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Accounting choices under IFRS and their effect on over-investment in capital expenditures

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University of Iowa

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ACCOUNTING CHOICES UNDER IFRS AND THEIR EFFECT
ON OVER-INVESTMENT IN CAPITAL EXPENDITURES

by

Mohamad Mazboudi

An Abstract

Of a thesis submitted in partial fulfillment
of the requirements for the Doctor of
Philosophy degree in Business Administration
in the Graduate College of
The University of Iowa

May 2012

Thesis Supervisor: Professor Daniel Collins

ABSTRACT

IFRS allows firms to choose between fair-value accounting and historical cost accounting with impairment testing for property, plant and equipment (*PPE*). This study examines the effect of firms' accounting choices for this group of non-financial assets on over-investment after *IFRS* mandatory adoption in the European Union (EU). My results indicate that over-investment in *PPE* (or capital expenditures) is lower following *IFRS* adoption among EU firms that used historical cost accounting with impairment testing in the post-*IFRS* period, consistent with EU firms having more timely loss recognition for *PPE* under *IFRS* strict impairment rules. In my analysis of United Kingdom (UK) firms, I find that most UK firms elected to use historical cost accounting with impairment testing for *PPE* after *IFRS* mandatory adoption. I also find that UK firms that previously used fair-value accounting under UK GAAP and then switched to historical cost accounting with impairment testing under *IFRS* exhibit greater reductions in over-investment relative to other EU firms that used historical cost accounting with impairment testing prior to *IFRS* adoption. Additional analysis suggests that the reductions in over-investment after *IFRS* mandatory adoption are greater as the severity of agency conflicts increases, consistent with outside shareholders demanding timely loss recognition as a means of addressing agency conflicts with managers.

Abstract Approved: _____
Thesis Supervisor

Title and Department

Date

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Graduate College
The University of Iowa
Iowa City, Iowa

CERTIFICATE OF APPROVAL

PH.D. THESIS

This is to certify that the Ph.D. thesis of

Mohamad Mazboudi

has been approved by the Examining Committee
for the thesis requirement for the Doctor of Philosophy
degree in Business Administration at the May 2012 graduation.

Thesis Committee:

Daniel Collins, Thesis Supervisor

Douglas DeJong

Paul Hribar

Erik Lie

Richard Mergenthaler

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Responsibility of any errors accrues solely to me.

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CHAPTER I

INTRODUCTION

Beginning in 2005, listed firms in the European Union (EU) countries are required to prepare their consolidated financial statements according to International Financial Reporting Standards (*IFRS*). One key objective of accounting standards is to efficiently allocate resources in an economy (Kothari et al. 2010). In this paper, I examine the effect of accounting choices that firms can make under *IFRS* on corporate investment efficiency, one dimension of efficient allocation of resources in an economy. In particular, I exploit an exogenous shock, *IFRS* mandatory adoption in 2005, that allowed EU firms to choose between two accounting alternatives (fair-value or historical cost with impairment testing) for property, plant and equipment (*PPE*). Further, I examine whether these two accounting alternatives are associated with a reduction in over-investment in capital expenditures after *IFRS* adoption. My purpose in conducting this analysis is to directly investigate the extent to which the accounting choices under *IFRS* promote more efficient real investment decisions.

Prior studies document that timely loss recognition is an important property of accounting that improves the efficiency of contracts. Timely loss recognition, through which expected future cash losses are charged against current earnings, is considered part of a corporate governance structure that constrains opportunistic behavior by managers, particularly their investment decisions (e.g., Ball 2001; Watts 2003; Ball and Shivakumar 2005; Francis and Martin 2010). Timely loss recognition allows outside suppliers of capital to monitor managerial performance and discipline managers' tendency to over-invest in a more timely manner (Francis and Martin 2010). If managers know, ex-ante, that economic losses will be recognized in a timely manner, they are less likely to engage

in value-destroying activities, such as empire building.¹ Further, timely loss recognition increases the incentives of managers to quickly abandon losing investments. Economic losses from losing investments will have negative earnings consequences and, thus, will reduce managers' earnings-based compensations and, consequently, their job security.²

Francis and Martin (2010) show that firms with more timely loss recognition pursue more profitable acquisitions and make better ex-post divestiture decisions. In a related study, Srivastava et al. (2010) find that timely loss recognition increases the likelihood of timely closures of unprofitable projects. Using data from twenty-five countries, Bushman et al. (2011) find that timely loss recognition disciplines managers who are confronted with declining investment opportunities (i.e., investments in ex-ante value-destroying projects). Furthermore, other studies show that timely loss recognition reduces agency conflicts between managers and outside shareholders (e.g., LaFond and Roychowdhury 2008; LaFond and Watts 2008; Ahmed and Duellman 2010). These studies provide evidence consistent with timely loss recognition being part of a firm's governance structure that results in better managerial investment decisions.

A number of prior studies examine whether adoption of *IFRS* leads to more timely loss recognition. The findings are mixed and inconclusive. For example, Barth et al. (2008) find an increase in timely loss recognition following firms' voluntary adoption of *IAS/IFRS* over the 1994-2003 period.³ However, Barth et al. (2008) do not account for managers' incentives and prior research (e.g., Christensen et al. 2008) shows that benefits from *IAS/IFRS* adoption are highly dependent on managers' incentives to voluntarily

¹ Jensen (1986) argues that managers have incentives to expand the firm beyond its optimal size because (1) this increases the resources under managerial control and (2) executive compensation is positively related to firm size.

² Warner et al. (1988) show that managers' bonuses and job tenure are a function of reported earnings.

³ International Accounting Standards (*IAS*) were issued by the International Accounting Standards Committee (*IASC*). The International Accounting Standards Board (*IASB*), the successor body to the *IASC*, issues *IFRS* that include standards issued by the *IASC*.

adopt *IAS/IFRS*. Further, Barth et al.'s (2008) findings may not apply to mandatory adopters of *IFRS* in 2005 because *IAS/IFRS* standards changed considerably from the early adoption period to the mandatory adoption period (Capkun et al. 2011a). In contrast to Barth et al. (2008), Ahmed et al. (2010) find less timely loss recognition following *IFRS* mandatory adoption relative to a control sample of firms that did not adopt *IFRS* standards. However, their control sample is largely comprised of U.S. firms and we know from prior research (e.g., Givoly and Hayn 2000; Barth et al. 2012) that relative to international accounting standards, U.S. GAAP has become more conservative (i.e., more timely loss recognition) over time.

Unlike Barth et al. (2008) and Ahmed et al. (2010), I do not include in my study firms that were allowed to voluntarily adopt *IFRS* and I examine EU firms only in the pre- and post-*IFRS* periods. In addition, I examine timely loss recognition for *PPE* by exploiting a setting where firms have changed their accounting treatment for *PPE* from one that is less conservative (fair-value accounting or historical cost accounting with loose impairment rules) to another that is more conservative (historical cost accounting with strict impairment rules).

For measuring *PPE*, *IFRS* offers two alternative treatments: historical cost or fair value (revaluation). Under historical cost accounting, assets are recognized at acquisition cost and then tested for impairment (write-down). Under fair-value accounting, assets are recognized at acquisition cost and then revalued to fair value both up and down.⁴ Christensen and Nikolaev (2010) show that after mandatory adoption of *IFRS* in United Kingdom (UK) and Germany, most firms chose historical cost accounting with impairment testing for *PPE*. They also find more historical cost accounting with impairment testing (i.e., less fair-value accounting) for *PPE* in the post-*IFRS* period

⁴ *IFRS* defines fair value as the amount for which an asset could be exchanged, a liability settled, or an equity instrument granted could be exchanged, between knowledgeable, willing parties in an arm's length transaction (*IFRS* 2.A).

relative to the pre-*IFRS* period among UK firms that had the option to use fair-value accounting for *PPE* in the pre-*IFRS* period. Furthermore, in its report to the European Commission in 2007, the Institute of Chartered Accountants in England and Wales (ICAEW) documents that the majority of firms in the EU elected to use a historical cost model rather than a fair-value model to measure non-financial assets following mandatory *IFRS* adoption.

IFRS, under IAS 36 (*Impairment of Assets*), requires regular impairment testing for *PPE* and provides detailed procedures for determining when asset impairment occurs and for measuring the amount of impairment. Further, *IFRS* requires impairment testing procedures be disclosed in the notes to the financial statements. On the other hand, most EU countries' domestic GAAP did not have detailed impairment testing procedures for *PPE* during the pre-*IFRS* period and impairment testing procedures were less transparent to investors and outside shareholders. In addition, given that EU firms are subject to the same impairment rules after *IFRS* mandatory adoption, impairment testing is more comparable among EU firms and managers have less discretion in measuring and reporting impairment losses. Overall, *IFRS*, under IAS 36, has more informative, more transparent, and more comparable impairment rules (i.e., strict impairment rules) for *PPE* relative to EU countries' domestic GAAP that had loose (i.e., less strict) impairment rules.⁵ Therefore, I predict that firms that used historical cost accounting with impairment testing in the post-*IFRS* period will exhibit a reduction in over-investment in *PPE* after *IFRS* adoption relative to pre-adoption levels because of more timely recognition of impairment losses under *IFRS* strict impairment rules.

⁵ This argument is consistent with the International Accounting Standards Board's (IASB) objective: "to develop, in the public interest, a single set of high quality, understandable and enforceable global accounting standards that require high quality, transparent and comparable information in financial statements and other financial reporting to help participants in the world's capital markets and other users make economic decisions (International Accounting Standards Committee (IASC) Foundation, Constitution Part A.2)."

My sample is comprised of publicly-listed firms in nine EU countries that mandated *IFRS* adoption in 2005. In order to minimize the self-selection bias related to managers' incentives to voluntarily adopt *IFRS* before *IFRS* became mandatory in 2005 (e.g., Christensen et al. 2008), I include firms only from those nine EU countries where voluntary adoption of *IFRS* was not allowed prior to 2005.⁶ I measure over-investment by examining whether a firm is more likely to over-invest using two partitioning variables: cash levels and free-cash flows. Prior literature (e.g., Jensen 1986; Harford 1999; Lie 2000; Richardson 2006) shows that firms with high cash levels and high free-cash flows are more likely to over-invest. My results suggest that there is more timely loss recognition for *PPE* following *IFRS* adoption. In particular, I find that the frequency of impairment losses for *PPE* is significantly greater in the post-*IFRS* period relative to the pre-*IFRS* period. I also find modest evidence of an increase in the asymmetric timeliness of loss recognition in earnings following *IFRS* adoption. My main results indicate that over-investment in *PPE* (or capital expenditures) is lower following *IFRS* adoption among EU firms that used historical cost accounting with impairment testing in the post-*IFRS* period, consistent with EU firms having more timely loss recognition for *PPE* under *IFRS* strict impairment rules.

I further examine UK firms that had the option of using fair-value accounting (i.e., revaluation) for *PPE* under UK GAAP. I find that most UK firms elected to use historical cost accounting with impairment testing for *PPE* after *IFRS* mandatory adoption. I also find that 30% of UK firms switched from fair-value accounting under UK GAAP to historical cost accounting with impairment testing under *IFRS* and only 1% switched from historical cost accounting with impairment testing under UK GAAP to fair-value accounting under *IFRS*.

⁶ See Table C2 (Panel A) for the list of these nine EU countries that did not allow firms to adopt *IFRS* before it became mandatory in 2005.

Under both UK GAAP and *IFRS*, increases in fair value for *PPE* are recognized in a revaluation reserve in shareholders' equity. Because most long-lived assets such as *PPE* are heterogeneous in nature (i.e., firm-specific) and are not traded in liquid markets, fair-value estimates of *PPE* are likely to exhibit less reliability than historical cost (Ball 2006; Holthausen and Watts 2001; Kothari et al. 2010; Watts 2006).⁷ Hence, I argue that the existence of a positive revaluation reserve in shareholders' equity creates slack that self-interested managers can opportunistically use to offset impairment losses among assets and delay the recognition of impairment losses in earnings. On the other hand, UK firms that use historical cost accounting with impairment testing (under UK GAAP or *IFRS*) have a zero balance in the revaluation reserve and, hence, self-interested managers will have no ability to opportunistically use previous upward revaluations to absorb or conceal impairment losses.⁸ Thus, relative to fair-value accounting, historical cost accounting with impairment testing has greater disciplinary implications because impairment losses are recognized in earnings in a more timely manner. In other words, self-interested managers are expected to be more disciplined in their investment decisions when historical cost accounting with impairment testing is used. Therefore, I predict that UK firms that previously used fair-value accounting under UK GAAP and then switched to historical cost accounting with strict impairment rules under *IFRS* will exhibit greater reductions in over-investment relative to other EU firms that used historical cost accounting with impairment testing prior to *IFRS* adoption. Using difference-in-differences and multivariate tests, I find results consistent with this prediction.

⁷ Barth et al. (2001, p.85-86) also argue that the reliability of fair-value estimates of long-lived assets "...is open to question because typically no market for these assets exists..."

⁸ UK firms that used fair-value accounting for *PPE* under UK GAAP and then switched to historical cost accounting with impairment testing under *IFRS* had to close, on transition to *IFRS*, the balance in their revaluation reserve.

To address the effects of the economic downturn and other institutional factors (e.g., enforcement mechanism) on my results, I examine only UK firms that were subject to the same economic downturn and institutional factors. I find that UK firms that switched from fair-value accounting under UK GAAP to historical cost accounting with impairment testing under *IFRS* exhibit greater reductions in over-investment after *IFRS* adoption relative to *other UK firms*. This finding mitigates the concern that the reduction in over-investment after *IFRS* adoption is an effect attributed to the economic downturn or to other institutional factors.

Prior literature (e.g., LaFond and Roychowdhury 2008; LaFond and Watts 2008; Ahmed and Duellman 2010) shows that timely loss recognition is a governance mechanism that mitigates agency conflicts between managers and outside shareholders. As a supplemental test, I examine the effect on over-investment based on the level of agency conflicts. If EU firms are indeed using historical cost accounting with strict impairment rules (i.e., more timely loss recognition) for *PPE* following *IFRS* adoption, then I predict that as the level of agency conflicts increases, the greater will be the effect of timely loss recognition on reducing over-investment. My results are consistent with this prediction. After *IFRS* mandatory adoption, outside shareholders appear to be demanding timely loss recognition as a means of addressing agency conflicts with managers.

This study contributes to the accounting literature in several ways. First, my paper contributes to the international accounting literature by examining the effect firms' accounting choices following mandatory *IFRS* adoption have on firms' investment efficiency. My findings suggest that the increase in investment efficiency for *PPE* (i.e., lower over-investment) following mandatory *IFRS* adoption is not uniform among firms. Rather, the investment efficiency benefits are dependent on the accounting choices that firms followed prior to *IFRS* and the option they chose after the mandatory adoption of *IFRS*. Understanding the effect of *IFRS* accounting choices on investment efficiency is of

potential interest to standard setters and regulators in countries that are considering *IFRS* adoption as well as in countries that have already adopted *IFRS*.

Second, my paper contributes to the literature on the effects of conservative financial reporting (i.e., timely loss recognition). Prior studies (e.g., Francis and Martin 2010; Srivastava et al. 2010; Ahmed and Duellman 2010) show that conservative financial reporting reduces over-investment. These studies examine firms under one set of domestic standards, U.S. GAAP, where all firms are required to use historical cost accounting for non-financial assets and are subject to the same impairment rules. However, in my study, I exploit a setting where firms have changed their accounting treatments for *PPE* from fair-value accounting (or historical cost accounting with loose impairment rules) to historical cost accounting with strict impairment rules. Therefore, I investigate in a more direct way the effect of conservative financial reporting on over-investment in *PPE*. Further, prior studies (e.g., Dietrich et al. 2007; Givoly et al. 2007; Gow et al. 2010; Tian et al. 2009) show that it is difficult to reliably measure ‘firm-level’ conservatism and that commonly-used conservatism measures, such as the one proposed by Basu (1997), suffer from measurement errors. In my study, I do not rely on a ‘firm-level’ measure of conservative reporting. Rather, I exploit a natural sample partitioning based on whether firms used fair-value accounting or historical cost accounting with either strict or loose impairment rules for *PPE* to identify which firms are less conservative in measuring *PPE* than others.

Third, this study provides evidence relevant to the heated debate among academics and standard setters regarding whether fair-value accounting for non-financial assets is beneficial to stakeholders (e.g., Ball 2006; Barth 2006; Schipper 2005; Watts 2006).⁹ My findings suggest that the reduction in over-investment in *PPE* after *IFRS*

⁹ Barth (2006, p. 98) states that in almost every standard-setting project of the U.S. Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB), the boards consider fair value as a possible measurement attribute. This includes the conceptual framework.

mandatory adoption is associated with firms' election to use historical cost accounting with strict impairment rules. Hence, my findings imply that any future *IFRS* standards that mandate fair-value accounting for non-financial assets could produce less firm-specific investment efficiency benefits than the current *IFRS* standards that allow both fair-value accounting and historical cost accounting with strict impairment rules.

The remainder of this paper is organized as follows. Chapter II reviews related literature and develops my hypotheses. Chapter III describes my measures, research design, and sample. Chapter IV presents my results while chapter V presents my supplemental test. Chapter VI concludes.

CHAPTER II

RELATED LITERATURE AND HYPOTHESES DEVELOPMENT

2.1 Related Literature

2.1.1 Timely Loss Recognition and Over-investment

Prior literature argues that conservative accounting policies characterized by timely loss recognition discipline managers to make better investment decisions (e.g., Ball 2001; Watts 2003; Ball and Shivakumar 2005). Specifically, timely loss recognition causes economic losses from poorly performing investments to be recognized more quickly. Hence, managers are less likely to make investments that decrease shareholder value because timely loss recognition will reduce managers' earnings-based compensations (Ball and Shivakumar 2005). Further, in the absence of timely loss recognition, subsequent generations of managers will inherit losing investments and, therefore, timely loss recognition provides more effective disciplining of current managers (Ball 2001).¹⁰ In addition to its direct effect on managers via reported earnings, timely loss recognition provides external directors and shareholders with timely signals for investigating the existence of losing investments and taking corrective actions (Watts 2003).

Francis and Martin (2010) examine the association between timely loss recognition and firms' acquisition-investment decisions. For a sample of corporate acquisitions and divestitures by U.S. firms between 1980 and 2006, they find that the bidder's acquisition profitability is positively associated with the bidder's timeliness of loss recognition. They also find that firms with more timely loss recognition are less likely to make post-acquisition divestitures, but when they do, they act more quickly to divest losing investments. In two related studies, Srivastava et al. (2010) and Bushman et

¹⁰ Watts (2003) and Leone et al. (2006) argue that it is difficult and costly for shareholders to recover excess compensation to managers for overstated current earnings that subsequently reverses, especially when managers leave the firm.

al. (2011) find results consistent with those of Francis and Martin (2010). Srivastava et al. (2010) find that timely loss recognition among U.S. firms allows lenders and shareholders to identify unprofitable projects more quickly and, hence, enables them to force managers to discontinue such projects before large value erosion occurs. Bushman et al. (2011) examine the association between corporate investment and timely loss recognition in twenty-five countries over the period 1995 to 2003. They find that timely loss recognition curbs investments in ex-ante value-destroying projects when managers face declining investment opportunities.

Ahmed and Duellman (2010) find that firms with more timely loss recognition have higher future profitability and lower magnitude (and likelihood) of future special items charges. Ahmed and Duellman's findings are consistent with timely loss recognition playing an important governance role by reducing managers' incentives to take on negative net present value (NPV) projects and improving monitoring of investments. In addition, LaFond and Watts (2008) show that timely loss recognition is part of a firm's governance structure that mitigates agency conflicts between insiders (managers) and outside shareholders. In their setting, timely loss recognition mitigates agency conflicts by reducing deadweight costs arising from asymmetric information. In a related study, LaFond and Roychowdhury (2008) investigate the association between managerial ownership and timely loss recognition and find that firms with lower managerial ownership have more timely loss recognition. Their results are consistent with outside shareholders demanding more timely loss recognition as a means of addressing agency conflicts arising from greater separation between ownership and control.

Several studies suggest that high-quality financial reporting, through its role in governance, can reduce over-investment. For example, Lambert et al. (2007) argue that high-quality financial reporting reduces managers' ability to appropriate assets to themselves and improves the coordination between managers and investors with respect to capital investment decisions. Bushman and Smith (2001) suggest that high-quality

financial reporting increases investment efficiency by encouraging investments in high-return projects, by reducing investments in low-return projects, and by reducing the expropriation of investors' wealth. In this regard, Biddle et al. (2009) provide empirical evidence that high-quality financial reporting among firms reporting under U.S. GAAP increases investment efficiency. Specifically, they find that high-quality financial reporting is associated with lower investment among firms that are more likely to over-invest. For a sample of private firms in emerging markets over the period 2002-2005, Chen et al. (2011b) also find that financial reporting quality positively affects investment efficiency. Collectively, the studies noted above suggest that an accounting choice (e.g., historical cost accounting with strict impairment rules) characterized by more timely loss recognition will reduce over-investment.

2.1.2 Accounting Choices for PPE before and after IFRS

Prior to mandatory *IFRS* adoption in 2005, firms in each of the nine EU countries in my sample used domestic GAAP.¹¹ Except for Norwegian GAAP, EU countries' domestic GAAP allowed fair-value accounting (revaluation) for *PPE*. However, fair-value accounting for *PPE* in most EU countries was much less common than in the UK. For example, fair-value accounting for *PPE* was very rare in practice under French GAAP because upward revaluations were taxed (Deloitte & Touche 2001). In addition, very few Swedish firms used fair-value accounting for *PPE* because Swedish GAAP allowed upward revaluations under strict conditions -- when upward revaluations were considered permanent, significant, and reliable (KPMG 2005; www.iasplus.com/country/sweden.htm). Also, Spanish GAAP allowed upward revaluations only after government approval (www.bde.es). In sum, except for UK firms,

¹¹ See Table C2 (Panel A) for the list of the nine EU countries.

EU firms in my sample predominantly used historical cost accounting with impairment testing for *PPE* under domestic GAAP.¹²

IFRS, which became mandatory in EU countries starting in 2005, allows two alternatives for measuring *PPE*. Specifically, IAS 16 (*Property, Plant and Equipment*) allows firms to use: (1) historical cost or (2) fair value (revaluation). Furthermore, IAS 36 (*Impairment of Assets*) requires firms to test whether *PPE* assets are impaired at each reporting date.¹³ When using fair value to measure *PPE*, any impairment loss on a revalued asset is treated as a revaluation decrease and will be first reported as an adjustment to a revaluation reserve in shareholders' equity and the excess, if any, will be reported in earnings. On the other hand, when using historical cost accounting with impairment testing, firms do not revalue their *PPE* assets upward but only recognize impairment losses (i.e., write-downs) directly in earnings.

Table C1 presents a comparison of impairment rules for *PPE* between *IFRS* and EU countries' domestic GAAP. IAS 36 establishes detailed procedures for determining when impairment occurs and for measuring the amount of impairment. On the other hand, most EU countries' domestic GAAP did not have detailed procedures for impairment testing during the pre-*IFRS* period (2000-2004). For example, under French GAAP, there were no specific criteria for determining when impairment of *PPE* occurred and the new standard (CRC regulation 2002-10) on impairment of assets, effective on or after January 1, 2005, included less guidance than IAS 36 (see www.iasplus.com/country/france.htm for more details). Another example is Italian GAAP. According to a 2005 comparison of Italian GAAP and *IFRS* published by the European Committee of Central Balance Sheet Data Offices (CBSO), Italian GAAP did

¹² UK, French, Swedish, and Spanish firms represent 86.6% of my total sample (see Table C2 - Panel A).

¹³ The International Accounting Standards Board (IASB) issued a revised IAS 16 in December 2003 and a revised IAS 36 in March 2004 (IFRS.org).

not have standards with explicit criteria for impairment testing. In addition, Dutch GAAP had no specific guidance on the recognition of impairment losses on revalued assets (KPMG 2006) and Spanish GAAP did not include the cash-generating unit (GCU) concept for measuring impairment losses (Callao et al. 2007).¹⁴ Overall, most EU countries' domestic GAAP did not have detailed procedures and guidance for *PPE* impairment testing during the pre-*IFRS* period (2000-2004). Consequently, it is expected that managers have more discretion in measuring and reporting impairment losses for *PPE* under domestic GAAP than under *IFRS*.

Relative to most EU countries' domestic GAAP, IAS 36 is considered more informative and more transparent because of its disclosure requirement in the notes to the financial statements. In a 2009 survey, Ernst & Young find that impairment disclosures in financial statements are important to analysts, investors, and lenders (Ernst & Young 2010, p.16). Specifically, they find that more than 90% of financial statements' users included in their survey utilize impairment information disclosed in financial statements in their investment or lending decision-making process, with 66% of respondents finding impairment disclosures useful in making decisions to buy, hold, or sell assets. Appendix B provides an example on impairment disclosures for *PPE* (non-current assets) in the annual reports of two UK firms reporting under UK GAAP in 2004 (Panel A) and under *IFRS* in 2006 (Panel B). Under UK GAAP, neither firm disclosed the impairment testing procedures. However, under *IFRS*, both firms have detailed description of the impairment testing procedures in the notes to the financial statements.¹⁵

¹⁴ A cash-generating unit (GCU) is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets. If it is not possible to estimate the impairment loss of the individual asset, an entity shall determine the recoverable amount of the GCU to which the asset belongs (IAS 36).

¹⁵ Based on my review of the annual reports for UK firms, I can say that the two examples in Appendix B reflect the overall level of disclosure for impairment testing related to *PPE* in the annual reports of most UK firms in my sample.

Prior studies (e.g., Barth et al. 2012; DeFond et al. 2010; Yu 2010) show that mandating *IFRS*, a uniform set of accounting standards, improves accounting information comparability among firms from different countries. Hence, given that EU firms are subject to the same standard for impairment testing after *IFRS* mandatory adoption, impairment testing is more comparable among those firms. Consequently, it can be argued that EU firms have less discretion in measuring and reporting impairment losses. Collectively, the arguments noted above and summarized in Table C1 suggest that *IFRS* has more informative, more transparent, and more comparable impairment rules (i.e., strict impairment rules) for *PPE* relative to EU countries' domestic GAAP that had less informative, less transparent, and less comparable impairment rules (i.e., loose impairment rules).

While *IFRS* allows firms the option of using fair-value accounting for *PPE*, studies show that most EU firms use historical cost accounting with impairment testing under *IFRS*. For example, the Institute of Chartered Accountants in England and Wales (ICAEW), in its 2007 report to the European Commission about EU implementation of *IFRS* and the fair-value directive, documents that “use of fair-value accounting under *IFRS* is much less extensive than is sometimes assumed to be the case, and is in fact very limited overall.” In particular, they find that when there is a choice between a historical cost model and a fair-value model, firms typically choose a historical cost model. For a sample of UK and German firms, Christensen and Nikolaev (2010) find results consistent with the findings in ICAEW's report. They find that, after *IFRS* mandatory adoption in UK and Germany, most firms elected to use a historical cost model rather than a fair-value model to measure non-financial assets. Further, among UK firms that had the option of using fair-value accounting for *PPE* under UK GAAP, Christensen and Nikolaev (2010) find less fair-value accounting for *PPE* under *IFRS* than under UK GAAP.

2.2 Hypotheses Development

The primary objective of this paper is to examine the effect of accounting choices that firms can make under *IFRS* on over-investment in *PPE*. Several studies (e.g., Ball 2001; Watts 2003; Ball and Shivakumar 2005; Francis and Martin 2010; Ahmed and Duellman 2010) suggest that timely loss recognition, one important characteristic of high-quality financial reporting, is part of a firm's governance structure that leads managers to make more efficient investment decisions. Further, *IFRS*, under IAS 36, arguably has more informative, more transparent, and more comparable impairment rules (i.e., strict impairment rules) for *PPE* relative to EU countries' domestic GAAP that had less informative, less transparent, and less comparable impairment rules (i.e., loose impairment rules) for *PPE*. Consequently, more timely loss recognition for *PPE* is expected following *IFRS* adoption among EU firms that used historical cost accounting with strict impairment rules under *IFRS*. Hence, managers are likely to be more disciplined in making investment decisions that increase shareholder value because timely loss recognition reduces managers' wealth via bonuses, reappointment, and reputation. In addition, managers knowing, ex-ante, that future losses will be recognized in earnings in a more timely manner under the new *IFRS* impairment rules, will find it unattractive to undertake negative NPV projects. Therefore, I test the following hypothesis (stated in alternative form):¹⁶

H1. EU firms that used historical cost accounting with strict impairment rules under IFRS will exhibit lower over-investment in PPE following IFRS adoption relative to pre-adoption levels.

UK GAAP allowed firms the option of using fair-value accounting (revaluation) for *PPE* and fair-value accounting was much more commonly used under UK GAAP

¹⁶ My first hypothesis is consistent with Ball's (2006, p.12) argument that "the increased transparency and loss recognition timeliness promised by *IFRS* therefore could increase the efficiency of contracting between firms and their managers..."

than under most other EU countries' domestic GAAP. Also, UK GAAP, like *IFRS*, required the increases in fair value of *PPE* to be recognized in a revaluation reserve in equity (i.e., similar to the accounting treatment under IAS 16 previously described). Fair-value estimates of long-lived assets such as *PPE* are likely to be less reliable than historical cost (Ball 2006; Holthausen and Watts 2001; Kothari et al. 2010; Watts 2006). Hence, upward revaluations of *PPE* previously recognized in a revaluation reserve in shareholders' equity create slack that self-interested managers can opportunistically use to offset impairment losses among assets and delay the recognition of impairment losses in earnings.¹⁷ Furthermore, prior literature (e.g., Brown 1997; Hirst and Hopkins 1998; Mains and McDaniel 2000) suggests that investors regard changes in equity (e.g., changes in a revaluation reserve) among the least useful components of the annual report and that changes in equity are less effective than earnings in communicating corporate and management performance. On the other hand, when historical cost accounting with impairment testing is used, self-interested managers will have no ability to use previous upward revaluations in the revaluation reserve in equity to absorb or conceal impairment losses. Hence, I expect the disciplinary implications of recognizing asset impairments in earnings will be greater when historical cost accounting with impairment testing is used than when fair-value accounting is used. Therefore, I test the following hypothesis (stated in alternative form):

H2. UK firms that switched from fair-value accounting under UK GAAP to historical cost accounting with strict impairment rules under IFRS will exhibit greater reductions in over-investment in PPE relative to other EU firms that used historical cost accounting with impairment testing prior to IFRS adoption.

¹⁷ I assume that each firm normally has multiple assets of *PPE*.

CHAPTER III

MEASURES, RESEARCH DESIGN, AND SAMPLE SELECTION

3.1 Measures of Over-investment

To measure the increase or decrease in over-investment, I first examine whether a firm is more likely to over-invest following the approach in Biddle et al. (2009). I use two firm-specific characteristics that affect the likelihood a firm will over-invest. Specifically, I use the firm's cash level (*CASH*) and free-cash flow (*FCF*) as two partitioning variables based on the argument that firms with low *CASH* and low *FCF* are more likely to be financially constrained. Alternatively, firms with high *CASH* and high *FCF* are more likely to face agency problems and to over-invest (e.g., Jensen 1986; Harford 1999; Lie 2000; Richardson 2006).

FCF is measured as cash flow from operating activities less predicted capital expenditures (*CAPEX*). Following Biddle et al. (2009), I estimate predicted *CAPEX* as a function of sales growth based on the following model:

$$CAPEX_t = \gamma_0 + \gamma_1 SALES_GROWTH_{t-1} + v_t \quad (1)$$

where $CAPEX_t$ is the natural logarithm of capital expenditures scaled by lagged total assets in year t . $SALES_GROWTH_{t-1}$ is the percentage change in net sales in year $t-1$. I estimate equation (1) by year for each 2-digit industry with at least 10 observations in a given year. I then estimate the predicted capital expenditures for each firm i using the estimated coefficients from equation (1):

$$PREDICTED_CAPEX_{it} = \hat{\gamma}_0 + \hat{\gamma}_1 SALES_GROWTH_{it-1} \quad (2)$$

where $PREDICTED_CAPEX_{it}$ is predicted capital expenditures for firm i in year t .

Hence, the free-cash flow (FCF_{it}) for each firm i in year t is measured as follows:

$$FCF_{it} = CFO_{it} - PREDICTED_CAPEX_{it} \quad (3)$$

where CFO_{it} is cash flow from operating activities scaled by lagged total assets.

My second proxy for the likelihood of over-investment is cash level (*CASH*). For each firm i , I measure $CASH_{it}$ as cash and cash equivalents at end of year t scaled by lagged total assets.

After measuring *FCF* and *CASH* for each firm-year, I rank firm-years into terciles based on *FCF* and *CASH*. I re-scale the ranked values to range between zero and one. Following the approach in Biddle et al. (2009), I then create a composite score measure, *OVER_INV*, which is computed as the average of ranked values of the two partitioning variables. I do so because each variable is likely to measure the likelihood of over-investment with error and aggregating these two variables reduces the measurement error in the individual variables. Thus, *OVER_INV* measures the likelihood of over-investment based on *CASH* and *FCF*. As *OVER_INV* increases, the likelihood of over-investment increases.

3.2 Research Design

To examine whether there are increases or decreases in over-investment after *IFRS* mandatory adoption, I estimate the following regression:

$$\begin{aligned} CAPEX_{it} = & \beta_0 + \beta_1 IFRS_{it} + \beta_2 OVER_INV_{it} + \beta_3 IFRS * OVER_INV_{it} \\ & + \beta_{4-14} CONTROLS_{it} + \beta_{15-25} CONTROLS_{it} * OVER_INV_{it} + \varepsilon_{it} \end{aligned} \quad (4)$$

where $CAPEX_{it}$ and $OVER_INV_{it}$ are as previously defined. $CAPEX_{it}$ is obtained entirely from the cash flow statement and it represents cash paid for investments in *PPE* by firm i during year t . $IFRS_{it}$ is an indicator variable equaling one for firms adopting *IFRS* after January 1, 2005 and zero otherwise.¹⁸

Following prior literature (e.g., Biddle and Hilary 2006; Biddle et al. 2009), I introduce a wide set of controls that are related to firms' capital expenditures and, thus,

¹⁸ All variables in this paper are measured in the pre-*IFRS* period separately from the post-*IFRS* period, which means there is no overlap between the two periods. For example, I scale variables in the post-*IFRS* period by lagged total assets in the post-*IFRS* period.

could confound my findings. Specifically, I control for a variety of innate firm characteristics that prior research has shown to be related to firms' investment behavior. These controls include firm size (*SIZE*), tangible fixed assets (*TANGIBILITY*), cash flow to sales (*CFO_SALE*), length of the operating cycle (*OPERATING_CYCLE*), dividend payouts (*DIV*), market-to-book ratio (*MTB*), frequency of losses (*LOSS*), capital structure (*CAP_STRUCTURE*), and bankruptcy risk (*Z_SCORE*). I measure *SIZE* as the natural logarithm of end of year market value of equity and *TANGIBILITY* as the ratio of gross value of *PPE* to total assets. *CFO_SALE* is the ratio of cash flow from operating activities to net sales. *OPERATING_CYCLE* is the natural logarithm of the sum of receivables to net sales and inventory to cost of goods sold multiplied by 360. *DIV* is an indicator variable that takes the value of one if the firm paid a dividend, and zero otherwise. *MTB* is the ratio of market value of total assets to book value of total assets. *LOSS* is an indicator variable that takes the value of one if the firm's net income before extraordinary items is negative, and zero otherwise. *CAP_STRUCTURE* is the ratio of long-term debt to the sum of long-term debt and market value of equity. *Z_SCORE* is a measure of bankruptcy risk (distress) computed following the methodology in Altman (1968).¹⁹ Consistent with prior literature (e.g., Biddle and Hilary 2006), I predict that firms that are larger, more profitable, and have more tangible fixed assets, higher *MTB* ratio, and lower bankruptcy risk, will have higher investment in *PPE* (capital expenditures).

Further, I include closely-held shares (*CLOSELY_HELD*) in equation (4). Prior research (e.g., Berle and Means 1932; Jensen and Meckling 1976; Ang et al. 2000) suggests that the separation of ownership and control increases the level of agency conflict between insiders and outside shareholders and, hence, could affect managerial investment decisions. *CLOSELY_HELD* is measured as percentage of closely-held shares

¹⁹ See "List of Variable Definitions" in Appendix A for more details.

for firm i as reported by WorldScope.²⁰ I also include *BIG4_5*, an indicator variable equaling one when the firm's auditor is either one of the big four or five auditors and zero otherwise, to control for any potential effect this governance variable has on over-investment (i.e., the interaction between *BIG4_5* and *OVER_INV* in equation (4)).²¹ Finally, I include country and industry fixed effects in equation (4) to control for cross-country differences (e.g., rule of law) and for industry-specific shocks that could affect firm's investment behavior.

In the context of equation (4), *OVER_INV* is increasing in the likelihood of over-investment. The estimated β_3 coefficient measures the incremental effect that *OVER_INV* has on investment in *PPE* (*CAPEX*) after *IFRS* mandatory adoption. Therefore, if over-investment in *PPE* is lower in the post-*IFRS* period relative to the pre-*IFRS* period as predicted by hypothesis 1 (H1), I expect a significantly negative β_3 coefficient.

3.3 Sample Selection

3.3.1 Total Sample

My total sample consists of all publicly-listed firms available on WorldScope database in nine EU countries that mandated *IFRS* adoption in 2005 (see Panel A of Table C2). Prior literature (e.g., Christensen et al. 2008) shows that capital market and economic benefits resulting from *IFRS* adoption are highly dependent on managers' incentives to voluntarily adopt *IFRS* (i.e., early adoption). Therefore, in order to minimize the self-selection bias related to managers' incentives to voluntarily adopt *IFRS* before *IFRS* became mandatory in 2005, I include firms only from those nine EU

²⁰ WorldScope defines closely-held shares as shares held by insiders. This variable includes shares held by officers, directors, and their immediate families.

²¹ WorldScope reports the auditor for each firm only for year 2009, the last year of data currently available on WorldScope. I assume that this control variable is fairly sticky and does not vary significantly over time. I also assume that firms that had Arthur Andersen as their auditor in 2002 moved to another *Big4_5* auditor upon Arthur Andersen's closure.

countries where voluntary adoption of *IFRS* was not allowed prior to 2005 (Capkun et al. 2011a). My sample period spans from 2000 to 2009 (i.e., five years in the pre-*IFRS* period and five years in the post-*IFRS* period). I delete firm-years of non-*IFRS* post 2005.²² I also delete financial firms and firm-years with no industry affiliation. Finally, I require a constant set of firms across the sample period to capture the effect of changes in accounting choices among the same firms in the pre-*IFRS* period and in the post-*IFRS* period. After deleting all firms with missing data, my total sample is comprised of 2,568 firm-years representing 321 unique firms.²³

Table C2 (Panel A) presents the distribution of firm-years by industry and country. While there is a reasonable distribution of industries across my sample, the bulk of my sample comes from the United Kingdom and France. This country distribution is quite consistent with prior studies on *IFRS* adoption in the EU (e.g., Chen et al. 2010a; Capkun et al. 2011b).²⁴

Table C2 (Panel B) presents the descriptive statistics for my total sample. The differences between the lower and upper quartile values show there is considerable cross-sectional dispersion for most variables in my analysis, including my dependent variable (*CAPEX*). The mean of *CAPEX* (in log format) is -3.35 corresponding to an annual average of roughly 3.5% of total assets.²⁵ Also, the descriptive statistics reveal that, on average, the firms' gross value of *PPE* is roughly 50% of the book value of their total assets. In addition, the firms typically are profitable (81.19% of firm-years), are paying dividends (79.48% of firm-years), and have a *BIG4_5* auditor (81.31% of firm-years).

²² I define firm-years as adopting *IFRS* if WorldScope reports code 23 in the field of accounting standards followed after January 1, 2005.

²³ Because I scale most variables by lagged total assets, the year 2000 is dropped from my sample in the pre-*IFRS* period and the year 2005 is dropped from my sample in the post-*IFRS* period.

²⁴ My results are qualitatively similar after dropping UK and French firms from my total sample.

²⁵ I find that my dependent variable, capital expenditures, is skewed. Hence, I normalize this variable by including it in log format.

3.3.2 Sub-samples based on Accounting Choices

Because fair-value accounting (i.e., revaluation) for *PPE* was much more commonly used under UK GAAP than under most other EU countries' domestic GAAP, I further examine a subset of UK firms within my total sample described above. As previously explained, I predict that impairment losses will have less disciplining effect on managers of firms with a positive revaluation reserve (i.e., upward revaluations) under the fair-value option. Therefore, to identify UK firms that used fair-value accounting under *IFRS* or UK GAAP, I check whether a positive revaluation reserve exists in shareholders' equity. WorldScope does not separate the revaluation reserve of *PPE* from other reserves such as unrecognized gains on available-for-sale securities. Hence, I check the firms' annual reports to make sure that the positive revaluation reserve is for *PPE*.²⁶ I begin with all UK firms in my total sample and I further require that a firm has an annual report under UK GAAP before *IFRS* mandatory adoption.²⁷

Panel A in Table C3 presents the accounting choices for *PPE* under UK GAAP and *IFRS* while Panel B presents how UK firms switched between accounting choices upon the mandatory adoption of *IFRS* in 2005. Under UK GAAP, 68 firms used historical cost accounting with impairment testing while 33 firms used fair-value accounting for *PPE*. Out of these 33 firms, 30 firms switched from fair-value accounting under UK GAAP to historical cost accounting with impairment testing under *IFRS*. Only one firm switched from historical cost accounting with impairment testing under UK GAAP to

²⁶ I also check the annual reports of UK firms that had no or zero revaluation reserve in equity to make sure that these firms were using historical cost accounting for *PPE*. Few UK firms closed the balance in their revaluation reserve for *PPE* during 2004. I consider these firms as firms that used fair-value accounting in the pre-*IFRS* period.

²⁷ *IFRS* 1 (First-time Adoption) permits firms to revalue their *PPE* at fair value once on transition and then account for these revalued assets at cost in the post-*IFRS* period. Four UK firms in my total sample that had used historical cost accounting with impairment testing before 2004 elected to revalue on transition in 2004 according to *IFRS* 1. I consider these firms as firms that used historical cost accounting with impairment testing in the pre- and post-*IFRS* periods.

fair-value accounting under *IFRS*. As a result, a total of 97 firms representing 96% of UK firms in my sample used historical cost accounting with impairment testing under *IFRS* whereas only four firms representing 4% of UK firms in my sample used fair-value accounting under *IFRS*.

In sum, Table C3 shows that when there was a choice between fair-value accounting and historical cost accounting with impairment testing following the mandatory adoption of *IFRS*, UK firms typically chose historical cost accounting with impairment testing. This finding is consistent with those of the Institute of Chartered Accountants in England and Wales' (ICAEW) 2007 report and Christensen and Nikolaev (2010) that find most EU firms elected to use historical cost accounting with impairment testing for *PPE* after *IFRS* adoption.

To test my second hypothesis (H2), I divide my total sample into two sub-samples. The first sub-sample of firms, which I label as *FV_HS*, consists of the 30 UK firms (Table C3 – Panel B) that used fair-value accounting (*FV*) under UK GAAP and then switched to historical cost accounting with strict impairment rules (*HS*) under *IFRS*. The second sub-sample of firms, which I label as *HL_HS*, consists of the remaining 291 EU firms in my total sample that predominantly used historical cost accounting with loose impairment rules (*HL*) under domestic GAAP and historical cost accounting with strict impairment rules (*HS*) under *IFRS*.²⁸ I predict that over-investment in *PPE* will be lower for the two sub-samples following *IFRS* adoption (hypothesis 1), but the reduction in over-investment will be greater among *FV_HS* firms relative to *HL_HS* firms (hypothesis 2).

²⁸ As a robustness check, I also remove from this sub-sample the 4 UK firms that used fair-value accounting under both UK GAAP and *IFRS* or switched from historical cost accounting with loose impairment rules under UK GAAP to fair-value accounting under *IFRS* (Table C3 – Panel B). The results (untabulated) are similar.

CHAPTER IV

RESULTS

4.1 Preliminary Results***4.1.1 The Frequency of Impairment Losses for PPE before and after IFRS Adoption***

IFRS has strict impairment rules for *PPE* whereas domestic GAAP had loose impairment rules for *PPE*. Among EU firms that elected to use historical cost accounting with strict impairment rules under *IFRS*, I predict more impairment losses in earnings for *PPE* following *IFRS* adoption. Hence, in this sub-section, I examine the frequency of impairment losses (write-downs) for *PPE* in the post-*IFRS* period relative to the pre-*IFRS* period. Impairment losses for *PPE* are not available on WorldScope prior to 2002.²⁹ In order to obtain a balanced-sample in the pre- and post-*IFRS* periods, I remove years 2008 and 2009 from the post-*IFRS* period.³⁰ Figure C1 presents the frequency of impairment losses for *PPE* over the period 2002-2007 for my sample of 321 EU firms. During the pre-*IFRS* period (2002-2004), the total frequency of impairment losses was 136 (14% of firm-years). As predicted, during the post-*IFRS* period (2005-2007), the total frequency increased to 190 (20% of firm-years) for the same sample of firms and this increase is significant at the 1% level.³¹

²⁹ I define firms as recognizing impairment losses for *PPE* if WorldScope reports a positive value in the field # 18274 (Impairment of Property, Plant & Equipment) in the 'Supplementary Income Statement Fields.'

³⁰ The removal of 2008 and 2009 from my analysis in this sub-section would also mitigate the effect of the economic downturn. The frequency of impairment losses for *PPE* increased to 97 in 2008 and to 104 in 2009.

³¹ While there are more impairment losses after *IFRS* mandatory adoption, the magnitude of these losses have decreased from an average of 1.2% of total assets during the pre-*IFRS* period (2002-2004) to an average of 0.5% of total assets during the post-*IFRS* period (2005-2007). This decrease in magnitude after *IFRS* adoption is mainly driven by few firms reporting very large but infrequent losses during the pre-*IFRS* period. For example, one firm had impairment losses of 16.4% of total assets in 2002 but no impairment losses in any of the subsequent years. This result of having larger losses at a much lower rate in the pre-*IFRS* period relative to the post-*IFRS* period may indicate more big bath earnings management activities (i.e., lower-quality financial reporting) under domestic GAAP and, therefore, would suggest that managers

The results in this sub-section indicate that using historical cost accounting with strict impairment rules under *IFRS* led to a greater frequency of impairment losses for *PPE* during the post-*IFRS* period relative to the pre-*IFRS* period. This finding is consistent with EU firms having more timely loss recognition for *PPE* following *IFRS* adoption and, consequently, more disciplinary implications on managerial investment decisions and stronger incentives for managers to reduce over-investment in *PPE*. However, it is worth noting that the recognition of impairment losses does not capture the full disciplining effect that historical cost accounting with strict impairment rules has on managerial investment decisions. For example, a manager in 2006 knowing that impairment losses from losing investments will be reported in earnings in a more timely manner under historical cost accounting with strict impairment rules will more likely invest in positive NPV projects (i.e., reduce over-investment) and, hence, the firm may not recognize subsequent impairment losses over the period 2007-2009 on these projects if the newly acquired assets' discounted cash flows remain positive.

4.1.2 Asymmetric Timeliness of Loss Recognition

As indicated earlier, the findings on whether adoption of *IFRS* leads to less or more timely loss recognition for all assets (i.e., *PPE*, other non-financial assets, and financial assets) are mixed and inconclusive (e.g., Barth et al. 2008; Ahmed et al. 2010). In this sub-section, I examine whether timely loss recognition for all assets is higher under *IFRS* than under domestic GAAP among EU firms in my total sample. To do so, I use Basu (1997) model which indicates whether 'bad news' is recognized in earnings in a

were likely less disciplined in their investment decisions during the pre-*IFRS* period relative to the post-*IFRS* period.

more timely manner than ‘good news.’³² The Basu (1997) model uses the following equation:

$$EARN_{it} = \alpha_0 + \alpha_1 D_{it} + \alpha_2 RET_{it} + \alpha_3 D_{it} * RET_{it} + u_{it} \quad (5)$$

The dependent variable, $EARN_{it}$, is earnings per share before extraordinary items scaled by stock price at the fiscal year-end of $t-1$ and RET_{it} is the 12-month compound return ending three months after the fiscal year-end of t . D_{it} is an indicator variable equaling one if RET_{it} is negative, and zero otherwise. RET_{it} is used as a proxy for economic gains (good news) when it is positive and for economic losses (bad news) when it is negative. α_2 captures the sensitivity of earnings to good news. α_3 captures the incremental sensitivity of earnings to bad news relative to good news (i.e., timely loss recognition or, in particular, the asymmetric timeliness of loss recognition in earnings). I am interested in examining the asymmetric timeliness of loss recognition in earnings following *IFRS* adoption. Accordingly, I expand equation (5) as follows:

$$\begin{aligned} EARN_{it}^* = & \alpha_0 + \alpha_1 D_{it} + \alpha_2 RET_{it} + \alpha_3 D_{it} * RET_{it} + \alpha_4 IFRS_{it} + \alpha_5 IFRS_{it} * D_{it} \\ & + \alpha_6 IFRS_{it} * RET_{it} + \alpha_7 IFRS_{it} * D_{it} * RET_{it} + u_{it} \end{aligned} \quad (6)$$

Following Ahmed et al. (2010), I measure $EARN_{it}^*$, the dependent variable in equation (6), as the residual from regressing $EARN_{it}$ (defined above) on industry and country fixed effects.³³ In equation (6), α_7 measures any change in the asymmetric timeliness of loss recognition following *IFRS* adoption. I interpret a positive α_7 coefficient as indicating an increase in asymmetric timeliness of loss recognition following *IFRS* adoption.

³² As indicated earlier, prior literature (e.g., Dietrich et al. 2007; Givoly et al. 2007) has shown that Basu (1997) model suffers from several drawbacks. Even though, Basu (1997) model is considered the most widely-used model to estimate the asymmetric timeliness of loss recognition.

³³ This approach of measuring the dependent variable in equation (6) is also in line with Ball et al.’s (2011) suggestion. In their recent paper, Ball et al. (2011) argue that the correlation between the ‘expected’ components of earnings and returns biases the estimate of the asymmetric earnings timeliness in Basu (1997) model. To address this bias problem, they suggest fixed-effects regression as an example. Therefore, by obtaining the residual from regressing earnings on country and industry fixed-effects, I control for the ‘expected’ earnings component across countries and industries.

Table C4 presents the results of a pooled regression based on equation (6). The estimated coefficient α_7 is positive, although it is not significant. This finding suggests that there is some modest evidence of an increase in the asymmetric timeliness of loss recognition following *IFRS* adoption and contrasts with that of Ahmed et al. (2010) who document a significant decrease in the asymmetric timeliness of loss recognition following *IFRS* adoption.

Taken together, my preliminary results suggest that there is more timely loss recognition for *PPE* following *IFRS* adoption. The frequency of impairment losses for *PPE* is significantly greater in the post-*IFRS* period relative to the pre-*IFRS* period and there is some modest evidence of an increase in the asymmetric timeliness of loss recognition following *IFRS* adoption. Therefore, these results are consistent with my prediction of having more timely loss recognition for *PPE* under *IFRS* strict impairment rules.

4.2 Main Results

4.2.1 Test of H1

Table C5 presents the multivariate results based on equation (4) of the effect on over-investment after *IFRS* mandatory adoption for my total sample of 321 EU firms (2,568 firm-years) that predominantly used historical cost accounting with strict impairment rules following *IFRS* adoption. If over-investment in *PPE* is lower in the post-*IFRS* period relative to the pre-*IFRS* period due to the strict impairment rules under *IFRS*, I expect a significantly negative β_3 coefficient on the interaction between *IFRS* and *OVER_INV*. Consistent with this prediction, the estimated β_3 coefficient is significantly negative (-0.3870; $p < 0.01$). The magnitude of β_3 coefficient suggests that when the

likelihood of over-investment is high, EU firms, on average, exhibit a reduction of approximately 11.5% in *CAPEX* (capital expenditures) following *IFRS* adoption.³⁴

The above finding provides support for my first hypothesis (H1). Following *IFRS* adoption, over-investment in *PPE* is lower among EU firms that used historical cost accounting with strict impairment rules under *IFRS*. Regarding control variables, the results are generally consistent with prior literature (e.g., Biddle and Hilary 2006). Firms that are larger, more profitable, and have more tangible fixed assets, higher *MTB* ratio, and lower bankruptcy risk, tend to have higher investment in *PPE* (capital expenditures).

4.2.2 Test of H2

To test whether UK firms that switched from fair-value accounting under UK GAAP to historical cost accounting with strict impairment rules under *IFRS* (*FV_HS* firms) exhibit greater reductions in over-investment relative to other EU firms that used historical cost accounting with impairment testing prior to *IFRS* adoption (*HL_HS* firms), I employ two tests. First, I employ a univariate test using difference-in-differences to examine the changes in capital expenditures between the pre-*IFRS* period and the post-*IFRS* period for the *FV_HS* firms and for the *HL_HS* firms. Second, I use a multivariate test by introducing to equation (4) an indicator variable, *FV_HS*, that takes the value of one for *FV_HS* firms, and zero otherwise. Specifically, I estimate the following regression:

$$\begin{aligned} CAPEX_{it} = & \beta_0 + \beta_1 IFRS_{it} + \beta_2 OVER_INV_{it} + \beta_3 IFRS_{it} * OVER_INV_{it} + \beta_4 FV_HS_{it} \\ & + \beta_5 IFRS_{it} * FV_HS_{it} + \beta_6 FV_HS_{it} * OVER_INV_{it} + \beta_7 IFRS_{it} * FV_HS_{it} * OVER_INV_{it} \\ & + \beta_{8-18} CONTROLS_{it} + \beta_{19-29} CONTROLS_{it} * OVER_INV_{it} + \varepsilon_{it} \end{aligned} \quad (7)$$

Consistent with my second hypothesis (H2), I predict that the estimated β_7 coefficient on the interaction between *IFRS*, *FV_HS*, and *OVER_INV* to be negative.

³⁴ The percentage is computed as $\beta_3/\text{mean_CAPEX}$ (-0.3870/-3.3539).

Table C6 presents the univariate results, using difference-in-differences, of the effect on investment in *PPE* for *HL_HS* firms and *FV_HS* firms that are more likely to over-invest based on the highest tercile of *OVER_INV*. If there is indeed a reduction in over-investment in the post-*IFRS* period relative to the pre-*IFRS* period, then among these firms I expect lower investment in *PPE* in the post-*IFRS* period. For *HL_HS* firms, the mean *CAPEX* is significantly lower ($p < 0.01$) in the post-*IFRS* period than in the pre-*IFRS* period. This result indicates that there is a reduction in over-investment in the post-*IFRS* period among *HL_HS* firms and is consistent with my first hypothesis. Further, for *FV_HS* firms, the mean *CAPEX* is significantly lower ($p < 0.01$) in the post-*IFRS* period than that in the pre-*IFRS* period. This result indicates that there is a reduction in over-investment in the post-*IFRS* period among *FV_HS* firms and is also consistent with my first hypothesis. When comparing *FV_HS* firms to *HL_HS* firms using difference-in-differences, the difference in mean *CAPEX* is significantly negative ($p < 0.05$), which suggests that *FV_HS* firms exhibit greater reductions in over-investment in the post-*IFRS* period relative to *HL_HS* firms.

Table C7 presents the multivariate results based on equation (7) of the effect on over-investment in *PPE* for my total sample that includes both *HL_HS* firms and *FV_HS* firms. Consistent with my earlier results in Table C5, the estimated β_3 coefficient on the interaction between *IFRS* and *OVER_INV* is significantly negative (-0.3332 ; $p < 0.01$). As predicted by hypothesis 2, the estimated β_7 coefficient on the interaction between *IFRS*, *FV_HS*, and *OVER_INV* is significantly negative (-0.6852 ; $p < 0.05$). The magnitude of β_7 coefficient suggests that when the likelihood of over-investment is high, *FV_HS* firms, on average, exhibit an incremental reduction of approximately 20.4% in *CAPEX* (capital expenditures) after *IFRS* adoption relative to *HL_HS* firms.³⁵

³⁵ The percentage is computed as $\beta_7/\text{mean_CAPEX}$ ($-0.6852/-3.3539$).

Interestingly, I find no significant difference in the levels of investment in *PPE* (capital expenditures) between the pre-*IFRS* and the post-*IFRS* periods. The multivariate results in Tables C5 and C7 reveal that the estimated β_I coefficient on *IFRS* is not significant. This finding suggests that the reduction in over-investment after *IFRS* adoption is not at the expense of an increase in under-investment.

Taken together, the univariate and the multivariate results in Tables C6 and C7 provide evidence that supports my second hypothesis (H2). UK firms that switched from fair-value accounting under UK GAAP to historical cost accounting with strict impairment rules under *IFRS* exhibit greater reductions in over-investment in *PPE* after *IFRS* adoption relative to other EU firms that used historical cost accounting with impairment testing prior to *IFRS* adoption.

Overall, my findings in this sub-section provide evidence relevant to the debate on whether fair-value accounting for non-financial assets, such as *PPE*, should become mandatory or more broadly used (e.g., Ball 2006; Barth 2006; Schipper 2005; Watts 2006). In particular, my findings indicate that having historical cost accounting with strict impairment rules as an accounting alternative for non-financial assets under *IFRS* promotes more efficient investment decisions. Therefore, my findings suggest that any shift towards a mandatory fair-value accounting for non-financial assets under *IFRS* could have an adverse effect on investment efficiency.

4.2.3 The Effect of the Economic Downturn and other Institutional Factors

The economic downturn in the EU during the post-*IFRS* period could lead managers to recognize losses on investments more quickly. Hence, the economic downturn could result in more efficient investment decisions (i.e., reduction in over-investment). If the reduction in over-investment is indeed an economic downturn effect, then I expect non-significant differences in over-investment between *HL_HS* firms and

FV_HS firms after *IFRS* adoption. However, the difference-in-differences and the multivariate results presented in Tables C6 and C7 suggest that *FV_HS* firms exhibit greater reductions in over-investment after *IFRS* adoption relative to *HL_HS* firms. These greater reductions in over-investment cannot be attributed to the economic downturn because all EU firms (or at least the majority of them) were facing deteriorating economic conditions after *IFRS* adoption.

To further address the economic downturn effect, I examine the reduction in over-investment among UK firms only because UK firms were subject to the same downturn in the UK economy after *IFRS* adoption. In addition, examining only UK firms controls for other institutional factors, such as regulatory and enforcement mechanisms, that affect how rigorously *IFRS* standards are implemented. Table C8 presents the multivariate results based on equation (7) of the effect on over-investment in *PPE* among UK firms only. The estimated β_3 coefficient that captures the reduction in over-investment among *HL_HS* firms (67 UK firms – Panel B of Table C3) is negative although insignificant.³⁶ If the economic downturn and other institutional factors in the UK are the causes for the reduction in over-investment in the post-*IFRS* period, then I expect no significant differences in over-investment between *FV_HS* firms (30 UK firms – Panel B of Table C3) and *HL_HS* firms. However, the estimated β_7 coefficient on the interaction between *IFRS*, *FV_HS*, and *OVER_INV* is significantly negative (-0.8284; $p < 0.05$). Hence, my findings in this sub-section mitigate the concern that the reduction in over-investment after *IFRS* adoption is an effect attributed to the economic downturn or to other institutional factors. Rather, my results suggest that the reduction in over-investment following *IFRS* adoption among UK firms, in particular *FV_HS* firms, is driven by the

³⁶ Relative to most EU countries' domestic GAAP, UK GAAP is considered to have more guidance for impairment testing. This could be one explanation for having a non-significant β_3 coefficient when only UK firms are examined.

disciplining effect on managers of these UK firms after using historical cost accounting with strict impairment rules under *IFRS*.

CHAPTER V

SUPPLEMENTAL TEST

In this chapter, I examine whether the level of managerial ownership in firms affects over-investment in *PPE* after *IFRS* mandatory adoption. Separation of ownership and control gives rise to agency conflicts between managers (insiders) and outside shareholders (e.g., Berle and Means 1932; Jensen and Meckling 1976; Ang et al. 2000). Hence, as managerial ownership declines, the interests of managers and outside shareholders are less aligned and, as a result, the severity of the agency problem increases.³⁷ Prior literature (e.g. LaFond and Watts 2008; LaFond and Roychowdhury 2008; Ahmed and Duellman 2010) shows that timely loss recognition is a governance mechanism that mitigates agency conflicts between managers and outside shareholders. Therefore, if EU firms are indeed using timely loss recognition (i.e., historical cost accounting with strict impairment rules) after *IFRS* adoption to mitigate agency conflicts, then I expect that as managerial ownership declines, the greater will be the effect of timely loss recognition on reducing over-investment, *ceteris paribus*. To test this conjecture, I introduce into equation (4) two indicator variables: *HIGH* and *LOW*. *HIGH* equals one for firms that are in the highest quartile of closely-held shares (*CLOSELY_HELD*), and zero otherwise. *LOW* equals one for firms that are in the lowest quartile of *CLOSELY_HELD*, and zero otherwise. I then interact each of these two indicator variables with *IFRS*OVER_INV* to capture the effect on over-investment after *IFRS* adoption among firms with high and low managerial ownership. Specifically, I

³⁷ Following LaFond and Roychowdhury (2008), I measure separation of ownership and control by the percentage of the firm owned by managers (insiders). This is consistent with long-standing arguments in the agency theory (see Jensen and Meckling 1976 and Demsetz 1983)

estimate the following regression:

$$\begin{aligned}
 CAPEX_{it} = & \beta_0 + \beta_1 IFRS_{it} + \beta_2 OVER_INV_{it} + \beta_3 IFRS_{it} * OVER_INV_{it} + \beta_4 HIGH_{it} \\
 & + \beta_5 LOW_{it} + \beta_6 IFRS_{it} * HIGH_{it} + \beta_7 IFRS_{it} * LOW_{it} + \beta_8 HIGH_{it} * OVER_INV_{it} \\
 & + \beta_9 LOW_{it} * OVER_INV_{it} + \beta_{10} IFRS_{it} * HIGH_{it} * OVER_INV_{it} \\
 & + \beta_{11} IFRS_{it} * LOW_{it} * OVER_INV_{it} + \beta_{12-21} CONTROLS_{it} \\
 & + \beta_{22-31} CONTROLS_{it} * OVER_INV_{it} + \varepsilon_{it}
 \end{aligned} \tag{8}$$

Consistent with my conjecture, I predict that the estimated β_{10} coefficient on the interaction between *IFRS*, *HIGH*, and *OVER_INV* to be negative but insignificant and the estimated β_{11} coefficient on the interaction between *IFRS*, *LOW*, and *OVER_INV* to be significantly negative.

Table C9 presents the multivariate results based on equation (8) of the effect on over-investment after *IFRS* mandatory adoption. As predicted, the estimated β_3 coefficient on the interaction between *IFRS* and *OVER_INV* is significantly negative. However, I find that the estimated β_{10} coefficient on the interaction between *IFRS*, *HIGH*, and *OVER_INV* is not significant. This finding suggests that EU firms with high managerial ownership, where there is greater alignment of managers' and shareholders' interests (less agency conflicts), have no incremental reductions in over-investment in the post-*IFRS* period relative to other EU firms. Consistent with my prediction, I find that the estimated β_{11} coefficient on the interaction between *IFRS*, *LOW*, and *OVER_INV* is significantly negative. This finding suggests that EU firms with low managerial ownership have greater improvement in investment efficiency (i.e., greater reductions in over-investment) in the post-*IFRS* period relative to other EU firms. Further, the estimated β_{10} coefficient for high managerial ownership firms is significantly different from the estimated β_{11} coefficient for low managerial ownership firms ($F = 2.62$; $p < 0.1$). This result indicates that EU firms with low managerial ownership exhibit greater reductions in over-investment in the post-*IFRS* period relative to EU firms with high

managerial ownership.³⁸ Overall, these findings are consistent with my conjecture that the effect of using historical cost accounting with strict impairment rules (i.e., more timely loss recognition) on reducing over-investment after *IFRS* adoption is greater as managerial ownership declines. Further, these findings imply that outside shareholders of EU firms appear to be demanding timely loss recognition as a means of addressing agency conflicts with managers after the mandatory adoption of *IFRS*. Therefore, these findings corroborate those of LaFond and Roychowdhury (2008) who find that outside shareholders of U.S. firms demand greater conservative financial reporting (i.e., more timely loss recognition) to mitigate agency conflicts arising from greater separation between ownership and control.

³⁸ This result would also mitigate the concern that the reduction in over-investment after *IFRS* adoption is an effect attributed to the economic downturn.

CHAPTER VI

CONCLUSION

In this study, I examine the effect of firms' accounting choices for *PPE* on over-investment after *IFRS* mandatory adoption in the EU. My results indicate that EU firms that used historical cost accounting with impairment testing in the post-*IFRS* period exhibit lower over-investment following *IFRS* adoption, consistent with EU firms having more timely loss recognition for *PPE* under *IFRS* strict impairment rules. In my analysis of UK firms, I argue that the existence of a positive revaluation reserve in the equity of firms that used fair-value accounting for *PPE* creates slack that self-interested managers can opportunistically use to offset impairment losses on *PPE* assets and delay the recognition of impairment losses in earnings. Hence, self-interested managers are likely to be more disciplined in their investment decisions under historical cost accounting with impairment testing than under fair-value accounting. Consistent with this argument, I find that UK firms that previously used fair-value accounting under UK GAAP and then switched to historical cost accounting with strict impairment rules under *IFRS* exhibit greater reductions in over-investment relative to other EU firms that used historical cost accounting with impairment testing prior to *IFRS* adoption. Furthermore, my results suggest that the effect on reducing over-investment after *IFRS* adoption is more pronounced as the severity of agency conflicts increases, consistent with outside shareholders demanding timely loss recognition as a means of addressing agency conflicts with managers.

The documented results in this study are subject to two caveats. First, the economic downturn in the EU is likely to affect managerial investment behavior and, thus, my results cannot be solely attributed to the accounting treatments under *IFRS*. Second, as EU countries revise their institutional mechanisms (e.g., enforcement,

auditing, and governance mechanisms) to support the adoption of *IFRS*, it is likely that my results partly reflect the effect of the improvements in those mechanisms.

With these two caveats in mind, my study demonstrates the importance of accounting choices that firms can make under *IFRS*. My findings suggest that firms exhibit investment efficiency gains in terms of lower over-investment in *PPE* after they chose historical cost accounting with strict impairment rules under *IFRS*. Therefore, my findings emphasize the importance of retaining conservative accounting policies (i.e., more timely loss recognition) for measuring non-financial assets. Finally, accounting choices for non-financial assets under *IFRS* may not only affect firms' investment decisions as my study has shown, but could also affect other important firms' decisions such as financing decisions. I leave that to future research.

APPENDIX A

LIST OF VARIABLE DEFINITIONS

<i>BIG4_5</i>	An indicator variable equaling one when the firm's auditor is either one of the big four or five auditors, and zero otherwise.
<i>CAPEX</i>	The natural logarithm of capital expenditures scaled by lagged total assets, where capital expenditures are obtained from the cash flow statement.
<i>CAP_STRUCTURE</i>	The ratio of long-term debt to the sum of long-term debt and the market value of equity.
<i>CASH</i>	Cash level measured as cash and cash equivalents scaled by lagged total assets.
<i>CFO</i>	Cash flow from operating activities scaled by lagged total assets.
<i>CFO_SALE</i>	The ratio of cash flow from operating activities to net sales.
<i>CLOSELY_HELD</i>	The percentage of closely-held shares for a firm as reported by WorldScope.
<i>D</i>	An indicator variable equaling one if <i>RET</i> is negative, and zero otherwise.
<i>DIV</i>	An indicator variable equaling one if the firm paid a dividend, and zero otherwise.
<i>EARN</i>	Earnings per share before extraordinary items scaled by stock price at the fiscal year-end of last year.
<i>FCF</i>	Free-cash flow measured as cash flow from operating activities scaled by lagged total assets minus predicted capital expenditures.
<i>FV_HS</i>	An indicator variable equaling one for firms that switched from fair-value accounting (<i>FV</i>) under domestic GAAP to historical cost accounting with strict impairment rules (<i>HS</i>) under <i>IFRS</i> , and zero otherwise.

<i>HIGH</i>	An indicator variable equaling one for firms that are in the highest quartile of <i>CLOSELY_HELD</i> , and zero otherwise.
<i>IFRS</i>	An indicator variable equaling one for firms adopting International Financial Reporting Standards (<i>IFRS</i>) after January 1, 2005, and zero otherwise. <i>IFRS</i> equals one if WorldScope reports code 23 in the field of accounting standards followed.
<i>LOSS</i>	An indicator variable equaling one if the firm's net income before extraordinary items is negative, and zero otherwise.
<i>LOW</i>	An indicator variable equaling one for firms that are in the lowest quartile of <i>CLOSELY_HELD</i> , and zero otherwise.
<i>MTB</i>	The ratio of market value of total assets to book value of total assets.
<i>OPERATING_CYCLE</i>	The natural logarithm of: (receivables/net sales + inventory/cost of goods sold) * 360
<i>OVER_INV</i>	The average of two ranked values based on terciles of free-cash flows (<i>FCF</i>) and cash levels (<i>CASH</i>).
<i>PPE</i>	The gross value of property, plant and equipment scaled by lagged total assets.
<i>RET</i>	12-month compound return ending three months after the fiscal year-end.
<i>SALES_GROWTH</i>	The percentage change in net sales as reported by WorldScope.
<i>SIZE</i>	The natural logarithm of end of year market value of equity.
<i>TANGIBILITY</i>	The ratio of the gross value of property, plant and equipment to total assets.
<i>Z_SCORE</i>	A measure of bankruptcy risk (distress) computed as follows: $3.3(\text{income before taxes}) + \text{net sales} + 0.25(\text{retained earnings}) + 0.5((\text{current assets} - \text{current liabilities})/(\text{total assets}))$

APPENDIX B

EXAMPLES OF IMPAIRMENT DISCLOSURES

Panel A: Disclosures under UK GAAP**Christie Group plc annual report and accounts 2004 (page 37)****Tangible Fixed Assets**

Tangible fixed assets are stated at cost, net of depreciation and provision for any impairment. Depreciation is calculated to write down the cost of all tangible fixed assets to estimated residual value by equal annual installments over their expected useful lives. The periods generally applicable are:

	Years
Leasehold property	Lease term
Fixtures, fittings and equipment	5-10
Computer equipment	2-3
Motor vehicles	4

SIG plc annual report and accounts 2004 (page 56)**Tangible fixed assets**

Tangible fixed assets are shown at original cost to the Group less accumulated depreciation and any provision for impairment.

Depreciation is provided at rates calculated to write off the cost less estimated residual value of fixed assets on a straight line basis over their estimated useful lives as follows:

Freehold buildings – 50 years
 Leasehold buildings – period of lease
 Plant and machinery – 3 to 8 years

Panel B: Disclosures under IFRS**Christie Group plc annual report and accounts 2006 (page 42)****2.7 Property, plant and equipment**

Tangible fixed assets are stated at cost, net of depreciation and provision for any impairment. Depreciation is calculated to write down the cost of all tangible fixed assets to estimated residual value by equal annual installments over their expected useful lives as follows:

Leasehold property Lease term
 Fixtures, fittings and equipment 5 – 10 years
 Computer equipment 2 – 3 years
 Motor vehicles 4 years

The assets' residual values and useful lives are reviewed, and adjusted if appropriate, at each balance sheet date. An asset's carrying amount is written down immediately to its recoverable amount if the asset's carrying amount is greater than its estimated recoverable amount.

Gains and losses on disposals are determined by comparing the disposal proceeds with the carrying amount and are included in the income statement.

2.9 Impairment of assets

Non-current assets are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognised for the amount by which the asset's carrying value exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs to sell and value in use. Value in use is based on the present value of the future cash flows relating to the asset. For the purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash flows (cash generating units). Any assessment of impairment based on value in use takes account of the time value of money and the uncertainty or risk inherent in the future cash flows. The discount rates applied are post-tax and reflect current market assessments of the time value of money and the risks specific to the asset for which the future cash flow estimates have not been adjusted.

SIG plc annual report and accounts 2006 (pages 62-63)

PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment is shown at original cost to the Group less accumulated depreciation and any provision for impairment.

Depreciation is provided at rates calculated to write off the cost less estimated residual value of property, plant and equipment on a straight line basis over their estimated useful lives as follows:

Freehold buildings – 50 years

Leasehold buildings – period of lease

Plant and machinery (including motor vehicles) – 3 to 8 years

Residual values, which are based on market rates, are reassessed annually.

IMPAIRMENT OF NON-CURRENT ASSETS

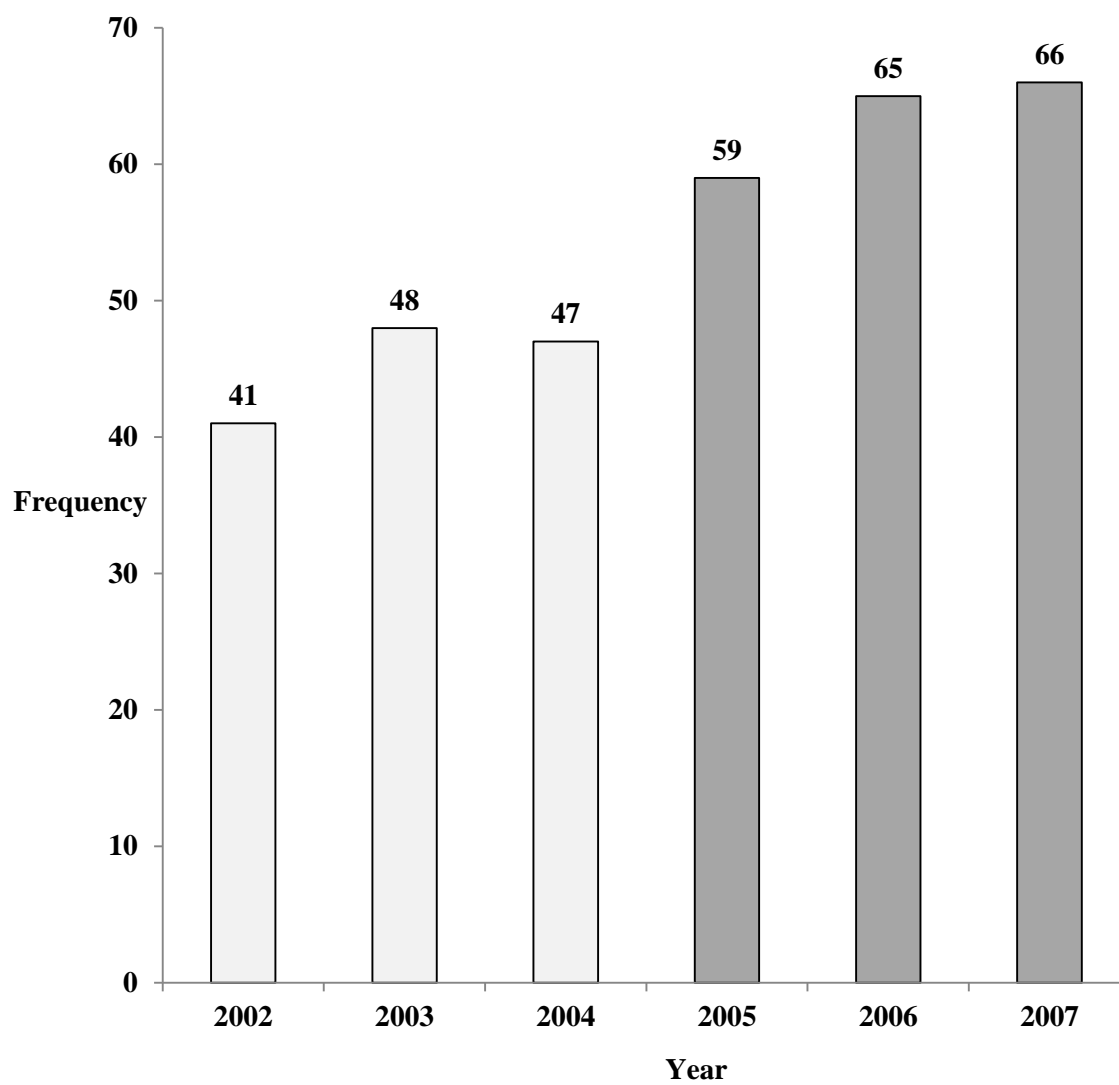
Determining whether a non-current asset is impaired requires an estimation of the “value in use” and/or the “fair value less costs to sell” of the cash-generating units (“CGU”) to which the non-current asset has been allocated. The value in use calculation requires an estimate of the future cash flows expected to arise from the CGU and a suitable discount rate in order to calculate present value. The key assumptions for these value in use calculations are those regarding discount rates, growth rates and expected changes to selling prices and direct costs. The Directors estimate discount rates using pre tax rates that reflect current market assessments of the time value of money and the risks specific to the individual CGU.

Cash flow forecasts are prepared using the following year's operating budget approved by the Directors and an appropriate projection of cash flows based upon industry expectations for up to five years. After this period, the growth rates applied to the cash flow forecasts are no more than 2% and do not exceed the long term average growth rate for the industry.

The carrying amount of non-current assets at 31 December 2006 was £449.560m (2005: £337.105m). No instances of impairment of non-current assets have been noted as a result of the impairment reviews performed in the year.

APPENDIX C
FIGURES AND TABLES

FIGURE C1
Frequency of Impairment Losses for PPE



This figure presents the frequency of impairment losses for PPE recognized by 321 EU firms over the period 2002-2007.

TABLE C1
Comparison of Impairment Rules for PPE between IFRS
and Domestic GAAP

Impairment Rules for PPE	
IFRS (IAS 36)	Domestic GAAP
Detailed procedures for when impairment occurs and for measuring the amount of impairment	No detailed procedures under most EU countries' domestic GAAP
Disclosure of the impairment testing procedures	No disclosure of the impairment testing procedures
More comparable among EU firms	Less comparable among EU firms
More informative, more transparent, and more comparable	Less informative, less transparent, and less comparable
Strict Impairment Rules	Loose Impairment Rules

This table presents a comparison of impairment rules for PPE between IFRS and domestic GAAP in the following EU countries: France, Ireland, Italy, Netherlands, Norway, Poland, Spain, Sweden, and United Kingdom.

TABLE C2
Distribution by Country & Industry and Descriptive Statistics

Panel A: Distribution by Country & Industry							
Country				Industry			
	%				%		
France	27.10%			Oil & Gas	4.05%		
Ireland	3.43%			Building Construction	3.43%		
Italy	2.18%			Heavy Construction	2.80%		
Netherlands	1.87%			Food Products	4.36%		
Norway	3.74%			Printing and Publishing	4.36%		
Poland	2.18%			Primary and Fabricated Metal Products	6.54%		
Spain	5.61%			Chemicals and Allied Products	6.54%		
Sweden	16.82%			Industrial, Commercial & Computer Equipment	7.48%		
United Kingdom	37.07%			Electronic and Other Electrical Equipment	4.05%		
	100.00%			Transportation Equipment	6.23%		
				Medical and Industrial Devices	3.74%		
				Communications	3.74%		
				Electric, Gas, and Sanitary Services	3.43%		
				Wholesale Trade	5.61%		
				Business and Computer Services	16.82%		
				Consulting and Research Services	4.67%		
				Others	12.15%		
					100.00%		

Panel B: Descriptive Statistics							
Variable	Obs	Mean	Std Dev	25th Pctl	Median	75th Pctl	
<i>CAPEX</i>	2,568	-3.3539	1.0333	-3.9294	-3.2397	-2.7011	
<i>IFRS</i>	2,568	0.5000	0.5001	0.0000	0.5000	1.0000	
<i>OVER_INV</i>	2,568	0.5034	0.2896	0.2500	0.5000	0.7500	
<i>SIZE</i>	2,568	6.4753	2.3078	4.8709	6.5003	8.1374	
<i>TANGIBILITY</i>	2,568	0.4950	0.3655	0.1879	0.4155	0.7339	
<i>CFO_SALE</i>	2,568	0.0807	0.5252	0.0428	0.0860	0.1463	
<i>MTB</i>	2,568	2.9128	5.0139	0.9800	1.2450	2.3530	
<i>OPERATING_CYCLE</i>	2,568	4.8821	0.6643	4.5400	4.9118	5.2000	
<i>DIV</i>	2,568	0.7948	0.4039	1.0000	1.0000	1.0000	
<i>LOSS</i>	2,568	0.1881	0.3909	0.0000	0.0000	0.0000	
<i>CAP_STRUCTURE</i>	2,568	0.1991	0.2126	0.0175	0.1190	0.3353	
<i>Z_SCORE</i>	2,568	5,324	12,806	222	885	3,499	
<i>CLOSELY_HELD</i>	2,568	35.8187	25.8004	13.4653	33.1816	54.8059	
<i>BIG4_5</i>	2,568	0.8131	0.3899	1.0000	1.0000	1.0000	

This table reports the distribution by country and industry and descriptive statistics for all variables. The sample includes 2,568 firm-years from 2000 to 2009 in 9 EU countries. For variable definitions, see "List of Variable Definitions" in Appendix A.

TABLE C3
Accounting Choices for PPE under UK GAAP and IFRS

Panel A: Accounting Choices by UK firms

Accounting Choice	UK GAAP			IFRS		
	Firms	Firm-years	%	Firms	Firm-years	%
Historical Cost	68	272	67%	97	388	96%
Fair Value	33	132	33%	4	16	4%
Total	101	404	100%	101	404	100%

Panel B: Switching between Accounting Choices by UK firms

UK GAAP		IFRS	Firms	Firm-years	%
Historical Cost	to	Historical Cost	67	536	66%
Fair Value	to	Historical Cost	30	240	30%
Fair Value	to	Fair Value	3	24	3%
Historical Cost	to	Fair Value	1	8	1%
Total			101	808	100%

This table presents in Panel A the accounting choices for PPE under UK GAAP and IFRS and in Panel B how UK firms switched between accounting choices upon the mandatory adoption of IFRS in 2005. The sample includes 101 UK firms (808 firm-years).

TABLE C4
Asymmetric Timeliness of Loss Recognition after IFRS
Mandatory Adoption

$$EARN^*_{it} = \alpha_0 + \alpha_1 D_{it} + \alpha_2 RET_{it} + \alpha_3 D_{it} * RET_{it} + \alpha_4 IFRS_{it} + \alpha_5 IFRS_{it} * D_{it} + \alpha_6 IFRS_{it} * RET_{it} + \alpha_7 IFRS_{it} * D_{it} * RET_{it} + u_{it} \quad (6)$$

	<u>Pred. Sign</u>	<u>Coefficient</u>	<u>t-stat</u>	<u>P-value</u>
Intercept	+/-	-0.0027	-0.24	0.8100
<i>D</i>	+/-	0.0299 **	2.57	0.0108
<i>RET</i>	+/-	-0.1286 ***	-4.45	<.0001
<i>D*RET</i>	+	0.1290 ***	4.32	<.0001
<i>IFRS</i>	+/-	0.0320 **	2.13	0.0340
<i>IFRS*D</i>	+/-	-0.0412 *	-1.89	0.0598
<i>IFRS*RET</i>	+/-	-0.0233	-0.48	0.6302
<i>IFRS*D*RET</i>	+	0.0214	0.43	0.3338

Observations 2,523

Adjusted R² 2.64%

This table presents the OLS regression estimates based on equation (6), where EARN* is the residual from regressing EARN on country and industry fixed effects. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. P-values are one-tailed when a directional prediction is made. Statistics for all variables are from firm-years between 2000 and 2009. Standard errors are clustered at the firm-level. For variable definitions, see "List of Variable Definitions" in Appendix A.

TABLE C5
Multivariate Analysis of the Effect on Over-investment
after IFRS Mandatory Adoption

$$CAPEX_{it} = \beta_0 + \beta_1 IFRS_{it} + \beta_2 OVER_INV_{it} + \beta_3 IFRS_{it} * OVER_INV_{it} + \beta_{4-14} CONTROLS_{it} + \beta_{15-25} CONTROLS_{it} * OVER_INV_{it} + \varepsilon_{it} \quad (4)$$

	<u>Pred. Sign</u>	<u>Coefficient</u>	<u>t-stat</u>	<u>P-value</u>
Intercept	+/-	-4.1853 ***	-7.76	<.0001
<i>IFRS</i>	+/-	0.0153	0.26	0.7985
<i>OVER_INV</i>	+	0.5631	0.75	0.2256
<i>IFRS*OVER_INV</i>	-	-0.3870 ***	-3.53	0.0003
<i>SIZE</i>	+	0.0556 **	1.93	0.0271
<i>TANGIBILITY</i>	+	0.8851 ***	6.33	<.0001
<i>CFO_SALE</i>	+/-	0.4997	1.52	0.1292
<i>OPERATING_CYCLE</i>	+/-	-0.1246	-1.49	0.1374
<i>DIV</i>	+/-	-0.0474	-0.42	0.6718
<i>MTB</i>	+	0.0366 ***	2.98	0.0016
<i>LOSS</i>	-	-0.2777 ***	-2.77	0.0030
<i>CAP_STRUCTURE</i>	+/-	0.0847	0.42	0.6783
<i>Z_SCORE</i>	-	0.0000 **	-1.66	0.0492
<i>CLOSELY_HELD</i>	+/-	0.0005	0.28	0.7778
<i>BIG4_5</i>	+/-	0.2338 *	1.76	0.0790
<i>SIZE*OVER_INV</i>	-	-0.0120	-0.25	0.4011
<i>TANGIBILITY*OVER_INV</i>	+	1.0107 ***	3.92	0.0001
<i>CFO_SALE*OVER_INV</i>	+/-	-0.4669	-1.09	0.2782
<i>OPERATING_CYCLE*OVER_INV</i>	+/-	-0.1123	-0.86	0.3912
<i>DIV*OVER_INV</i>	+/-	0.2545	1.29	0.1967
<i>MTB*OVER_INV</i>	+/-	-0.0251 *	-1.68	0.0942
<i>LOSS*OVER_INV</i>	+/-	-0.1524	-0.87	0.3870
<i>CAP_STRUCTURE*OVER_INV</i>	+/-	-0.6532 *	-1.76	0.0786
<i>Z_SCORE*OVER_INV</i>	+	0.0000 **	1.69	0.0458
<i>CLOSELY_HELD*OVER_INV</i>	-	0.0001	0.03	0.4873
<i>BIG4_5*OVER_INV</i>	-	-0.3430 *	-1.44	0.0759
Country Fixed Effects		Yes		
Industry Fixed Effects		Yes		
Observations		2,568		
Adjusted R ²		50.03%		

This table presents the OLS regression estimates of the effect on over-investment of PPE after IFRS mandatory adoption. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. P-values are one-tailed when a directional prediction is made. Statistics for all variables are from firm-years between 2000 and 2009 in 9 EU countries. The model includes country and industry fixed effects. Standard errors are clustered at the firm-level. For variable definitions, see "List of Variable Definitions" in Appendix A.

TABLE C6
Univariate Analysis using Difference-in-Differences of the Effect on Over-investment
between HL_HS firms and FV_HS firms

Accounting Choices (Pre_Post)	Prediction for Difference	N	Mean CAPEX Pre_IFRS	Mean CAPEX Post_IFRS	Difference (Post-Pre)	t-stat	P-value
FV_HS firms	Post < Pre	36	-3.7996	-4.5750	-0.7754 ***	-2.74	0.0042
HL_HS firms	Post < Pre	400	-3.5990	-3.9208	-0.3218 ***	-4.31	<.0001
Difference	-				-0.4536 **	-2.31	0.0164

This table presents the univariate analysis using difference-in-differences of the effect on over-investment for firms that used historical cost accounting with loose impairment rules (HL) under domestic GAAP and historical cost accounting with strict impairment rules (HS) under IFRS relative to firms that used fair-value accounting (FV) under domestic GAAP and then switched to historical cost accounting with strict impairment rules (HS) under IFRS. This table includes firms that are more likely to over-invest. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. P-values are one-tailed when a directional prediction is made.

TABLE C7
Multivariate Analysis of the Effect on Over-investment
for HL_HS firms and FV_HS firms

$$CAPEX_{it} = \beta_0 + \beta_1 IFRS_{it} + \beta_2 OVER_INV_{it} + \beta_3 IFRS_{it} * OVER_INV_{it} + \beta_4 FV_HS_{it} + \beta_5 IFRS_{it} * FV_HS_{it} + \beta_6 FV_HS_{it} * OVER_INV_{it} + \beta_7 IFRS_{it} * FV_HS_{it} * OVER_INV_{it} + \beta_{8-18} CONTROLS_{it} + \beta_{19-29} CONTROLS_{it} * OVER_INV_{it} + \varepsilon_{it} \quad (7)$$

	Pred. Sign	Coefficient	t-stat	P-value
Intercept	+/-	-4.1482 ***	-7.79	<.0001
IFRS	+/-	-0.0040	-0.06	0.9488
OVER_INV	+	0.4099	0.55	0.2923
IFRS*OVER_INV	-	-0.3332 ***	-2.98	0.0016
FV_HS	+/-	-0.4357 **	-2.39	0.0173
IFRS*FV_HS	+/-	0.2388	1.13	0.2577
FV_HS*OVER_INV	+/-	0.6233 **	2.07	0.0390
IFRS*FV_HS*OVER_INV	-	-0.6852 **	-1.81	0.0354
SIZE	+	0.0544 **	1.92	0.0281
TANGIBILITY	+	0.8782 ***	6.23	<.0001
CFO_SALE	+/-	0.5024	1.54	0.1252
OPERATING_CYCLE	+/-	-0.1301	-1.58	0.1153
DIV	+/-	-0.0282	-0.25	0.8011
MTB	+	0.0359 ***	2.91	0.0020
LOSS	-	-0.2922 ***	-2.94	0.0018
CAP_STRUCTURE	+/-	0.1229	0.61	0.5416
Z_SCORE	-	0.0000 **	-1.82	0.0350
CLOSELY_HELD	+/-	0.0001	0.08	0.9329
BIG4_5	+/-	0.2409 *	1.86	0.0632
SIZE*OVER_INV	-	-0.0077	-0.16	0.4363
TANGIBILITY*OVER_INV	+	1.0100 ***	3.89	0.0001
CFO_SALE*OVER_INV	+/-	-0.4722	-1.11	0.2699
OPERATING_CYCLE*OVER_INV	+/-	-0.0956	-0.73	0.4630
DIV*OVER_INV	+/-	0.2262	1.14	0.2550
MTB*OVER_INV	+/-	-0.0238	-1.59	0.1119
LOSS*OVER_INV	+/-	-0.1359	-0.78	0.4379
CAP_STRUCTURE*OVER_INV	+/-	-0.7003 *	-1.91	0.0565
Z_SCORE*OVER_INV	+	0.0000 **	1.74	0.0411
CLOSELY_HELD*OVER_INV	-	0.0007	0.18	0.4275
BIG4_5*OVER_INV	-	-0.3438 *	-1.45	0.0743
Country Fixed Effects			Yes	
Industry Fixed Effects			Yes	
Observations			2,568	
Adjusted R ²			50.24%	

This table presents the OLS regression estimates of the effect on over-investment for firms that used historical cost accounting with loose impairment rules (HL) under domestic GAAP and historical cost accounting with strict impairment rules (HS) under IFRS relative to firms that used fair-value accounting (FV) under domestic GAAP and then switched to historical cost accounting with strict impairment rules (HS) under IFRS. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. P-values are one-tailed when a directional prediction is made. Statistics for all variables are from firm-years between 2000 and 2009. The model includes country and industry fixed effects. Standard errors are clustered at the firm-level. For variable definitions, see "List of Variable Definitions" in Appendix A.

TABLE C8
Multivariate Analysis of the Effect on Over-investment among UK firms

$$CAPEX_{it} = \beta_0 + \beta_1 IFRS_{it} + \beta_2 OVER_INV_{it} + \beta_3 IFRS_{it} * OVER_INV_{it} + \beta_4 FV_HS_{it} + \beta_5 IFRS_{it} * FV_HS_{it} + \beta_6 FV_HS_{it} * OVER_INV_{it} + \beta_7 IFRS_{it} * FV_HS_{it} * OVER_INV_{it} + \beta_{8-18} CONTROLS_{it} + \beta_{19-29} CONTROLS_{it} * OVER_INV_{it} + \varepsilon_{it} \quad (7)$$

	<u>Pred. Sign</u>	<u>Coefficient</u>	<u>t-stat</u>	<u>P-value</u>
Intercept	+/-	-6.2475 ***	-7.32	<.0001
<i>IFRS</i>	+/-	-0.1260	-1.01	0.3142
<i>OVER_INV</i>	+	4.3423 ***	3.63	0.0003
<i>IFRS*OVER_INV</i>	-	-0.1741	-0.89	0.1878
<i>FV_HS</i>	+/-	-0.4303 *	-1.90	0.0603
<i>IFRS*FV_HS</i>	+/-	0.3250	1.24	0.2188
<i>FV_HS*OVER_INV</i>	+/-	0.7014 *	1.70	0.0918
<i>IFRS*FV_HS*OVER_INV</i>	-	-0.8284 **	-1.86	0.0328
<i>SIZE</i>	+	0.0874 *	1.54	0.0631
<i>TANGIBILITY</i>	+	1.2024 ***	5.04	<.0001
<i>CFO_SALE</i>	+/-	0.2015	0.27	0.7867
<i>OPERATING_CYCLE</i>	+/-	0.2612	1.53	0.1283
<i>DIV</i>	+/-	0.0547	0.22	0.8284
<i>MTB</i>	+	0.2090 *	1.48	0.0710
<i>LOSS</i>	-	-0.1803	-0.86	0.1954
<i>CAP_STRUCTURE</i>	+/-	0.2972	0.76	0.4462
<i>Z_SCORE</i>	-	0.0000	-0.47	0.3194
<i>CLOSELY_HELD</i>	+/-	-0.0027	-0.47	0.6385
<i>BIG4_5</i>	+/-	0.1141	0.28	0.7815
<i>SIZE*OVER_INV</i>	-	-0.1255	-1.23	0.1101
<i>TANGIBILITY*OVER_INV</i>	+	0.5451	1.22	0.1121
<i>CFO_SALE*OVER_INV</i>	+/-	1.0274	0.85	0.3950
<i>OPERATING_CYCLE*OVER_INV</i>	+/-	-0.8308 ***	-3.76	0.0003
<i>DIV*OVER_INV</i>	+/-	0.3425	0.83	0.4084
<i>MTB*OVER_INV</i>	+/-	-0.0618	-0.41	0.6801
<i>LOSS*OVER_INV</i>	+/-	-0.3539	-1.07	0.2878
<i>CAP_STRUCTURE*OVER_INV</i>	+/-	-0.7743	-1.25	0.2154
<i>Z_SCORE*OVER_INV</i>	+	0.0000	1.14	0.1290
<i>CLOSELY_HELD*OVER_INV</i>	-	0.0038	0.45	0.3273
<i>BIG4_5*OVER_INV</i>	-	0.0744	0.13	0.4500
Industry Fixed Effects			Yes	
Observations			776	
Adjusted R ²			60.27%	

This table presents the OLS regression estimates of the effect on over-investment for UK firms that used historical cost accounting with loose impairment rules (HL) under UK GAAP and historical cost accounting with strict impairment rules (HS) under IFRS relative to UK firms that used fair-value accounting (FV) under UK GAAP and then switched to historical cost accounting with strict impairment rules (HS) under IFRS. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. P-values are one-tailed when a directional prediction is made. Statistics for all variables are from firm-years between 2000 and 2009. The model includes industry fixed effects. Standard errors are clustered at the firm-level. For variable definitions, see "List of Variable Definitions" in Appendix A.

TABLE C9
Multivariate Analysis of the Effect on Over-investment based on
Managerial Ownership

$$\begin{aligned}
 CAPEX_{it} = & \beta_0 + \beta_1 IFRS_{it} + \beta_2 OVER_INV_{it} + \beta_3 IFRS_{it} * OVER_INV_{it} + \beta_4 HIGH_{it} + \beta_5 LOW_{it} \\
 & + \beta_6 IFRS_{it} * HIGH_{it} + \beta_7 IFRS_{it} * LOW_{it} + \beta_8 HIGH_{it} * OVER_INV_{it} + \beta_9 LOW_{it} * OVER_INV_{it} \\
 & + \beta_{10} IFRS_{it} * HIGH_{it} * OVER_INV_{it} + \beta_{11} IFRS_{it} * LOW_{it} * OVER_INV_{it} + \beta_{12-21} CONTROLS_{it} \\
 & + \beta_{22-31} CONTROLS_{it} * OVER_INV_{it} + \varepsilon_{it}
 \end{aligned} \tag{8}$$

	<u>Pred. Sign</u>	<u>Coefficient</u>	<u>t-stat</u>	<u>P-value</u>
Intercept	+/-	-4.2221 ***	-8.13	<.0001
<i>IFRS</i>	+/-	-0.0756	-0.88	0.3778
<i>OVER_INV</i>	+	0.5931	0.82	0.2069
<i>IFRS*OVER_INV</i>	-	-0.2215 *	-1.43	0.0768
<i>HIGH</i>	+/-	0.0308	0.25	0.8062
<i>LOW</i>	+/-	-0.0325	-0.27	0.7867
<i>IFRS*HIGH</i>	+/-	0.1194	0.85	0.3957
<i>IFRS*LOW</i>	+/-	0.2276	1.55	0.1228
<i>HIGH*OVER_INV</i>	-	-0.0889	-0.40	0.3445
<i>LOW*OVER_INV</i>	+	-0.0248	-0.12	0.4520
<i>IFRS*HIGH*OVER_INV</i>	-	-0.0774	-0.28	0.3905
<i>IFRS*LOW*OVER_INV</i>	-	-0.5671 **	-2.04	0.0213
<i>SIZE</i>	+	0.0547 **	1.91	0.0283
<i>TANGIBILITY</i>	+	0.8894 ***	6.29	<.0001
<i>CFO_SALE</i>	+/-	0.5029	1.54	0.1247
<i>OPERATING_CYCLE</i>	+/-	-0.1129	-1.34	0.1802
<i>DIV</i>	+/-	-0.0529	-0.47	0.6391
<i>MTB</i>	+	0.0382 ***	3.10	0.0011
<i>LOSS</i>	-	-0.2837 ***	-2.79	0.0028
<i>CAP_STRUCTURE</i>	+/-	0.0724	0.36	0.7224
<i>Z_SCORE</i>	-	0.0000 *	-1.60	0.0556
<i>BIG4_5</i>	+/-	0.2391 *	1.82	0.0695
<i>SIZE*OVER_INV</i>	-	-0.0006	-0.01	0.4951
<i>TANGIBILITY*OVER_INV</i>	+	0.9984 ***	3.84	0.0001
<i>CFO_SALE*OVER_INV</i>	+/-	-0.4747	-1.11	0.2690
<i>OPERATING_CYCLE*OVER_INV</i>	+/-	-0.1241	-0.96	0.3386
<i>DIV*OVER_INV</i>	+/-	0.2603	1.32	0.1893
<i>MTB*OVER_INV</i>	+/-	-0.0278 *	-1.83	0.0687
<i>LOSS*OVER_INV</i>	+/-	-0.1287	-0.72	0.4690
<i>CAP_STRUCTURE*OVER_INV</i>	+/-	-0.6750 *	-1.82	0.0695
<i>Z_SCORE*OVER_INV</i>	+	0.0000 **	1.68	0.0470
<i>BIG4_5*OVER_INV</i>	-	-0.3443 *	-1.46	0.0731
Country Fixed Effects			Yes	
Industry Fixed Effects			Yes	
Observations			2,568	
Adjusted R ²			50.25%	
Test: $\beta_{10} = \beta_{11}$			F = 2.62 (p = 0.0728)	

This table presents the OLS regression estimates of the effect on over-investment after IFRS mandatory adoption based on managerial ownership. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. P-values are one-tailed when a directional prediction is made. Statistics for all variables are from firm-years between 2000 and 2009. The model includes country and industry fixed effects. Standard errors are clustered at the firm-level. For variable definitions, see "List of Variable Definitions" in Appendix A.

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