthermore, statistical analytical techniques and tools were the main means of investigation and research findings derive from this analysis had been tested for robustness and replicability. These features are consistent with positivism, which is referred to as the received view, uses scientific methods to develop general abstract laws describing and predict patterns in the physical world (Suppe and Jacox, 1985).

4.3. Research Objectives and Hypotheses

There were three main objectives of this study. The first research objective was designed to address critics that financial reporting had become too dominated by a valuation approach and to explore direct effects of IFRS on earnings and intangible assets. Prior studies suggest that lower accruals and higher impairment expenses are indicators of a valuation approach (Dechow and Ge, 2006; Dichev, 2008). The second and third research objective focused on how IFRS had affected the attributes of accounting information; earnings persistence and value relevance. The impact on two primary ingredients of value relevance; informational and predictive values (FASB, SFAC 2) were also examined. Intangible assets and different classes of intangible assets were the specific accounting information in the third research objective. Earnings were the most important accounting information for equity valuation meanwhile current reporting of intangible assets was viewed by many as

still inadequate and needed a reform (Skinner, 2008). The research hypotheses were as follows,

1st Research Objective (Chapter 5)

H_1: IFRS had significantly increased earnings and intangible assets

H_2: IFRS had significantly further shifted the financial reporting approach from a matching approach to a valuation approach

2nd Research Objective (Chapter 6)

H_1: IFRS has significantly increased earnings volatility and reduced earning persistence

H_2: Earnings volatility is significantly more related to cash earnings volatility under IFRS

3rd Research Objective (Part I) (Chapter 7)

H_1: IFRS as a disclosed adopted accounting policy, is significantly more value relevant than U.K. GAAP

H_2: IFRS has significantly increased the value relevance of intangible assets

H_3: The value relevance of non-goodwill intangible assets is significantly greater than the value relevance of goodwill under IFRS

H_4: IFRS does significantly increase the value relevance of goodwill

3rd Research Objective (Part II) (Chapter 8)

H_1: The informative value of intangible assets has been significantly changed under IFRS

H_2: The predictive value of intangible assets has been significantly improved under IFRS

4.4. Research Design and Methods of Investigation

This section explains the key features of the research design. The research design provides a critical link between the theory and the arguments underlying the research and the empirical data collected because it generally guides the collection and analysis of data of a study.

4.4.1. Data and Sampling

The data population was all UK listed companies. Initially, there were 2,148 companies. However, only companies that met the required criteria were included in the sample and the detailed sample selection was described in the respective chapters. The criteria were companies must adopt UK GAAP prior to 2005, using pound sterling as the reporting currency and having data available for the study period. Three hundred and ninety-nine (399) UK listed companies which had adopted non-UK GAAP such as US GAAP were excluded to control the influences of other accounting standards. Two hundreds and forty-eight (248) companies reported in USD were also excluded. Eliminating companies using other currencies such as Euro and US dollars shall avoid the currency translation effects. Finally, eight hundreds and four (804) companies with no data available throughout the required period were excluded to ensure the data was a balanced panel data. The final sample consists of six hundreds and ninety-seven companies. The study period was decided based on the common approach in existing studies. For example, to assess changes in matching of expense against revenue and earnings persistence model requires longer study periods whereas the pre- and post-IFRS model does not.

UK data was chosen because of its uniqueness as compared to other countries. Its financial reporting environment is very shareholders-orientated which is ideal to assess the impact of IFRS on the company valuation. Besides, the fact that there was virtually no IFRS/IAS adopter prior to 2005 made it a clean research setting to examine the effects of IFRS among mandatory adopters. Unlike some studies that include multi-countries, this setting minimises heterogeneity effect due to country

differences such as in the ownership and financial structure, size, domestic accounting system (Anglo-Saxon or Continental), jurisdictions and the degree of accounting sophistication (Schipper 2005).

In addition to the confounding effects of different regulatory and pre-IFRS accounting regime, a single homogenous institutional and geographical environment might also mitigate sample selection bias of pre-IFRS voluntarily adopters (Jeanjean and Stolowy, 2008). No early or voluntary adopter was permitted in the U.K. prior to 2005 which reduced the problem of layered introduction with different incentives and impacts. Moreover, a uniform institutional setting did not require any control for variations in regulatory and accounting settings.

Opponents of IFRS adoption argue that IFRS had little or no impact in the UK. Surprisingly, findings from prior studies do not support such claim. Existing empirical evidence suggests substantial benefits among U.K companies; significant reduction in cost of equity capital (Lee et al., 2008), greater value relevance of intangible assets and goodwill (Sahut et al., 2011) and value relevance of earnings (Horton and Serafeim, 2009). Empirical evidence from this study would confirm existing findings.

This study differs from the majority of existing studies because rather than excluding financial companies (e.g. ElBakry, 2010; Iatridis, 2010), this study analysed nonfinancial and financial samples separately. Hence, it documented the impact of IFRS on both the financial and nonfinancial companies analysed under similar basis (e.g. researcher, methods and data). Most value relevance studies exclude financial companies because of the different nature of their assets and the specialised nature of financial statements. These studies claim that assets of the financial companies do not legally and truly owned by the financial companies but on leased from the savers (e.g. Kontopoulos et al., 2010). Kontopoulos et al. (2010) argue that financial companies have a different structure of financial reporting than nonfinancial companies. Therefore, the relationship among different elements of financial statements is different. In addition, they argue financial companies are subjected to

additional regulation related to the banking and insurance industries (Barth & Landsman, 2010).

In some studies (e.g. ElBakry, 2010), utility companies are also excluded because, similar to financial companies, these companies were subjected to additional regulations. Profits for utility companies are expected to be more stable than other industries due to a highly regulated market. Therefore, their estimated future cash flows are more predictable and hence their investors were assumed not to act at par with investors of other industries. However, in this study its sample size was the smallest of the three sub-samples and the robustness tests indicated that their exclusion would not significantly affect the results.

In the robustness tests, some fixed company characteristics were controlled by partitioning the sample. Following prior studies (e.g. Hevas & Siougle, 2011), the sample was partitioned by six criteria; profit and loss making companies, small and large companies (market capitalisation exceed average as large, market capitalisation less than average as small), growth and no growth (positive change in total assets as growth companies, no or negative change in total assets as no growth companies), high and low audit company (big four as high quality auditors, non-big four audit companies as low quality auditors) and high leverage or low leverage (leverage exceeds average leverage as high leverage, leverage less than average leverage as low leverage) and high and low closely held shares. For companies that did not disclose their parents' auditors were assumed as having non-big four auditors. Growth is defined in terms of the change in net tangible assets and riskiness is defined as the debt to equity ratio (Hevas and Siougle, 2011). In the tests, companies with negative book values were excluded, following Franzen & Radhakrisnan (2009) who exclude companies with negative book values because abnormal earnings based upon negative book value have no meaningful economic interpretation. Companies with losses were also excluded, in the sensitivity test particularly for the return (informational) model as existing literature suggests that profits are more associated with returns than losses (Goodwin & Ahmed, 2006).

The main sources of data were Data Stream, World scope, One Banker, and the company's website. It was assumed that these data were reasonably validated before being entered into the database. At the first data collection stage, company codes, name, year of incorporation, reporting currencies and their accounting policies were extracted from Data Stream. These data were required for screening the companies (sample selection). At this stage, whenever necessary, only companies incorporated before the year 2000, using pound sterling (£) and adopted U.K. accounting standards prior to 2005 were selected. Then, for the first research objective, companies were grouped as Group 0 (non-adopters), Group 1 (1^{st} year of adopting IFRS was year 2005), Group 2 (1^{st} year of adopting IFRS was year 2006), Group 3 (1^{st} year of adopting IFRS was year 2007) and Group 4 (1^{st} year of adopting IFRS was year 2008). The required accounting data were extracted for the selected companies. Only Group 1 was required for the first and second research objective. The list for the third research objective included Group 1 to 4.

Next, the data was collated; summarised, tabulated, and screened for missing values. It was organised in according to the research objectives. Some data (e.g. accruals) were determined based on the measurement used in the existing studies. In addition, these data were deflated by five deflators (sales, number of common shares, opening market values, average assets and book value) to minimise heterogeneity issue. However, for the third research objective (Chapter 7 and 8) only results based on one deflator, i.e. the ordinary shares, are presented to be consistent with related studies such as Sahut et al., (2011), Chalmers et al., (2008) and Goodwin and Ahmed (2006). For the first and second research objectives, the deflator was average assets because their methods of investigation follow Dichev (2008) and Dichev and Tang (2008, 2009).

However, in the original data set, the distribution of data was much skewed (not normally distributed) which was very common for the U.K. data (Akbar & Stark, 2003). Differences within the sample such as sizes, nature of business and business maturity might have contributed to the spread of data values. To address this, data were scrutinised manually to eliminate any outliers both across time and panels. The

manual elimination of outliers was executed after eliminating outliers following common procedures in quantitative research, i.e. eliminating 0.5% of the top and bottom ranked data values (Akbar and Stark, 2003). In addition, any value exceeded three times the standard deviations was considered an outlier and thus was excluded (Sahut et al. 2011; Kontoupolous et al., 2010). Hair et al., (2006, p86) indicates that *"normality can have serious effects on small samples (less than 50 cases), but the impact effectively diminishes when sample sizes reach 200 cases or more"*. Therefore, the skewed distribution of data was assumed not to seriously affect the reliability of the test results.

4.4.2. Study period

The study period was originally nine years, from the year 2000 to 2008. However, it was slightly different for the first research objective where the study period was divided into two sub-periods, pre-IFRS (2000 - 2004) and post-IFRS (2005 – 2008). In the robustness tests, the transitional years (2004 and 2005) were excluded. In addition, only companies that adopted IFRS in 2005 were included. The study period commenced from the year 2000 to minimise the impact of major changes in the accounting standards (Soderstrom and Sun, 2007). For example, the core international accounting standards (IAS) were fully completed in 1998 and new IFRS was only effective after 1 January 2009.

The study period for the second part of the first research objective was longer in order to assess the trend in matching of expense against revenue (Dichev, 2008). It was also different because the regression models required previous year data (1-lagged year data). For the third research objective, the study period was from 2000 to 2008. However, the period was shortened by one year for the regression models which required previous year data (e.g. the informational model in Chapter 8) and cash flows from operations for two additional years (2009 and 2010) were required for the predictive model (Chapter 8).

4.4.3. Methods of Investigation

The research method for this study was a combination of univariate and regression analysis, including multivariate analysis. Univariate analysis was used to explore the data and bivariate analysis is a tool to examine the potential relation between a pair of variables (e.g. IFRS and an accounting variable of interest). Multiple regressions and time series regression models are based from prior studies. Multivariate analysis was employed to study the effects of IFRS on the predictability value of a set of variables (e.g. intangible assets and different classes of intangible). The methods of investigations were discussed in the order of the research questions which basically covered the impact of IFRS on indicators of a valuation approach to financial reporting, specific earnings attributes, and value relevance of intangible assets.

The first step of the investigation was descriptive statistics or univariate analysis. These statistics described the general features of the data such as normality and the spread of the data. They were also used as part of the diagnostic test to identify outliers. If the minimum and maximum values were too deviate from the mean, the data were screened for outliers.

Next, prior to the multiple regressions analysis, a correlation matrix was analysed. The correlation matrix was produced using a Pearson pairwise correlation where the correlations were based upon all possible observations available for each pair of variables. Furthermore, to address 'multiple comparison fallacy' because such correlations were based on a random sample of the whole observations, the significance level was adjusted to take multiple comparisons into account. In multiple comparison, particular in a large sample, the correlation coefficient is more likely to be significant. The larger sample will require more comparison tests. The higher number of tests will increase the probability of Type 1 error, i.e. rejecting the null hypothesis when it is true. This study employed a Sidak Method to adjust the significant level appropriately. This method corrects the alpha level where it is smaller or more stringent and thus creates less errors in multiple comparisons. The Sidak method is considered more accurate than an alternative method (e.g.

Bonferroni Method) in STATA (Hamilton, 2009, page 187). The correlation matrix was then used to explore the potential relation between any pair of variables where no distinction was necessary between the dependent variable and the independent variables (Tabachnick and Fidell, 2007).

Last, to supplement the multiple regression models, the multivariate analysis was employed to test the impact of IFRS in predicting future cash flows (1-year, 2-year and 3-year ahead cash flows from operations). These models were based on existing literature and were amended accordingly to accommodate the research objectives and hypothesis.

The Deflators

This study used deflated data to minimise heterokedasticity in the residuals due to fixed characteristics of companies (e.g. company size) not captured by the variables. Following existing literature, (for example Tsoligkas and Tsalavoutas, 2011; Barth and Clinch, 2009)[10] and Chalmers et al. (2008), the main deflator was the outstanding number of ordinary shares. As per Data Stream definition, the outstanding number of shares was the number of issued shares minus any treasury shares. It was assumed to reflect the size of company's shareholdings, and hence, it represented the number of company's shares available in the equity market.

Furthermore, it was more meaningful to analyse the market value and accounting numbers in per one ordinary share basis. It was also highly correlated with company's book value, another common deflator in the literature. Existing studies argue that there is no optimal deflator for U.K. data (Akbar and Stark, 2003). To test the robustness of the results, other deflators (opening market value, book value, average assets and sales) were also used.

[10] Barth and Clinch (2009) has suggested that an effective proxy to capture the scale effect is the number of shares

Table 1: A Correlation Coefficients Matrix (the Deflators[11])

	# ord. shares (cs)	sales (s)	BV of Equity(b)
# ord. shares (cs)	1		
sales (s)	0.5415*	1	
	0.000		
BV of Equity(b)	0.9512*	0.5230*	1
	0.000	0.000	

Reliability of Data

Since this study relied on data extracted from the Data Stream, an additional analysis, to ensure the accuracy, reliability and completeness of the data was undertaken. Data of selected companies was manually cross-checked to their annual reports (financial statements and notes to the accounts). Annual reports were obtained either from the free Annual Reports Service (the hard copies by mail) or downloaded from the companies' websites. The sampling was based on the majority industry group (the first 2-SIC digit). There were 25 groups and the first company in each group was chosen. For groups with greater than 35 companies, two companies were selected. In total, the sample size for the reliability check was 30 companies.

Data on the intangible assets and different types of intangible assets were reasonably accurate. Intangible assets were reported on the face of the balance sheet and their breakdowns were disclosed in the notes to the accounts. However, there were some discrepancies (5% to 8%) on different profit lines (operating profits and net income before extraordinary items) in 30% of the sample due different presentation styles and reported items, particularly prior to IFRS and among the financial sample. To avoid using inconsistent data for earnings, this study opted to use the net income for common shareholders for the third research objective as it was the most consistent profit line.

[11] The Pearson's correlation coefficients for opening market values and average assets with ordinary shares and book value of equity ranges between 0.8 to 0.95 but they were not shown for simplicity reason.

In addition to checking the accuracy and reliability of the data, this step provided insights into the impact of IFRS on the financial statements and notes to the accounts, in particular those relating to intangible assets and different types of intangible assets. Based on the contents analysis, it was observed that prior to IFRS; the presentation styles for the income statements were varied where some companies provided additional columns for profit items such as extraordinary items and amortisation of goodwill and different profit lines but others did not. During post-IFRS, the presentation of income statements was more standardised.

In terms of disclosure relating to intangible assets, during post-IFRS, companies disclosed more information in the notes to the accounts. However, the majority of the sample used value in use as their recoverable value for intangible assets, in particular goodwill. This observation shows that active markets for intangible assets are practically very rare that hinders the extensive application of fair value in the subsequent measurement and impairment test for intangible assets.

Contemporary Linear Regression for Panel Data

This study followed prior studies (e.g. Saadi, 2005) by using a panel-corrected standard error (PCSE) technique. When computing the standard errors and the variance-covariance estimates, it assumed that the disturbances were, by default, heteroskedastic and contemporaneously correlated across panels (Hamilton, 2009), i.e. heterokdasticy-adjusted-standard errors. This technique was appropriate for the study because it permitted the violation of few assumptions for the multiple regressions. Based on the regression diagnostic tests, the data in this sample were not normally distributed and heterokedastic. If the errors were independent and homoskedastic, ordinary least square technique (OLS) can be used to estimate the coefficients. However, in reality, using real data, it was very rare for the data to be normally distributed data. A panel-corrected standard error was employed because it was unrealistic to expect that OLS would suffice for non-normally distributed data (Hair, et al., 2006).

Multiple regressions models that use data with heterokedastic errors could also be addressed by using estimated or feasible generalised least squares (EGLS or FGLS). OLS with panel corrected errors provide a more efficient estimation than FGLS (Yaffee, 2003). However, a panel-corrected standard error has an extra advantage as it could automatically exclude any variable with multicollinearity problem. Despite researcher's effort to ensure no multicollinearity problems among independent variables, having a second filter by the statistical technique would ensure this issue was effectively avoided. Furthermore, some studies use a White's statistic for robust errors to address the heterkedasticity problem. Following Kontopoulous et al., (2010) who argue that a model with least standard errors is more capable of explaining the dependent variable and compared to other linear regression for panel data, a panel-corrected standard errors or xpcse regression has smaller standard errors than a technique that use White's statistics for robust errors. In short, based on the preliminary tests, standard errors and diagnostic tests, the panel-corrected standard errors regression model was the most appropriate for this study.

4.5. Econometric Issues

First, as the study relied on financial information, a concrete and objective data, it was assumed not to suffer from any scale bias. The change in accounting standards was confined to differences between U.K. GAAP and IFRS GAAP where companies that had adopted non-U.K. GAAP prior to the 2005 were excluded. The robustness tests further assessed the influence of other factors such as company-fixed characteristics and transitional years.

Second, this study examined the impact of IFRS among mandatory or forced adopters. However, there is a possibility that some of these companies will adopt IFRS regardless of the EC's decision in 2002. These companies may have gradually changed their accounting system to accommodate IFRS for their financial reporting. Thus, their decisions may be driven by other incentives such as planning for cross listing or accessing global capital markets. The effects of IFRS in 2005 might not

bring material effect on their financial statements and thus has little effect on their economic decision. Therefore, the interpretation of research findings was limited to such factor.

Third, the modelling and multivariate equation was adapted from existing studies where they had been rigorously tested. Thus, no serious misspecification issue pertaining to these models was assumed. Furthermore, a diagnostic analysis was done beforehand where any violation of the multiple regressions models was addressed accordingly. Any pair of highly correlated independent variables (coefficient correlation values exceeded 0.6) was either replaced with another variable or was not simultaneously incorporated into the equation. Akbar and Stark (2003) considered 0.65 as highly correlated and hence, indicating a serious co-linearity problem. In addition, the statistical technique was appropriately chosen to cater for any inherent feature of the data that did not meet the required assumptions of the multiple regressions.

4.6. Summary and Conclusions

This chapter explains research methodology and method for the current thesis. Generally, the study followed a positivist research paradigm where the subjects of interest were objective and quantifiable. Whenever appropriate, proxies, which were also quantifiable, were used to measure other observations such as the adopted accounting policy and indicators of a balance sheet approach to financial reporting.

The research objectives were met by hypothesis testing. The impact of IFRS was examined under a single homogenous institutional and geographical environment, i.e. a single country (the U.K). Using U.K. listed companies provided several merits to the study because of its established equity market, high quality accounting regime prior to IFRS and a clean research setting; all mandatory adopters and all had adopted U.K. GAAP prior to 2005.

The sample selection covered all U.K. companies that had met the required criteria; adopted U.K. GAAP prior to 2005, used pound sterling as the reporting currencies, and had all the required accounting data for the study period. Major change either in U.K. GAAP or IAS/IFRS was minimised by using data from the year 2000 to 2008 as the core IAS was fully completed in 1998 and was effective since 1999. In addition, several IFRSs were substantially revised and new IFRS was issued, which were effectively binding since the year 2009. Therefore, the influence of new IFRS and newly revised IAS/IFRS was minimised.

The econometric issues were examined by the descriptive analysis, univariate and diagnostic tests. Based on these analyses, a panel-corrected standard error (PCSE) technique was employed to run the multiple regressions models. This technique allowed violations of the multiple regressions assumptions such as non-normally distributed data, heterogeneous and it automatically eliminated any highly correlated independent variables. Further details on the research design, methods and hypotheses are reported in the appropriate chapters (Chapter 5 to 8).

CHAPTER 5

IFRS, EARNINGS, INTANGIBLE ASSETS, AND FINANCIAL REPORTING APPROACH

5.1. Introduction

This chapter provides initial evidence to the other three empirical chapters. It explores the impact of IFRS on earnings and intangible assets and the indicators of a valuation approach to financial reporting. It consists of two parts; first, it investigates the impact of IFRS on earnings and intangible assets; second, it examines whether the financial reporting approach has been practically further shifted towards a valuation approach, i.e. a balance sheet approach. Earnings and intangible assets are the first two subjects of interest because existing studies indicate that earnings are viewed as the most important output of financial reporting (Cauwenberge and Beelde, 2007; Graham et al., 2005) and are significantly higher under IFRS (Clarkson, et al., 2011; Gaston, et al., 2010; Hung and Subramanyam, 2007) which might due to greater application of a valuation approach (Penman, 2007).

Supplementary revaluation of intangible assets under IFRS contributes to greater earnings (e.g. Sahut et al., 2011). Financial reporting of intangible assets has been criticised as still lacking and is in need of immediate reform (Skinner 2008; Lev, 2001). Existing evidence that calls for reform of current financial reporting of intangible assets is still insufficient (Stark, 2008) and it is vital to determine if the adoption of IFRS has improved reporting of intangible assets. This thesis proposes that greater application of a valuation approach under IFRS is expected to increase reporting of intangible assets.

For the purpose of this study, a valuation approach is also known as a balance sheet approach and a matching approach is also known as an income statement approach or a transaction approach (Fox, et al., 2003). These terms may be used interchangeably.

The two approaches to financial accounting and reporting are different in many aspects which are discussed in the literature review section. Many argue that IFRS shifts financial reporting further away from a matching approach towards a valuation approach (Dichev, 2008; Whittington 2008a). This is expected to increase earnings as under IFRS, an income from the valuation of assets and liabilities are expected to increase. In addition, under IFRS, the definition of intangible assets is broader (Horton and Serafeim, 2006) which permits more capitalisations of intangible assets. However, little evidence is available to support that the financial reporting approach has indeed in reality been shifted towards a valuation approach. The advantages and disadvantages of a valuation approach and a matching approach and their trade-offs have been debated for decades. Based on current evidence, this issue is still unresolved and current financial reporting is still based on a mixed basis (Fox et al. 2003). The downside of mixed bases is earnings have no definite meaning and is more likely to convey mixed messages to users (Barker, 2004).

Nevertheless, the IASB's decision to prioritise decision usefulness over stewardship as the main purpose of financial reporting indirectly implies that the IASB plans to standardise the underlying basis from a conceptual perspective (Barker, 2004; Fox et al., 2003). Is shifting financial reporting approach further away from a matching approach is beneficial to users? This question calls for more research that not only investigates the impact of IFRS on earnings attributes but links it with the changes in financial reporting approach. This study will to a certain extent address this issue by examining three indicators of a valuation approach; higher impairment expense, lower accruals, and declines in the revenue/expense relation (matching). These indicators are suggested by Dichev (2008), Dichev and Tang (2008) and Dichow and Ge (2006). Empirical evidence in the U.S., suggest that a declining trend in matching of expenses against revenue results from the domination of a valuation approach to financial reporting (Dichev and Tang, 2008). IFRS is more likely to cause similar decline in matching of revenue against expense as the IASB and the FASB have been collaborated in joint projects such as the project for the Conceptual Framework. Hence, this study proposes that the same trend is expected to occur in the U.K.

There are three key findings from this study. First, this study finds that not only earnings are greater under IFRS, the presentations of earnings has become more standardised. Existing studies suggest that earnings are higher under IFRS. This study contributes by showing that earnings are higher at all five profit lines for nonfinancial sectors and at three out of five profit lines for the financial sector. Prior to IFRS, only half of the financial companies in the study sample reported the five profit lines. Under IFRS, all companies report the five profit lines. This evidence indicates that accounting rules under IFRS have significantly increased reported earnings and have standardised the presentation of earnings. Second, evidence from this study shows that intangible assets and goodwill are higher under IFRS. Third, based on the selected indicators of a valuation based approach to financial reporting, this study does not find sufficient evidence to conclude that IFRS adoption has significantly moved financial reporting approach further away from a matching approach. Current financial reporting standards, including IFRS, are still based on mixed bases; a valuation and a matching approach (Fox, et al., 2003). Nevertheless, similar to the U.S. evidence, this study finds strong evidence to suggest that the trend in matching of expenses against revenue, which reflects an application of a matching approach, is declining in the U.K.

This chapter is organised in the following manner; Section 5.2 provides an overview of prior studies, Section 5.3 explains the development of research hypothesis, Section 5.4 describes research design and methods of investigations, Section 5.5 reports data analysis and findings, Section 5.6 discusses the impact of IFRS on earnings and intangible assets, Section 5.7 discusses the impact of IFRS on indicators of a valuation approach, Section 5.8 address the econometric issues, and finally Section 5.9 summarises and concludes the chapter.

5.2. Literature Review

Most of prior studies investigate the impact of IFRS on earnings (e.g., Armstrong et al., 2008; Horton and Serafeim 2009) and they rely on early evidence such as the reconciliation statements (Gaston, et al., 2010) and 2005's and 2006's financial

statements (Iatridis, 2010). Existing studies on its impact on intangible assets produce mixed findings (e.g. Sahut et al., 2011; Chalmers et al. 2008). In addition, there is very little evidence in the existing literature on the impact of IFRS on financial reporting approaches. This section reviews the history of financial reporting approaches and the impact of IFRS on earnings and intangible assets.

At the beginning, a business was owned by few owners who themselves managed its day-to-day operations; a simple statement of financial position was an adequate report (Dichev, 2008). Over time, a business entity expanded until it is impractical for them to manage the business. They appoint agents, i.e. the managers, to manage the business on their behalf. Agency theory purports that a separation of management and ownership may lead to pursuing self-interests by the management which rationalises the need for accounting (Lennard, 2007). Therefore, both financial position and financial performance reports are essential in documenting how well management is performing and as evidence of their accountability to their principal or the shareholders. Reporting how well the business was managed or the business performance was increasingly becoming more important and was the main purpose of financial reporting (Fox et al., 2003) where income, or earnings, a key business performance indicator was mainly determined based on a matching or a transaction-based approach. This approach is still very important to the U.K. GAAP (Penman, 2007) as compared to IFRS which is geared towards fair values and a balance sheet approach (Paanamen and Parmar, 2008).

The transaction-based approach has been criticised as enabling income smoothing due to its reliance on matching current expenses against revenue. Therefore, accounting regulators, academics and researchers turn to a valuation approach which starts to gain support from the accounting standard setters such as the FASB and the IASB (Penman, 2007). Under a valuation approach, the definition of income directly depends on the definition of both assets and liabilities as *'increases in the economic benefits during the accounting period in the form of inflows or enhancements of assets or liabilities that results in an increase in equity, other than those relating to contributions from equity participants'* (Ernst and Young, 2008).

According to Fox et al. (2003), a matching approach compares revenue with costs and deducts from the revenue all expenses incurred to generate that revenue for a particular period. On the other hand, a valuation approach determines income as an increase in the value of a company during an accounting period (Sterling, 1979) and hence, it requires a proper identification and measurement of assets and liabilities (Fox et al., 2003). However, a transaction approach better represents existing accounting practices (ICAEW, 2009). Based on a simplified scenario under a set of assumptions, Fox et al. (2003) provide evidence that U.K. and international accounting standard rules are based on mixed bases, i.e. applying both matching approach and valuation approach. Unless changes in equity under both approaches are constant over time, Fox et al. (2003) argue that application of mixed-based approaches causes companies to report income with no defined meaning and this income could mislead users who interpret it with a single internally consistent approach. However, since the adoption of a valuation approach in the Statement Principles (ASB, 1999a), a more consistent use of this approach is expected to increase under U.K. GAAP.

Nevertheless, accounting standards continue to be based on either a valuation approach or a matching approach or both approaches (Fox et al., 2003). Impairment of assets and accounting for deferred tax are two examples of a balance sheet approach to financial accounting. Goodwill is amortised (matching concept) under U.K. GAAP in contrast to the required annual impairment test (valuation approach) under IFRS. This change is unavoidable when U.K. listed companies are mandated with IFRS since 2005. Empirical evidence to support whether IFRS has significantly further shifted towards a valuation approach is still very limited (see for example, Dichev, 2008). The change may have not been substantial because of many similarities in other accounting standards between U.K. GAAP and IFRS (Li, 2010). Nonetheless, less emphasis on matching concept under the IASB's conceptual framework as compared to U.K. GAAP can reduce accruals, increase impairment expenses and lead a decline in matching of expenses against revenue (Dichev and Tang, 2008).

Another important implication of the approach is on the determination of income or earnings. This implication is crucial because earnings are viewed by users as the most important output of the financial system (Graham, et al., 2005). Hence, negative effects on earnings and its attributes are likely to cause adverse effects on users' confidence in earnings. Earnings or income is meaningful if users can clearly link it with economic performance, either in terms of an excess of revenue over costs or increase in net assets (assets minus liabilities). In this case, a matching approach is superior because it has a definitive link to the underlying business performance where it is more likely to produce greater persistence in earnings.

However, a valuation approach can minimise self-serving behaviours by managers (e.g. income smoothing) and it can increase earnings because earnings are determined based on changes in assets and liabilities (Fox, et al. 2003). On the other hand, IFRS is likely to inject more uncertainties into earnings (Barth, 2006). Accounting treatments for goodwill under IFRS are inherent with subjectivity because they require numerous assumptions in estimating fair value, value in use and recoverable amounts (Wines et al, 2007) which might cause earnings to be more volatile.

Using fair value as the primary basis of asset/liability measurement will produce more relevant financial results (Whittington, 2008a) but it is expected to contribute to more volatile accounting information (Jermakowicz and Gornik-Tomaszewski, 2006). It is thus important to anticipate the implication of IFRS on earnings in order to avoid significant share mispricing (Richardson, et al., 2005). Existing studies that investigate possible reasons for earnings to be either smoother or more volatile than cash flows suggest that this scenario may be due to either natural application of accounting rules and conventions, or managers' behaviours (e.g. proactive discretionary choices) or both. Therefore, any change in accounting regime would have some impact on earnings and other accounting information.

Differences between IFRS and U.K. GAAP relating to the disclosures and presentation requirements exist in cash flow statement, income taxes, accounting for leases and segmental reporting (Horton and Serafeim, 2008; and Ernst and Young, 2008; Rodgers, 2007). For measurement inconsistencies, differences can be found in accounting for intangibles, asset impairment, investment properties, and tangible non-current assets. U.K. accounting standards have been aligned to IFRS partly via issuing new standards that mirror IFRS to replace 'old' U.K accounting standards. However, some measurement based differences still exist (Elbakry, 2010). This study focuses on those relating to intangible assets.

First, IFRS includes contingent liabilities in the determination of purchased goodwill which is calculated as the residual of fair value of consideration given and fair value of assets, liabilities and contingent liabilities acquired (IAS 38). Under FRS 10, contingent liabilities are excluded and purchased goodwill is the difference between the fair value of the consideration given and the fair value of identifiable net assets acquired. Second, FRS 10 requires negative goodwill to be deducted from any positive goodwill in the balance sheet which is credited or released to the income statement over the life of the associated assets whereas IFRS 3 requires any negative goodwill left after reviewing the fair value of net assets and contingent liabilities to be credited to the income statement as income (International GAAP, 2008).

Third, FRS 10 requires companies to amortise any positive purchased goodwill over its useful life (not exceeding 20 years). On the other hand, *IFRS 3 Business combination* adopts a valuation approach where it does not permit amortisation of goodwill but requires goodwill to be tested for impairment on an annual basis. Fourth, to capture all internally generated intangibles other than goodwill, international GAAP's interpretation of research and development is conceptually broader than U.K. GAAP where pure and 'applied' research are all expensed off to the income statement (Horton and Serafeim, 2006). Although, both accounting regimes require development cost that meets the specified conditions to be capitalised, unlike U.K. GAAP, the capitalisation is not an option under the international GAAP.

A number of discrepancies also exist in accounting for asset impairment. Although both *IAS 36 Impairment of Assets* and *FRS 11 Impairment of Fixed Assets* provide examples of the indicators of impairment, the international standard includes additional indicator relating to market capitalisation, i.e. for companies to detect lack of synergy and potential impairment when the carrying value of net assets exceeds its market capitalisation. Furthermore, whenever impairment occurs, U.K. GAAP allocates impairment costs against assets in an income generating unit (IGU) in a priority order of goodwill, other intangible assets and tangible assets whereas IAS 36 uses cash generating unit (CGU) with goodwill and other intangible assets as a single class and then followed by tangible assets. In addition, IAS 36 does not permit reversal of impairment made to goodwill but FRS 11 allows impairment reversal on intangible assets under restricted circumstances. These differences may affect intangible assets as early evidence on the impact of IFRS shows that IFRS has significantly increased assets and liabilities, equities, operating income and net income in the U.K. (Gaston, et al., 2010). Differences in accounting treatments for intangible assets and impairment of assets are summarised in Table 2.

Table 2 shows that recognition of goodwill and intangible assets under IFRS are broader where they do not require rights over intangible assets to be transferable or separable from the entity. In addition, IAS 36 does not require an impairment review where the forecast of cash flows are to be compared against actual cash flows for five consecutive years after the impairment. Horton and Serafeim (2010) also identify these differences including stricter capitalisation of development cost under IFRS where an option for the managers to capitalise development expenditure that meets the recognition criteria has been removed.

Table 2: Accounting Treatments for Impairment of Assets, Goodwill and Intangible Assets under U.K. GAAP and IFRS

Financial Statements' Items	U.K. GAAP	IFRS/IAS
Impairment of Assets	Comparison of **actual cash flows** with **a forecast for each of five years** following an impairment review where recoverable amount is based on value in use *(FRS 11 Impairment of Assets)*	*IAS 36 Impairment of Assets* **does not** require such reviews and the IASB has rejected such as test
Goodwill and Intangible Assets	Recognition of Intangible assets; capitalised at cost (if purchased separately), separable if can be measured reliably otherwise subsumed within goodwill (business acquisition/combination), at readily ascertainable market value (developed internally) *(FRS 10 Goodwill and Intangible Assets)*	Recognition of an asset as an intangible assets when it arises from contractual or other legal rights, regardless of whether those rights are transferable or separable from the entity or from other rights and obligations *(IAS 38 Intangible Assets)*

Source: D Cairns (2004) The Implications of IAS/IFRS for U.K. companies, International Journal of Disclosure and Governance; 1(2)

Definitions

Financial reporting approaches or bases are defined as either an asset/liability or revenue/expense approach to financial accounting and reporting. An asset/liability is also known as a balance sheet or a valuation approach where income is measured by an increase in the net worth of a company. On the other hand, a revenue/expense approach is sometimes called a matching based (transaction based) or income statement approach which directly implies that an income shall be determined by

matching revenue with all expenses incurred to generate that revenue for a particular period (Fox et al., 2003).

Mandatory adopters are defined as companies which have to adopt IFRS after the European Commission's decision to mandate IFRS to all listed companies in the European countries (Li, 2010). IFRS refers to both IAS (international accounting standards issued by IASC) and IFRS (international financial reporting standards issued by the IASB, the IASC's successor). U.K. GAAP covers all accounting standards issued by the ASB and other accounting regulation in the U.K. including rules and regulation under the Companies Act 1989.

The indicators of a balance sheet approach to financial reporting are based on Dichev (2008), Dichev and Tang (2009) and Dechow and Ge (2006). A balance sheet approach involves valuation of assets and liabilities which would manifest in financial statements in terms of lower accruals, higher impairment charges and subsequently cause a declining matching of expenses against revenue. Matching of expenses against revenue is measured by the correlation coefficient of expenses in a multiple regressions model where current revenue is regressed on current expenses, previous year expenses and subsequent year expenses.

5.3. Development of the Hypotheses

Prior studies that investigate the direct effects of IFRS are only intitial studies. For example, based on the 2004's reconciliation statements, the greatest average impact as a percentage of profit was on goodwill (39.05%, IFRS 3) and investment properties (41.68%, IAS 40) (Stenka, et al., 2008). International accounting standards that apply to these accounting items are *IFRS 3 Business Combination, IAS 36 Impairment of Assets, IAS 38 Intangible Assets and IAS 40 Investment Properties* which contain fair value rules. However, investment properties are only prevalent in specific industries such as real estate and estate management companies and fair value accounting for investment properties is already an alternative method under U.K. GAAP. Thus, this study did not intend to examine the impact of IFRS on

investment properties. Instead, it aimed at gathering empirical evidence on how IFRS affects accounting information of companies at large and it focused on earnings and intangible assets (including goodwill) and indicators of a valuation approach. Besides, in the U.K., accounting for goodwill has undergone major changes after the adoption of IFRS (Roberts, et al., 2008) where an amortisation regime is replaced by an impairment regime. Carrying balance for goodwill is expected to increase under IFRS because impairment is not fixed per year and it involves a higher degree of subjectivity. Since reporting intangible assets prior to the year 2005 are largely comprised of goodwill, for consistent analysis, this study also examined changes in goodwill.

Based on these changes in accounting rules for intangible assets and impairment of assets and early evidence from existing studies, this study proposes that earnings and intangible assets will increase under IFRS. Intangible assets are expected to increase under IFRS because of three reasons. First, goodwill, the main component of intangible assets is no longer amortised. Although it is subjected to the annual impairment test, impairment is uncertain and is unlikely to occur every year. Second, the definition of intangible assets under IFRS is broader (Cairns, 2004) and less strict (Horton and Serafeim, 2006). Third, an option not to capitalise development costs that meet the recognition criteria has been removed. Therefore, the first null hypothesis and alternative or research hypothesis were as follows,

H_0: IFRS has not significantly affected earnings and intangible assets

H_1: IFRS has significantly increased earnings and intangible assets

Based on the current debate on the financial reporting approach and existing evidence from the literature, the adoption of IFRS is expected to shift financial reporting approach further away from a matching approach towards a valuation approach. A greater domination of valuation approach is measured via its indicators; lower accruals and increase impairment charges. In addition, effects on accruals and impairment would be reflected in the lower degree of matching between revenue and expenses. Previous studies such as Dichev and Tang (2008), find evidence of poorer

matching of expenses against revenue for the past 40 years and thus, the same trend is expected to occur in the U.K.

H_0: IFRS has not significantly further shifted the financial reporting approach from a matching approach to a valuation approach
H_2: IFRS has significantly further shifted the financial reporting approach from a matching approach to a valuation approach

5.4 Research Design and Methods of Investigation

This section describes research designs, including how the sample is selected. It explains how the variables are measured and what methods are used to test the hypotheses.

Sample Selection

The study sample consisted of all U.K. listed companies which used pound sterling (£) as their reporting currency. To test the first part of the research hypothesis, the sample size was smaller because it only included companies that adopt IFRS for the first time in 2005 (financial year ended 31 December). These companies were those with data available for four post-IFRS fiscal years, the longest possible period at the time of data collection (January 2009) to be compared against pre-IFRS period. It employed a classical test of hypothesis, i.e. the means-comparison paired t-test to test the hypotheses. In this test, the average of earnings and intangible assets for pre-IFRS period for a particular company was compared against its respective averages for post-IFRS period. To test the impact of IFRS on matching of expense against revenue, the sample was larger, consisted of listed company that met the sample selection criteria (refer Table 3). The derivation of the study sample is shown in Table 3. Table 4 provides the breakdown of the larger sample for the second part of the second hypothesis.

Table 3: Derivation of the Study Sample (1st Filter - Reporting Currency)

Criteria	No. of companies	Frequency/ Relative Frequency
All companies on the U.K. stock exchange (extracted from the Data Stream on 28 Jan 2009)	2,148	100 %
Reporting in GBP (£)	1,501	70%
Reporting in USD ($)	248	12%
Others	399	18%

Table 3 shows the first stage of the sample selection. Only companies that use GBP (£) as the reporting currency are considered for the next stage (Table 4). All companies are from the all share index (London Stock Exchange). This data is as on 30 January 2009, the data collection date.

The population data are defined as all U.K. listed companies which use the pound sterling (GBP) as their reporting currency. Based on the Data Stream listing as on 30 January 2009, there were 1,501 companies that meet the sample selection criteria. However, only 711 companies were selected because the remaining companies did not have sufficient number of annual reports, i.e., for the study period of ten years. In other words, this study only included companies which have been established before or in the year 1999. Table 4 summarises the sample grouping by the first year of reporting under IFRS and by financial or nonfinancial samples.

The sample size for the first hypothesis was 200 companies. These companies had adopted IFRS for the first time since 1 January 2005. Different first years of reporting under IFRS were due to different fiscal year ends and different board of exchanges. Companies that closed accounts on 31 December and were traded on the main board must adopt IFRS for the first time starting from 1 January 2005 and hence, they would close their accounts on 31 December 2005. For non-December year ends companies, their first fiscal year reporting under IFRS commencing in the year 2005 and ending in 2006. For the AIM listed companies, they were required to adopt IFRS effectively from 1 January 2007. Those AIM's companies with 31-December year end would first close their accounts on 31 December 2007 whereas the non-December companies would have closed their accounts in 2008.

Table 4: Derivation of the Study Sample (2nd Filter - year of adopting IFRS)

Criteria	No. of co.	No. of co.
All U.K. listed companies with GBP as the reporting currency (as per DataStream) (from Table 3)		1501
Companies with available data for 1999 to 2008 (A)		711
Companies which still do not adopt IFRS in 2008 (B)[12]		
Financial	3	
Nonfinancial	11	(14)
Companies with 1st financial reports under IFRS in 2005 (C)		
Financial	36	
Nonfinancial	164	
Sample size for the 1st part of the first research hypothesis and 1st part of the second hypothesis)		**200**
Companies with 1st financial reports under IFRS in 2006 (D)		
Financial	43	
Nonfinancial	214	257
Companies with 1st financial reports under IFRS in 2007 (E)		
Financial	21	
Nonfinancial	79	99
Companies with 1st financial reports under IFRS in 2008 (F)		
Financial	20	
Nonfinancial	121	141
Sample size for the 2nd part of the second hypothesis		**697**

Table 4 illustrates the second stage of the sample selection. Sample size for the second part of the second hypothesis was determined by A minus B plus C, D, E and F. Companies that adopt IFRS in 2007 (E) and 2008 (F) are from the AIM index as they are subjected to IFRS from 1 January 2007.

[12] Group B companies are small companies in terms of market values which are on average only 0.3% as compared to those companies in Group C; half of them were generally making loss during the study period; all are audited by non-big 4 audit firms; and majority are generally classified by Datastream as industrial (10 out of 11 companies). For example, Cassidy Brothers, Palmaris and Peel Hotels from the Toys Industry, Coal Industry and Hotel Industry respectively.

The sample size for the second part of the second hypothesis was larger, 697 companies because it included AIM companies. The majority of sample was nonfinancial companies (578) whereas the remaining companies were financial companies (120). In the data analysis, the financial and non-financial sample were analysed separately to control for their distinctive nature of operating and non-operating assets and liabilities. In addition, the study period was also longer because it employed time series regressions. The period was 29 years, starting from 1980 and ending in 2008. In the related studies, such as Dichev and Tang (2008), the study period was longer, i.e. 40 years. However, this study could not cover a longer period due to the unavailability of data. A shorter time period was not uncommon in the existing literature of a time series regression analysis. For example, Jayaraman (2007)'s study period was only fifteen years. Combining the number of companies and the study period, the sample size was 13,427 company-year observations.

Methods of Investigation

The impact of IFRS on earnings and intangible assets are assessed using a classical hypothesis testing where the means of earnings and intangible assets under IFRS and U.K. GAAP for a company are compared (paired-t test). The same test applies to two of the indicators of a valuation approach; accruals and impairment charges. Except for accruals and matching, the indicators were direct accounting items, generated from the Data Stream. Total current accruals and operating accruals were determined in accordance with prior studies and were discussed in the subsequent paragraphs. Matching was measured by the correlation coefficient between revenue and expenses (previous or one-year lagged, current and future or one-year ahead) (Dichev and Tang, 2008). The main focus is on the matching of current expenses against current revenue.

Accruals

Accruals are proxies for a matching approach to financial reporting. Two categories of accruals are widely used in the literature, namely, operating and total accruals.

Also, there are two approaches to determine accruals; direct approach (cash flows statement figures) and indirect approach (using balance sheet figures). Dechow and Ge (2006) follow Hribar and Collin (2002)'s recommendation to use data directly from the cash flow statement as compared to other previous studies which calculate accruals based on balance sheet items (Richardson, et al., 2005). Hribar and Collin (2002) highlight that the use of balance sheet data can introduce errors into the measurement of accruals, which is very likely to occur in the presence of mergers and acquisitions. Under the recommended (direct) approach, accruals are calculated as follows,

Operating accruals = (Net income – CFO)/Average Assets
Total accruals = (Net income – FCF)/Average Assets
Where:

- Net income is earnings before extraordinary items
- CFO is cash flows from operations
- FCF is free cash flows, i.e., cash flows from operations plus cash flows from investing activities

FCF better matches the flows of earnings because earnings include capital charges such as depreciation and amortisation. Besides, it reflects both the impact of cash spent on property, plant and equipment and other investment that have been capitalised as assets on the balance sheet as well as cash received from divested assets and other investment. For robustness, total current accruals (TCA) and total accruals (TA) were also calculated using the balance sheet or an indirect approach (Francis et al., 2004).

$$TCA_{it} = \Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta STDebt_{it} \quad (1)$$

$$TA_{it} = \Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta STDebt_{it} - (Depn_{it} + \text{other non-cash expenses}_{it}) \quad (2)$$

Where,

- ΔCA_{it} is changes in current assets, excluding cash balances
- ΔCL_{it} is changes in current liabilities, excluding short term debts

- $\Delta Cash_{it}$ is changes in cash balances
- $\Delta STDebt_{it}$ is changes in short term debt, or debt in current liabilities

For the 2nd part of the second hypothesis, matching of expenses against revenue was measured by the estimated coefficient correlations between current revenue and current expenses. The regression model was replicated from Dichev and Tang (2008) as follows,

$$Rev_t = \alpha + ß_1 Exp_t + ß_2 Exp_{t-1} + ß_3 Exp_{t+1} + \varepsilon_t \quad (3)$$

Where,

- Rev_t is current revenue or revenue in year t;
- Exp_t is current expenses or expenses in year t;
- Exp_{t-1} is the previous year expenses or 1-year lagged expenses and
- Exp_{t+1} is the future expenses or 1-year forward expenses
- ε_t is the residuals

5.5 Data Analysis and Findings

This section discusses the results from the data analysis; trends in the accounting variables of interests by graphs, descriptive statistics, the paired t-test and the time series regression. These results are presented in accordance to the hypothesis.

Trends in the Intangible Assets, Different Classes of Intangibles and Non-cash Expenses

Figures 3 to 7 illustrate trends in intangible assets and goodwill, different classes of intangible assets, non-cash expenses and different impairment expenses. Impairment charges are directly related to the non-tangible assets, particularly the intangible assets, and the first two graphs shed some insights into trends in intangible assets during the study period (1999 to 2008). These graphs were drawn based on accounting data, extracted from the Data Stream, of U.K. listed companies which had

adopted IFRS for the first time in the year 2005. Average assets per year were used to deflate the data in order to minimise the heterokedasticity in the data. Average assets per year were calculated by adding opening assets to closing assets and then divided the total by two. The deflated data was aggregated by year.

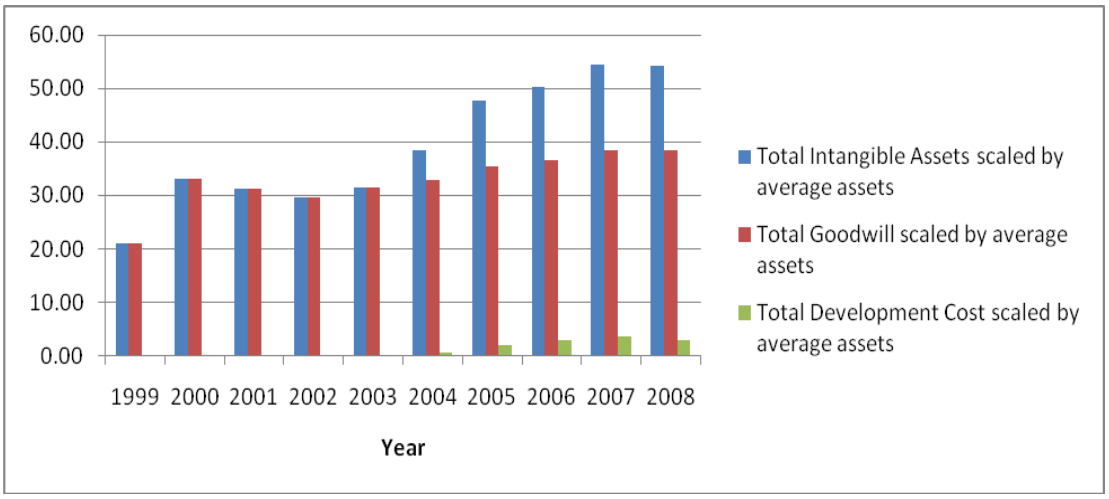

Figure 3: Trends in Intangible Assets and Goodwill (in £ per average assets)

Figure 3 shows that trends in reported goodwill during the 10-year period closely follows the trends in reported intangible assets. In five of the six pre-IFRS fiscal years, reported goodwill equalled intangible assets, indicating that the only reported intangible assets during those fiscal years were goodwill. However, post-IFRS, companies started to report other classes of intangible assets. Development cost was rarely reported (Stark, 2008) and most was expensed off. Figure 4 illustrates trends in different classes of intangible assets throughout of the study period. This observation is further signified by the next graph (Figure 4).

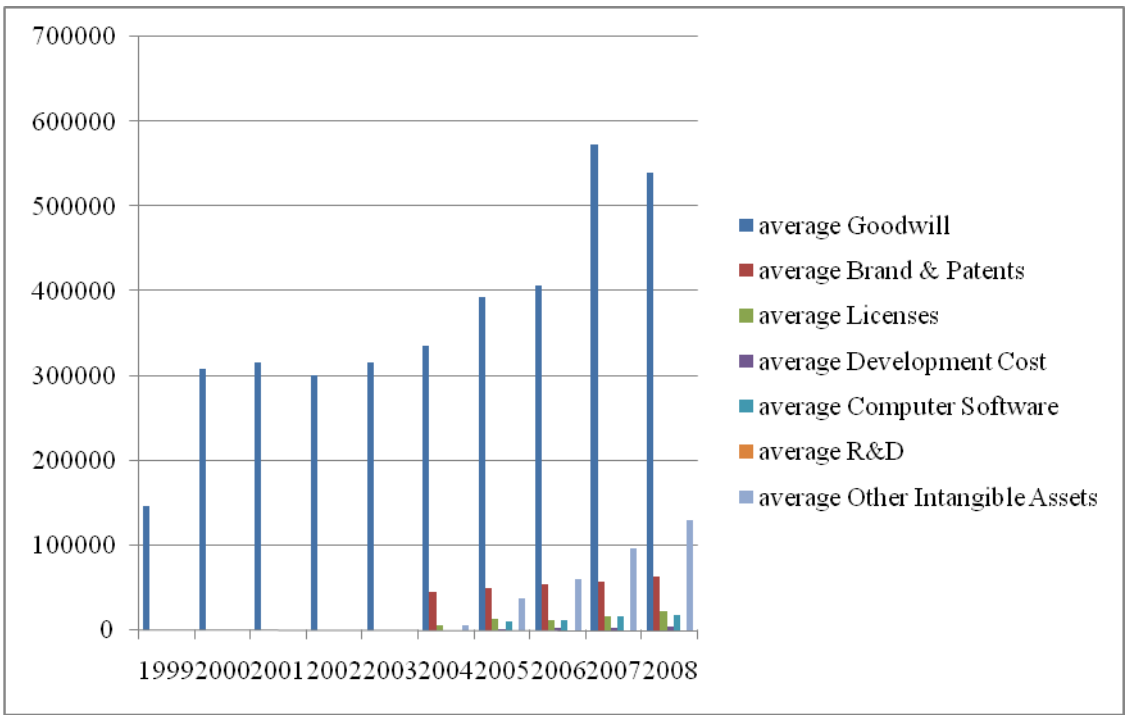

Figure 4: Trends in Different Classes of intangible assets (in £000s)

Figure 4 confirms that prior to 2004, purchased goodwill was the only class of capitalised intangible assets. Since 2004, other classes of intangible assets are gradually being reported in the financial report. Research and development cost (R&D) was miniscule relative to the total intangible assets and goodwill, indicating that management had opted to expense off R&D under U.K. GAAP (Stark, 2008). Consistent with changes in the business environment towards more knowledge based orientated, intangible assets such as computer software, brands and patents and licenses were gradually increasing throughout the study period. Nevertheless, difficulties in classifying intangible assets might force companies to group them as other intangible assets (Nixon, 1997) which were also on an increasing trend. Goodwill had gradually increased during the 10-year period and was at the highest level in the year 2007. Based on these trends, impairment and amortisation of intangible assets were expected to significantly increase after IFRS adoption. The following figure compares total amortisation and total impairment with total non-cash expenses.

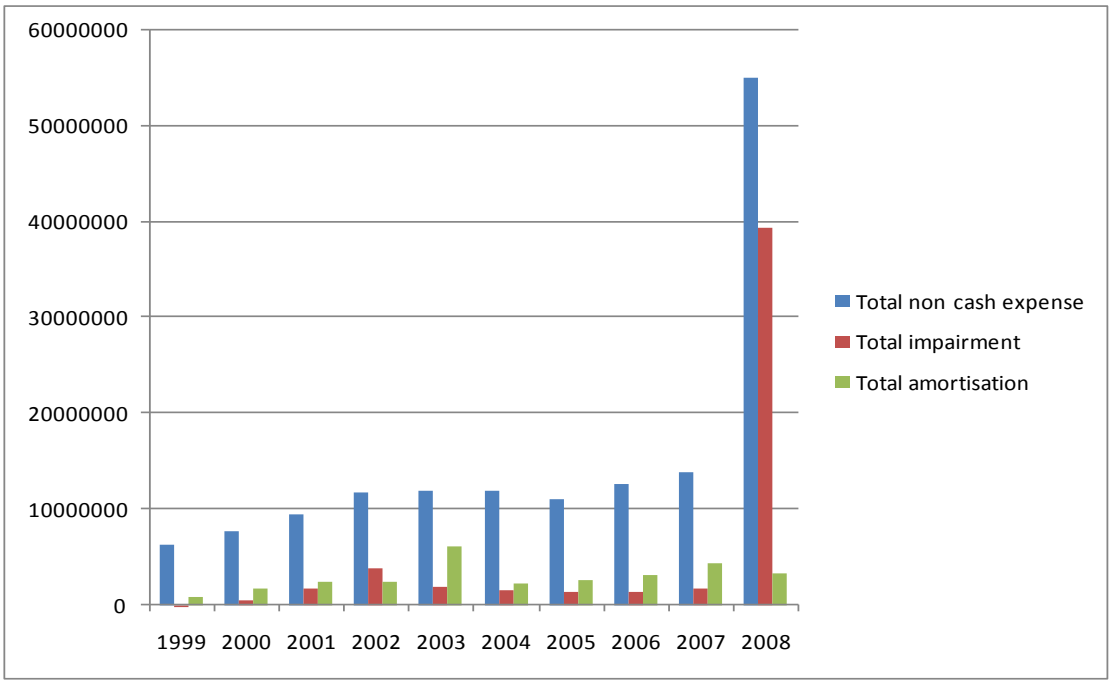

Figure 5: Trends in Total Non Cash Expenses, Impairment and Amortisation Expense (in £000s)

Figure 5 illustrates that non-cash expenses were generally lower during pre-IFRS period than post-IFRS period except in the year 2005. Non-cash expenses are consisting of depreciation, depletion, impairment, amortisation and other non-cash expenses. Changes in these expenses were very moderate and not drastic prior to IFRS adoption. These trends persisted only three years after IFRS. In 2008, non-cash expense shot up, which was hugely contributed by the impairment expense. This substantiated the notion that fair value rules in general, and impairment expense in specific could inject volatility into financial statements (Barth, 2006; Wines et al., 2007). The next graph illustrates different sources of impairment expenses during the study period for financial and nonfinancial samples.

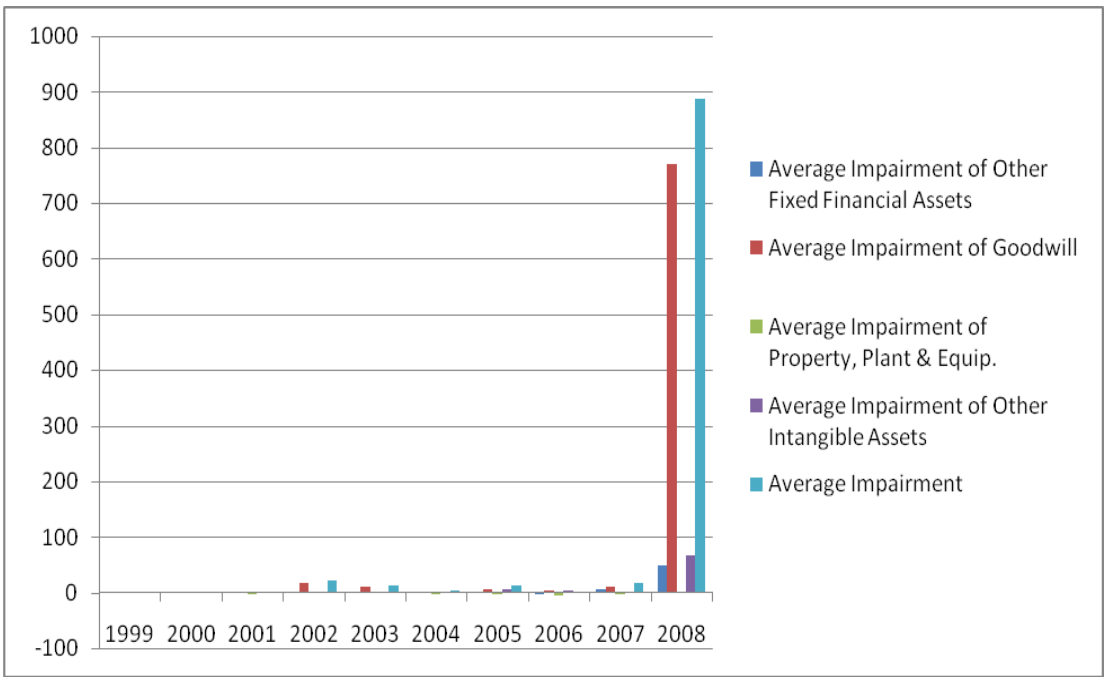

Figure 6: Trends in Average Impairment Expenses and Its Main Classes for Financial Sample (in £million)

There were four main accounting items that contributed to the impairment expenses; other fixed financial assets, goodwill, property, plant and equipment and other intangible assets. Figure 6 indicates that impairment expenses for financial companies are substantially high in the year 2008. This reflects the economic consequences of the financial crisis where financial companies have to write offs their assets, particularly goodwill, other intangible assets and other fixed financial assets. Figure 8 further illustrated this trend.

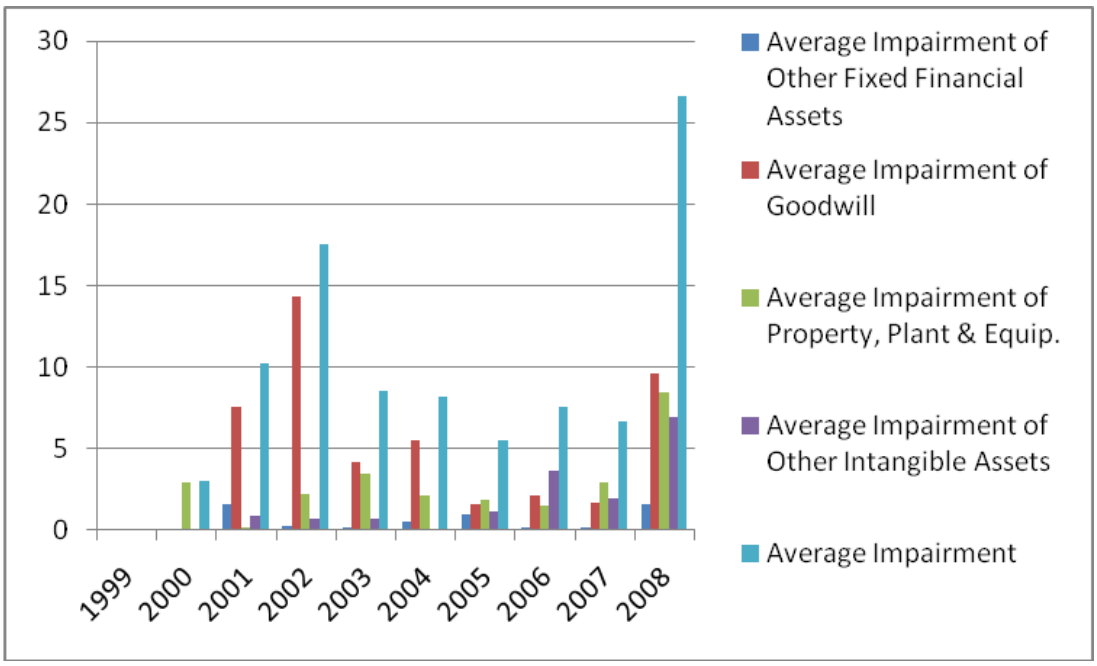

Figure 7: Trends in Average Impairment Expenses and Its Main Classes for NonFinancial Sample (in £million)

For nonfinancial companies, Figure 7 shows that U.K. companies have already charged impairment of goodwill prior to IFRS which is allowed by FRS 10. The graph shows that impairment of other intangible assets is increasing after IFRS. Generally, the amount of average impairment expense was lower than the financial sample. Similar to the financial sample, average impairment expense was the highest in the year 2008. However, the impairment charge per £1 of average non-current assets were actually at peak in the first year of IFRS adoption (refer Figure 9).

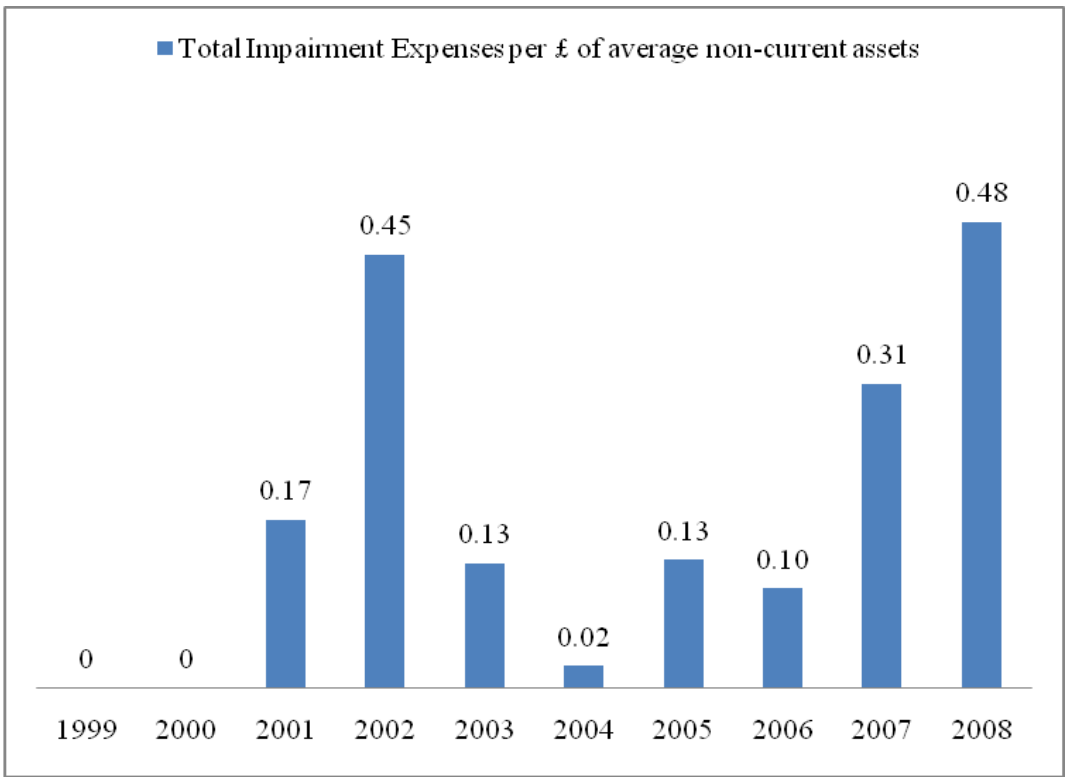

Figure 8: Trends in Deflated Total Impairment Expenses for Financial Sample

Although total impairment expenses prior to 2008 were comparatively low as compared to in 2008 (Figure 6), total impairment expenses per every pound of noncurrent assets for financial companies followed a bell-shaped trend. Figure 8 shows that it is at the highest level in the year 2008 which is consistent with the average impairment expense trend in Figure 6.

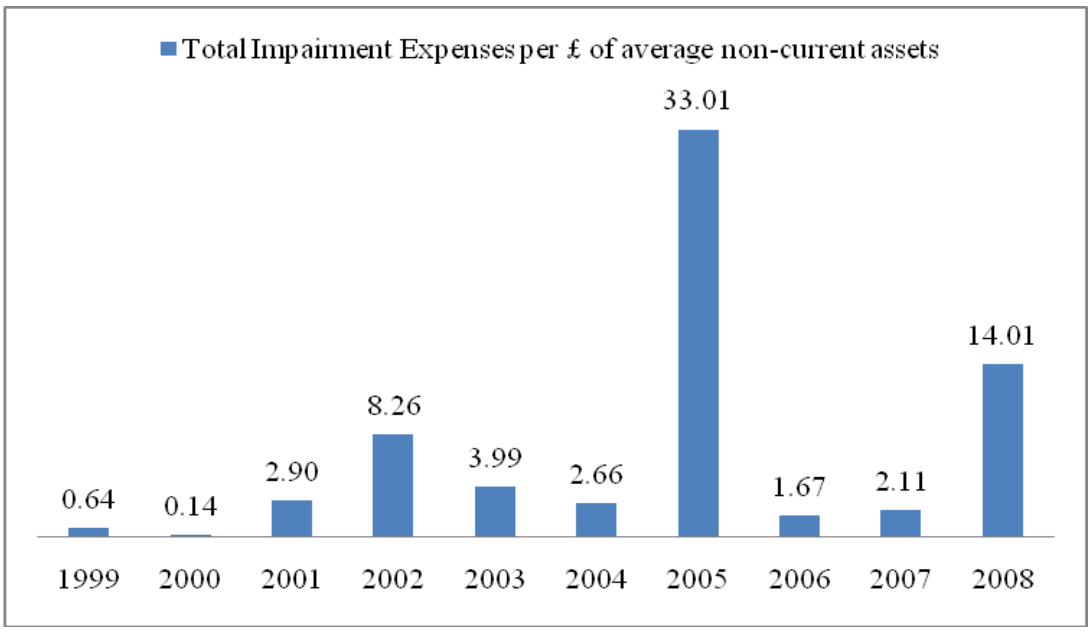

Figure 9: Trends in Deflated Total Impairment Expenses for NonFinancial Sample

When total impairment expenses of each company were deflated by average non-current assets, impairment expense for nonfinancial sample followed a bell-shaped distribution over four or five years. Except for the year 2005, IFRS did not seem to significantly change this pattern. Total deflated impairment expense in the 2005, was exceptionally high as compared to the other financial years, reflecting the drastic change in the accounting treatment for goodwill from amortisation to impairment. This figure suggests that for consistent comparison purposes, companies have added back amortisation of goodwill in the year 2004 (Clarkson et al., 2011) and might have charged it as impairment expenses in the year 2005. Other than the substantial increase in the total impairment expense in 2005, the trend of the deflated total impairment post-IFRS was consistent with the bell-shaped distribution but with steeper slope. Table 5 shows the distribution of companies and their accounting treatment for goodwill throughout the study period.

Table 5: Distribution of Companies with Goodwill, Amortisation and Impairment of Goodwill

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Companies & Goodwill										
No goodwill	20	4	3	1	1	2	1		1	1
Zero goodwill c/f	64	59	54	55	50	46	41	35	29	31
Negative goodwill c/f		1								
With goodwill c/f	127	147	154	155	160	163	169	176	181	179
Total no. companies	211	211	211	211	211	211	211	211	211	211
Amortisation Regime										
Amortised goodwill	1	2	3	1	7	129	3			1
Zero goodwill c/f & amortised goodwill						3				
Reverse amortised goodwill						2				
Not amortise goodwill	126	145	151	154	153	29	166	176	181	178
No. companies	127	147	154	155	160	163	169	176	181	179
Impairment Regime										
Zero goodwill c/f & impairment	1		1	3		4	1	2	4	4
Impair goodwill			19	27	31	22	33	34	30	46
Not impair goodwill	125	147	135	127	129	141	133	142	151	133
No. of companies	126	147	155	157	160	167	167	178	185	183

Table 5 illustrates companies' accounting treatments for goodwill during the study period. No goodwill is where goodwill is not applicable to a particular company. Zero goodwill c/f refers to a company with a positive goodwill in previous years but reported a nil balance of goodwill for the current year. The number of companies was greater than the final sample for the first hypothesis because it included companies with extreme cases.

Table 5 shows the number of companies with and without carrying value of goodwill, and their accounting treatments for goodwill (amortisation or impairment regimes). Zero carry forward goodwill represented companies which had an opening balance of goodwill but had either amortised or impaired all of this goodwill, leaving a zero or nil closing balance of goodwill. Thirty percent of the study sample reported zero closing balance of goodwill in 1999 and it gradually declined to only fifteen

percent in 2008. About nine percent of the sample did not carry goodwill on their balance sheets at the beginning of the study period which had reduced to less than one percent after IFRS adoption. Except for one company with negative goodwill in the year 2000, the remaining companies, ranging from sixty to eighty five percent of the sample did carry a certain amount of goodwill in their financial statements.

Table 5 also illustrates that the majority of companies carry goodwill with indefinite useful lives (Wyatt, 2008; Stark, 2008). Hence, they do not amortise their goodwill. Less than 3% of companies with positive goodwill and zero balance of goodwill had charged amortisation of goodwill in the year 1999 to 2003. FRS 10 prescribes that companies must amortise goodwill unless they can demonstrate that the benefits accrue from their goodwill last longer than 20 years. The lower number of companies under the amortisation regime prior to 2005 suggests that more goodwill had useful lives longer than 20 years. Some companies charged impairment of goodwill since the year 2003 and the number of companies with impairment of goodwill were growing from thirteen percent (13%) to about twenty-six percent (26%) in the year 2008. However, there were a large number of companies that had amortised their goodwill in the year 2004 which supported similar observation in Figure 7. In addition, 60% of companies had amortised goodwill in 2004. This suggests that companies intend to start adopting IFRS with clean balance sheets. To control the effect of this transitional year (2004), the year 2004 was excluded from the pre-IFRS (2001, 2002, and 2003).

The descriptive statistics and results of the t-test for the first research hypothesis were discussed in the subsequent section.

5.6 The Impact of IFRS on Earnings and Intangible Assets

This section discusses results for the first hypothesis which is generated from the classical testing of hypotheses (mean-comparison test, paired-t test).

Existing studies suggest that earnings are higher under IFRS as compared to local GAAP. However, this evidence is largely based on voluntary adopters (Hung and Subramanyam, 2007), 2004's reconciliation statements (Horton and Serafeim, 2009) and shorter time horizon (Iatridis, 2010). This study intended to provide additional evidence by testing a hypothesis that earnings were higher after IFRS. This study controls for country-specific factors because it is conducted in a single country setting where the legal and regulatory institutions are alike.

In addition, this study also examines the impact of IFRS on five different profit lines; operating income, operating income before depreciation and amortisation, earnings before interest and depreciation, net income before extraordinary items and preferred dividends, and net income. Every company in the sample had reported net income, net income before extraordinary items and preferred dividends and operating income. However, about 50% of the financial companies did not report operating income before depreciation and amortisation and earnings before interest and depreciation prior to 2005.

Prior to IFRS, U.K. companies could choose from four formats of income statements (the Schedule 4 of the Companies Act). IFRS clearly specifies minimum disclosures of information to be reported on the face of the income statement. However, IFRS does not require companies to formally differentiate between extraordinary and exceptional items which may standardise the presentation of financial statements. This study found that after IFRS adoption, all companies had reported the five profit lines, suggesting the adoption of IFRS standardised the income statement format among financial companies.

The five profit lines were obtained from the Data Stream and their codes were; net income available to common shareholders (Data Stream code-WC01751), net income before extraordinary items and preferred dividends (Data Stream code-WC01551), operating income (Data Stream code-WC01250), operating income before depreciation and amortisation (Data Stream code-WC18155) and earnings before interest, taxes and depreciation (Data Stream code-WC18198).

The first hypothesis is,

H_1: IFRS had significantly increased earnings and intangible assets

This study employed a classical test of the hypothesis of mean-comparison using a paired t - test. The null hypothesis proposes that the mean difference between post-IFRS and pre-IFRS equalled zero. Each mean of the profit lines for each company during pre-IFRS was compared against its respective means during post-IFRS. Therefore, this study controlled for company-fixed characteristics and other factors specific to a particular company that might influence the reported profit. To be consistent with existing studies, financial companies and nonfinancial companies were analysed separately.

The means were compared between three pairs of sub-periods (all pre- and post-fiscal years, excluding the transitional years, and equal number of fiscal years for pre and post-IFRS); pre-IFRS (1999 – 2004) vs. post-IFRS (2005 – 2008), pre-IFRS (1999 – 2003) vs. post-IFRS (2006 – 2008), and pre-IFRS (2001 – 2003) vs. post-IFRS (2006 – 2008). Testing the mean differences of the five profit lines between the sub-periods that exclude the transitional years (2004 and 2005) and of equal length (three years each) would control for the influence of the transitional and the first year of IFRS adoption and unequal length of pre- and post-IFRS periods on the results. This approach also helps to identify whether earnings in the transitional years are substantially different from other fiscal years.

Financial Sample

There were forty financial companies in this sample. Results for both one-tail and two-tailed paired-t tests were presented separately.

Table 6: IFRS and Net Income Available to Common Shareholders (Financial Sample)

Profit Line	NET INCOME AVAILABLE TO COMMON					
T-Test: Paired Two Sample for Means	All Fiscal Years		Excl. 2004 & 2005		Equal Length & excl. 2004 &2005	
	1999-04	2005-08	1999-03	2006-08	2001-03	2006-08
	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS
Mean (£million)	220	239	195	161	186	161
Observations	40	40	40	40	40	40
Pearson Correlation	0.606		0.399		0.333	
Hypothesized Mean Difference	0		0		0	
P(T<=t) one-tail	0.427		0.409		0.435	
P(T<=t) two-tail	0.854		0.818		0.871	

Table 6 summarises results from the paired t-test. The year 2004 and 2005 are excluded to control for the adjustments made in the IFRS transitional years. ***,**,* denotes significant at 1%, 5% and 10% respectively.

Table 6 shows that the average net income available to common shareholders for financial companies was higher during pre-IFRS. However, when the transitional years, (2004 and 2005) were excluded and equal lengths for pre- and post-IFRS were used, the average net income was lower in post-IFRS period. Nevertheless, these differences were not significant at 5% significance level. Hence, the null hypothesis is rejected and this study infers that there is insufficient statistical evidence to conclude that the net income was significantly different under IFRS. The evidence from this study suggests that accounting rules under IFRS do not produce significantly lower net income than U.K. GAAP. This might be due to some of the fair value rules for financial assets and financial liabilities under IFRS have been carved out by the European Commission (Schipper, 2005) and hence, these rules are not applicable to European listed companies. Accounting rules under IFRS may also produce offsetting effects. For example, an increase in amortisation expenses may offset gains from revaluation of non-tangible assets.

Table 7: IFRS and Net Income before Extraordinary Items and Preferred Dividends (Financial Sample)

Profit Line	NET INC BEFORE EXTRAORDINARY ITEMS/PREFERRED DIVIDENDS					
T-Test: Paired Two Sample for Means	All Fiscal Years		Excl. 2004 & 2005		Equal Length & excl. 2004 &2005	
	1999-04	2005-08	1999-03	2006-08	2001-03	2006-08
	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS
Mean (£million)	239	249	216	172	217	172
Observations	40	40	40	40	40	40
Pearson Correlation	0.545		0.287		0.174	
Hypothesized Mean Difference	0		0		0	
P(T<=t) one-tail	0.465		0.391		0.399	
P(T<=t) two-tail	0.929		0.782		0.798	

Table 7 summarises results from the paired t-test. The year 2004 and 2005 are excluded to control for the adjustments made in the IFRS transitional years. ***,**,* denotes significant at 1%, 5% and 10% respectively.

The means of net income before extraordinary items and preferred dividends for pre and post-IFRS were less correlated than the net income (Table 7) as indicated by the lower Pearson correlation coefficients. However, similar to the net income for common shareholders, they were higher in post-IFRS period when all fiscal years were considered. When they were compared without the transitional years (2004 and 2005) and under equal lengths of pre- and post-IFRS, they were higher under U.K. GAAP. This suggests that greater earnings figure for financial companies during post-IFRS are due to the adjustments made in 2004 and 2005. However, based on the p-values, these differences were not significant.

Table 8: IFRS and Operating Income (Financial Sample)

Profit Line	OPERATING INCOME					
T-Test: Paired Two Sample for Means	All Fiscal Years		Excl. 2004 & 2005		Equal Length & excl. 2004 &2005	
	1999-04	2005-08	1999-03	2006-08	2001-03	2006-08
	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS
Mean (£million)	385	547	304	464	266	464
Observations	40	40	40	40	40	40
Pearson Correlation	0.914		0.877		0.833	
Hypothesized Mean Difference	0		0		0	
P(T<=t) one-tail	**0.029****		**0.043****		**0.047****	
P(T<=t) two-tail	**0.059***		**0.086***		**0.095***	

Table 8 summarises results from the paired t-test. The year 2004 and 2005 are excluded to control for the adjustments made in the IFRS transitional years. ***,**,* denotes significant at 1%, 5% and 10% respectively.

Table 8 shows that average operating incomes for pre- and post-IFRS are highly correlated. The Pearson correlation coefficients were greater than 0.6. Their means were greater under IFRS for all three comparisons. Their differences were significantly higher during post-IFRS period at 5 % significance level for the one-tail tests and significant at 10% significance level for the two-tailed tests. This study infers that there is sufficient statistical evidence to reject the null hypothesis. These results suggest that operating income for financial companies is significantly higher under IFRS. This indicates that differences between IFRS and U.K. GAAP are relating to accounting items for the determination of operating profits. For example, the remaining fair value rules under IFRS might have injected additional income to financial companies. Despite the financial crisis in 2007 and 2008, operating incomes for financial companies are still significantly higher under IFRS. This evidence supports Barth et al. (2010) that fair value rules (and IFRS) are not to be blamed for

the financial crisis as operating incomes for financial companies are in reality higher under IFRS. Nevertheless, it is still remains to be seen what impact fair value had in instigating the financial crisis.

Table 9: IFRS and Operating Income before Depreciation and Amortisation (Financial Sample)

Profit Line	OPERATING INCOME BEFORE DEPN & AMORT					
T-Test: Paired Two Sample for Means	All Fiscal Years		Excl. 2004 & 2005		Equal Length & excl. 2004 &2005	
	1999-04	2005-08	1999-03	2006-08	2001-03	2006-08
	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS
Mean (£million)	35	51	33	46	35	46
Observations	22	22	22	22	22	22
Pearson Correlation	0.884		0.840		0.843	
Hypothesized Mean Difference	0		0		0	
P(T<=t) one-tail	**0.009*** **		**0.021** **		**0.034** **	
P(T<=t) two-tail	**0.019** **		**0.042** **		**0.069***	

Table 9 summarises results from the paired t-test. The year 2004 and 2005 are excluded to control for the adjustments made in the IFRS transitional years. ***,**,* denotes significant at 1%, 5% and 10% respectively.

Table 9 shows that only twenty-two financial companies reported this profit line prior to IFRS. Eighteen companies or forty-five percent of financial sample started to report operating income before depreciation and amortisation after IFRS. The smaller sample size contributes to lower average operating profit before depreciation and amortisation than average operating income (Table 8). The lower averages also suggest that these companies are those reported lower operating profit. The t-test results show that operating profit before depreciation and amortisation is significantly higher under IFRS. The inclusion of the transitional years and unequal lengths between pre- and post-IFRS did not change the test results.

Table 10: IFRS and Earnings before Interest, Taxes and Depreciation (Financial Sample)

Profit Line	EARNINGS BEFORE INTEREST & DEPRECIATION					
T-Test: Paired Two Sample for Means	All Fiscal Years		Excl. 2004 & 2005		Equal Length & excl. 2004 &2005	
	1999-04	2005-08	1999-03	2006-08	2001-03	2006-08
	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS
Mean (£million)	64	43	60	13	62	13
Observations	22	22	22	22	22	22
Pearson Correlation	0.353		-0.196		-0.165	
Hypothesized Mean Difference	0		0		0	
P(T<=t) one-tail	0.121		**0.054***		**0.045****	
P(T<=t) two-tail	0.244		0.108		**0.091***	

Table 10 summarises results from the paired t-test for earnings before interest, taxes and depreciation. The year 2004 and 2005 are excluded to control for the adjustments made in the IFRS transitional years. ***,**,* denotes significant at 1%, 5% and 10% respectively.

Table 10 shows that average earnings before interest, taxes and depreciation was significantly lower under IFRS when the transitional years were excluded. The results were more significant between equal pre- and post-IFRS periods. This suggests that some accounting rules (e.g. valuation of assets at fair values) under IFRS have reduced earnings before interest, taxes and depreciation.

As a summary, this study makes five inferences for the financial sample. First, IFRS has significantly increased operating profit and operating profit before depreciation and amortisation. Second, earnings before interest, taxes and depreciation are significantly lower under IFRS. Third, IFRS has not significantly affected net income and net income before extraordinary items and preferred dividends. These findings suggest that earnings are significantly affected by differences in accounting rules relating to the determination of operating profit. IFRS does not produce similar effects on all profit lines. In addition, this study indicates that IFRS has effectively standardised the presentation of income statements for financial companies.

Nonfinancial Sample

The sample size for nonfinancial companies was greater, it consisted of one hundred and seventy-one (171) companies. The results are presented in Table 11 to 16 in a similar manner as the financial sample.

Table 11: IFRS and Net Income Available to Common shareholders (Nonfinancial Sample)

Profit Line	NET INCOME AVAILABLE TO COMMON					
T-Test: Paired Two Sample for Means	All Fiscal Years		Excl. 2004 & 2005		Equal Length & excl. 2004 &2005	
	1999-04	2005-08	1999-03	2006-08	2001-03	2006-08
	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS
Mean (£million)	54	220	49	107	42	107
Observations	171	171	171	171	171	171
Pearson Correlation	0.926		0.907		0.884	
Hypothesized Mean Difference	0		0		0	
P(T<=t) one-tail	**0.001*** **		**0.000*** **		**0.000*** **	
P(T<=t) two-tail	**0.003*** **		**0.001*** **		**0.000*** **	

Table 11 summarises results from the paired t-test for net income available to common shareholders. The year 2004 and 2005 are excluded to control for the adjustments made in the IFRS transitional years. ***,**,* denotes significant at 1%, 5% and 10% respectively.

Table 11 shows that net income for common shareholders in pre-IFRS and post-IFRS periods for nonfinancial sample are highly correlated. Their averages were significantly higher under IFRS. They were roughly four times greater than in the pre-IFRS. After excluding 2004 and 2005, average net income remained higher in post-IFRS period. The t-test results show that the average net income in post-IFRS is significantly higher at 1% significance level. Thus, there is sufficient statistical evidence to reject the null hypothesis and to infer that the net income for nonfinancial sample is significantly greater under IFRS. This finding indicates that

net income is not only higher under IFRS in the 2004's reconciliation as suggested by Gaston et al. (2010), it is also applicable to a longer time horizon. Other than changes to accounting for goodwill, intangible assets and impairment assets, changes in accounting for taxation, especially for deferred tax might have contributed to the higher net income under IFRS. The next profit line (net income before extraordinary items and preferred dividends) may indicate if accounting for these two items is different under IFRS and whether they contribute to the significant differences in net income.

Table 12: IFRS and Net Income before Extraordinary Items and Preferred Dividends (Nonfinancial Sample)

Profit Line	NET INC BEFORE EXTRAORDINARY ITEMS/PREFERRED DIVIDENDS					
T-Test: Paired Two Sample for Means	All Fiscal Years		Excl. 2004 & 2005		Equal Length & excl. 2004&2005	
	1999-04	2005-08	1999-03	2006-08	2001-03	2006-08
	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS
Mean (£million)	55	105	51	107	43	107
Observations	171	171	171	171	171	171
Pearson Correlation	0.927		0.909		0.889	
Hypothesized Mean Difference	0		0		0	
P(T<=t) one-tail	**0.000*** **		**0.000*** **		**0.000*** **	
P(T<=t) two-tail	**0.001*** **		**0.001*** **		**0.000*** **	

Table 12 summarises results from the paired t-test for the net income before extraordinary items and preferred dividends. The year 2004 and 2005 are excluded to control for the adjustments made in the IFRS transitional years. ***,**,* denotes significant at 1%, 5% and 10% respectively.

In Table 12, extraordinary items and preferred dividends are added to the net income and will control for the influence of these two items in the net income differences. These two items are not commonly applicable to all companies. Extraordinary items are very unique to an individual company and they occur beyond the normal scope of business operations. Preference dividends depend on whether a company has issued preference shares and the amount of this issued capital. Table 12 shows that the average net income before extraordinary items and preference dividends for post-IFRS are substantially different than the average of net income (Table 11) when post-IFRS includes 2004 and 2005. However, after excluding these transitional years, they

were approximately similar which suggest that adjustments relating to extraordinary items and preference dividends in 2004 and 2005 have reduced net income before extraordinary items and preference dividends. Except for extraordinary items and preference dividend in 2004 and 2005, these two items under IFRS does not substantially affect net income. The t-tests results show that their averages are significantly higher during post IFRS at 1% significance level. These differences are likely not due to extraordinary items and preference shares but might be contributed by differences in accounting for taxation (e.g. Finningham, 2010; Paananem, 2008). However, changes in accounting for taxation (and deferred tax) brought by IFRS are beyond this study research scope. As being mentioned earlier, this study focuses on accounting for goodwill, intangible assets and impairment of assets which will be captured by operating income. The next table illustrates whether operating income is significantly different (and higher) under IFRS.

Table 13: IFRS and Operating Income (Nonfinancial Sample)

Profit Line	OPERATING INCOME					
T-Test: Paired Two Sample for Means	All Fiscal Years		Excl. 2004 & 2005		Equal Length & excl. 2004&2005	
	1999-04	2005-08	1999-03	2006-08	2001-03	2006-08
	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS
Mean (£million)	105	174	103	182	103	182
Observations	171	171	171	171	171	171
Pearson Correlation	0.963		0.952		0.938	
Hypothesized Mean Difference	0		0		0	
P(T<=t) one-tail	**0.000*** **		**0.000*** **		**0.000*** **	
P(T<=t) two-tail	**0.000*** **		**0.000*** **		**0.000*** **	

Table 13 summarises results from the paired t-test for the operating income. The year 2004 and 2005 are excluded to control for the adjustments made in the IFRS transitional years. ***,**,* denotes significant at 1%, 5% and 10% respectively.

Table 13 illustrates that the average operating income in post-IFRS is more than one and a half times greater than in pre-IFRS. However, they were highly correlated; suggesting that either they were accounted in approximately equal basis or most of them reflected the underlying economic performance which was persisted in both

sub-periods. Nevertheless, their differences were significant at 1% significance level. Operating income under IFRS was significantly higher than under U.K. GAAP at 1% significance level. Changing from amortisation regime to impairment regime may avoid the mechanic charge of goodwill to the income statement and hence, among other factors, it may contribute to the higher operating income. Gaston et al. (2010) argue that operating income is higher under IFRS and this study shows that the scenario sustains beyond the transitional year. The following test on operating income before depreciation and amortisation provides evidence on whether depreciation and amortisation contribute to the higher operating income under IFRS.

Table 14: IFRS and Operating Income before Depreciation and Amortisation (Nonfinancial Sample)

Profit Line	OPERATING INCOME BEFORE DEPN & AMORT					
T-Test: Paired Two Sample for Means	All Fiscal Years		Excl. 2004 & 2005		Equal Length & excl. 2004&2005	
	1999-04	2005-08	1999-03	2006-08	2001-03	2006-08
	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS
Mean (£million)	150	220	147	231	150	231
Observations	171	171	171	171	171	171
Pearson Correlation	0.972		0.964		0.949	
Hypothesized Mean Difference	0		0		0	
P(T<=t) one-tail	**0.000*** **		**0.000*** **		**0.000*** **	
P(T<=t) two-tail	**0.000*** **		**0.000*** **		**0.000*** **	

Table 14 summarises results from the paired t-test. The year 2004 and 2005 are excluded to control for the adjustments made in the IFRS transitional years.
***,**,* denotes significant at 1%, 5% and 10% respectively.

Table 14 presents results for the operating income before depreciation and amortisation. When the depreciation and amortisation were not deducted, the average operating income was also significantly greater under IFRS. Thus, this study could not rule out the contribution of other types of expenses such as impairment expense to the significant increases in operating income. The average operating income before depreciation and amortisation under IFRS was significantly greater at 1% significance level. This study could find sufficient statistical evidence to reject the

null hypothesis. Accounting rules relating to operating items under IFRS are likely to cause operating income before depreciation and amortisation to be greater than under U.K. GAAP. For example, gains and loss from the supplementary revaluation of goodwill and other intangible assets for the compulsory impairment tests can increase operating income before depreciation and amortisation (Sahut et al, 2011). However, accounting for depreciation and amortisation under both accounting regimes are similar and they are not expected to exert substantial effects on operating income between pre- and post-IFRS.

Similarly accounting rules relating to interest and taxes can also contribute to the higher earnings as shown by significant differences in earnings before interest and depreciation between pre- and post-IFRS in Table 15.

Table 15: IFRS and Earnings before Interest, Taxes and Depreciation (Nonfinancial Sample)

Profit Line	EARNINGS BEFORE INTEREST & DEPRECIATION					
T-Test: Paired Two Sample for Means	All Fiscal Years		Excl. 2004 & 2005		Equal Length & excl. 2004&2005	
	1999-04	2005-08	1999-03	2006-08	2001-03	2006-08
	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS
Mean (£million)	147	225	141	232	135	232
Observations	171	171	171	171	171	171
Pearson Correlation	0.963		0.954		0.937	
Hypothesized Mean Difference	0		0		0	
P(T<=t) one-tail	**0.000*** **		**0.000*** **		**0.000*** **	
P(T<=t) two-tail	**0.001*** **		**0.001*** **		**0.001*** **	

Table 15 summarises results from the paired t-test for earnings before interest, taxes and depreciation. The year 2004 and 2005 are excluded to control for the adjustments made in the IFRS transitional years. ***,**,* denotes significant at 1%, 5% and 10% respectively.

Table 15 shows that the fifth profit line, earnings before interest, taxes and depreciation are significantly higher under IFRS. These differences were significantly greater at 1% significance level. After excluding the effects of accounting rules relating to interest, taxes and depreciation, earnings remain

significantly different and higher under IFRS than under U.K. GAAP. Thus, this supports that there is sufficient evidence to infer that all different earnings lines for nonfinancial companies under IFRS to be greater than under local GAAP in the U.K.

As a conclusion, based on the t-tests results, this study suggests that there is sufficient statistical evidence to reject the null hypothesis for nonfinancial sample pertaining to all five profit lines. Hence, it infers that the various profit lines of nonfinancial companies are significantly greater under IFRS. Existing studies that compare earnings under IFRS with under U.K. GAAP for the same fiscal year (2004) suggest IFRS has produced greater earnings or profits in the U.K. (Gaston et al., 2010; Stenka et al., 2008). This study indicates that earnings for other fiscal years are also higher under IFRS. This study provides evidence that some accounting rules under IFRS produce significant impact on earnings among nonfinancial companies, particularly those relating to operating income and expenses and taxation.

In the next section, this study tests whether intangible assets are higher under IFRS than under U.K. GAAP which indirectly determines if accounting rules under IFRS improve financial reporting of intangible assets.

Table 16: IFRS and Intangible Assets (and Goodwill)

Variable	Obs.	Mean	Std. Dev.	Min	Max	Classical test of hypotheses, Means-comparison, Paired- t-test Prob. (mean diff. ≠ 0)	 Prob. (mean diff > 0)
Average Intangible Assets (pre-IFRS)							
All sample	200	309	1,149	0	11,500		
Financial	36	618	2,004	0	11,500		
Nonfinancial	164	241	851	0	6,739		
Average Intangible Assets (post-IFRS) All sample	200	675	2,361	0	26,800	**0.000*** ^{A} **0.089*** ^{F} **0.000*** ^{N}	**0.000*** ^{A} **0.045** ^{F} **0.000*** ^{N}
Financial	36	1,403	4,668	0	26,800		
Nonfinancial	164	515	1,409	0	26,800		
Average Goodwill (pre-IFRS)							
All sample	200	299	1,143	0	11,500		
Financial	36	618	2,004	0	11,500		
Nonfinancial	164	228	840	0	6,739		
Average Goodwill (post-IFRS) All	200	497	2,017	0	23,700	**0.004*** ^{A} **0.014** ^{F} **0.000*** ^{N}	**0.002*** ^{A} **0.071*** ^{F} **0.000*** ^{N}
Financial	36	1,142	4,074	0	23,700		
Nonfinancial	164	356	1,136	0	8,642		

Table 16 summarises the descriptive statistics of the variables (intangible assets and goodwill) and the paired-t test results. The values for intangible assets and goodwill are in thousands. ^{A} is for all sample, ^{F} is for financial sample ^{N} is for nonfinancial sample. ***,**,* denotes significant at 1%, 5% and 10% respectively. Figures for intangible assets and goodwill are in £million.

Table 16 provides some statistics for intangible assets and goodwill. Goodwill was compared between pre- and post-IFRS because it was the main class of intangible

assets prior to IFRS. Hence, it is possible to conduct the paired- t tests on goodwill unlike other classes of intangible assets such as brand and patents, licenses and computers which was rarely reported before 2005. Goodwill was directly available on the Data Stream but intangible assets were determined by adding up all classes of intangible assets. The pre-IFRS period and post-IFRS periods were both of equal length, i.e. of three (3) fiscal years, i.e. 2001 to 2003 and 2006 to 2008 respectively and the transitional years (2004 and 2005) were excluded. Financial companies reported greater average intangible assets and wider dispersion of intangible assets within the group than the nonfinancial companies. However, nonfinancial companies' variation of intangible assets from their average intangible assets was higher during post-IFRS. Average goodwill for all companies was £299 million. Similar to intangible assets, financial companies reported greater goodwill on average during post-IFRS period. The minimum value of zero indicated that some companies were reporting zero balance of goodwill on their balance sheet in a particular fiscal year during the study period.

Based on the means-comparison, paired t-test, average intangible assets were significantly different between post-IFRS and pre-IFRS. It was significantly greater under IFRS at 1% and 5% significant level for nonfinancial and financial samples respectively. Similar results are applicable to goodwill. Average goodwill under IFRS was significantly higher than those under U.K. GAAP which was significant at 1% for nonfinancial sample and at 10% for financial sample. These results show that there is sufficient statistical evidence to reject the null hypothesis and to infer that intangible assets and goodwill are both significantly higher under IFRS across sectors. This is consistent with Sahut et al. (2011) who argue that goodwill and intangible assets are higher under IFRS as a result of the supplementary revaluation for the impairment review. However, this study is unable to definitively argue that increases in reported intangible assets and goodwill are significantly contributed by changes in accounting rules related to these accounting items brought by IFRS or by changes in the economic environment towards more intangibles-based environment such as customers' relation and intellectual capital-based. Nevertheless, there is a possibility that broader definition of intangible and changing from amortisation

regime to impairment regime for goodwill under IFRS have enabled companies to account and to capitalise more intangible assets.

As a conclusion for the first hypothesis, this study finds that earnings and intangible assets are both significantly greater under IFRS. Could this occur as a result of greater domination of a valuation or a balance sheet approach to financial reporting? Impairment regime is an example of a valuation based approach to financial accounting and reporting (Paananem, 2008). In the next section, similar tests are undertaken on selected indicators of a valuation approach to financial reporting. This will gather some evidence to suggest whether IFRS has in reality further shifted financial reporting approach from a transaction based approach towards a valuation approach.

5.7 The Impact of IFRS on Indicators of a Valuation Approach

This section is dedicated to the second hypothesis. It is divided into two parts because it requires two different methods of investigation; the means-comparison paired t-test and the time series regression. The first and second parts investigate the impact of IFRS on accruals and impairment and matching of expense against revenue respectively.

The Impact of IFRS on Accruals and Impairment Expenses

Table 17 summarises the descriptive statistics and results for the means-comparison paired t-tests for all sub-samples (financial and nonfinancial samples). The first indicator of a valuation approach to financial reporting (impairment expenses) was higher after IFRS adoption. However, it was only significant among financial companies. This is either due to higher levels of impairment from intangible assets, financial assets and other fixed financial assets. In deflated units, average impairment in post-IFRS was about sixty percent greater than the pre-IFRS's average. For

nonfinancial companies, average deflated impairment expense had only slightly increased during the post-IFRS sample.

Although the deflated means for impairment expenses were slightly higher during post-IFRS, they were not significant for both samples. Figure 7 (page 98) shows that the trend in impairment expenses under IFRS is consistent with the trend in impairment expenses under U.K. GAAP but its level is slightly higher under IFRS. IFRS has slightly shifted the impairment expense levels but the increase is not substantial. Using deflated impairment expenses is useful because it shows changes in impairment expenses relative to the amount of non-current assets. Companies with larger balances of non-current assets in general and intangible assets in particular are more likely to incur more impairment expenses. Therefore, this evidence suggests that there is insufficient statistical reason to infer that IFRS has significantly increased impairment expenses.

For the second indicator, accruals, the tests examined differences in several types of accruals, namely operating accruals and total accruals determined under both the direct method (based on cash flows statement items) and the indirect method (based on the balance sheet items). Operating accruals and total accruals are negative when net income is less than cash flows from operations and free cash flows. Free cash flows are cash flows from operation plus cash from investing activities. Table 17 shows the results for the total current accruals (or TCA).

Generally, total current accruals were higher under IFRS but average total current accruals between pre- and post-IFRS were not significantly different. The same results are applicable to the average deflated total current accruals. When individual accounting items to calculate the deflated total current accruals were deflated by average assets, their values became very small and the formula produced negative values. However, these values were very small and the t-test results were consistent with the un-deflated values.

Table 17 : IFRS and Impairment and Total Current Accruals

Variable	Obs.	Mean	Std. Dev.	Min	Max	Classical test of hypotheses, Means-comparison, Paired- t-test Prob. (mean diff. ≠ 0)	Prob. (mean diff > 0)
Avg. Impairment pre-IFRS; All	200	8	30	-0.4	276		
Financial	36	4	20	0	118		
Nonfinancial	164	9	32	-0.4	276	0.248^{A}	0.124^{A}
Avg. Impairment post-IFRS; All	200	56	577	-31	8,145	**0.048^{F**}** 0.291^{N}	**0.024^{F**}** 0.145^{N}
Financial	36	27	71	0	333		
Nonfinancial	164	61	636	-31	8,145		
Avg. Deflated Impairment pre-IFRS;							
All	200	0.019	0.059	-0.003	0.439		
Financial	36	0.005	0.022	-0.003	0.128		
Nonfinancial	164	0.022	0.064	0	0.439	0.509^{A}	0.254^{A}
Avg. Deflated Impairment post-IFRS;	200	0.025	0.107	-0.089	1.224	0.508^{F} 0.546^{N}	0.254^{F} 0.273^{N}
All	36	0.008	0.017	0.000	0.074		
Financial	164	0.029	0.118	-0.089	1.224		
Nonfinancial							
Avg. TCA pre-IFRS;	200	158	1,610	-704	20,900		
All	36	904	3,745	-299	12,900		
Financial	164	-5	73	-704	388	0.483^{A}	0.759^{A}
Nonfinancial						0.786^{F} 0.379^{N}	0.393^{F} 0.810^{N}
Avg. TCA post-IFRS;All	200	884	9,560	-2,908	129,000		
Financial	36	4,974	22,300	-2,908	129,000		
Nonfinancial	164	-14	119	-9517	569		
Avg. Deflated TCA pre-IFRS:							
All	200	-0.002	0.055	-0.430	0.280		
Financial	36	-0.012	0.085	-0.430	0.220		
Nonfinancial	164	-0.001	0.047	-0.240	0.280	0.483^{A}	0.759^{A}
Avg. Deflated TCA post-IFRS:						0.786^{F} 0.379^{N}	0.393^{F} 0.810^{N}
All	200	-0.008	0.088	-1.060	0.170		
Financial	36	-0.007	0.051	-0.160	0.110		
Nonfinancial	164	-0.008	0.094	-1.060	0.170		

Table 17 shows descriptive statistics and the means t-test results for average impairment and average TCA. TCA is the total current accruals. The deflator is average assets (the average of opening total assets plus closing total assets for the year). ***, ** and * denotes significant at 1%, 5% and 10% level respectively. ^{A} is for all samples, ^{F} is for financial sample ^{N} is for nonfinancial sample.

Table 18: IFRS and Operating Accruals

Variable	Obs.	Mean	Std. Dev.	Min	Max	Classical test of hypotheses, Means-comparison, Paired- t-test Prob. (mean diff. ≠ 0)	Prob. (mean diff > 0)
Avg. Op. Accrual pre IFRS; All	200	-828	303	-3,556	305		
Financial	36	-189	625	-3,556	305		
Nonfinancial	164	-59	159	-1,134	218	0.483^{A}	0.241^{A}
						0.928^{F}	0.535^{F}
Avg. Op. Accrual post-IFRS; All	200	14	1,688	-3,510	2,300	0.461^{N}	0.231^{N}
Financial	36	339	3,994	-3,10	2,300		
Nonfinancial	164	-57	152	1,117	148		
Avg. Deflated Op. Accrual pre IFRS;							
All	200	-0.056	0.079	-0.440	0.190		
Financial	36	-0.021	0.075	-0.380	0.100		
Nonfinancial	164	-0.065	0.079	-0.440	0.190		
Avg. Deflated Op. Accrual post-IFRS;						0.483^{A} 0.928^{F} 0.461^{N}	0.241^{A} 0.535^{F} 0.231^{N}
All	200	-0.049	0.117	-1.330	0.110		
Financial	36	-0.022	0.048	-0.190	0.070		
Nonfinancial	164	-0.055	0.127	-1.330	0.130		

Table 18 shows descriptive statistics and the means t-test results for average operating (Op.) accruals. Operating accruals are calculated using a direct method by deducting net income from cash flows from operation. The deflator is average assets (the average of opening total assets plus closing total assets for the year). The descriptive statistics are for both un-deflated (in £millions) and deflated values (per £ of average assets). ^{A} is for all sample, ^{F} is for financial sample ^{N} is for nonfinancial sample. ***, ** and * denotes significant at 1%, 5% and 10% level respectively.

The next type of accruals is operating accruals. Based on Table 18, average operating accruals prior to IFRS were negative which had increased during post-IFRS. During post-IFRS, average operating accruals were positive for financial sample but were still negative for nonfinancial sample, signifiying the effects of accruals application among this sector. Negative operating accruals were due to cash flows from operations exceeded net income. However, the t-test results suggest that operating accruals under IFRS and under U.K. GAAP are not statistically different. The

deflated average operating accruals were all negative for both pre- and post-IFRS periods. Again, their differences were not significant.

Table 19: IFRS and Total Accruals

Variable	Obs	Mean	Std. Dev.	Min	Max	Classical test of hypotheses, Means-comparison, Paired- t-test Prob. (mean diff ≠ 0)	Prob. (mean diff > 0)
Avg. TA pre-IFRS; All	200	-755	4,624	-47,100	530,174		
Financial	36	-3,107	10,600	-47,100	314,000		
Nonfin.	164	-239	732	-6,865	530,174		
						0.004^{A***}	**0.002^{A***}**
Avg. TA post-IFRS; All	200	-829	5,885	-63,500	26,400	0.995^{F} **0.016^{N**}**	0.497^{F} **0.008^{N***}**
Financial	36	-3,092	13,600	-63,500	26,400		**(diff<0)**
Nonfin.	164	-332	1,019	-8,832	585		
Avg. Deflated TA pre-IFRS;							
All	200	-0.180	0.215	-0.830	0.570		
Financial	36	-0.095	0.146	-0.570	0.210		
Nonfin.	164	-0.199	0.224	-0.830	0.570	0.732^{A}	0.366^{A}
						0.560^{F}	0.280^{F}
Avg. Deflated TA post-IFRS;						0.850^{N}	0.425^{N}
All	200	-0.174	0.248	-1.270	1.260		
Financial	36	-0.078	0.138	-0.590	0.210		
Nonfin.	164	-0.195	0.263	-1.270	1.260		

Table 19 shows descriptive statistics and the means t-test results for total accruals (TA). Total accruals are also determined based on a direct method where net income is deducted from free cash flows (cash flows from operations plus cash from investing activities). The deflator is average assets (the average of opening total assets plus closing total assets for the year). The descriptive statistics are for both un-deflated (in £millions) and deflated values (per £ of average assets). ^{A} is for all sample, ^{F} is for financial sample ^{N} is for nonfinancial sample.***, ** and * denotes significant at 1%, 5% and 10% level respectively.

For the third type of accrual, Table 19 shows that the un-deflated total accruals were slightly higher for financial sample and slightly lower for nonfinancial companies during post-IFRS. The decrease in total accruals among nonfinancial companies after IFRS was significant at 1% significance level. The average deflated total accruals

were higher but not significant for all samples. Hence, the significant decrease in total accruals among nonfinancial sample is not supported by the deflated total accruals as the differences between average deflated total accruals between under IFRS and U.K. GAAP were not significantly different.

As a conclusion, this study does not find strong statistical evidence to suggest that IFRS has significantly changed financial reporting approach to be more dominated by a balance sheet approach. Based on two indicators of a valuation approach, IFRS had only significantly increased impairment expense of financial sample and had decreased total accruals of nonfinancial sample. However, these results do not sustain when impairment and total accruals are deflated by average assets. Although, compared to U.K. GAAP, the international standards contain more fair value and more emphasis on a valuation approach (Paananem, 2008; Penman, 2007), the mandatory change from U.K. GAAP to IFRS does not significantly affect impairment expenses of nonfinancial companies and accruals of financial companies. As discussed in Chapter 3, despite some inconsistencies between accounting for impairment both accounting regimes are developed on mixed bases. Their accounting standards are based on either a valuation approach or a matching approach or both (Fox et al., 2003).

Next section discusses results relating to the impact of IFRS on the third indicator of the valuation approach to financial reporting, i.e. the degree of revenue/expense relation (matching).

The Impact of IFRS and Matching of Expense against Revenue

This section deals with the second hypothesis testing which aims at investigating the impact of IFRS on the degree relation between revenue and expense (matching).

The source of data for all variables was the Data Stream. Definitions of variables follow closely Dichev and Tang (2008). Data Stream codes for these variables were; Revenue or net sales (WC1001); Expenses were determined by deducting earnings

from revenue and earnings are net income before extraordinary items and preferred dividends (Data Stream code-WC01551).

Descriptive Statistics

The mean, standard deviation, minimum and maximum values of the un-deflated values were all in £ million.

Table 20: Descriptive Statistics of Revenue and Expenses

Variable	Observations	Mean	Std. Deviation	Min	Max
Revenue or net sales	13427	794	2,948	-10,300	58,400
Expenses	13427	757	2,894	9,871	82,000
Deflated Revenue	13427	1.231	1.782	-0.338	82.382
Deflated Expenses	13427	1.249[13]	1.835	2.047	82.359

Table 20 provides the descriptive statistics for revenue, expenses and their respective deflated values. The deflator is average assets (Dichev & Tang, 2008). The observations are in company-year observations.

Table 20 shows that the average revenue was £794 million pounds with the lowest value of -£10,300 million pounds and the highest value of £58,400 million pounds. On the other hand, the average expenses were £757 million pounds. However, the average deflated revenue (£1.23 per £1 of average assets) was slightly insufficient to cover the average deflated expenses (£1.25 per £1 of average assets). The analysis of changes in matching of expenses against revenue was done over a 29-year period first before similar analysis was made during a period that covers pre- and post-IFRS.

The hypothesis to ascertain whether the degree of matching between revenue and current expenses has declined under IFRS is as follows,

[13] Average expense was slightly higher than average revenue due to companies from certain industries such as mining and construction had incurred large expenses despite having no revenue for 1 to 3 years during the study period.

H_2: IFRS had significantly further shifted the financial reporting approach from a matching approach to a valuation approach

Matching is an essential accounting principle, in particular to a transaction or a revenue/expense approach to financial reporting. Declining in matching of expenses against revenue is likely to indicate a further shift towards a more valuation based (Dichev and Tang, 2008). This change was investigated by examining changes in the correlation coefficients between current revenue and current expenses over time. The coefficient correlations measured the degree of relation between revenue and expenses. Revenue was regressed on current expense, previous expense and future expense.

Figure 10, 11 and 12 illustrate the trends in matching of revenue against current expenses, previous expenses and future expenses during the 29-year study period.

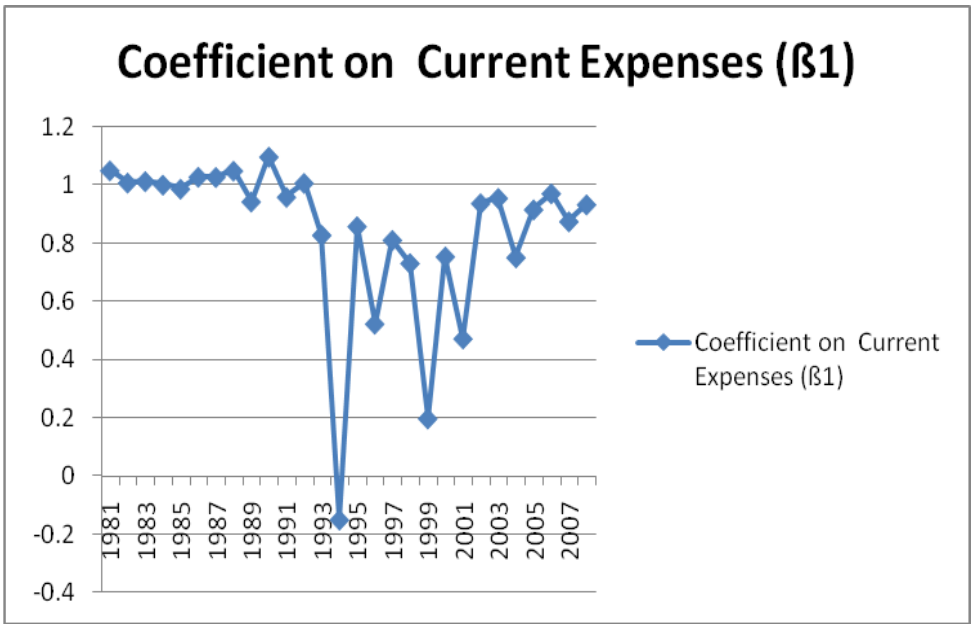

Figure 10: Trends in Matching of Revenue against Current Expenses

First, Figure 10 shows that the estimated correlation coefficient between revenue and current expense was hovering around 1 in the 1980s, indicating a high degree of matching. It then became very volatile during the 1990s and early 2000s. Beyond the 2000s, it started to increase but with slight fluctuation. Prior to 1990, the coefficient

between revenue and previous expense and future expense stayed close to each other except for the year 1982.

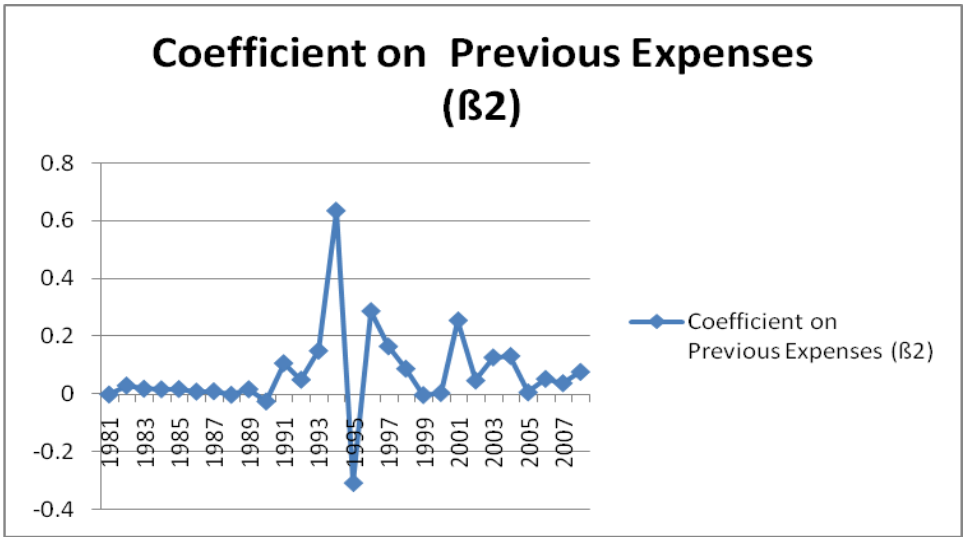

Figure 11: Trends in Matching of Revenue against Previous Expenses

Second, Figure 11 presents how the degree of matching between revenue and previous expenses which is quite low in the 1980s. Similar to revenue/current expense relation, their relations were very volatile between 1991 and 2001. Then, they became less volatile especially after the year 2005.

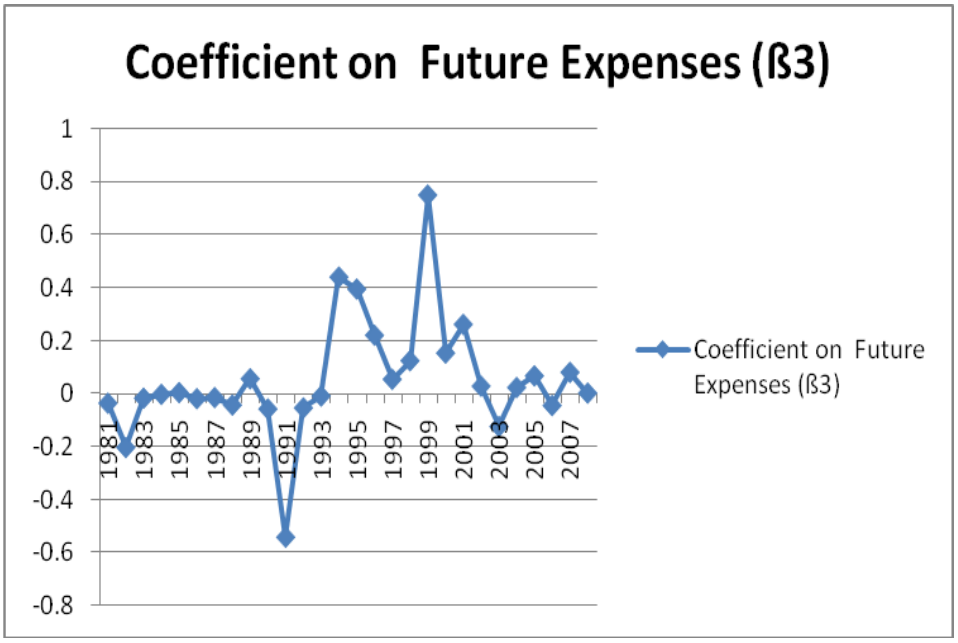

Figure 12: Trends Matching of Revenue against Future Expenses

Third, Figure 12 illustrates that the coefficient of current expenses was slightly above 1 in 1981 and went steady above 1 over four years with a small drop in the fifth year (1985). However, it rose again before decreased drastically in 1994. In the following years, it fluctuated and remained below 1.

Table 21 lists the coefficients of current, previous and future expenses against revenue ($ß_1$, $ß_2$ and $ß_3$) by year. Following Dichev and Tang (2008), the correlation coefficients were compared between two roughly equal periods; 1981 to 1994 versus 1995 to 2008. The correlation coefficients between revenue and current expense were significantly different at the 10% significance level. This study finds that the correlation coefficients were significantly less in the later period which supports Dichev and Tang (2008) who find a declining trend in the revenue/expense relation over a period of forty years in the U.S.

For the revenue/previous expense relation, their correlation coefficients were on average decreasing over time. However, the degree of revenue/previous expense relation during 1981 to 1994 was not statistically different than their respective values during 1995 to 2008 period. On the other hand, revenue/future expense relation was getting stronger and their relations between the two sub-periods were significantly different at the 5% significance level. This suggests that revenue is becoming more matched against future expenses as compared to the previous expenses, suggesting financial statements have incorporated more future estimates (Barth, et al, 2008) over time. In Table 21, the t-tests are employed to determine whether the declines in the degree of relation between revenue and current and previous expenses and an increase in matching of future expense against revenue are significant.

Based on the p-value of the difference between the average coefficient correlation between revenue and current expense in the two periods; 1981 to 1994 (0.918) and 1995 to 2008 (0.763), the decline in these coefficient correlations were significant at 10% significance level. This result suggests that current expense has become less

matched against current revenue, indicating a further shift from a matching approach to a valuation approach. In other words, this supports existing evidence (e.g. Penman, 2007) that a balance sheet (or valuation) approach is becoming more dominant, consistent with the major accounting regulators' agenda such as the IASB and the FASB. In addition, these major accounting regulators consider this approach would provide more relevant financial information for decision making (decision-usefulness). However, this benefit is achieved at the expense of reporting reliable financial performance, an essential element of reporting for stewardship. The IASB emphasises that reporting for decision usefulness would also ensure financial reports are appropriate for reporting how well a company is being managed (stewardship). Hence, the trade-off between a matching or income statement and a valuation or balance sheet approaches to financial reporting will continue in the pursuit of improving the quality of financial reporting.

In addition, the degree of relation between revenue and previous expenses was declining. This shows that financial reporting has moved even further away from historical accounting rules and has embraced more current accounting rules such as the fair value accounting. In addition, a significant (at 5% significance level) increase in the degree of matching (relation) between current revenue and future expense suggest that financial reporting recognises more future estimates into financial statements. Theoretically, this indicates that financial reporting in the U.K. has embraced more valuation approach over time as being suggested existing studies such as Dichev (2008), Barker (2004) and Fox et al. (2003).

Table 21: Regression of Revenues on Current, Previous and Future Expenses

Year	Obs. /all	Coefficient on Current Expenses (ß1)	Coefficient on Previous Expenses (ß2)	Coefficient on Future Expenses (ß3)
1981	75	1.050	-0.002	-0.036
1982	80	1.008	0.029	-0.203
1983	82	1.013	0.018	-0.017
1984	87	1.001	0.016	-0.003
1985	107	0.987	0.017	0.004
1986	128	1.028	0.008	-0.019
1987	147	1.027	0.009	-0.015
1988	240	1.049	-0.003	-0.043
1989	326	0.943	0.016	0.056
1990	354	1.097	-0.026	-0.058
1991	362	0.959	0.106	-0.541
1992	373	1.007	0.049	-0.054
1993	380	0.828	0.149	-0.009
1994	386	-0.151	0.633	0.439
1995	405	0.858	-0.308	0.394
1996	425	0.523	0.286	0.220
1997	555	0.811	0.164	0.054
1998	615	0.731	0.087	0.124
1999	643	0.197	-0.004	0.748
2000	684	0.754	0.003	0.153
2001	769	0.472	0.254	0.261
2002	774	0.937	0.046	0.028
2003	774	0.955	0.126	-0.124
2004	775	0.751	0.131	0.023
2005	773	0.916	0.005	0.067
2006	777	0.971	0.052	-0.045
2007	777	0.875	0.037	0.080
2008	10	0.933	0.076	0.002
mean 1981 to 2008		0.840	0.070	0.053
median		0.940	0.033	0.003
mean 1981 to 1994		0.918	0.073	-0.036
mean 1995 to 2008		0.763	0.068	0.142
difference		-0.155	-0.005	0.177
p-value		**0.071***	0.324	**0.030****

Table 21 shows the correlation coefficients between revenue and current, past and future expense from a time series regression, $Rev_t = \alpha + ß_1 Exp_t + ß_2 Exp_{t-1} + ß_3 Exp_{t+1} , + e_t$ [adapted from Dichev and Tang, 2008]. *** and ** denotes significant at 1% and 5% level respectively, the p-value is for the one-tailed t-test (assuming equal variances).

However, Figures 10, 11 and 12 have shown that the coefficient correlations between revenue and previous, current and future expenses were very volatile in 1994. The correlation coefficients for this year were considered as outliers and were excluded in the following tests to minimise their effects on the regression results. Table 22 shows stronger results where the p-values were more significant for revenue/current expense (p-value; 0.07 to 0.000) and revenue/future expense (p-value; 0.03 to 0.003). Both were now significant at 1% significance level. Thus, consistent with existing studies (e.g. Dichev and Tang, 2008), this study finds that matching of current expenses against current revenue is declining over time which may be due to increasing emphasis by accounting regulators on a valuation or a balance sheet approach in the accounting standards.

Table 22: Changes in Matching of Expenses against Revenue (Excluding Outliers)

Descriptive & tests	Coefficient on Current Expenses ($ß_1$)	Coefficient on Previous Expenses ($ß_2$)	Coefficient on Future Expenses ($ß_3$)
mean 1981 to 1993	1.000	0.030	-0.072
mean 1995 to 2007	0.750	0.068	0.153
difference	-0.250	0.038	0.225
p-value (t test, equal variance)	**0.000*** **	0.194	**0.003*** **
p-value(t test, unequal variance)	**0.000*** **	0.191	**0.003*** **

Table 22 shows the means of correlation coefficients between revenue and current, past and future expense from a time series regression, $Rev_t = \alpha + ß_1 Exp_t + ß_2 Exp_{t-1} + ß_3 Exp_{t+1} , + e_t$ [adapted from Dichev and Tang, 2008]. ***denotes significant at 1% level, the p-value is for the one-tailed t-test (assuming equal and unequal variances).

The tests were repeated for financial and nonfinancial to investigate whether the trends in matching of current expenses, past expenses and future expenses against current revenue were influenced by sectors. The test results are summarised in Table 23.

Table 23: Regression of Revenues on Current, Previous and Future Expenses (by Sub-samples)

Year	Obs.	Coefficient on Current Expenses (ß1)		Coefficient on Previous Expenses (ß2)		Coefficient on Future Expenses (ß3)	
	Fin/NFin	Fin	NFin	Fin	NFin	Fin	NFin
1981	11/64	0.822	1.072	0.056	-0.029	0.137	-0.046
1982	12/68	1.208	1.008	-0.250	0.027	0.067	-0.023
1983	12/70	1.028	1.031	-0.014	0.009	0.008	-0.037
1984	13/74	1.052	0.985	-0.006	0.027	-0.026	-0.014
1985	14/93	0.934	0.980	0.012	0.013	0.072	-0.003
1986	18/110	0.760	1.025	0.105	0.003	0.171	-0.027
1987	23/124	1.504	1.008	0.185	0.008	-0.665	-0.010
1988	38/202	0.833	1.055	0.166	-0.019	0.046	-0.051
1989	50/276	1.045	0.931	-0.038	0.016	0.024	0.062
1990	55/299	1.054	1.112	-0.008	-0.035	-0.012	-0.074
1991	57/305	1.038	0.947	-0.006	0.129	-0.016	-0.067
1992	57/316	0.684	1.021	0.079	0.040	0.271	-0.065
1993	57/323	1.058	0.819	0.009	0.144	-0.029	-0.009
1994	60/326	0.698	-0.159	0.229	0.603	0.101	0.440
1995	65/340	0.729	0.868	0.131	-0.324	0.173	0.382
1996	70/355	0.724	0.521	0.193	0.287	0.096	0.219
1997	96/459	0.240	0.843	0.157	0.166	0.614	0.025
1998	108/507	1.069	0.718	-0.066	0.090	0.015	0.127
1999	113/530	0.718	0.185	0.084	-0.025	0.167	0.786
2000	120/564	0.442	0.766	0.137	-0.001	0.447	0.134
2001	137/632	0.688	0.448	0.151	0.266	0.024	0.287
2002	138/636	0.341	0.756	0.078	0.176	0.577	0.008
2003	137/637	0.968	0.944	0.265	0.107	-0.371	-0.094
2004	138/637	0.378	0.746	0.086	0.177	0.494	0.008
2005	136/637	1.096	0.916	-0.084	0.004	-0.011	0.065
2006	138/639	0.440	0.983	0.580	0.032	0.013	-0.036
2007	139/638	0.947	0.851	0.001	0.043	0.074	0.096
mean 1981 to 2008		0.833	0.829	0.083	0.072	0.091	0.077
median		0.833	0.931	0.079	0.027	0.067	-0.003
mean 1981 to 1994		0.980	0.917	0.037	0.067	0.011	0.005
mean 1995 to 2008		0.675	0.734	0.132	0.077	0.178	0.154
difference		-0.305	-0.183	0.095	0.010	0.167	0.149
p-value, equal variance		**0.002*** **	**0.050***	**0.049****	0.218	**0.053***	**0.042****
p-value, unequal variance		**0.005*** **	**0.043***	**0.053***	0.436	**0.049****	**0.028****

Table 23 shows the correlation coefficients between revenue and current, past and future expense from a time series regression, $Rev_t = \alpha + ß_1\ Exp_t + ß_2\ Exp_{t-1} + ß_3\ Exp_{t+1}\ , + e_t$.***, ** and * denotes significant at 1%, 5% and 10% level respectively, the p-value is for the one-tailed t-test (assuming equal variances).

Table 23 demonstrates that that the average coefficient correlations between revenue and current expense were significantly lower for both sub-samples. It was significant at 1% and 5 % significant for financial and nonfinancial sample respectively. In addition, the erratic coefficient correlation between revenue and current expenses in the year 1994 occurred within nonfinancial sample. In that year, the coefficient correlation drastically dropped from 0.82 to -0.16. Excluding this year, the result of nonfinancial sample was even more significant. For revenue/previous expense relation, the average coefficient correlations were significant only for financial sample. For financial sample, revenue was having a greater correlation with previous expenses during the later period (1995 to 2008 as compared to 1981 to 1994). However, results for the revenue/future expense relation were significant for both sub-samples, indicating that future expenses was becoming more matched against current expenses for the U.K. listed companies at large.

When the coefficient correlations between revenue and expenses were compared between pre- and post-IFRS, changes in the coefficients were not statistically significant for both financial and nonfinancial samples except for revenue/previous expenses of nonfinancial companies (refer Table 24). The time series regression results showed that average coefficient correlations between revenue and previous expense for nonfinancial companies (at 10% significance level) declined after IFRS adoption, from 0.183 to 0.027. This is consistent with less emphasis on the historical cost basis in international accounting standards. The insignificant results for revenue/current expenses and revenue/future expenses might be influenced by a small number of company-year observations as the pre- and post-IFRS periods are very short. This issue might be rectified in the future when more post-IFRS years are available.

Table 24: IFRS and Changes in Matching of Expenses against Revenue

Statistics	Coefficient on Current Expenses (ß1)		Coefficient on Previous Expenses (ß2)		Coefficient on Future Expenses (ß3)	
	Fin	Non-Fin	Fin	Non-Fin	Fin	Non-Fin
mean 2000 to 2003	0.666	0.716	0.164	0.183	0.077	0.067
mean 2005 to 2008	0.827	0.917	0.166	0.027	0.025	0.042
difference	0.161	0.201	0.001	-0.156	-0.051	-0.026
p-value, equal variance	0.464	0.180	0.447	**0.094***	0.397	0.332
p-value, unequal variance	0.464	0.190	0.449	**0.095***	0.399	0.341

Table 24 shows the descriptive statistics and t-tests of means of correlation coefficients between revenue and current, past and future expense from a time series regression, $Rev_t = \alpha + ß_1 Exp_t + ß_2 Exp_{t-1} + ß_3 Exp_{t+1} , + e_t$ [adapted from Dichev and Tang, 2008] for financial (Fin) and non-financial (NFin) pre- and post-IFRS. ***denotes significant at 1% level, the p-value is for the one-tailed t-test (assuming equal and unequal variances).

This section concludes that there is sufficient statistical evidence to infer that there is a significant decline in the degree of relation between current expenses against current revenue (matching) over time. However, no significant evidence to infer that it is declining after IFRS. This study also finds revenue has become less matched against past expenses which indicate less emphasis on a historical cost basis among nonfinancial sample. However, these results are limited by short sub-periods, particularly the post-IFRS period.

5.8. Econometric Issues

The accuracy of data was validated by taking a random sample of companies to be cross-checked against their annual reports. This study also used a matched- pair t test, (or paired t-test or paired samples t-test or dependent t-test) where data for a particular company was compared between pre- and post-IFRS. Hence, it controlled for company's fixed characteristics such as different industries, market synergies, business maturity. In addition, for the time-series regressions, extreme values were

manually screened and eliminated from the tests. Furthermore, this study used a deflator to minimise the effect of heterokedasticity in the data.

In the time regression analysis for the whole sample, results for the correlation coefficients between current revenue and future expenses were based on few observations because at the time of gathering the data (end 2009), data for the year 2009 were only available for very few companies. However, the t-tests with and without the year 2008 were conducted and compared and it indicated that the inclusion and exclusion of the year 2008 did not lead to qualitatively different t-test results. Furthermore, the study also minimised the influence of the year 2004 on the results by excluding this year from the pre- and post-IFRS analysis.

5.9. Summary and Conclusions

This chapter sets to explore the impact of IFRS on earnings and intangible assets, and indicators of a valuation approach to financial reporting (lower accruals, higher impairment charges and declining matching of current expenses against current revenue). A valuation or balance sheet approach is not a new perspective of financial reporting as current financial reporting is based on mixed models; a matching or an income statement approach and a valuation or a balance sheet approach (Fox, et al., 2003). Observations from the ongoing debates on which approach is more appropriate for financial reporting and empirical evidence from existing studies suggest financial reporting is becoming more dominated by a valuation approach (Dichev, 2008), particularly under IFRS. This trend is quite alarming as some critics argue that it impairs the effectiveness of financial reporting as a means of reporting the financial performance (Barker, 2004; Fox et al., 2003). Thus, this study hypothesises; earnings and intangible assets are greater under IFRS and IFRS would increase impairment, decrease accruals and matching of revenue against expenses.

First, this study finds evidence to suggest that IFRS has significantly increased the bottom line profit which is consistent with prior studies (Hung and Subramanyam, 2007; Iatridis, 2010). This implies that some of accounting rules under IFRS have

caused earnings to be significantly greater than U.K. GAAP. By analysing its impact on five different levels of profit lines, this study suggests that IFRS has standardised the presentation of these profits, particularly among financial companies. For financial companies, two profit lines, i.e. net income and net income before taxes and preferred dividends were not significantly different under IFRS. Other profit lines, operating income (Gaston, et al., 2010), operating before depreciation and amortisation and operating income before depreciation and interest were significantly different after IFRS. However, for nonfinancial companies, in addition to similar presentations of the five profit lines, all five profit lines were significantly greater after IFRS adoption.

By analysing differences in the five profit lines, this study is able to approximately identify which accounting rules contribute to the significant increase in earnings. For financial companies, potential accounting rules are those relating to operating incomes and operating expenses because their average operating incomes are significantly different under IFRS. However, accounting rules pertaining to extraordinary items and preferred dividends are least likely to significantly affect their earnings in the U.K. For nonfinancial companies, the potential accounting rules are numerous, ranging from those applicable to various income statement items because all five profits lines are significantly different under IFRS. This suggests that IFRS is more likely to affect earnings of nonfinancial companies than financial companies.

Second, evidence from this study suggests that intangible assets and goodwill are higher under IFRS. Analysis for other (non-goodwill) intangible assets is not viable because they are rarely reported prior to IFRS. However, this study cannot conclude that increases in intangible assets and goodwill are solely resulted from accounting rules under IFRS. Although the definition of intangible assets under IFRS is broader (Horton and Serafeim, 2006) and amortisation regime for goodwill is replaced by impairment regime might lead to more intangible assets being capitalised and greater carrying values for goodwill and other intangible assets (Sahut et al., 2011), increases in both balance sheet items might also reflect changes in the economic environment

towards more capital and knowledge-based. Future research can design a method of investigation that can delineate the effects of changes in accounting rules and changes in the economic environment.

Third, based on the indicators of a valuation approach to financial reporting, the study evidence shows that no significant decrease in accruals except for financial companies under IFRS. Furthermore, there is no statistical evidence to conclude that impairment expenses are higher under IFRS. However, matching of current expenses against current revenue had been significantly declining over time (Dichev and Tang, 2008). Current expenses have become less matched against current revenue (Donelson et al., 2010), indicating a shift further away from a matching to a valuation approach. Furthermore, there is a declining (increasing) trend in matching of previous expenses (future expenses) against revenue which indicates less emphasis on historical cost accounting and more inclusion of future estimates into financial statements. However, except for declining trend in matching of previous expenses against revenue for nonfinancial sample, these findings are not significant between pre- and post-IFRS which is probably due to a short post-IFRS period. In the future, when more post-IFRS years are available, this test can be repeated to provide stronger evidence that more incorporation of a valuation approach into accounting standards (or IFRS) has caused a declining matching of current expenses against current revenue.

In the following chapter (Chapter 6), this study will investigate whether the higher earnings under IFRS are more persistent and hence, more decision-useful to users.

CHAPTER 6

IFRS AND EARNINGS PERSISTENCE, EARNINGS VOLATILITY AND EARNINGS - CASH EARNINGS RELATION

6.1. Introduction

This chapter reports how IFRS adoption in the U.K. has affected earnings attributes. It is a second empirical chapter of the thesis. This chapter focuses on a specific earning attribute, namely earnings persistence, because it is considered vital for investors in making economic decisions. Therefore, if IFRS increases earnings persistence, it shows that IFRS does produce better accounting information for decision-usefulness. Accounting rules under IFRS, as expressed by the IASB member below move towards greater incorporation of future values into not only financial instruments but also other financial statement items (Barth, 2006). Consequently, it might inject more volatility into the reported earnings (Wines et al., 2007) and impair earnings persistence.

'Over the last two decades the IASB and its predecessor, IASC, have increasingly used current or fair value concepts for the measurement of assets and liabilities in several areas, most notably in the area of financial instruments, but in several other areas too.'

(Patrick Finnegan, January 2012 perspectives[14])

Assets write-offs and impairment loss resulted from the application of fair values and other valuation model would potentially add noise to earnings (Donelson et al., 2011; Barker, 2004; Fox et al., 2003). Consequently, accounting earnings may become less reliable as an indicator of recurring earnings. Most impairment loss depends on the accuracy of management estimates due to scarcity of liquid markets. Thus, the timings of the write offs and impairment are likely to be under management's discretion (marked-to-models). These items are sometimes known as the transitory

[14] http://www.ifrs.org/Investor+resources/2012+perspectives/January+2012+perspectives/Performance+Reporting.htm

items and their occurrences may cause reported earnings to increase (Donelson et al., 2011). Consequently, as they resulted from changes in current values, earnings might also be more volatile and less persistent. On the other hand, earnings under IFRS may be a better indicator of business reality as measured by their relations with cash earnings persistence and volatility. Whether such effects are more common under IFRS is a matter of empirical research.

There are four key findings from this study. First, earnings (net income before extraordinary items) are significantly higher under IFRS for nonfinancial companies. Second, consistent with the U.S. evidence, earnings persistence is declining and the decline is significant among nonfinancial companies. Third, earnings have become more volatile under IFRS, particularly for financial companies. Fourth, IFRS has improved earnings ability to capture changes in business reality as measured by changes in cash earnings but the effects are less substantial among nonfinancial companies.

This chapter is organised in the following manner; Section 6.2 reviews related literature, Section 6.3 explains the hypotheses development, Section 6.4 describes research design and method of investigation, Section 6.5 reports research results and findings, Section 6.6 discusses econometric issues and finally Section 6.7 summarises and concludes the chapter.

6.2. Literature Review

Earnings are commonly regarded as the most important output from the financial reporting system (Dichev 2008; Graham et al. 2005). Evidence from surveys and interviews indicate that earnings or net income is the most important accounting information for investors to gauge corporate performance (Graham, et al., 2005), a basis to forecast future investment income. The role played by earnings as an indicator of financial performance might explain why it has been extensively been the subject of interest in the literature. For example, Francis et al. (2004) study seven earnings attributes and its link with cost of capital and cost of debt. These attributes

are accruals quality, persistence, predictability, smoothness, value relevance, timeliness, and conservatism.

This chapter chose to focus on earnings persistence, which is categorised as accounting-based earnings attribute (Francis, et al., 2004) because it is directly related to earnings volatility (Dichev and Tang, 2009) and is closely related to the use of accounting information by investors. Earnings are persistent if they indicate recurring profits (Dichev and Tang, 2008). Earnings persistence is an important attribute of accounting information for investors to assess the market value of a company's equity (Kohlbeck Warfield, 2007). From a research design perspective, earning persistence can be calculated without reference to the share price and returns and thus it possesses construct validity as indicators of financial reporting outcomes.

Moreover, it may subsequently affect relevance, one of the required characteristics of accounting information set by accounting regulators for decision-usefulness (FASB, 2006). Relevance refers to being useful to users in making economic decisions. Earnings persistence and value relevance are attributes of earnings which may lower risk premium and consequently reduce the cost of equity capital (Francis et al., 2004) and making the entity more attractive to investors. Since, accounting earnings are determined based on the enforceable accounting rules and principles, changes in accounting rules and regulation (e.g. IFRS adoption) can affect the quality of accounting information (Holthausen, 2009) as measured by their effects on information attributes such as earnings attributes.

Existing studies suggest that earnings are essential to satisfy users' information needs and to influence users' decisions. Graham et al. (2005) find that managers would strive to produce smooth earnings and avoid earnings volatility. Dichev and Tang (2009) investigate the relationship between earnings volatility and earnings persistence which test the utility of findings from previous studies such as Dichev and Ge (2006). They find less volatile earnings are significantly more persistent with higher R^2 while highly volatile earnings tend to be extreme earnings which revert to mean faster and thus are less persistent. Their findings also indicate that volatile

earnings are more likely to include transitory items such as restructuring costs and assets write offs. Frankel and Litov (2009) later retest Dichev and Tang (2009)'s findings and claim that the link between earnings volatility and earnings persistence is robust to additional control variables, namely, loss companies, size and earnings growth and to a correction for sampling bias by increasing sample size and estimating earnings volatility using an industry-based measure. However, they argue that earnings volatility does not have predictive power for share returns. Such findings might explain why most managers prefer less volatile earnings. Transitory items are also known as special items. For low accrual companies, special items contribute to the low earnings persistence (Dechow and Ge, 2006). Furthermore, using analysts' forecasts as a proxy for sophisticated users' expectation, Dechow and Ge (2006) discover that users do not fully understand the implications of earnings volatility for future earnings. Donelson et al., (2011) argue that an increase in earnings volatility and a decline in earnings persistence as suggested by Dichev and Tang (2009) are largely attributable to an increase in large special items due to changes in economic events such as increase competition in the U.S. for the past forty years.

IFRS may increase earnings volatility and consequently may impair earnings persistence as accounting treatments for goodwill under IFRS are inherent with subjectivity such as numerous assumptions in estimating fair value, value in use and recoverable amounts (Wines et al., 2007). Some studies provide empirical evidence that supports the potential effects of IFRS on earnings volatility. For example, net income under IFRS in the U.K. exhibits higher volatility (Iatridis, 2010). In addition, the IASB has placed greater emphasis on a balance sheet which would increase income/loss from re-measurements of other assets and liabilities (Paananem and Parmar, 2008; Penman, 2007). Jermakowitctz and Gornik-Tomaszewski, (2006) examine the implementation of IFRS by EU companies and find that companies anticipate IFRS to increase volatility in financial results. Using more fair value as the primary basis of asset/liability measurement will produce greater relevance financial results (Whittington, 2008a) but it is expected to contribute to more volatile earnings (Jermakowicz and Gornik-Tomaszewski, 2006). Thus, earnings are expected to be

less persistent under IFRS. Furthermore, earnings persistence largely depends on accruals quality where less reliable accruals might lead to significant shares mispricing (Richardson, et al., 2005).

Evidence from prior studies suggests that ignoring the importance of matching is at the expense of earnings properties which consequently lead to declining public confidence in earnings (Dichev, 2008). Dichev and Tang (2008) investigate the trends in matching of revenue against expenses and attempt to prove that the declining revenue/expense matching has resulted from the evolution in standard setting, particularly, moving towards more fair value rules and asset/liability approach to financial reporting and changes in business and economic environment. Based on results from a time series regression on 1,000 large U.S. companies over a period of 40 years (1967 to 2003), they find the contemporaneous correlation between revenue and expenses has declined, while the correlation between current revenue and past and future revenue become poorer and stronger respectively over the years. In addition, earnings volatility has doubled, causing earnings persistence to decrease from 0.91 to 0.65, despite stable volatilities in the underlying revenue and expenses. To regain public confidence, earnings properties such as earnings persistence should reflect changes in the underlying business condition as depicted by cash flows persistence.

Several reasons for earnings to be smoother or more volatile than cash flows are natural application of accounting rules and conventions, or managers' behaviours (e.g. proactive discretionary choices) or both. Jayaraman (2007) investigates whether earnings that are either smoother or more volatile than cash flows provide or garble information to capital market participants. Jayaraman (2007) defines 'provide information and garble information' as 'public disclosures that ameliorates the adverse selection problem by partially or fully revealing to market makers information known by informed traders' and 'stimulate informed judgements among traders who possess public disclosures into private information' respectively. He used the difference between earnings volatility and cash flows volatility as the accrued component of earnings volatility (ACEV) and bid-ask spreads and informed

trading probability as proxies for informed trading. Negative (positive) ACEV indicates smoother (more volatile) earnings than cash flows. Using large U.S. sample and multivariate regression with control variables (company size, turnover, illiquidity, and the inverse of stock price), his results reveal that higher levels of informed trading are associated with more negative and positive values of ACEV and the lowest level of informed trading is when ACEV is close to zero.

Existing literature indicates that earnings are very important and earnings persistence and relevance are some of the desired features of earnings, particularly to investors. At the moment, the concept of other comprehensive performance measure has not yet been finalised by the IASB and users still need to rely on a single performance measure, the accounting earnings (Whittington, 2008b). Concerns about the impact of IFRS on accounting earnings volatility are not yet subsiding as expressed by an IASB member below.

'Concerns about the potential for greater volatility in profit or loss caused by new accounting standards will be unabated until the focus on a single measure of performance is reduced.'

(Patrick Finnegan, January 2012 perspectives)[15]

This study aims to provide empirical evidence related to the impact of IFRS on earnings persistence and earnings volatility and their ability to reflect underlying business performance (cash earnings persistence and volatility).

The Underlying Assumptions

There are several underlying assumptions related to how accounting earnings are related to cash earnings. First, cash earnings are reasonably measured by cash flows from operations (Jayaraman, 2007). Accounting earnings and cash earnings were considered measures of an entity's financial performance (Figure 13). In practice, they differed due to the application of accruals in financial accounting and reporting. In other words, accounting earnings reflect among other factors, the underlying economic performance and accounting rules relating to the determination of income (e.g. revenue and expenses). Second, changes in cash earnings reflect real changes in

[15] http://www.ifrs.org/Investor+resources/2012+perspectives/January+2012+perspectives/Performance+Reporting.htm

an entity's economic conditions (Jayaraman, 2007). A new accounting regime is beneficial if it produces accounting earnings which are better in portraying the entity's economic performance. Thus, it is assumed that IFRS would benefit investors if accounting earnings are more closely related to cash earnings. However, earnings under IFRS might also include items not directly related to advancing expense to generate revenue such as from asset revaluations. Consequently, earnings under IFRS were expected to be less related to the business underlying performance (cash earnings). Changes in the degree of this relation can be measured by the coefficient correlation between accounting earnings and cash flow from operations. Following discussions from the previous chapter (Chapter 5), a valuation based approach to financial accounting and reporting, and to the determination of income is also known as a balance sheet based approach or an asset/liability approach. The other approach is a matching approach or an income statement based approach, which is also known as a transaction approach or a revenue/expense approach (Fox, et al., 2003).

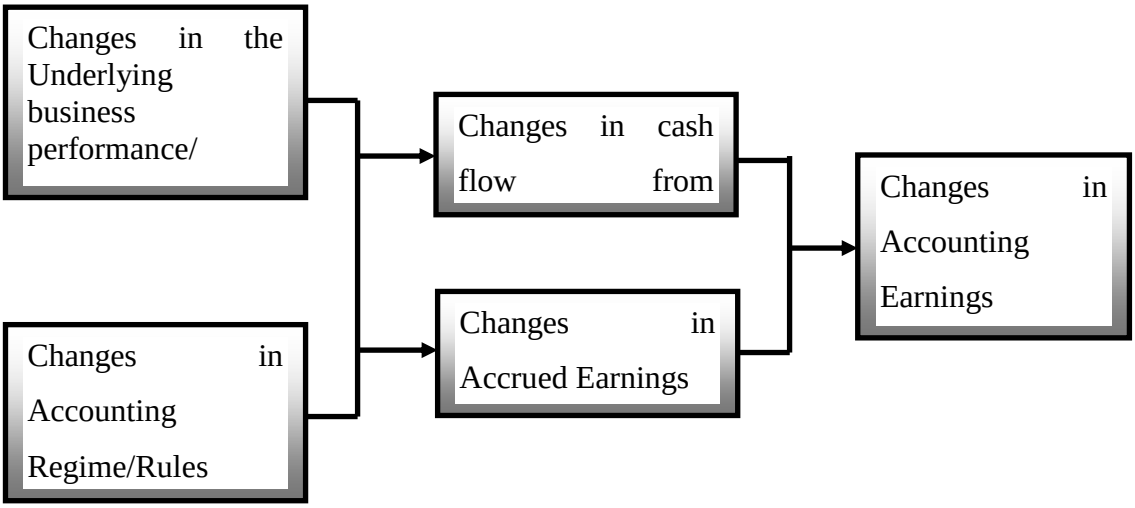

Figure 13: Measures of Financial Performance

6.3. Hypotheses Development

This study proposes that a shift to a valuation based approach in the determination of income and greater application of fair value accounting under IFRS is expected to increase earnings volatility and thus less persistent. Dichev and Tang (2008) examine

changing properties of accounting earnings over a period of forty years and find evidence that suggests the FASB's stated goal of moving from matching concept towards more valuation based approach, including the fair value accounting increase earnings volatility and decrease earnings persistence. Thus, the same trend is expected to occur in the UK. Since Dichev and Tang (2009) and Frankel and Litov (2009) find that earnings persistence is inversely related to earnings volatility, this study also investigates the impact of IFRS on earnings volatility. The first hypothesis was as follows,

H_0: IFRS has not significantly affected earnings volatility and earning persistence
H_1: IFRS has significantly increased earnings volatility and reduced earning persistence

Earnings persistence is not really priced by investors as much as accrued earnings volatility. Thus, this study also investigated the impact of IFRS reporting on accrued earnings volatility. This study assumes that earnings are comprised of accrued earnings and cash earnings. Hence, accrued earnings persistence and volatility and cash earnings persistence and volatility are two key components of earnings persistence and volatility (Jayaraman, 2007). Moving further away from the matching based financial reporting and less emphasis on the matching concept is expected to reduce accruals, making earnings more volatile (Dichev, 2008). Furthermore, being more fair value oriented, earnings were expected to be more volatile under IFRS. Nevertheless, as IFRS is applicable to group accounting and reporting and some listed companies might have gradually applied accounting rules which are consistent with IFRS prior to 2005, IFRS might not have significantly affected earnings persistence. However, greater application of fair values and future estimates into financial statements are more likely to improve earnings ability to reflect changes in the underlying business and economic performance. As mentioned earlier, this study assumes that cash earnings are a better indicator of the underlying business performance and this study hypothesises that incorporation of future estimates into earnings makes earnings better predictor of the underlying business performance as measured by its relation with cash earnings. Here, these relations are

examined based on earnings volatility-cash earnings volatility. This was tested in the second hypothesis which was as follows,

H_0: Earnings volatility is not significantly more related to cash earnings volatility under IFRS
H_2: Earnings volatility is significantly more related to cash earnings volatility under IFRS

There are two key sources of earnings volatility; changes in underlying business performance and changes in accounting rules (Dichev & Tang, 2009). Basically, accounting rules that relate to matching of expenses and revenues are expected to smooth out fluctuations in cash flows and to report a smooth stream of earnings. Moreover, accounting rules that involve predicting future cash flows to revalue assets and liabilities expose accounting earnings to additional volatility. For example, write-offs from the subsequent valuation of assets can cause accounting earnings to be more volatile than cash earnings (Dechow and Dichev, 2002). In addition, accounting conventions such as conservatism can widen the gap between accrued earnings and cash earnings and hence between earnings volatility and cash earnings volatility (Basu, 1997). However, in practice, greater volatile earnings may also due to discretionary choices, such as "big bath" and loss recognition (Ball and Shivakumar, 2006; Givoly and Hayn, 2000; Kirschenheiter and Melumad, 2002). In other words, reported earnings may be smoother than cash flows earnings due to managers' proactive discretionary choices via for example, income smoothing (Leuz, et al., 2003). Other factors that contribute to higher earnings volatility such as conservatism, big bath and managers' discretionary choices are beyond the scope of this study. Instead, this study focuses on the impact of IFRS on earnings persistence (earnings volatility) over the study period.

In the robustness test, the tests include control variables such as age, industry and profit status. For example, loss-making companies are expected to avoid or minimise assets write-offs such as impairment to ensure the smallest possible reported loss. Therefore, controlling for this factor is more likely to strengthen the test results.

6.4. Research Design and Methods of Investigation

This section explains how the variables of interest are measured, models are developed and methods of investigations are selected for each hypothesis.

In this study, earnings are net income before extraordinary items and **earnings volatility** is defined as the variance of the most recent five years' net income before extraordinary items (Dichev and Tang, 2009; Jayaraman, 2007), scaled by average assets. Likewise, cash earnings volatility is defined as the variance of the most recent five years' annual cash flows from operations scaled by average assets (Dichev and Tang, 2009; Frankel and Litov, 2009; Jayaraman, 2007). The scalar, average assets refer to average assets of company *i* at the end of year *t* and *t-1*. Using average assets minimises heterokedasticity in regression residuals and also reduces the effects of differences in entity sizes (Collins and Hribar, 2002). To control for the effect of mergers, acquisition and divestitures, the sample was limited to companies experiencing 'moderate' changes in total assets during year t. Moderate change is where the changes in company's total assets grew no more than 100% or decreased by no more than 50% (Collins & Hribar, 2002). None of the companies in the sample experienced other than moderate changes in assets.

The decomposition of accrued earnings, cash earnings and their volatilities are derived based on Jayaraman (2007). Earnings were decomposed into cash earnings and accrued earnings. Since cash flows from operations were reported in the financial statements, accrued earnings were determined by deducting cash flows from operations from earnings.

$$E_{it} = CFO_{it} + ACE_{it} \quad (1)$$

E_{it} was net income before extraordinary items (Jayaraman, 2007) for company *i* in year *t*, CFO_{it} was cash flows from operations for company *i* in year *t*, and ACE_{it} was accrued earnings for company *i* in year *t*. The variance of earnings consisted of

variance in cash earnings, variance in accrued earnings and the co-variance of cash earnings and accrued earnings and was expressed as follows,

$$Var\ (E_{it}) = Var\ (CFO_{it}) + Var\ (ACE_{it}) + 2Cov\ (CFO_{it}, ACE_{it}) \ldots \quad (2)$$

Therefore, the accrued earnings volatility (ACEV) was derived as,

$$ACEV_{it} = Var\ (ACE_{it}) + 2Cov\ (CFO_{it}, ACE_{it}) \ldots \quad (3)$$

Replacing (2) into (3),

$$ACEV_{it} = Var\ (E_{it}) - Var\ (CFO_{it}) \ldots \quad (4)$$

Equation (3) captures the difference between earnings volatility and cash earnings volatility, the combined effect of cash earnings-accrued earnings covariance (Cov (CFO_{it}, ACE_{it})) and the variance of accrued earnings (Var (ACE_{it})). It provides a comprehensive measure of income smoothing and is a better proxy of income smoothing than the ratio of earnings volatility to cash flow volatility which excludes the covariance between CFO_{it} and ACE_{it} (Gu, 2005; Jayaraman, 2007). Furthermore, neither Cov (CFO_{it}, ACE_{it}) nor Var (ACE_{it}) in isolation can determine smoother or more volatile earnings than cash earnings. From this equation, accrued earnings volatility was calculated as earnings volatility minus cash earnings volatility. However, the purpose of calculating ACEV in this study was different from Jayaraman (2007) who used ACEV to partition his sample into smoother earnings and earnings more volatile than cash flows companies. This study only adapted Jayaraman (2007)'s model to develop an equation model to investigate the changes in the degree of association between earnings volatility cash earnings volatility and accrued earnings volatility after IFRS. Earnings and cash earnings relations are assessed based on their persistence and volatilities.

This study also differs from prior studies such as Frankel and Litov (2009) by incorporating earnings volatility into a multiple regression model in order to examine how IFRS affects earnings volatility. In contrast, Frankel and Litov (2009) and Dichev and Tang (2009) use earnings volatility to partition their samples into deciles because they intend to assess how earnings persistence is related to earnings

volatility. They run the regression model for earnings persistence for each sub-sample and infer an inverse relation between earnings persistence and earnings volatility. Furthermore, partitioning sample is not viable to the current study due to insufficient sample size. Thus, their findings may not be consistent with findings from this study.

For examining earnings persistence, the models are based on Dichev and Tang (2009) where it is measured by the slope coefficient from an autoregressive model of order one (ARI) of earnings per average assets, estimated for each company year using maximum likelihood estimation (Bonnett, 2008; Dichev and Tang, 2009; Francis, et al., 2004).

This model was run on **a time series** to measure the yearly earnings persistence **(1st Hypothesis)**.

Model 1a: $Ebex_t = ø_{oi} + ø_1 Ebex_{t-1} + v_t$

Where (for company *i* and year *t*):

- $Ebex_t$ was net income before extraordinary items scaled by average assets
- $Ebex_{t-1}$ was prior year's net income before extraordinary items scaled by average assets
- v_t was the residuals

The closer the value of $ø_1$ to 1 implies higher earnings persistence, vice versa.

Replacing $Ebex_t$ with cash from operation (CFO_t) scaled by average assets, the model is employed to measure cash earnings (CFO_t) persistence. Cash earnings persistence is assumed to better reflect underlying economic reality and is compared against the earnings persistence. This comparison would give some indication on whether IFRS had improved earnings in terms of having earnings persistence that better mirrors cash earnings persistence and hence, a better measurement for company's underlying economic performance.

Model 1b: $CFO_t = ø_{oi} + ø_1 CFO_{t-1} + v_t$

Where (for company *i* and year *t*):

- CFO_t was cash flows from operations scaled by average assets
- CFO_{t-1} was prior year's cash flows from operations scaled by average assets
- v_t was the residuals

Dichev and Tang (2009)'s model was modified for the panel data set to examine how IFRS has influenced earnings persistence **(1st Hypothesis)**.

Model 1: $Ebex_{it} = ß_o + ß_1 Ebex_{it-1} + ß_2 Difrs_{it} + v_{it}$

Model 2: $Ebex_{it} = ß_o + ß_1 Ebex_{it-1} * Difrs_{it} + v_{it}$

Where (for company *i* and year *t*):

- $Ebex_{it}$ was net income before extraordinary items scaled by average assets
- $Ebex_{it-1}$ was prior year's net income before extraordinary items scaled by average assets
- $Ebex_{it-1} * Difrs_{it}$ was previous year earnings under IFRS scaled by average assets
- $Difrs_{it}$ was a dummy variable, assigned as 1 for IFRS and 0 for U.K. GAAP
- v_{it} was the residuals

For earnings volatility, models were constructed based on Jayaraman (2007) **(1st Hypothesis)**. The models are as follows,

Model 3: $EbexV_{it} = ß_o + ß_1 CFOV_{it} + ß_2 Difrs_{it} + v_{it}$

Model 4: $EbexV_{it} = ß_o + ß_1 ACEV_{it} + ß_2 Difrs_{it} + v_{it}$

The control variables are added to the models for the additional tests. Age_{it} and $Dloss_{it}$ (assigned as 1 for loss and 0 for profit) is applicable to both financial and nonfinancial samples and $\sum_{l=1}^{3} Dind_{it}$ (three main industry group) is only applicable to nonfinancial sample. Age was the number of operating years and was determined

by deducting the year of incorporation from the current year. The industry was determined based on the Data Stream, grouped into four main industries (Industrial, Transportation, Utility, and Financial). Therefore, for nonfinancial sample, three different industries are applicable (Industrial, Transportation, and Utility). Profit status is either loss or profit. The multiple regression equation was run on financial and nonfinancial companies separately to avoid misleading results due to the fact that financial companies have different nature of assets and liabilities and was subjected to additional regulation (e.g. banking regulation) and to be consistent with prior studies that exclude financial companies in their studies (Dedman, et al., 2009; ElBakry, 2010; Saadi, 2005).

Data and Sampling

The sample consisted of U.K. listed companies that had switched from UK GAAP to IFRS in 2005 to enable a pre and post-IFRS comparison. After excluding companies with insufficient data for the required 10-year study period, the final sample consisted of 326 companies or 3,260 company-year observations. Eighty percent of the study sample companies were from the industrial sector. The distribution of sample companies across six general classifications of industry sectors (based Data Stream) is shown in Table 25.

Table 25: Distribution of Sample by General Industry Classification

	Accounting Regimes				Total	
General Industry Classification	UK GAAP	%	IFRS	%	company-year observations	%
Industrial	1,709	80%	901	80%	2,610	80%
Utility	61	3%	29	3%	90	3%
Transportation	52	2%	28	2%	80	2%
Banks/Savings & Loan	43	2%	27	2%	70	2%
Insurance	36	2%	24	2%	60	2%
Other Financial	233	11%	117	10%	350	11%
Total	2,134	100%	1,126	100%	3,260	100%

The number of company-year observations under UK GAAP was greater because the pre-IFRS period (1999 to 2004) was longer than the post-IFRS period (2005 to

2008). These companies were later regrouped into financial and nonfinancial companies. Banks/savings and loans, insurance and other financial were grouped as financial companies. Financial sample size was finalised after eliminating REITS and other funds firms such as Aberdeen Asset Management. Table 26 summarises the distribution of financial and nonfinancial companies by the accounting regime (UK GAAP and IFRS).

Table 26: Distribution of Sub-samples by Accounting Regimes

Groups	Accounting Regimes				Total company-year observations	
	UK GAAP	%	IFRS	%		%
Financial	364	17%	196	17%	560	17%
Nonfinancial	1,770	83%	930	83%	2,700	83%
Total	2,134	100%	1,126	100%	3,260	100%

As per Table 26, fifty-six companies or 17% of the study sample were financial companies. The remaining companies were nonfinancial companies. The last fiscal year for post-IFRS for this study was the year 2008 to minimise the impact of new accounting standards under both IFRS and UK GAAP. For example, revised and new IFRS are effective in 2009. Table 27 shows that the length of pre-IFRS and post-IFRS periods.

Table 27: Sub-samples and Length of Pre and Post IFRS

Groups	**Observations**	
	Pre-IFRS	Post-IFRS
Financial	N = 364	N = 196
	n = 56	n = 56
	T = 6.5	T = 3.5
Nonfinancial	N = 1770	N = 930
	n = 270	n = 270
	T = 6.6	T = 3.44

The lengths of periods were unequal where post-IFRS was shorter because of different financial year ends. Companies which published their first financial reports

under IFRS either in 2005 (for those with 31 December financial year-ends) or in 2006 (non-31 December financial year ends) resulted to the lengths of post-IFRS (T) were 3.5 and 3.44 for financial and nonfinancial companies respectively. The effect of the unequal lengths was tested by executing the models for pre- and post-IFRS separately. This study found that results were not significantly and qualitatively different from the modified models where a dummy variable, Difrs was added as a proxy for the accounting standards (0 for the U.K. GAAP and 1 for IFRS).

6.5. Data Analysis and Findings

In most prior studies, financial companies were excluded from the study because of their different nature of assets and liabilities. Their current and non-current assets are dissimilar to nonfinancial companies (e.g. ElBakry, 2010). Hence, including financial companies would produce distorted results as their accounting numbers are not comparable to nonfinancial companies. However, as IFRS is obligatory to all listed companies, including financial companies, this study does not exclude financial companies from the sample. Instead, nonfinancial companies and financial companies were analysed separately.

Moreover, this study does not intend to compare the two sub-samples. For the data analysis and findings, this study discusses results from the financial sample first. There were two research objectives of this chapter; to investigate the impact of IFRS on earnings volatility and persistence and on the components of earnings volatility and earnings persistence. Conclusions for each hypothesis were derived after considering results for both financial and nonfinancial companies.

For the purpose of data analysis, accounting earnings or reported earnings refer to net income before extraordinary items. These terms were used interchangeably. In addition, IFRS covers the international accounting standards (IAS), IFRS and IFRS GAAP.

6.6.1. IFRS, Earnings Persistence, Earnings Volatility and their Components (Financial Sample)

The descriptive statistics illustrate key features of the data. However, they were intended for exploratory purposes. These statistics were very important because they were related to the required assumptions for the multiple regression models such as in identifying the outliers. For the purpose of descriptive statistics, results for both the un-deflated and deflated variables[16] were presented. The deflator was average assets to be consistent with related existing studies where total assets were used as the deflator. This study differed from those studies by using average assets[17] to provide better scale to reflect the level of assets throughout the year.

Table 28 reports the descriptive statistics of the variables of interest for the financial sample. Average earnings were 39% higher during post-IFRS which was consistent with evidence from prior studies such as Horton and Serafeim (2007) and Iatridis (2010). In contrast, cash flows from operations were 52% lower under IFRS. Higher earnings and lower cash earnings during post-IFRS were captured by a 90% increase in accrued earnings. However, after controlling for the size effect using average assets, the average deflated earnings were actually lower post-IFRS. This suggests that an increase in earnings after the IFRS adoption is offset by additional investment in assets. Meanwhile, the average earnings volatility was about double under IFRS. As average cash earnings volatility was lower post-IFRS, an increase in earnings volatility might be contributed by accrued earnings volatility. These statistics suggest that changes in accounting rules (UK GAAP to IFRS) are more likely to contribute to higher earnings volatility as compared to the underlying economic conditions (cash earnings volatility).

[16]Consistent results were observed when other common deflators were used.

[17]Existing studies use total assets. Pearson correlation coefficients shows that average assets (the average of opening total assets and closing total assets) were highly correlated with total assets and other common deflators (opening book value, sales, number of ordinary shares).

Table 28 : Descriptive Results (Financial Sample)

n = 560	Mean		Std. Dev.		Min		Max	
Variables	Pre-IFRS	**Post-IFRS**	Pre-IFRS	**Post-IFRS**	Pre-IFRS	**Post-IFRS**	Pre-IFRS	**Post-IFRS**
Un-deflated Unit (in £millions)								
$Ebex_{it}$	160.086	**222.524**	614.686	**2,064.732**	-1,710	**-23,500**	4,510	**7,550**
CFO_{it}	265.589	**127.186**	1,415.980	**7,369.748**	-1,520	**-96,900**	18,600	**18,700**
ACE_{it}	-105.503	**95.338**	984.001	**5,604.781**	-14,000	**-12,300**	3,250	**73,300**
Deflated Unit (£ per £1 of average assets)								
$Ebex_{it}$	0.028	**0.026**	0.059	**0.103**	-0.600	**-0.540**	0.240	**0.290**
CFO_{it}	0.034	**0.015**	0.068	**0.082**	-0.280	**-0.630**	0.420	**0.320**
ACE_{it}	-0.006	**0.010**	0.071	**0.126**	-0.500	**-0.520**	0.250	**0.690**
$EbexV_{it}$	0.023	**0.044**	0.042	**0.048**	0.000	**0.000**	0.290	**0.270**
$CFOV_{it}$	0.039	**0.033**	0.042	**0.043**	0.000	**0.000**	0.200	**0.290**
$ACEV_{it}$	-0.015	**0.011**	0.046	**0.059**	-0.180	**-0.240**	0.230	**0.230**

Table 28 summarises the descriptive statistics of the variables for financial sample. The variables are defined as follows; $Ebex_{it}$ is net income before extraordinary items, CFO_{it} is cash earnings, measured by cash flows from operations, ACE_{it} are accrued earnings which are determined by deducting CFO_{it} from $Ebex_{it}$. $Ebex_{it}$, CFO_{it} and ACE_{it} are deflated by average assets. $EbexV_{it}$ is earnings volatility of company i (standard deviation of the most recent 5-year net income before extraordinary assets) scaled by average assets in year t, $CFOV_{it}$ is cash earnings volatility of company i (standard deviation of the most recent 5-year cash flows from operations) scaled by average assets in year t and $ACEV_{it}$ is accrued earnings volatility of company i in year t ($EbexV_{it}$ minus $CFOV_{it}$). Results in **bold** are for post-IFRS..

Bivariate Analysis

Table 29: A Correlation Matrix (Pre-IFRS, Financial sample)

Pre-IFRS	$Ebex_{it}$	$EbexV_{it}$	CFO_{it}	ACE_{it}	$CFOV_{it}$	$ACEV_{it}$	$LagEbex_{it}$	$LagCFO_{it}$
$Ebex_{it}$	1							
$EbexV_{it}$	-0.396*	1						
CFO_{it}	**0.384***	-0.002	1					
ACE_{it}	**0.473***	-0.331*	-0.628*	1				
$CFOV_{it}$	**0.110***	**0.390***	0.176*	-0.070	1			
$ACEV_{it}$	**-0.456***	**0.529***	-0.170*	-0.225*	-0.568*	1		
$LagEbex_{it}$	**0.346***	-0.256*	0.087	0.209*	-0.109	-0.126	1	
$LagCFO_{it}$	0.252*	-0.030	**0.445***	-0.199*	0.219*	-0.223	0.122*	1

Table 29 illustrates the correlation coefficients for the variables (in deflated units) during pre-IFRS. The variables are defined as follows; $Ebex_{it}$ is net income before extraordinary items, CFO_{it} is cash from operations, ACE_{it} are accrued earnings which are determined by deducting CFO_{it} from $Ebex_{it}$. $Ebex_{it}$, CFO_{it} and ACE_{it} are deflated by average assets. $EbexV_{it}$ is earnings volatility of company i (standard deviation of the most recent 5-year earnings before extraordinary assets) scaled by average assets in year t, $CFOV_{it}$ is cash earnings volatility of company i (standard deviation of the most recent 5-year cash from operations) scaled by average assets in year t and ACEV is accrued earnings volatility of company i in year t (EbexV minus CFOV). $LagEbex_{it}$ and $LagCFO_{it}$ are previous year net income before extraordinary items and previous cash flows from operations. Both are used to measure earnings persistence and cash earnings persistence.*significant at 5% level, Pearson correlation. **Results in bold are for the variables of interest.**

Based on Table 29, prior to IFRS, both cash earnings and accrued earnings are positively related to earnings. Earnings ($Ebex_{it}$) refer to net income before extraordinary items as per reported in the income statement. The correlation matrix suggests that earnings are more related to accrued earnings (0.473) than cash earnings (0.384) which reflect the application of accrual principles in the determination of earnings. IFRS improves accounting earnings as a measurement of company's economic performance if its degree of relation with cash earnings increases after IFRS adoption. Meanwhile, cash earnings volatility (0.390) also contributes to earnings volatility but not as much as accrued earnings volatility (0.529). In terms of their effects on earnings, accrued earnings tend to be less volatile (-0.456) than cash earnings (0.110) because application of accrual principles involves

mechanisation charging of expenses against revenue. Hence, the greater its proportion into earnings, the more it reduces earnings volatility. However, prior to IFRS, cash earnings are more persistent (0.445) than earnings (0.345) as indicated by the correlation coefficient between current earnings ($Ebex_{it}$) and previous year earnings ($LagEbex_{it}$) and current cash earnings with previous year cash earnings ($LagCFO_{it}$).

Table 30: A Correlation Matrix (Post-IFRS, Financial sample)

Post-IFRS	$Ebex_{it}$	$EbexV_{it}$	CFO_{it}	ACE_{it}	$CFOV_{it}$	$ACEV_{it}$	$LagEbex_{it}$	$LagCFO_{it}$
$Ebex_{it}$	1							
$EbexV_{it}$	-0.419*	1						
CFO_{it}	**0.089**	-0.180*	1					
ACE_{it}	**0.764***	-0.227*	-0.571*	1				
$CFOV_{it}$	**0.039**	**0.149***	-0.283*	0.217*	1			
$ACEV_{it}$	**-0.366***	**0.700***	0.056	-0.338*	-0.595*	1		
$LagEbex_{it}$	**0.408***	-0.238*	0.057	0.302*	0.086	-0.258	1	
$LagCFO_{it}$	0.138	-0.064	**0.409***	-0.149*	-0.239*	0.119	0.056	1

Table 30 illustrates the correlation coefficients for the variables (in deflated units) during post-IFRS. The variables are defined as follows; $Ebex_{it}$ is net income before extraordinary items, CFO_{it} is cash earnings, measured by cash flows from operations, ACE_{it} are accrued earnings which are determined by deducting CFO_{it} from $Ebex_{it}$. $Ebex_{it}$, CFO_{it} and ACE_{it} are deflated by average assets. $EbexV_{it}$ is earnings volatility of company i (standard deviation of the most recent 5-year net income before extraordinary assets) scaled by average assets in year t, $CFOV_{it}$ is cash earnings volatility of company i (standard deviation of the most recent 5-year cash from operations) scaled by average assets in year t and ACEV is accrued earnings volatility of company i in year t (EbexV minus CFOV). $LagEbex_{it}$ and $LagCFO_{it}$ are previous year net income before extraordinary items and previous cash flows from operations. Both are used to measure earnings persistence and cash earnings persistence.*significant at 5% level, Pearson correlation. **Results in bold are for the variables of interest.**

Table 30 shows that cash earnings are still positively correlated with earnings but at lower degree and not significant at 5% significance level. However, accrued earnings are more strongly (0.764) related to earnings. Similarly, cash earnings volatility is still positively related to earnings volatility but it is now less (0.149) than pre-IFRS (0.390) whereas accrued earnings volatility has a stronger (increase from 0.529 to 0.700) relation with earnings volatility. However, earnings persistence has increased

to almost equal to cash earnings persistence. The correlation between current earnings and prior year earnings had increased from 0.346 (pre-IFRS) to 0.408 (post-IFRS), indicating that earnings for financial companies might have become more persistent and closely reflect cash earnings persistence (0.409). These relations would be further investigated in the hypothesis testing. The correlation matrix also shows the existence of dependent variables, particularly between the un-deflated variables (undocumented). For example, the correlation coefficients between earnings and cash earnings under IFRS were 0.892 which exceeded 0.6. However, this issue was addressed by using their deflated variables where their correlation coefficients (0.089) were well within the acceptable levels, i.e. less than 0.65 (Akbar and Stark, 2003).

The first hypothesis seeks to investigate the impact of IFRS on earnings persistence and earnings volatility among financial companies. This section also includes discussion on the impact of IFRS on earning levels in a larger sample size which will substantiate findings from the previous chapter.

H_1: IFRS has significantly increased earnings volatility and reduced earning persistence

Table 31 summarises results from Model 1. This model explains about 15% of the current earnings. The expected sign of the correlation coefficients for both explanatory variables are positive. Theoretically, part of earnings is expected to recur in the future years. The percentage of recurring earnings indicates the degree of earnings persistence (Francis, et al., 2004). Investors prefer current earnings to be persistence because it is more predictable and it will be more useful in predicting companies' future earnings (Dichev and Tang, 2008). Evidence from the literature suggests that earnings are higher under IFRS (e.g. Gaston, et al., 2010). The correlation coefficients of Difrs were positive but not significant, indicating that IFRS had not significantly increased accounting earnings for financial sectors. The financial crisis in 2007 and 2008 might have contributed to the lower post-IFRS earnings among financial companies. Furthermore, this finding is consistent with

finding from the previous chapter where net income before extraordinary items and preferred dividends is not significantly affected by IFRS.

In terms of earnings persistence, measured by the coefficient correlations of the 1-year lagged earnings (**$Ebex_{it-1}$**), was positive and significant (0.264). Approximately 26.4 pence of previous earnings explained every 1 pound of current year earnings. Thus, there is sufficient evidence to imply that earnings are persistent throughout the study period. When an interaction variable (**$Ebex_{it-1}$*$Difrs_{it}$**) was added to test whether IFRS caused earnings to be more persistent, the results indicate that earnings were slightly more persistence at 5% significance level under IFRS (coefficient = 0.286 and p-value = 0.000).

These results indicates that IFRS had no significant impact on the magnitude of earnings but it had slightly increased earnings persistence among financial companies. This suggests that even though accounting rules under IFRS such as the applications of fair value accounting for financial assets and liabilities are more prominent in financial sectors, their effects are not substantial to impair earnings persistence. This evidence supports Barth et al. (2010) that fair value rules are not responsible for the financial crisis. Furthermore, this study suggests that IFRS has improved the quality of earnings among financial companies.

Table 31: IFRS, Earnings and Earnings Persistence (Financial Sample)

Variables	Exp. sign	Model 1 Coef.	n=503 p-value	Model 2	n=503 p-value
intercept		0.012	0.033**	0.019	0.000***
Previous Earnings, $Ebex_{it-1}$	+	0.264	0.000***		
$Difrs_{it}$	+	0.009	0.272		
$Ebex_{it-1}$ * $Difrs_{it}$	+			0.286	0.000***
R^2		0.147		0.127	
Prob > Chi^2		0.000***		0.000***	

Table 31 summarises results from Model 1 : $Ebex_{it} = ß_o + ß_1 Ebex_{it-1} + ß_2 Difrs_{it} + v_{it}$ and Model 2: $Ebex_{it} = ß_o + ß_1 Ebex_{it-1} * Difrs_{it} + v_{it}$. *, **, *** denotes significant at 10%, 5% and 1% respectively.

Table 32 lists the yearly correlation coefficients between current earnings and previous earnings as well as between current cash earnings and previous cash earnings (Model 1a and 1b). Earnings persistence was declining during pre-IFRS but became a bit fluctuating post-IFRS. The financial crisis has affected earnings persistence at its worst in the year 2008 where earnings were not even significantly persistent. Cash earnings were very persistent in 2007 but earnings were relatively less persistent which might suggest the occurrence of non-cash expenses such as assets write offs. However, based on the paired t-test, this change was not significantly different between pre- and post-IFRS as compared to the significant change in the cash earnings persistence at 10% significance level. This contradicts Dichev and Tang (2008). However, results from the current study are limited by much shorter pre- and post-IFRS periods as Dichev and Tang (2008) cover a substantially longer time horizon (1967 to 1985 versus 1986 to 2003) and in different country, i.e. the U.S.

Table 32: Trends in Earnings Persistence and Cash Earnings Persistence (Financial Sample)

	Earnings Persistence				**Cash Earnings Persistence**			
	Previous Earnings		**constant**		**Previous CFO**		**constant**	
Year	**Coeff.**	**p-value**	**Coeff.**	**p-value**	**Coeff.**	**p-value**	**Coeff.**	**p-value**
2000	0.656	0.180	-0.012	0.785	0.929	0.007***	0.004	0.720
2001	0.219	0.024**	0.017	0.008***	0.393	0.035**	0.015	0.027**
2002	0.311	0.008***	0.003	0.767	0.189	0.123	0.014	0.015**
2003	0.172	0.109	0.011	0.314	0.517	0.041**	0.016	0.044**
2004	0.151	0.043**	0.017	0.009***	0.564	0.000***	0.005	0.511
2005	0.203	0.000***	0.030	0.000***	0.192	0.228	0.026	0.000***
2006	0.434	0.094*	0.038	0.101	0.541	0.001***	0.007	0.420
2007	0.218	0.007***	0.047	0.000***	1.332	0.000***	-0.020	0.087**
2008	0.167	0.188	-0.040	0.009***	0.200	0.762	0.009	0.329
t-test	0.460	0.431			0.218	**0.054***		

Table 32 lists the correlation coefficients from Model 1a: $Ebex_t = ø_{oi} + ø_1 Ebex_{t-1} + v_t$ and Model 1b: $CFO_t = ø_{oi} + ø_1 CFO_{t-1} + v_t$. *, **, *** denotes significant at 10%, 5% and 1% respectively.

To visualise the trends in earnings persistence during the study period, Figure 14 plots the respective coefficients for 1-year lagged earnings and cash earnings.

Earnings persistence was consistently less than cash earnings persistence, particularly after IFRS adoption. In 2007, cash earnings is substantially more persistent than accrued earnings. This is due to the financial crisis where cash earnings better reflects the underlying economic performance for financial sectors. During financial crisis, accrued earnings tend to include more noise from the asset write offs which is more uncertain, making accrued earnings less capable of indicating recurring earnings. Thus, accrued earnings are less persistent as compared to cash earnings. However, earnings and cash earning persistence was approximately at the same level in the following year because of the timing different between accrued earnings and cash earnings cause them to move into the same direction in alternate year. This evidence suggests that despite no significant change in earnings volatility trend, earnings persistence partially reflects changes in real economic performance of financial companies. Nevertheless, the graph shows that IFRS may have improved the quality of accounting earnings where the trend in earnings persistence is more consistent with the trend in cash earnings persistence during post-IFRS period as compared to pre-IFRS period.

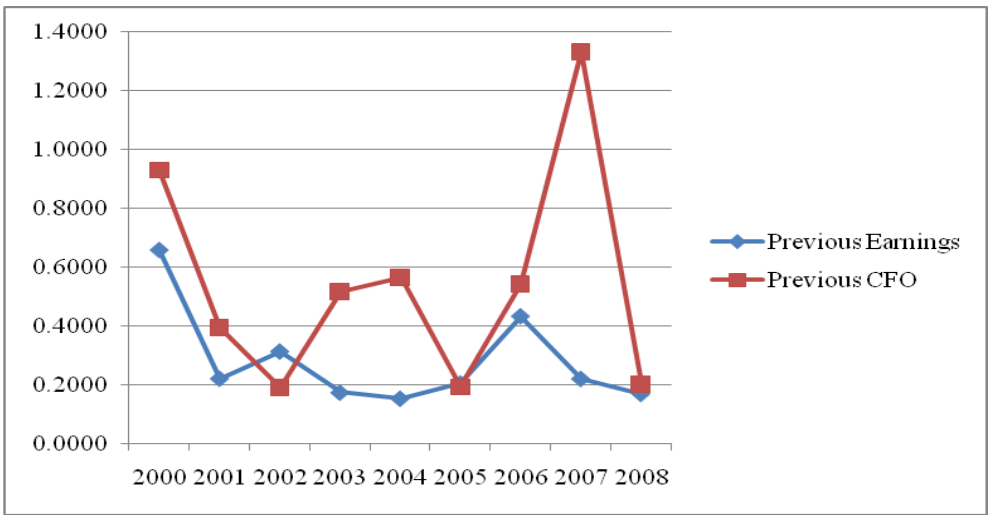

Figure 14: The Coefficients for Earnings Persistence versus Cash Earnings Persistence (Financial Sample)

Lower earnings persistence is normally related to greater earnings volatility. As discussed earlier, this study finds earnings are slightly more persistent under IFRS for financial sectors. However, the descriptive statistics show that average earnings

volatility is also higher for post-IFRS and the next test would determine whether this increase was significant (Table 33).

Table 33: IFRS and Earnings Volatility (Financial Sample)

Variables	Exp. sign	Model 3 Coef.	n=560 p-value	Model 4 Coef.	n=560 p-value
intercept		0.010	0.024	0.033	0.000***
$CFOV_{it}$	+	0.308	0.000***		
$ACEV_{it}$	+			0.519	0.000***
$Difrs_{it}$	+	0.022	0.000***	0.007	0.067**
R^2		0.131		0.396	
Prob > Chi^2		0.000***		0.000***	

Table 33 summarises results from Model 3 and 4. These models are Model 3 : $EbexV_{it} = ß_o + ß_1 CFOV_{it} + ß_2 Difrs_{it} + v_{it}$ and Model 4 : $EbexV_{it} = ß_o + ß_1 ACEV_{it} + ß_2 Difrs_{it} + v_{it}$. $Ebex_{it}$ is net income before extraordinary items for current year and $Ebex_{it-1}$ is net income before extraordinary items for previous year. $CFOV_{it}$ and $ACEV_{it}$ are cash earnings volatility and accrued earnings volatility respectively. $Difrs_{it}$ is a dummy variable and is assigned a value of 1 for IFRS and 0 for UK GAAP. *, **, *** denotes significant at 10%, 5% and 1% respectively.

In Model 3, earnings volatility ($EbexV_{it}$) was regressed against cash earnings volatility, and $Difrs_{it}$ and in Model 4, accrued earnings volatility substituted cash earnings volatility to assess its explanatory power or the degree of its contribution to earnings volatility. Model 4 explains about 40% of variation in earnings whereas Model 3 provides lower explanatory power (only 13%). This reflects the application of accrual accounting in the determination of accounting earnings. Despite a lower explanatory power, the cash earnings model, i.e. Model 3, was superior in explaining earnings volatility in terms of having lower residuals (e.g. Kontopolous et al., 2010). Both the correlation coefficients of cash earnings volatility (0.308) and accrued earnings volatility were positive and significant but the latter had greater value (0.519), indicating accrued earnings volatility was the main source of earnings volatility, which was theoretically acceptable as earnings were basically based on accrued earnings (Belkaoui, 2004).

The expected sign of the correlation coefficient for Difrs was positive as IFRS was expected to increase earnings volatility. As shown in Table 33, under both models, the correlation coefficients for IFRS (Difrs) were positive and significant. This indicates that IFRS has a significant and positive relation with earnings volatility among financial companies. These results suggest that IFRS has potentially contributed to greater earnings volatility for financial companies. The larger and more significant coefficient under Model 3 is probably due to accrued earnings volatility captures greater proportion of IFRS's influence on changes in earnings than cash earnings. Nevertheless, they were inferentially similar under both models.

However, an inverse relation between earnings volatility and earnings persistence as suggested by Dichev and Tang (2009) does not apply to this sample over the study period as this study finds earnings under IFRS are slightly more persistent despite being more volatile. As discussed earlier, this study has different objectives and research design than Dichev and Tang (2009) which might explain the different findings. In the additional tests (undocumented) these results were robust to equal length between pre (2000 to 2003) and post-IFRS (2005 to 2008) and other control variables. The control variable (i.e., age) was weakly negatively related with earnings volatility but very significant. The negative relation suggests that older companies experience lower earnings volatility than newer companies as more established companies might experience lower growth but steady revenue as compared to younger companies. Hence, their earnings are likely to be more stable.

The second hypothesis dealt with the impact of IFRS on components of earnings volatility (accrued earnings volatility and cash earnings volatility).

H_2: Earnings volatility is significantly more related to cash earnings volatility under IFRS

Cash earnings volatility is assumed to reflect the underlying economic risk whereas accrued earnings volatility capture both the risks in business and changes in

accounting rules relating to the determination of income. Table 34 presents key results from 6 for financial sample.

Table 34: IFRS and Components of Earnings Volatility (Financial Sample)

Variables	Exp. sign	Model 5 Coef.	n=560 p-value
intercept		0.019	0.000***
$CFOV_{it}$	+		
$ACEV_{it}$	+		
$CFOV_{it}$*$Difrs_{it}$	+	0.713	0.000***
$ACEV_{it}$*$Difrs_{it}$	+	0.847	0.000***
R^2		0.404	
Prob > Chi^2		0.000***	

Table 34 summarises results Model 5: $EbexV_{it} = ß_o + ß_1 CFOV_{it}*Difrs_{it} + ß_2 ACEV_{it}*Difrs_{it} + v_{it.}$ $CFOV_{it}$ and $ACEV_{it}$ are cash earnings volatility and accrued earnings volatility respectively. $Difrs_{it}$ is a dummy variable and is assigned a value of 1 for IFRS and 0 for UK GAAP. $CFOV_{it}*Difrs_{it}$ and $ACEV_{it}*Difrs_{it}$ are the interaction variables between cash earnings volatility and accrued earnings volatility with Difrs, representing cash earnings volatility and accrued earning volatility under IFRS.*, **, *** denotes significant at 10%, 5% and 1% respectively.[1] is positive but is very small, i.e. 0.00004.

Table 34 shows the correlation coefficients of cash earnings volatility and earnings volatility in Model 5. These variables combined the effects of IFRS on either cash earnings volatility or accrued earnings volatility on the regression model. The explanatory powers of both variables were significant, indicating positive relations with earnings volatility. Accrued earnings volatility under IFRS shows stronger relation with earnings volatility than cash earnings volatility. This result suggests that accrued earnings volatility under IFRS has a stronger relation with earnings and is a better predictor of the variation in earnings than cash earnings volatility. However, if the explanatory power of each variable under IFRS are compared with their respective explanatory power separately (Model 3 and Model 4), cash earnings volatility has a higher explanatory power under IFRS (0.713 versus 0.308) which suggests that earnings volatility captures a higher proportion of cash earnings volatility. This may benefit investors as earnings are now better indicator of the

underlying business risk which is more useful in forecasting company's future cash flows.

As a result, this study can infer that earnings volatility relation with cash earnings volatility is stronger under IFRS. This inference may imply that changes in accounting rules, in particular relating to greater application of fair values and yearly re-measurement of assets and liabilities to their net realisable values under the international accounting regime has injected more volatilities into earnings but variation in earnings now capture a higher proportion of variations in cash earnings.

To summarise, this study finds four possible effects of IFRS among financial companies. First, there is no significant increase in net income before extraordinary items which substantiate similar findings from the previous chapter. Second, IFRS has significantly increased earnings volatility and its influence is greater with respect to its combined effect with accrued earnings volatility. Third, IFRS has slightly increased earnings persistence despite increases in earnings volatility. Fourth, earnings volatility under IFRS captures a greater proportion of cash earnings volatility which is likely to improve the usefulness of earnings to investors in estimating company's future cash flows.

6.6.2. IFRS, Earnings Persistence, Earnings Volatility and their Components (Nonfinancial Sample)

Descriptive Statistics

Nonfinancial companies formed the majority of the study sample size. It consisted of companies from three general industries (industrials, transportation and utilities). The format for the presentation of their descriptive statistics is similar to the financial sample. Table 35 shows that the un-deflated earnings and cash from operations for nonfinancial companies were both higher during post-IFRS period by more than three times and one-third respectively. The deflated earnings were on average greater by 45% during post-IFRS. However, the deflated cash flows from operations were 6% lower than pre-IFRS, suggesting that nonfinancial companies spent most of the

additional cash earnings on non-current assets. Volatilities in deflated earnings and cash flows from operations were all lower, on average, during post-IFRS period (by 26% and 20% respectively). The descriptive results indicate that earnings, on average were greater after IFRS adoption but become less volatile. This suggests that the much criticised effect of greater application of fair values on earnings volatility is not substantially large enough to increase earnings volatility among nonfinancial companies. Its effects may be more pronounced for financial companies. The correlation matrix for the variables explores changes in earnings persistence and earnings volatility before and after IFRS adoption.

Table 35: Descriptive Results (Nonfinancial Sample)

n = 2700	**Mean**		**Std. Dev.**		**Min**		**Max**	
Variable	Pre-IFRS	**Post-IFRS**	Pre-IFRS	**Post-IFRS**	Pre-IFRS	**Post-IFRS**	Pre-IFRS	**Post-IFRS**
Un-deflated Unit (in £millions)								
$Ebex_{it}$	17,210	74,833	662,412	833,121	-16,200	-21,900	3,720	6,660
CFO_{it}	150,019	196,788	648,446	777,394	-399	-180	13,000	12,300
ACE_{it}	-132,809	-121,955	1,123,686	1,258,453	-23,000	-34,200	1,920	455
Deflated Unit (£ per £1 of average assets)								
$Ebex_{it}$	0.031	0.045	0.152	0.097	-3.910	-0.880	0.560	0.540
CFO_{it}	0.088	0.083	0.129	0.100	-3.690	-1.030	0.630	0.620
ACE_{it}	-0.057	-0.037	0.106	0.080	-1.290	-0.590	0.750	0.570
$EbexV_{it}$	0.070	0.052	0.174	0.061	0.000	0.000	4.510	0.480
$CFOV_{it}$	0.057	0.045	0.108	0.043	0.000	0.000	2.230	0.450
$ACEV_{it}$	0.013	0.006	0.098	0.057	-0.150	-0.190	2.290	0.450

Table 35 summarises the descriptive statistics of the variables for nonfinancial sample. The variables are defined as follows; $Ebex_{it}$ is net income before extraordinary items, CFO_{it} is cash flows from operations, ACE_{it} are accrued earnings which are determined by deducting CFO_{it} from $Ebex_{it}$. $Ebex_{it}$, CFO_{it} and ACE_{it} are deflated by average assets. $EbexV_{it}$ is earnings volatility of company i (standard deviation of the most recent 5-year net income before extraordinary assets) scaled by average assets in year t, $CFOV_{it}$ is cash earnings volatility of company i (standard deviation of the most recent 5-year

cash from operations) scaled by average assets in year t and $ACEV_{it}$ is accrued earnings volatility of company i in year t ($EbexV_{it}$ minus $CFOV_{it}$).

Bivariate Analysis

Table 36: A Correlation Matrix (Pre-IFRS, Nonfinancial Sample)

Pre-IFRS	$Ebex_{it}$	$EbexV_{it}$	CFO_{it}	ACE_{it}	$CFOV_{it}$	$ACEV_{it}$	$LagEbex_{it}$	$LagCFO_{it}$
$Ebex_{it}$	1							
$EbexV_{it}$	-0.521*	1						
CFO_{it}	**0.728***	-0.498*	1					
ACE_{it}	**0.551***	-0.145*	-0.168*	1				
$CFOV_{it}$	-0.368*	**0.862***	-0.383*	-0.064*	1			
$ACEV_{it}$	-0.524*	**0.832***	-0.467*	-0.186*	0.438*	1		
$LagEbex_{it}$	**0.351***	-0.100*	0.183*	0.234*	-0.055*	-0.109	1	
$LagCFO_{it}$	0.249*	-0.545*	**0.369***	-0.033	-0.321*	-0.566	0.102*	1

Table 36 illustrates the correlation coefficients of the variables (in deflated unit) during pre-IFRS. The variables are defined as follows; $Ebex_{it}$ is net income before extraordinary items, CFO_{it} is cash flows from operations, ACE_{it} are accrued earnings which are determined by deducting CFO_{it} from $Ebex_{it}$. $Ebex_{it}$, CFO_{it} and ACE_{it} are deflated by average assets. $EbexV_{it}$ is earnings volatility of company i (standard deviation of the most recent 5-year net income before extraordinary assets) scaled by average assets in year t, $CFOV_{it}$ is cash earnings volatility of company i (standard deviation of the most recent 5-year cash flows from operations) scaled by average assets in year t and $ACEV_{it}$ is accrued earnings volatility of company i in year t ($EbexV_{it}$ minus $CFOV_{it}$). $LagEbex_{it}$ and $LagCFO_{it}$ are previous year net income before extraordinary items and previous cash flows from operations. Both are used to measure earnings persistence and cash earnings persistence.*significant at 5% level, Pearson correlation. **Results in bold are for the variables of interest.**

Based on Table 36, prior to IFRS, both cash earnings (0.728) and accrued earnings (0.551) are positively related to earnings. The correlation coefficients suggest that earnings are more related to cash earnings than accrued earnings which indicate high quality of earnings in measuring economic or business performance. IFRS improves earnings as a measurement of company's economic performance if its degree of relation with cash earnings increases after IFRS adoption. Meanwhile, cash earnings volatility (0.862) contributes to earnings volatility at slightly higher degree than accrued earnings volatility (0.832). The quality of earnings reported by nonfinancial

companies is documented by being persistent (0.351) which approximately reflects cash earnings persistence (0.369). The following table will explore if IFRS has reduced earnings volatility and has improved earnings persistence.

Table 37: A Correlation Matrix (Post-IFRS, Nonfinancial Sample)

Post-IFRS	$Ebex_{it}$	$EbexV_{it}$	CFO_{it}	ACE_{it}	$CFOV_{it}$	$ACEV_{it}$	$LagEbex_{it}$	$LagCFO_{it}$
$Ebex_{it}$	1							
$EbexV_{it}$	-0.301*	1						
CFO_{it}	**0.668***	-0.253*	1					
ACE_{it}	**0.368***	-0.045	-0.443*	1				
$CFOV_{it}$	-0.287*	**0.444***	-0.198*	-0.098*	1			
$ACEV_{it}$	-0.110*	**0.737***	-0.121*	0.019	-0.272*	1		
$LagEbex_{it}$	**0.453***	-0.237*	0.258*	0.221*	-0.215*	-0.095*	1	
$LagCFO_{it}$	0.545*	-0.229*	**0.637***	-0.137*	-0.200*	-0.095	0.172*	1

Table 37 demonstrates the correlation coefficients of the variables (in deflated unit) during post-IFRS. The variables are defined as follows; $Ebex_{it}$ is net income before extraordinary items, CFO_{it} is cash flows from operations, ACE_{it} are accrued earnings which are determined by deducting CFO_{it} from $Ebex_{it}$. $Ebex_{it}$, CFO_{it} and ACE_{it} are deflated by average assets. $EbexV_{it}$ is earnings volatility of company i (standard deviation of the most recent 5-year net income before extraordinary assets) scaled by average assets in year t, $CFOV_{it}$ is cash earnings volatility of company i (standard deviation of the most recent 5-year cash flows from operations) scaled by average assets in year t and $ACEV_{it}$ is accrued earnings volatility of company i in year t ($EbexV_{it}$ minus $CFOV_{it}$). $LagEbex_{it}$ and $LagCFO_{it}$ are previous year net income before extraordinary items and previous cash flows from operations. Both are used to measure earnings persistence and cash earnings persistence.*significant at 5% level, Pearson correlation. **Results in bold are for the variables of interest.**

Table 37 shows that cash earnings are still positively correlated with earnings under IFRS but at a lower degree (0.668 versus 0.728). Similarly, accrued earnings are positively and significantly related to earnings but is weaker than prior to IFRS (0.368 versus 0.551). However, cash earnings volatility is no longer a better predictor of earnings volatility as its explanatory power (0.444) is now less that accrued earnings volatility (0.737). Earnings persistence as measured by a correlation coefficient between current earnings and prior year earnings had increased from 0.351 to 0.453 after IFRS, indicating that IFRS may have improved earnings persistence. Nevertheless, it is much lower than cash earnings persistence. Cash earnings are by far more persistence under IFRS (0.637 versus 0.369). This indicates

better economic performances enjoyed by nonfinancial companies during post-IFRS but due to accruals accounting it has not been effectively captured by earnings.

H_1: IFRS has significantly increased earnings volatility and reduced earning persistence

Table 38 summarises results from Model 1 and 2 for nonfinancial sample. The variables of interest were **$Ebex_{it-1}$** and **$Difrs_{it}$**. Model 1 and 2 explained about 15% and 6% of the variation in earnings among nonfinancial companies respectively. In terms of the impact of IFRS on the magnitude of earnings, the positive and significant coefficient (0.32) of Difrs suggests that IFRS has significantly increased earnings among nonfinancial companies. This substantiates finding from Chapter 5 where net income before extraordinary items is significantly greater under IFRS for nonfinancial sample. However, higher earnings under IFRS might due to transitory items such as assets write off and fair value adjustments which add noise to earnings (Donelson, et al., 2011) and might lead to lower earnings persistence. Transitory items are more one off in nature and thus they are least likely to recur in the future (Dichev and Tang 2008). The following paragraph discusses the trend in earnings persistence and the impact of IFRS on earnings persistence.

Table 38: IFRS and Earnings Persistence (Nonfinancial Sample)

Variables	Exp. sign	Model 1 Coef.	n=2430 p-value	Model 2 Coef.	n=2430 p-value
intercept		0.019	0.000***	0.022	0.000***
Previous Earnings, $Ebex_{it-1}$	+	0.318	0.000***		
Difrs	+	0.014	0.006***		
$Ebex_{it-1} * Difrs_{it}$	+			0.276	0.000***
R^2		0.148		0.057	
Prob > Chi^2		0.000***		0.000***	

Table 38 summarises results from Model 1 and 2. These models are Model 1 : $Ebex_{it} = ß_o + ß_1 Ebex_{it-1} + ß_2 Difrs_{it} + v_{it}$ and Model 2 : $Ebex_{it} = ß_o + ß_1 Ebex_{it-1} * Difrs_{it} + v_{it}$. $Ebex_{it}$ is net income before extraordinary items for current year. $Difrs_{it}$ is a dummy variable and is assigned a value of 1 for IFRS and 0 for UK GAAP. $Ebex_{it-1} * Difrs_{it}$ is an interaction variable between earnings and Difrs. *, **, *** denotes significant at 10%, 5% and 1% respectively.

Earnings persistence was measured by the coefficient correlations of the 1-year lagged earnings (**$Ebex_{it-1}$**), Table 38 shows that it is positive and significant at 1% significance level (coefficient correlation of about 0.32). Approximately 32 pence of the previous earnings explained every 1 pound of current earnings. This amount is lower when compared to the U.S evidence where about 57% of earnings recur in the subsequent year (Dichev and Tang 2008). However, the difference might due to difference economic conditions and sample as the U.S. evidence was based on late 1990s and early 2000s data. Moreover, large sample size, country specific factors, accounting and legal environment might also contribute to higher recurring earnings in the U.S.. Nevertheless, both suggest that earnings persistence has gradually been declining. In addition, IFRS has contributed to higher earnings as Difrs is positive and significant at 1% significance level. Again, this supports evidence from previous chapter where net income before extraordinary items is significantly greater during post-IFRS.

When an interaction variable (**$Ebex_{it-1}$*$Difrs_{it}$**) was added to test whether IFRS had affected earnings persistence, the results indicate that earnings were still significantly persistence under IFRS (coefficient = 0.276 and p-value = 0.000). This evidence shows that IFRS does not only increase earnings but also sustain its persistence. However, at this stage, this study cannot definitively say that earnings under IFRS are more persistent. To provide supplementary evidence to examine whether IFRS has significantly affected earnings persistence, Table 39 lists the yearly correlation coefficients between current earnings and previous earnings and between cash earnings and current cash earnings. It shows that the trends in earnings persistence is more fluctuating prior to the year 2005 as compared to a gradual decline after IFRS adoption. In addition, the t-test results indicate that changes in earnings persistence between pre- and post-IFRS are significant at 1% significance level. Thus, there is statistical evidence to infer that earnings have become less persistence. However, it may have been contributed by changes in economic condition and changes in accounting rules. It is more likely that changes in accounting rules has reduced earnings persistence because Table 39 documents increases in cash earnings

persistence over time where the t-test results suggest that the increase is significant but at a less significant level (10% significance level).

Table 39: Trends in Earnings and Cash Earnings Persistence (Nonfinancial Sample)

Earnings Persistence					Cash Earnings Persistence			
	Previous Earnings		Intercept		Previous CFO		Intercept	
Year	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
1999								
2000	0.634	0.000***	0.016	0.096*	0.051	0.561	0.076	0.000***
2001	0.504	0.000***	0.018	0.002***	0.557	0.000***	0.038	0.000***
2002	0.112	0.215	0.011	0.220	0.639	0.000***	0.038	0.000***
2003	0.503	0.000***	0.001	0.751	0.668	0.000***	0.027	0.003***
2004	0.647	0.000***	0.013	0.112	0.534	0.000***	0.047	0.001***
2005	0.453	0.000***	0.022	0.002***	0.439	0.052*	0.045	0.017**
2006	0.495	0.000***	0.032	0.000***	0.655	0.000***	0.025	0.000**
2007	0.461	0.000***	0.030	0.001***	0.804	0.000***	0.019	0.152
2008	0.314	0.000***	0.025	0.000***	0.664	0.000***	0.028	0.169
t-test	0.341		**0.003*** **		0.165		**0.080***	

Table 39 lists the correlation coefficients between current earnings and previous year earnings as well as between current cash earnings and previous year cash earnings. These coefficients are obtained from a times series regression model which is used to examine trends in earnings and cash earnings persistence. These models are Model 1a: $Ebex_t = ø_{oi} + ø_1 Ebex_{t-1} + v_t$ and Model 1b: $CFO_t = ø_{oi} + ø_1 CFO_{t-1} + v_t$ where $Ebex_t$ and CFO_t are earnings (net income before extraordinary items) and cash from operations respectively. *, **, *** denotes significant at 10%, 5% and 1% respectively.

To better illustrate the trends in earnings persistence and cash earnings persistence, these coefficients were plotted on a graph (Figure 13). Changes in earnings persistence were not consistent with changes in cash earnings persistence prior to 2005 but it has improved in terms of a better reflection of cash earnings persistence post-IFRS. This evidence suggests that despite declining earnings persistence, IFRS has produced better quality of earnings in terms of reflecting the underlying economic conditions. Table 40 presents results relating to IFRS and earnings volatility.

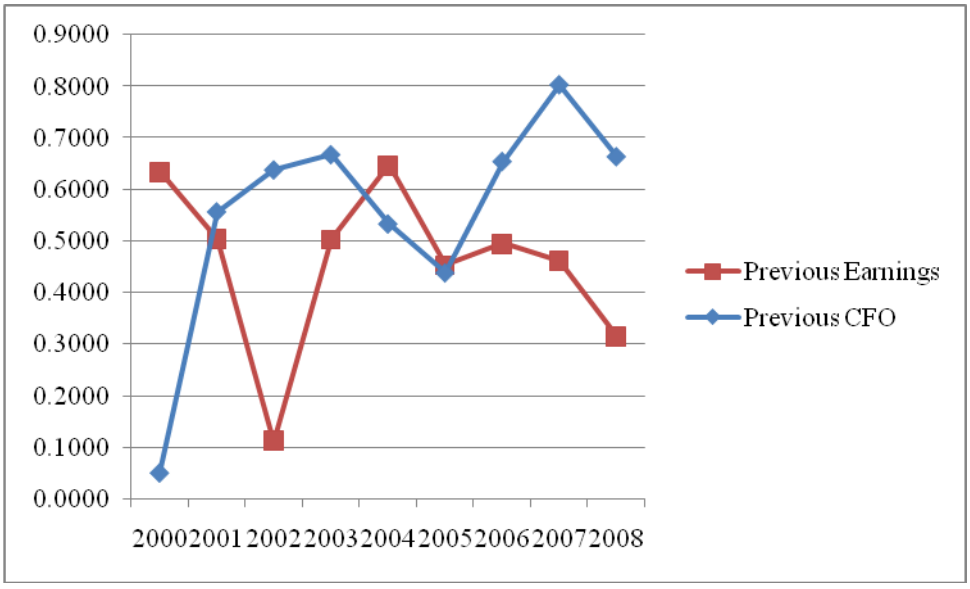

Figure 15: The Coefficients for Earnings Persistence versus Cash Earnings Persistence (Nonfinancial Sample)

Figure 13 illustrates the trends in earnings persistence and cash earnings persistence as measured by their correlation coefficients. Deflated CFO is cash earnings deflated by average assets and Deflated Acc. Earn is accrued earnings deflated by average assets.

Table 40: IFRS and Earnings Volatility (Nonfinancial Sample)

Variables	Exp. sign	Model 3 Coef.	n=2700 p-value	Model 4 Coef.	n=2700 p-value
intercept		-0.004	0.696	0.044	0.000***
$CFOV_{it}$	+	1.338	0.000***		
$ACEV_{it}$	+			1.370	0.000***
Difrs	+	-0.003	0.364	-0.009	0.020**
R^2		0.695		0.668	
Prob > Chi^2		0.000***		0.000***	

Table 40 summarises results from Model 3 and 4. These models are Model 3 : $EbexV_{it} = ß_o + ß_1 CFOV_{it} + ß_2 Difrs_{it} + v_{it}$ and Model 4 : $EbeVx_{it} = ß_o + ß_1 ACEV_{it} + ß_2 Difrs_{it} + v_{it}$. $Ebex_{it}$ is net income before extraordinary items for current year and Ebex $_{it-1}$ is net income before extraordinary items for previous year. $CFOV_{it}$ and $ACEV_{it}$ are cash earnings volatility and accrued earnings volatility respectively. $Difrs_{it}$ is a dummy variable and is assigned a value of 1 for IFRS and 0 for UK GAAP. *, **, *** denotes significant at 10%, 5% and 1% respectively.

Table 40 documents that the expected sign of the correlation coefficient for Difrs was positive as most academic papers and literature indicate that IFRS would include more future estimates in the financial statements and hence, it is more likely to increase earnings volatility (e.g. Bath, 2006). However, this study finds contradicting results. The coefficient correlation of Difrs was negative (-0.003 but not significant) in Model 3 and negative (-0.009) and significant in Model 4. This result suggests that IFRS has not caused earnings to be more volatile. Instead, IFRS contributes to lower earnings volatility. In addition, in the additional tests (undocumented), the control variables were all significant in Model 4, suggesting that the number of operating years (age) and industries did significantly influence earnings volatility. Age was weakly negatively related to earnings volatility but was very significant. The negative relation suggests that older companies experienced lower earnings volatility than newer companies. In addition, certain industry such as utility and transportation had experienced lower earnings volatility as compared to other industrial sectors. However, these variables have not qualitatively changed the results. As a conclusion, this study has sufficient statistical evidence to reject the null hypothesis but it cannot infer that IFRS contributes to more volatile earnings as the evidence shows that IFRS has reduced earnings volatility.

In addition to lower volatility, earnings are considered greater in quality and more decision usefulness to investors if they are better mapped to cash earnings and the IASB conceptual framework emphasises on producing more decision useful accounting information. This test would gather evidence whether this objective has been effectively achieved. From a volatility perspective, the variation in earnings is generally contributed by volatilities in cash earnings and accrued earnings. Accrued earnings reflect not only variation in the underlying business reality but also variation due to changes in accounting rules. However, cash earnings volatility is considered to better encapsulate changes in the underlying business performance. Although, not substantial, the change in accounting regime from U.K. GAAP to IFRS has brought some changes to the existing accounting rules (e.g. accounting for intangibles, including goodwill) that would potentially produce accrued earnings but would better reflect the economic performance. Therefore, in the second hypothesis,

this study proposed that earnings volatility has a stronger relation with cash earnings volatility under IFRS. This hypothesis was,

H_2: Earnings volatility is significantly more related to cash earnings volatility under IFRS

As the most important output of the financial reporting system (Graham et al., 2005), managers strive to ensure earnings are smoother or less volatile. However, smoother earnings are less useful to investors if they do not reflect the underlying business reality. Investors rely on earnings to forecast future cash flows of a particular business entity. Cash earnings are considered the best indicators of company's economic performance (Jayaraman, 2007). However, the application of accruals accounting causes earnings to differ from cash earnings. Based on these arguments, earnings are more useful to investors if it is as good as cash earnings in explaining the changes in earnings. Model 5 and 6 are intended to provide evidence on the impact of IFRS on earnings volatility and cash earnings volatility relation.

Table 41 documents key statistical results from Model 5. Model 5 incorporates both cash earnings volatility and accrued earnings volatility under IFRS. Its results show that accrued earnings volatility is much superior to cash earnings volatility in explaining earnings volatility. The fact that cash earnings is not substantially affected by changes in accounting rules as much as accrued earnings might explain its lower correlation coefficient.

However, the explanatory power of Model 5 was hugely reduced to less than 5%. The low R^2 indicates the existence of other contributing factors. In the additional tests, the number of operating years and all three industries (industrial, utility and transportation) were significant explanatory variables. More established companies or older companies are more likely to report steady earnings as they tend to sustain strong presences in the market and good relations with large customers.

Except for transportation, industrial and utility were negatively correlated with the earnings volatility. This implies that industrial and utility companies enjoy less volatile earnings. Utility companies might experience less earnings volatility because they get a privilege of regulated market where the price or rate charged to customers is fixed by the government and hence, their earnings are quite stable. For the transportation sector, the sub-sample size was only 2% (refer Table 25) of the total sample size. Thus, the selected companies were probably very few large and established transportation companies because smaller companies (listed on the AIM) were excluded from the study sample due to insufficient data. Nevertheless, these additional variables had only increased the explanatory power of Model 6 by about 1.4%. Other variables which are beyond the scope of this study may be added to improve the R^2 of this model.

When the volatility in the accrued earnings and cash earnings under IFRS was compared, accrued earnings volatility showed greater explanatory power (81.1% versus 32.2%) and stronger significant level (significant at 1% versus significant at 10% for cash earnings volatility). These results suggest that under IFRS, for nonfinancial companies, accrued earnings volatility is a better predictor of the variation in earnings volatility than cash earnings volatility. This explains why accrued earnings are very important to investors in assessing the future profitability of companies. Poor accruals would cause accrued earnings to be poorly measured, and evidence from the literature suggests that poor accruals (less reliable) could lead to mispricing of equity (e.g. Richardson et al. 2005). Based on these results, this study has insufficient evidence to accept H_2 to infer that IFRS has significantly strengthened the relation between earnings volatility and cash earnings volatility.

Table 41: IFRS and Components of Earnings Volatility (Nonfinancial Sample)

Variables	Exp. sign	Model 5 Coef.	n=2700 p-value
intercept		0.057	0.000***
CFOV	+		
ACEV	+		
CFOV*difrs	+	0.322	0.052*
ACEV*difrs	+	0.811	0.001***
R^2		0.036	
Prob > Chi^2		0.001***	

Table 41 summarises results from Model 5 : $EbexV_{it} = ß_o + ß_1 CFOV_{it}\_difrs_{it} + ß_2 ACEV_{it}\_difrs_{it} + v_{it.}$ $Ebex_{it}$ is net income before extraordinary items for current year and $CFOV_{it}$ and $ACEV_{it}$ are cash earnings volatility and accrued earnings volatility respectively. $Difrs_{it}$ is a dummy variable and is assigned a value of 1 for IFRS and 0 for UK GAAP. $CFOV_{it*}Difrs_{it}$ and $ACEV_{it*}Difrs_{it}$ are the interaction between cash earnings volatility and accrued earnings volatility with Difrs, representing cash earnings volatility and accrued earning volatility under IFRS.*, **, *** denotes significant at 10%, 5% and 1% respectively.[1] is negative but is very small, i.e. -0.0001.

As a summary, this study makes four inferences for nonfinancial companies. First, it finds that IFRS is more likely to increase earnings as measured by net income before extraordinary items. Second, despite increases in earnings, in contrast to common critique of IFRS in general and fair value accounting in particular, it finds that IFRS has contributed to lower earnings volatility. Third, consistent with the U.S. evidence, earnings persistence is declining over time. Fourth, IFRS has not improved earnings volatility relation with cash earnings volatility. Earnings volatility is still substantially explained by accrued earnings volatility which may lessen its usefulness for investors in estimating company's future cash flows as accrued earnings are also influenced by accounting rules such as accruals and conservatism principles more than changes in the underlying business performance.

6.7. Econometric Issues

There are several econometric issues pertaining to this study. First, the issue of outliers was addressed by eliminating 1% from the top and bottom ranked values (e.g. Dedman et al., 2009, Clarkson et al., 2011). In addition, any data that was out of trend for a particular company was checked manually and deleted accordingly. Second, multicollinearity problem was minimised by scrutinising the correlation matrix to identify any pair of explanatory variables with high correlation. Although the explanatory variables were theoretically highly correlated such as between cash earnings and accrued earnings, the interaction variables and Difrs were not added simultaneously to the models if they are dependent or highly correlated to ensure the test results are not misleading. Third, heterokedasticity issue was addressed by three complementary approaches. First, sample companies were selected based on their first year of published financial reports under the IFRS (2005 and 2006). These companies were incidentally large and established companies because smaller companies such as those being listed on the AIM board was required to apply IFRS effective from 2007. Hence, smaller companies were indirectly excluded from the finalised sample. Second, a deflator (average assets) was used to convert the data into similar unit basis, i.e. per every £1 worth of average assets. Last, additional variables were added to the models to control for other differences such as operating years, profit status and industry.

6.8. Summary and Conclusions

This study examines the impact of IFRS on earnings persistence. It also investigates whether IFRS has increased earnings volatility as existing findings suggests that earnings persistence is inversely related to earnings volatility (e.g. Dichev and Tang, 2009 and Frankel and Litov, 2009). Earnings persistence is important to investors because it indicates how much earnings are recurring and the evolution of accounting standards (e.g. switching from local GAAP to IFRS) favours further departure from historical costs (e.g. fair value accounting) which is more likely to inject future

estimates into accounting numbers (Barth, 2006). Consequently, it may increase earnings volatility and potentially reduce earnings persistence.

Based on the statistical evidence, this study makes four conclusions. First, consistent with evidence from existing literature, this study finds that earnings, i.e., net income before extraordinary items and preferred dividend are significantly higher under IFRS. However, it is only applicable to nonfinancial companies. Evidence for financial companies is not significant. The 2007's and 2008's financial crisis might exert offsetting effects resulting to a net decrease in earnings. This finding is not surprising because existing studies have excluded financial companies from their studies (e.g. Iatridis, 2010 and Gaston, et al., 2010). Second, this study suggests that earnings are persistent but no evidence to infer that IFRS has improved earnings persistence among nonfinancial companies. However, for financial companies, their earnings are slightly more persistent under IFRS.

Third, evidence from this study suggests that IFRS has increased (decreased) earnings volatility for financial companies (nonfinancial companies). This is probably due to additional noise to financial company's earnings as this sector is more likely to incur more assets write offs to reflect the economic events (Donelson, et al., 2011), i.e. financial crisis. Hence, their earnings are more volatile under IFRS. Such impact may be less sizeable for nonfinancial companies as these companies do not normally carry financial assets and liabilities which are subjected to fair value rules.

Fourth, findings related to the impact of IFRS on improving the usefulness of earnings in term of capturing a greater proportion of cash earnings volatility is mixed. For financial companies, this study finds that IFRS has significantly strengthened earnings volatility-cash earnings volatility which can potentially improve its usefulness to investors. However, this study finds no significant effect among nonfinancial companies. Instead, it suggests that IFRS has signified the importance of accrued earnings among nonfinancial companies because under IFRS earnings volatility has significantly been explained by accrued earnings volatility.

Indirectly, this implies that it is very important for accounting regulators while pursuing a uniform basis for accounting regulation, e.g. via a conceptual framework, to consider its potential impact on accruals quality. Otherwise, the rules might reduce the quality of accruals and consequently accrued earnings. When accrued earnings are not effective in capturing the underlying business reality, earnings are likely to be less reliable to investors in assessing company's future performance because accrued earnings and reported earnings are strongly related. Poor accruals might lead to equity mispricing (Richardson et al. 2005).

The adoption of IFRS in a country with existing high accounting quality is viewed by many not to bring any significant impact on accounting information (Li, 2010), in particular on earnings attributes. Some argue that IFRS will inject more uncertainties in earnings because the international accounting standards contain more fair value rules (Barth, 2006) and more emphasis on a valuation approach to the determination of income. This study finds that earnings are superior under U.K. GAAP in terms of capturing business reality as indicated by a stronger cash earnings volatility and earnings volatility relation prior to IFRS, particularly for nonfinancial companies.

However, accrued earnings volatility under IFRS is less erratic where it stays below cash earnings volatility and it moves in the same direction as the cash earnings. These evidences suggest that earnings convey consistent information as cash earnings. This pattern might be more dominant in a longer time horizon. Overall, the change in accounting regime in the U.K. from local accounting standards to the international accounting standards to a certain extent seems to move in the right direction, towards a higher quality of accounting information.

CHAPTER 7

IFRS AND THE VALUE RELEVANCE OF INTANGIBLE ASSETS AND DIFFERENT CLASSES OF INTANGIBLE ASSETS IN THE UK

7.1. Introduction

This chapter investigates the impact of IFRS on the value relevance of intangible assets and different classes of intangible assets. Intangible assets are increasingly more important over time (Skinner, 2008). However, financial reporting for intangible assets has been criticised as still lacking (Lev, 2001; Skinner, 2008; Stark, 2008) which can limit the usefulness of financial reports. Financial reports are useful if they provide value relevance information to users and accounting information is value relevant when it helps users making economic decisions (e.g. Francis et al., 2004). This study focuses on investors' utilisation of accounting information as direct input to their equity valuation.

Although earnings are the key accounting information from the financial reporting system (Graham et al., 2005), capitalised intangible assets can reduce current income (e.g. via amortisation and impairment of intangible assets) while generating future benefits to companies. However, as earnings are currently determined based on mixed bases, namely a combination of matching and valuation bases, investors might not fully price intangible assets because earnings comprise of both earnings from business operations and earnings from revaluation of assets, which can potentially convey misleading information to users (Fox et al., 2003). Investors may not fully understand intangible assets and their impact on future earnings, they may feature conservatively in any valuations due to their inherent risk and complexity. Investors may therefore use judgement and prudence with regards to their value. In addition, The IASB's move to focus on 'decision usefulness' as the main objective of financial reports indicates that the board intends to impose more valuation rules. This would potentially improve the value relevance of accounting information.

Nevertheless, opponents of the board's decision believe that reporting for stewardship should be directly stated as the main purpose of the financial statements (Whittington, 2008c). The IASB's decision to imply stewardship as secondary in its conceptual framework causes some concerns over declining emphasis on reliability of accounting information. If users question the reliability of the accounting information, users might not rely on accounting reports in making economic decisions which consequently reduce the value relevance of accounting information. On the other hand, a greater emphasis on valuation rules is expected to produce accounting information which is more relevant for valuing a company. Hence, this study proposed that IFRS would have significantly improved value relevance of accounting information. In the literature, this type of study is known as value relevance studies where value relevance models are employed to examine changes in the strength of relation between accounting variable of interests and market value, share price or share returns (e.g. Barth et al., 2008).

The specific objective of this chapter is to report empirical evidence on whether IFRS has significantly affected the value relevance of intangible assets and different classes of intangible assets. This chapter is the third empirical part of the thesis. The first part (Chapter 5) documents the impact of IFRS on the magnitude of earnings and intangible assets, and on indicators of a valuation based financial reporting and the second part (Chapter 6) analyses the impact of IFRS on earnings persistence, earnings volatility and earnings-cash earnings relations, particularly between earnings volatility and cash earnings volatility. Findings from both parts of study suggest that IFRS has significantly increased earnings and intangible assets and lower matching of expenses against revenue, increased (decreased) earnings persistence for financial (nonfinancial) companies and strengthened relation between earnings volatility and cash earnings volatility. The final empirical part (Chapter 8) further examines how IFRS affects two of the primary ingredients of relevance; the informative and predictive values of accounting information.

The key motivation to undertake this study is initiated by mixed empirical evidence on the impact of IFRS on the value relevance of intangible assets (e.g. Sahut et al., 2011 versus Chalmers et al., 2008), and most existing evidence is limited to short term effects (e.g. Gaston et al., 2010; Clarkson et al., 2011). This study differs from existing value relevant studies by at least three aspects. First, most existing value relevance studies focus on earnings and book value (e.g. Gaston et al., 2010; Hung and Subramanyam, 2007). Second, existing literature offers very little evidence related to financial companies because these companies are often excluded from the study sample. Third, existing studies focus on total intangible assets and goodwill (e.g. Chalmers et al., 2008) because different classes of intangible assets have been rarely reported prior to IFRS in the U.K. The subjectivity of intangible assets valuation forces management to often avoid the entire exercise of valuing intangible assets (Kanodia, et al., 2004). Management argue that despite the importance of intangible assets to sustain companies' competitive advantage, very little incentive exists to value them. In addition, once intangible assets are recognised in the financial statements, they are subjected to amortisation over their useful lives and impairment tests and subsequently would reduce earnings. The following extract from a survey of senior executives in 2003 sheds some reality of management's attitudes towards valuing intangible assets prior to IFRS adoption.

'Although 49% of participating senior executives said they relied on intangible assets to create shareholder wealth, only 5% systematically measured and tracked intangible assets performance'

Source: Accenture Ltd., survey of senior executive, 2003.[18]

Unreported intangibles might explain the widening market value-book value gap (Danthine and Jin, 2007; Lev, 2001). Nevertheless, accounting information still plays an important role in market valuation of companies' equities (e.g. Oswald, 2004). For example, Bath et al. (2001) find reported book value and liabilities, and the net book values explain 75-80 percent of the variation in market value of equity in the U.S.

[18]So Much for What? Accenture Ltd., survey of senior executives, 2003, http://newsroom.accenture.com/article_display.cfm?article_id=4076

Accounting information, in particular intangible assets provides better signals about companies' values if management can voluntarily opt to recognise them because such decisions are more likely to reflect companies' underlying economic conditions (Wyatt, 2008). However, management's option to capitalise research and development is no longer available under IFRS. Would this change adversely affect the value relevance of research and development costs? In addition, little is known whether a drastic change in accounting treatment of goodwill from amortisation to impairment under IFRS would significantly affect the value relevance of goodwill to investors in the U.K.

There are two key findings from this study. First, IFRS as a company's disclosed accounting policy is not significantly related to the market valuation of the company's equity. Investors might not find this information relevant to market valuation of company's equity probably due to perceived similarities between U.K. GAAP and IFRS (e.g. Li, 2010). However, this finding also suggests that U.K. GAAP is perceived to be more value relevant than IFRS as local accounting standards might be better fitted for local business and legal environment (Jermakowicz and Gornik-Tomaszewski, 2006). This finding is consistent with existing studies such as Clarkson et al., (2011) who suggest that the value relevance of both earnings and book value are lower under IFRS as compared to the local GAAP in common law countries.

Second, intangible assets are positively and significantly value relevant throughout the study period but IFRS has not effectively improved its value relevance. Furthermore, the study findings suggest that a radical change in accounting for goodwill under IFRS has not significantly transformed goodwill into a stronger predictor of the companies' market values in the U.K.(e.g. Sahut et al., 2011). Other classes of intangible assets such as computer software are more value relevant than goodwill under IFRS. Nevertheless, accounting information as represented by the accounting variables are value relevant where explanatory powers of the models

ranged between 20% and 17%. For financial companies, the results were not as strong where both IFRS and intangible assets were not significantly value relevant.

This study contributes to the existing literature to a certain degree first, by providing evidence on the impact of IFRS in the U.K. Despite no substantial change to accounting rules under IFRS as compared to U.K. GAAP, Lee et al. (2008) argue that IFRS provides higher benefits to the U.K. companies than companies in other countries as evidenced by greater reduction in the cost of equity capital. Furthermore, stronger regulatory and institutional settings might have contributed to significant improvement to accounting information quality under IFRS (Ball et al, 2003). Second, it contributes to the value relevance studies related to intangible assets in particular and other key accounting information in general as existing evidence is limited to short term evidence. Third, this study provides evidence on the value relevance of intangible assets and other key accounting information among mandatory adopters. Most of the early studies examine the impact of IFRS among voluntary adopters (e.g. Hung and Subramanyam, 2007). For example, evidence from other countries such as Germany and the Netherlands are not applicable to the U.K. where early adopters or volunteer adopters are not permitted. This is important because the effects of IFRS are most likely to be different for mandatory adopters. Fourth, findings from this study do not suffer from country-specific factors unlike other studies (e.g. Sahut et al. 2011) which investigate the value relevance of the identifiable intangible assets and goodwill in multiple countries. Fifth, this study contributes to the literature of value relevance studies among financial sector which is often ignored in existing studies.

This chapter is organised in the following manner; Section 7.2 provides an overview of the literature review, including value relevance models and U.K. GAAP versus IFRS, Section 7.3 explains the development of hypotheses: Section 7.4 describes method of investigations and sample selection; Section 7.5 reports data analysis and findings, Section 7.6 discusses econometric issues and Section 7.7 summarises and concludes the chapter.

7.2. Literature Review

Many studies have attempted to investigate the effectiveness of financial reporting by examining how reported accounting information affects users' economic decisions. Such studies generally share common subject of interest. First, users refer mainly to the capital providers. Second, relevance and reliability are two primary qualities of accounting information for decision usefulness agreed and accepted by major accounting standard setters (Figure 17). Third, earnings and book values are two popular accounting variables of interests in the value relevance studies. Fourth, researchers usually employ proxies for economic decisions. For example, changes in share prices (Agostino et al., 2011; Sahut et al, 2011) and returns and market values of companies (Chalmers et al., 2008), trading volumes, the cost of equity capital (Lee, et al., 2008) and bid and ask spread and analyst following and analysts forecast errors (Hodgdon et al., 2008).

Market valuation of equity is challenging as it is influenced by various factors. Investors need relevant information, beyond earnings and book value, both company-specific information and non-company-specific information such as market-based and industry-based information to make a proper valuation of the company's equity. Prior studies suggest that financial statements are an important source of company-based information in providing useful input for accounting based valuation of equity (Akbar and Stark, 2003; Barth, 2000; Holthausen and Watts, 2001; Oswald, 2008). Previous studies also indicate that multiple financial statement items are relevant in a company valuation (Liu, et al., 2002).

In an established capital market, financial reporting should ideally help investors evaluate current and future financial well being of the reporting entity (Hand, 2005). Despite being criticised as becoming less relevant over time, research findings show that financial reports are still useful (e.g. Li, 2010). Financial report usefulness is assessed either by studying the value relevance of financial information or nonfinancial information or both. Valuation models are employed to test the value relevance of information, which is measured by its relation with share prices.

Researchers can also examine changes in the value relevance of accounting information after a specific event such as IFRS adoption (e.g. Armstrong et al. 2008). Financial information, such as earnings and book value is commonly tested using Ohlson's or modified Ohlson's models (e.g. Agostino et al., 2011).

Existing empirical evidence shows that accounting information is useful in market valuation of companies. For instance, book value and liabilities, and the net book value explain 75-80 percent of the variation in market value of equity (Barth et al, 2001). Evidence related to the U.K. also suggests that IFRS has a positive impact on the value relevance of financial indicators (ElBakry, 2010), and earnings and book value (Kontopoulos, et al., 2010). After excluding outliers, Kontopolous et al., (2010) find that post-IFRS, the value relevance of earnings is stable whereas of book value is increasing. Such findings suggest that incorporating more valuation based rules into the financial statements improves accounting information quality.

So far, studies that investigate the value relevance of intangible assets are still very limited with mixed findings. Some studies find intangible assets to be less value relevant under IFRS (e.g. Chalmers et al. 2008) but other studies suggest intangible assets under IFRS are more value relevant (e.g. Sahut et al. 2011). Intangible assets are in nature more difficult to value (Barth and Landsman, 1995; Basu and Waymire, 2008; Wyatt, 2008) and accounting for intangible assets is very restrictive (Davison and Skerratt, 2007). Prior to 2005, Davidson and Skerratt (2007) reveal that when U.K. companies carry high intangible assets, these companies use discretionary words and pictures to report their intangible assets and are comparatively more likely to adopt stylistic presentations of annual reports than those companies with no intangible assets. Chalmers et al., (2008) investigate the potential impact of IFRS on intangible assets in Australia. Similar to the U.K, IFRS was first mandated in Australia for all listed companies in 2005. The first financial statements prepared under IFRS for 2005 provide comparative figures for the Australian accounting standards (AGAAP). Companies were also required to prepare the reconciliation statements for the 2005's opening balances, i.e., balance sheet values for the 2004. In both countries, a drastic change from switching from domestic accounting standards

to IFRS is in accounting rules for goodwill and restricting to some extent management's discretion to capitalise research and development expenditure. Using a modified balance sheet valuation model, they compare market values and intangible assets relation under IFRS and under Australian accounting standards. Their results indicate that goodwill under IFRS generally conveys incremental useful information to investors. However, they could not provide sufficient evidence to conclude that the aggregate identifiable intangible assets under IFRS convey information beyond that in AGAAP.

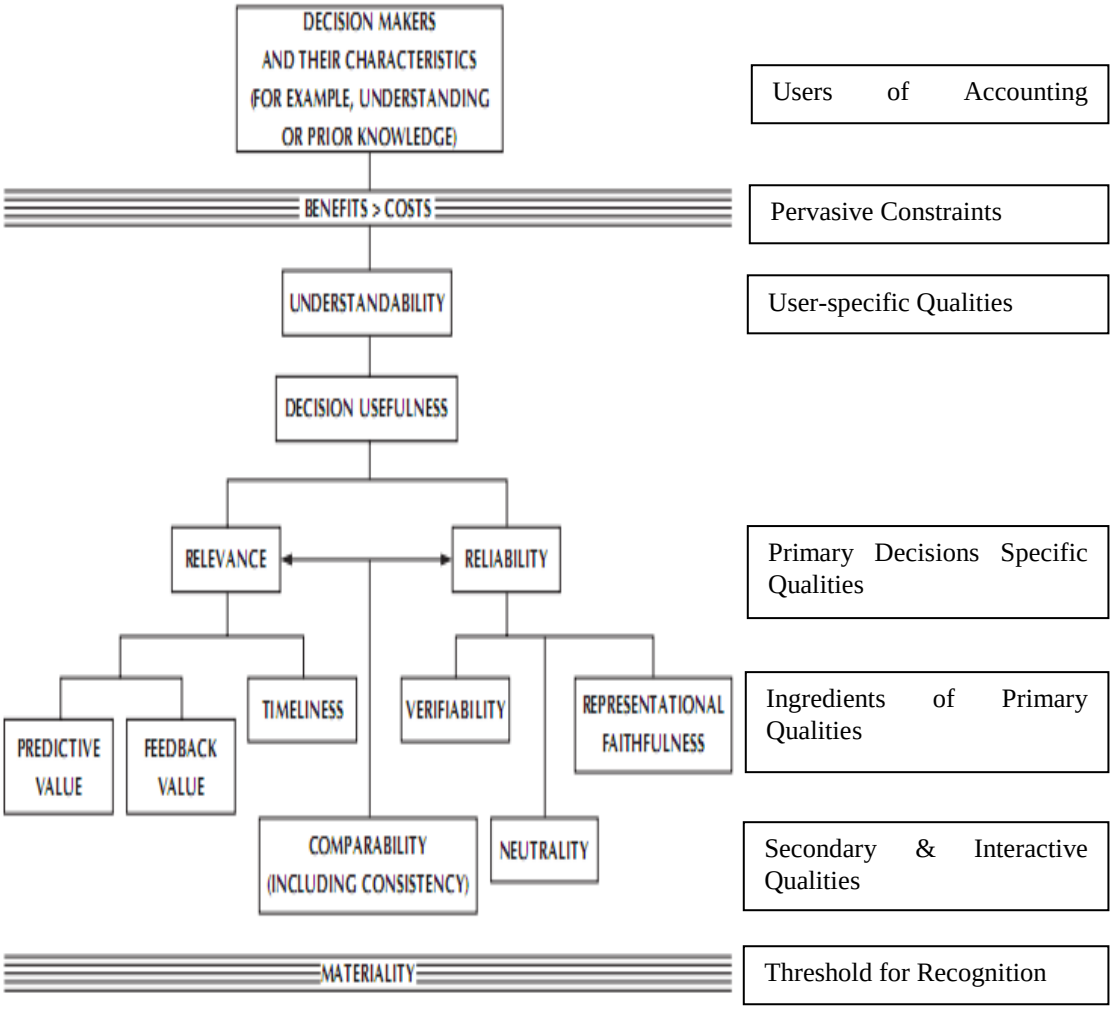

Figure 16: A Hierarchy of Accounting Information Qualities (Reporting for Decision-usefulness)

[Source**:** Financial Accounting Standards Board, Statement of Financial Accounting Concepts No. 2, par. 32**].**

The Value Relevance Models

Value relevance models in the literature can be classified into three types (Holthausen and Watts, 2001); the balance sheet or valuation model, the earnings or return model and the price model, also known as the Ohlson and Modified Ohlson model. The first type is also known as the price-level balance sheet valuation models (Belkaoui, 2004). It is based on an accounting equation (Assets = Equity + Liability). Fundamentally, the market value of equity (MVE) shall reflect the net book value of company (Equity = Assets - Liabilities). However, in reality, market values are also influenced by unreported net assets and other factors. Thus, effective financial reporting should be able to capture assets and liabilities comprehensively and would consequently reduce the differences between the market value and book value. This model is expressed as $MVE_{it} = MVA_{it} – MVL_{it} + MCV_{it}$. Since, market values of net assets (book value or, $MVA_{it} – MVL_{it}$) are not directly observable, accounting numbers are used as proxies (MVE_{it} = $Assets_{it}$ – $Liabilities_{it}$ + other accounting $information_{it}$ + e_{it}). MVA is the market value of separable assets, MVL is the market value of separable liabilities and MVC is the market value of the variable of interest, which in this study are intangible assets, and e_{it} is the residual..

This model is useful for investigating the value relevance of a specific accounting information such as book value and pension assets (Landsman, 1986), earnings and book value (Oswald, 2008), intangible assets and goodwill (Chalmers, et al., 2008), research and development (Shevlin, 1991) and liabilities, contingent payment contracts (McCarthy and Schneider, 1995) with the market value of equity and market value of banks' common equity on book value and non-performing loan of banking industry (Beaver, et al., 1989). Over the years, this value relevance model has incorporated income statement elements such as earnings to increase its explanatory power. The explanatory variables are adjusted to study the impact of alternative accounting treatment. For example, Oswald (2008) uses this model to compare the explanatory power of earnings and book value under two different accounting treatments for the development costs and finds that the explanatory power of earnings and book values are greater when development costs are capitalised.

The second type is the earnings model (the return model) which represents a relation between share returns and accounting earnings, $RET_{it} = a_0 + a_1E_{it} / P_{it-1} + a_2 (E_{it} – E_{it-1}) / P_{it-1} + e_{it}$. RET is the annual return, including cash dividend of company i between the current announcement month and last year's annual report announcement month, E_{it} is the annual earnings per share, $E_{it} – E_{it-1}$ is the change in annual earnings per share and e_{it} is the residuals. P_{it-1} is the share price at the beginning of the last year's annual report month.

The third type is the price model or the Ohlson model which regresses share price on balance sheet and income statement items, as expressed by this equation, $MV_{it} = a_0 + a_1BVE_{it} + a_2E_{it} + e_{it}$. MV_{it} is the market value per share of company i at the end of year t, BVE_{it} is the book value of equity per share of company i at year t, E_{it} is the reported earnings per share of company i at year t and e_{it} is the residuals. This model differs from the first type of valuation model because it includes Ohlson's conceptualisation of the residuals as other value relevance information not captured by earnings and book values. Other information refers to other accounting information and non-accounting information such as industry-based and market-based information. Although, findings from the value relevance studies suggest share prices are explained by accounting-based past performance, non-accounting information is strongly related to future share prices (Daniel and Titman, 2006). Bissessur and Hodgson (2012) suggest that there is a trade-off between investors' reliance on accounting information and industry-based and market-based (stock price synchronicity) information. However, the effects of IFRS on stock price synchronicity are outside the scope of this thesis.

Theoretically, earnings are expected to contribute to changes in a company's market value based on three assumptions about the information contained in earnings and share prices (Nichols and Wahlen, 2004). These assumptions are earnings provides new information to investors about company's current and future profitability, a company's current and expected future profitability provide capital holders with information about the company's current and expected future dividends and the

present value of expected future dividends equals share price. Based on these assumptions, financial reports are useful and value relevant if it provides investors with information that can change investors' expectations about a company's current and future wealth creation (direct input to equity valuation theory).

The second and third type of models share common theoretical foundation as both models are derived from the same source that is the Ohlson (1995) linear information model. However, their results are sometimes inconsistent with each other (Harris, et al., 1994; Holthausen and Watts, 2001). The price model yields unbiased earnings coefficients because share prices reflect the cumulative effect of earnings information (Kothari and Zimmermen, 1995) where accounting information, i.e. earnings can be value relevant if it is affecting the share price even if it does not provide new information to affect share return. Hence, it provides more meaningful findings than the return model because the latter will produce a bias earnings coefficient towards zero in price leading earnings that is when share market participants anticipate component of accounting earnings and incorporate that anticipation in the beginning share price. Based on these reasons, this study chose to adopt the price model. The price model is also the most appropriate because it permits incorporation of other accounting variable of interest into the model (Barth, et al., 2001), a platform to examine the value relevance of intangible assets and different classes of intangibles. Examples of other existing studies that apply such approach to test the value relevance of balance sheet items other than book value of equity are Oswald (2008) (R&D) and Chalmers et al., (2008) (intangible assets).

In addition, these models link accounting information with the company's value. A valuation theory and contextual arguments provide the theoretical basis for value relevance studies (Beaver, 2002). Existing literature related to intangible assets is the source of contextual arguments for this study. Wyatt (2008) reviews and discusses the existing body of literature on intangibles and other disciplines of literature (i.e. economics and management) and argues that two specific qualities of accounting information for decision-making, relevance and reliability, provides the link between accounting information and the market values (Figure 18).

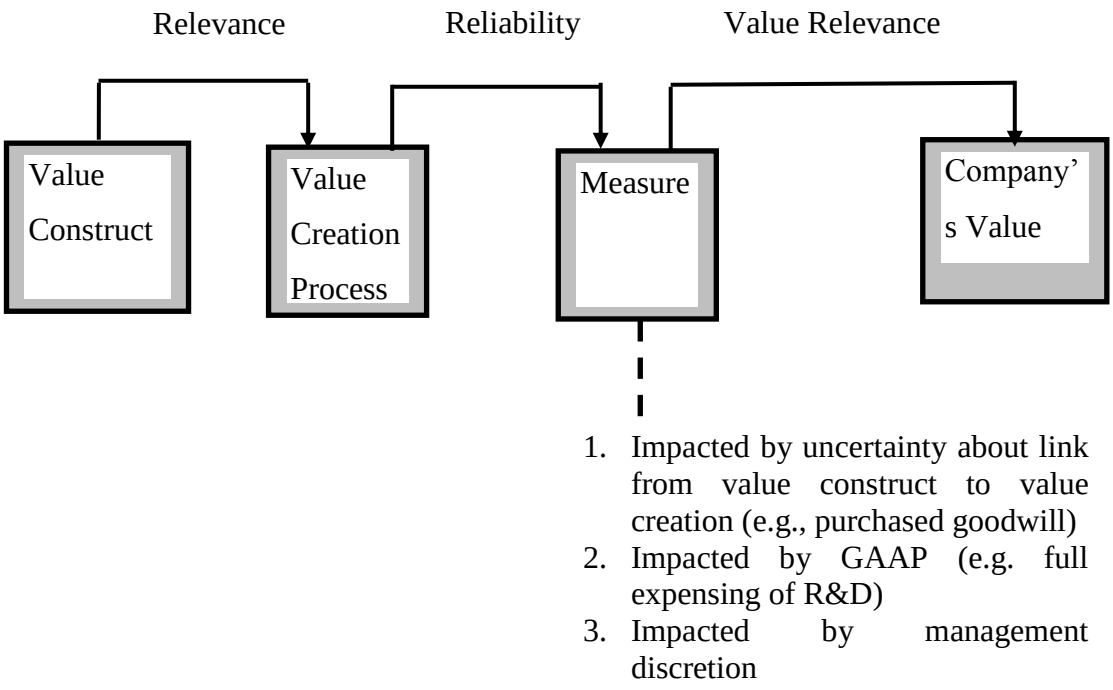

Figure 17: Concepts of Relevance and Reliability in Value Relevance Studies

Source: Wyatt, A. (2008). "What financial and non-financial information on intangibles is value-relevant? A review of the evidence." Accounting and Business Research**38**(3): 40.

A relevant accounting information must have both a clear value construct and a clear value creation process link (Wyatt, 2008). For example, research and development is more generally classified as compared to computer software. The latter has a definite value construct whereas the former is a bundle of expenditures with no definitive purpose until at a later stage. Hence, computer software is expected to be more value relevant because investors can better associate it with future economic benefits to the companies. Kallapur and Kwan (2004) find brands assets recognised as a result of acquisition in the U.K. are value relevant. However, most value relevant studies investigate the degree of relevancy of the accounting information despite in theory, accounting information is value relevant when it is both relevant and reliable. This is due to difficulties in designing a direct test of reliability in value relevance studies. Very few studies attempt to separate the impact of the reliability of accounting information on share prices or share returns. For example, Healy et al., (2002), examine the value relevance (reliability component) of research and development under different GAAP treatment by simulating accounting data for 500

pharmaceutical companies where the value creation process, the research and development expenditure and the company value are known.

The following figure which is based on discussions on accounting for intangibles illustrates accounting treatments for intangibles; capitalising/amortisation regime and immediate expensing regime and its potential link with the valuation of the company's equity.

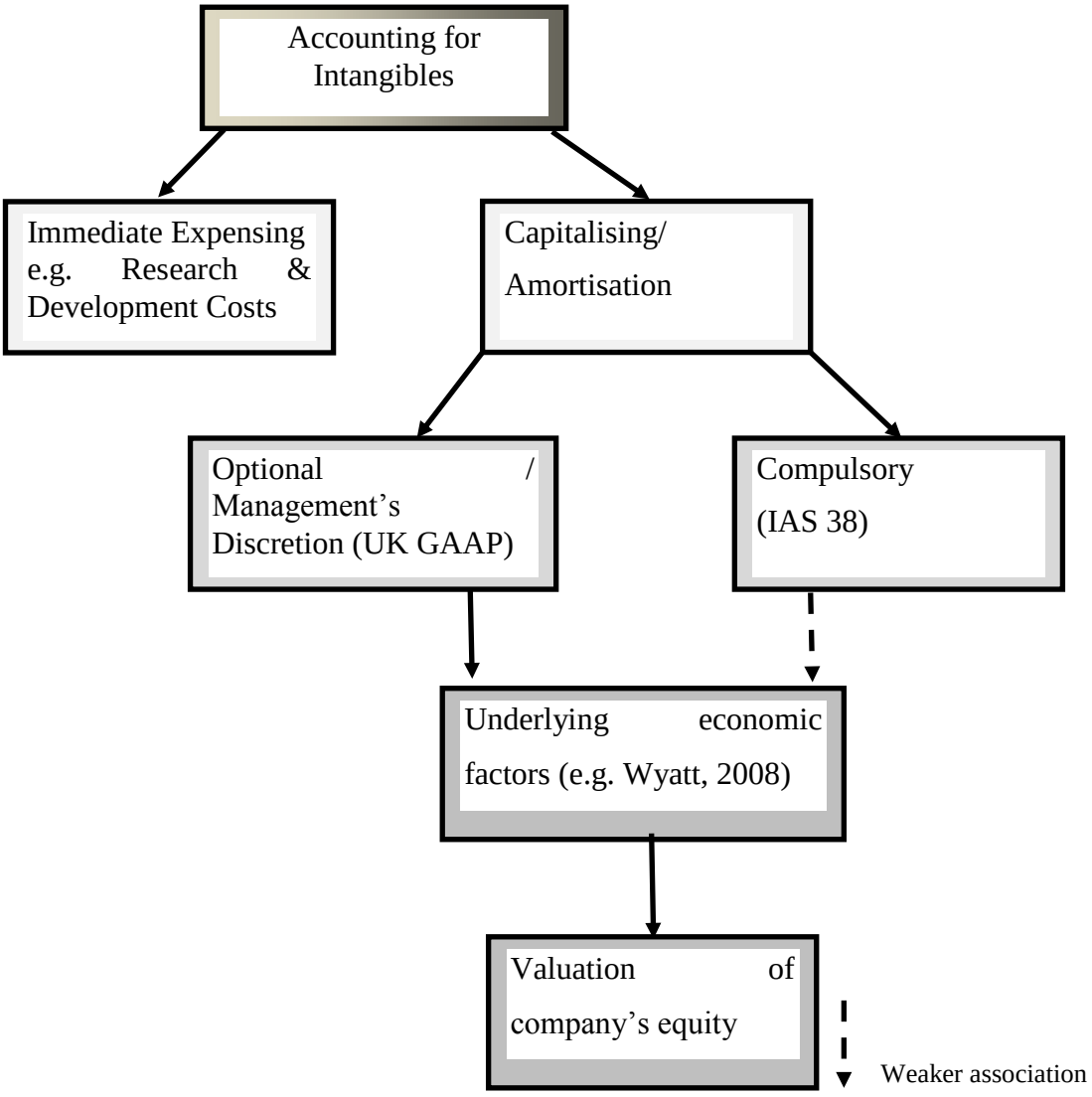

Figure 18: Accounting for Intangibles and Valuation of Company's Equity

Wyatt (2005) investigates the extent to which management makes accounting choices to record intangible assets based on their insights into the underlying

economics of their company. Her results suggest that it is associated with the strength of the technology that affects business operations, the length of the technology cycle time, and property rights-related factors which affect a company's ability to appropriate investment benefits. These factors are consistent with the underlying economic operating factors which are more important than other contracting and signalling factors as a first-order effect envisaged by GAAP. Her results also indicate that when the management has a voluntary or unregulated choice to record identifiable intangible assets; intangible assets better reflects a company's underlying economic factors than the regulated classes such as purchased goodwill and R&D assets. She argues limiting management's choices to record intangible assets tends to reduce, rather than improve, the quality of the balance sheet item and its informational contents to investors. Nevertheless, to give managers a full range of reporting choices assumes that managers are perfect agents and so to limit their range of choices has an element of stewardship.

Since Wyatt (2005) suggests that intangible assets are more informative when management has an option to capitalise or expense their acquisition costs, the move to adopt IFRS also removes this option. To determine whether this change would significantly affect the value relevance of intangible assets calls for future value relevance research. Oswald (2008) supports the notion that the removal of management's discretion whether to capitalise or expense development cost adversely affect a company's ability to communicate useful information to the stock market. Managers tend to choose a method for R&D that best communicate private information to investors in the U.K. (Oswald, 2008). Stark (2008) who reviews related existing literature relating to intangible assets, particularly in the U.K. concludes that IFRS may be purer in accounting terms but it might not be an absolute informational virtue. However, Nixon (1997) argues that very few UK companies apply this discretion, as shown by Oswald (2008) where only 14.5% of the study sample exercised the option. Therefore, the withdrawal of the discretion or option to capitalise development cost is not likely to have a drastic impact in the U.K. However, a recent study by Sahut et al., (2011) suggest that the book value of other intangible assets is greater and more value relevance under IFRS than local GAAP

except for Italian and Finnish investors. They defined other intangible assets as recognised intangibles other than goodwill whereas the capitalised goodwill was regarded as unidentified intangible assets transferred under goodwill.

Changes in accounting for impairment might influence Sahut et al., (2011)'s findings. Although, the development of FRS 11 shadows the development of IAS 36, it does not mean no discrepancies exist in accounting for asset impairment. *IAS 36 Impairment of Assets* provides more indicators of asset impairment than *FRS 11 Impairment of Fixed Assets and Goodwill* relating to market capitalisation (lack of synergy) and potential impairment when the carrying value of net assets exceeds its market capitalisation. In addition, if impairment occurs, under U.K. GAAP the impairment cost is allocated against assets in an income generating unit (IGU) in a priority order of goodwill, other intangible assets and tangible assets whereas IAS 36 uses cash generating unit (CGU) with goodwill and other intangible assets as a single class and then followed by tangible assets. Moreover, IAS 36 does not permit reversal of impairment made to goodwill but FRS 11 may allow impairment reversal on intangible assets under restricted circumstances.

7.3. Development of Hypotheses

The IASB has highlighted that IFRS will improve the quality of accounting information. Empirical studies on the impact of IFRS suggests that IFRS is beneficial such as in term of higher accounting information quality (e.g. Barth et al., 2001; Sahut et al., 2011; Kontopolus et al., 2010) and lower cost of equity capital (Lee et. al., 2008). Broader definition of intangible assets under IFRS enables companies to recognise and report more components of intangible assets, and greater application of fair value (e.g. valuation of intangible assets and impairment test) is expected to increase the value relevance of intangible assets. Thus, this study proposes that investors perceive IFRS to significantly affect the value relevance of accounting information. The quality of accounting information here refers to greater value relevant, measured by the estimated coefficient correlation between the accounting variables of interest and market value of equity. The accounting variables of interest

are a dummy variable for IFRS, intangible assets in general and its five components (Goodwill, Development Cost, Licenses, Brand and Patents, Computer Software and Other Intangible Assets).

Existing literature suggests that if investors perceived IFRS as merely a pure accounting change (Stark, 2008) then in an efficient market it would not significantly affect share prices. IFRS may produce mixed effects on accounting information such as the lower value relevance of earnings and book value in common law countries (Clarkson, et al., 2011). In other words, in such cases local accounting regime is perceived to be better fitted to local business and legal environment (Jermakovicz and Gornick-Tomaszewski, 2006). However, if there are contracting and political consequences, as hinted at by practitioners, or new information that may signal future cash flow effects, then there may be real economic consequences from the adoption of IFRS, and hence a positive market reaction.

Based on existing empirical evidence, the first null and alternative hypotheses were as follows,

H_0: IFRS as a disclosed adopted accounting policy, is not significantly more value relevant than U.K. GAAP

H_1: IFRS as a disclosed adopted accounting policy, is significantly more value relevant than U.K. GAAP

Existing value relevance studies might not be able to capture the impact of changes in accounting treatments related to intangible assets because such effects might be better reflected in intangible assets than in earnings and book values (Stark, 2008). Therefore, adding a separate variable for intangible assets might produce more specific evidence relating to the impact of IFRS on the value relevance of intangible assets. However, there is no conclusive evidence to support that the identifiable intangible assets under IFRS is more value relevant (Chalmers et al., 2008). On the other hand, IFRS's greater detailed guidance on recognising other intangible assets and its broader definition of intangible assets might enable more companies to capitalise intangible assets which potentially would convey new information relating

to future cash flows to investors. Hence, intangible assets might be more value relevant under IFRS. This study proposes that IFRS would increase the value relevance of intangible assets as the potential negative effects on their usefulness (e.g. a removal of an option to capitalise research and development costs) is expected to be minimal. Thus, this study proposes a second hypothesis as follows,

The second null and alternative hypotheses were,
H_0: IFRS has not significantly increased the value relevance of intangible assets
H_2: IFRS has significantly increased the value relevance of intangible assets

Evidence on the value relevance of classes of intangible assets other than goodwill is still lacking, particularly in the U.K. which is probably due to them being rarely recognised in the balance sheet prior to 2005. Sahut et al. (2011) categorise intangible into two classes; goodwill and other intangible assets and find that after IFRS, goodwill is less value relevant but the value relevance of other intangible asset is higher. Other classes of intangible assets can be value relevant as suggested by Kallapur and Kwan (2004) who find a component of other intangible assets, namely the brands assets recognised as a result of acquisition in the U.K. are value relevant.

Capitalisation of intangible assets may also contribute to greater value relevance of earnings (Goodwin and Ahmed, 2006). These findings show that existing evidence from the literature relating to the comparative value relevance of goodwill and other intangible assets is still mixed. Hence, this study does not have sufficient evidence from the literature to propose a definite sign of relation direction between each class of identified intangible assets with the market values of the company's equity.

In theory, the greater link between intangible assets with expected future benefits (cash flows) to the company, the stronger its expected relation with the market values (Wyatt, 2008). For example, computer software is more likely to be more positively and significantly related to the market value than other intangible assets. In practice, prior to IFRS, non-goodwill is rarely reported because current recognition rules do not permit capitalisation of internally-generated intangible assets. Therefore, this

study cannot predict any comparative strength of relations between goodwill and other classes of intangibles and the market value prior to IFRS. Instead, the third null and alternative hypothesis below compares the value relevance of goodwill to other classes of intangible assets under IFRS.

H_0: The value relevance of non-goodwill intangible assets is not significantly greater than the value relevance of goodwill under IFRS
H_3: The value relevance of non-goodwill intangible assets is significantly greater than the value relevance of goodwill under IFRS

Another important issue with IFRS is the compulsory impairment test on goodwill, which removes the mechanical straight-line amortisation. However, Chapter 5 documented that very few U.K. companies had amortised goodwill prior to IFRS. Hence, this drastic change may not have any significant impact on the value relevance of goodwill. Nevertheless, the impairment test is expected to produce more value relevance of goodwill (Chalmers et al., 2008) and a better indicator of share price (Jennings, 2001) because it involves re-measurement of the carrying value of goodwill to its recoverable amount (fair value less selling cost or value in use, whichever is higher, IAS 36.105). It also removes an arbitrary allocation of goodwill cost across its estimated useful lives and improves its reflection of economic condition and future benefits to accrue to the entity (Barth, 2006).

However, the impairment test might not cause any reduction of goodwill if the carrying value of goodwill is already less than its recoverable amount. Most companies might also opt for value in use because the determination of fair value is practically difficult. Consequently, it may result in no significant change in the carrying value of goodwill, and hence, no negative impact on its value relevance (Sahut et al., 2011). Therefore, this study hypothesises that goodwill is value relevant and IFRS can potentially increase the value relevance of goodwill.

The fourth null and alternative hypotheses were,
H_0: IFRS does not significantly increase the value relevance of goodwill

H_4: IFRS does significantly increase the value relevance of goodwill

7.4. Research Design and Method of Investigation

The method of investigation was by a multiple regression model, which was modified to suit the hypothesis testing. Following related prior studies, the dependent variable was the market value, six months after the fiscal year end (e.g. Agostino et al., 2011; Chalmers et al., 2008). The explanatory accounting variable of interest was intangible assets and their components and other accounting variables were earnings, total tangible assets and total liabilities. A dummy variable of interest is Difrs (for IFRS). Their descriptions are as follows;

Earnings or Net Income (E_{it})

This variable is very common in value relevance studies. Earnings are the net income for common shareholders. It represents the stock flow concept of income in the valuation of equity. Existing studies suggest that earnings under IFRS is higher (Hung and Subramanyam, 2007) and experience a gradual and stable increase in its degree of relation with market values or value relevance (Chalmers, et al., 2008). A change from amortisation of goodwill to the impairment of goodwill reduces the arbitrary allocation of expenses against income and it is more likely to increase earnings. Impairment charges are not fixed and are uncertain, which will incur only when events indicating impairment in goodwill exist (e.g. lacking synergy). Hence, the estimated coefficient of earnings is expected to be positively significant because earnings are better reflector of companies' economic and underlying performance.

Intangible Assets (TIA_{it})

Intangible assets are the amounts reported in the balance sheet which represent capitalised or identifiable intangible assets. Empirical evidence on how IFRS affects its value relevance is still lacking. Existing research provide mixed findings. Intangible assets are more value relevant under IFRS in Europe (Sahut et al., 2011) but not more value relevant than the local GAAP in Australia (Chambers et al., 2008). Generally, the definition of intangible assets under IAS 38 is broader (except

for capitalisation of development costs) but stricter than FRS 10 (Horton and Serafeim, 2006), where companies must recognise internally generated intangibles if the recognition criteria are met (IAS 38.22). This study anticipates the estimated coefficient of intangible assets to be significantly positive and is greater under IFRS.

Goodwill (G_{it})

Goodwill is a class of intangible assets that attracts the most attention from researchers due to purchased goodwill has been recognised in the financial statements for decades. IFRS brings a drastic change in the accounting for goodwill; its amortisation has been replaced by compulsory impairment test. Purchased goodwill is expected to continue to increase. Its balance sheet value is expected to convey more information to investors. However, the change is not expected to significantly affect the value relevance of goodwill because only very few of U.K. companies follow an amortisation regime. Therefore, the expected sign of goodwill is positive and significant but IFRS is not expected to significantly strengthen this relation beyond the U.K. GAAP.

Other Class of Intangible Assets (CI_{it})

IAS 38 provides more guidance than FRS 10 in accounting for other classes of intangibles. It not only lists out other classes of intangible such as development cost, licenses, brands and patents, computer software and other intangible assets but also details out when to recognise, what the initial acquisition cost, and how to subsequently value them (International GAAP, 2008). Therefore, the reported level of other classes of intangible assets is expected to increase. However, the removal of an option to capitalise development costs is expected to lessen its informativeness and difficulties to measure other intangible assets are more likely to contribute to their lower explanatory powers of market values. Thus, IFRS is expected to increase the value relevance of more specific class of intangible assets (e.g. computer software and brands) but not much impact on the value relevance of other broadly classed intangible assets (e.g. development cost and other intangible assets).

Control Variables

Age_{it}

Age was calculated as the number of years of operations in the current fiscal year. The more established companies (longer years in operations) were assumed to have matured demand and hence more stable earnings and greater assets (superior fundamentals). Moreover, it was also assumed that their growth rates were more stable and earnings were not as volatile as younger companies. **Age_{it}** was added to control for this effect and was expected to be negatively and significantly correlated with market values.

Industry and Other Control Variables

In existing studies, researchers commonly include a dummy variable to control for industry. Following prior studies (e.g. Lee et al., 2008), a dummy variable, **Ind_{it}**, is added to the control variables. It is determined by 2-SIC digit. There were 25 groups (Refer Table 42). These groups were broadly classified as nonfinancial, financials and utilities. In addition, two dummy variables to control for the negative book values **(Dbv_{it})** and loss-making companies **($Dloss_{it}$)** were added. Literature shows that investors of companies with negative book values are more interested in the potential liquidated value of the companies (Franzen and Radhakrishnan, 2009). Hence, book value is expected to show stronger relation with the market values than earnings for companies with negative book values.

Other control variables were types of auditors **(Dau_{it})**, the company's market capitalisation **(Dmc_{it})**, growth **($Dgrowth_{it}$)**, closely-held shares **($Dchs_{it}$)**, and leverage **($Dlev_{it}$)** and each was included and tested one at a time. Types of auditors were grouped into either high quality (assigned 1) or poor quality (assigned 0) (Stokes, 2010). Other dummy variables were determined based Hayes and Sigley (2008) where the median of the average value of each basis were the cut off values. Any company with value greater than the median of these average values are grouped as high market capitalisation, highly closely held shares, high leverage, and high growth. Otherwise, they are assigned 0 as low market capitalisation, low closely held

shares, low leverage, and low growth. Different company sizes can also influence the value relevance of accounting information. For example, investors of smaller companies perceive earnings as more value relevant than of larger companies because smaller companies are less diversified and hence, they have limited rooms to manage their earnings (Brimble and Hodgson, 2007). However, as per existing studies (Dedman, et al., 2009) the effects of different company sizes on the value relevant of accounting information is minimised by using deflators.

The Modified Valuation Models

Considering the pros and cons of the value relevance models, this study chose to employ a modified balance sheet identity models where intangible assets (**IA_{it}***)* and its components (**G_{it}**-goodwill, **DC_{it}**-development cost, **L_{it}**-licenses, **BP_{it}**-brand and patents, **CS_{it}**-computer software and **OIA_{it}**-other intangible assets) were the accounting variables of interest. In addition, a dummy variable **($Difrs_{it}$)** was added to test the value relevance of IFRS. However, a return model (informational model) was used to capture the possibilities that share market anticipates changes in intangible assets and incorporate it in the beginning share price. The next chapter (Chapter 8) provides further discussion on this model and this relation which measures the impact of IFRS on the informative value of intangible assets.

The balance sheet identity model or valuation model were modified to accommodate each hypothesis. Therefore, five modified models were required and the models were illustrated by equation 1 to 4. In Model 1, the market value of company's equity was regressed on accounting variables of interest where intangible assets (TIA) was separated from tangible assets (TTA). The modified balance sheet valuation model 1 was,

Model 1: $MV_{it} = \beta_0 + \beta_1 TTA_{it} + \beta_2 \mathbf{TIA_{it}} - \beta_3 TL_{it} + \beta_4 E_{it} + \beta_5 \mathbf{Difrs_{it}} + \varepsilon_{it}$

Where,

MV_{it} is the market value of equity for company i in time t**,** **TIA_{it}** is intangible assets, **TTA_{it}** is total tangible assets, and is calculated as the reported total assets minus

reported intangible assets, $\mathbf{TL_{it}}$ is total liabilities, $\mathbf{E_{it}}$ is net income available to common shareholders, $\mathbf{Difrs_{it}}$ is a dummy variable, taking a value of 1 for IFRS and 0 for UK GAAP, $\mathbf{Age_{it}}$ is its number of operating years, is determined as the current year minus the company's incorporation year, and $\boldsymbol{\varepsilon_{it}}$ is the residuals or unexplained variation of market values.

This study uses net income instead of earnings before extraordinary items because net income is subjected to changes in accounting rules for interest and taxes and hence it captures more comprehensive effects of IFRS. In addition, as mentioned in Chapter 5, net income is more consistent as there are some discrepancies between earnings before extraordinary items reported in the annual reports and stored in the Data Stream. Next, to minimise the influence of multicolinearity, in particular between TTA_{it} (Total Tangible Assets) and TL_{it} (Total Liabilities), they were replaced by $NETTA_{it}$ (Net Tangible Assets), Total Tangible Assets minus Total Liabilities. The Pearson's correlation matrix indicated high and significant correlation between TTA and TL. Hence, substituting them with $NETTA_{it}$ is assumed to control their colinearity influence on the regression results. The regression model 1 and 2 were developed for the first hypothesis (H_1).

Model 2: $MV_{it} = \beta_0 + \alpha\, \beta_1 NETTA_{it} + \boldsymbol{\alpha}\, \beta_2 \mathbf{TIA_{it}} + \alpha\, \beta_3 E_{it} + \boldsymbol{\alpha}\, \beta_4 \mathbf{Difrs_{it}} + \varepsilon_{it}$

To examine the value relevance of different classes of intangible assets, intangible assets (TIA) were decomposed into different classes of intangible assets. However, not all companies in the sample had carried different classes of intangibles on their balance sheet and thus, the data for these different classes of intangibles were not available, especially for pre-IFRS. Therefore, it was not possible to decompose TIA into its different classes simultaneously. Thus, TIA was broken down into **CI** (a class of intangibles – Goodwill, Development Costs, Brands and Patents, Licences, Computer Software or Other Intangible Assets), and **Non-CI** (other than that class of intangibles; **NG** – non-goodwill, **NDC**-non-development costs, **NBP** – non-brands and patents, **NL**-non-licenses, **NCS**-non-computer software, and **NOIA** – non other intangible assets). Model 3 was expressed as,

Model 3: $MV_{it} = \beta_0 + \beta_1 NETTA_{it} + \beta_2 \mathbf{CI_{it}} + \beta_3 NCI_{it} + \beta_4 E_{it} + \beta_5 \mathbf{Difrs_{it}} + \varepsilon_{it}$

To assess the impact of IFRS on intangible assets and the different classes of intangibles, interaction variables were added. Following existing literature (e.g. Hennning, 1994, Agostino et al., 2011), the accounting variables of interest were multiplied with Difrs. Model 2 was further modified as follows

Model 4: $MV_{it} = \beta_0 + \beta_1 NETTA_{it} + \beta_2 \mathbf{TIA_{it}} + \beta_3 E_{it} + \beta_4 \mathbf{TIA*Difrs_{it}} + \varepsilon_{it}$

For the additional tests, control variables were incorporated into model 2 and 4 to capture the effects of companies' fixed characteristics namely, age (**Age**), Industry (**Ind**), quality of auditors (**Aud**), size (**MktCap**), closely-held shares (**CHS**), growth (**Gr**) and level of risk (**Lev**). These models were executed by a contemporary linear regression which was based on a panel-corrected standard errors technique[19] to control for non-normality and heterokedasticity of the data.

The Data and Sample Selection

Similar to previous two chapters, the data source was the Data Stream. The sample selection was also similar except for this chapter chose companies with sufficient data from the year 2000 (including intangible assets and its decomposition). The population of companies were all listed companies in the U.K. that had adopted U.K. GAAP prior to 2005. These companies were selected to minimise changes due to other accounting regimes and regulatory and institutional differences. Therefore, companies which adopted other accounting standards such as U.S. GAAP were excluded. Companies that report in other currencies were also excluded to avoid the need to convert into pound sterling and hence avoiding foreign currency translation effects. The study period started in 2000 because the majority of the IASs was completed in 1998 and were effective in 1999 where companies must adopt them as a full set (Hung and Subramanyam, 2007) and hence, the year 1999 was the transitional years for IFRS. This study used deflated[20] data to control for

[19] Following prior studies with non-normal and heterokedastic data such as Kontopolous et al. (2010) and Saadi (2005).

[20] The main deflator was the outstanding number of shares, a deflator used by existing studies such as Tsoligkas and Tsalavoutas, (2011), Barth and Clinch (2009)[20] and Chalmers et al. (2008). Other deflators (sales, opening market values and average assets) were used for robustness test.

heterokedasticity in the regression residuals. Data was validated by a manual checking on a random sample of companies. Accounting figures as per Data Stream were cross-checked with accounting figures in the financial reports. The discrepancies were minuscule (3% to 5%) on different profit lines except for the most bottom profit line, i.e. the net income for ordinary shareholders. No discrepancy in accounting figures was applicable to other accounting information of interest.

Table 42 shows the distribution of company-year observations across industries. The sample was initially sub-divided into three main groups; nonfinancial, financial and utilities. Unlike most studies (e.g. Saadi, 2005; ElBakry, 2010; Kontopoulos et al, 2010), financial companies were not excluded but they were analysed separately. For the nonfinancial sample, the tests were conducted for both inclusive and exclusive of utilities. Originally, there were 5,391 company-year observations, consisting of 4,572 (or 85%) nonfinancial companies, 675 (or 13%) financial companies and 144 (or 3%) utilities. As this sample included companies from various industries and market maturities and sizes, there were some extreme values in the data.

These outliers were based on data deflated by number of ordinary shares, and they were excluded by few steps. First, data for each variable was ranked in ascending order one at a time. The top and lowest 1 % of the data was eliminated (Dedman, et al., 2009). Second, they were compared for consistencies across the study period for each company. If the values were not consistent within the time series, they were checked manually to their annual reports.

Table 42: Distribution of Study Sample by Industries

Industry Groups	Industry Group Name (2-SIC digit)	Original Freq.	%	Outliers Freq.	%	Final Sample Freq.	%
1	AEROSPACE	45	1	-	0	45	1
2	APPAREL	81	2	3	0.5	78	2
3	AUTOMOTIVE	27	1	-	0	27	1
4	BEVERAGES	72	1	4	0.7	68	1
5	CHEMICALS	126	2	1	0	125	3
6	CONSTRUCTION	450	8	59	11	391	8
7	DIVERSIFIED	63	1	-	0	63	1
8	DRUGS, COSMETICS & HEALTH	135	3	8	1	127	3
9	ELECTRICAL	90	2	-	0	90	2
10	ELECTRONICS	801	15	53	10	748	15
12	FOOD	135	3	23	4	112	2
13	MACHINERY & EQUIPMENT	189	4	6	1	183	4
14	METAL PRODUCERS	27	1	-	0	27	1
15	METAL PRODUCT MANUFACTURERS	144	3	2	0	142	3
16	OIL, GAS, COAL & RELATED SERVICES	63	1	2	0	61	1
17	PAPER	45	1	-	0	45	1
18	PRINTING & PUBLISHING	162	3	3	1	159	3
19	RECREATION	324	6	28	5	296	6
20	RETAILERS	279	5	18	3	261	5
21	TEXTILES	81	2	-	0	81	2
22	TOBACCO	18	0	3	1	15	0
23	TRANSPORTATION	108	2	15	3	93	2
25	MISCELLANEOUS	1107	21	51	9	1056	22
	NONFINANCIAL (exc. Utilities)	4572	84.8	279	51	4293	89
11	FINANCIAL	675	12.5	238	43	437	9
24	UTILITIES	144	2.7	35	6	109	2
	Total	5391	100	552	100	4839	100

Table 42 shows the industry grouping which follows the Data Stream's 2-SIC digit. The sample was divided into two: financial and nonfinancial. Utilities companies were added to the nonfinancial sample during the sensitivity test and their inclusion did not significantly influenced results. Frequency was in terms of company-year observations. Percentage (%) was relative to total figures.

Some annual reports of new and small companies for early fiscal years (e.g. 2000 and 2001) were not available due to they were in the process of listing or management change (e.g. in takeover process). Therefore, these companies were eliminated. Third, following Agostino et al. (2011), values that fell outside the normal distributed data (i.e. less than -3 times the standard deviation or exceeded 3 times the standard deviation) were eliminated. Most of the outliers came from financial companies (43%) and construction companies (11%). Last, the descriptive statistics were scrutinised to identify remaining outliers. These outliers were again manually checked for accuracy before being excluded. Some extreme values were due to small value of the deflator such as small and newly established companies (e.g. in the year 2000) and hence, the deflated values became very high. The final sample size was 4,839 company-year observations, comprised of 4,293 (or 89%) nonfinancial, 437 (or 9%) financial and 109 (or 2%) utilities.

Companies with Different Classes of Intangible Assets

The sample size to test the value relevance of different classes of intangible assets was smaller because not all companies in the sample reported these intangibles on their balance sheet. Table 43 shows the number of company-year observations, mean, minimum and maximum values of reported intangible assets before excluding the outliers by the three groups. The descriptive statistics for the intangible assets were in the deflated form. On average, financial companies carry the least intangible assets. Despite being the smallest group, the average intangible asset for utilities was higher than financial companies. Most values of intangibles were concentrated among nonfinancial companies. The minimum values of intangible assets for financial and utilities were zero which indicated that some financial and utility companies did not carry intangible assets on their balance sheets. Thus, these companies were excluded. Table 44 summarises the yearly distribution of companies with intangible assets and different classes of intangible assets for the whole sample.

Table 43: Descriptive Statistics for Reported Intangible Assets

	Company-year observations	Mean	Minimum	Maximum
Financials	437	0.111	0	2.556
Nonfinancial excluding Utilities	4292	0.431	-0.003[21]	6.957
Utilities	109	0.367	0	2.506

Table 43 provides key descriptive statistics with respect to company-year observations of intangible assets. It was used to detect any remaining company-year observation with no or zero balance of intangible assets, which were later eliminated.

Table 44: Yearly Distribution of Companies with Intangible Assets and Different Classes of Intangible Assets

	2000	2001	2002	2003	2004[22]	2005	2006	2007	2008
Intangible Assets	478	427	440	455	462	482	502	512	523
Goodwill	394	398	415	432	436	449	460	460	459
Dev. Cost	0	0	0	0	31	60	93	115	126
Brands & Patents	0	0	0	0	50	67	99	119	134
Licences	0	0	0	0	40	44	58	62	67
Computer Software	0	0	0	1	2	70	178	218	243
Other Intangibles	0	0	0	0	43	116	219	257	292

Table 44 summarises the number of companies with intangible assets on their balance sheets by fiscal year as per DataStream. This number includes all industries in the sample.

The sample size of companies with intangible assets ranged from 427 to 523 companies per year. Generally, the number of companies reporting intangible was increasing across the study period. For different classes of intangible assets, the largest class was goodwill. Some companies did not classify their intangible assets into different classes of intangibles (goodwill, brands and patents, licenses, computer software and other intangible assets). Hence, the number of companies with these different classes of intangibles was less than those with intangible assets. Prior to IFRS, reporting other than goodwill was very rare (Stark, 2008). Only one company

[21]The minimum value for intangible was negative due to a company that had reported a negative goodwill in the year 2000.
[22] 2004 is considered as a transitional year (Iatridis, 2010)

had reported computer software in 2003 and two to fifty companies had started to capitalise and to carry development cost, brands and patents, licenses, computer software and other intangible assets in 2004. The number of companies capitalising computer software in 2007 has been doubled as compared to 2006 which is probably due to broader definition for computer software under IFRS.

This scenario suggests that companies are slowly adjusting to the broader scope and guidance of financial accounting and reporting for the different classes of intangibles since the year 2004. The number of companies reporting each class of intangibles was crucial because it must be sufficient for the multiple regressions. The rule of thumb for the required number of observations or sample size must be at least equal to 50 plus 8 times the number of independent variables (Green, 1991 as referred by Tabachnick and Fidell, 2007). Otherwise, the model will perfectly predict the dependent variable which is due to the artefact of cases-to-independent variables ratio (Tabachnik and Fidell, 2007), particularly when the dependant variable is skewed and not normally distributed because more cases are needed to explain variance in the dependent variable.

7.5. Data Analysis and Findings

Results are presented and are discussed separately for nonfinancial and financial samples.

The final sample size for nonfinancial sample was 3,580 company-year observations (refer Table 63, Appendix. The sample sizes of non-zero observations for different classes of intangible assets were smaller. Some companies did not decompose their intangible assets which explained zero minimum values for some classes of intangible assets. Very few nonfinancial companies had reported licenses (241 company-year observations), followed by development costs (409 company-year observations), brands and patents (417 company-year observations), computer software (590 company-year observations) and other intangible assets (749 company-year observations). Purchased goodwill has the largest number of non-zero

observations (3,299 company-year observations). Except for goodwill, most of zero observations occurred before 2005. As illustrated by Table 43, the sample size of utility companies was the smallest with only 109 company-year observations (roughly 10 companies per year). The descriptive statistics for utilities were briefly described below but were not documented.

Despite being the smallest group, the average market value of utility companies was not substantially different from other nonfinancial and financial sample, suggesting that despite fewer numbers, utility companies were large and quite established in the capital market. However, its average total intangible assets were lower than nonfinancial companies (£0.37 as compared to £0.43 per share). In all sub-samples, goodwill contributed the most of the intangible assets. Other classes of intangibles (development costs and brands and patents) were the least contributors. Some value relevance studies excluded utilities because among other factors, they are subjected to regulated selling price and hence they enjoy stable net income and market values. This factor probably explains why utilities reported the highest average net income compared to financial companies and nonfinancial companies and the lowest standard deviation (least volatile). For robustness, this study would test the value relevance model by both including and excluding the utility companies.

7.5.1. The Value Relevance of IFRS and Intangible Assets (Nonfinancial Sample)

The Descriptive Statistics

The study population consisted of all listed companies in the U.K., which were drawn from various sizes and characteristics, including financial systems, performance and position. The high standard deviations and large gap between the minimum and the maximum values from the original sample reflect these differences. However, after excluding the outliers, the gaps were reduced. Nonfinancial companies formed the majority of the study sample with 4,292 company-year observations before excluding the outliers. Table 45 shows that the average market value (£1,340 millions) was greater than the average net assets (the average total tangible assets, £1,365m plus total intangible assets, £431m and minus

the average total liabilities, £751m) whereas the average earnings was £31m. Table 63 (refer Appendix) documents that computer software was on average the highest identifiable intangible assets (£674m), followed by licenses (£382m), goodwill (£362m), brands and patents (£171m), other intangible assets (£58m) and development cost was the smallest (£12m). In deflated units, the average market values were £2.23 per share which was much greater than the average earnings (£0.08 per share). An average total tangible asset and intangible assets were £1.93 per share and £0.53 per share respectively which exceeded average total liabilities, resulting to positive average net assets (£0.96 per share).

Table 45: Descriptive Statistics (Nonfinancial Sample)

n = 4292	Market Value	Total Tangible Assets	Total Intangible	Total Liabilities	Earnings
			un-deflated values, £millions		
Mean	1,340	1,365	431	751	31
Std. Dev.	6,998	7,906	4,297	2,870	662
Min.	0.340	0.362	0.001	-3	-21,900
Max.	178 ,000	172, 000	143,000	49,400	6,660
			deflated values[23], £ per share		
Mean	2.230	1.930	0.530	1.500	0.080
Std. Dev.	2.630	1.840	0.810	1.600	0.325
Min.	0.010	0.003	0.00006	-0.017	-9.36
Max.	27.20	9.718	6.958	9.818	1.803

Table 45 reports key descriptive statistics of the final sample for both model's dependent variable (market value) and explanatory variables (total tangible assets, total intangible assets, total liabilities and earnings). The deflated data was computed by dividing original data with number of ordinary shares. Hence, the amount was in £ per ordinary share each.

The Multiple Regressions Results

The multiple regressions results were discussed according to the hypotheses and sub-samples (nonfinancial and financial companies). The data was deflated to minimise the heterokedasticity in the regression residuals (or errors) and to minimise any effect

[23] Per outstanding ordinary share

of spurious relationship among the explanatory variables. Nevertheless, additional steps were taken to ensure these variables were independent. The correlation matrix table indicates no high interdependent variables. Correlation coefficients which are less than 0.6, are not considered as highly correlated (Ali and Hwang, 2000).

Table 46 and 47 present the R^2, the estimated correlation coefficients and the p-values from Model 1 to 4 for nonfinancial sample. Results from this section represent U.K. listed companies at large because nonfinancial sample formed the majority of the study sample (approximately 89%). Model 1 to 4 explains approximately 11.5% to 21% of the market values. This is slightly lower than the R^2 (26%) in Sahut et al., (2011). However, Sahut et al. (2011) who investigate the impact of IFRS on the value relevance of goodwill and non-goodwill intangible assets in European countries, including the U.K. use a price valuation model with slightly different accounting variables (net income, book value of equity, goodwill, other intangible assets and density of intangible assets). In addition, their dependent variable is share price four months after the fiscal year - end and they adopted a pre- and post-IFRS research design with shorter post-IFRS period (2005 to 2007).

The intercept values were all significant. This indicates significant portion of the market values are unexplained by the explanatory variables. In nature, there are various factors influencing market values, including non-tangible information such as the market sentiment (Daniel and Titman, 2006). Furthermore, investors are likely to rely on non-accounting source of information. For example, there is a trade off between the level of investors' reliance on accounting information and other source of information such as industry based and market based information (Bissessur and Hodgson, 2012). However, these factors are beyond the research scope of this thesis.

Table 46: Value Relevance of Accounting Information and IFRS (Nonfinancial Sample)

n = 4292		Model 1[24]		Model 2[25]	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value
R^2	+	0.210	0.000***	0.171	0.000***
Intercept		0.879	0.000***	1.231	0.000***
TTA_{it}	+	0.596	0.000***		
TL_{it}	-	-0.150	0.217		
$NETTA_{it}$	+			0.687	0.000***
TIA_{it}	+	0.593	0.000***	1.105	0.000***
E_{it}	+	0.642	0.000***	0.586	0.000***
$Difrs_{it}$	+	0.043	0.531	0.090	0.203

Table 46 presents results from Model 1 and 2 for nonfinancial sample. The variables were defined as follows; the dependent variable was MV_{it} or market value six month after the fiscal year end; TTA_{it} was total tangible assets, TL_{it} was total liabilities, $NETTA_{it}$ was net tangible assets (TTA_{it} minus TL_{it}), TIA_{it} was total intangible assets, E_{it} or earnings was net income, $Difrs_{it}$ was a dummy variable for the disclosed accounting policies. A deflator was number of outstanding ordinary shares.
*, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

The first hypothesis aims to assess the value relevance of the disclosed accounting policy, IFRS. The hypothesis contends that IFRS is significantly more value relevant than U.K GAAP. Although some studies (e.g. Armstrong et al, 2010) have examined the degree of market reaction towards EU announcement to mandate IFRS in the Europe and their findings suggest positive market reactions, the reaction might change during post-IFRS as users (investors) are more aware of IFRS and its impact on the quality of accounting information. The market had reacted positively during the transitional period and during the early adoption period (Armstrong, et al., 2008). The expectations of improvement in the quality of financial reporting (Barth, 2008) such as greater comparability and more relevant accounting information is more likely to contribute to the positive market reactions. However, investors may also now realise that the local GAAP is better fitted to the local business and legal

[24]Model 1: $MV_{it} = \beta_0 + \beta_1 TTA_{it} + \beta_2 \mathbf{TIA_{it}} - \beta_3 TL_{it} + \beta_4 E_{it} + \beta_5 \mathbf{Difrs_{it}} + \varepsilon_{it}$
[25] Model 2: $MV_{it} = \beta_0 + \alpha\beta_1 NETTA_{it} + \boldsymbol{\alpha}\beta_2 \mathbf{TIA_{it}} + \alpha\beta_3 E_{it} + \boldsymbol{\alpha}\beta_4 \mathbf{Difrs_{it}} + \varepsilon_{it}$

environment (Jermakovicz and Gornick-Tomaszewski, 2006), and have probably changed their perception towards IFRS accordingly. This section will provide some evidence that support or against Jermakovics and Gornick-Tomaszewski's findings.

For the first hypothesis, the variable of interest was the dummy variable, **Difrs** (assigned 0 for UK GAAP and 1 for IFRS). This study assumed investors are aware of the disclosed accounting policy in the financial statements. This hypothesis tests whether they consider IFRS is relevant to their market valuation of the company's equity.

H_1: IFRS as a disclosed adopted accounting policy, is significantly more value relevant than U.K. GAAP

Existing literature (e.g. Armstrong et al., 2010 and Barth 2008), suggest that investors perceive IFRS to signal higher quality of accounting information. Consequently, investors would incorporate more accounting information in their market valuation of equity and hence, accounting information becomes more value relevant. If that happens, Difrs would be positively correlated with companies' market values. Table 46 shows that the coefficient correlation of Difrs was positive but very weak (0.043) and not significant (p-value = 0.531). Therefore, H_1 was rejected for nonfinancial sample. This study suggests that IFRS is not significantly more value relevant than U.K. GAAP. There are several possible reasons.

First, investors of nonfinancial sectors in the U.K. may not find IFRS value relevant due to the fact that generally both IFRS and U.K. GAAP are perceived to be similar (Li, 2010; ElBakry, 2010) due to among other factors both are designed for equity market users, rooted from the Anglo-Saxon jurisdiction, and have been involved in convergence projects. Second, they may also view local accounting to fit better with the domestic business and legal environment (Jermakovicz and Gornick-Tomaszewski, 2006). Third, U.K. investors are likely not to expect the impact of a drastic change in the accounting treatment for goodwill to substantially to affect company's reported earnings and net assets. This expectation is quite reasonable

because U.K. companies have been allowed to treat goodwill similar to IFRS if they can demonstrate that their goodwill's useful life is indefinite (Stark, 2008). Therefore, IFRS would not in practice change the accounting treatment of goodwill for such companies.

This result remains unchanged even when utility companies were excluded. However, when loss-making companies and companies with negative book values were eliminated, the Difrs was negatively (-0.05 and p-value = 0.481) related to the market value of equity. Investors of profit-making companies might fear of adverse impact on earnings after implementing IFRS rules (e.g., impairment of assets, applying fair values) and additional charges (e.g. removal of manager's option to capitalise development costs would consequently lead to higher amortisation expenses). The elimination of loss-making companies (777 company-year observations) and companies with negative book values (56 company-year observations) caused the correlation coefficient of Difrs to be negative but its effects was not strong enough to produce significant results.

Existing studies that examine the impact of value relevance of IFRS per se are not yet available to the researcher's knowledge. Prior studies use a dummy variable for the accounting regime (IFRS or local GAAP) in their regression models to test whether IFRS is a significant predictor of cost of equity capital (e.g. Lee et al., 2008) and find that IFRS is negatively and significantly related to the cost of equity capital, implying more transparent and comparable financial reporting under IFRS lead to lower cost of capital. Furthermore, existing studies investigate the impact of IFRS on the value relevance of accounting information by an interaction variable (accounting variable*dummy variable) to pre- and post-IFRS results (e.g. Sahut et al., 2011 and Kontopolous et al., 2010). Thus, result from the current study is new to the literature and no comparison with existing studies is yet possible.

As a conclusion, this study indicates that IFRS as an accounting policy in the financial reports is not significantly value relevant to U.K. investors of nonfinancial sectors, suggesting that local accounting standards might be better fitted for local

business and legal environment (Jermakovicz and Gornick-Tomaszewski, 2006) and IFRS might be purer in accounting terms but not an absolute informational virtue (Stark, 2008). Investors might not be convinced that IFRS would significantly be better than U.K. GAAP as indicated by the majority responses on IFRS implementation; IFRS would inject more volatility into financial results; and companies do not expect IFRS adoption to reduce their cost of capital (Jermakovicz and Gornick-Tomaszewski, 2006). Nonetheless, the impact of IFRS might be manifested in specific accounting information which would be tested by the subsequent hypotheses.

H_2: IFRS has significantly increased the value relevance of intangible assets

Although the variable of interest is intangible assets, this study includes other independent variables (earnings, total tangible assets, total liabilities, and total net tangible assets) in the data analysis and discussion.

Table 46 shows that the expected signs for all explanatory variables were as predicted. The estimated coefficient correlations were significant except for total liabilities. Total tangible assets were positively (0.596) and significantly (p-value = 0.000) related to market values and therefore, it was value relevant. This coefficient was slightly greater (0.616 and p-value = 0.000) when utility companies were excluded from the sample (undocumented). However, total tangible assets were not significantly related to market value when loss-making and negative book value companies were excluded. This indicates that investors of poorly performed companies have incorporated total tangible assets in the company valuation because they are more concerned about the current net worth (bankruptcy or liquidation value) as compared to performance indicators such as earnings and cash flows (Franzen and Radhakrishnan, 2009). Earnings (or net income), were positively and significantly related to the market values for all five models. This supports existing evidence that earnings are the most important accounting information to investors (e.g. Graham et al., 2008). In Model 1, it was positively and significantly related to market (0.642 and p-value = 0.000) and hence, was considered value relevant. This

positive and significant relation was very high (6.112 and p-value = 0.000) for profit-making and non-negative book value companies, i.e. excluding loss-making and negative book value companies, signifying the importance of earnings as direct input to the company equity valuation for profit-making companies.

Fundamentally, liabilities exist to finance asset acquisitions. Hence, the two variables (total assets and total liabilities) were highly correlated as shown in the correlation matrix tables (Table 65, Appendix). This issue was rectified by replacing them with net tangible assets. The estimated correlation coefficients of net tangible assets as an explanatory variable of market value were positive and significantly stronger. Furthermore, eliminating loss-making companies and companies with negative book values had not qualitatively changed the direction of relations and significant levels between net tangible assets and market value.

As discussed in the literature review section, accounting for intangible assets is inherent with some practical issues. In nature, financial accounting and recognition of intangible assets is more difficult than tangible assets because they are more difficult to measure and hence they are least likely to be recognised in the financial statements (Barth et al., 2002). Only identifiable intangible assets that meet the recognition criteria are capitalised and hence reported in the balance sheet. Such criteria are quite similar under both U.K. GAAP and IFRS. However, IFRS provides a broader definition of intangible assets where the standards provide more detailed guidance in dealing with different classes of intangibles. IFRS also removes an option to capitalise research and development cost that met the recognition criteria, and replace amortisation of goodwill by compulsory annual impairment test. Would these changes significantly increase the value relevance of intangible assets?

The accounting variable of interest here was TIA*Difrs which represented intangible assets under IFRS. Table 47 (Model 4) shows that the coefficient correlation of intangible assets was positive and significant under IFRS (0.527 and p-value = 0.000) but it was lower than the coefficient correlation of TIA for the study period (1.105 and p-value = 0.000) (Model 2, Table 46). This could be interpreted as IFRS

has not bring significant improvement to the value relevance of intangibles in the U.K. and this relation between intangible assets and market values remain qualitatively unchanged even when loss-making and negative book value companies were excluded, signifying the importance of reporting intangible assets to the equity market even prior to IFRS.

As a conclusion, this study does not find sufficient statistical evidence to accept H_2 and suggests that IFRS has not substantially improved the value relevance of total intangible assets. This study finds intangible assets are not more value relevance than under the local GAAP. This finding supports Chalmers et al. (2008) who find strikingly lower coefficient for non-goodwill intangible assets after IFRS. The correlation coefficient was 0.13 (under IFRS) as compared to 0.817 (under Australian GAAP).

If IFRS does not increase the value relevance of intangible assets, what about different classes of intangible assets? In the next hypothesis, the value relevance of goodwill is compared against other classes of intangible assets.

Table 47: Value Relevance of Intangible Assets and Different Classes of Intangibles under IFRS (Nonfinancial Sample)

n = 4292		Model 3[26]		Model 4[27]	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value
R^2	+	0.172	0.000***	0.115	0.000***
Intercept		1.297	0.000***	1.820	0.000***
$NETTA_{it}$	+	0.657	0.000***	0.438	0.000***
E_{it}	+	0.689	0.000***	0.532	0.001***
$Difrs_{it}$	+	0.087	0.246		
G_{it}	+	1.047	0.000***		
DC_{it}	-	0.811	0.730		
BP_{it}	+	1.755	0.004***		
L_{it}	+	0.557	0.768		
CS_{it}	+	1.054	0.000***		
OIA_{it}	-	0.066	0.885		
$TIA_{it} * Difrs_{it}$	+			0.527	0.000***

Table 47 presents results from Model 3,4 and 5 for the nonfinancial sample. The variables were defined as follows; the dependent variable was MV_{it} or market value six month after the fiscal year; TTA_{it} was total tangible assets, TL_{it} was total liabilities, $NETTA_{it}$ was net tangible assets (TTA_{it} minus TL_{it}), E_{it} or earnings was net income, $Difrs_{it}$ was a dummy variable for the disclosed accounting policies, G_{it} was goodwill, DC_{it} was development cost, BP_{it} was brand and patents, L_{it} was licences, CS_{it} was computer software and OIA_{it} was other intangible assets. TIA_{it}*$Difrs_{it}$ was intangible assets reported under IFRS. Model 3 was run for each class of intangible assets. However, their coefficients were presented together for ease of comparison purposes. The coefficients for NCI_{it} were all significant but they were not the subjects of interest for the hypothesis testing. The coefficients for other variables remain unchanged and the differences in R^2 was very minimal (0.5% to 1%). A deflator was number of outstanding ordinary shares.
*, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

H_3: The value relevance of non-goodwill intangible assets is significantly greater than the value relevance of goodwill under IFRS

Existing studies focus on a specific intangible asset such as brands (Kwan and Kallapur, 2004), goodwill (Wines, et al., 2007), research and development (Franzen and Radhakrishnan, 2009) and some studies decompose intangible assets into

[26] Model 3: $MV_{it} = \beta_0 + \beta_1 NETTA_{it} + \beta_2 \mathbf{CI_{it}} + \beta_3 NCI_{it} + \beta_4 E_{it} + \beta_5 \mathbf{Difrs_{it}} + \varepsilon_{it}$

[27] Model 4: $MV_{it} = \beta_0 + \beta_1 NETTA_{it} + \beta_2 E_{it} + \beta_3 \mathbf{TIA*Difrs_{it}} + \varepsilon_{it}$

goodwill and other intangible assets (Chalmers, et al., 2008). This study decomposed intangible assets into five classes; goodwill, research and development, brands and patents, licenses, computer software and other intangible assets.

Table 47 (Model 3) indicates that three classes of intangibles (goodwill, brands and patents, and computer software) are positively and significantly related to the market value. Hence, these intangible assets are value relevant. Brand and Patents had the highest coefficient correlation (1.755, p-value = 0.000), followed by computer software (1.054, p-value = 0.000) and goodwill (1.047, p-value = 0.000) during the study period. Therefore, based on these results, other classes of intangibles, namely, brand and patents and computer software are more value relevant than goodwill. This is due to brand and patents are considered as more specifically constructed or classified as compared to goodwill (Wyatt, 2008). Goodwill is defined by existing literature such as Sahut et al. 2011 as unidentified intangible assets. Thus, brand and patent is expected to be more value relevant because investors can better associate it with future economic benefits to the companies.

Sahut et al. (2011) suggest that goodwill remains value relevant but it is less value relevance under IFRS (the estimated coefficient = 0.382, p-value = 0.005). However, Chalmers et al. (2008) find goodwill to be more value relevant under IFRS (coefficient = 1.402) than under the Australian GAAP (AGAAP) (coefficient = 0.785) and suggest that goodwill under IFRS provides significant incremental explanatory power than under AGAAP. Compared to these studies, this study finding is consistent with Sahut et al. (2011) and contradicts Chalmers et al. (2008). This is probably due to Sahut et al. (2011) is using U.K. data whereas Chalmers et al. (2008) use Australian's data. The impact of IFRS on goodwill might differ between the U.K. and Australia because U.K. companies could opt to impair their goodwill if their goodwill's useful lives exceed 20 years and indefinite. In addition, quite a number of U.K. companies as previously discussed (Table 5, Chapter 5), did not amortise their goodwill prior to 2005 which may lessen the impact of IFRS on goodwill and hence its potential impact on its value relevance. In an additional test, Chalmers et al. (2008) decompose other intangible assets into eight subcomponents (brands, patents,

licenses, R&D, intellectual property, rights, software, contracts and others) and find similar finding.

Brands and patent were value relevant during the study period (1.755, p-value = 0.004). This result is partly consistent with Chalmers et al. (2008). Chalmers et al. (2008) analyse brands and patents separately and find that **brands** are not positively and significantly related to market value under both AGAAP and A-IFRS. In contrast, they find **patents** are positively and significantly related to market value under AGAAP. Kallapur and Kwan (2004) investigate the value relevance of capitalised brands under the U.K. GAAP (1984 to 1998; sample size of 33 companies) and the influence of contracting incentive. Their finding shows that the brand is positively related to market value. Barth et al. (2001) interpret such result as brand valuation is value relevant, particularly when the contracting incentive is low. This finding shows that brands have been value relevant prior to IFRS. In fact, the U.K. company law and SSAP 14 allow capitalisation of self-generated or acquired brands, trademarks and titles (Kallapur and Kwan, 2004). However, Kallapur and Kwan (2004) observe only nine percent of companies (three out of thirty-three companies) recognise self-generated titles and brands. Furthermore, the accounting treatment for brands and other intangible assets had changed as FRS 10 (a SSAP 14's successor and was issued in 1998) removed the distinction between goodwill and identifiable assets by not requiring their amortisation if their useful lives are indefinite. Therefore, Kallapur and Kwan (2004) findings might not be fully applicable to this study period as they are only limited to pre-FRS 10 period.

Other classes of intangible assets, including development costs were not significantly related to the market values both throughout the study period and under IFRS. Development cost was not significantly value relevant both during the study period and under IFRS. Chalmers et al. (2008) find that research and development is negatively and significantly associated with market values, indicating the negative impact of IFRS on development costs with respect to company's equity valuation. These findings suggest that development costs might still be too broadly classified with no definitive link to company's future benefits (Wyatt, 2008). Therefore,

investors cannot incorporate future benefits from the development costs into their company valuation. A similar line of argument applies to other intangible assets, another broad classification of intangible assets. Wyatt (2008)'s argument is consistent with this finding where she argues that a broadly classified intangible assets such as development costs lack construct validity for investors to incorporate it in the market value. Other than development costs and other intangible assets, licenses were also not value relevant. In contrast to the two classes of intangible assets, license is more specific. It does have a construct validity. However, smaller company-year observations might not suffice to assess its explanatory power of the market values. Moreover, in the world of uncertainty, license might not guarantee a certain flow of future benefits to the companies. It is subjected to legal matters and other constitutional factors. These factors might contribute to license not being value relevant to investors in the U.K.

Companies can address this weak link between each class of intangible assets and market values by disclosing more information in the notes to the accounts relating to the specific assets such as detailing and explaining specific expected future benefits to the company. Such disclosures are not yet required by the regulation but voluntary disclosure of such information is crucial to improve the value relevance of 'less specific' intangible assets.

As a conclusion, based on the test results, brands and patents and computer software are more value relevant than goodwill during the study period. In addition, computer software is more value relevant than goodwill under IFRS. A removal of the mechanical amortisation approach to goodwill under IFRS has not significantly transformed goodwill to convey new information beyond what has been reported under U.K. GAAP. These findings demonstrate that specific classification of intangible assets is very important to ensure their usefulness to investors as it helps investors to link them with future stream of cash flows (Wyatt, 2005).

H_4: IFRS does significantly increase the value relevance of goodwill

The fourth hypothesis has been partially answered in the third hypothesis. However, this hypothesis focuses on goodwill because accounting for goodwill has been drastically changed, i.e. from the amortisation approach to impairment approach. Prior to the adoption of IFRS, purchased goodwill formed a huge portion of intangible assets. Many studies (e.g. Chalmers et al., 2008; Goodwin and Ahmed 2006) find goodwill to be value relevant to investors. Impairment test involves revaluation of goodwill to its recoverable amounts which is supposedly to better reflect its current value and its expected future economic benefits to companies. Hence, more up-to-date carrying value of goodwill will convey new information to investors which is useful to their economic decision making (Barth, 2006). Therefore, IFRS is expected to improve the value relevance of goodwill.

It worth to note again that throughout the study period, the coefficient correlation of goodwill was positive and significant for all sub-samples of nonfinancial companies (all: 1.047, p-value = 0.000; excluding non-utilities: 1.045, p-value = 0.000 and profit-making and positive book value companies: 0.714, p-value = 0.000). Under IFRS, goodwill is positively and significantly (all: 0.382, p-value = 0.005; excluding utilities: 0.369, p-value = 0.007) related to the market values. The lower coefficient under IFRS is consistent with Sahut et al. (2011)[28] who find a positive and significant goodwill per share, both under local and international accounting standards with lower coefficient under IFRS.

To make a fair comparison with Sahut et al., (2011) who use equal length of pre- and post-IFRS (2002 to 2004 and 2005 to 2007), Model 3 was run separately for but equal length of pre- and post-IFRS (2000 to 2003 and 2005 to 2008). Its results were not qualitatively different. Sahut et al. (2011)'s higher coefficient is probably due to different independent variables which this study views may suffer from multicollinearity. Total intangible assets include goodwill and shareholders' equity also partially represents intangible assets (net assets = equity). In addition, this study used market value as compared to Sahut et al. who used share price as the dependent variable. This study also differs from Sahut et al. (2011) because it focuses on a

[28] Coefficient correlation for goodwill was 1.44 and 1.22 for the local GAAP and IFRS respectively. Both were significant at 1% significant level.

single country. Thus, its results might be more substantiated as the influenced by country-specific characteristics, including divergence between various local GAAPs and IFRS is controlled. However, Chalmers et al. (2008) reveal opposite results, suggesting some differences in accounting practice relating to goodwill between the U.K. and Australian companies. Amortisation of goodwill is probably more widespread in the Australia and thus, IFRS has in practice drastically changed accounting treatment on goodwill. Similar to Sahut et al. (2011), this study finds that goodwill is positively and significantly related to the market value but the degree of relation is lesser after IFRS. Since reporting of other classes of intangibles is increasing after 2005, investors might have turned to these intangible assets as a source of information for assessing the market values of companies. Prior to IFRS, generally, goodwill was the only source of information about an entity's intangible assets in the U.K. and hence, investors had no other choice than to rely on goodwill in making economic decisions.

As a conclusion, this study has insufficient evidence to infer that IFRS has improved the value relevance of goodwill for nonfinancial companies. Goodwill is value relevant even prior to IFRS (Sahut, et al., 2011). The test results also indirectly show that a drastic change from amortisation of goodwill to impairment has not changed accounting practices relating to goodwill because U.K. companies are allowed to choose an impairment approach if the goodwill's useful lives exceed twenty years or indefinite. In the following sections, whichever feasible, the hypotheses were tested on the financial sample.

7.5.2. The Value Relevance of IFRS and Intangible Assets (Financial Sample)

Financial companies are subjected to additional regulation such as the banking regulation. For example, banks must maintain a certain level of capital and they are at a disadvantage because intangible assets are not considered as part of their capitals. Regulators argue that intangible assets are not very useful in providing financial assistance to banks during bad financial times[29]. This might discourage

[29] http://www.prmia.org/Weblogs/General/VenkateshNS/2008/08/when_banking_re.php

financial companies from investing in intangible assets. Consequently, they carry less intangible assets than nonfinancial sectors as illustrated by Table 3. However, intangible assets such as customer relations and easy access to cheap deposit base are crucial to sustain financial companies in the longer term. In the following sections, results from the univariate, bivariate and multiple regressions are discussed with specific focus on investigating whether IFRS has improved the value relevance of intangible assets.

The Descriptive Statistics

Table 48 reports that on average, the market value for financial sample was a £404 million which is greater than the average net assets of approximately £367 million (average total tangible assets of £1,169 million plus average intangible assets of £74 million minus average total liabilities of £876 million). Average earnings were about £21 millions. In deflated units, the average market value was £1.69 per share. However, average earnings were quite low (£0.007) which partially reflected the impact of financial crisis on financial sectors in 2007 and 2008. An average total tangible asset was £3.44 per share. Despite higher average liabilities, the net assets (£1.15 per share) were sufficient to absorb additional liabilities which may not be captured in the financial statements (e.g. off-balance sheet items).

Table 48: Descriptive Statistics (Financial Sample)

n = 437	Market Value	Total Tangible Assets	Total Intangible	Total Liabilities	Earnings
			un-deflated values, £millions		
Mean	404	1,169	74	876	21
Std. Dev.	683	3,126	187	2,614	110
Min.	5	10	0.013	4	-768
Max.	4,672	21,000	995,728	17,800	587
			deflated values, £ per share		
Mean	1.691	3.445	0.238	2.529	0.007
Std. Dev.	1.437	2.699	0.434	2.071	0.917
Min.	0.090	0.120	0.0002	0.012	-11.76
Max.	9.306	9.363	2.556	8.791	1.105

Table 48 reports key descriptive statistics of the final sample for both model's dependent variable and explanatory variables. The deflated data was computed by dividing original data with number of ordinary shares. Hence, the amount was in £ per share each.

Multiple Regressions Results

Only three models were applicable to the financial sample because of insufficient common time periods to all panels and hence the disturbance covariance matrix using case wise inclusion could not be estimated (Hamilton, 2009). As a result, this study could not test the impact of IFRS on goodwill and other different classes of intangible assets. Furthermore, existing studies on the impact of IFRS focus on earnings and book value (e.g. Agostino et al., 2011) and have excluded financial companies from their samples. Hence, existing evidence to compare and contrast with this study, in particular relating to intangible assets, is very little.

Table 49 summarises key results from the three models, Model 1, 2 and 4. Generally the three models explained 37% to 38% of market values. In Model 1, total tangible assets (TTA_{it}) and total liabilities (TL_{it}) were added separately and it provided the highest explanatory power. TTA_{it} (total tangible assets) was positively (correlation coefficient = 0.67) and significantly (p-value = 0.000) related to market value. Replacing the two variables with net tangible assets did not increase R^2. Agostino et al., (2011) investigate the impact of IFRS on the value relevance of accounting information in the European banking industry using an Ohlson (1995)'s price model and find R^2 of approximately 23% to 24%. However, their study covers banks from fifteen European countries where only seventeen banks or hundred and seven bank-year observations (7.69% of the total sample) are from the U.K, and their study period is shorter (2000 to 2006). In addition, Agostino et al.'s study sample includes both voluntary and mandatory adopters of IFRS. These factors might contribute to the lower explanatory power from their models. Nevertheless, this study might use results from their additional and robustness tests where they exclude voluntary adopters for comparison purpose.

Table 49: Results for Model 1, 2 and 4 (Financial Sample[30])

n = 437 Var(s)	Exp. Sign	Model 1[31] Coefficients	p-value	Model 2[32] Coefficients	p-value	Model 4[33] Coefficients	p-value
R^2	+	0.381	0.000***	0.373	0.000***	0.367	0.000***
Intercept		0.876	0.000***	1.032	0.000***	1.074	0.000***
TTA_{it}	+	0.670	0.000***				
TL_{it}	-	-0.590	0.217				
$NETTA_{it}$	+			0.709	0.000***	0.704	0.000***
TIA_{it}	+	0.172	0.531	0.214	0.475		
E_{it}	+	-0.300	0.022**	-0.320	0.014**	-0.300	0.019**
$Difrs_{it}$	-	-0.050	0.742	-0.050	0.767		
TIA_{it} *$Difrs_{it}$	-					-0.017	0.950

Table 49 shows the R^2, coefficients and p-values for Model 1, 2 and 4 for the financial sample. The descriptions of the explanatory variables are; TTA_{it} was the total tangible assets, TL_{it} was the total liabilities, $NETTA_{it}$ was the net tangible assets (TTA_{it} minus TL_{it}), TIA_{it} was the total intangible assets, E_{it} was the net income, $Difrs_{it}$ was a dummy variable for the disclosed accounting policies, and TIA_{it}*$Difrs_{it}$ was intangible assets reported under IFRS.*, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

H_1: IFRS as a disclosed adopted accounting policy, is significantly more value relevant than the U.K. GAAP

IFRS has been criticised for injecting more uncertainties into the financial reports of financial companies via fair value accounting as financial companies are usually carrying financial assets and financial liabilities (Barth, 2006). In 2008, many blamed fair value accounting to cause panic among investors and hence, deepened the global financial crisis (Cotter, 2011). For example, Lehman Brothers had to write off their assets which drastically reduced their earnings which lead to its collapse when the market reacted aggressively towards its share price. However, this study is in the opinion that fair value accounting is not to be blamed for the Lehman Brother's collapse (Barth, 2010). Fair value accounting is a tool to ensure financial reporting conveys the true picture of the company's financial performance and position.

[30]Model 3 and 5 were not applicable to the financial sample because this sample did not have common time periods to all panels and hence disturbance covariance matrix using case wise inclusion could not be estimated

[31] Model 1: $MV_{it} = \beta_0 + \beta_1 TTA_{it} + \beta_2 \mathbf{TIA_{it}} - \beta_3 TL_{it} + \beta_4 NI_{it} + \beta_5 \mathbf{Difrs_{it}} + \varepsilon_{it}$

[32] Model 2: $MV_{it} = \beta_0 + \alpha\beta_1 NETTA_{it} + \boldsymbol{\alpha}\beta_2 \mathbf{TIA_{it}} + \alpha\beta_3 NI_{it} + \boldsymbol{\alpha}\beta_4 \mathbf{Difrs_{it}} + \varepsilon_{it}$

[33] Model 4: $MV_{it} = \beta_0 + \beta_1 NETTA_{it} + \beta_2 \mathbf{TIA_{it}} + \beta_3 NI_{it} + \beta_4 \mathbf{TIA*Difrs_{it}} + \varepsilon_{it}$

Findings from this study might shed some indirect empirical evidence from the U.K. related to the implications of fair value accounting via IFRS on the market valuation of the financial companies.

As IFRS is widely known to impose more fair value rules, investors of financial sectors are expected to react negatively towards the application of IFRS. Therefore, the expected sign of Difrs is negative. Table 49 shows that the correlation coefficient of Difrs was negative but it was not significant. Agostino et al. (2011) find a positive and significant coefficient correlation for their dummy variable for IFRS (labelled as PostIAS). However, as mentioned earlier, their research setting and design and value relevance model are different. The negative correlation coefficient suggests that investors of financial companies react to IFRS negatively probably due to higher anticipation of adverse impact on earnings, particularly during the financial crisis. In other words, earnings could be adversely affected by the revaluation of financial instruments such as financial assets and financial liabilities. On the other hand, earnings could be boosted by rules on income tax, the capitalisation of the development cost and recognition of pension losses on the balance sheet rather than in the income statement (Jopson, 2005). However, changes in accounting standards relating to financial assets and financial liabilities, income tax rules and pensions after IFRS are beyond the scope of this study.

This section concludes that IFRS, as an accounting policy is not more value relevant than U.K. GAAP. This finding remains unchanged after controlling for loss making companies and companies with negative book values. In addition, consistent with Barth et al. (2010), this study implies that IFRS has no adverse impact on the market value of financial companies. Indirectly, this finding suggests that fair value accounting has no significant role in worsening the share market efficiency or deepening any financial crisis. Moreover, insignificant coefficient correlation support majority claims and views that IFRS and the U.K. GAAP are quite similar in term of design, purpose and quality and local GAAP to fit local business and legal environment better (Jermakowicz and Gornik-Tomaszewski, 2006).

H_2: IFRS has significantly increased the value relevance of intangible assets

It is widely acknowledged that financial accounting and recognition of intangible assets is more difficult than tangible assets because they are more difficult to measure in nature (Barth, 2006). However, IFRS provides more detailed guidance in dealing with different classes of intangibles. Similar to nonfinancial sectors, intangible assets are essential in the current business environment. However, many argue that financial statements are inadequate because many valuable intangibles are not capitalised (Lev, 2001).

Table 49 illustrates that the accounting variables, except for total liabilities were value relevant. Total tangible assets were positive (0.67) and significantly (p-value = 0.000) related to market values. However, the strength of this relation was less for profit-making companies (0.282 and p-value = 0.056) and companies with positive book value (0.266 and p-value = 0.071). Earnings were positively related to the market values but they were only significant to the profit-making and companies with positive book value. This is consistent with existing literature that suggests investors consider the book value of equity and tangible assets more value relevant than earnings for loss-making companies (Franzen and Radhakrishnan, 2009). Agostino et al., (2011) suggest that the impact of IFRS on earnings are positive and significant (coefficient correlation = 1.59 and significant at 1% significance level) but very marginal.

For the second hypothesis, the accounting variable of interest was TIA*Difrs which represented intangible assets under IFRS. Table 49 shows that total intangible assets (TIA) were not significantly related to market values. These results were probably due to financial companies did not carry substantial intangible assets on their balance sheet. Furthermore, IFRS had not increased the usefulness of intangible assets as direct input to the equity valuation of financial companies. Under IFRS, intangible assets were negatively but not significantly related to market value. The sign of direction of intangible assets and market value relation post-IFRS was negative and not significant for all sample (-0.017, p-value = 0.95), excluding loss-making (-

0.252, p-value = 0.524), and excluding both loss-making and negative book value companies (-0.261, p-value = 0.495).

Based on these results, this study concludes that there is insufficient evidence to infer that IFRS has significantly increased the value relevance of intangible assets beyond U.K. GAAP for financial companies. These results suggest that investors might have paid less attention to the intangible assets and are more concerned about the tangible net worth of the companies as financial sectors has been badly hit by the financial crisis.

7.6. Econometric Issues

Some of the econometric issues have been discussed earlier. In addition, these issues were also covered via diagnostic tests which were carried out to test whether the required assumptions for multiple regressions were met. First, unusual and influential data were addressed by identification and elimination of outliers. Second, normality of residuals was tested by several approaches; the stem and leaf plots and the Shapiro–Wilk test. Both show that the distribution of data is not normal. However, the issue of non-normality is not a serious matter because a large sample size (Gujarati, 2006). Nonetheless, the extreme values as indicated by the plots were eliminated by both manual elimination and eliminating 1 % of top and bottom of the ranked data.

The regression residuals were automatically normalised by the panel-corrected standard error regression technique. Third, homoscedasticity was investigated by the Likelihood test ratio and p-value which indicated that variance of residuals was not homoscedastic. Therefore, to address the heterokedasticity problem, this study uses a deflator[34] (Ali and Hwang, 2000) and employed a panel-corrected standard error regression technique and White's statistics (robust standard error). Fourth, the

[34]Other than the number of outstanding ordinary shares and sales, for robustness, this study also used other deflators commonly used in existing literature such as opening market values, book value (e.g. Dedman et. al 2008) and average assets. Most of the results were qualitatively unchanged

multicollinearity was identified and rectified. Several approaches were used to detect multicollinearity.

First, both Pearson and Spearman's rank (undocumented) estimated correlation matrix were analysed. For example, Table 50 shows no high (exceed 0.6) correlation coefficients between the independent variables. The Durbin-Watson (less than 1) and Baltagi-WU LBi (less than 1.5) statistics also did not indicate any serious colinearity problem. Second, highly correlated variables (TTA or total tangible assets and TL or total liabilities) were replaced by NETTA or net tangible assets (TTA minus TL). Third, a panel-corrected standard error regression or the general least square techniques were used. It permitted this violation of regression assumption. Fifth, the models were reasonably specified because they have been rigorously used and tested by other researchers.

Table 50: A Correlation Matrix (Nonfinancial Sample[35])

n = 4292	MV_{it}	$NETTA^{1}_{it}$	TIA_{it}	E_{it}	$Difrs_{it}$	TIA_ifrs_{it}	Age_{it}
MV_{it}	1						
$NETTA^{1}_{it}$	0.097*	1					
TIA_{it}	0.474*	-0.401*	1				
E_{it}	0.355*	0.211*	0.103*	1			
$Difrs_{it}$	0.095*	-0.077*	0.161*	0.142*	1		
TIA_ifrs_{it}	0.299*	-0.301*	0.677*	0.198*	0.512*	1	
Age_{it}	0.094*	0.125*	0.135*	0.095*	0.076*	0.107*	1

The estimated correlation coefficients were Pearson's pair wise correlation, adjusted for the sample size using Sidak's adjustment. * denotes significant at 5% significant level

7.7. Summary and Conclusions

Proponents of IFRS argue that the international accounting standards benefit users in terms of higher quality accounting information (Lee, et al., 2008). In addition, the IASB has formally stated that decision usefulness is the official primary purpose of the financial reporting. However, higher degrees of similarities between U.K. GAAP

[35] The estimated correlation coefficients were Pearson's pair wise correlation, adjusted for the sample size using Sidak's adjustment to minimise the effect of large sample size on the significant levels

and IFRS may not bring significant improvement to the quality of accounting information in the U.K. Nevertheless, reporting incentive view suggests that companies will enjoy more benefits of switching from local GAAP to IFRS if they have more incentive to adopt the new accounting regime (Ball, et al., 2003). However, incentive to report more intangible assets may not suffice to compensate for the difficulties (time and costs) to track intangible assets (Nixon, 1997) as intangible assets are in nature very subjective to measure (Basu and Waymire, 2008). Literature shows that unreported intangible assets, among other factors, explain why market value is different than the book value of equity and failure to address the inadequate reporting on intangible assets may reduce the usefulness of financial statements in company valuation (Basu and Waymire, 2008). This study aims to examine whether IFRS as an accounting policy is more value relevant than U.K. GAAP and to investigate the value relevance of intangible assets and different classes of intangible assets, and between goodwill and other classes of intangible assets under IFRS.

First, this study does not find any significant statistical evidence to suggest that the change in accounting regime from U.K. GAAP to IFRS is value relevant across sectors. In other words, investors in the U.K. perceive IFRS, as an accounting policy, not to significantly signal contracting and political consequences, as hinted by practitioners, or new information that may signal future cash flow effects beyond what has been reported under U.K. GAAP. Instead, they find local GAAP to better fitted to local legal and business environment (Jermakowicz and Gornik-Tomaszewski, 2006). This finding challenges claims made by the proponents of international accounting standards that IFRS shall improve the quality of accounting information, in particular, to the U.K. users. Findings from this study also support Barth et al. (2010) that the fair value accounting do not contribute to the global financial crisis.

Second, the test results suggest that intangible assets play important role in company valuation. This is evidenced by the positive and significance relation between intangible assets and market values. However, in aggregate, IFRS has not

substantially changed the degree of this relation. More classes of intangible assets were reported in the balance sheet in the U.K post-IFRS and two of these specific intangible assets, namely, brands and patents, computer software were more value relevant than goodwill. This study shows that goodwill no longer dominated intangible assets. Although, the number of companies reporting these intangible assets was still less than those reporting goodwill, it is gradually increasing over the years, particularly after 2005. This study also suggests that goodwill is value relevant but IFRS has not significantly improved its value relevant (Sahut et al., 2011). Computer software is more value relevant than goodwill under IFRS. However, these findings are only applicable to the nonfinancial sectors.

Third, this study finds that a classification of intangible assets into specific class is useful to investors. Intangible assets which are specifically classified such as computer software and brands are value relevant. They provide better links between intangible assets and company's future benefits (Wyatt, 2008). Less specified intangible assets are not value relevant. For example, development costs and other intangible assets are both not value relevant. For such broadly classified intangible assets, voluntary disclosures that provide further details are beneficial to help investors gauge their future benefits.

Fourth, this study does not find a positive significant impact on the value relevance of goodwill as a result of a drastic switch from a mechanical straight-line amortisation (under U.K. GAAP) to rather subjective impairment test (under IFRS). Evidence from this study suggests that for nonfinancial companies, the value relevance of goodwill is lower under IFRS which is consistent with Sahut et al. (2011). Insignificant impact on the value relevance of intangible assets among financial companies is probably due to intangible assets (e.g. goodwill) is considered inferior than tangible assets during bad financial times. The 2007 and 2008 financial crisis that hit the financial sectors may further lessen its usefulness to investors. Furthermore, majority of U.K. companies opts to impair their goodwill prior to IFRS. Hence, it is very unlikely for IFRS to cause a major impact on their accounting

treatment of goodwill. Nevertheless, on general, goodwill is still useful to investors in the valuation of company's equity.

In addition, reporting incentive theory purports that companies with greater reporting incentive are more likely to benefit from IFRS (Ball et al., 2003) such as in terms of lower cost of capital and more value relevance of accounting information. However, results from this study suggest that investors of less financially performed companies might have perceived the change to IFRS to produce more useful financial information. Investors of poorly performed companies perceive tangible assets as more importance to the company valuation as compared to intangible assets. This might contribute to intangible assets being not value relevant to investors of financial sectors post-IFRS as they experience bad financial times in 2007 and 2008. Agostino et al. (2011) find goodwill is more value relevant under IFRS but their results are based on fiscal years prior to the financial crisis (2005 to 2006). On the other hand, companies with better financial performance might have greater incentive to adopt IFRS because they have greater profit to cushion the impact of IFRS on their earnings. Hence, investors of these companies might be more interested to incorporate intangible assets into the valuation of the company.

In the next chapter (Chapter 8), the investigation of the impact of IFRS on the value relevance of accounting information is extended to the two primary qualities of value relevance, namely, informational and predictive value. IFRS may have not significantly increased the value relevance of intangible assets but it could improve either informational value or predictive value or both primary qualities of value relevance.

CHAPTER 8

IFRS AND INFORMATIONAL AND PREDICTIVE VALUES OF ACCOUNTING INFORMATION

8.1. Introduction

This chapter documents more evidence related to the impact of IFRS on the value of relevance of accounting information. Relevant information serves two roles; confirmatory and predictive roles (Ernst and Young, 2008). Hence, to be relevant information must possess predictive and feedback (or confirmatory) values (IASB GAAP, 2008; FASB 2006). In the previous chapter (Chapter 7), findings from the valuation models suggest that some accounting information (e.g. computer software) is more value relevant (e.g. goodwill) under IFRS. This study further investigates which properties of value relevance are being significantly affected by IFRS. It provides more evidence to support findings from Chapter 7. It employed two additional models, namely, informational and predictive models to investigate whether accounting information under IFRS is more informative and is more useful to help investors predict future cash flows to the companies. The specific accounting information of interest is intangible assets.

This chapter is organised as follows; Section 8.2 provides an overview of the literature review, Section 8.3 discusses the development of hypotheses, Section 8.4 explains research design and methods of investigations, Section 8.5 presents data analysis and findings, Section 8.6 explains the econometric issues, and the last section summarises and concludes the chapter.

8.2. Literature Review

Relevance is one of the key qualitative characteristic of accounting information under IFRS (Whittington, 2008a). Based on the IASB conceptual framework, to be

relevant, the information must possess predictive and feedback value (IASB GAAP 2008). The U.S. accounting regulator also considers informative value and predictive value as two primary information qualities for decision-usefulness (FASB, 2006). If the informativeness of GAAP earnings is low, users rely less on GAAP numbers and more on pro forma earnings (Lougee and Marquardt, 2004). In addition, if the uncertainty surrounding accounting information is exceptionally high, investors rely more on non-accounting information (Amir and Lev 1996) and may forego valuation altogether. Thus, examining the informative value of published accounting information is crucial for preparers of financial reports and accounting regulators because it provides evidence to indicate whether investors find financial reports and accounting information decision-useful.

Some criticise that the reported annual earnings are not very informative because financial reports take some time to be published. It is not surprising to see empirical evidence suggesting pro-forma earnings are having more predictive value. For example, Brown and Sivakumar (2001) and Lougee and Marquardt (2004) examine the predictive ability of pro forma earnings for future performance. Brown and Sivakumar (2001) suggest that pro forma earnings are better self-predictor than GAAP earnings. Lougee and Marquardt (2004) conduct a limited analysis of the GAAP earnings' ability to predict future cash flows from operations, but they only examine it for a short time span, i.e. one quarter in the future and they find no significant difference in the predictive ability of GAAP's earnings and pro forma earnings for their full sample. Furthermore, components of earnings (revenue and expenses) are more value relevant than earnings (Donelson et al., 2011). Other existing studies investigate the relative predictive value of accruals and cash flows for future cash flows, and examine the capital market pricing of these two components of earnings (Richardson et al., 2002; Barth et al., 2001).This study attempts to contribute by providing empirical evidence on how IFRS has affected not only the informative and the predictive value of earnings but also other key accounting information, including intangible assets.

Nichols and Wahlen, (2004) shows that earnings are expected to contribute to changes in a company's market value based on three assumptions about the information contained in earnings and share prices. Earnings provide new information to capital holders about company's current and future profitability, the company's current and expected future dividends and the present value of expected future dividends equals share price. Based on these assumptions, financial reports are useful and value relevant if it provides investors with new information that can change investors' expectations about a company's current and future wealth creation (direct input to equity valuation theory). Researchers examine the informational value of accounting information of interest (e.g. earnings) by comparing the correlation coefficients between accounting information (e.g. earnings, changes in earnings) and changes in share prices (or market values) between pre- and post-IFRS (Kousenidis et al., 2010). However, prior studies do not investigate further which primary qualities of value relevance are being significantly affected by IFRS.

The mandatory adoption of IFRS in the Europe has attracted many researchers to examine the impact of the international accounting standards on the value relevance of accounting information (e.g. Sahut et al., 2011; Kousenidis et al., 2010; Hung and Subramanyam, 2007). However, prior to IFRS adoption, many companies doubt that IFRS would bring any significant capital market effects in the U.K. (Horton and Serafeim, 2010). IFRS and U.K. GAAP are perceived to share common features such as both are designed for equity market and common law countries. However, not many realise that in term of conceptual framework, these accounting regimes may differ in several aspects such as those related to the primary purpose of financial reporting and the required qualitative characteristic of accounting information. The IASB's conceptual framework is more influenced by U.S. GAAP's conceptual framework than U.K. GAAP (Paanamen, 2008).

U.K. GAAP comprises of both company law and the accounting standards where company law regulates matters relating to a company's accountability to shareholders (e.g. publication of annual reports). Therefore, reporting for stewardship and reporting from a proprietary perspective are more important in the

U.K. than in the U.S. Eliminating this objective from the primary purpose of financial reporting and assuming that it is assumed to be met under the IASB's stated objective (reporting for decision-usefulness) might impair public confidence in the financial reports in the U.K. Reporting for decision-usefulness might be appropriate for a country like the U.S. where any deviation from the accounting rules and regulations would be punished by the market itself as those matters are directly regulated by the Stock Exchange Commission (Whittington, 2008b). Although, providing decision useful information has dominated financial reporting in the U.K. such as the application of accounting principle, 'True and Fair View' since 1978, the key users are existing shareholders. Furthermore, the IASB's decision to replace reliability with faithful representation emphasises the board's preference towards greater application of fair values. Not focusing on producing reliable accounting information might in reality lead to less reliable accounting information, which consequently might reduce its informational value.

In addition, despite being claimed as very similar to U.K. GAAP, accounting for goodwill has changed drastically where purchased goodwill with definitive useful life is no longer being amortised but is now subjected to an impairment test (Roberts, et al., 2008). This means the accounting treatment for goodwill is similar regardless to whether its useful life is definite or not. Accounting for other intangibles such as research and development has also changed where capitalising development cost that meets the recognition criteria is compulsory (Wyatt, 2005) . Wyatt (2005) argues that the change may reduce the informational value of capitalised development cost as her evidence shows that such cost has a weaker link with the underlying economic reality. Current empirical evidence shows that intangible assets are value relevant (Goodwin and Ahmad, 2006) even prior to IFRS adoption. However, as intangible assets are increasingly more important under current business setting, the difficulties to capture and measure intangible assets and the limitations placed on their recognition, existing financial statements do not fully 'capture the value drivers that dominate the new economy'(Jenkins and Upton, 2001) and hence, reducing the usefulness of intangible assets to users. Although, existing studies suggest the

positive impact of IFRS on the value relevance of intangible assets, little evidence that examines its impact on the primary qualities of value relevance is available.

Furthermore, existing studies indicate that the length of financial reports has substantially increased after the adoption of IFRS (Li, 2010). Although, assessing the impact of additional disclosures under IFRS as compared to U.K. GAAP is beyond the scope of this study, those additional disclosure pages might be dedicated to among other items, notes on intangible assets such as the basis for re-measurement, impairment test and further break down for the intangibles. Such disclosures are more likely to increase the informativeness of accounting information, in particular intangible assets. Hence, IFRS might increase the informational value of accounting information (e.g. intangible assets).

U.K.'s accounting regime is commonly regarded as of high-quality standards (Haller, 2002) with strong enforcement and monitoring system. There are two sides of the argument relating to whether IFRS would benefit U.K. users. From one perspective, IFRS is not expected to significantly improve accounting qualities in the U.K. simply because both U.K. GAAP and IFRS are of approximately equivalent qualities, are designed for equity markets and IFRS are not expected to bring new major changes to the accounting rules in the U.K. From the other perspective, some studies suggest that the impact is greater in the U.K. than other European countries (e.g. Sahut et al., 2011; Clarkson et al., 2011; Iatridis 2010; Lee et. al., 2008). The financial reporting incentive view would provide possible explanation for this claim. This view suggests that companies with greater incentive to report their financial performance and position under the new accounting regime are more likely to reap greater benefits such as producing more informational and predictive accounting information. Their financial reports might be more likely to contain more value relevance information that would reduce information asymmetries and hence lower the cost of equity capital (Ball, et al., 2003).

However, empirical evidence to support whether IFRS has significantly improved primary qualities of value relevant, particularly intangible assets is still very limited.

This study intends to contribute by investigating the impact of IFRS on each of the qualities of relevance, namely, informational value and predictive value.

8.3. The Development of Hypotheses

Prior to IFRS adoption, different classes of intangibles in the U.K. have been rarely capitalised except for purchased goodwill (Stark, 2008). Hence, information about other intangibles is very limited. Financial accounting commonly follows conservatism where future losses are to be accounted for but only highly probable future benefits are recognised. Therefore, internally generated intangibles are not recognised under major accounting regimes, including U.K. GAAP because their measurement is very subjective and their future benefits are quite uncertain. IFRS adoption may address this recognition hurdle because among other factors, as accounting for intangibles is being consistently revised to accommodate current business practice, it tends to provide more detailed and broader guidance to recognise different classes of intangibles (Ernst & Young, 2011) as compared to more restrictive definition and recognition under U.K. GAAP. Moreover, IFRS has removed an option not to capitalise any development that met the recognition criteria (Wyatt, 2005). These factors may allow companies to capitalise more intangible assets. When more different classes of intangibles are reported, it is expected to convey more informational values to investors because they are more specific than being broadly reported as intangible assets. Existing studies show that the value relevance of intangible assets among companies which capitalise intangible assets has significantly improved (Goodwin and Ahmed, 2006). However, the removal of an option to capitalise development costs might impair to some extent the informational value of intangible assets as Wyatt (2005) suggests that the option allows management to provide information with a stronger link with the company's underlying economic performance. Hence, this study is not able to propose the definitive direction of the relation between IFRS and informational value of intangible assets.

The first null and the research hypotheses for this study are,

H_0: The informative value of intangible assets has not been significantly changed under IFRS

H_1: The informative value of intangible assets has been significantly changed under IFRS

Wider application of fair value accounting in IFRS may cause financial reports to include more estimates of future values of assets and liabilities in the financial statements (Barth, 2006). This might improve the predictive value of accounting information. For example, under IFRS, more fair values are incorporated in the intangible assets via asset revaluation and impairment reviews. As more intangible assets are reported after IFRS adoption, investors would have more information to assess companies' future cash flows. Findings from Chapter 7 suggests that specific classifications of intangible assets such as brands and patents, licenses and computer software is more informative than aggregated intangible assets and may help investors to specifically link these intangibles with future benefits to companies (Wyatt, 2005). Furthermore, the IASB has made several changes to its conceptual framework. Prior to the IFRS adoption, relevance and reliability are two of the required characteristics of accounting information. However, now, reliability has been replaced by a faithful representation whereas relevance remains. Another change is related to the primary purpose of financial reporting. Reporting for stewardship, an essential element to ensure management's accountability to the stakeholders, has not been explicitly stated as the primary purpose of the financial reporting (Barth, 2006; IASB 2006). The board has chosen reporting for decision-usefulness and considers reporting for stewardship to be indirectly covered under this objective of financial reporting. The board is in the opinion that accounting information to serve decision-usefulness is expected to better *'help present and potential investors and creditors and others to assess the amounts, timing and uncertainty of the entity's future cash inflows and outflows'* (Whittington, 2008a). Therefore, this study hypothesised that IFRS would significantly increase the predictive value of intangible assets.

The second null and the research hypotheses for this study are,

H_0: The predictive value of intangible assets has not been significantly improved under IFRS

H_2: The predictive value of intangible assets has been significantly improved under IFRS

8.4. Research Design and Methods of Investigation

The method of investigation was by multiple regressions models and multivariate analysis. There were two models for the first and second hypotheses respectively; the informational model and the predictive model. Each model was discussed in the following paragraphs.

First, **the informational model** is originally used to examine the informational content or value of earnings. It is also known as a return model as explained in the Chapter 7. An example of such model is $RET_{it} = a_0 + a_1E_{it} / P_{it-1} + a_2 (E_{it} – E_{it-1}) / P_{it-1} + e_{it}$. RET is the annual return (including cash dividend) of company i between the current announcement month and last year's annual report announcement month, E_{it} is the annual earnings per share, $E_{it} – E_{it-1}$ is the change in annual earnings per share and e_{it} is the residuals. P_{it-1} is the share price at the beginning of the last year's annual report month. This model is also known as earnings and earnings change model (Goodwin and Ahmed, 2006). The key underlying assumption under this model is particular accounting information is informative if it can significantly explain the changes in annual return or market value.

For this study, the basic informational model was modified by few ways. First, the variables were changed; a change in market value replaced annual return and a new variable was added to the model, a change in total intangible assets (ΔTIA_{it}). It was calculated by deducting last year's total intangible assets from current year's balance which might result in an increase or decrease in the carrying intangible assets during the year. The correlation coefficient of ΔTIA_{it} was used as a proxy for the informative value of intangible assets. Second, similar to some existing study such as

Goodwin and Ahmad (2006), this study used number of ordinary shares as the deflator.

This model was tested for two sub-periods namely pre-IFRS and post-IFRS period to assess the impact of IFRS on the informative value of intangible assets.
The finalised modified model was,

$$\Delta MV_{it} = \alpha_0 + \alpha_1 E_{it} + \alpha_2 \Delta E_{it} + \alpha_3 \Delta TIA_{it} + \varepsilon_{it} \quad (1)$$

$\Delta \mathbf{MV_{it}}$ was the change (increase or decrease) in market value of equity and was calculated by deducting previous year's market value from the current year's market value of a company, similar to previous chapter, market value was the value at six month after the balance sheet date; $\mathbf{E_{it}}$ was the current year's net income available to common shareholders; $\Delta \mathbf{E_{it}}$ was the change in net income available to common shareholders, determined by deducting previous year's earnings from the current year's earnings; $\Delta \mathbf{TIA_{it}}$ was the change (increase or decrease) in the reported intangible assets and was calculated by deducting previous year's intangible assets from the current year's intangible assets and $\boldsymbol{\varepsilon_{it}}$ was the regression residuals.

Second, **the predictive model** was developed to study whether the predictive value of accounting information has significantly increased after IFRS adoption. Predictive value is another ingredient of the primary qualities of financial information for decision-usefulness (the IASC/IASB conceptual framework, 1989). The correlation coefficients of the explanatory variables measure the degree of relation between the accounting variables and a company's future cash flows from operation. This study assumed a greater coefficient value to imply a higher predictive value for the particular explanatory variable. The accounting variable of interest was intangible assets. This study also examined the impact of IFRS on the aggregate predictive value of financial information represented by all explanatory variables in the model, and was measured by the R^2. The predictive model was as follows,

$$CFO_{i,t+1,\, t+2,\, t+3} = \alpha_0 + \alpha_1 (TA - TIA)_{it} - \alpha_2 TL_{it} + \alpha_3 TIA_{it} + \alpha_4 E_{it} + \varepsilon_{it} \quad (2)$$

$CFO_{i,t+1,t+2,t+3}$ was the cash flow from operation in following year, two-year ahead and three-year ahead, **TA_{it}** was the total assets of company i in year t, **TIA_{it}** was the total intangible assets of company i in year t, **TL_{it}** was the total liabilities of company i in year t, **E_{it}** was the net income for common shareholders of company i in year t and **ε_{it}**was the regression residuals.

To be consistent with the previous chapter in addressing a multicolinearity problem, $NETTA_{it}$ or net tangible assets substituted $TA_{it} - TIA_{it} - TL_{it}$ and the finalised model was,

$$CF_{t+1,t+2,t+3} = \alpha_0 + \alpha_1 NETTA_{it} + \alpha_2 TIA_{it} + \alpha_3 E_{it} + \varepsilon_{it} \quad (3)$$

The predictive value of the explanatory variables in general and intangible assets in particular was measured by the degree of their explanatory powers (α_1 to α_3) against cash flows from operation for the following year (t+1), next two years (t+2) and next three years (t+3). Therefore, the dependent variables were $CFO_{i,t+1}$, to $CFO_{i,t+2}$ and $CFO_{i,t+3}$ for each current year of study (year t).

Data and Sample Selection

The sample selection was similar to the previous chapter. The sample consisted of any U.K. listed company that met the required condition; using pound sterling as the reporting currency, adopted the U.K. GAAP prior to IFRS and has all the required data. Table 51 summarises the selection for the final sample.

Table 51: Sample Selection for the Informational and Preditive Models

Informational Model						
Groups	Original size	%	Outliers	%	Final Sample	%
Financial	790	100%	88	11%	702	89%
Nonfinancial	4,603	100%	696	15%	3,907	85%
Preditive Model						
Groups	Original size		Outliers		Final Sample	
Financial	879	100%	89	10%	790	90%
Nonfinancial	5,233	100%	841	16%	4,392	84%

Table 51 shows the number of observations for the original sample, outliers and the final sample.

Table 51 summarises the sample selection for the informational and the predictive models. The original size was based on the valuation model in the previous chapter. For example, for the informational model, there were seven hundred and ninety financial companies in the original sample. After eliminating eighty-eight companies because their values were outliers, i.e., either fell outside three standard deviations or in top and lowest 1% of the ranked data or both, the finalised sample consisted of seven hundred and two financial companies. For nonfinancial sample, the sample selection followed similar procedures. The final sample size was three thousand nine hundred and five companies where six hundred and ninety-nine noncompanies were excluded for being outliers.

The cut off points for the extreme values were different, resulting to different sample size for each model or test. For the informational model, the outliers were based on different variables of interest, namely, earnings, the change in earnings and change in intangible asset values. For the predictive model, the outliers were extreme values for cash from operation for the following year (t+1), the next two years (t+2) and the next third year (t+3), earnings, net tangible assets and intangible asset values. The identification and elimination procedures for outliers were similar to the previous parts of the thesis.

In addition, the predictive model required cash flows from operation of the year 2009 (t+1), 2010 (t+2) and 2011 (t+3) for the year 2008. In earlier chapters, the justification to end the study period with the year 2008 was to minimise the impact of IFRS changes on the test results, such as revision and new issues of IFRS where most of these changes are effective from 1 January 2009. However, this model required future cash flows from operations (next year, next two years and the next three years) for the last year of the study period, i.e. year 2008. Therefore, data for the year 2009 and 2010 were only applicable to future cash flows from operations required for the year 2008. The use of 2009's, 2010's and 2011's cash flows from operations was not expected to significantly affect the results because among other reasons, accounting standard for a cash flow statement has not been significantly involved in the revision of IFRS.

8.5. Data Analysis and Findings

As the two hypotheses were tested using two different models, both their descriptive and multiples regressions results were discussed in accordance to the hypotheses. The first and second hypotheses were designed to test the impact of IFRS on the informative value and predictive value of accounting information respectively. For both hypotheses, the main accounting variable of interest was intangible assets. Nonetheless, results for other accounting variables were also briefly discussed. The results were organised in the following manner; descriptive statistics, bivariate analysis, and key results from the multiple regressions models. Results for the nonfinancial sample were discussed first before the respective results for the financial sample.

8.5.1 IFRS and Informational Value of Accounting Information (Nonfinancial Sample)

Descriptive Statistics

As shown in Table 52, there were 3,907 company-year observations for the deflated data set. The panel data was an unbalanced panel set where missing values and companies with no intangible assets were not included in the sample. The informational model required data for the changes in market values, earnings, changes in earnings and total intangible assets. The study period begins from 2001 instead of 2000 because no opening balance was available for the year 2000 from the existing data sets. This study did not consider an exclusion of the year 2000 to affect the test results because the number of company-year observations for pre-IFRS period still exceeded post-IFRS's number of company-year observations.

On average, during the study period the amount of negative changes in the market values for nonfinancial sectors exceeded positive market value changes. The market value was generally decreased by £52 millions despite the average increase in

earnings of £32 million pounds (refer Table 77, Appendix). In terms of per one outstanding ordinary share, the average decrease in market value was 3.5 pence with the highest increase of £9.81 and the lowest decrease of £9.63 per share. However, the market values on average had increased by 4 pence per share prior to IFRS adoption. Thus, the negative change in average market values during the study period was most likely contributed by changes in market values during post-IFRS as Table 52 documents that market values has generally decreased by 17 pence per share in this period. Market values were also more volatile during post-IFRS where the standard deviation was 50% higher than pre-IFRS, suggesting a higher degree of uncertainty in the equity capital market. Higher volatility in the market values might be due to factors other than related to the companies' performance such as investors' sentiment and general economic conditions.

During the study period, earnings had generally increased by £32 million pounds or 9.4 pence per share. The maximum and minimum change in earnings roughly reflected the respective values for change in market values. A change in earnings had increased by £3 million pounds on average or 1.6 pence per share. Average earnings were higher during post-IFRS (17.4 pence per share versus 5.6 pence per share) but were less volatile (lower standard deviation). Existing studies such as Sahut et al. (2011) and Horton and Serafeim (2008) suggest similar finding. This evidence is also consistent with Chapter 6 where results suggest that earnings are less volatile and potentially more persistence under IFRS for nonfinancial companies. However, in terms of changes in earnings or new earnings, its average was comparatively lower under IFRS. This might reflect poorer underlying economic performance where companies are probably being affected by weaker and unstable economic conditions. The banking financial crisis that began in 2007 might have some spill over effects on nonfinancial companies.

Table 52: Descriptive Statistics (the Informational Model, Nonfinancial Sample)

Nonfinancial Sample		Study Period[1]	Pre-IFRS	Post-IFRS
	n	**3907**	**2502**	**1405**
Change in MV	Mean	-0.035	0.040	-0.170
	Std. Dev	1.276	1.056	1.586
	Min	-9.631	-8.679	-9.631
	Max	9.831	8.433	9.831
Earnings	Mean	0.094	0.056	0.174
	Std. Dev	0.421	0.458	0.312
	Min	-9.026	-9.026	-2.065
	Max	4.890	4.890	1.803
Change in Earnings	Mean	0.016	0.021	0.006
	Std. Dev	0.382	0.440	0.248
	Min	-8.496	-8.496	-3.432
	Max	7.848	7.848	1.654
Change in TIA	Mean	0.060	0.011	0.148
	Std. Dev	0.432	0.298	0.591
	Min	-8.675	-8.675	-2.176
	Max	13.203	3.775	13.203

Table 52 presents the number of company-year observations for the nonfinancial sample (n) and the descriptive statistics for change in market value (ΔM_{it}), MV was the market value of company i six months after the fiscal year end, earnings (E_{it}, net income for common shareholders), change in earnings (ΔE_{it}, earnings for year t minus earnings for year t-1), and change in intangible assets (ΔTIA_{it}) for the study period (2001 – 2008), pre-IFRS (2001-2004) and post-IFRS (2005 – 2008). Values for the variables were deflated by the number of outstanding ordinary shares. [1] 2001 to 2008.

Intangible assets had increased on average by about £40 million pounds or by 6 pence per share. Further analysis (undocumented) shows that approximately 40% (or 2.3 pence per share) of the increase in average change of intangible assets was contributed by an increase in goodwill, and 60% of the increase in intangible assets was due to increase in non-goodwill intangibles. After IFRS adoption, changes in intangible assets on average had increased to more than ten times as compared to prior IFRS. This result supports findings from Chapter 5 that intangible assets have significantly increased after IFRS, indicating that more intangible assets are

capitalised from year to year during post-IFRS. Nevertheless, this study is unable to definitively infer whether IFRS has caused this increase or not because such change may also be due to general trends in the business environment.

Bivariate Analysis

The correlation matrix illustrates that the correlation coefficients between two variables which is very useful to identify highly correlated independent variables. The regression model requires all explanatory variables to be independent from each other to ensure unbiased results. Table 53 shows that all correlations coefficients between explanatory variables were below 0.6. Hence, they were considered not high enough to affect the multiple regressions results (Kontopoulos, et al., 2010).

The matrix table also explores potential relations between explanatory variables and the dependent variable (change in market values). Table 53 shows that earnings were significantly and positively related to changes in the market values prior to IFRS adoption. However, after IFRS, earnings were no longer significantly related to changes in market values. These results indicate that earnings are likely to be more informative to investors during pre-IFRS. It had conveyed more useful information to investors in predicting companies' future cash flows and dividend payout (Nichols and Wahlen, 2004). In contrast to earnings, change in earnings was not significantly related to changes in market values for pre-IFRS but it had become positively and significantly associated with change in market values for post-IFRS. This suggests that the informative value of earnings has been transferred to changes in earnings (or new earnings) under IFRS.

For the specific accounting variable of interest, i.e. change in intangible assets, the correlation coefficients indicated no significant association with change in market value during the study period, pre-IFRS period and post-IFRS period.

Table 53: A Correlation Matrix (the Informational Model, Nonfinancial Sample)

The Study Period (2001 – 2008)				
	chMV	E	chE	chTIA
Change in Market Value (chMV)	1.000			
Earnings (E)	0.123*	1.000		
	0.000			
Change in Earnings (chE)	0.068*	0.330*	1.000	
	0.000	0.000		
Change in Total Intangible Assets (chTIA)	-0.029	0.241*	-0.016	1.000
	0.649	0.000	0.995	
Pre-IFRS (2001 – 2004)				
Change in Market Value (chMV)	1.000			
Earnings (E)	0.225*	1.000		
	0.000			
Change in Earnings (chE)	0.034	0.301*	1.000	
	0.722	0.000		
Change in Total Intangible Assets (chTIA)	0.037	0.247*	-0.020	1.000
	0.620	0.000	0.996	
Post-IFRS (2005 – 2008)				
Change in Market Value (chMV)	1.000			
Earnings (E)	0.029	1.000		
	0.990			
Change in Earnings (chE)	0.159*	0.491*	1.000	
	0.000	0.000		
Change in Total Intangible Assets (chTIA)	-0.050	0.238*	-0.011	1.000
	0.601	0.000	1.000	

This table 53 shows the correlation coefficients and p-values between variables. * indicates significant at 5%. All correlation coefficients were Sidak-adjusted. All correlation coefficients were below 0.6 and thus, indicating no serious high dependence among the explanatory variables or multicollinearity issues for the multiple regressions models.

This result suggests that reported intangible assets were potentially not informative to investors. Furthermore, IFRS has not statistically improved its informative value. This may be due to among other reasons, investors are not yet aware of new information conveyed by reported intangible assets which might be useful for their assessment of market values. Unlike earnings and change in earnings, intangible

assets might be less specifically linked to future cash flows and hence, to market valuation of companies.

This bivariate analysis suggests that IFRS is least likely to affect the informational value of intangible assets. However, the international accounting regime has significantly decreased and increased the informative value of earnings and changes in earnings respectively for nonfinancial companies. The following test, via multiple regressions model, provides more statistical evidence to support this finding.

Multiple Regressions Model

This section deals with hypothesis testing to investigate whether IFRS has significantly affected the informative value of accounting information, in particular the reported intangible assets of nonfinancial companies. In other words, this study attempted to test the following hypothesis,

H_1: The informative value of intangible assets has been significantly changed under IFRS

Table 54 summarises the key results from the informational model for the nonfinancial sample. First, this model was significant in explaining market value changes for the study period and the study sample. However, its aggregate explanatory power ranged between 3% to 5% for the study period and its sub-periods. The R^2 of the informational model was greater for pre-IFRS (5.3 % as compared to 3%). This suggests that investors find accounting information as represented by the explanatory variables is more informative during pre-IFRS than post-IFRS. The correlation coefficient of a dummy variable, Difrs was consistent with this finding. The low R^2 indicated that changes in market values were also contributed by other variables such as other accounting variable (e.g. net tangible assets or book value of equity excluding intangible assets) and non-accounting source of information. Other sources of information such as the industry and market wide information as well as other events might have been significantly affecting the

market values (Bissessur and Hodgson, 2012). Non-accounting source of information factors are beyond the research scope of this study. Prior studies also suggest that other accounting variables such as dividends and capital contribution are potential significant predictors of the market values (e.g. Dedman et al., 2009) and hence, they might be other factors that explain changes in market values too. However, these accounting variables are commonly added to the modified Ohlson's model.

Table 54: IFRS and Informational Value of Accounting Information (Nonfinancial Sample)

Variables		All n = 3907		Pre-IFRS n = 2500		Post-IFRS n = 1407	
Dependent Variable (ΔMV_{it}, Change in Market Value)	Exp. Sign	Coef.	p-value	Coef.	p-value	Coef.	p-value
R^2		0.028	0.000***	0.053	0.000***	0.030	0.006***
Intercept, ε_{it}		0.007	0.761	-0.002	0.935	-0.117	0.006
Earnings, E_{it}	+	0.526	0.000***	0.711	0.000***	-0.268	0.439
Change in Earnings, ΔE_{it}	+	0.063	0.493	-0.093	0.345	1.181	0.001***
Change in TIA, ΔTIA_{it}	+	-0.146	0.105	-0.084	0.594	-0.096	0.497
Difrs	?	-0.248	0.000***	n/a		n/a	

Table 54 presents key results from the informational model. Change in market values **(ΔMV_{it})** was market value for company i in year t minus market value for company i in year t-1 and the market value was 6 month after the fiscal year end, earnings **(E_{it})** was the net income available for common shareholders, change in earnings **(ΔE_{it})** was net income for company i in year t minus net income for company i in year t-1, change in total intangible assets **(ΔTIA_{it})** was total intangible assets for company i in year t minus total intangible assets for company i in year t-1. The Informational Model was $\Delta MV_{it} = \alpha_0 + \alpha_1 E_{it} + \alpha_2 \Delta E_{it} + \alpha_3 \Delta TIA_{it} + \varepsilon_{it}$. *, ** and *** indicates significant at 10%, 5% and 1% significance level respectively.

For the accounting policy, it was either IFRS (was assigned a value of 1) or U.K. GAAP, and it was represented by the dummy variable, Difrs. IFRS was negatively (-0.248) and significantly (p-value = 0.000) related to the changes in market values. This suggests that IFRS is more associated with negative or decrease in market values. In other words, U.K. GAAP is significantly related to favourable changes or increases in market values. It may indicate that investors tend to reduce the company's value after IFRS adoption because they anticipate that IFRS would more

likely to reduce earnings and hence lessening future dividend payout and consequently company's market value (Nichols and Wahlen, 2004) as compared to U.K. GAAP. In previous chapter where a balance sheet valuation model was used to test the value relevance of accounting information, its results suggest that the Difrs was not significantly related to the market value. However, when it was tested as a predictor of market value changes, via the informational model, the Difrs was negatively and significantly related to the market value changes, indicating that IFRS was conveying additional information to the investors but in a negative manner. The negative relation suggests that the informative value of IFRS as accounting policies to prepare financial statements of the listed companies is lower than U.K. GAAP. Investors might perceive IFRS to inject more future estimates into the financial statements (Barth et al., 2008) and hence, greater uncertainties into the accounting information. For example, fair value rules are more widely applicable under IFRS which may cause earnings to be more unpredictable, making it more difficult to rely on earnings to predict future financial performance and cash flows to companies.

When the informational model was tested to pre-IFRS and post-IFRS periods separately, the R^2 was higher for pre-IFRS, suggesting that the aggregate informative value of accounting information was lower after IFRS adoption. This substantiated the negative relation between Difrs (IFRS) and changes in market values. However, change in the informative values of the individual explanatory variables was mixed. Earnings were positively (0.711) and significantly (p-value = 0.000) related to market value changes during pre-IFRS. However, after the adoption of IFRS, earnings were no longer having significant explanatory power of the market value changes, indicating that earnings were more informative prior to IFRS adoption. Its coefficient correlation was negative (-0.268) but not significant (p-value = 0.439). In contrast, changes in earnings which were not significant during pre-IFRS were now positively (1.181) and significantly (p-value = 0.001) related with changes in market values. These results suggest that new earnings (changes in earnings) or earnings above previous year earning levels during post-IFRS convey additional useful information to investors to explain changes in share returns (Ohlson, 2009). This evidence supports rules under IFRS such as fair value accounting as better rules to

provide more informational financial statements as compared to historical cost accounting or mixed cost accounting. Earnings might be more uncertain and volatile under IFRS but changes in earnings seem to better explain changes in the market values.

Despite higher level of intangible assets under IFRS, evidence from this test indicates that additional intangible assets were not significantly related to the market value changes. This is probably due to the nature of intangible assets where benefits from additional investment in intangible assets usually take time to materialise. Thus, investors may choose to 'wait and see' before incorporating it into their market pricing. When managers have no discretion in capitalising intangible assets such as due to a removal of manager's option relating to capitalising development cost, the capitalised intangible assets tend to be less related to the company's underlying economic performance (Wyatt, 2005). Hence, intangible assets become less informational to investors. In addition, investors may perceive intangible assets as not very financially useful to companies during financial turmoil. Therefore, investors may not include intangible assets in their valuation of company's market values when the economic condition is less promising. As a conclusion, there is insufficient statistical evidence to reject the null hypothesis. Based on these evidences, IFRS has not significantly changed the informational value of intangible assets for the nonfinancial companies in the U.K.

8.5.2 IFRS and Informational Value of Accounting Information (Financial Sample)

During the global financial crisis that hit financial sectors badly in 2007 and 2008, many blame fair value rules to deepen the financial crisis because under the fair value rules companies must write down their assets and liabilities, drastically reducing earnings and causing panic among investors (Cotter, 2011). However, Barth et al. (2010) argue that fair value accounting has no significant role in worsening the financial crisis. In the same line of argument, opponents of IFRS adoption doubt the benefits of adopting IFRS. They argue that IFRS may inject too many uncertainties into the financial reports, in particular for the financial sectors as financial companies

usually carry financial assets and liabilities which are subjected to the fair value rules. Hence, financial companies are more exposed to the fluctuation in the market. This section investigates whether IFRS adoption has significantly affected the informative value of accounting information reported by the financial sectors.

Descriptive Statistics

Table 55 summarises the descriptive statistics of both the dependent and explanatory variables of the informational model. These statistics were for the deflated data with respect to the whole study period (2001 to 2008), pre-IFRS (2001 to 2004) and post-IFRS (2005 to 2008). The respective sample sizes were 702, 436 and 266 company-year observations. The sample size for post-IFRS was lower than pre-IFRS due to different first year of adopting IFRS which could be 2005, 2006, 2007 or 2008 and hence less number of company-year observations for post-IFRS. The descriptive statistics for the un-deflated data were reported in the Appendix (Table 85).

Table 55: Descriptive Statistics (the Informational Model, Financial Sample)

Financial Sample		Study Period[1]	Pre-IFRS	Post-IFRS
	n	702	436	266
Change in MV	Mean	-0.052	0.116	-0.327
	Std. Dev	1.295	1.087	1.542
	Min	-8.205	-8.205	-6.353
	Max	4.884	4.884	4.466
Earnings	Mean	0.164	0.123	0.247
	Std. Dev	0.623	0.293	0.988
	Min	-6.343	-2.464	-6.343
	Max	6.684	2.457	6.684
Change in Earnings	Mean	-0.038	0.041	-0.167
	Std. Dev	0.804	0.512	1.120
	Min	-8.362	-2.361	-8.362
	Max	9.297	9.297	3.510
Change in TIA	Mean	0.022	0.011	0.040
	Std. Dev	0.213	0.128	0.305
	Min	-3.553	-0.437	-3.553
	Max	2.385	1.360	2.385

Table 55 presents the number of company-year observations for the financial sample (n) and the descriptive statistics for the variables for the study period (2001 – 2008), pre-IFRS (2001-2004) and post-IFRS (2005 – 2008).

Generally, the market values of the financial companies had declined during the study period by £104 million pounds or 5.2 pence per share. This reflects changes in earnings which have decreased on average by £53 million pounds (3.8 pence per share). However, decrease in average market values mostly occurred during post-IFRS (32.7 pence per share) as it had actually increased prior to IFRS adoption (11.6 pence per share). A similar trend is observed in changes in earnings where the average change in earnings was negative (16.7 pence per share) during post-IFRS as compared to a positive change for pre-IFRS (4.1 pence per share). This result indicates that changes in earnings potentially convey useful information (informational values) to investors as it moves in the same direction as changes in market values.

In contrast to changes in earnings, average earnings were positive for both periods. The average earnings was approximately £120 million pounds or 1.64 pence per share for the study period. Comparing pre- and post-IFRS, average earnings for post-IFRS were approximately double than pre-IFRS (24.7 pence per share versus 12.7 pence per share). This finding is consistent with findings from Chapter 5 and existing literature such as Iatridis (2010). However, investors may not find positive annual earnings informative if earnings contain income not directly reflecting underlying business performance such as from revaluation of financial assets (Barker, 2004). Earnings under IFRS might be higher but it may not be as informative as changes in earnings or new earnings in determining market values of financial companies.

Although intangible assets are not considered in calculating capital for certain financial companies such as banks (Basel II Framework), financial companies in this sample had on average invested £36 million pounds (2.2 pence per share) in intangible assets of which was distributed almost equally between goodwill (1.2 pence per share) and other intangible assets (1 pence per share). The average amount of new intangible assets being capitalised during post-IFRS was roughly four times (4 pence per share) greater than prior to IFRS adoption (1.1 pence per share). However, the increase is either as a result of better guidance from IFRS in dealing

with accounting and reporting intangible assets or trends in business towards more knowledge-based and technology-based environments.

Bivariate Analysis

Table 56 presents the correlation coefficients matrix of the informational model's variables for financial sample. The coefficient matrix provides a preliminary analysis of how explanatory variables were related to changes in the market values as well as identification of potential multicollinearity among explanatory variables. As per Table 56, no serious multicollinearity among these variables existed as supported by their low coefficients (less than 0.6) except for between earnings and changes in earnings for post-IFRS. However, earnings and changes in earnings are theoretically correlated and correctly specified. In addition, the statistical software (stata) would have automatically dropped one of the explanatory variables if they cause serious effect on the results (Hamilton, 2009).

Table 56 also shows that two of the explanatory variables, namely, earnings and changes in earnings were having significant relations with changes in market value. Earnings were positive and significantly related to changes in market value both during pre-IFRS and post-IFRS. However, the strength of this relation was lower after IFRS adoption. On the other hand, the relation between changes in earnings and changes in market values had significantly improved (coefficient correlation = 0.445, p-value = 0.000) during post-IFRS. It was negatively (coefficient correlation = -0.18, p-value = 0.002) related to changes in market value prior to IFRS adoption.

These results suggest that both earnings and new earnings (changes in earnings) have become significantly more informative post-IFRS, which support Barth et al., (2010)'s argument that not only fair value accounting has no substantial role in worsening the financial crisis, its wider application under IFRS is more likely to improve the informational value of financial reports among financial sector.

Table 56: A Correlation Matrix (the Informational Model, Financial Sample)

The Study Period (2001 – 2008)				
	chMV	E	chE	chTIA
Change in Market Value (chMV)	1.000			
Earnings (E)	0.211*	1.000		
	0.000			
Change in Earnings (chE)	0.239*	0.583*	1.000	
	0.000	0.000		
Change in Total Intangible Assets (chTIA)	-0.047	0.110*	0.055	1.000
	0.971	0.048	0.894	
Pre-IFRS (2000 – 2004)				
Change in Market Value (chMV)	1.000			
Earnings (E)	0.359*	1.000		
	0.000			
Change in Earnings (chE)	-0.180*	-0.187*	1.000	
	0.002	0.001		
Change in Total Intangible Assets (chTIA)	-0.178*	0.128	-0.009	1.000
	0.002	0.101	1.000	
Post-IFRS (2005 – 2008)				
Change in Market Value (chMV)	1.000			
Earnings (E)	0.214*	1.000		
	0.006			
Change in Earnings (chE)	0.445*	0.785*	1.000	
	0.000	0.000		
Change in Total Intangible Assets (chTIA)	0.030	0.101	0.088	1.000
	1.000	0.786	0.916	

This table 56 shows the correlation coefficients between variables. * indicates significant at 5%, the coefficients had been Sidak-adjusted to account for the influence of large sampling size on the correlation coefficients. Almost all correlation coefficients were below 0.6 and thus, indicating no serious high dependence among the explanatory variables or multicollinearity issues for the multiple regressions models.

However, the coefficient correlations between changes in intangible assets and changes in market value were not significant during the whole study period and post-IFRS. This indicates that IFRS has not significantly improved the informative value of intangible assets. Nevertheless, the correlation matrix shows that changes in intangible assets were negatively and significantly related to changes in market value during pre-IFRS. Thus, IFRS has slightly improved the informational value of intangible assets from been negatively correlated with changes in market value to insignificant relation. These results suggest that investors find additional capitalisation of intangible assets to signal future negative impact on future earnings (e.g. via amortisation or impairment charges) prior to IFRS. During post-IFRS investors are indifferent to new intangible assets in assessing the market value of a company due to probably unclear link between intangible assets and future cash flows, and intangible assets being considered by regulator (e.g. banking regulator) to be financially not useful during bad financial times.

The impact of IFRS on the informational value of accounting information for financial companies would be further tested in the next section.

Multiple Regressions

This section discusses results from the informational model. They were used to test the first hypothesis that investigate whether IFRS had significantly affected the informational value of accounting information, in particular intangible assets of financial companies. The hypothesis is,

H_1: The informative value of intangible assets has been significantly changed under IFRS

Overall, the informational model had significantly explained 9.4%, 19.3% and 24.6 % of the market value changes for the whole study period, pre-IFRS period and post-IFRS period respectively. The R^2 suggests that the aggregate informational value of

the accounting information represented by the explanatory variables was significantly more informative during post-IFRS period than during pre-IFRS.

Table 57: IFRS and Informational Value of Accounting Information (Financial Sample)

(fnf=0)		All		Pre-IFRS		Post-IFRS	
		n = 702		n = 436		n = 266	
Var(s)	Exp.	Coef.	p-	Coef.	p-	Coef.	p-
Change in MV	Sign		value		value		value
R^2		0.094	0.000***	0.193	0.000***	0.246	0.000***
Intercept		0.075	0.211	-0.015	0.805	-0.025	0.783
Earnings (E)	+	0.315	0.099*	1.412	0.000***	-0.551	0.011**
Change in E	+	0.211	0.233	-0.242	0.215	0.994	0.000***
Change in TIA	+	-0.374	0.127	-1.931	0.000***	0.012	0.969
Difrs	?	-0.430	0.000***	n/a		n/a	

Table 57 presents key results from the informational model. Change in market values **(ΔMV_{it})** was market value for company i in year t minus market value for company i in year t-1 and the market value was 6 month after the fiscal year end, earnings **(E_{it})** was net income available for common shareholders, change in earnings **(ΔE_{it})** was net income for company i in year t minus net income for company i in year t-1, change in total intangible assets **(ΔTIA_{it})** was total intangible assets for company i in year t minus total intangible assets for company i in year t-1. The Informational Model was $\Delta MV_{it} = \alpha_0 + \alpha_1 E_{it} + \alpha_2 \Delta E_{it} + \alpha_3 \Delta TIA_{it} + \varepsilon_{it}$. *, ** and *** indicates significant at 10%, 5% and 1% significant level respectively.

Table 57 shows that IFRS had significantly affected the informative value of changes in earnings. During post-IFRS, changes in earnings have positively and significantly related to changes in market value (coefficient correlation = 0.994 and p-value = 0.000). It had significantly improved compared to pre-IFRS (coefficient correlation = -0.242 and p-value = 0.215). However, the impact of IFRS on the informative value of earnings was not favourable. Earnings were significantly related to changes in market value prior to IFRS with coefficient correlation of 1.412 (p-value of 0.000) but the shift in accounting regime also shifted the relation of earnings into an inverse relation (coefficient correlation = -0.551 and p-value = 0.011) with market value changes. This negative relation under IFRS indicates that investors react in an opposite way to higher reported earnings. Higher reported earnings may not necessarily be appropriately priced by investors due to few possible factors. Earnings may not reflect companies' underlying economic performance; particularly if it

contains one-offs income (e.g. from fair valuing financial assets) (Donelson et al., 2011). However, changes in earnings or earnings above previous year earning level was more informative in explaining changes in market value during post-IFRS. This result suggests that fair value rules and other accounting rules under IFRS improve the informational value of changes in earnings (Dichev and Tang, 2009).

The dummy variable that represents an accounting policy, Difrs was more related to lower changes in market value (coefficient correlation = -0.43 and p-value = 0.000). Investors generally favour U.K. GAAP as an accounting policy to better suit local legal and business environment (Jermakowicz and Gornik-Tomaszewski, 2006) and thus, to produce more informative accounting. They may also perceive U.K. GAAP to produce more reliable information which is more useful to assess future cash flows of financial companies as compared to IFRS. This reflects common expectation that IFRS (via its fair value rules) is more likely to inject more uncertainties into the financial reports, causing investors not to be able to fairly assess changes in the market values.

Investors might partially rely on reported intangible assets to gauge the expected market values and reported financial performance prior to IFRS adoption. Changes in intangible assets were negatively and significantly (at 1% significance level) related to changes in market value during pre-IFRS (coefficient correlation = -1.931 and p-value = 0.000). However, after IFRS adoption, changes in intangible assets did not convey new information, either positive or negative as it became insignificant explanatory variable of changes in market value (coefficient correlation = 0.012 and p-value = 0.969).

As a conclusion, there is insufficient statistical evidence to reject the null hypothesis. Based on the informational model results, IFRS has not significantly increased the informative value of intangible assets for financial sectors but it has changed intangible assets from providing negative signal to changes in market values to not conveying new informational value to investors of financial companies in the U.K.

8.5.3 IFRS and Predictive Value of Accounting Information (Nonfinancial Sample)

This section is dedicated to the second hypothesis where it tests whether IFRS has significantly improved the predictive value of accounting information for the nonfinancial companies. Results were discussed in the following order; descriptive statistics or univariate analysis, bivariate analysis, and the multivariate analysis.

Descriptive Statistics

Table 58 provides a summary of the descriptive statistics for the variables (deflated values). The deflator was number of outstanding shares. The number of observations for the nonfinancial sample was 4,392 company-year observations. It was less in the multivariate analysis because companies with zero balance of intangible assets were excluded. In addition, the use of future accounting information for the predictive model's dependent variable, i.e. future cash flows from operations (one-year ahead, two-year ahead and three-year head) further reduced the sample size. After excluding the outliers, the minimum and maximum values ranged in between plus and minus three times the standard deviations (e.g. approximately -11.5 and 11.5 for TTA or total tangible assets). The variables were defined as cash flows from operations (**CFO_{it}**)**,** total tangible assets (**TTA_{it}**), total liabilities (**TL_{it}**), total intangible assets (**TIA_{it}**) and earnings (**E_{it}**) for company i in year t.The net tangible assets (**$NETTA_{it}$**) were not presented in the table but its descriptive statistics could be easily determined by deducting total liabilities from the total tangible assets.

Descriptive statistics for the un-deflated data is presented in Table 79 (refer the Appendix). The average cash flows from operations was about £114 million pounds (or 23.5 pence per ordinary share). This amount was much greater than average earnings (£32 million pounds or 9.4 pence per ordinary share), probably because earnings were the net income for common shareholders, i.e. after deducting all expenses including finance costs and taxes. The average operating profit would be closer to average cash flows from operations as it measures profit from operating

activities. However, its value was not presented here because this study opted to use net income for common shareholders as the explanatory variable to be consistent with prior studies (e.g. Iatridis, 2011) and more importantly to avoid bias because during pre-IFRS, operating profits were presented in slightly different manners among companies.

Average cash flows from operations for post-IFRS were 44% (29.6 pence per share) higher than pre-IFRS (20.6 pence per share), indicating better economic performance after 2005. However, the standard deviation of cash flows from operations was greater for pre-IFRS, suggesting greater volatility or uncertainty in the underlying economic performance for nonfinancial companies prior to 2005. This trend is similar to average earnings. Average earnings were higher during post-IFRS which was consistent with findings in Chapter 6 and existing studies (e.g. Sahut et al., 2011). Generally, the descriptive statistics show that nonfinancial companies were solvent. Their average tangible assets (£914 million pounds or £2.50 per ordinary share) exceeded average total liabilities (£730 million pounds or £1.77 per ordinary share).

Moreover, their average intangible assets were £379 million pounds or 49 pence per ordinary share. The minimum values for total intangible assets were zero, indicating some companies did not carry any intangible on their financial reports. These companies were excluded from the test. In addition, data for some variables such as total tangible assets, total liabilities and total intangible assets were skewed to the right where some companies were having very large balances of these items on their balance sheets. This was due to the diversity of the sample, covering all U.K. listed companies, including those smaller companies listed on the A.I.M. Deflating the variables was expected to minimise such firm size differences.

Both average total tangible assets and average total liabilities were higher for post-IFRS than pre-IFRS by 25% and 51% respectively. However, net tangible assets had decreased by 25% (from 79 pence per share to 59.1 per share) due to relatively higher increase in average total liabilities. The reduction in net tangible assets was to

a certain extent compensated by an increase in average intangible assets. During post-IFRS, nonfinancial companies in this sample were generally carrying higher intangible assets (77 pence per share) than during pre-IFRS (36.4 pence per share).

Table 58: Descriptive Statistics (the Predictive Model, Nonfinancial Sample)

Nonfinancial Sample		**Study Period**	**Pre-IFRS**	**Post-IFRS**
	n	**4392**	**2987**	**1405**
Cash Flows from Operations	Mean	0.235	0.206	0.296
	Std. Dev	0.786	0.892	0.482
	Min	-10.622	-10.622	-2.015
	Max	41.558	41.558	6.963
Total Tangible Assets	Mean	2.499	2.315	2.889
	Std. Dev	3.897	3.959	3.732
	Min	0.002	0.007	0.002
	Max	140.540	140.540	35.766
Total Liabilities	Mean	1.772	1.525	2.298
	Std. Dev	2.676	2.407	3.111
	Min	-0.017	0.002	-0.017
	Max	48.331	48.331	27.944
Total Intangible Assets	Mean	0.494	0.364	0.770
	Std. Dev	1.034	0.863	1.284
	Min	0.000	0.000	0.000
	Max	19.581	18.938	19.581
Earnings	Mean	0.094	0.056	0.174
	Std. Dev	0.421	0.458	0.312
	Min	-9.026	-9.026	-2.065
	Max	4.890	4.890	1.803

Table 58 presents the number of company-year observations for the nonfinancial sample (n) and the descriptive statistics for the variables. The variables are cash flows from operations (CFO_{it}), total tangible assets (TTA_{it}), total liabilities (TL_{it}), total intangible assets (TIA_{it}) and earnings (E_{it}, net income for common shareholders for the study period (2001 – 2008), pre-IFRS (2001-2004) and post-IFRS (2005 – 2008). Values for the variables were deflated by the number of outstanding ordinary shares.

Bivariate Analysis

Based on the correlation matrix (Table 59), the relations among three future cash flows from operations were all positively and significantly related. However, the

longer the time gap between two cash flows from operations, the coefficient correlations would be smaller. For example, cash flows from operations in year t+1 were more closely related to cash flows from operations in year t+2 (coefficient correlation = 0.77) as compared to between $CFO_{i,t+1}$ and $CFO_{i,t+3}$ (coefficient correlation = 0.38). The coefficient correlations between IFRS (Difrs) and future cash flows from operations indicated that it was not significantly related to all three future cash flows from operations. This is due to accounting treatment for financial accounting and reporting for cash flows from operations do not significantly differ between U.K. GAAP and IFRS (Cotter, 2012; PricewaterhouseCoopers, 2008).

The relations between other explanatory variables and the dependent variable (future cash flows from operations) between pre-IFRS and post-IFRS were greater during post-IFRS for net tangible assets, intangible assets and earnings. During pre-IFRS period, net tangible assets were negatively related to the subsequent year's cash flows from operations (coefficient correlation = -0.283) and positively related to subsequent two and three year's cash flows from operations. During post-IFRS, all relations between them were positive and stronger. Similar pattern was observed for intangible assets. The correlation coefficient between intangible assets and one-year ahead cash flows from operations was negative but not significant. Intangible assets were positively and significantly related with two-year ahead and three-year ahead cash flows from operations. A significant positive relation with cash flows from operations in further years highlights the cash generating nature of intangible assets where intangible assets are expected to generate cash flows in longer time horizon than tangible assets. Earnings were all positively and significantly related to future cash flows from operations and their degrees of relations were all stronger after the adoption of IFRS.

These results suggest that IFRS might have significantly improved the predictive values of some accounting information represented by the accounting variables in this model such as earnings and intangible assets. In the next part, these relations were further tested in the predictive model.

Table 59: A Correlation Matrix[36] (the Predictive Model, Nonfinancial Sample)

The Study Period (2000 to 2008)							
fnf = 1	**$CFO_{i,t+1}$**	**$CFO_{i,t+2}$**	**$CFO_{i,t+3}$**	$NETTA_{it}$	TIA_{it}	E_{it}	$Difrs_{it}$
$CFO_{i,t+1}$	1.000						
$CFO_{i,t+2}$	0.771*	1.000					
	0.000						
$CFO_{i,t+3}$	0.380*	0.735*	1.000				
	0.000	0.000					
$NETTA_{it}$	-0.290*	-0.212	-0.100	1.000			
	0.004	0.145	0.996				
TIA_{it}	0.230	0.153	0.213	0.408*	1.000		
	0.068	0.685	0.206	0.000			
E_{it}	-0.213	-0.299*	-0.533*	-0.058	-0.288*	1.000	
	0.130	0.002	0.000	1.000	0.004		
$Difrs_{it}$	0.157	0.148	0.097	-0.073	0.149	-0.047	1.000
	0.635	0.743	0.997	0.999	0.724	1.000	
The Pre-IFRS Period							
$CFO_{i,t+1}$	1.000						
$CFO_{i,t+2}$	0.651*	1.000					
	0.000						
$CFO_{i,t+3}$	0.597*	0.787*	1.000				
	0.000	0.000					
$NETTA_{it}$	-0.283*	0.168*	0.172*	1.000			
	0.000	0.000	0.000				
TIA_{it}	-0.006	0.192*	0.199*	0.232*	1.000		
	1.000	0.000	0.000	0.000			
E_{it}	0.406*	0.330*	0.269*	-0.144*	-0.170*	1.000	
	0.000	0.000	0.000	0.000	0.000		
The Post-IFRS Period							
$CFO_{i,t+1}$	1.000						
$CFO_{i,t+2}$	0.744*	1.000					
	0.000						
$CFO_{i,t+3}$	0.652*	0.664*	1.000				
	0.000	0.000					
$NETTA_{it}$	0.217*	0.213*	0.270*	1.000			
	0.000	0.000	0.000				
TIA_{it}	0.373*	0.340*	0.327*	-0.426*	1.000		
	0.000	0.000	0.000	0.000			
E_{it}	0.575*	0.5607	0.586*	0.284*	0.3298	1.000	
	0.000	0.000	0.000	0.000	0.000		

[36] The results were Pearson correlation coefficient adjusted for large sample effect by Sidak method.
* indicate that the coefficients were significant at 5% significance level.

Multivariate Analysis

Results from this model were used to test the research hypotheses. The second research hypothesis is,

H_2: The predictive value of intangible assets has been significantly improved under IFRS

Table 60 summarises the key results from the multivariate analysis for the three dependent variables; cash flows from operation in subsequent year (**$CFO_{i,t+1}$**), subsequent two year (**$CFO_{i,t+2}$**) and subsequent three years (**$CFO_{i,t+3}$**) and three period; the whole study period, pre-IFRS period and post-IFRS period. The R^2 of the predictive model was 24% for the **$CFO_{i,t+1}$**, 26.8% for the **$CFO_{i,t+2}$** and 22.1% for the **$CFO_{i,t+3}$**. The accounting variables in aggregate were having the highest predictive value relating to the subsequent two years cash flows from operations, reflecting the effect of applying accruals rules where income and expenses are recognised in the year they were accrued. These timing differences between the recognition of cash flows and other accounting items may reduce the degree of their relations in a current year.

In addition, earnings were more closely related to the next year's cash flows from operations (coefficient correlation = 0.523), and its degree of relation has gradually lessened as the future year extended to next two (coefficient correlation = 0.454) and three years (coefficient correlation = 0.411). Net tangible assets were negatively related to current cash flows from operations (**$CFO_{i,t+1}$**) but were positively related to following years' future cash flows from operations. This is consistent with tangible assets being non-current assets and being used in the business to generate earnings for longer term. In addition to net tangible assets, intangible assets (**TIA_{it}**) were positively related to the cash flows from operations for all three measures of future cash flows. Its strength of relation had increased (0.081 with **$CFO_{i,t+1}$**; 0.127 with **$CFO_{i,t+2}$** and 0.132 with **$CFO_{i,t+3}$**).

IFRS (Difrs) was not significantly related to the subsequent year's cash flows (coefficient correlation = 0.02 and p-value = 0.167) but were positively and significantly related to the subsequent two (coefficient correlation = 0.04 and p-value = 0.003) and three (coefficient correlation = 0.055 and p-value = 0.001) years' cash flows from operations, implying that IFRS had a significant relation with longer term cash flows. These results support some claims by the opponents of IFRS in general and of fair value rules in particular that IFRS is more likely to inject future estimates into the financial reports.

To further investigate the impact of IFRS on the predictive value of accounting information, similar model was tested for both pre-IFRS and post-IFRS periods. In all three measures of future cash flows, accounting information was more predictive during post-IFRS period, as indicated by the greater R^2; 41.3% versus 23% (**CFO** $_{i,t+1}$), 38% versus 20.1% **(CFO** $_{i,t+2}$) and 38.1% versus 16.2% **(CFO** $_{i,t+3}$). The relation between the explanatory variables and the future cash flows were all stronger during post-IFRS. First, in predicting the subsequent year's cash flows from operations, **CFO**$_{i,t+1,}$ net tangible assets was a negative predictor (coefficient correlation = -0.054 and p-value = 0.005) but had become a positive predictor (coefficient correlation = 0.091 and p-value = 0.001) after the adoption of IFRS. An increase in the degree of relation between intangible assets and the subsequent year's cash flows were even greater, as measured by the coefficient correlation of 0.067 for pre-IFRS to 0.152 for post-IFRS period. IFRS had also improved the predictive value of earnings as suggested by the increase in its coefficient correlation from 0.415 to 0.662.

Next, accounting information was also more predictive of the subsequent two years' cash flows from operations. Net tangible assets were positively and significantly related with the next two years' cash flows from operations with stronger relation during post-IFRS. Similarly, intangible assets were having a greater degree of relation with the future two years' cash flows during post-IFRS. The increase in the degree of relation between earnings and future two years' cash flows were almost double during post-IFRS period.

Third, as predictors of the next three years' cash flows, again, all explanatory variables showed greater predictive value. Based on these results, it is fair to conclude that there is sufficient statistical evidence to reject the null hypothesis and to accept the alternative hypothesis. IFRS had significantly improved the predictive value of not only intangible assets but also net tangible assets and earnings for the nonfinancial companies. In practice, there is always a trade-off between reliability and relevance. More application of fair value rules under IFRS have injected more future estimates into the financial reports which are difficult to assure their reliability but accounting information become more relevance as predictor of companies' future cash flows.

Table 60: IFRS and Predictive Value of Accounting Information (Nonfinancial Sample)

$CFO_{i,t+1}$ (fnf=1)		All n = 4360		Pre-IFRS n = 2988		Post-IFRS n = 1372	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value	Coef.	p-value
R^2		0.244	0.000***	0.230	0.000***	0.413	0.000***
Intercept		0.169	0.000***	0.200	0.000***	0.037	0.177
$NETTA_{it}$	+	-0.030	0.071*	-0.054	0.005***	0.091	0.001***
TIA_{it}	+	0.081	0.000***	0.067	0.003***	0.152	0.000***
E_{it}	+	0.523	0.000***	0.415	0.000***	0.662	0.000***
$Difrs_{it}$	+	0.020	0.167	n/a		n/a	
$CFO_{i,t+2}$ (fnf=1)		All n = 4296		Pre-IFRS n = 2975		Post-IFRS n = 1321	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value	Coef.	p-value
R^2		0.268	0.000***	0.201	0.000***	0.38	0.000*
Intercept		0.114	0.000***	0.138	0.000***	0.054	0.124
$NETTA_{it}$	+	0.045	0.000***	0.032	0.001***	0.092	0.005***
TIA_{it}	+	0.127	0.000***	0.106	0.000***	0.149	0.000***
E_{it}	+	0.454	0.000***	0.357	0.000***	0.746	0.000***
$Difrs_{it}$	+	0.040	0.003***	n/a		n/a	
$CFO_{i,t+3}$ (fnf=1)		All n = 3807		Pre-IFRS n = 2945		Post-IFRS n = 862	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value	Coef.	p-value
R^2		0.221	0.000***	0.162	0.000***	0.381	0.000***
Intercept		0.133	0.000***	0.151	0.000***	0.077	0.08*
$NETTA_{it}$	+	0.044	0.000***	0.034	0.001***	0.079	0.071*
TIA_{it}	+	0.132	0.000***	0.116	0.000***	0.138	0.000***
E_{it}	+	0.411	0.000***	0.334	0.000***	0.828	0.000***
$Difrs_{it}$	+	0.055	0.001***	n/a		n/a	

Table 60 presents key results from the predictive model. *, **, *** indicates that the coefficients or R^2 was significant at 10%, 5% and 1% respectively. $NETTA_{it}$ is net tangible assets (total tangible assets minus total liabilities), $\mathbf{CFO_{it+n}}$ is cash flows from operations for company i in year t + n, $\mathbf{TIA_{it}}$ is total intangible assets for company i in year t, $\mathbf{E_{it}}$ is net income for company i in year t.

8.5.4 IFRS and Predictive Value of Accounting Information (Financial Sample)

Results for the financial sample were presented in the same manner as the nonfinancial sample in previous sections; descriptive statistics, bivariate analysis and multivariate analysis.

Descriptive Statistics

Table 61 and Table 79 (refer the Appendix) illustrate key descriptive statistics for deflated data and un-deflated data respectively. Financial sectors on average had reported £170 million pounds (20.7 pence per ordinary share) cash flows from operations during the study period. Some financial companies had reported negative cash flows from operations, being the lowest at -£2.55 per ordinary share, whereas some had the highest level of cash flows at £7.92 per ordinary share. The minimum and maximum values of earnings were roughly consistent with the minimum and maximum values of cash flows from operation.

Average cash flows from operations were almost doubled in post-IFRS period than in pre-IFRS period. Similarly, average earnings for post-IFRS were approximately twice of average earnings for pre-IFRS. However, under IFRS, earnings and cash flows from operations were more dispersed from their averages which indicate greater volatility in the business performance among financial companies. This reflects financial crisis that badly hit financial sectors beginning 2007 and throughout 2008. The application of fair value rules under IFRS might benefit financial sectors in terms of making sure earnings capture changes in assets and liabilities. Consequently, earnings are better indicators of the underlying economic performance as measured by the cash flows from operations. As cash flows from operations are more accurate in reporting the real economic performance of a company (Dichev and Tang, 2008; Jayaraman, 2007), a closer mapping between earnings and cash flows from operations might improve the predictive value of earnings. Furthermore, this evidence supports Barth et al. (2010)'s argument that IFRS in general and fair value

accounting in particular is not worsening the financial crisis as in fact IFRS helps banks to produce more transparent earnings.

Table 61: Descriptive Statistics (the Predictive Model, Financial Sample)

		Study Period	Pre-IFRS	Post-IFRS
Variables	**n**	**790**	**524**	**266**
Cash Flows from Operations	Mean	0.207	0.160	0.300
	Std. Dev	0.708	0.566	0.921
	Min	-2.551	-2.551	-2.459
	Max	7.922	6.442	7.922
Total Tangible Assets	Mean	11.158	7.719	17.932
	Std. Dev	23.060	13.569	33.919
	Min	0.003	0.003	0.007
	Max	250.175	97.938	250.175
Total Liabilities	Mean	8.928	5.788	15.115
	Std. Dev	22.270	12.454	33.356
	Min	0.000	0.000	0.004
	Max	246.084	90.346	246.084
Total Intangible Assets	Mean	0.216	0.153	0.341
	Std. Dev	0.419	0.309	0.557
	Min	-0.003	-0.003	0.000
	Max	4.062	2.241	4.062
Earnings	Mean	0.164	0.123	0.247
	Std. Dev	0.623	0.293	0.988
	Min	-6.343	-2.464	-6.343
	Max	6.684	2.457	6.684

Table 61 presents the number of company-year observations for the financial sample (n) and the descriptive statistics for cash flows from operations (CFO_{it}), total tangible assets (TTA_{it}), total liabilities (TL_{it}), total intangible assets (TIA_{it}) and earnings (E_{it}, net income for common shareholders for the study period (2001 – 2008), pre-IFRS (2001-2004) and post-IFRS (2005 – 2008). Values for the variables were deflated by the number of outstanding ordinary shares.

Based on this sample, average total tangible assets (£320 million pounds or £11.16 per ordinary share) were sufficient to cover average total liabilities (£304 million pounds or £8.93 per ordinary share). Hence, financial companies in this sample were having positive net tangible assets. However, their values were widely spread and

skewed to the right as indicated by huge gap between the minimum and maximum values and high standard deviations, indicating the existence of outliers. These outliers which probably represented a very few large and well-established banks, were eliminated from the multivariate tests. Both total tangible assets and total liabilities had generally increased by more than double during post-IFRS as compared to pre-IFRS. Therefore, the net financial position of these companies on average was still good (net tangible assets of £2.817 per share). However, this amount might not enough to buffer the potential effects of the financial crisis as some of the liabilities might be on- and off-balance sheet items such as the bank leverage (Basel II Framework)[37]. Large standard deviations for total tangible assets and liabilities might reflect large differences in the company sizes and fluctuations in the carrying values of assets and liabilities during bad economic condition as some banks are more likely to write offs their assets and liabilities during such times (Barth et al., 2010).

This sample only selected financial companies that carry intangible assets. For the study period, the average intangible assets were £435 million pounds or 21.6 pence per ordinary share. Consistent with findings from Chapter 5, average intangible assets were greater during post-IFRS than pre-IFRS by approximately 223%. Despite not being allowed by the banking regulation as part of the bank's capital[38], more intangible assets were recognised and reported in the balance sheet after IFRS adoption. In the next test, the multivariate analysis will investigate whether these intangible assets are useful to investors in predicting the future cash flows for financial companies.

Bivariate Analysis

Table 62 shows that none of the explanatory variables were significantly related with future cash flows during the study period. However, for pre-IFRS, net tangible and

[37] http://www.bis.org/publ/bcbs189.pdf
[38] http://www.prmia.org/Weblogs/General/VenkateshNS/2008/08/when_banking_re.php

intangible assets were positively and significantly related to the three measures of future cash flows whereas earnings were only positively related to the one year ahead's cash flows from operations. Earnings were only positively and significantly related to the closest cash flows from operations, i.e. the one-year ahead cash flows from operations. During post-IFRS period, these accounting variables were not significantly related to any of the future cash flows except for intangible assets. Intangible assets were positively and significantly related to only next year's cash flows from operations but this relation was slightly stronger than in pre-IFRS.

In overall, the correlation matrix shows no serious multicollinearity issues. The explanatory variables were not highly correlated with each other as their coefficient correlations were all below 0.6 except for between earnings and net tangible assets. However, their correlation coefficient of 0.603 was only slightly above 0.6. Therefore, this study assumes the requirement for the predictors or the explanatory variables to be linearly independent has been reasonably met.

Table 62: A Correlation Matrix (the Predictive Model, Financial Sample)

The Study Period (2000 to 2008)							
fnf = 0	$CFO_{i,t+1}$	$CFO_{i,t+2}$	$CFO_{i,t+3}$	$NETTA_{it}$	TIA_{it}	E_{it}	$Difrs_{it}$
$CFO_{i,t+1}$	1.000						
$CFO_{i,t+2}$	0.360	1.000					
	0.235						
$CFO_{i,t+3}$	0.184	0.341	1.000				
	0.997	0.458					
$NETTA_{it}$	0.295	0.281	0.262	1.000			
	0.606	0.696	0.883				
TIA_{it}	0.153	0.307	0.186	0.491*	1.000		
	0.999	0.532	0.997	0.009			
E_{it}	0.288	0.299	0.351	0.603*	0.218	1.000	
	0.654	0.581	0.404	0.000	0.958		
$Difrs_{it}$	-0.064	-0.146	0.082	0.195	0.278	0.386	1.000
	1.000	0.999	1.000	0.987	0.713	0.142	
Pre-IFRS							
$CFO_{i,t+1}$	1.000						
$CFO_{i,t+2}$	0.489*	1.000					
	0.000						
$CFO_{i,t+3}$	0.322*	0.581*	1.000				
	0.000	0.000					
$NETTA_{it}$	0.198*	0.221*	0.219*	1.000			
	0.0001	0.000	0.000				
TIA_{it}	0.229*	0.317*	0.347*	-0.034	1.000		
	0.000	0.000	0.000	0.999			
E_{it}	0.237*	0.079	0.051	0.372*	0.020	1.000	
	0.000	0.651	0.983	0.000	1.000		
Post-IFRS							
$CFO_{i,t+1}$	1.000						
$CFO_{i,t+2}$	0.214*	1.000					
	0.007						
$CFO_{i,t+3}$	-0.043	0.073	1.000				
	1.000	0.997					
$NETTA_{it}$	0.121	0.074	0.065	1.000			
	0.522	0.980	0.999				
TIA_{it}	0.259*	0.144	0.042	-0.094	1.000		
	0.000	0.251	1.000	0.866			
E_{it}	0.090	0.041	0.016	0.347*	0.071	1.000	
	0.897	1.000	1.000	0.000	0.985		

This table 62 summarises the correlation coefficient matrix between the variables. * indicate that the coefficients were significant at 5% significance level. The results were Pearson correlation coefficient adjusted for large sample effect by Sidak method.

Multivariate Analysis

The same models were tested for the financial sample to test the second research hypothesis. Key results were reported in Table 63.

H_2: The predictive value of intangible assets has been significantly improved under IFRS

When the model was tested for the whole study period, the R^2 was significant, indicating the aggregate accounting variables were significant in predicting future cash flows. However, the explanatory power was mainly contributed by net tangible assets and intangible assets. Earnings were not significantly related to any of the future cash flows. Net tangible assets were positively and significantly related to all three future cash flows but their coefficient correlations were smaller than the correlation coefficients of intangible assets. Among the three measures of future cash flows, their greatest explanatory power occurred when predicting the three-year ahead cash flows from operations (R^2 = 15.6%). However, these results did not suggest that accounting information under IFRS were more predictive because the R^2 with respect of the two-year and three-year ahead were not significant. Hence, the R^2 between pre- and post-IFRS were not comparable. In addition, IFRS had not significantly affected the determination of future cash flows from operations.

First, when the predictive value is measured in term of predicting the one-year ahead cash flows from operations ($\mathbf{CFO_{i,t+1}}$), accounting information during pre-IFRS produced greater R^2 than those of post-IFRS (12.4% versus 8.9%). However, the coefficient correlation of net tangible assets was higher and more significant for post-IFRS period. It was significant at 10% significance level for pre-IFRS (coefficient correlation = 0.032, p-value = 0.094) but was significant at 1% significance level for post-IFRS period (coefficient correlation = 0.041, p-value = 0.002), suggesting that IFRS might have increased its predictive value. Furthermore, the correlation coefficient for intangible assets was slightly greater during post-IFRS (coefficient correlation = 0.476, p-value = 0.047) but it was only significant at 5% significance

level as compared to being significant at 1% significance level for pre-IFRS period (coefficient correlation = 0.438, p-value = 0.002).

Second, in terms of predicting the two-year ahead and three years ahead of cash flows from operations, both net tangible and intangible assets had more predictive value during pre-IFRS period than post-IFRS. These results suggested that the impact of IFRS on improving the predictive value of assets, in general and intangible assets in particular was only limited to ability to predict a one-year ahead financial companies' cash flows. To predict longer term cash flows, there is insufficient evidence to reject the null hypothesis and hence this section concludes that IFRS has not significantly improved the predictive value of intangible assets reported by the financial companies.

Table 63: IFRS and Predictive Value of Accounting Information (Financial Sample)

CFO_{t+1} (fnf=0)		All n = 790		Pre-IFRS n = 524		Post-IFRS n = 266	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value	Coef.	p-value
R^2		0.097	0.000***	0.124	0.003***	0.089	0.007*
Intercept		0.020	0.523	0.004	0.890	-0.020	0.754
$NETTA_{it}$	+	0.041	0.000*	0.032	0.094*	0.041	0.002***
TIA_{it}	+	0.461	0.001***	0.438	0.002***	0.476	0.047**
E_{it}	+	0.073	0.103	0.362	0.150	0.024	0.471
$Difrs_{it}$	+	-0.047	0.400	n/a		n/a	
CFO_{t+2} (fnf=0)		All n = 785		Pre-IFRS n = 524		Post-IFRS n = 261	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value	Coef.	p-value
R^2		0.068	0.004***	0.155	0.000***	0.029	0.297
Intercept		0.042	0.292	-0.002	0.952	0.101	0.355
$NETTA_{it}$	+	0.047	0.000***	0.056	0.004***	0.033	0.088*
TIA_{it}	+	0.454	0.001***	0.631	0.000***	0.338	0.156
E_{it}	+	-0.017	0.718	-0.033	0.855	-0.00001	1.000
$Difrs_{it}$	+	-0.015	0.826	n/a		n/a	
CFO_{t+3} (fnf=0)		All n = 698		Pre-IFRS n = 524		Post-IFRS n = 174	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value	Coef.	p-value
R^2		0.156	0.005***	0.177	0.000***	0.009	0.588
Intercept		0.056	0.202	-0.017	0.617	0.178	0.263
$NETTA_{it}$	+	0.067	0.000***	0.073	0.000***	0.048	0.172
TIA_{it}	+	0.463	0.005***	0.854	0.000***	0.119	0.659
E_{it}	+	-0.149	0.134	-0.123	0.595	-0.117	0.232
$Difrs_{it}$	+	-0.045	0.627	n/a		n/a	

Table 63 presents key results from the predictive model. *, **, *** indicates that the coefficients or R^2 was significant at 10%, 5% and 1% respectively. $NETTA_{it}$ is net tangible assets (total tangible assets minus total liabilities), $\mathbf{CFO_{it+n}}$ is cash flows from operations for company i in year t + n, $\mathbf{TIA_{it}}$ is total intangible assets for company i in year t, $\mathbf{E_{it}}$ is net income for company i in year t.

8.6. Econometric Issues

Diagnostic tests were undertaken to ensure assumptions for the multivariate analysis were met. Any violation of the assumptions, namely non-normal data and

heterokedasiticy were addressed using approaches from prior studies. Heterokedastic issues were minimised by using a deflator. Non-normal data is considered common feature of accounting and financial data. Its effects is not serious if the sample size is large (Hair, et al., 2006). This study has identified and eliminated outliers.

Both models were tested on equal periods (four fiscal years) for pre-IFRS and post-IFRS. Results remained qualitatively unchanged. Therefore, different number of company-observations for panel data for pre-IFRS and post-IFRS has not caused results to be biased (e.g. in favour of the pre-IFRS). In addition, these results were robust as they remained qualitatively unchanged after controlling for other factors including the number of operating years, types of auditors, profit or loss companies, growth, leverage level, closely-held shares and market capitalisation (undocumented).

8.7 Summary and Conclusions

This study investigated the impact of IFRS on the informative and predictive value of accounting information in general and intangible assets in specific. It employed two models; informational model and predictive model as the methods of investigations. Accounting variables were the explanatory variables for the informational models (earnings, changes in earnings and changes in intangible assets). The dependent variable was changes in market values. When changes in accounting information were positively related to changes in market values, this accounting information would be considered informative. The accounting information of interest here is intangible assets which in nature are more difficult to recognise than the tangible assets. They are normally being broadly capitalised as intangible assets. In contrast, accounting for purchased goodwill has been quite established and existing studies show that it is informative to the investors. However, IFRS has brought some changes to accounting for intangible assets such as purchased goodwill is no longer to be amortised but must be tested for impairment on an annual basis. IFRS provides more details of indicators of impairment which includes declining in market synergy (IFRS GAAP 2008). Furthermore, detailed guidelines relating to accounting and

reporting different classes of intangible assets as discussed in previous chapter could lead to more specific information about the type of intangible assets and their future benefits (Wyatt, 2005). This will make it more informative to investors where investors can relate it with company's future cash flows. Therefore, the intangible assets post-IFRS are expected to be more informative than pre-IFRS period.

However, this study finds that intangible assets are not significantly more informative under IFRS for both nonfinancial and financial companies. Limitations in current financial accounting and reporting rules to fully capture intangible assets as the 'value drivers that dominate the new economy' (Jenkins and Upton, 2001) may have reduced their usefulness and hence, their informational value. Other factors might also play significant role in explaining changes in market value. These factors such as inflation, oil prices, interest rates, governmental policies and other market sentiments are not related to financial reporting and hence, beyond the scope of this research. Nevertheless, findings from this study support the importance role of earnings in capital market (Graham, et al., 2005). Earnings, is commonly cited by practice as playing an important role in the market valuation of companies' equities. Based on results from the informational model, changes in earnings are informative after IFRS. For financial companies, both the yearly earnings and changes in earnings are informative during post-IFRS. Therefore, this study suggests that IFRS, despite having no significant impact on the informative value of intangible, has significantly improved the informative value of earnings. Evidence from this study also indicates that being more informative contributes to earnings being more relevant to investors' decision making after the adoption of IFRS.

Other than informational value (feedback value or confirmatory value), where accounting information is relevant when it provides users with useful information to confirm past information about the company's financial position and performance, to be relevant, accounting information must also have predictive value (FASB, 2006; IFRS GAAP, 2008). This study examines how IFRS has affected the predictive value of accounting by regressing the accounting variables on three measures of future cash flows; one-period ahead, two-period ahead, and three-period ahead cash flows

from operations. Up till now, the IASB demonstrates its intention to incorporate more fair value rules in its international accounting standards and many claims that this will inject more future estimates into the financial statements (Barth et al, 2006), causing earnings to be more volatile. However, the advantage of fair valuing assets and liabilities is making accounting information better predictors of the market values of assets and liabilities, hence increasing the ability accounting information in predicting future cash flows (Whittington, 2008). This study contributes to the literature by testing the utility of the IASB's claim that IFRS will provide accounting information which is more useful to predict the timing and amount of future cash flows. However, the previous accounting regime, U.K. GAAP is acknowledged by many as a high quality accounting regime (Haller, 2002), leading many to doubt any significant impact of IFRS on accounting quality, including improving the predictive value of accounting information.

Based on the evidence from the multivariate analysis, this study finds that the predictive value of accounting information, in particular, intangible assets have been significantly improved under IFRS. This study suggests that for post-IFRS, intangible assets have greater predictive values with respect to the three measures of future cash flows for the nonfinancial companies. However, for financial companies, intangible assets are only superior in predicting the one-period ahead cash flows from operations. Furthermore, it is surprising to see evidence from this study indicates earnings, as the most important output of financial reporting system not having a significant predictive value of future cash flows for financial sector. The global financial crisis that hit financial sectors badly in 2007 and 2008 where cash flows and earnings are more uncertain might have contributed to the insignificant relation between earnings and future cash flows. The situation is even worse when fair value rules under IFRS force financial companies to incur more loss due to the assets write offs during financial turmoil (Barth and Landsman, 2010) which increase noise in earnings (Donelson et al., 2011; Barker, 2004) and impair earnings ability to predict future cash flows. Nevertheless, if the accounting information could have predicted the bleak performance in financial sectors during impending financial crisis, financial reporting could regain its credibility as a reliable reporting tool for

investors. However, in practice, financial reporting is constrained by certain rules and principles where an item must pass the recognition test (e.g. reliably measured) before it can be accounted in the financial reports. Nevertheless, the trade off between producing reliable versus relevant information might now be less debatable as the IASB has decided to prioritise relevancy over reliability. Although, IFRS is expected to improve the predictive value of accounting information, results for the financial companies is less substantial which is probably due to the financial crisis and the financial sector is subjected to additional regulation such as the banking regulation and the Basel II Framework.

Overall, this chapter shows that IFRS has no significant impact on the informational value of intangible assets but it has significantly improved the predictive value of intangible assets, particularly for nonfinancial companies. However, this offsetting effects is not substantial to improve the value relevance of intangible assets as evidenced by the previous chapter.

In the future, researchers may incorporate other accounting information (e.g. dividend payout, capital contribution) and other variables, including economic factors into the model in order to assess the aggregate impact of IFRS on the informative value of accounting information. In addition, the amount of disclosures can be compared between pre-IFRS and post-IFRS and is added as one of the explanatory or predictor variables. By considering both the quantitative and qualitative changes brought by IFRS and their impact on the informative value of accounting information, especially, intangible assets can shed more insights and evidence on the benefit of adopting the international accounting regime to the U.K. investors.

CHAPTER 9:
SUMMARY, CONCLUSIONS AND FUTURE RESEARCH

9.1. Introduction

The adoption of IFRS is timely and is appropriate as a global language of business in the era of borderless business environment (Godfrey and Chalmers, 2007). In addition, many companies, including in the U.K. are traded on foreign stock exchanges such as the U.S. stock exchange and are subjected to foreign reporting regimes,i.e., U.S. GAAP. However, by adopting IFRS, the preparation and the presentation of financial reports are internationally standardised. Hence, they are more comparable to investors around the globe and it reduces the need to prepare two sets of financial reports.

By 2007, more than 100 countries have adopted IFRS and the number of adopting countries is increasing (Negash, 2008). The mandatory adoption of IFRS in the U.K. is resulted from the 2002's European Union resolution (No. 1606/2002) (EC Regulation). Although, the IASB aims to develop an internationally acceptable set of high quality financial reporting standards (Barth, et al., 2008), U.K. GAAP, as a set of local accounting standards is more likely of higher quality, particularly for local legal and business environment (Epstein and Jermakowicz, 2008).

This thesis proposed that IFRS shall bring changes to the quality of accounting information, particularly intangible assets. The scale of changes in accounting information quality can only be assessed by empirical evidence. Reporting of intangible assets is an interesting subject because it is viewed as still lacking (Skinner, 2008). Prior to 2005, reporting different classes of intangible assets other than goodwill was very rare (Stark, 2008). Reporting intangible assets as an aggregate total is not useful to investors because they are unable to link future benefits of those intangible assets to future cash flows (Wyatt, 2008). Accounting

and recognition of intangible assets is difficult and challenging (Barth, 2006), their recognition is very much depending on accounting rules. Thus, accounting regulation can increase recognition of different classes of intangible assets, e.g. by providing more detailed guidance. Companies cannot afford to ignore reporting of intangible assets because existing literature suggests that unreported intangible assets contribute to the inability of book value to reflect the market value of a company's equity (Kohlbeck and Warfield., 2007). This issue is important to enhance users' confidence in using accounting information for making economic decisions (e.g. direct equity valuation).

The main objective of this thesis is to investigate the impact of IFRS on the value relevance of intangible assets. Different classes of intangible assets were goodwill, development costs, brands and patents, licenses, computer software and other intangible assets. The sub-objectives are to explore how IFRS has affected earnings, earnings attributes, intangible assets and indicators of a valuation approach to financial reporting.

This study was conducted in four stages. Each stage was dedicated to a set of related research hypotheses. At the first stage, it examined the impact of IFRS on earnings and intangible assets, and selected indicators of a valuation approach to financial reporting (Chapter 5). At the second stage, it assessed the impact of IFRS on earnings persistence, volatility and earnings ability to capture changes in business performance (Chapter 6). At the third stage, this study investigated the impact of IFRS on the value relevance (Chapter 7) and the last stage further examined the impact of IFRS on two primary qualities of relevance (predictive and informational value, Chapter 8) of intangible assets.

Basically, this chapter summarises the whole thesis. It is organised in the following manner; Section 9.2 reports its key findings, Section 9.3 summarises its contributions, Section 9.4 explains its limitations, Section 9.5 describes future research, and lastly Section 9.6 concludes the chapter.

9.2. Key Findings

Key findings are presented in accordance to the four research hypotheses. First, IFRS has shifted financial reporting approach further away from a matching approach and has significantly increased earnings and intangible assets. Second, IFRS has significantly increased earnings volatility and reduced earnings persistence but strengthened earnings volatility – cash earnings volatility relation. Third, IFRS has significantly increased the value relevance of intangible assets and different classes of intangible assets. Fourth, IFRS has affected informational value and increased predictive values of intangible assets.

Based on indicators of a valuation approach to financial reporting, the study findings suggest that IFRS has not significantly shifted financial reporting approach towards a more balance sheet approach (a valuation based approach). The indicators were based from Dichev (2008); less accruals, higher impairment expenses and declining matching of expenses against revenue. Two of the indicators, accruals and impairment expenses were not significantly lower and higher respectively during post-IFRS as compared to pre-IFRS period. However, the third indicator documents significant impact of more emphasis on a balance sheet where current expenses have become less matched against current revenue. This also suggests that the determination of earnings has been more inclined towards a valuation based in practice. Nevertheless, this finding is only applied to nonfinancial companies. Consistent with existing studies such as Hung and Subramayam (2007) and Sahut et al. (2011), earnings were significantly greater under IFRS. In addition, the presentation of different profit lines (operating income, operating income before depreciation and amortisation, earnings before interest and taxes, net income before taxes and preferred dividends and net income) had become more standardised, particularly among financial companies.

This evidence shows that current financial reporting is still based on mixed approaches (Barker, 2009; Fox et al., 2003). However, the IASB places more emphasis on a balance sheet (Paananem and Parmar, 2008) which can cause earnings

under IFRS to convey unclear message relating to the company's financial performance (Barker, 2004). Accounting earnings represent both incomes from business activities and gains and losses from the application of a valuation approach (e.g. gains from discontinued operation). Earnings would be more difficult to interpret and earnings from a mixed model would hinder effective analysis of the company's current and future performance (Barker, 2004; Fox et al., 2003). Consequently it would either cause equity mispricing (Richardson et al., 2005) or declining in users' confidence in the accounting earnings. However, mixed bases, particularly a valuation basis play an important role in producing information for decision-usefulness. Existing studies indicate that investors place more reliance on the income statement to assess the current value of a company (ICAEW, 2009), particularly earnings. Earnings are useful to investors if it indicates recurring earnings (earnings persistence) (Francis et al., 2004). So far, evidence to assess whether IFRS has significantly affected the properties of earnings in the U.K. is still lacking. This study finds that earnings are significantly greater under IFRS among nonfinancial companies which support evidence gathered in Chapter 5. It also suggests that there is no significant impact on reported earnings (net income before extraordinary items) of financial companies. Results from the first research stage shows that only three of their profit lines were significantly different under IFRS (higher operating income and operating income before depreciation and amortisation and lower earnings before depreciation and interest). Changes in accounting rules may produce offsetting effects and hence no significant impact on net income before extraordinary items.

The impact of IFRS on earnings persistence was investigated directly by the earnings persistence model and indirectly by the earnings volatility model. Based on the yearly earnings persistence coefficients, the research results were consistent with the declining trend in earnings persistence as suggested by previous studies (Dichev, 2008; Dichev and Tang, 2009). It had declined from 0.65 in the year 1999 to 0.17 in 2008. However, by comparing pre- and post-IFRS results, the earnings persistence model indicated that earnings among financial companies were more persistence under IFRS. To substantiate these findings, this study tests the utility of an inverse

relation between earnings volatility and earnings persistence, namely, lower (higher) earnings volatility causes earnings to be more (less) persistence (e.g. Dichev and Tang, 2009). For nonfinancial companies, results from the earnings volatility model indicate that earnings are less volatile and potentially more persistence under IFRS. However, this inference is not applicable to financial companies. On one hand, this evidence corroborated findings from the earnings persistence model that earnings persistence is slightly higher greater under IFRS for financial companies. On the other hand, the inverse relation between earnings volatility and earnings persistence does not apply to financial companies. The fair value rules (e.g. for derivatives) and a valuation approach have increased their earnings volatilities. However, these accounting rules and approach have improved earnings in terms of a better indicator of their economic reality (permanence earnings). For example, the financial crisis in 2007 and 2008 might contribute to the higher earnings volatility post-IFRS but earnings after considering assets write offs are more indicative of recurring earnings.

The main sources of earnings volatility are cash earnings volatility and accrued earnings volatility (Jayaraman, 2007). Both were significant contributors to earnings volatility during the study period. Nevertheless, accrued earnings volatility had greater explanatory power of earnings volatility among nonfinancial companies under IFRS. For financial companies, both cash earnings and accrued earnings volatility are equally strong predictors of earnings volatility. This result suggests that earnings are a better indicator of the underlying economic performance under IFRS. However, this is only applicable to financial companies. For nonfinancial companies accrued earnings volatility is the main contributor to earnings volatility which suggests that accruals accounting is still dominating the determination of accounting earnings.

Next, the research findings are related to the impact of IFRS on the value relevance of intangible assets and different classes of intangible assets and the value relevance of IFRS as an accounting policy. They are based on three models; a balance sheet identity model, an informational model and a predictive model. Generally, the reporting levels of different classes of intangible (other than goodwill) is increasing

since the adoption of IFRS (1st research stage). However, this study is unable to suggest whether this is a common trend in financial reporting or because of the broader, less stricter (Horton and Serafeim, 2006) and more detailed guidance relating to financial accounting and reporting of different classes of intangible assets under IFRS as compared to U.K. GAAP. There are three main findings.

First, based on the balance sheet identity model, this study finds that IFRS is not value relevant in the U.K. A high quality accounting regime prior to IFRS (the U.K. GAAP) (Haller, 2002) and no major measurement and disclosure based differences between U.K. GAAP and IFRS (Li, 2010) might explain why U.K. investors do not factor in the new accounting regime in their economic decision making (e.g. equity valuation). Local accounting standards are more appropriate for local business and legal environment (Jermakowicz and Gornik-Tomaszewski, 2006). Similarly, this study suggests that the value relevance of intangible assets (in aggregate) is not significantly affected by the new accounting regime (IFRS) (e.g. Chalmers et al., 2008). However, several classes of intangible assets were value relevant under IFRS. In addition to goodwill, brands and patents and computer software were all value relevant. After the adoption of IFRS, computer software has shown greater value relevance than goodwill. Nevertheless, findings related to different classes of intangible are not applicable to the financial companies due to insufficient number of common time panels.

Second, results from the informational model suggest that IFRS has a negative relation with changes in market value, indicating that it is less informative than U.K. GAAP. However, under IFRS, changes in earnings are more strongly related to changes in the market value, suggesting that changes in earnings are better in explaining changes in the market of values of equity. Hence, earnings are more informative. This is consistent with finding from the second research stage that earnings are more indicative of permanence earnings (more earnings persistence) under IFRS. This study also finds that IFRS has no significant impact on the informational value of intangible assets for nonfinancial companies. It remains not significant in explaining the variation in the market values for financial companies.

For financial companies, prior to IFRS changes in intangible assets are negatively related to changes in market values. However, under IFRS, changes in intangible assets were no longer a significant explanatory variable. Factors relating to the nature of intangible assets which are inherent with subjective measurement and their long term future benefits might hinder investors from linking the future benefits of new investment in intangible assets on earnings and hence on the market value of equity in the short term (in the current year). Furthermore, findings from this study show that specific classification of intangible assets is useful to investors. A very broad classification of intangible assets such as other intangible assets is not value relevant because investors cannot ascertain their future benefits and cannot link them with future cash flows to the companies (Wyatt, 2005). As tracking costs and measuring of intangible assets to specific class are difficult (Nixon, 1997), voluntary disclosures, particularly relating to their future benefits can help investors to estimate future cash flows of intangible assets (ICAEW, 2009).

Third and last, results from the predictive model supports the IASB claim that IFRS will significantly increase the predictive value of accounting information (e.g. Whittington, 2008). This supports finding from the first research stage that revenue is more related to future expenses than current expenses. Hence, earnings are potentially more predictive of future cash flows. Intangible assets during post-IFRS have greater predictive values relating to predicting 1-year, 2-year and 3-year ahead cash flows from operation for nonfinancial companies. For financial companies, intangible assets under IFRS show greater predictive value only relating to predicting a 1-year ahead cash flows from operations. Its predictive value was lower during post-IFRS for the longer term cash flows from operation. The future cash flows in the longer term (beyond subsequent year) for the financial sector are probably more uncertain, especially during the financial crisis in the year 2007 and 2008.

This study shows that IFRS has not significantly increased the value relevance of intangible assets. However, intangible assets for nonfinancial companies are value relevant throughout the study period. Furthermore, a few classes of intangible assets are more value relevant than goodwill under IFRS. Increases in their value relevance

are most likely contributed by significant increases in their predictive value but least likely as a result of changes in their informational value. This supports the fair value orientation of IFRS and its greater emphasis on a valuation approach. Hence, less reliance on historical basis and a matching approach. This shift will increase the predictive power of accounting information but it is likely to reduce informational value of accounting information. Overall, an increase in the predictive value of intangible assets is not sufficient to offset a decrease in the its informational value after IFRS (Chapter 8). Hence, it explains why IFRS has not significantly improved the value relevance of intangible assets (Chapter 7).

9.3. Research Contributions

This study makes at least seven contributions to the existing literature relating to the impact of the mandatory adoption of IFRS in the U.K.

First, it provides empirical evidence relating to the impact of the mandated IFRS on reporting levels of intangible assets and different classes of intangible assets, their value relevance, including informational values and predictive values. Such evidence is still lacking as majority of existing value relevance studies focus on earnings and book values. Prior studies on intangible assets only limited to goodwill, R&D and other intangible assets. This study provides new evidence relating to the value relevance of different classes of intangible assets. These evidences are robust because they are based on three models. In addition to the balance sheet based identity model, this study employed two other models (informational and predictive models). Findings from these models are complementary as informational and predictive values are two key ingredients of primary financial information quality (relevance) for providing decision-useful information to users (specifically for investors).

Second, this study provides empirical evidence on whether the primary objective of financial reporting (reporting for decision-usefulness) has been effectively achieved. The board argues that meeting this objective shall assure fulfilment of other purpose

of financial reporting such as reporting for stewardship (Whittington, 2008). Some proponents of reporting for stewardship argue that this objective should be directly stated as the primary purpose of financial reporting. The IASB's assumption that it is indirectly met once reporting for decision-usefulness is achieved is not sufficient (Penman, 2007). Therefore, this study contributes to the current debate relating to the current purpose of financial reporting by at least assuring those involved in financial reporting that IFRS has some positive impact on the specific qualities of financial information for decision-usefulness (e.g. increase predictive values of earnings and intangible assets).

Third, this study contributes to existing literature relating to the financial reporting approaches. The IASB's primary purpose of financial reporting implies greater emphasis on a balance sheet approach to financial accounting and reporting. A balance sheet approach broadly reflects the current position of the accounting regulators (the IASB and the ASB) but a transaction approach better reflects existing accounting practices (Barker, 2009; ICAEW 2009). The U.S. evidence shows that a further shift towards a balance sheet approach could worsen some properties of earnings such as matching of expenses against revenue and earnings persistence as the determination of income will also depends on the changes from the supplementary valuation of asset and liability. This issue is very important to regain public confidence in financial reports because such earnings or income will contain more noise (Fox et al., 2003) and hence, it might be less useful to investors in forecasting companies' future profitability. This study documents evidence on whether the adoption of IFRS has indeed moved financial reporting further away from an income statement approach (or a matching or a transaction approach).

Fourth, in terms of research design, this study is different from the majority of existing value relevance studies where financial companies are not excluded from the study sample. Instead, this study provides a separate analysis for this sector. It contributes by providing empirical evidence on the impact of IFRS among financial companies which is still currently lacking despite accounting rules under IFRS are perceived to produce greater impact on their earnings (e.g. application of fair values

to financial assets and liabilities). Findings for both nonfinancial and financial companies are derived from similar methods of investigations and data analysis. Thus, findings from this study can be reasonably assumed to represent U.K. companies at large.

Fifth, a few recent studies on the impact of IFRS include multiple countries such European countries (e.g. Sahut et al., 2011 and Clarkson et al., 2011), and some include both voluntary and mandatory adopters (e.g. Hung and Subramanyam, 2007) and comparison of different local GAAP with IFRS. Their findings suggest positive and significant impact of IFRS on the value relevance of intangible assets in the U.K. However, Chalmers et al. (2008) who utilise a single country setting produce contradicting findings. A multiple country research setting might not address all influences due to country-specific characteristics such as legal and business environments. This study substantiates such studies by utilising a unique research setting in the U.K. (e.g. all mandatory adopters in an established equity-oriented market, and a common-law country).

Sixth, many challenge the potential benefits of adopting IFRS in the U.K. as U.K. GAAP is considered of high quality (Haller, 2002) and IFRS does not pose any substantial measurement and disclosure requirements in this country (Li, 2010). However, existing studies show that the impact of IFRS is very substantial in the U.K. (e.g. Sahut et al., 2011 and Lee et al., 2008). Therefore, this study contributes by providing empirical evidence relating the impact of the forced changed from U.K. GAAP to IFRS on earnings, intangible assets and their attributes. U.K. listed companies which follow other accounting standards (e.g. U.S. accounting standards) are excluded from the study sample. Furthermore, evidence from this study not only counters existing claims that IFRS will not produce significant impact in the U.K. but also relevant to other countries which have yet to adopt IFRS. If IFRS produces significant impact in the U.K., its impact in other countries might be more significant.

Last, this study also documents the impact of IFRS on the presentation of financial reports, namely, the presentation of different profit lines. Despite being principles-based, where the requirements are less rigid, IFRS could lead to better standardisation of financial reports. Such evidence could justify the IASB's claim that IFRS would produce more comparable financial reports both in terms of the underlying approach and presentation. It will also justify the benefits of additional accounting requirements, including greater disclosure requirement under IFRS than U.K. GAAP.

In short, this study contributes to the existing literature by providing empirical evidence relating to the impact of IFRS on the magnitudes of earnings and intangible assets, earnings persistence (and earnings volatility), and the value relevance of intangible assets and different classes of intangible assets, including informational and predictive values of intangible assets.

9.4. Research Limitations

Findings from this study are probably limited to large and established companies because the sample selection criteria might have excluded smaller companies, particularly in Chapter 5. However, these companies represent U.K. listed companies at large as their aggregate market capitalisation is almost 98% of the total market capitalisation. Smaller companies were excluded because only companies which were established prior to the year 1999 were selected and the fact that smaller listed companies were commonly listed on the AIM. Hence, their financial statements under IFRS were not sufficient for the study period.

Econometric issues might also influence the research results such as the existence of remaining outliers and heterokedastic data. Factors that contribute to heterokedasticity are very common in market-based research. This study has followed methods from prior studies to minimise the influence of these econometric factors on the test results. In addition, the models are all based from existing studies

and hence, the models have been rigorously tested. It is also reasonable to assume that these models have been appropriately specified.

9.5. Future Research

This study can be extended to countries with weak investors' protection such as the Asian countries and other countries with emerging equity markets. This is important to understand how IFRS affects the value relevance of accounting information in countries where the investors' protection is not as strong as in the UK.

In the future, researchers may extend this study to smaller companies only (e.g. those listed on the AIM). Smaller companies might experience larger or smaller effects of the mandatory adoption of IFRS. Future studies might also investigate the unexplained portion of the market value of equity with unrecognised intangible assets. This requires cooperation with the management to provide information relating to expenditure on intangible assets which are currently expensed off (e.g. advertising costs and salary expenses). This kind of research might shed evidence on how severe is the unrecognised intangible assets, how much is accounted under IFRS and its implication on equity pricing. Findings from such studies may solidify the importance of recognising intangible assets and its impact on the value relevance of intangible assets as well as the impact of IFRS on reporting of intangible assets. Consequently, it will enhance users' confidence in financial reporting. In addition, future researchers can also investigate the impact of IFRS on reliability of accounting information, particularly earnings and intangible assets.

9.6. Conclusion

This chapter summarises the current thesis. It concludes the thesis by highlighting the main research findings, discusses the research contributions, and explains the limitations of the study and suggestions for future research.

Basically, this thesis focuses on investigating the impact of IFRS on indicators of a balance sheet approach to financial reporting, the magnitudes of earnings and intangible assets, earnings persistence and the value relevance of intangible assets and different classes of intangible assets and IFRS as the disclosed accounting policy. Its research findings suggest that the adoption of IFRS does not cause financial reporting approach to be further shifted towards a balance sheet based. In addition, IFRS has not substantially affected the quality of accounting information in the U.K. IFRS may have increased earnings but it has slightly improved earnings persistence. Although, the reported levels of different classes of intangible assets are increasing, particularly after 2005, this study is unable to conclude whether this trend is mainly contributed by the adoption of IFRS or by other factors such as the dynamic nature in business and management's incentives. Furthermore, IFRS has contributed to earnings volatility (financial sectors) and negative changes in market values which may explain why U.K. investors do not find IFRS more value relevant than U.K. GAAP. This study supports existing evidence that the local accounting standards are better to cater for local legal and business environment (Jermakowicz and Gornik-Tomaszewski, 2006) and IFRS adoption is merely a pure accounting change with no impact on the informational value of accounting information (Stark, 2008). On a positive note, this study suggests that IFRS has increased the predictive values of earnings and intangible assets. However, there is insufficient evidence to suggest that IFRS has significantly improved the value relevance of intangible assets. Examining the impact of IFRS on two primary qualities of relevance (informational and predictive values) reveals that no significant increase on the informational value of intangible assets is most likely contributing to no significant increase in its value relevance as this study shows that its predictive value (nonfinancial companies) has significantly improved under IFRS. This study contributes to the existing literature by providing empirical evidence relating to the impact of IFRS on intangible asset and different classes of intangible assets which are currently still lacking. It findings cover both financial and nonfinancial sectors. This study can be extended to smaller companies as smaller companies which are unintentionally excluded from the current thesis and might experience different impact.

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APPENDICES

Appendix 1

Phases of the Development of a Single International Conceptual Framework

Phases	Scope	Extract of the IASC's 1989 Conceptual Framework not yet updated in the 2010's framework
A	Objectives and qualitative characteristics (completed September 2010)	
B	Elements of Financial Statements	Elements, Recognition of the elements of financial statements
C	Measurements	Measurement of the elements of financial statements
D	Reporting entity (exposure draft published March 2010)	
E	Presentation and Disclosure	
F	Purpose and Status	
G	Application to not-for-profit entities	
H	Remaining issues	Capital and capital maintenance

Source: Cotter, D., (2012), Advanced Financial Reporting: A Complete Guide to IFRS, page 9)

Note: Other parts of the conceptual framework were transferred from the 1989's conceptual framework and would be gradually replaced by the IASB (Melville, 2011).

Appendix 2

Table 63: Descriptive Statistics (Nonfinancial Sample, Un-deflated Data, £millions)

Variable	Mean	Std. Dev.	Min	Max	Observations
MV_{it} (Market Value)	1,340	6997	0.340	171,000	N = 3581
TTA_{it} (Total Tangible Assets)	1,365	7906	0.362	172,000	N = 3581
TIA_{it} (Total Intangible Assets)	431	4297	0.001	109,000	N = 3581
TL_{it} (Total Liabilities)	751	2870	-3.021	49,400	N = 3581
G_{it} (Goodwill)	362	3726	0	94,800	N = 3300
DC_{it} (Development Cost)	12	46	0	456	N = 410
$B\&P_{it}$ (Brands & Patents)	171	628	0	4,283	N = 418
L_{it} (Licence)	382	2160	0	16,900	N = 242
CS_{it} (Computer Software)	674	4032	0.100	60,000	N = 590
OIA_{it} (Other Intangible Assets)	58	200	0	3,656	N = 750
E_{it} (Earnings)	31	662	-21,900	6,660	N = 3581

Table 63 shows the descriptive statistics of the original data for all variables.

Table 64: Descriptive Statistics (Nonfinancial Sample, Deflated Data)

Variable	Mean	Std. Dev.	Min	Max	Observations
MV_{it} (Market Value)	2.227	2.634966	0	27.207	N = 3581
TTA_{it} (Total Tangible Assets)	1.934	1.847	0.003	9.718	N = 3580[a]
TIA_{it} (Total Intangible Assets)	0.527	0.813	0.00006	6.958	N = 3580
TL_{it} (Total Liabilities)	1.496	1.595	-0.017	9.818	N = 3580
$NETTA_{it}$ (Net Tangible Assets)	0.438	0.945	-4.890	8.707	N = 3580
G_{it} (Goodwill)	0.463	0.672	0.00007	5.604	N = 3299
DC_{it} (Development Cost)	0.057	0.106	0.0002	0.864	N = 409
$B\&P_{it}$ (Brands & Patents)	0.238	0.696	0.00002	5.520	N = 417
L_{it} (Licence)	0.065	0.139	0.00004	0.834	N = 241
CS_{it} (Computer Software)	0.059	0.665	6.00E-06	16.135	N = 590
OIA_{it} (Other Intangible Assets)	0.143	0.273	6.60E-06	2.325	N = 749
E_{it} (Earnings)	0.077	0.325	-9.359	1.803	N = 3580
$Difrs_{it}$ (UK GAAP-0, IFRS-1)	0.349	0.477	0	1	N = 3581
Age_{it}	39	34	0	138	N = 3581

Table 64 shows the descriptive statistics of the deflated data for all variables. The values were in £ per ordinary share except for $Difrs_{it}$ and Age_{it}.

[a]The sample size for the non-financial sample which was based on the number of company-year observations of companies with intangible assets on their balance sheets.

Table 65: A Correlation Coefficient Matrix (Nonfinancial Sample)

	MV_{it}	TTA_{it}	TIA_{it}	TL_{it}	E_{it}	$Difrs_{it}$	TIA_ifrs_{it}	Age_{it}
MV_{it}	1							
TTA_{it}	0.522*	1						
TIA_{it}	0.474*	0.318*	1					
TL_{it}	0.543*	**0.856***	0.606*	1				
E_{it}	0.355*	0.239*	0.103*	0.149*	1			
$Difrs_{it}$	0.095*	0.070*	0.161*	0.126*	0.142*	1		
TIA_ifrs_{it}	0.299*	0.196*	0.677*	0.405*	0.198*	0.512*	1	
Age_{it}	0.094*	0.252*	0.135*	0.215*	0.095*	0.076*	0.107*	1

Table 65 shows the correlation coefficients between variables for non-financial sample. The descriptions of variables are; MV_{it} was companies' market value 6 month after financial year end; TTA_{it} was total tangible assets; TIA_{it} was total intangible assets; TL_{it} was total liabilities; E_{it} was earnings or net income for common shareholders; $Difrs_{it}$ was a dummy variable for the disclosed accounting policy, taking the value of 0 for UK GAAP and 1 for IFRS; TIA_ifrs_{it} was the multiplication of TIA and Difrs, hence, intangible assets under IFRS; and Age_{it} was the number of years in operations, current year minus the year of incorporation

The estimated correlation coefficients were Pearson's pair wise correlation, adjusted for the sample size using Sidak's adjustment. * denotes significant at 5% significance level

Table 66: Additional Tests Results for Model 3 (Nonfinancial Sample)

		All Non-financial (n= 3580 company-year observations)		Excluding utilities (n= 3482 company-year observations)		Excluding loss companies (n= 2703 company-year observations)		Excl. loss & negative BV companies (n = 2647 company-yr observations)	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value
R^2	+	**0.117**	**0.000*** **	**0.114**	**0.000*** **	**0.300**	**0.000*** **	**0.302**	**0.000*** **
Intercept		1.850	0.000***	1.843	0.000***	1.246	0.000***	1.240	0.000***
$NETTA_{it}$	+	0.446	0.000***	0.451	0.000***	-0.026	0.746	-0.024	0.777
$TIA_{it}\_ifrs_{it}$	+	**0.592**	**0.000*** **	**0.589**	**0.000*** **	**0.251**	**0.039** **	**0.272**	**0.03** **
E_{it}	+	0.549	0.000***	0.515	0.001***	7.190	0.000***	7.215	0.000***
$Difrs_{it}$	+	-0.122	0.11	-0.128	0.097*	-0.132	0.132	-0.134	0.134

Table 66 shows the R^2, coefficients and p-values for the additional tests. The descriptions of the explanatory variables were; $NETTA_{it}$ was the net tangible assets (TTA_{it} minus TL_{it}),$TTA_{it}$was the total tangible assets, TL_{it} was the total liabilities, TIA_{it} was the total intangible assets, E_{it} was the net income, $Difrs_{it}$ was a dummy variable for the disclosed accounting policies, TIA_ifrs_{it} was the multiplication of TIA and Difrs, hence, intangible assets under IFRS. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively. The multiple regressions were using panel corrected standard error, assuming heterokedasticity. The standard errors were normalised by N-k.

Table 67: Additional Tests Results for Model 5 (Nonfinancial Sample)

		Goodwill (n = 3229 company-yr. obs.)		**Goodwill** (excl. utilities, n = 3204 company-yr. obs.)		**Goodwill** (excl. loss and negative BV, n=2473)		**Development Cost** (n = 409)	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value
R^2	+	**0.172**	**0.000*** **	**0.169**	**0.000*** **	**0.345**	**0.000*** **	**0.515**	**0.000*** **
Intercept		1.297	0.000***	1.291	0.000***	0.883	0.000***	0.261	0.215
$NETTA_{it}$	+	0.657	0.000***	0.656	0.000***	0.192	0.060*	1.014	0.003***
CI_{it}	+	**1.047**	**0.000*** **	**1.045**	**0.000*** **	**0.714**	**0.000*** **	**0.811**	**0.73**
NCI_{it}	+	**1.248**	**0.000*** **	**1.284**	**0.000*** **	**0.629**	**0.041** **	**2.177**	**0.000*** **
E_{it}	+	0.689	0.000***	0.648	0.000***	6.873	0.000***	4.390	0.000***
$Difrs_{it}$		0.087	0.246	0.073	0.337	-0.062	0.479	0.162	0.402

Table 67 shows the R^2, coefficients and p-values for the additional tests. The descriptions of the explanatory variables were; $NETTA_{it}$ was the net tangible assets (TTA_{it} minus TL_{it}),$TTA_{it}$was the total tangible assets, TL_{it} was the total liabilities, CI_{it} was the specific class of intangible assets, NCI_{it} was other than the specific class of intangible assets (total intangible assets minus the specific class of intangible assets), E_{it} was the net income, $Difrs_{it}$ was a dummy variable for the disclosed accounting policies. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively. The multiple regressions were using panel corrected standard error, assuming heterokedasticity. The standard errors were normalised by N-k.

Table 68 : Additional Tests Results for Model 5 (Nonfinancial Sample)

		Brands & Patents (n=417)		**Licences** (n = 241)		**Computer Software** (n=590)		**Other Intangible Assets** (n=749)	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value
R^2	**+**	**0.393**	**0.000*** **	**0.404**	**0.000*** **	**0.312**	**0.000*** **	**0.335**	**0.000*** **
Intercept		1.185	0.001***	1.385	0.000***	1.397	0.000***	1.141	0.000***
$NETTA_{it}$	+	0.539	0.074*	0.435	0.153	0.483	0.003***	0.828	0.000***
CI_{it}	**+**	**1.755**	**0.004*** **	**0.557**	**0.768**	**1.054**	**0.000*** **	**0.066**	**0.885**
NCI_{it}	**+**	**1.301**	**0.000*** **	**1.393**	**0.000*** **	**1.102**	**0.000*** **	**1.055**	**0.000*** **
E_{it}	+	3.551	0.000***	4.747	0.000***	2.687	0.000***	2.607	0.000***
$Difrs_{it}$	+	-0.146	0.640	-0.303	0.297	-0.169	0.449	0.161	0.462

Table 68 shows the R^2, coefficients and p-values for the additional tests. The descriptions of the explanatory variables were; $NETTA_{it}$ was the net tangible assets (TTA_{it} minus TL_{it}),$TTA_{it}$was the total tangible assets, TL_{it} was the total liabilities, CI_{it} was the specific class of intangible assets, NCI_{it} was other than the specific class of intangible assets (total intangible assets minus the specific class of intangible assets), E_{it} was the net income, $Difrs_{it}$ was a dummy variable for the disclosed accounting policies. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

Table 69 : Additional Tests Results for Model 6 (Nonfinancial Sample)

	CI/exp. sign	**Goodwill** (n = 3229 company-yr. obs.)		**Goodwill** (excl. utilities, n = 3204 company-yr. obs.)		**Goodwill** (excl. loss and negative BV, n=2473)		**Development Cost** (n = 409)	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value
R^2	**+**	**0.124**	**0.000*** **	**0.120**	**0.000*** **	**0.312**	**0.000*** **	**0.513**	**0.000*** **
Intercept		1.843	0.000***	1.836	0.000***	1.213	0.000***	0.390	0.019**
$NETTA_{it}$	+	0.432	0.000***	0.422	0.000***	-0.009	0.927	1.012	0.003***
$CI_{it}\_ifrs_{it}$	**+**	**0.382**	**0.005*** **	**0.369**	**0.007*** **	**0.108**	**0.459**	**0.920**	**0.684**
NCI_{it}	+	1.136	0.000***	1.157	0.000***	0.582	0.079	2.179	0.000***
E_{it}	+	0.610	0.000***	0.574	0.001***	7.253	0.000***	4.399	0.000***

Table 69 shows the R^2, coefficients and p-values for the additional tests. The descriptions of the explanatory variables were; $NETTA_{it}$ was the net tangible assets (TTA_{it} minus TL_{it}),$TTA_{it}$was the total tangible assets, TL_{it} was the total liabilities, $CI_{it}\_ifrs_{it}$ was the specific class of intangible assets under IFRS, NCI_{it} was other than the specific class of intangible assets (total intangible assets minus the specific class of intangible assets), E_{it} was the net income, $Difrs_{it}$ was a dummy variable for the disclosed accounting policies. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

Table 70 : Additional Tests Results for Model 6 (Nonfinancial Sample)

	CI/exp. sign	**Brands & Patents** (n=417)		**Licences** (n = 241)		**Computer Software** (n=590)		**Other Intangible Assets** (n=749)	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value
R^2	**+**	**0.350**	**0.000*** **	**0.398**	**0.000*** **	**0.310**	**0.000*** **	**0.335**	**0.000*** **
Intercept		1.414	0.000***	1.246	0.000***	1.247	0.000***	1.274	0.000***
$NETTA_{it}$	+	0.300	0.327	0.420	0.164	0.486	0.003***	0.838	0.000***
$CI_{it}\_ifrs_{it}$	**+**	**0.825**	**0.132**	**-0.154**	**0.926**	**1.050**	**0.000*** **	**0.276**	**0.562**
NCI_{it}	+	1.160	0.000***	1.396	0.000***	1.097	0.000***	1.034	0.000***
E_{it}	+	3.873	0.000***	4.598	0.000***	2.662	0.000***	2.582	0.000***

Table 70 shows the R^2, coefficients and p-values for the additional tests. The descriptions of the explanatory variables were; $NETTA_{it}$ was the net tangible assets (TTA_{it} minus TL_{it}),TTA_{it} was the total tangible assets, TL_{it} was the total liabilities, $CI_{it}\_ifrs_{it}$ was the specific class of intangible assets under IFRS, NCI_{it} was other than the specific class of intangible assets (total intangible assets minus the specific class of intangible assets), E_{it} was the net income, $Difrs_{it}$ was a dummy variable for the disclosed accounting policies, TIA_ifrs_{it} was the multiplication of TIA and Difrs, hence, intangible assets under IFRS. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively. The multiple regressions were using panel corrected standard error, assuming heterokedasticity. The standard errors were normalised by N-k.

Financial Sample

Table 71 : Descriptive Statistics (Financial Sample, Un-Deflated Data)

Variable	Mean	Std. Dev.	Min	Max	Observations
MV_{it} (Market Value)	404	683	5	4,672	N = 204
TTA_{it} (Total Tangible Assets)	1,169	3,126	10	21,000	N = 204
TIA_{it} (Total Intangible Assets)	741	187	0.013	996	N = 204
TL_{it} (Total Liabilities)	876	2,614	4	17,800	N = 204
G_{it} (Goodwill)	57	139	0.013	956	N = 186
DC_{it} (Development Cost)	468	0.032	0.433	0.497	N = 3
$B\&P_{it}$ (Brands & Patents)	0.174	0.077	0.086	0.289	N = 5
L_{it} (Licence)	0.956	2	0.022	6	N = 13
CS_{it} (Computer Software)	515	884	12	330	N = 30
OIA_{it} (Other Intangible Assets)	61	95	0.480	418	N = 48
E_{it} (Earnings)	21	110	-768	587	N = 204

Table 71 shows the descriptive statistics of the original data for all variables. The values were in £millions.

Table 72 : Descriptive Statistics (Financial Sample, Deflated Data)

Variable	Mean	Std. Dev.	Min	Max	Observations
MV_{it} (Market Value)	1.691	1.437	0.090	9.306	N = 204
TTA_{it} (Total Tangible Assets)	3.445	2.699	0.120	9.363	N = 204
TIA_{it} (Total Intangible Assets)	0.238	0.434	0.0002	2.556	N = 204
TL_{it} (Total Liabilities)	2.529	2.071	0.012	8.791	N = 204
$NETTA_{it}$ (Net Tangible Assets)	0.916	1.163	-1.190	5.729	N = 204
G_{it} (Goodwill)	0.204	0.396	0.0002	2.556	N = 186
DC_{it} (Development Cost)	0.004	0.000	0.003	0.004	N = 3
$B\&P_{it}$ (Brands & Patents)	0.002	0.001	0.001	0.003	N = 5
L_{it} (Licence)	0.008	0.010	0.0003	0.030	N = 11
CS_{it} (Computer Software)	0.026	0.055	0.001	0.214	N = 15
OIA_{it} (Other Intangible Assets)	0.055	0.051	0.004	0.163	N = 25
E_{it} (Earnings)	0.007	0.917	-11.760	1.105	N = 204
$Difrs_{it}$ (UK GAAP-0, IFRS-1)	0.387	0.488	0	1	N = 204
Age_{it}	27	31	2	130	N = 204

Table 72 shows the descriptive statistics of the deflated data for all variables. The values were in £ per ordinary share except for $Difrs_{it}$ and Age_{it}.

Table 73 : A Correlation Coefficient Matrix (Financial Sample)

	MV_{it}	TTA_{it}	TIA_{it}	TL_{it}	E_{it}	$Difrs_{it}$	TIA_ifrs_{it}	Age_{it}	G_{it}
MV_{it}	1								
TTA_{it}	0.518*	1							
TIA_{it}	0.064	0.031	1						
TL_{it}	0.372*	**0.914***	0.164	1					
E_{it}	-0.165	-0.006	0.049	-0.041	1				
$Difrs_{it}$	0.120	0.178	0.108	0.134	0.067	1			
TIA_ifrs_{it}	0.082	0.049	0.692*	0.065	0.060	0.423*	1		
Age_{it}	0.171	0.261*	-0.041	0.218	0.045	0.087	0.022	1	
G_{it}	-0.009	0.088	0.790*	0.125	0.009	0.118	0.532*	-0.070	1

Table 74 : A Correlation Coefficients Matrix with Additional Variables (Financial Sample)

	MV_{it}	$NETTA^{1}{}_{it}$	TIA_{it}	E_{it}	$Difrs_{it}$	TIA_ifrs_{it}	Age_{it}
MV_{it}	1.00						
$NETTA^{1}{}_{it}$	0.539*	1.000					
TIA_{it}	0.064	-0.219	1.000				
E_{it}	-0.165	0.058	0.049	1.000			
$Difrs_{it}$	0.120	0.174	0.108	0.067	1.000		
TIA_ifrs_{it}	0.082	-0.002	**0.692***	0.060	**0.423***	1.000	
Age_{it}	0.171	0.218	-0.041	0.045	0.087	0.022	1.000

Table 73 and 74 show the correlation coefficients between variables for non-financial sample. The descriptions of variables are; MV_{it} was companies' market value 6 month after financial year end; $NETTA_{it}$ was net tangible assets (TTA minus TL) where TTA_{it} was total tangible assets; TIA_{it} was total intangible assets; TL_{it} was total liabilities; E_{it} was earnings or net income for common shareholders; $Difrs_{it}$ was a dummy variable for the disclosed accounting policy, taking the value of 0 for UK GAAP and 1 for IFRS; TIA_ifrs_{it} was the multiplication of TIA and Difrs, hence, intangible assets under IFRS; and Age_{it} was the number of years in operations, current year minus the year of incorporation. [1] TTA and TL were netted off, both variables were replaced by Net Tangible Assets (NETTA) to minimise co-linearity The estimated correlation coefficients were Pearson's pair wise correlation, adjusted for the sample size using Sidak's adjustment. * denotes significant at 5% significance level

Table 75 : Additional Tests Results for Model 2 (Financial Sample)

		All (n= 204 company-year observations)		Excluding loss companies (n= 156 company-year observations)		Excl. loss & negative BV companies (n = 151 company-yr observations)	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value	Coef.	p-value
R^2	**+**	**0.372**	**0.000*** **	**0.404**	**0.000*** **	**0.401**	**0.000*** **
Intercept		**1.032**	**0.000*** **	**1.089**	**0.000*** **	**1.153**	**0.000*** **
$NETTA_{it}$	**+**	**0.709**	**0.000*** **	**0.349**	**0.019** **	**0.324**	**0.032**
TIA_{it}	+	0.214	0.475	-0.164	0.660	-0.197	0.589
E_{it}	**+**	**-0.319**	**0.014** **	**2.372**	**0.005*** **	**2.385**	**0.005*** **
$Difrs_{it}$	+	-0.047	0.767	0.007	0.963	0.016	0.916

Table 75 shows the R^2, coefficients and p-values for the additional tests. The descriptions of the explanatory variables were; $NETTA_{it}$ was the net tangible assets (TTA_{it} minus TL_{it}),$TTA_{it}$was the total tangible assets, TL_{it} was the total liabilities, TIA_{it} was the total intangible assets, E_{it} was the net income, $Difrs_{it}$ was a dummy variable for the disclosed accounting policies. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.The multiple regressions were using panel corrected standard error, assuming heterokedasticity. The standard errors were normalised by N-k.

Table 76 : Additional Tests Results for Model 4 (Financial Sample)

		All (n= 204 company-year observations)		Excluding loss companies (n= 156 company-year observations)		Excl. loss & negative BV companies (n = 151 company-yr observations)	
Var(s)	Exp. Sign	Coef.	p-value	Coef.	p-value	Coef.	p-value
R^2	**+**	**0.367**	**0.000*** **	**0.4**	**0.000*** **	**0.398**	**0.000*** **
Intercept		**1.074**	**0.000*** **	**1.081**	**0.000*** **	**1.140**	**0.000*** **
$NETTA_{it}$	**+**	**0.704**	**0.000*** **	**0.362**	**0.015** **	**0.338**	**0.023** **
$TIA_{it}\_ifrs_{it}$	+	-0.017	0.950	-0.252	0.524	-0.261	0.495
E_{it}	**+**	**-0.306**	**0.019** **	**2.330**	**0.004*** **	**2.343**	**0.004*** **

Table 76 shows the R^2, coefficients and p-values for the additional tests. The descriptions of the explanatory variables were; $NETTA_{it}$ was the net tangible assets (TTA_{it} minus TL_{it}),$TTA_{it}$was the total tangible assets, TL_{it} was the total liabilities, TIA_{it} was the total intangible assets, E_{it} was the net income, $Difrs_{it}$ was a dummy variable for the disclosed accounting policies, TIA_ifrs_{it} was the multiplication of TIA and Difrs, hence, intangible assets under IFRS.*, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

The multiple regressions were using panel corrected standard error, assuming heterokedasticity. The standard errors were normalised by N-k.

Appendix 3

Table 77: Descriptive Statistics (the Informational Model, Un-deflated Data, Nonfinancial Sample)

Nonfinancial Sample		2001-08	Pre-IFRS	Post-IFRS
	n	3907	2502	1405
Change in MV	Mean	-52	-68	-25
	Std. Dev	2071	2195	1830
	Min	-70,000	-70,000	-30,000
	Max	30,000	26,000	30,000
Earnings	Mean	32	13	71
	Std. Dev	603	530	732
	Min	-22,000	-16,000	-22,000
	Max	6,700	4,500	6,700
Change in Earnings	Mean	3	-3	13
	Std. Dev	516	386	689
	Min	-14,500	-10,300	-14,500
	Max	17,100	6,263	17,100
Change in TIA	Mean	40	28	61
	Std. Dev	1,564	1,859	806
	Min	-17,700	-17,700	-14,000
	Max	88,000	88,000	15,000

Table 77 presents the number of company-year observations for the non-financial sample (n) and the descriptive statistics for change in market value (MV), earnings (net income for common shareholders), change in earnings (earnings for year t minus earnings for year t-1), and change in intangible assets (TIA) for the study period (2001 – 2008), pre-IFRS (2001-2004) and post-IFRS (2005 – 2008). Values for the variables were in un-deflated form and were in £millions.

Table 78: Descriptive Statistics (the Informational Model, Un-deflated data, Financial Sample)

Financial Sample		2001-08	Pre-IFRS	Post-IFRS
	n	702	436	266
Change in MV	Mean	-104	-25	-233
	Std. Dev	1,879	1,187	2,645
	Min	-25,000	-12,000	-25,000
	Max	11,000	11,000	6,000
Earnings	Mean	120	90	178
	Std. Dev	1,103	457	1,790
	Min	-24,000	-1,700	-24,000
	Max	7,300	4,300	7,300
Change in Earnings	Mean	-53	13	-162
	Std. Dev	1,244	201	2,002
	Min	-33,100	-1,177	-31,300
	Max	2,000	2,000	1,800
Change in TIA	Mean	36	14	73
	Std. Dev	1,553	255	2,504
	Min	-28,000	-794	-28,000
	Max	29,000	5,000	29,000

Table 78 presents the number of company-year observations for the financial sample (n) and the descriptive statistics for change in market value (MV), earnings (net income for common shareholders), change in earnings (earnings for year t minus earnings for year t-1), and change in intangible assets (TIA) for the study period (2001 – 2008), pre-IFRS (2001-2004) and post-IFRS (2005 – 2008). Values for the variables were in un-deflated form and were in £millions.

Table 79: Descriptive Statistics (the Predictive Model, Un-deflated Data)

	CFO_{it}	TTA_{it}	TL_{it}	TIA_{it}	E_{it}
			Nonfinancial sample, n=4394[1]		
Mean	114	914	730	379	32
Std. Dev.	597	3,995	2,766	3,950	603
Min.	-399	125	-3	0	-22,000
Max.	13,000	128,000	49,000	110,000	6,700
			Financial sample, n=790		
Mean	170	32,000	30,400	435	120
Std. Dev.	3,797	163,000	158,000	2,500	1,103
Min.	-96,900	0.940	0.034	-3	-24,000
Max.	18,700	2,380,000	2,300,000	48,000	7,300

Table 79 presents key descriptive statistics for the predictive model. $\mathbf{CFO_{it}}$ is cash flows from operations for company i in year t, $\mathbf{TTA_{it}}$ is total tangible assets for company i in year t, $\mathbf{TL_{it}}$ is total liabilities for company i in year t, $\mathbf{TIA_{it}}$ is total intangible assets for company i in year t, $\mathbf{E_{it}}$ is net income for company i in year t. All values were in £millions.

[1]The number of company-year observations for the un-deflated dataset (4,394) was slightly greater than the deflated dataset (4,392) because the deflator values for two company-year observations were not available.