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Empirical Studies in Financial Accounting

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Preface

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Contents

Chapter 1

Capital market effects of mandatory IFRS adoption on banks*

1.1 Introduction

Since 2005, listed companies in more than 100 countries mandatorily prepare their financial statements under International Financial Reporting Standards (IFRS). The economic consequences of the new accounting standards have been the center of attention of both practitioners and academics in recent years. Most of the empirical research focuses on the effects of the adoption of IFRS at an economy-wide level (e.g., Daske [2006]; Daske et al. [2008]; Hail and Leuz [2007]; Li [2010]). However, there is little evidence on the impact of IFRS on firms in the banking sector (e.g., Armstrong et al. [2010]; Gebhardt and Novotny-Farkas [2010]). We add to this stream of literature by examining the impact of IFRS adoption on the cost of equity and liquidity of banks.

The banking sector is of particular interest for three reasons. First, as a result of the adoption of IFRS, banks have significantly increased the reporting of assets and liabilities at fair value (e.g., PricewaterhouseCoopers [2006]). Yet, the merits of the transition from historical cost to fair value accounting are far from obvious. Advocates of fair value argue that it increases the value relevance of accounting numbers (e.g., Barth et al. [1996]). But other

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researchers, such as Bleck and Gao [2011], claim that fair value increases the riskiness of banks. Second, the changes in financial reporting caused by the adoption of IFRS—such as the classification of financial instruments and the restriction of items that firms are allowed to keep off balance sheet—are more pronounced for financial compared to nonfinancial firms. Third, banks have been the strongest opponents to the adoption of IFRS. A prime example of this opposition is the letter that the French president Jacques Chirac wrote to the European Commission in 2003 to express his concerns and the concerns of the French banks' managers about the potential adverse effects of IFRS adoption.

The main changes in banks' financial reporting caused by the adoption of IFRS are: increased disclosure requirements, increased comparability of financial statements, and increased use of fair value accounting. Regarding disclosure requirements, International Accounting Standards (IAS) 32 mandates that banks provide extensive information on their risk management policies and objectives as well as information on their exposure to a number of risks such as credit and liquidity risk.[1] The adoption of IFRS has also increased the comparability of banks' financial statements. For example, the adoption of IAS 39 has standardized the classification and measurement of financial assets and hedging instruments of adopting banks across different countries. In addition, banks have significantly increased the reporting of assets and liabilities at fair value after the adoption of IFRS. For example, the ratio of investment securities measured at fair value to total investment securities for the banks in our sample increased from 46% in 2004 under domestic accounting standards to 92% in 2005 under IFRS. The same pattern is observed in the case of financial liabilities.

There are two main reasons driving this increase in the use of fair value accounting. The first is the restrictive nature of the held-to-maturity category of financial assets. More specifically, if a bank sells or reclassifies before maturity a significant amount of financial assets that is originally classified as held-to-maturity, then this bank cannot classify any financial assets as held-to-maturity for the following two years (IAS 39.46.b). To avoid potential penalties that arise from reclassifications, banks classify a larger portion of investment securities as available-for-sale and measure them at fair value, instead of classifying them as held-to-maturity and measuring them at historical cost (PricewaterhouseCoopers [2006]). Second, banks measure a larger portion of financial assets at fair value to mitigate the accounting mismatches that stem from recognition and measurement inconsistencies (PricewaterhouseCoopers [2006]). Accounting mismatches arise when banks measure assets and liabilities on different basis.

[1] IAS is a set of standards that comprise IFRS. IAS was issued before 2001 and was significantly revised as part of the mandatory adoption of IFRS in 2005. Whenever we refer to IAS, we mean the revised versions of the standards.

Academic studies suggest that increased disclosure requirements and increased comparability of financial statements increase a firm's liquidity and decrease its cost of equity (e.g., Diamond and Verrecchia [1991]; Barth et al. [1999]). However, other studies argue that fair value accounting increases banks' earnings volatility, makes banks more procyclical, and accentuates their risk-taking behavior, which can result in increased cost of equity (e.g., Plantin et al. [2008]). Hence, the impact of IFRS adoption on the cost of equity and liquidity of banks is an empirical question. We shed light in this area by first examining the effect of mandatory IFRS adoption on the cost of equity and liquidity of European banks. Then, we test the theoretical predictions that fair value accounting can have adverse effects on banks' cost of equity. Further, we examine whether there is any cross-sectional variation in the capital market effects of IFRS adoption.

We focus on European banks for two reasons. First, European countries adopted the same amended version of IAS 39 in 2005.[2] Since the adoption of IAS 39 had a considerable impact on banks' financial statements (Ernst & Young [2006]), we focus on European banks to ensure homogeneity of the adopted standards. Second, the enforcement of rules and regulations in Europe is relatively high. We expect that this stricter legal and regulatory environment will result in proper enforcement of the new accounting standards and will increase the robustness of our results (e.g., Bhattacharya and Daouk [2002]). In addition, we limit our analysis to mandatory IFRS adopters, to circumvent possible endogeneity issues related to the voluntary adoption of IFRS.

We measure the cost of equity averaging over the estimates of four different implied cost-of-equity models (Hail and Leuz [2006]). As our proxy for liquidity we use the Amihud [2002] illiquidity measure and as robustness test we use bid-ask spread and zero returns. To examine the impact of mandatory IFRS adoption on the cost of equity of European banks, we use a panel of 1,997 bank-year observations of banks from 37 countries for the period 2002–2007; 422 bank-year observations from 18 European countries (treatment sample) and 1,575 bank-year observations from 19 non-European countries (control sample). For liquidity, we use a panel of 4,562 bank-year observations of banks from 49 countries for the period 2002–2007; 1,142 bank-year observations from 20 European countries (treatment sample) and 3,420 bank-year observations from 29 other non-European countries (control sample).

Our multivariate analysis shows a statistically and economically significant decrease in cost of equity by ninety basis points for European banks that mandatorily report under IFRS. Regarding liquidity, the results of our analysis are sensitive to the proxy used. Contrary to the predictions of recent theoretical studies, we find no evidence

[2]The following two carve-outs were imposed to the adoption of IAS 39 by European banks: the removal of the fair value option for liabilities that are not required to be measured at fair value and the permission of fair value hedge accounting for the interest-rate hedges of core deposits.

of lower capital market benefits for banks with higher exposure to fair value accounting. Quite the opposite, the decrease in cost of equity is only present in the subsample of banks with a large increase in the exposure to fair value accounting after the adoption of IFRS. These results are consistent with fair value accounting providing value relevant information to investors. In addition, banks with low pre-adoption information quality experience significantly larger improvements in their cost of equity compared to banks with high pre-adoption information quality.

Our study adds to the literature in a number of ways. First, we examine the effect of IFRS adoption on banks. Doing so is particularly interesting due to the controversial impact of fair value accounting on the cost of equity of banks. Our findings do not support the idea that fair value accounting is suboptimal for this particular industrial sector. On the contrary, our findings provide support to the theory that fair value accounting can increase the value relevance of accounting numbers and can enhance transparency. Second, we show that the adoption of IFRS has mostly benefitted the banks operating in countries with low pre-adoption quality of information environment. These findings are in line with the idea that the new accounting standards contribute to the homogenization of information quality across different countries and they level the playing field for investors. Third, in the case of accounting standards ”one size does not fit all”. The majority of prior research examines the impact of IFRS adoption on the economy as a whole. Banks are highly regulated institutions that serve a unique economic role. Hence, the impact of IFRS on banks can differ significantly from the impact of IFRS on other industrial sectors. We believe that our industry focus will reduce the noise in the estimates and will produce more robust results. Fourth, our study provides a novel attempt to test the theoretical predictions of the papers on the economic role of fair value accounting and to disentangle the effects of increased use of fair value accounting from increased disclosure requirements and increased comparability of financial statements.

The chapter proceeds as follows. In section 1.2, we discuss relevant academic papers. In section 1.3, we describe our research design. In section 1.4, we describe the sample and present descriptive statistics. In sections 1.5 and 1.6, we report the results of the main and additional analysis, respectively. In section 1.7, we report the results of the robustness tests and section 1.8 concludes.

1.2 Related Literature

Theoretical studies suggest that corporate disclosure can affect the cost of equity in both an indirect and a direct way. According to the first stream of literature, the effect of disclosure on cost of equity flows through liquidity.

More specifically, corporate disclosure reduces information asymmetry between a firm and its investors and mitigates adverse selection problems. This reduction in information asymmetry increases liquidity, which ultimately results in lower cost of equity (e.g., Diamond and Verrecchia [1991]). The second stream of literature suggests a direct relation between corporate disclosure and cost of equity. For example, Merton [1987] shows that corporate disclosure introduces less known firms to investors and increases the diversification benefits, hence lowering the cost of equity.

Higher comparability of financial statements can also lead to capital market improvements. On the one hand, higher comparability lowers the information acquisition costs that investors have to bear (Barth et al. [1999]). On the other hand, it induces positive externalities; investors can use information acquired from the financial statements of a firm in one country to compare and value firms in other countries (Dye [1990]).

Academic research identifies increased disclosure requirements and increased comparability of financial statements as the main changes caused by the adoption of IFRS (e.g., Li [2010]) and pays less attention to the role of increased use of fair value accounting. A number of recent analytical papers provide interesting predictions regarding the effect of the transition from historical cost to fair value accounting, particularly for banks. Plantin et al. [2008] and Allen and Carletti [2008] compare historical cost with fair value accounting in the presence of an exogenous liquidity shock. Plantin et al. [2008] show that when liquidity dries up, asset prices are smoother under historical cost than under mark-to-market accounting. The excessive volatility under mark-to-market makes prices less informative and increases the risk, which investors have to bear. Allen and Carletti [2008] suggest that the transition of a liquidity shock from the insurance to the banking sector is more likely under fair value than under historical cost accounting. This higher probability of contagion leads to excessive liquidations and increases the firm's risk.

Freixas and Tsomocos [2006] show that historical cost is more efficient than fair value accounting, because under fair value reported earnings and consequently dividend distribution is more volatile. Glavan and Trombetta [2009] reach to similar conclusions by showing that consumption smoothing is ex-ante more efficient under historical cost accounting because historical cost accounting provides protection to banks in bad times.

Theory also suggests that fair value accounting increases the risk-taking behavior of banks. Burkhardt and Strausz [2006] argue that fair value accounting reduces the information asymmetry between banks and the market. This decrease in information asymmetry increases asset liquidity and amplifies banks' investment opportunities. Consequently, banks increase their risk-taking activities, which ultimately raises the probability of default. Bleck and Gao [2011] also investigate the real effects of mark-to-market on banks' activities. They show that mark-to-

market increases the retention of loans that the banks originate and at the same time it reduces banks' incentives to originate loans of good quality.

Fewer theoretical papers suggest that fair value is preferable over historical cost accounting. For example, Bleck and Liu [2007] show that fair value provides investors with an early warning signal, thus reducing the occurrence of asset price crashes. Overall, the majority of the theoretical papers on the effects of increased use of fair value accounting for banks suggest an increase in the risk that investors have to bear. Under the assumption that this risk is systematic, we expect that it will ultimately translate to higher cost of equity.[3]

If we take into account the increased disclosure requirements and increased comparability of financial statements as a result of the adoption of IFRS, we expect a decrease in the cost of equity and an increase in liquidity of adopting firms. The opposite prediction can be derived from the majority of the theoretical papers that model the transition from historical cost to fair value accounting for banks. These opposite effects make an empirical study into the capital market consequences of mandatory IFRS adoption on banks a relevant topic for research.

1.3 Research Design

To examine the effect of mandatory IFRS adoption on the cost of equity of banks, we regress the cost-of-equity proxy (r_{avg}) on a dummy variable ($IFRS_{ravg}$) that takes the value of one if the company mandatorily reports under IFRS, and zero otherwise. We also regress this proxy on a set of control variables. To study the impact of IFRS on liquidity, we regress the liquidity proxy ($liquidity_{Amihud}$) in the same way. Hence, we run pooled regressions at bank-year level on the cost-of-equity model 1.1:

$$r_{avg} = \gamma_0 + \gamma_1 \times IFRS_{ravg} + \sum_{k=2}^{K} \gamma_k \times Control_k + Year/CountryDummies + v \tag{1.1}$$

And we run pooled regressions at bank-year level on the liquidity model 1.2:

$$liquidity_{Amihud} = \delta_0 + \delta_1 \times IFRS_{liquidity} + \sum_{n=2}^{N} \delta_n \times Control_n + Year/CountryDummies + \eta \tag{1.2}$$

To produce unbiased coefficient estimates, we must control for time-series variability in the dependents that is

[3] It is well established that increased procyclicality and increased risk-taking increases firms' systematic risk. What is less clear is the relation between earnings volatility and systematic risk.

unrelated to the adoption of IFRS. To this end, we use a control sample of banks that do not report under IFRS. The choice of a control sample is far from obvious since all European listed firms are required to report under IFRS in the post-2005 period. Voluntary IFRS adopters could be a valid control sample. However, there are only few observations of voluntary adopters, which reduces significantly the power of our tests. So, we use all observations of non-European banks that do not report under IFRS as a control sample. In addition, we include year dummies.

We use four different implied cost-of-equity estimates suggested by Claus and Thomas [2001], Gebhardt et al. [2001], Gode and Mohanram [2003], and Easton [2004] to measure expected returns. We use implied cost-of-equity estimates instead of realized returns because realized returns have been shown to be a poor proxy for expected returns (e.g., Elton [1999]). Appendix A describes the calculation of the implied cost-of-equity estimates in detail. Following Hail and Leuz [2006], we average over the four estimates. To ensure that previous year's financial statements are publicly available and to reduce the error in forecasted earnings, we take earnings forecasts as of October of each year. To make prices synchronous to financial statement data, we discount the prices as of October to the beginning of the year using the cost-of-equity estimate, that is we use $(1 + r_{avg})^{-\frac{10}{12}}$ as a discount factor.

To calculate the cost of equity, we require positive mean forecasted earnings per share for years 1 and 2. To calculate the medium-term growth in earnings we need either the long-term growth estimate provided by IBES or the mean forecasted earnings per share for year 3. We also require that medium-term growth in earnings be positive and that price data be available on IBES. As a perpetual growth estimate, we use the country-specific risk-free rate minus 3% (Gode and Mohanram [2003]). We replace negative values of the perpetual growth rate with the average historical country-specific risk-free rate minus 3%. For the dividend payout we use the three-year average dividend payout provided by Worldscope and assume that firms will retain it in the future. Whenever dividend payout data are unavailable, we use the average country-specific value.

As liquidity proxy, we use the illiquidity measure suggested by Amihud [2002]. So, we measure liquidity as the yearly median of the daily ratio of absolute stock returns to trading volume measured in U.S. dollars. We measure trading volume in U.S. dollars to ensure the comparability of the illiquidity measure across countries with different currencies. To facilitate reporting, we multiply the liquidity proxy by 10^6. The main advantage of the Amihud [2002] illiquidity measure is that it can be easily obtained from daily stock market data. Moreover, as Goyenko et al. [2009] show, Amihud's illiquidity proxy does a good job in measuring price impact. As robustness test, we use bid-ask spread and zero returns as proxies for liquidity.

The set of control variables for the cost-of-equity model includes: *Beta*, which we calculate as the covariance of firms' returns to a country-specific broad market index divided by the variance of that index using monthly observations over the last five years; *Total Assets*, which we measure as the book value of total assets in U.S. dollars at year end; *Book to Market*, calculated as the book-to-market value of shareholders' equity at year end; and *Financial Leverage*, calculated as the ratio of total liabilities to total assets at year end. We also include *Beta Volatility*, which we calculate as the standard deviation of daily betas over the past five years (Hughes et al. [2009]). Daily betas are calculated using daily observations over the past year. In addition, we control for *Forecast Bias*, which we calculate as the one-year-ahead IBES analyst forecast error scaled by book value per share. Although analysts' forecast error is not a priced risk factor, failing to control for it might lead to false inferences. For example, an increase in analysts' optimism as a result of the adoption of IFRS will increase the cost-of-equity estimates and will bias the coefficient of the $IFRS_{ravg}$ dummy upwards. Further, to control for the fact that analyst forecasts are expressed in nominal terms, we include *Expected Inflation*, which we calculate as the median annualized one-year-ahead change in the country-specific Consumer Price Index (CPI) (Hail and Leuz [2006]).

The set of control variables in the liquidity model comprises *Return Volatility*, which we calculate as the standard deviation of monthly returns over the last year; *Market Value of Equity*, which we measure as the market value of shareholders' equity in U.S. dollars at year end; and *Share Turnover*, which we calculate as the annual trading volume divided by the market value of equity. All variables are truncated at the 1 and 99% level.

As additional analysis, we examine whether there is any cross-sectional variation in the effect of IFRS adoption on banks' cost of equity. In particular, we test whether the impact of IFRS depends on the banks' exposure to fair value accounting, on the difference between domestic accounting standards and IFRS, on the pre-adoption quality of the information environment of banks, and on the pre-adoption information asymmetry between banks and investors and between investors. To that end, we split the cost-of-equity sample in banks with above-median and banks with below-median values of the variables of interest (e.g., pre-adoption information asymmetry), we run subsample regressions on model 1.1, and we compare the resulting coefficients of the $IFRS_{ravg}$ dummy.

As a proxy for the increase in the exposure of banks to fair value accounting (ΔFV), we use the ratio of financial assets measured at fair value to total assets in the restated 2004 financial statements prepared under IFRS minus the ratio of financial assets measured at fair value to total assets in the 2004 financial statements prepared under domestic accounting standards.[4] To construct the variable ΔFV we collect data from the banks' annual reports.

[4]Banks that adopt IFRS in 2005 must restate the 2004 financial statements from domestic accounting standards to IFRS in the 2005 annual reports. So, the 2004 financial statements for every bank are reported under

We use the *Absence* and *Divergence* measures suggested by Ding et al. [2007] as proxies for the difference between domestic accounting standards and IFRS. *Absence* is a proxy for the extent to which accounting rules regarding specific topics are covered in IAS but are not covered in domestic accounting standards. *Divergence* is a proxy for the extent to which accounting rules regarding certain topics differ between IAS and domestic accounting standards.

We measure information quality (*InfoQuality*) as the first principal component derived from the variables *ADR*, *Standards*, *Exchanges*, and *Market Value of Equity* (Armstrong et al. [2010]). *ADR* is a dummy that takes the value of one if the bank participates in an American Depository Receipt program, and zero otherwise. *Standards* is a dummy variable that takes the value of one if the bank reports under U.S. standards or IAS before 2005, and zero otherwise. *Exchanges* measures the number of exchanges on which a bank is listed and *Market Value of Equity* is the market value of shareholders' equity in U.S. dollars at year end.

We use as a proxy for information asymmetry (*InfoAsymmetry*) the first principal component derived from the variables *Turnover*, *CloselyHeld*, and *BankConcentration* (Armstrong et al. [2010]). *Turnover* is the annual average of the daily ratio of trading volume to shares outstanding. *CloselyHeld* measures the percentage of shares held by insiders. *BankConcentration* is the country-specific ratio of the total assets of the three largest banks to the assets of all commercial banks (Beck et al. [2010]). To construct the variables *InfoQuality* and *InfoAsymmetry* for the period 2005–2007, we use the values of the variables *ADR*, *Standards*, *Exchanges*, *Market Value of Equity*, *Turnover*, *CloselyHeld*, and *BankConcentration* as of the end of 2004, because we are interested in the pre-adoption information quality and pre-adoption information asymmetry of banks.

Since we are dealing with panel data, we are concerned that our models might suffer from time-invariant omitted variables bias, which will result in inconsistent Ordinary Least Squares (OLS) estimates. For the cost-of-equity model, we have few annual observations per bank, so the Fixed Effects (FE) estimation technique is not appropriate. Hence, we use OLS for the estimation of the parameters of the cost-of-equity model and FE for the estimation of the parameters of the liquidity model. We also test the appropriateness of the Random Effects (RE) estimation technique for the liquidity model. However, the Hausman [1978] specification test rejects the null that the RE produces consistent estimates. We use standard errors that are robust to heteroscedasticity and are clustered by bank.

domestic accounting standards in the 2004 annual reports and under IFRS in the 2005 annual reports.

1.4 Sample Selection and Descriptive Statistics

1.4.1 Sample Selection

Our treatment sample consists of banks (SIC codes 6000–6199) domiciled in countries that belong either to the European Union (E.U.) or to the European Economic Area (E.E.A.). The control sample consists of banks (SIC codes 6000–6199) that report under domestic accounting standards and are domiciled in any country other than the countries of the E.U. and the E.E.A.. Our sample comprises the same number of years before and after the mandatory adoption of IFRS in 2005. Hence, the cost-of-equity sample consists of annual data from 2002–2007 for banks whose earnings forecast data are available on IBES. The liquidity sample consists of annual data from 2002–2007 for banks whose market data are available on Datastream. We obtain earnings forecast data from IBES. We get financial statement data from Worldscope and from the banks' annual reports, which we download from Thomson Research. We obtain market data from Datastream.

1.4.2 Descriptive Statistics

Table 1.1, panel A presents the composition of the cost-of-equity sample by country. Panel B shows the composition of the liquidity sample. The cost-of-equity treatment sample consists of 422 bank-year observations representing 128 distinct banks from 18 European countries. The control sample consists of 1,575 bank-year observations representing 477 distinct banks from 19 countries. Almost half of the observations of the treatment sample concern French, Italian, and British banks. The European liquidity sample consists of 1,142 bank-year observations representing 283 distinct banks from 20 European countries. The liquidity control sample consists of 3,420 bank-year observations representing 785 distinct banks from 29 countries. Half of the bank-year observations of the treatment sample belong to French, Italian, and British banks. The cost-of-equity sample is less than half of the liquidity sample because the coverage in IBES is limited compared to the coverage in Datastream.

Table 1.1
Sample Composition

Panel A: Composition of cost-of-equity sample by country

Treatment sample			Control sample		
Country	Bank-year	Bank	Country	Bank-year	Bank
Austria	1	1	Argentina	2	1
Belgium	8	2	Australia	15	4

(Continued)

Table 1.1 – *Continued*

Treatment sample			Control sample		
Country	Bank-year	Bank	Country	Bank-year	Bank
Czech Republic	5	1	Canada	41	7
Denmark	28	10	Egypt	2	1
Finland	6	2	Hong Kong	15	5
France	35	10	India	34	14
Germany	10	4	Indonesia	26	10
Greece	34	8	Israel	6	2
Hungary	2	1	Japan	22	9
Ireland	13	3	Malaysia	17	5
Italy	76	27	Philippines	16	5
Norway	19	7	Singapore	8	2
Poland	28	8	South Africa	14	4
Portugal	20	4	South Korea	20	6
Spain	17	4	Switzerland	24	8
Sweden	13	4	Taiwan	12	6
The Netherlands	15	6	Thailand	19	7
U.K.	92	26	Turkey	2	2
Total	422	128	U.S.A.	1,280	379
			Total	1,575	477

Panel B: Composition of liquidity sample by country

Treatment sample			Control sample		
Country	Bank-year	Bank	Country	Bank-year	Bank
Austria	7	4	Argentina	27	7
Belgium	24	6	Australia	1	1
Czech Republic	6	1	Brazil	56	12
Denmark	66	14	Canada	134	34
Finland	7	2	Chile	37	7
France	171	42	Colombia	18	4
Germany	47	16	Egypt	28	9
Greece	85	17	Hong Kong	62	12
Hungary	2	1	India	159	41
Ireland	49	9	Indonesia	41	12
Italy	229	53	Israel	49	10
Lithuania	2	1	Japan	464	92
Luxembourg	4	1	Jordan	3	2
Norway	35	10	Malaysia	81	16
Poland	56	12	Mexico	13	3
Portugal	25	5	Morocco	13	5
Spain	61	14	New Zealand	3	1
Sweden	20	10	Pakistan	44	16
The Netherlands	79	17	Peru	2	1
U.K.	167	48	Qatar	4	2
Total	1,142	283	Singapore	22	5
			South Korea	84	22
			Sri Lanka	20	7
			Switzerland	66	17
			Taiwan	131	29
			Thailand	100	20
			Turkey	31	9

(Continued)

Table 1.1 – *Continued*

Treatment sample			Control sample		
Country	Bank-year	Bank	Country	Bank-year	Bank
			U.S.A.	1,722	387
			Venezuela	5	2
			Total	3,420	785

Panel A and panel B of this table present the composition of the cost-of-equity and liquidity sample by country, respectively.

Table 1.2, panel A presents descriptive statistics for the dependent variables of models 1.1 and 1.2 and for the four separate implied cost-of-equity estimates that comprise the cost-of-equity proxy. The average cost-of-equity estimate is 10.86% and the median is 9.98%. Despite the fact that we truncate the liquidity proxy at the 1% level, its mean value is very different from its median (i.e., 83.61 versus 16.62). This difference is similar to previous studies (Hail and Leuz [2007]). Since the distribution of the liquidity proxy departs greatly from normality, we use its logarithmic transformation in subsequent analyses.

Table 1.2, panel B presents descriptive statistics for the models 1.1 and 1.2 independent variables. Many independent variables are skewed, so we use their logarithmic transformation in the regression analysis. In particular, we use the logarithmic transformation of all the ratio independent variables that are strictly positive (i.e., all variables except for *Beta*, *Forecast Bias*, and *Expected Inflation*). For the cost-of-equity sample, only 10% of the bank-year observations are banks that report under IFRS. For the liquidity sample, only 12% of the bank-year observations regard banks that report under IFRS. Both the cost-of-equity and the liquidity samples are weighted towards larger firms.[5] As a result, we expect that the capital market proxies will be measured with greater precision. For example, analysts' forecast error is smaller for larger firms (Bhushan [1989]), so the cost-of-equity proxy will be more accurate. This sample bias also works against us, if we assume that the largest changes in the information environment as a result of IFRS are mainly present in smaller banks.

Table 1.3, panel A presents correlation coefficients for the cost-of-equity sample with Spearman (Pearson) correlation coefficients reported below (above) the diagonal. Table 1.3, panel B presents the correlation coefficients for the liquidity sample. The absolute values of all correlation coefficients between the independent variables are below 0.6. These low correlations suggest that multicollinearity is not an issue for our models.

[5]The mean of *Total Assets* (*Market Value of Equity*) for our cost-of-equity (liquidity) sample is 55,462 (6,277) but the mean of *Total Assets* (*Market Value of Equity*) for the banks that comprise the Worldscope universe is 37,589 (4,491).

Table 1.2

Descriptive Statistics

Panel A: Descriptive statistics for dependent variables of models 1.1 and 1.2						
Variable	Mean	Median	Std. Dev.	Skewness	Kurtosis	N
r_{avg}	10.86%	9.98%	0.03	1.51	5.67	1,997
r_{ct}	10.62%	9.20%	0.05	3.39	16.58	1,997
r_e	11.80%	10.83%	0.04	1.69	8.20	1,997
r_{gm}	11.80%	10.93%	0.04	1.71	7.74	1,997
r_{gls}	9.22%	8.68%	0.03	1.17	5.59	1,997
$liquidity_{Amihud}$	83.61	16.62	190.89	5.39	44.89	4,562
Panel B: Descriptive statistics for independent variables of models 1.1 and 1.2						
Variable	Mean	Median	Std. Dev.	Skewness	Kurtosis	N
$IFRS_{ravg}$	0.10	0.00	0.30	2.62	7.86	1,997
Beta	0.64	0.57	0.42	0.59	2.82	1,997
Total Assets	55,462.48	6,572.16	145,336.80	4.45	25.16	1,997
Book to Market	0.60	0.55	0.27	1.64	7.28	1,997
Financial Leverage	0.86	0.91	0.15	−2.67	10.03	1,997
Beta Volatility	0.24	0.20	0.13	1.13	3.93	1,997
Forecast Bias	0.81	0.00	4.15	5.59	35.17	1,997
Expected Inflation	3.04%	2.96%	0.01	1.18	6.59	1,997
$IFRS_{liquidity}$	0.12	0.00	0.32	2.41	6.80	4,562
Return Volatility	0.02	0.02	0.01	0.91	4.21	4,562
Market Value of Equity	6,276.99	821.00	15,328.64	4.05	21.96	4,562
Share Turnover	0.96	0.48	1.85	6.73	62.37	4,562

Panel A and panel B of this table present descriptive statistics for the model 1.1 and model 1.2 dependent and independent variables, respectively. All variables are as defined in Appendix B.

Table 1.3

Spearman and Pearson Pairwise Correlation Coefficients

Panel A: Spearman and Pearson pairwise correlation coefficients between variables of model 1.1

	r_{avg}	$IFRS_{ravg}$	*Beta*	*Total Assets*	*Book to Market*	*Financial Leverage*	*Beta Volatility*	*Forecast Bias*	*Expected Inflation*
r_{avg}		−0.005	0.291***	0.032	0.326***	−0.104***	−0.013	0.119***	0.179***
$IFRS_{ravg}$	0.047**		0.202***	0.207***	−0.104***	0.118***	−0.124***	0.222***	−0.004
Beta	0.304***	0.196***		0.327***	0.055**	−0.084***	0.079***	0.160***	0.089***
Total Assets	0.138***	0.265***	0.412***		0.018	0.201***	−0.026	0.186***	−0.132***
Book to Market	0.288***	−0.097***	0.045**	0.065***		0.014	−0.091***	−0.091***	−0.077***
Financial Leverage	0.016	0.209***	0.049**	0.521***	0.019		−0.173***	0.034	−0.083***
Beta Volatility	−0.005	−0.118***	0.100***	−0.148***	−0.096***	−0.090***		−0.056**	0.097***
Forecast Bias	0.158***	0.100***	0.127***	0.134***	−0.060***	0.111***	−0.046**		0.031
Expected Inflation	0.017	−0.019	0.012	−0.154***	−0.120***	−0.170***	0.125***	−0.037	

Panel B: Spearman and Pearson pairwise correlation coefficients between variables of model 1.2

	$liquidity_{Amihud}$	$IFRS_{liquidity}$	*Return Volatility*	*Market Value of Equity*	*Share Turnover*
$liquidity_{Amihud}$		−0.093***	0.164***	−0.126***	−0.116***
$IFRS_{liquidity}$	−0.158***		−0.180***	0.299***	−0.008
Return Volatility	0.167***	−0.208***		−0.142***	0.221***
Market Value of Equity	−0.736***	0.249***	−0.210***		−0.060***
Share Turnover	−0.468***	−0.055***	0.176***	−0.031**	

Panel A and panel B of this table present Spearman (Pearson) correlation coefficients below (above) the diagonal between the variables of model 1.1 and between the variables of model 1.2, respectively. All variables are as defined in Appendix B. *, **, and *** significance at the 10%, 5%, and 1% level, respectively, all two-tailed.

1.5 Main Analysis

Table 1.4 presents the results of our univariate analysis of the dependent variables of models 1.1 and 1.2. We split the cost-of-equity and the liquidity samples in European firms and firms from other countries. We also split the samples in pre- and post-IFRS adoption periods. We report mean values, median values, and the number of observations for each subsample.

Table 1.4, panel A presents the results of the univariate analysis for the cost of equity. For European banks that report under IFRS, the mean (median) cost of equity is lower by 1.19% (1.41%) than that of European banks reporting under domestic accounting standards. This difference is statistically significant at the 1% level. For the control sample, the difference in the mean values between the pre- and post-IFRS period is not statistically different from zero and the difference in the medians is significant at the 5% level. The mean cost of equity of European firms is higher than that of the control sample only for the pre-IFRS adoption period. So, we observe a large and statistically significant decrease in the cost of equity of banks in the treatment sample after the adoption of IFRS and a smaller decrease in the cost of equity of banks in the control sample.

Table 1.4, panel B presents the results of our univariate analysis for liquidity. For European banks that report under IFRS, the mean (median) liquidity is higher by 47% (45%) than that of European banks reporting under domestic accounting standards and this difference is statistically significant at the 1% level. We observe the same pattern in the control sample; there is a significant increase in the liquidity of banks comprising the control sample in the post-IFRS period. Hence, we observe a significant increase in the liquidity of banks of both the treatment and the control sample in the post-IFRS period.

Next, we discuss the findings of our multivariate analysis. Table 1.5 presents the results of the multivariate analysis for the cost-of-equity model. We report the OLS coefficients and the robust standard errors clustered by bank in parentheses. The coefficient on the test variable $IFRS_{ravg}$ is equal to -0.009 and is statistically significant at the 1% level. Hence, after controlling for other relevant factors, the adoption of IFRS is associated with a 90-basis-points decrease in European banks' cost of equity. Contrary to our prediction, the coefficient of the variable *Ln(Financial Leverage)* is negative and significant at the 1% level. This result is consistent both with leverage being endogenously determined and with leverage being negatively associated with agency costs (Berger and di Patti [2006]).

Table 1.6 presents the results of the multivariate analysis for the liquidity model. We report the regression parameters estimated using FE and the robust standard errors clustered by bank in parentheses. The country

Table 1.4
Univariate Analysis

Panel A: Univariate analysis for cost of equity				
		Pre-IFRS	Post-IFRS	Post-IFRS − Pre-IFRS
Treatment sample	Mean	12.00%	10.81%	−1.19%***
	Median	11.81%	10.40%	−1.41%***
	N	217	205	
Control sample	Mean	10.79%	10.62%	−0.17%
	Median	9.90%	9.54%	−0.36%**
	N	777	798	
Treatment sample	Mean	1.21%***	0.19%	
− Control sample	Median	1.91%***	0.86%***	
Panel B: Univariate analysis for liquidity				
		Pre-IFRS	Post-IFRS	Post-IFRS − Pre-IFRS
Treatment sample	Mean	64.3	34.26	−30.04***
	Median	13.3	7.32	−5.98***
	N	616	526	
Control sample	Mean	113.2	80.01	−33.19***
	Median	29.43	13.92	−15.51***
	N	1,512	1,908	
Treatment sample	Mean	−48.90***	−45.75***	
− Control sample	Median	−16.13***	−6.60***	

Panel A and panel B of this table present the results of the univariate analysis for the dependent variables of model 1.1 and model 1.2, respectively. We split the cost-of-equity and liquidity samples by sample period, that is in pre-IFRS and post-IFRS period, and by sample type, that is in treatment sample and control sample. We use *t*-test to compare the means and Wilcoxon rank-sum test to compare the medians across subsamples. *, **, and *** significance at the 10%, 5%, and 1% level, respectively, all two-tailed.

dummies drop from the liquidity model when we use the FE estimation technique because they are time-invariant. The coefficient on the test variable $IFRS_{liquidity}$ is equal to 0.032 and is not statistically different from zero. Hence, the adoption of IFRS is not associated with a change in the liquidity of banks. The coefficients of the rest of the independent variables have the predicted sign and are statistically significant at the 1% level.

1.6 Additional Analysis

In this section, we examine whether there is any cross-sectional variation in the effects of IFRS adoption on cost of equity. Table 1.7 presents the results of the subsample analysis. The table reports the coefficients of the $IFRS_{ravg}$ dummy, the standard errors, and the number of observations for each subsample.

Panel A presents the results of the analysis for the subsamples split by the increase in the exposure of banks to fair value (ΔFV). The coefficient of the $IFRS_{ravg}$ is negative and statistically significant only for the subsample of banks with above median ΔFV. This finding is consistent with papers that argue that fair value accounting

Table 1.5
Effect of IFRS Adoption on Cost of Equity

Independent variables	Predicted sign	r_{avg}
Intercept		0.161***
		(0.007)
$IFRS_{ravg}$	?	−0.009***
		(0.003)
Beta	+	0.010***
		(0.002)
Ln(Total Assets)	−	−0.00003
		(0.0005)
Ln(Book to Market)	+	0.020***
		(0.002)
Ln(Financial Leverage)	+	−0.013***
		(0.004)
Ln(Beta Volatility)	+	0.003**
		(0.001)
Forecast Bias	+	0.0004
		(0.0004)
Expected Inflation	+	−0.189**
		(0.081)
Year/ Country Dummies		Included
Adj. R^2		39.57%
# of firm-year observations		1,997
# of distinct banks		605
# of countries		37
# of years		6

This table presents the results of the regression on model 1.1. We use Ordinary Least Squares to estimate the regression coefficients and the standard errors are robust to heteroscedasticity and are clustered by bank. The standard errors are reported in parentheses below the coefficient estimates. All variables are as defined in Appendix B. *, **, and *** significance at the 10%, 5%, and 1% level, respectively, all two-tailed.

provides relevant information to investors (e.g., Bleck and Liu [2007]) and is not in line with the idea that fair value accounting can be suboptimal for banks (e.g., Plantin et al. [2008]). The difference in the coefficients of the two subsamples is not statistically different from zero. Hence, we find no evidence of lower capital market benefits for banks with high exposure to fair value accounting. Nonetheless, our findings should be interpreted with caution because of the endogenous nature of our partitioning variable. The variable ΔFV is endogenously determined because managers have discretion over the classification and measurement of financial assets.[6]

[6]In table 1.7, panel A the sum of the observations of the two subsamples (i.e., 1,747 and 1,743) is higher than the number of bank-year observations for the cost-of-equity sample (i.e., 1,997). This happens because we split only the treatment sample by the variable ΔFV. In each subsample regression, we use all the available observations of non-European banks as a control sample. We follow this procedure because the variable ΔFV can only be defined for the treatment sample. We do the same for the subsample regressions of panels B and C. In this case, the reason is that more than half of the bank-year observations of the control sample regard U.S. banks. As a result, we cannot split the control sample in two equal subsamples. In panels D and E, we

Table 1.6
Effect of IFRS Adoption on Liquidity

Independent variables	Predicted sign	*Ln(liquidity$_{Amihud}$)*
Intercept		11.351***
		(0.284)
IFRS$_{liquidity}$	?	0.032
		(0.037)
Ln(Return Volatility)	+	0.549***
		(0.042)
Ln(Market Value of Equity)	−	−0.959***
		(0.035)
Ln(Share Turnover)	−	−0.635***
		(0.029)
Year Dummies		Included
R^2 within		80.95%
# of firm-year observations		4,562
# of distinct banks		1,068
# of countries		49
# of years		6

This table presents the results of the regression on model 1.2. We use Fixed Effects to estimate the regression coefficients and the standard errors are robust to heteroscedasticity and are clustered by bank. The standard errors are reported in parentheses below the coefficient estimates. All variables are as defined in Appendix B. *, **, and *** significance at the 10%, 5%, and 1% level, respectively, all two-tailed.

Panel B and panel C present the results of the analyses for the subsamples split by *Absence* and *Divergence*, respectively. We expect that the impact of IFRS will be more pronounced for banks operating in countries with larger dissimilarities between domestic accounting standards and IFRS. Regarding *Absence*, the decrease in the cost of equity is statistically nonsignificant in both subsamples. In the case of *Divergence*, the decrease in the cost of equity is only present in the subsample of European banks with above-median *Divergence*. Again, the differences in the coefficients of the subsamples are not statistically different from zero. The nonsignificant results are most likely due to noise in the proxies for the differences between domestic accounting standards and IFRS.

Panel D presents the results of the subsample analysis for banks with below-median and banks with above-median pre-adoption quality of the information environment (*InfoQuality*). We expect that banks with poor pre-adoption information quality will enjoy larger marginal benefits as a result of the IFRS adoption. Consistent with our expectations, the decrease in the cost of equity is larger for the subsample of banks with below-median pre-adoption information quality. The difference in the coefficients of the two subsamples is positive and significant

split both the treatment and the control sample by *InfoQuality* and *InfoAsymmetry*, respectively. The sum of the observations of the subsamples in panels D and E is smaller than the number of bank-year observations for the cost-of-equity sample. The reason is the increased data required for the construction of the variables *InfoQuality* and *InfoAsymmetry*.

at the 1% level. This finding is in line with Armstrong et al. [2010] who find a significant market reaction to events affecting the probability of IFRS adoption in Europe only for banks with low pre-adoption information quality.

Panel E reports the results of the subsample analysis for banks with below-median and banks with above-median pre-adoption information asymmetry between banks and investors as well as between investors (*InfoAsymmetry*). The level of pre-adoption information asymmetry can both moderate and accentuate the positive impact of IFRS adoption. On the one hand, IFRS can decrease information asymmetries by mandating increased disclosures and by making financial statements across countries more comparable. On the other hand, increased disclosure requirements can have adverse effects on banks with higher pre-adoption information asymmetry due to high proprietary costs of disclosure. Our analysis shows that the decrease in the cost of equity is only present in the subsample of banks with below-median information asymmetry. Our results provide weak support to the idea that IFRS can be suboptimal for banks with high proprietary costs of disclosure. Still, the difference in the coefficients of the two subsamples is not statistically significant.

Overall, the subsample analysis does not support the idea that increased use of fair value accounting can have adverse effects on banks. Further, our tests provide evidence of higher capital market benefits for banks with low pre-adoption quality of the information environment.

1.7 Untabulated Robustness Tests

1.7.1 Alternative Proxies for the Cost of Equity and Liquidity

To test the sensitivity of our results to the perpetual growth rate assumption, we use expected inflation as our alternative proxy for the perpetual growth rate in the estimation of the cost of equity (Hail and Leuz [2006]). We measure expected inflation as the median annualized one-year-ahead change in the country-specific CPI. We replace negative values with the average of historical country-specific estimates. The results of our analysis are similar to those of table 1.5; the coefficient of the $IFRS_{ravg}$ dummy is equal to -0.007 and is statistically significant at the 5% level.

For liquidity, we use bid-ask spread and zero returns as alternative proxies. We calculate bid-ask spread as the yearly median of the daily ask prices minus the daily bid prices divided by the midpoint. We measure zero

Table 1.7

Subsample Regressions for the Cost of Equity

Panel A: Subsamples split by ΔFV				
		Low ΔFV	High ΔFV	High ΔFV − Low ΔFV
$IFRS_{ravg}$	coeff.	−0.007	−0.008*	−0.001
	std.err.	(0.005)	(0.004)	
	N	1,747	1,743	
Panel B: Subsamples split by *Absence*				
		Low *Absence*	High *Absence*	High *Absense* − Low *Absence*
$IFRS_{ravg}$	coeff.	−0.004	−0.006	−0.002
	std.err.	(0.004)	(0.004)	
	N	1,750	1,787	
Panel C: Subsamples split by *Divergence*				
		Low *Divergence*	High *Divergence*	High *Divergence* − Low *Divergence*
$IFRS_{ravg}$	coeff.	−0.005	−0.008**	−0.003
	std.err.	(0.004)	(0.004)	
	N	1,743	1,794	
Panel D: Subsamples split by *InfoQuality*				
		Low *InfoQuality*	High *InfoQuality*	High *InfoQuality* − Low *InfoQuality*
$IFRS_{ravg}$	coeff.	−0.022***	0.009*	0.031***
	std.err.	(0.004)	(0.004)	
	N	935	933	
Panel E: Subsamples split by *InfoAsymmetry*				
		Low *InfoAsymmetry*	High *InfoAsymmetry*	High *InfoAsymmetry* − Low *InfoAsymmetry*
$IFRS_{ravg}$	coeff.	−0.007*	−0.006	0.001
	std.err.	(0.004)	(0.005)	
	N	883	884	

This table presents the results of the subsample regressions on model 1.1. In panel A, we split the sample in bank-year observations with below-median values of ΔFV (Low ΔFV) and bank-year observations with above-median values of ΔFV (High ΔFV). In panels B, C, D, and E we split the samples by *Absence*, *Divergence*, *InfoQuality*, and *InfoAsymmetry*, respectively. We use Ordinary Least Squares to estimate the regression coefficients and the standard errors are robust to heteroscedasticity and are clustered by bank. The standard errors are reported in parentheses below the coefficient estimates. All variables are as defined in Appendix B. *, **, and *** significance at the 10%, 5%, and 1% level, respectively, all two-tailed.

returns as the number of days with zero returns within a year divided by the number of trading days for that year. The coefficient of the $IFRS_{liquidity}$ dummy is equal to −0.119 and is statistically significant at the 5% level, when we use bid-ask spread as a proxy for liquidity. The coefficient of the test variable is equal to −0.113 and is significant at the 1% level, when we use zero returns as proxy for liquidity. These findings contradict the nonsignificant findings when we use the Amihud [2002] illiquidity measure as our proxy for liquidity.

1.7.2 Alternative Specification of the Control Sample

We examine the sensitivity of our results to the construction of the control sample. As robustness test, we use observations only from the U.S. as a control sample (Gebhardt and Novotny-Farkas [2010]). We use a sample of U.S. banks because U.S. companies operate in similar capital market environments and under similar regulatory requirements as European companies. In addition, there is high integration and economic interdependence between European and U.S. markets. The results of the robustness test are similar to the results of the main analysis for the cost of equity; the coefficient of the $IFRS_{ravg}$ is equal to -0.015 and is statistically significant at the 1% level. However, the coefficient of the variable $IFRS_{liquidity}$ is equal to 0.252 and it becomes statistically significant at the 1% level.

1.7.3 Other

We also repeat the analyses for the cost-of-equity and liquidity models, but now we winsorize the variables at the 1% level instead of truncating them. The coefficient of the $IFRS_{ravg}$ dummy for the cost-of-equity model is equal to -0.009 and is significant at the 1% level and the coefficient of the $IFRS_{liquidity}$ dummy for the liquidity model is equal to 0.032 and is statistically nonsignificant. So, our results are not sensitive to the winsorization of the variables.

Moreover, to calculate the cost-of-equity proxy we assume that the fiscal year of all firms ends in December. We exclude firms with other than December fiscal year-end and rerun model 1.1. Again, the coefficient of the $IFRS_{ravg}$ dummy is equal to -0.011 and is statistically significant at the 1% level. We also examine the sensitivity of our results to the existence of extreme observations for the Amihud [2002] illiquidity proxy. We do so by truncating the Amihud illiquidity proxy at the 5 and 95% level instead of the 1 and 99% level used so far and rerun model 1.2. The $IFRS_{liquidity}$ dummy remains positive and statistically nonsignificant.

Finally, the results of our main analyses are robust to clustering the errors by both bank and year (Petersen [2009]). All untabulated results are available on request.

1.8 Conclusion

In this paper, we examine the effects of mandatory IFRS adoption on the cost of equity and liquidity of European banks. Our main analysis shows a statistically and economically significant decrease in the cost of equity of banks by ninety basis points after the mandatory adoption of IFRS. Our subsample analysis does not provide support to the concerns of academics and practitioners that fair value is suboptimal for banks. Further, the decrease in the cost of equity is more pronounced for banks with lower pre-adoption quality of information environment. Regarding the effect of IFRS on liquidity, our results are sensitive to the proxy used. In particular, we find no effect when we use the Amihud [2002] illiquidity measure as our proxy for liquidity. However, we find a significant increase in liquidity when we use either bid-ask spread or zero returns as proxies for liquidity. Overall, our results are in line with theory that suggests that increased disclosure and increased comparability of financial statements caused by the mandatory adoption of IFRS can have a positive impact on banks' cost of equity.

Our conclusions are relevant to policy makers and standard setters. In particular, our results do not support the idea that fair value accounting can increase the systematic risk of financial institutions. On the contrary, we show that fair value accounting can benefit investors by increasing the value relevance of accounting numbers and by enhancing transparency. These results contribute to the ongoing debate on whether financial statements should be more or less fair-value based. Moreover, our results support the idea that the harmonization of accounting standards can have capital market benefits for adopting firms and support the efforts of standard setters to achieve global convergence of financial reporting. In addition, our findings are relevant to academics because they highlight the importance of industry characteristics in studies that examine the real effects of changes in accounting regulations.

There are potential caveats related to our study. First, all European listed banks mandatorily report under IFRS after 2005, so the choice of a control sample is difficult. Second, our study does not separate in a robust manner the effects of increased disclosure requirements, increased comparability of financial statements, and increased use of fair value accounting on the cost of equity of European banks. Nevertheless, our additional analysis on the effect of IFRS on cost of equity conditional on the increase in the exposure of banks to fair value accounting is a valid starting point. Finally, our sample period ends at the beginning of the financial crisis, which might pose some limitations to the generalizability of our conclusions. Yet, given that stock prices reflect investor expectations, we believe that our analysis does provide evidence of the effects of IFRS adoption on banks during economic downturns.

Appendix A. Cost-of-equity models

Claus and Thomas [2001]:

$$P_t = BVPS_t + \frac{AE_{t+1}}{(1+r_{ct})^1} + \frac{AE_{t+2}}{(1+r_{ct})^2} + \frac{AE_{t+3}}{(1+r_{ct})^3} + \frac{AE_{t+4}}{(1+r_{ct})^4} + \frac{AE_{t+5}}{(1+r_{ct})^5} + \frac{AE_{t+5}(1+g_{lt})}{(1+r_{ct})^5(r_{ct}-g_{lt})} \tag{1.3}$$

This model is a variation of the residual income valuation model. Clean surplus accounting holds. For the first 3 years, we use the mean forecasted earnings per share provided by IBES. Whenever the forecast of earnings per share for year 3 is unavailable, we calculate it as the mean forecasted earnings per share for year 2 times one plus the long-term growth rate in earnings provided by IBES (*ltg*). Forecasted earnings per share for years 4 and 5 are equal to previous year's forecasted earnings per share times one plus the *ltg*. From year 5 and on, the model assumes a constant perpetual growth rate of abnormal earnings. *P* is market price of a firm's stock. *BVPS* is book value of equity per share. *AE* is abnormal earnings per share. *AE* is earnings per share at time *t* minus the cost of equity times the book value of equity per share at time *t−1*. r_{ct} is the cost of equity and g_{lt} is the long-term growth rate.

Easton [2004]:

$$P_t = \frac{(FEPS_{t+2} + r_e DPS_{t+2} - FEPS_{t+1})}{r_e^2} \tag{1.4}$$

This model is a variation of the abnormal earnings growth valuation model suggested by Ohlson and Juettner-Nauroth [2005]. *FEPS* is forecasted earnings per share. *FEPS* for year 1 and 2 are equal to the mean forecasted earnings per share provided by IBES. *P* is market price of a firm's stock. *DPS* is dividends per share. *DPS* is calculated as net income multiplied by the dividend payout ratio. r_e is the cost of equity.

Gode and Mohanram [2003]:

$$r_{gm} = A + \sqrt{A^2 + \frac{FEPS_{t+1}}{P_t}(g_{st} - g_{lt})} \tag{1.5}$$

where

$$A = \frac{1}{2}(g_{lt} + \frac{DPS_{t+1}}{P_t}) \tag{1.6}$$

This model is a variation of the abnormal earnings growth valuation model suggested by Ohlson and Juettner-Nauroth [2005]. *FEPS* is forecasted earnings per share. *FEPS* are equal to the mean forecasted earnings per share provided by IBES. The short-term growth in earnings (g_{st}) is equal to the average of the two-year growth forecast and the *ltg*. *ltg* is the long-term growth rate in earnings provided by IBES. r_{gm} is the cost of equity. *P* is market price of a firm's stock. g_{lt} is long-term growth rate and *DPS* is dividends per share. *DPS* is calculated as net income multiplied by the dividend payout ratio.

Gebhardt et al. [2001]:

$$P_t = BVPS_t + \frac{FROE_{t+1} - r_{gls}}{(1 + r_{gls})}BVPS_t + \frac{FROE_{t+2} - r_{gls}}{(1 + r_{gls})^2}BVPS_{t+1} + TV \tag{1.7}$$

where

$$TV = \sum_{i=3}^{T-1} \frac{FROE_{t+i} - r_{gls}}{(1 + r_{gls})^i}BVPS_{t+i-1} + \frac{FROE_{t+T} - r_{gls}}{r_{gls}(1 + r_{gls})^{T-1}}BVPS_{t+T-1} \tag{1.8}$$

This model is a variation of the residual income valuation model. Clean surplus accounting holds. *FROE* is forecasted return on book value of equity. *FROE* is calculated as *FEPS* divided by lagged *BVPS*. *FEPS* is forecasted earnings per share. *BVPS* is book value of equity per share. For the first 3 years, we use the mean forecasted earnings per share provided by IBES to calculate the *FROE*. Whenever the mean forecasted earnings per share for year 3 is unavailable, we use the mean forecasted earnings per share for year 2 multiplied by one plus the *ltg*. *ltg* is the long-term growth rate in earnings provided by IBES. From year 4 to year 12, we calculate *FROE* using linear interpolation to the industry median return on equity. From year 12 and on, the model assumes zero perpetual growth in abnormal earnings. To calculate the industry median return on equity, we exclude firms with negative net income. We calculate the industry median return on equity using observations of banks (SIC code 6000–6199) from at least five and up to ten years, depending on data availability. The industry median return on equity is country-specific. *P* is market price of a firm's stock. r_{gls} is the cost of equity and *TV* is terminal value.

Appendix B. Variables definition

Variable name	Variable description
r_{avg}	average of four different implied cost-of-equity estimates: r_{ct}, r_e, r_{gm}, and r_{gls}
r_{ct}	cost-of-equity estimate using the model suggested by Claus and Thomas [2001]
r_e	cost-of-equity estimate using the model suggested by Easton [2004]
r_{gm}	cost-of-equity estimate using the model suggested by Ohlson and Juettner-Nauroth [2005] as implemented by Gode and Mohanram [2003]
r_{gls}	cost-of-equity estimate using the model suggested by Gebhardt et al. [2001]
$liquidity_{Amihud}$	yearly median of the Amihud [2002] illiquidity measure multiplied by 1 million
$IFRS_{ravg}$	dummy variable that takes the value of one if the company mandatorily reports under IFRS, and zero otherwise
Beta	covariance of monthly stock returns to a broad country-specific equity index divided by the variance of that index, over the past five years
Total Assets	total assets measured in U.S. dollars at year end
Book to Market	ratio of book value of equity to market value of equity at year end
Financial Leverage	ratio of total liabilities to total assets at year end
Beta Volatility	standard deviation of daily betas over the last five years. Daily betas are calculated using daily observations over the past year
Forecast Bias	one-year-ahead mean analyst consensus forecast minus the year's actual earnings scaled by book value per share
Expected Inflation	median annualized one-year-ahead change in the country-specific CPI
$IFRS_{liquidity}$	dummy variable that takes the value of one if the company mandatorily reports under IFRS, and zero otherwise
Return Volatility	standard deviation of monthly returns calculated over the last year
Market Value of Equity	market value of shareholders' equity measured in U.S. dollars at year end
Share Turnover	annual trading volume divided by the market value of equity
Ln(Total Assets)	natural logarithm of total assets measured in U.S. dollars at year end
Ln(Book to Market)	natural logarithm of the ratio of book value of equity to market value of equity at year end
Ln(Financial Leverage)	natural logarithm of the ratio of total liabilities to total assets at year end
Ln(Beta Volatility)	natural logarithm of the standard deviation of daily betas over the last five years
Year Dummies	set of dummy variables that take the value of one if the bank-year observation corresponds to a year, and zero otherwise
Country Dummies	set of dummy variables that take the value of one if the bank operates in a country, and zero otherwise
Ln(liquidityAmihud)	natural logarithm of the yearly median of the Amihud [2002] illiquidity measure multiplied by one million
Ln(Return Volatility)	natural logarithm of the standard deviation of monthly returns calculated over the last year

(Continued)

Appendix B – *Continued*

Variable name	Variable description
Ln(Market Value of Equity)	natural logarithm of the market value of shareholders' equity measured in U.S. dollars at year end
Ln(Share Turnover)	natural logarithm of the annual trading volume divided by the market value of equity
ΔFV	ratio of financial assets measured at fair value to total assets in the 2004 financial statements prepared under IFRS minus the ratio of financial assets measured at fair value to total assets in the 2004 financial statements prepared under domestic accounting standards. This variable is only applicable to banks that report under IFRS
Absence	measure of the extent to which accounting rules regarding specific topics are covered in IAS but are not covered in domestic accounting standards (Ding et al. [2007]). This variable is only applicable to banks that report under IFRS
Divergence	measure of the extent to which accounting rules regarding specific topics differ between IAS and domestic accounting standards (Ding et al. [2007]). This variable is only applicable to banks that report under IFRS
InfoQuality	first principal component derived from the variables *ADR*, *Standards*, *Exchanges*, and *Market Value of Equity* (Armstrong et al. [2010])
ADR	dummy variable that takes the value of one if the bank participates in an American Depository Receipt program, and zero otherwise
Standards	dummy variable that takes the value of one if the bank reports under U.S. standards or IAS, and zero otherwise
Exchanges	number of exchanges on which the bank is listed
InfoAsymmetry	first principal component derived from the variables *Turnover*, *CloselyHeld*, and *BankConcentration* (Armstrong et al. [2010])
Turnover	annual mean of daily ratio of shares traded to shares outstanding
CloselyHeld	percentage of shares held by insiders
BankConcentration	country-specific ratio of the assets of the three largest banks to the assets of all commercial banks (Beck et al. [2010])

Chapter 2

Impact of IFRS on banks' risk exposure*

2.1 Introduction

Banks' adoption of International Financial Reporting Standards (IFRS) has sparked a heated debate both among practitioners and within the academic community regarding its potential benefits and costs. Proponents of IFRS argue that it increases the value relevance of accounting numbers (e.g., Barth et al. [1996]) and it enhances market transparency (e.g., Bleck and Liu [2007]). At the same time, concerns have been raised that IFRS can, among others, make banks more procyclical (e.g., Allen and Carletti [2008]) and it can increase earnings' volatility (e.g., Barth et al. [1995]). Despite the controversial nature of IFRS, there are only a few academic papers that empirically study the economic consequences of the new accounting standards particularly for banks (e.g., Gebhardt and Novotny-Farkas [2010]). Our paper contributes to this stream of literature by investigating the impact of mandatory IFRS adoption on the risk exposure of banks in Europe.

The two changes mandated by IFRS that can potentially impact the risk exposure of adopting banks are increased use of fair value accounting and increased disclosure requirements for derivatives and hedges. On the one hand, theory suggests that fair value accounting and increased disclosure requirements for hedges and derivatives can increase market transparency and can enhance managerial discipline (e.g., Bleck and Liu [2007]). On the other hand, a number of analytical papers argue that fair value accounting and increased hedging disclosures can lead to increased managerial risk taking and suboptimal hedging (e.g., Burkhardt and Strausz [2006]). Consequently, the impact of IFRS on banks' risk exposure remains an empirical question.

*This chapter is based on Gkougkousi et al. [2011]. We thank the workshop participants at Rotterdam School of Management, Erasmus University and the session participants at the American Accounting Association Annual Meeting 2011 for helpful comments.

To answer this research question, we first measure the exposure of banks to equity risk, interest rate risk, exchange rate risk, and commodity risk as the absolute values of the beta coefficients that we derive by regressing monthly bank returns on monthly equity market returns, monthly interest rate changes, monthly exchange rate changes, and monthly commodity price changes over a year, respectively (Guay [1999]). Then, we regress these risk-exposure proxies on a dummy variable that takes the value of one if the bank reports under IFRS and zero otherwise and on a set of control variables. As additional analysis, we examine whether there is any cross-sectional variation in the impact of mandatory IFRS adoption on banks' risk exposure. In particular, we examine whether the impact of IFRS depends on the likelihood that accounting numbers are used for contracting purposes, on the difference between local accounting standards and IFRS, and on the degree of requlatory restrictions imposed on banks' activities. We expect that the impact of IFRS will be more pronounced in countries where accounting numbers are more likely to be used for contracting purposes because in these countries accounting numbers are used more often in managerial compensation contracts. Therefore, managers operating in these countries have more incentives to adjust the banks' risk exposure as a response to changes in financial statements caused by the adoption of IFRS. Moreover, we expect that the impact of IFRS will be more pronounced in countries where local accounting standards differ more from IFRS and in countries where managers have more leeway in determining the banks' investment positions.

We focus on the effect of mandatory adoption of IFRS to circumvent possible endogeneity issues associated with the voluntary adoption of accounting standards. Further, we limit our analysis to European banks for two reasons. First, European countries adopted the same amended version of International Accounting Standards (IAS) 39 in 2005. So, we focus on European banks to ensure homogeneity of the adopted standards. Second, literature suggests that changes in regulations can have an economic impact only if they are properly enforced (e.g., Bhattacharya and Daouk [2002]). The enforcement of rules and regulations in Europe is relatively high, so we use a sample of European banks to increase the power of our tests. To control for synchronous and unrelated to the adoption of IFRS changes (e.g., changes in macroeconomic conditions), we use U.S. banks as a control sample (Gebhardt and Novotny-Farkas [2010]). Our final sample consists of 8,847 bank-year observations representing 1,100 distinct banks from 23 countries for the period January 1999 to December 2010.

Our analysis shows an increase in the banks' risk exposure after the mandatory adoption of IFRS in 2005. Our results are not sensitive to the exclusion of the subprime mortgage crisis period. We provide limited support to the hypothesis that the change in risk exposure is more pronounced in countries where accounting numbers are more likely to be used for contracting purposes. Overall, our findings are in line with the theory that fair value accounting and increased disclosure requirements of hedging activities can increase the risk exposure of banks

by increasing managerial risk appetite and by inducing suboptimal hedging.

Our study contributes to the literature in a number of ways. First, we provide evidence on the real effects of changes in accounting regulations and more specifically on the real effects of changes in the hedge and fair value accounting rules. To our knowledge, our paper is the first to examine the impact of changes in these two specific accounting rules on banks' activities. Second, prior literature explores the impact of IFRS adoption on, among others, cost of equity, liquidity, earnings management, and analysts' forecasts. We examine the impact of IFRS on a relatively unexplored area, that is on the investment and hedging decisions of banks. Third, our study adds to the growing body of literature on the economic consequences of IFRS adoption (e.g., Daske et al. [2008]; Li [2010]; Byard et al. [2010]). However, in contrast to the majority of the papers in this research stream, we focus on banks. This industry focus is important because accounting standards can have different impact on different industrial sectors. Fourth, our study has regulatory implications as it contributes to the ongoing debate on the global convergence of financial reporting standards. More specifically, we show that changes in accounting standards can have unintended economic consequences on the investment and hedging positions of banks. We find that banks have increased their exposures to a number of risk factors after the mandatory adoption of IFRS in 2005. Nevertheless—to the extent that these risks are diversifiable—our results do not suggest that the adoption of IFRS has adverse consequences on banks.

The remainder of the chapter is organized as follows. We develop the hypotheses in section 2.2. We discuss the research design in section 2.3. In section 2.4, we present the sample and some descriptive statistics. Section 2.5 presents the results of the main and the subsample analysis. We present the robustness tests in section 2.6 and in section 2.7, we conclude.

2.2 Hypotheses Development

The adoption of IFRS has caused an increase in the reporting of assets and liabilities at fair value and an increase in the risk management disclosure requirements. There is disagreement in the literature regarding the economic consequences of increased use of fair value accounting particularly for banks. Bleck and Liu [2007] argue that fair value accounting—compared to historical cost accounting—facilitates the monitoring of banks' activities and provides investors with an early warning signal. The reason is that under fair value accounting managers profit from asset appreciations but also get penalized for asset depreciations. On the contrary, under historical cost accounting managers can sell appreciated assets and profit from gains on sales but at the same time they can

keep depreciated assets on balance sheet and avoid realizing losses.

Nevertheless, a number of analytical papers argue that fair value accounting can have adverse consequences on banks' activities. More specifically, theory suggests that increased use of fair value accounting can increase managerial risk appetite and can increase the riskiness of banks' positions. For example, Burkhardt and Strausz [2006] argue that fair value accounting reduces the information asymmetry between a bank and its investors and it increases the liquidity of the bank's assets. Due to the highly levered nature of banks, bank managers have increased incentives to take on more risk. So, increased use of fair value accounting improves the bank's investment opportunities and ultimately aggravates the bank managers' risk-shifting behavior. Bleck and Gao [2011] show that fair value accounting induces banks to retain excessive exposure to the loans they originate and the logic behind their proposition is as follows. Banks must retain a portion of the loans they originate to signal their quality to the market. Under fair value accounting, loan retention is more valuable to all banks because they can benefit from early profit recognition by marking-to-market the retained portion of the loan. So, bad banks have more incentives to mimic good banks by retaining a larger portion of the loans they originate. At the same time good banks must retain a larger portion of loans in order to distinguish themselves from bad banks. Consequently, loan retention is higher under fair value compared to historical cost accounting in equilibrium. To sum up, theoretical literature is divided as to whether increased use of fair value accounting can improve managerial discipline or it can accentuate banks' risk-taking behavior.

Literature on the effect of increased disclosure requirements for hedges and derivatives is also inconclusive. DeMarzo and Duffie [1995] show that full disclosure of hedging activities destroys the incentives of managers to fully hedge the firm's risk exposure. The intuition is as follows. Disclosure of hedging activities makes firm profits more informative about managerial talent. As a result, the sensitivity of management compensation to firm profitability increases. Assuming constant variability of firm profits, this higher sensitivity of management compensation to firm profitability leads to increased volatility of managerial wages. Hence, under full disclosure of hedging activities, managers choose not to hedge the firm's risk exposure in order to reduce the variability of their income stream. Sapra [2002] reaches to similar conclusions. He argues that managers use hedging to credibly signal their beliefs about the firm's future prospects. Mandatory hedge disclosures increase managerial incentives to take risky positions that indicate favorable private information about the firm's prospects. Consequently, mandatory hedge disclosures can increase managerial speculation and risk taking. A recent survey by Lins et al. [2011] confirms the theoretical predictions of DeMarzo and Duffie [1995] and Sapra [2002] by documenting that reporting for derivatives and hedges under SFAS 133 and IAS 39 has compromised firms' economic hedging strategies.

On the contrary, Melumad et al. [1999] show that higher transparency of hedging activities can result in optimal hedging of firms' risk exposure. More specifically, the authors argue that hedge disclosures reduce the variance of the firm's expected payoffs because hedge disclosures reduce uncertainty. This decrease in variance compensates the costs of hedging and makes it more profitable for managers to hedge the firm's risk exposure. The theoretical predictions of Melumad et al. [1999] are supported by the empirical findings of Zhang [2009].

Overall, literature suggests that IFRS can impact both the banks' investment and the banks' hedging decisions by mandating increased use of fair value accounting and increased disclosures of hedging activities. Based on the theory provided by Bleck and Liu [2007] and Melumad et al. [1999], it is reasonable to expect that the adoption of IFRS will lead to better monitoring of managerial activities and to improved hedging of the bank's risks and consequently to lower risk exposure. However, based on the theoretical predictions of Bleck and Gao [2011], DeMarzo and Duffie [1995], and Sapra [2002], we expect that IFRS will cause an increase in the risk exposure of adopting firms. So, we formulate the following two-directional hypothesis.

H1a: The risk exposure of banks decreases after the adoption of IFRS.

H1b: The risk exposure of banks increases after the adoption of IFRS.

In line with Lins et al. [2011], we expect that the change in the risk exposure of banks will be more pronounced in countries where accounting numbers are more likely to be used in management compensation contracts. The reason is that in these countries managerial compensation will be more heavily affected by the adoption of IFRS. As a result, managers have stronger incentives to adjust the firm's risk exposure as a response to the adoption of IFRS.

H2: The effect of IFRS on risk exposure is more pronounced for banks operating in countries where accounting numbers are used more often for contracting purposes.

We also expect that the impact of IFRS on banks' risk exposure will be more pronounced for banks operating in countries where local accounting standards differ more from IFRS. Larger differences between local accounting standards and IFRS will result in larger changes in banks' financial statements. Subsequently, managers operating in these countries will make more adjustments to the firm's investment and hedging positions as a response to the IFRS adoption.

H3: The effect of IFRS on risk exposure is more pronounced for banks operating in countries where local accounting standards differ more from IFRS.

The change in banks' risk exposure caused by the mandatory adoption of IFRS also depends on the degree of regulatory restrictions imposed on banks' activities. Managers operating in countries that impose fewer regulatory restrictions will have more flexibility to adjust the banks' risk exposure as a response to the adoption of IFRS. Hence, we expect that the change in the risk exposure of banks will be more pronounced in countries where banks have more investment freedom.

H4: The effect of IFRS on risk exposure is more pronounced for banks operating in countries where there are less regulatory restrictions on banks' investment activities.

2.3 Research Design

To measure risk exposure, we use the methodology proposed by Guay [1999]. We focus on equity exposure, interest rate exposure, exchange rate exposure, and commodity exposure because these are the main risks to which banks are exposed. We measure equity exposure as the absolute value of the beta coefficient that we derive by regressing monthly stock returns on monthly returns of an equity market index over a year. We measure interest rate exposure as the absolute value of the beta coefficient that we derive by regressing monthly stock returns on monthly returns of an equity market index and monthly percentage changes in interest rates over a year. We measure exchange rate exposure as the absolute value of the beta coefficient that we obtain when we regress monthly stock returns on monthly returns of an equity market index and monthly percentage changes in exchange rates over a year. And we measure commodity exposure as the absolute value of the beta coefficient that we get by regressing monthly stock returns on monthly returns of an equity market index and monthly percentage changes in commodity prices over a year.[1] Hence, we run time-series regressions at bank-month level over a year on the following models:

$$Return_{it} = \alpha_{0i} + \alpha_{1i} Return_{mt} + \omega_{it} \tag{2.1}$$

$$Return_{it} = \beta_{0i} + \beta_{1i} Return_{mt} + \beta_{2i} Interest_{t} + \epsilon_{it} \tag{2.2}$$

$$Return_{it} = \gamma_{0i} + \gamma_{1i} Return_{mt} + \gamma_{2i} Exchange_{t} + \eta_{it} \tag{2.3}$$

$$Return_{it} = \delta_{0i} + \delta_{1i} Return_{mt} + \delta_{2i} Commodity_{t} + \upsilon_{it} \tag{2.4}$$

[1] We use monthly instead of daily or weekly returns because they are less noisy. Further, beta estimates using monthly returns suffer less from downwards bias related to the infrequent trading of stocks.

where *Return*$_i$ is the continuously compounded monthly stock return of bank i; *Return*$_m$ is the continuously compounded country-specific value-weighted monthly equity market return; *Interest* is the monthly percentage change in overnight LIBOR; *Exchange* is the monthly percentage change in the European Central Bank trade-weighted euro denominated exchange rate basket of a group of 40 trading partners for the case of European banks and the monthly percentage change in the Federal Reserve Bank of St. Louis trade-weighted dollar denominated exchange rate basket of major currencies for the case of U.S. banks; and *Commodity* is the monthly percentage change in the Dow Jones-UBS value-weighted euro denominated commodity index. The absolute values of the coefficients α_{1i}, β_{2i}, γ_{2i}, and δ_{2i} capture the bank- and year-specific exposures to equity risk (*Equity Exposure*), interest rate risk (*Interest Exposure*), exchange rate risk (*Exchange Exposure*), and commodity risk (*Commodity Exposure*), respectively.

Next, we regress these measures of risk exposure on a dummy variable called *IFRS* that takes the value of one if the company mandatorily reports under IFRS and zero otherwise and on a set of control variables. The set of control variables includes *Return Volatility*, calculated as the standard deviation of monthly stock returns over a year; *Total Assets*, calculated as the natural logarithm of total assets measured in U.S. dollars; *Book to Market*, calculated as book value of equity to market value of equity; *Financial Leverage*, calculated as total liabilities to total assets; *ROA*, calculated as net income to total assets; *Loans to Assets*, calculated as total loans to total assets; *Deposits to Assets*, calculated as total deposits to total assets; and *Noninterest to Total Income*, calculated as noninterest income to total income (Zhang [2009]; Fraser et al. [2002]). All accounting variables are lagged one year to ensure that financial statement information is publicly available and are measured at fiscal year end. In addition, all variables are winsorized at the 1% level. So, we run pooled regressions at bank-year level on the following models:

$$Equity\ Exposure_{it} = \alpha_2 + \alpha_3 IFRS_{it} + \sum_{n=4}^{N} \alpha_n \times Control_{nit} + \omega'_{it} \tag{2.5}$$

$$Interest\ Exposure_{it} = \beta_3 + \beta_4 IFRS_{it} + \sum_{k=5}^{K} \beta_k \times Control_{kit} + \epsilon'_{it} \tag{2.6}$$

$$Exchange\ Exposure_{it} = \gamma_3 + \gamma_4 IFRS_{it} + \sum_{k=5}^{K} \gamma_k \times Control_{kit} + \eta'_{it} \tag{2.7}$$

$$Commodity\ Exposure_{it} = \delta_3 + \delta_4 IFRS_{it} + \sum_{k=5}^{K} \delta_k \times Control_{kit} + \upsilon'_{it} \tag{2.8}$$

To test whether the change in risk exposure is more pronounced in countries where accounting numbers are more

likely to be used for contracting purposes, we run subsample regressions and we compare the coefficients of the *IFRS* dummies. We use two proxies to capture the extent to which accounting numbers are used in contracts. First, we use the variable *Burden of Proof*, which measures the country-specific level of difficulty to prove liability of accountants due to misleading financial statements (La Porta et al. [2006]). Higher values of *Burden of Proof* are associated with lower likelihood that accounting numbers are used in contracts. Second, we use the variable *Reporting Quality*, which is equal to the CIFAR score and it measures the country-specific quality of financial reporting. Higher values of *Reporting Quality* are positively associated with the likelihood that financial statement numbers are used in management compensation contracts.

We also test for cross-sectional variation depending on the difference between local accounting standards and IFRS. We measure the differences between local accounting standards and IFRS using the variables *Absence* and *Divergence* calculated by Ding et al. [2007]. *Absence* measures the extent to which accounting rules regarding specific topics are covered in IFRS but are not covered in domestic accounting standards. *Divergence* measures the extent to which accounting rules regarding specific topics differ between IFRS and local accounting standards. Further, we test for cross-sectional variation depending on the degree of investment restrictions imposed on banks' activities. We measure country-specific investment restrictions using the variable *Investment Freedom* calculated by Barth, Caprio and Levine [2008].

We estimate models 2.1–2.4 using Ordinary Least Squares (OLS) and models 2.5–2.8 using Fixed Effects (FE) estimation technique to control for the impact of time-invariant firm-fixed effects. We also examine the appropriateness of the Random Effects (RE) technique for models 2.5–2.8 by means of the Hausman [1978] specification test. However, the test rejects the null hypothesis that the RE produces consistent estimators. The standard errors are robust to heteroscedasticity and are clustered by bank.

2.4 Sample Selection and Descriptive Statistics

2.4.1 Sample Selection

Our treatment sample consists of banks (primary SIC code 6000–6199) that belong to the European Union (E.U.) and/or to the European Economic Area (E.E.A.) and our control sample consists of U.S. banks. Our sample period spans from January 1999 to December 2010. We use an equal number of years before and after the mandatory adoption of IFRS in 2005. We exclude firms with other than December fiscal year end to better

align our proxies for risk exposure with the mandatory adoption of IFRS. We require a minimum of 12 months of return data per year to estimate the parameters of models 2.1–2.4. We include only mandatory adopters in our sample to circumvent endogeneity issues that arise from the voluntary adoption of IFRS. We retrieve market data from Datastream, the European Central Bank website, and the Federal Reserve Bank of St. Louis website and accounting information from Worldscope. We download the CIFAR score from the website of Andrei Shleifer and data to calculate the variable *Investment Freedom* from the World Bank website. Table 2.1 presents the sample selection procedure. Our selection criteria and data requirements result in loss of about 12% of the initial bank-month observations. Our final sample is equal to 106,164 bank-month observations, which corresponds to 8,847 bank-year data points.

Table 2.1
Sample Selection

Description	N	%
initial bank-month obs. with available data	121,023	100.00
minus bank-month obs. with other than December FYE	13,232	10.93
minus bank-month obs. with less than 12 months of return data per year	439	0.36
minus bank-month obs. of voluntary adopters	1,188	0.98
final bank-month observations	106,164	87.72
(final bank-year observations)	(8,847)	

This table presents the sample selection procedure.

2.4.2 Descriptive Statistics

Table 2.2 presents the sample composition by country. Our sample comprises 8,847 bank-year observations representing 1,100 distinct banks from 23 countries. The control sample of U.S. banks is more than double the treatment sample of European banks. About 45% of the bank-year observations of the treatment sample regard Danish, French, and Italian banks. The average number of bank-year observations per country for the treatment sample is 120. The countries with the least observations available are Hungary, Iceland, and Luxembourg with 7, 2, and 3 bank-year observations, respectively.

Table 2.3 presents descriptive statistics for the dependent and independent variables of models 2.1 to 2.8. Panel A presents descriptive statistics for the variables of models 2.1 to 2.4. The mean monthly bank-specific return is negative and equal to -0.4% and the median is equal to 0. The mean monthly bank return is negative presumably because our sample includes the subprime crisis period. Panel B presents descriptive statistics for the variables of models 2.5 to 2.8. The mean (median) of *Equity Exposure* is equal to 0.34 (0.10). The low equity market

Table 2.2
Sample Composition

	Bank-year		Bank	
	N	%	N	%
Austria	69	0.78	8	0.73
Belgium	43	0.49	5	0.45
Czech Republic	21	0.24	4	0.36
Denmark	485	5.48	51	4.64
Finland	29	0.33	6	0.55
France	369	4.17	56	5.09
Germany	192	2.17	31	2.82
Greece	134	1.51	18	1.64
Hungary	7	0.08	1	0.09
Iceland	2	0.02	2	0.18
Ireland	17	0.19	2	0.18
Italy	343	3.88	51	4.64
Lithuania	13	0.15	3	0.27
Luxembourg	3	0.03	1	0.09
Netherlands	30	0.34	5	0.45
Norway	233	2.63	28	2.55
Poland	164	1.85	20	1.82
Portugal	69	0.78	10	0.91
Romania	10	0.11	2	0.18
Spain	166	1.88	18	1.64
Sweden	52	0.59	5	0.45
U.K.	183	2.07	27	2.45
U.S.A.	6,213	70.23	746	67.82
Total	8,847	100.00	1,100	100.00

This table presents the sample composition by country.

betas are probably due to the small number of observations used to run regressions on model 2.1 (i.e., 12 bank-month observations per regression) and due to the defensive nature of bank stocks. The mean *Interest Exposure*, *Exchange Exposure*, and *Commodity Exposure* are equal to 0.25, 1.22, and 0.53, respectively. About 11% of the bank-year observations regard banks that report under IFRS. The distribution of the variable *Noninterest to Total Income* departs greatly from normality despite the fact that the variable is winsorized at the 1% level. Our results are qualitatively similar when we winsorize the variable *Noninterest to Total Income* at the 5% level.

Table 2.4 presents Spearman correlation coefficients between the dependent and independent variables of models 2.1 to 2.8. Panel A presents the correlation coefficients between the variables of models 2.1 to 2.4. Bank returns are positively correlated with equity market returns, with changes in interest rates, and with changes in commodity prices and negatively correlated with changes in exchange rates. Panel B presents the correlation coefficients between selected variables of models 2.5 to 2.8. The test variable *IFRS* is positively and significantly correlated with three out of four risk-exposure proxies; that is, the *IFRS* dummy is positively and significantly

Table 2.3
Descriptive Statistics

Panel A: Variables of models 2.1–2.4						
	Mean	Median	Std. Dev.	Skewness	Kurtosis	N
Return$_i$	−0.004	0.000	0.099	−0.615	6.584	106,164
Return$_m$	0.000	0.007	1.161	−0.495	12.760	106,164
Interest	−0.016	0.000	0.178	−0.150	5.494	106,164
Exchange	−0.001	−0.001	0.019	0.077	3.111	106,164
Commodity	0.005	0.010	0.046	−0.516	3.564	106,164
Panel B: Variables of models 2.5–2.8						
	Mean	Median	Std. Dev.	Skewness	Kurtosis	N
Equity Exposure	0.343	0.095	0.525	2.151	7.536	8,847
Interest Exposure	0.249	0.108	0.417	3.587	17.781	8,847
Exchange Exposure	1.217	0.858	1.206	2.045	8.726	8,847
Commodity Exposure	0.533	0.357	0.558	2.107	8.370	8,847
IFRS	0.114	0.000	0.318	2.427	6.888	8,847
Return Volatility	0.089	0.068	0.071	2.458	10.535	8,847
Total Assets	7.345	6.908	2.102	0.823	3.601	8,847
Book to Market	0.990	0.710	0.987	3.932	22.888	8,847
Financial Leverage	0.892	0.910	0.094	−4.878	31.063	8,847
ROA	9.047	3.175	13.633	3.377	21.690	8,847
Loans to Assets	0.694	0.706	0.140	−1.002	5.292	7,882
Deposits to Assets	0.686	0.742	0.185	−1.419	4.781	7,882
Noninterest to Total Income	0.107	0.002	0.846	39.746	2,432.356	7,882

This table presents descriptive statistics for the variables of models 2.1 to 2.4 (panel A) and the variables of models 2.5 to 2.8 (panel B). All variables are as defined in Appendix C.

Table 2.4

Correlation Matrix

Panel A: Spearman correlation coefficients of models 2.1–2.4 variables

	Return$_i$	*Return*$_m$	*Interest*	*Exchange*
Return$_m$	0.15***			
Interest	0.02***	−0.08***		
Exchange	−0.06***	−0.01***	0.06***	
Commodity	0.02***	0.14***	−0.07***	−0.05***

Panel B: Spearman correlation coefficients of models 2.5–2.8 variables

	Equity Exposure	*Interest Exposure*	*Exchange Exposure*	*Commodity Exposure*	*IFRS*	*Return Volatility*	*Total Assets*	*Book to Market*	*Financial Leverage*
Interest Exposure	−0.12***								
Exchange Exposure	0.08***	0.19***							
Commodity Exposure	−0.05***	0.23***	0.26***						
IFRS	0.37***	0.08***	0.13***	−0.02					
Return Volatility	0.07***	0.27***	0.45***	0.47***	0.03***				
Total Assets	0.31***	0.01	0.08***	0.01	0.36***	0.07***			
Book to Market	−0.13***	0.05***	0.05***	0.12***	0.01	0.22***	−0.17***		
Financial Leverage	0.18***	−0.02	0.04***	0.01	0.15***	0.06***	0.34***	−0.13***	
ROA	−0.38***	−0.01	−0.11***	−0.04***	−0.43***	−0.13***	−0.77***	−0.06***	−0.32***

This table presents Spearman correlation coefficients between the variables of models 2.1 to 2.4 (panel A) and between selected variables of models 2.5 to 2.8 (panel B). All variables are as defined in Appendix C. *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively, all two-tailed.

related to *Equity Exposure*, *Interest Exposure*, and *Exchange Exposure* but is unrelated to *Commodity Exposure*. There is high correlation between some of the independent variables of models 2.5 to 2.8 (e.g., *ROA* and *Total Assets*). However, all variance inflation factors are below 3, so multicollinearity is not an issue in our models.

2.5 Results

Table 2.5 presents the results of the univariate analysis for the dependent variables of models 2.5 to 2.8. Panel A reports the results of the univariate analysis for the treatment sample and panel B for the control sample. We split both samples in bank-year observations before the mandatory adoption of IFRS in 2005 (pre-IFRS) and after (post-IFRS). We report mean and median values as well as the differences in the means and medians across subsamples. We use *t*-test to compare the means and Wilcoxon rank-sum test to compare the medians. There is a statistically significant increase in the risk exposures of European banks after the adoption of IFRS in 2005. In the case of U.S. banks the pattern is mixed; *Interest Exposure*, *Exchange Exposure*, and *Commodity Exposure* increase after 2005 while *Equity Exposure* decreases. These findings provide preliminary evidence of increased risk exposure of European banks after the mandatory adoption of IFRS in 2005.

Table 2.6 presents the results of our main analysis. Panel A reports the results of the regressions on the baseline model when only *Return Volatility*, *Total Assets*, *Book to Market*, *Financial Leverage*, and *ROA* are used as control variables. Panel B presents the results of the regressions when the baseline model is extended to include controls that are only relevant to banks. So, we also include the variables *Loans to Assets*, *Deposits to Assets*, and *Noninterest to Total Income*. The results of the regressions on the baseline model in panel A show a statistically significant increase in the equity, exchange rate, and commodity risk exposures of European banks after the mandatory adoption of IFRS in 2005. We find no evidence of change in the interest rate exposure of banks. The coefficients of the control variables vary across the different models. This variation is most likely due to the endogenous nature of the variables and the highly regulated nature of banks. The explanatory power of the models ranges from 2.5% to 22.1%. The results of the regressions in panel B show a similar picture. Banks increased their exposure to three out of four risk categories after the adoption of IFRS. The addition of controls increases only moderately the explanatory power of our models. To sum up, the results of our main analysis provide evidence in support of H1b; the mandatory adoption of IFRS is associated with an increase in the risk exposure of European banks in our sample.

Table 2.5
Univariate Analysis

Panel A: Treatment sample				
		Pre-IFRS	Post-IFRS	Post-IFRS − Pre-IFRS
Equity Exposure	mean	0.552	0.842	0.290***
	median	0.376	0.760	0.384***
Interest Exposure	mean	0.123	0.287	0.164***
	median	0.061	0.149	0.088***
Exchange Exposure	mean	1.157	1.779	0.622***
	median	0.767	1.275	0.508***
Commodity Exposure	mean	0.387	0.494	0.107***
	median	0.274	0.354	0.080***
Panel B: Control sample				
		Pre-IFRS	Post-IFRS	Post-IFRS − Pre-IFRS
Equity Exposure	mean	0.360	0.093	−0.267***
	median	0.062	0.036	−0.026***
Interest Exposure	mean	0.113	0.398	0.285***
	median	0.070	0.194	0.124***
Exchange Exposure	mean	1.086	1.182	0.097***
	median	0.826	0.836	0.010
Commodity Exposure	mean	0.442	0.678	0.236***
	median	0.307	0.465	0.158***

This table presents the results of the univariate analysis for the dependent variables of models 2.5 to 2.8. Panel A presents the results of the univariate analysis for the treatment sample and panel B for the control sample. We split both samples in the period before the mandatory adoption of IFRS in 2005 (pre-IFRS) and in the period after the mandatory adoption of IFRS in 2005 (post-IFRS). We use *t*-test to compare the means and Wilcoxon rank-sum test to compare the medians. All variables are as defined in Appendix C. *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively, all two-tailed.

Table 2.6
Main Analysis

Panel A: Main model					
Independents	Sign	*Equity Exposure*	*Interest Exposure*	*Exchange Exposure*	*Commodity Exposure*
Intercept		0.324**	−0.853***	0.829*	−0.057
		(2.122)	(−4.902)	(1.867)	(−0.385)
IFRS	+	0.256***	0.008	0.670***	0.046**
		(8.939)	(0.483)	(10.629)	(2.379)
Return Volatility	+	0.611***	0.147	8.899***	3.448***
		(5.449)	(1.259)	(26.771)	(21.373)
Total Assets	±	−0.039**	0.180***	0.030	0.036***
		(−2.422)	(13.381)	(0.796)	(2.763)
Book to Market	±	−0.032***	0.137***	−0.172***	0.077***
		(−3.490)	(9.999)	(−6.908)	(5.293)
Financial Leverage	±	0.250	−0.387**	−0.604	−0.037
		(1.565)	(−2.312)	(−1.185)	(−0.242)
ROA	±	0.003**	−0.003***	0.001	−0.003***
		(2.278)	(−2.684)	(0.504)	(−2.912)
bank-year obs.		8,847	8,847	8,847	8,847

(Continued)

Table 2.6 – *Continued*

Independents	Sign	*Equity Exposure*	*Interest Exposure*	*Exchange Exposure*	*Commodity Exposure*
distinct banks		1,100	1,100	1,100	1,100
countries		23	23	23	23
years		12	12	12	12
R^2 within		2.45%	13.72%	20.79%	22.11%
Panel B: Extended model					
Independents	Sign	*Equity Exposure*	*Interest Exposure*	*Exchange Exposure*	*Commodity Exposure*
Intercept		0.316	−1.021***	1.783***	−0.042
		(1.628)	(−6.015)	(2.611)	(−0.181)
IFRS	+	0.288***	−0.003	0.704***	0.042**
		(9.954)	(−0.136)	(10.948)	(2.145)
Return Volatility	+	0.589***	0.069	9.387***	3.573***
		(5.017)	(0.542)	(27.003)	(20.038)
Total Assets	±	−0.038**	0.221***	−0.052	0.030**
		(−2.284)	(15.947)	(−1.285)	(1.973)
Book to Market	±	−0.028***	0.151***	−0.185***	0.074***
		(−2.606)	(10.238)	(−6.450)	(4.739)
Financial Leverage	±	0.571***	−0.850***	−0.816	−0.074
		(2.691)	(−4.186)	(−0.973)	(−0.304)
ROA	±	0.005***	−0.006***	0.004	−0.005***
		(4.313)	(−5.516)	(1.558)	(−3.901)
Loans to Assets	−	−0.489***	−0.355***	0.062	0.038
		(−5.568)	(−4.421)	(0.310)	(0.446)
Deposits to Assets	−	0.034	0.765***	−0.389	0.051
		(0.307)	(7.860)	(−1.387)	(0.501)
Noninterest to Total Income	+	−0.001	0.034***	0.007	0.017***
		(−0.165)	(4.384)	(0.733)	(3.556)
bank-year obs.		7,882	7,882	7,882	7,882
distinct banks		982	982	982	982
countries		23	23	23	23
years		12	12	12	12
R^2 within		3.51%	18.41%	22.71%	23.65%

This table presents the results of the regression analysis. Panel A presents the results of the regressions on the main model and panel B the results of the regressions on the extended model. All variables are as defined in Appendix C. The model parameters are estimated using Fixed Effects estimation technique and the standard errors are robust to heteroscedasticity and clustered by bank. The *t*-statistics are reported in parentheses below the coefficient estimates. *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively, all two-tailed.

We repeat our analysis after excluding the period of the subprime crisis. We exclude this period because asset price volatility is higher and asset co-movements are more pronounced during crises (e.g., Hartmann et al. [2004]). So, we exclude the years 2007, 2008, and 2009 and rerun the regressions on models 2.5 to 2.8. Table 2.7 presents the results of the regressions. Our main conclusions remain unchanged. The coefficients of the *IFRS* dummies are positive and statistically significant in three out of four cases. Hence, after controlling for the impact of the financial crisis, the adoption of IFRS remains associated with an increase in the risk exposure of banks in the treatment sample.

Table 2.7
Main Analysis Excluding the Crisis Period

Independents	Sign	*Equity Exposure*	*Interest Exposure*	*Exchange Exposure*	*Commodity Exposure*
Intercept		0.119	−2.198***	2.083***	−0.093
		(0.555)	(−10.113)	(2.770)	(−0.372)
IFRS	+	0.201***	−0.028	0.607***	0.038*
		(6.518)	(−0.993)	(8.381)	(1.729)
Return Volatility	+	1.470***	2.821***	9.883***	4.628***
		(6.289)	(12.159)	(18.772)	(16.129)
Total Assets	±	0.004	0.451***	−0.028	0.058***
		(0.183)	(19.714)	(−0.595)	(2.999)
Book to Market	±	−0.062***	0.142***	−0.322***	0.016
		(−3.853)	(7.327)	(−8.183)	(0.915)
Financial Leverage	±	0.347	−1.763***	−1.259	−0.389
		(1.461)	(−6.592)	(−1.260)	(−1.599)
ROA	±	0.005***	−0.005***	−0.000	−0.003**
		(3.349)	(−3.857)	(−0.020)	(−2.324)
Loans to Assets	−	−0.372***	0.163	−0.021	0.151
		(−3.376)	(1.331)	(−0.094)	(1.501)
Deposits to Assets	−	0.057	0.465***	−0.247	0.055
		(0.445)	(3.296)	(−0.736)	(0.487)
Noninterest to Total Income	+	−0.004	0.032***	0.008	0.014***
		(−0.887)	(3.971)	(1.292)	(5.324)
bank-year obs.		5,690	5,690	5,690	5,690
distinct banks		965	965	965	965
countries		22	22	22	22
years		9	9	9	9
R^2 within		2.67%	43.96%	17.71%	25.25%

This table presents the results of the regression analysis after excluding the period of the subprime crisis (i.e., years 2007–2009). All variables are as defined in Appendix C. The model parameters are estimated using Fixed Effects estimation technique and the standard errors are robust to heteroscedasticity and clustered by bank. The *t*-statistics are reported in parentheses below the coefficient estimates. *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively, all two-tailed.

Next, we test hypotheses 2 to 4. More specifically, we examine whether the change in the risk exposure after the adoption of IFRS is more pronounced for banks operating in countries where accounting numbers are more likely to be used for contracting purposes, for banks operating in countries with larger differences between local accounting standards and IFRS, and for banks operating in countries that impose fewer restrictions on banks' investment activities. We use the variables *Burden of Proof* and *Reporting Quality* to measure the propensity of banks to use financial numbers in management compensation contracts (Lins et al. [2011]). We measure the difference between local accounting standards and IFRS using the *Absence* and *Divergence* variables proposed by Ding et al. [2007] and we measure the level of restrictions on banks' investment activities using the variable *Investment Freedom* proposed by Barth, Caprio and Levine [2008]. We split our sample in banks that operate

in countries with above median values of the variable of interest and in banks that operate in countries with below median values of the variable of interest (e.g., High *Burden of Proof* and Low *Burden of Proof*), we run subsample regressions, and we compare the coefficients of the *IFRS* dummies.

Table 2.8 presents the results of the subsample analysis. Panels A to D present the results of the analysis when we split the sample by the variable *Burden of Proof*. In two out of four regressions, the increase in the risk exposure is significantly higher for the subsample of banks operating in countries with below median values of *Burden of Proof*, that is in countries where accounting numbers are more likely to be used in contracts. Panels E to H present the results of the analysis when we split the sample by the variable *Reporting Quality*. The differences in the coefficients of the *IFRS* dummies are statistically nonsignificant in all subsample regressions. Taken together, the results in panels A to H provide only limited support to hypothesis 2 that the impact of IFRS adoption will be more pronounced in countries where financial statement numbers are more likely to be used in management compensation contracts.

Panels I to L present the results of the subsample analysis when we split the sample by the variable *Absence*. The differences in the coefficients of the *IFRS* dummies are statistically nonsignificant in three out of four cases. The difference in the *IFRS* coefficients is statistically different from zero only when we use *Interest Exposure* as dependent. However, in contrast to our expectations, there is a statistically significant decrease in the interest rate exposure for the subsample of banks with smaller differences between local accounting standards and IFRS. In panels M to P, we split the sample by the variable *Divergence*. The differences in the coefficients are nonsignificant in three out of four regressions. Moreover, the difference in the coefficient of the *IFRS* dummy in panel N has the opposite sign of that expected; there is a statistically significant decrease in the interest rate risk exposure in the subsample of banks operating in countries with larger differences between local accounting standards and IFRS. Overall, the results of panels I to P do not lend support to hypothesis 3.

Finally, panels Q to T present the results of the subsample analysis when we split the sample by the degree of banks' investment freedom. The difference in the *IFRS* coefficients is statistically significant only in the case of *Interest Exposure*. But opposite to what we expect, the difference in the coefficients is driven by a statistically significant decrease in the interest rate exposure of banks with below median *Investment Freedom*. To summarize, the evidence provided by the subsample analysis of table 2.8 lends limited support to the idea that the change in the risk exposure of banks is more pronounced for the subsample of firms operating in countries where accounting numbers are more likely to be used for contracting purposes. In addition, we find no evidence of larger changes in the risk exposure for banks that operate in countries where local accounting standards differ more from IFRS

and for banks that have to comply with fewer restrictions on their investment activities.

Table 2.8
Subsample Analysis

Panel A: Effect of IFRS on *Equity Exposure*				
		High *Burden of Proof*	Low *Burden of Proof*	High *Burden of Proof* − Low *Burden of Proof*
IFRS	*coeff.*	0.290***	0.394***	−0.104*
	t-stat.	(10.243)	(8.140)	(*p*-value 0.094)
	N	7,288	6,428	
Panel B: Effect of IFRS on *Interest Exposure*				
		High *Burden of Proof*	Low *Burden of Proof*	High *Burden of Proof* − Low *Burden of Proof*
IFRS	*coeff.*	−0.035	0.098**	−0.133***
	t-stat.	(−1.419)	(2.206)	(*p*-value 0.001)
	N	7,288	6,428	
Panel C: Effect of IFRS on *Exchange Exposure*				
		High *Burden of Proof*	Low *Burden of Proof*	High *Burden of Proof* − Low *Burden of Proof*
IFRS	*coeff.*	0.650***	0.863***	−0.213
	t-stat.	(10.771)	(8.528)	(*p*-value 0.164)
	N	7,288	6,428	
Panel D: Effect of IFRS on *Commodity Exposure*				
		High *Burden of Proof*	Low *Burden of Proof*	High *Burden of Proof* − Low *Burden of Proof*
IFRS	*coeff.*	0.039	0.008	0.031
	t-stat.	(1.303)	(0.143)	(*p*-value 0.439)
	N	7,288	6,428	
Panel E: Effect of IFRS on *Equity Exposure*				
		High *Reporting Quality*	Low *Reporting Quality*	High *Reporting Quality* − Low *Reporting Quality*
IFRS	*coeff.*	0.327***	0.315***	0.012
	t-stat.	(9.877)	(9.304)	(*p*-value 0.831)
	N	6,917	6,799	
Panel F: Effect of IFRS on *Interest Exposure*				
		High *Reporting Quality*	Low *Reporting Quality*	High *Reporting Quality* − Low *Reporting Quality*
IFRS	*coeff.*	−0.010	−0.016	0.006
	t-stat.	(−0.342)	(−0.526)	(*p*-value 0.871)
	N	6,917	6,799	
Panel G: Effect of IFRS on *Exchange Exposure*				
		High *Reporting Quality*	Low *Reporting Quality*	High *Reporting Quality* − Low *Reporting Quality*
IFRS	*coeff.*	0.720***	0.704***	0.016
	t-stat.	(10.112)	(10.027)	(*p*-value 0.894)
	N	6,917	6,799	
Panel H: Effect of IFRS on *Commodity Exposure*				
				High *Reporting Quality* −

(Continued)

Table 2.8 – *Continued*

		High *Reporting Quality*	Low *Reporting Quality*	Low *Reporting Quality*
IFRS	*coeff.*	0.024	0.041	−0.017
	t-stat.	(0.677)	(1.115)	(*p*-value 0.609)
	N	6,917	6,799	
Panel I: Effect of IFRS on *Equity Exposure*				
				High *Absence* −
		High *Absence*	Low *Absence*	Low *Absence*
IFRS	*coeff.*	0.325***	0.299***	0.026
	t-stat.	(9.948)	(7.846)	(*p*-value 0.648)
	N	7,064	6,652	
Panel J: Effect of IFRS on *Interest Exposure*				
				High *Absence* −
		High *Absence*	Low *Absence*	Low *Absence*
IFRS	*coeff.*	0.022	−0.069**	0.091**
	t-stat.	(0.799)	(−2.012)	(*p*-value 0.012)
	N	7,064	6,652	
Panel K: Effect of IFRS on *Exchange Exposure*				
				High *Absence* −
		High *Absence*	Low *Absence*	Low *Absence*
IFRS	*coeff.*	0.757***	0.646***	0.111
	t-stat.	(11.499)	(8.167)	(*p*-value 0.342)
	N	7,064	6,652	
Panel L: Effect of IFRS on *Commodity Exposure*				
				High *Absence* −
		High *Absence*	Low *Absence*	Low *Absence*
IFRS	*coeff.*	0.033	0.033	0.000
	t-stat.	(0.999)	(0.798)	(*p*-value 0.993)
	N	7,064	6,652	
Panel M: Effect of IFRS on *Equity Exposure*				
				High *Divergence* −
		High *Divergence*	Low *Divergence*	Low *Divergence*
IFRS	*coeff.*	0.282***	0.366***	−0.084
	t-stat.	(8.837)	(9.660)	(*p*-value 0.120)
	N	7,082	6,634	
Panel N: Effect of IFRS on *Interest Exposure*				
				High *Divergence* −
		High *Divergence*	Low *Divergence*	Low *Divergence*
IFRS	*coeff.*	−0.065**	0.054	−0.119***
	t-stat.	(−2.337)	(1.562)	(*p*-value 0.001)
	N	7,082	6,634	
Panel O: Effect of IFRS on *Exchange Exposure*				
				High *Divergence* −
		High *Divergence*	Low *Divergence*	Low *Divergence*
IFRS	*coeff.*	0.620***	0.774***	−0.154
	t-stat.	(9.190)	(9.698)	(*p*-value 0.213)
	N	7,082	6,634	
Panel P: Effect of IFRS on *Commodity Exposure*				
				High *Divergence* −
		High *Divergence*	Low *Divergence*	Low *Divergence*

(Continued)

Table 2.8 – *Continued*

IFRS	*coeff.*	0.039	0.007	0.032
	t-stat.	(1.138)	(0.168)	(*p*-value 0.356)
	N	7,082	6,634	
Panel Q: Effect of IFRS on *Equity Exposure*				
		High *Investment Freedom*	Low *Investment Freedom*	High *Investment Freedom* − Low *Investment Freedom*
IFRS	*coeff.*	0.269***	0.356***	−0.087
	t-stat.	(8.876)	(8.215)	(*p*-value 0.167)
	N	7,178	6,538	
Panel R: Effect of IFRS on *Interest Exposure*				
		High *Investment Freedom*	Low *Investment Freedom*	High *Investment Freedom* − Low *Investment Freedom*
IFRS	*coeff.*	−0.001	−0.075*	0.074**
	t-stat.	(−0.029)	(−1.935)	(*p*-value 0.015)
	N	7,178	6,538	
Panel S: Effect of IFRS on *Exchange Exposure*				
		High *Investment Freedom*	Low *Investment Freedom*	High *Investment Freedom* − Low *Investment Freedom*
IFRS	*coeff.*	0.675***	0.699***	−0.024
	t-stat.	(10.310)	(7.851)	(*p*-value 0.846)
	N	7,178	6,538	
Panel T: Effect of IFRS on *Commodity Exposure*				
		High *Investment Freedom*	Low *Investment Freedom*	High *Investment Freedom* − Low *Investment Freedom*
IFRS	*coeff.*	0.049	0.009	0.040
	t-stat.	(1.507)	(0.195)	(*p*-value 0.229)
	N	7,178	6,538	

This table presents the results of the subsample analysis. We split the sample in banks with above median values of *Burden of Proof*, *Reporting Quality*, *Absence*, *Divergence*, and *Investment Freedom* (High *Burden of Proof*, High *Reporting Quality*, High *Absence*, High *Divergence*, and High *Investment Freedom*) and banks with below median values of *Burden of Proof*, *Reporting Quality*, *Absence*, *Divergence*, and *Investment Freedom* (Low *Burden of Proof*, Low *Reporting Quality*, Low *Absence*, Low *Divergence*, and Low *Investment Freedom*), we run subsample regressions, and compare the coefficients of the *IFRS* dummies. All variables are as defined in Appendix C. The model parameters are estimated using Fixed Effects (FE) estimation technique and the standard errors are robust to heteroscedasticity and clustered by bank. The *t*-statistics are reported in parentheses below the coefficient estimates. *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively, all two-tailed.

2.6 Untabulated Robustness Tests

As robustness test, we examine the sensitivity of our results to the choice of variables used to measure monthly changes in interest rates, exchange rates, and commodity prices. We alternatively measure interest rate changes as the monthly changes in the one year LIBOR instead of the monthly changes in the overnight LIBOR. The coefficient of the *IFRS* dummy is positive and significant at the 1% level (coefficient 0.278 and *p*-value 0.000). Further, we use the European Central Bank exchange rate basket of a group of 12 trading partners as a proxy for changes in exchange rates for European banks and the monthly percentage change in the Federal Reserve

Bank of St. Louis trade-weighted dollar denominated exchange rate basket of a broad group of U.S. trading partners for the case of U.S. banks. Our conclusions remain unchanged. The adoption of IFRS is associated with a statistically significant increase in the exchange rate risk exposure of banks in our sample (coefficient 0.685 and *p*-value 0.000). We also measure the changes in commodity prices using the Economist instead of the Dow Jones-UBS commodity index. The coefficient of the *IFRS* dummy is positive and statistically significant at the 1% level (coefficient 0.090 and *p*-value 0.000). Hence, our main conclusions are robust to alternative measures of interest rate, exchange rate, and commodity exposure. All untabulated results are available upon request.

2.7 Conclusion

Our analysis shows an increase in the risk exposure of European banks after the mandatory adoption of IFRS in 2005. Our results are robust to the exclusion of the period of the subprime crisis. We provide limited support to the hypothesis that the change in risk exposure is more pronounced in countries where accounting numbers are more likely to be used for contracting purposes. We find no evidence of larger changes in risk exposure for the subsample of banks operating in countries with larger differences between local accounting standards and IFRS and for the subsample of banks with fewer restrictions on their investment activities. Our findings are in line with theory that suggests that increased use of fair value accounting and increased disclosure requirements of hedging activities can increase managerial risk taking and can induce suboptimal hedging (e.g., Burkhardt and Strausz [2006]; DeMarzo and Duffie [1995]).

Our study adds to the literature by providing evidence on the real consequences of changes in accounting regulations. In particular, our paper contributes to existing research by exploring the impact of changes in accounting standards on a previously unexplored area, that is on banks' investment and hedging decisions. We document an increase in the risk exposure of banks. Nevertheless, the risks we are measuring are diversifiable. So, our findings do *not* suggest that IFRS adoption is associated with an increase in the risk that investors have to bear.

There are a number of caveats related to our study. All European listed banks mandatorily report under IFRS after 2005. So, controlling for concurrent effects that are unrelated to the adoption of IFRS is not a trivial task. Further, we do not distinguish the impact of changes in hedge and fair value accounting rules on the risk exposure of banks in our sample.

Appendix C. Variables definition

Variable name	Variable description
Return$_i$	monthly return of bank i
Return$_m$	monthly return of value-weighted equity market portfolio
Interest	monthly percentage change in overnight LIBOR
Exchange	monthly percentage change in the European Central Bank trade-weighted euro denominated exchange rate basket
Commodity	monthly percentage change in the Dow Jones-UBS value-weighted euro denominated commodity index
Equity Exposure	absolute value of coefficient from regression of bank-specific monthly returns on monthly returns of value-weighted equity market portfolio
Interest Exposure	absolute value of coefficient from regression of bank-specific monthly returns on monthly percentage changes in overnight LIBOR (Zhang [2009])
Exchange Exposure	absolute value of coefficient from regression of bank-specific monthly returns on monthly percentage changes in the European Central Bank trade-weighted euro denominated exchange rate basket (Zhang [2009])
Commodity Exposure	absolute value of coefficient from regression of bank-specific monthly returns on monthly percentage changes in the Dow Jones-UBS value-weighted euro denominated commodity index (Zhang [2009])
IFRS	dummy that takes the value of 1 if the bank is reporting under IFRS and zero otherwise
Return Volatility	standard deviation of monthly returns over a year
Total Assets	natural logarithm of total assets measured in U.S. dollars
Book to Market	book value of equity to market value of equity
Financial Leverage	total liabilities to total assets
ROA	net income to total assets
Loans to Assets	total loans to total assets
Deposits to Assets	total deposits to total assets
Noninterest to Total Income	non-interest income to net income
Burden of Proof	country-specific index that measures the difficulty to prove liability of accountants due to misleading financial statements (La Porta et al. [2006])
Reporting Quality	country-specific index that measures financial reporting quality taken from CIFAR (Bushman et al. [2004])
Absence	measure of the extent to which accounting rules regarding specific topics are covered in IAS but are not covered in local

(Continued)

Appendix C – *Continued*

Variable name	Variable description
	accounting standards (Ding et al. [2007]). This variable is only applicable to banks that report under IFRS
Divergence	measure of the extent to which accounting rules regarding specific topics differ between IAS and local accounting standards (Ding et al. [2007]). This variable is only applicable to banks that report under IFRS
Investment Freedom	measure of the regulatory restrictions imposed on banks investment activities taken from Barth, Landsman and Lang [2008]

Chapter 3

Aggregate Earnings and Corporate Bond Markets*

3.1 Introduction

Empirical literature shows that firm-specific earnings are positively related to firm-specific stock returns (e.g., Ball and Brown [1968]; Beaver [1968]) and positively related to firm-specific corporate bond returns (e.g., Datta and Dhillon [1993]; Easton et al. [2009]). However, the earnings-returns relation at firm level differs considerably from the earnings-returns relation at market level. Kothari et al. [2006] document a negative relation between quarterly aggregate earnings changes and stock market returns and Cready and Gurun [2010] confirm this negative relation using daily frequency data. Existing research on aggregate earnings focuses on the relation between aggregate earnings changes and stock market returns. I extend this stream of literature by examining the relation between aggregate earnings changes and corporate bond market returns.

This research question is important for various reasons. First, the information content of earnings is interesting because earnings are the primary summary indicator of a firm's performance and for this reason earnings are used both for valuation and for contracting purposes. For example, analysts forecast earnings per share and they use these forecasts to derive an estimate of the firm's value and earnings are used in debt covenants and in management compensation contracts. Consequently, studying the information content of earnings and their relation

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to capital markets has implications for managers, investors, and regulators. Second, academic literature provides extensive evidence on the information content of firm-specific earnings. However, firm-specific earnings contain different type of information than aggregate earnings; firm-specific earnings contain primarily information about firm-specific cash flows while aggregate earnings contain primarily information about discount rates. Aggregate earnings contain information about discount rates because aggregate earnings move together with the macroeconomy. As a result, understanding the earnings-returns relation at firm level does not necessarily translate to an understanding of the earnings-returns relation at market level. Third, corporate bonds are different than stocks because corporate bonds have shorter maturities and predetermined and senior payments compared to stocks. Subsequently, prior findings on the relation between aggregate earnings and stock market returns are not generalizable to corporate bond markets. Fourth, the relation between aggregate earnings and market returns is interesting over and above the relation between firm-specific earnings and firm-specific asset returns for well diversified investors who invest in the market.

Aggregate earnings move together with cash flows (cash-flow effect) and with discount rates (discount-rate effect). Aggregate earnings changes are positively related to changes in cash flows because higher than expected earnings provide good news about future cash flows. Nevertheless, the relation between aggregate earnings and discount rates remains an open question. Sadka and Sadka [2009] argue that aggregate earnings are negatively related to discount rates. In particular, they suggest that aggregate earnings are highly predictable. High expected aggregate earnings reduce investors risk aversion and/or decrease risk, which ultimately reduces risk premia. As a result, the negative contemporaneous aggregate earnings-returns relation is driven by a negative relation between expected aggregate earnings changes and expected returns. Patatoukas and Yan [2011] suggest that aggregate earnings are positively related to discount rates. More specifically, they argue that aggregate earnings contain new information and they claim that the negative aggregate earnings-returns relation is driven by a positive relation between unexpected aggregate earnings changes and discount-rate news. Regardless of which of these two streams of literature is correct, the fact remains that the cash-flow effect and the discount-rate effect of aggregate earnings move asset prices in opposite directions.

In the case of stocks, the discount-rate effect dominates the cash-flow effect and the aggregate earnings-returns relation is negative. But the relation between aggregate earnings and corporate bond market returns is not clear a priori. On the one hand, payments to bondholders are predetermined and have priority over payments to other stakeholders. Thus, the sensitivity of corporate bond market returns to cash-flow changes is low. On the other hand, corporate bonds have shorter maturities than other claims on firm's assets. Therefore, their sensitivity to discount-rate changes is low. Taking the abovementioned into account, it is an empirical question whether the

cash-flow effect or the discount-rate effect will be the dominant force in the relation between aggregate earnings changes and corporate bond market returns.

I test this relation using a sample of quarterly observations from January 1973 to December 2010. I find that aggregate earnings changes are negatively related to investment-grade corporate bond market returns and positively but nonsignificantly related to high-yield corporate bond market returns. My results are opposite to prior firm-level findings of a positive relation between firm-specific earnings changes and firm-specific corporate bond returns and are in line with prior market-level findings of a negative relation between aggregate earnings changes and stock market returns. Further, my findings provide support to the theory that aggregate earnings move together with cash flows and with discount rates.

In addition, I test whether the relation between aggregate earnings changes and corporate bond market returns depends on corporate bond credit ratings and corporate bond maturities. The impact of credit ratings on the aggregate earnings-returns relation is not obvious ex-ante. On the one hand, it is possible that the aggregate earnings-returns relation is lower for bonds with higher credit ratings. Low-rated bonds are more sensitive to changes in cash flows than high-rated bonds (Easton et al. [2009]). Hence, the cash-flow effect of aggregate earnings should be stronger for low-rated bonds. Further, literature suggests that aggregate earnings are positively related to interest rates (Patatoukas and Yan [2011]). Interest rates are negatively related to credit spreads and this negative relation is more pronounced for low-rated bonds (Duffee [1998]). The change in credit spreads dampens the relation between aggregate earnings and discount rates and ultimately reduces the discount-rate effect of aggregate earnings. Taking the aforementioned into account, the discount-rate effect of aggregate earnings should be weaker for low-rated bonds. On the other hand, it is possible that the aggregate earnings-returns relation is lower for bonds with lower credit ratings. The reason is that low-rated bonds are more sensitive to discount-rate changes compared to high-rated bonds (Fama and French [1989]). Concerning the impact of bond maturity on the aggregate earnings-returns relation, long-term bonds are by construction more sensitive to changes in discount rates than short-term bonds. In addition, long-term bonds are less sensitive to changes in cash flows compared to short-term bonds because cash-flow shocks are less persistent than discount-rate shocks (Campbell [1991]). Therefore, I expect that the aggregate earnings-returns relation will be lower for long-term compared to short-term bonds.

My analysis shows that there is indeed variation in the aggregate earnings-returns relation across bonds of different credit ratings and different maturities. In particular, I find that the relation between aggregate earnings changes and bond market returns is lower for bonds with higher credit ratings and for bonds with longer matu-

rities. Thus, corporate bond characteristics have an impact on the sensitivity of bonds to changes in cash flows and to changes in discount rates. Prior literature shows that corporate bond credit ratings have an effect on the earnings-returns relation at firm level. I find that both corporate bond credit ratings and corporate bond maturity impact the earnings-returns relation at market level.

Then, I decompose aggregate earnings changes to aggregate accruals changes and aggregate cash-flow changes and examine their relation to corporate bond market returns. Literature shows that the negative relation between aggregate earnings changes and stock market returns is driven by the information contained in aggregate accruals (Hirshleifer et al. [2009], Guo and Jiang [2011]).[1] I test whether the same holds for the corporate bond markets. To that end, first, I regress corporate bond market returns on aggregate accruals changes and then, I regress corporate bond market returns on aggregate cash-flow changes. Surprisingly, I find that aggregate accruals have limited explanatory power over corporate bond market returns. In contrast, aggregate cash flows are significantly and negatively related to corporate bond market returns. These results demonstrate an interesting difference in the pricing of information by the stock and corporate bond markets.

Next, I attempt to determine whether the relation between aggregate earnings changes and corporate bond market returns is driven by the expected or the unexpected component of aggregate earnings. For this purpose, I perform four sets of tests. First, I control for lagged aggregate earnings changes and lagged corporate bond market returns in the regressions of corporate bond market returns on contemporaneous aggregate earnings changes. In this way, I am more confident that the coefficient of aggregate earnings changes captures the relation between unexpected aggregate earnings changes and bond market returns. My analysis shows that aggregate earnings changes remain negatively and significantly related to investment-grade corporate bond market returns. Further, aggregate earnings changes become positively and significantly related to high-yield corporate bond market returns. Thus, it appears that the relation between aggregate earnings changes and market returns is not driven by the expected but by the news component of aggregate earnings. Second, I examine the relation between aggregate earnings changes and future corporate bond market returns. If aggregate earnings provide new information about discount rates, then they must be positive predictors of corporate bond returns. I find that aggregate earnings changes are for the most part unrelated to future bond returns. These results contradict the idea that aggregate earnings contain new information and are in line with the theory put forward by Sadka and Sadka [2009]. Third, I regress aggregate earnings changes on various proxies for discount-rates news and fourth, I

[1] Kang et al. [2010] show that aggregate discretionary accruals drive the negative relation between aggregate total accruals and stock market returns. I focus my analysis on aggregate total accruals to circumvent issues related to the measurement of aggregate discretionary accruals.

test the relation between corporate bond market returns and aggregate earnings changes after controlling for these discount-rate-news proxies. Aggregate earnings changes are negatively related to changes in term premia and positively related to changes in expected inflation and to growth in industrial production. These results uncover an important difference in the information content of firm-specific and market earnings. Firm-specific earnings contain information about default risk (e.g., Callen et al. [2009]) while market earnings contain primarily information about term premia and future inflation. Further, these results provide limited support to the idea that aggregate earnings changes are positively related to discount-rate news. In addition, I find that aggregate earnings changes do not lose their explanatory power over corporate bond market returns after controlling for the various discount-rate-news proxies. These latter findings do not support the idea that aggregate earnings surprises are positively related to discount-rate news. In summary, the four aforementioned sets of tests provide conflicting evidence. Therefore, I cannot conclude whether it is the expected or the news component of aggregate earnings that drives the relation between aggregate earnings changes and corporate bond market returns.

My study contributes to the literature in a number of ways. First, my findings suggest that aggregate earnings contain information both about cash flows and about discount rates. Prior literature documents that firm-specific earnings contain mainly information about cash flows. Hence, my findings are important because they suggest that aggregate earnings can provide different type of information to investors than firm-specific earnings. Second, I show that corporate bond characteristics—and in particular corporate bond credit ratings and corporate bond maturity—are important determinants of the earnings-returns relation at the aggregate level. Existing literature shows that only corporate bond credit ratings impact the earnings-returns relation at firm level. Third, I provide evidence of differential pricing of information by the stock and corporate bond markets. More specifically, I show that the relation between aggregate accruals, aggregate cash flows, and corporate bond market returns is different than the relation between aggregate accruals, aggregate cash flows, and stock market returns.

The remainder of the chapter is organized as follows. I discuss the data in section 3.2. In section 3.3, I present my empirical findings. I present the robustness tests in section 3.4 and in section 3.5, I conclude.

3.2 Data and Summary Statistics

3.2.1 Sample Selection, Variables Description, and Empirical Methods

My sample consists of all firms with data available in Compustat North America Fundamentals Quarterly from January 1973 to December 2010. I exclude firm-quarter observations with beginning of year market value of equity below $1 million. I drop firms that are not listed in NYSE, AMEX, or NASDAQ to increase the comparability of my results to previous studies. I exclude firms with fiscal year ends other than March, June, September, and December to better align the aggregate earnings changes with the quarterly corporate bond market returns. I drop firms with earnings announcement dates more than three months after the quarter end to exclude stale earnings. I exclude the top and bottom 0.5% of firms ranked by earnings changes each quarter. My results are qualitatively similar when I impose none of the aforementioned sample selection criteria.

I measure aggregate earnings changes ($\Delta E/A$) as the value-weighted average of firm-specific quarterly earnings changes.[2] I calculate firm-specific earnings changes as earnings in the current quarter minus earnings four quarters ago scaled by lagged total assets. The scaling factor is lagged by four quarters. I measure earnings as income before extraordinary items. These criteria and data requirements yield a sample of 360,614 firm-quarter observations. My results are qualitatively similar when I scale firm-specific earnings changes by lagged market value of equity, lagged absolute earnings, lagged absolute book value of equity, and lagged enterprise value. My results are also robust to calculating firm-specific earnings changes as the quarterly firm-specific analyst forecast errors. Further, my main inferences are the same when I use operating income after depreciation instead of income before extraordinary items as a measure of earnings.

To measure quarterly corporate bond market returns, I use the total returns of the value-weighted Bank of America Merrill Lynch U.S. Corporate Bond Indices downloaded from Bloomberg. Total return is the sum of price return, accrued interest return, and coupon return. I use ten corporate bond indices with different maturities and different credit ratings (*R_1-3_AAA-AA, R_1-3_A-BBB, R_3-5_AAA-AA, R_3-5_A-BBB, R_5-10_AAA-AA, R_5-10_A-BBB, R_15+_AAA-AA, R_15+_A-BBB, R_all_invest_grade, R_all_high_yield*). The numbers in the names of the corporate bond indices represent the remaining maturities of the bonds that comprise the indices and the letters represent the credit ratings of the bonds that comprise the indices. The credit ratings are the average of the indi-

[2]The corporate bond indices used as dependents are value-weighted. Hence, I use value-weighted aggregate earnings changes to better match the weighting of the dependent and independent variables. The results of my analysis are the same, when I use equal-weighted aggregate earnings changes as independents.

vidual bond ratings provided by Moody's, Standard & Poor's, and Fitch. *R_all_invest_grade* and *R_all_high_yield* are indices comprising bonds of all available maturities that are investment-grade and high-yield, respectively.

The average number of issues populating the indices is 852 and each firm participates in each index with less than two issues, on average. As a result, the corporate bond indices used in my analysis are well diversified. The indices are rebalanced monthly, so the average remaining maturity and the average credit ratings of the indices remain fairly stable through time. Further, the investment-grade (high-yield) corporate bonds included in the indices have a minimum outstanding value equal to \$250 (\$100) million. Bond issuance size is positively associated with bond liquidity (e.g., Hong and Warga [2000]). Hence, the corporate bond indices used in my analysis include relatively liquid bond issues. In addition, zero returns occur less than 0.3% of the trading days in my sample, which further suggests that bond illiquidity is not an issue.

I calculate aggregate accruals changes ($\Delta Acc/A$) as the value-weighted average of firm-specific accruals changes and aggregate cash-flow changes ($\Delta CF/A$) as the value-weighted average of firm-specific cash-flow changes. Firm-specific accruals change is the seasonally differenced quarterly accruals scaled by lagged total assets and firm-specific cash-flow change is the seasonally differenced quarterly cash flows scaled by lagged total assets. I measure firm-specific accruals using the indirect balance sheet method. Hence, accruals are defined as the change in noncash current assets minus the change in current liabilities excluding the changes in short-term debt minus depreciation and amortization. I measure firm-specific cash flows as the difference between income before extraordinary items and accruals. I truncate the top and bottom 0.5% of firms ranked by firm-specific accruals changes and firm-specific cash-flow changes each quarter. This leaves me with 210,879 firm-quarter observations.

I use the following six proxies for discount-rate news. First, I use the ΔCP factor calculated as the quarterly change in the fitted value from a regression of equal-weighted excess returns on bonds of two, three, four, and five years maturities on a constant, the one-year yield, and the forward rates of two, three, four, and five years (Cochrane and Piazzesi [2005]). Second, I use the variable $\Delta term$ calculated as the quarterly change in the spread between the yield of a ten-year constant maturity Treasury note index and the yield of a one-year constant maturity Treasury note index (Fama and French [1989]). Third, I use the variable $\Delta default$ calculated as the quarterly change in the spread between the yield of a U.S. corporate bond index that includes corporate bonds with maturities greater than ten years and the yield of a U.S. Treasury bond index that includes Treasury bonds with maturities greater than ten years (Fama and French [1989]). Fourth, I use the variable $\Delta tbill$ measured as the quarterly change in the yield of the three-month Treasury bill (Fama and French [1989]). Fifth, I use the variable

Δexp_infl calculated as the quarterly change in inflation expectations taken from the University of Michigan Survey of Consumers (Fama and Schwert [1977]).[3] And sixth, I use *Gindpro* measured as the quarterly growth in industrial production. Industrial production growth is a leading indicator of macroeconomic activity and is positively related to discount-rate news (Chen [1991]; Campbell and Mei [1993]). The changes in the discount-rate proxies are measured from the end of quarter $t-1$ to the end of quarter t. I get the Fama-Bliss data of one through five years discount bond prices used to calculate the ΔCP factor from CRSP. I retrieve data to calculate $\Delta term$, $\Delta tbill$, Δexp_infl, and *Gindpro* from the Federal Reserve Economic Data database of the Federal Reserve Bank of St. Louis. I retrieve the yields necessary to calculate the variable $\Delta default$ from Datastream.

For the estimation of my models, I use Ordinary Least Squares Regression (OLS) and Newey-West heteroscedasticity and autocorrelation consistent standard errors. I set the bandwidth of the Bartlett kernel to the integer value of $4\times(\frac{T}{100})^{\frac{2}{9}}$ (Newey and West [1987]) where T is the number of observations used in the time-series regressions. So, I use four lags in my estimations since the number of quarterly observations ranges from 91 to 152.

3.2.2 Summary Statistics

Table 3.1 reports summary statistics for all the variables of the regression models. The mean quarterly returns of the various corporate bond indices range from 1.90% to 2.28%. As expected, bonds with longer maturities and bonds with lower credit ratings have higher returns, on average. However, the differences in the means are not statistically different from zero. The mean quarterly aggregate earnings change ($\Delta E/A$) is equal to 0.16% and is similar to previous studies. Aggregate earnings changes exhibit significant time-series variation. Further, some variables are persistent but the augmented Dickey-Fuller test rejects the null hypothesis of unit root for all the variables at the 1% level.

Table 3.2 presents Spearman correlation coefficients between selected variables. The quarterly returns of the various corporate bond indices are positively and significantly correlated at the 1% level. Thus, there is significant degree of commonality in the returns of the various corporate bond indices. Aggregate earnings changes are negatively and significantly related to the returns of the corporate bond indices; the correlation coefficients range from -0.29 to -0.42 and are significant at the 1% level. These correlations are in contrast to the posi-

[3] Alternatively, I could measure inflation expectations as the spread between the yield of a Treasury bond and the yield of a Treasury Inflation Protected (TIP) security of the same maturity. However, yields of TIP securities are only available from September 1997 and onwards. So, using TIPs would reduce significantly my sample size and would decrease the power of my tests. For the same reason, I measure default premia using credit spreads instead of credit default swap prices.

Table 3.1
Summary Statistics

	Mean	Median	St.Dev.	Skew.	Kurt.	Autocorr.	N
R_1-3_AAA-AA	1.90%	1.59%	1.96%	1.872	10.716	0.056	140
R_1-3_A-BBB	1.99%	1.78%	1.86%	1.143	9.259	0.190	140
R_3-5_AAA-AA	2.02%	1.84%	2.72%	1.190	8.645	−0.079	140
R_3-5_A-BBB	2.07%	1.93%	2.69%	1.062	7.741	0.069	135
R_5-10_AAA-AA	2.09%	1.78%	3.71%	0.616	5.308	−0.086	152
R_5-10_A-BBB	2.14%	1.82%	3.63%	0.678	5.856	0.066	152
R_15+_AAA-AA	2.23%	1.77%	5.45%	0.572	5.338	−0.128	152
R_15+_A-BBB	2.28%	1.97%	5.17%	0.534	5.572	−0.024	152
R_all_invest_grade	2.09%	1.81%	4.10%	0.757	6.889	−0.004	152
R_all_high_yield	2.26%	2.38%	4.90%	0.243	8.452	0.340	97
$\Delta E/A$	0.16%	0.22%	0.43%	−1.591	9.673	0.684	152
$\Delta Acc/A$	−0.17%	−0.13%	0.58%	−3.383	23.397	0.393	143
$\Delta CF/A$	0.32%	0.31%	0.64%	2.496	20.490	0.405	143
ΔCP	0.00%	−0.11%	1.67%	0.934	10.646	−0.253	152
$\Delta term$	0.01%	−0.02%	0.68%	2.131	16.955	−0.164	152
$\Delta default$	0.01%	−0.01%	0.29%	−0.939	15.960	0.181	151
$\Delta tbill$	−0.11%	0.00%	0.73%	−2.974	18.605	0.138	115
Δexp_infl	−0.03%	0.00%	0.65%	−1.189	6.151	−0.139	131
Gindpro	0.50%	0.74%	1.72%	−1.638	7.576	0.465	152

This table presents summary statistics for the dependent and independent variables used in the regressions. All variables are as defined in Appendix D. My sample extends from January 1973 to December 2010.

tive correlations between earnings changes and corporate bond returns at firm level (e.g., Easton et al. [2009]) and are in line with the negative correlations between earnings changes and stock returns at market level (e.g., Kothari et al. [2006]). Aggregate accruals changes ($\Delta Acc/A$) are uncorrelated with corporate bond market returns and aggregate cash-flow changes ($\Delta CF/A$) are negatively and significantly correlated with corporate bond market returns. These latter correlation coefficients are in contrast to previous findings of a significantly negative relation between aggregate accruals changes and stock market returns and a significantly positive relation between aggregate cash-flow changes and stock market returns (Hirshleifer et al. [2009]). These coefficients provide preliminary evidence of differential pricing of aggregate accruals and aggregate cash flows by the stock and corporate bond markets.

Aggregate earnings changes are significantly correlated with three out of six discount-rate proxies. More specifically, aggregate earnings changes are unrelated to changes in the Cochrane and Piazzesi [2005] factor (ΔCP). Further, aggregate earnings changes are negatively and significantly related to changes in term premia ($\Delta term$). This correlation coefficient has the opposite sign of that expected assuming that aggregate earnings changes are positively related to discount rates. Aggregate earnings changes are unrelated to changes in default premia

($\Delta default$). This result comes in contrast to prior findings of a strong negative relation between firm-specific earnings and default risk (Callen et al. [2009]). In line with prior literature (Patatoukas and Yan [2011]), aggregate earnings changes are positively and significantly related to changes in interest rates ($\Delta tbill$) and to industrial production growth (*Gindpro*). Further, in contrast to prior findings (Shivakumar [2007]) aggregate earnings changes are unrelated to changes in inflation expectations (Δexp_infl). Taken as a whole, these findings provide preliminary evidence that aggregate earnings move together with discount rates.

3.3 Results

3.3.1 Corporate Bond Market Returns and Aggregate Earnings

In this section, I examine the relation between corporate bond market returns and contemporaneous aggregate earnings changes. Table 3.3, panel A presents the results of the analysis. Aggregate earnings changes are negatively and significantly related to the returns of the investment-grade corporate bond indices (Columns 1 to 9). Further, aggregate earnings changes are positively but nonsignificantly related to the returns of the high-yield corporate bond index (Column 10).[4] These results suggest that aggregate earnings move together with cash flows and with discount rates. The discount-rate effect of aggregate earnings dominates the cash-flow effect in the case of investment-grade corporate bond indices but the cash-flow effect swamps the discount-rate effect in the case of the high-yield corporate bond index. Aggregate earnings changes explain between 0.6% and 5.7% of quarterly corporate bond market returns. The low adjusted R^2s are presumably due to the confounding impact of the cash-flow effect and the discount-rate effect of aggregate earnings. The relation between aggregate earnings changes and investment-grade corporate bond market returns is not only statistically but also economically significant; a two-standard-deviation positive shock to aggregate earnings changes corresponds to a 0.7%–2.7% decrease in investment-grade corporate bond market returns.

In table 3.3, panels B and C, I test whether the aggregate earnings-returns relation depends on corporate bond characteristics. Table 3.3, panel B presents the differences in the coefficients of $\Delta E/A$ for pairs of bonds with the same maturity but different credit ratings. All differences are negative but only the difference in the coefficients of the last pair of bonds is statistically significant. The nonsignificant differences of the first four pairs are probably

[4] The results of my analysis are not sensitive to the exclusion of the period 2001–2003 (Jorgensen et al. [2009]).

Table 3.2

Correlation Matrix

	R_1-3_ AAA-AA	*R_1-3_ A-BBB*	*R_15+_ AAA-AA*	*R_15+_ A-BBB*	*ΔE/A*	*ΔAcc/A*	*ΔCF/A*	*ΔCP*	*Δterm*	*Δdefault*	*Δtbill*	*Δexp_infl*
R_1-3_ A-BBB	0.92***											
R_15+_ AAA-AA	0.74***	0.68***										
R_15+_ A-BBB	0.72***	0.71***	0.97***									
ΔE/A	−0.42***	−0.42***	−0.30***	−0.29***								
ΔAcc/A	−0.12	−0.08	−0.10	−0.10	0.49***							
ΔCF/A	−0.31***	−0.31***	−0.21**	−0.20**	0.53***	−0.38***						
ΔCP	−0.19**	−0.12	−0.40***	−0.35***	−0.08	0.02	−0.12					
Δterm	0.16*	0.14	−0.24**	−0.23**	−0.27***	−0.25***	−0.04	0.46***				
Δdefault	0.04	−0.13	0.13	−0.02	0.06	−0.02	0.05	−0.27***	−0.27***			
Δtbill	−0.51***	−0.43***	−0.37***	−0.35***	0.37***	0.20**	0.18*	−0.07	−0.59***	−0.02		
Δexp_infl	−0.17*	−0.13	−0.30***	−0.28***	0.14	0.06	0.10	0.14	0.17*	−0.09	0.09	
Gindpro	−0.28***	−0.22**	−0.20**	−0.20**	0.29***	0.06	0.27***	−0.12	−0.23**	−0.09	0.42***	0.02

This table presents Spearman correlation coefficients between selected dependent and independent variables used in the regressions. All variables are as defined in Appendix D. My sample extends from January 1973 to December 2010. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

because these pairs capture the differences in the coefficients of $\Delta E/A$ for investment-grade bonds while the last pair captures the difference in the coefficients of $\Delta E/A$ for investment-grade versus high-yield bonds. The results in panel B show that the aggregate earnings-returns relation is lower for high-rated compared to low-rated bonds. These results provide support to the hypothesis that low-rated bonds are more sensitive to cash-flow changes than high-rated bonds. These findings are also in line with the proposition that the discount-rate effect of aggregate earnings is weaker for low-rated bonds because the dampening effect of credit spreads is more pronounced for bonds with low credit ratings.

Table 3.3, panel C presents the differences in the coefficients of aggregate earnings changes for pairs of bonds with the same credit rating but different maturities. The differences in the coefficients are, as expected, positive and statistically different from zero at the 11% level or lower. Long-term bonds are more negatively related to aggregate earnings changes than short-term bonds. These findings are in line with long-term bonds being more sensitive to discount-rate changes and with short-term bonds being more sensitive to cash-flow changes. I should note that the indices used in my analysis also include callable bonds that are at least one year from the first call date. Even though call options are more common for long-term compared to short-term bonds (Kish and Livingston [1992]), the results of table 3.3, panel C are not driven by differences in the optionality of the corporate bond indices but by differences in corporate bond maturities. Embedded call options decrease the sensitivity of corporate bond prices to interest rate changes. Therefore, the higher percentage of callable bonds for long-term compared to short-term indices should decrease the discount-rate effect of aggregate earnings and should ultimately have a positive impact on the aggregate earnings-returns relation.

To sum up, the findings in table 3.3, panels B and C provide evidence of variation in the aggregate earnings-returns relation across different types of bonds. The aggregate earnings-returns relation is lower for bonds with higher credit ratings and for bonds with longer maturities. These findings suggest that corporate bond characteristics have an impact on the sensitivity of corporate bond prices to changes in cash flows and to changes in discount rates. Prior literature finds that corporate bond credit ratings have an impact on the relation between firm-specific earnings and firm-specific returns. I show that both corporate bond credit ratings and corporate bond maturities matter at the aggregate level.

Table 3.3

Corporate Bond Market Returns and Contemporaneous Aggregate Earnings Changes

Panel A: Corporate bond market returns and contemporaneous aggregate earnings changes										
	$R\_1\text{-}3\_AAA\text{-}AA_t$	$R\_1\text{-}3\_A\text{-}BBB_t$	$R\_3\text{-}5\_AAA\text{-}AA_t$	$R\_3\text{-}5\_A\text{-}BBB_t$	$R\_5\text{-}10\_AAA\text{-}AA_t$	$R\_5\text{-}10\_A\text{-}BBB_t$	$R\_15+\_AAA\text{-}AA_t$	$R\_15+\_A\text{-}BBB_t$	$R\_all\_invest\_grade_t$	$R\_all\_high\_yield_t$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.020***	0.021***	0.022***	0.022***	0.024***	0.024***	0.027***	0.027***	0.024***	0.021***
	(9.914)	(9.086)	(8.891)	(7.460)	(7.252)	(6.318)	(5.734)	(5.412)	(6.013)	(3.142)
$\Delta E/A_t$	−1.001**	−0.835*	−1.583***	−1.167*	−1.951***	−1.560**	−3.178***	−2.601***	−1.984**	1.261
	(−2.550)	(−1.793)	(−3.033)	(−1.904)	(−2.813)	(−2.066)	(−2.815)	(−2.654)	(−2.457)	(1.010)
N	140	140	140	135	152	152	152	152	152	97
Adj. R^2	4.08%	3.00%	5.54%	2.80%	4.55%	2.81%	5.74%	4.10%	3.74%	0.56%
Panel B: Impact of bond credit ratings on the aggregate earnings-returns relation										
	(1)−(2)		(3)−(4)		(5)−(6)		(7)−(8)		(9)−(10)	
difference in	−0.166		−0.416		−0.391		−0.577		−3.245**	
$\Delta E/A$ coeff.	(−0.272)		(−0.517)		(−0.382)		(−0.386)		(−2.182)	
Panel C: Impact of bond maturity on the aggregate earnings-returns relation										
	(1)−(7)	(2)−(8)								
difference in	2.177*	1.766								
$\Delta E/A$ coeff.	(1.821)	(1.627)								

Panel A of this table presents the results of the regressions of the returns of various corporate bond indices on contemporaneous aggregate earnings changes. Panel B presents the differences in the coefficients of aggregate earnings changes from panel A for pairs of corporate bond indices with the same maturity but different credit ratings. Panel C presents the differences in the coefficients of aggregate earnings changes from panel A for pairs of corporate bond indices with the same credit rating but different maturities. All variables are as defined in Appendix D. My sample extends from January 1973 to December 2010. I use Ordinary Least Squares for the calculation of the regression coefficients and Newey-West heteroscedasticity and autocorrelation consistent standard errors. The *t*-statistics are reported in parentheses below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

3.3.2 Corporate Bond Market Returns, Aggregate Accruals, and Aggregate Cash Flows

In this section, I decompose aggregate earnings changes to aggregate accruals changes ($\Delta Acc/A$) and aggregate cash-flow changes ($\Delta CF/A$) and examine whether it is aggregate accruals or aggregate cash flows that drive the negative aggregate earnings-returns relation. Table 3.4, panel A presents the results of the regressions of corporate bond market returns on $\Delta Acc/A$. All regression coefficients are statistically nonsignificant. Table 3.4, panel B describes the results of the regressions when $\Delta CF/A$ is used as independent. Aggregate cash-flow changes are negatively and significantly related to contemporaneous investment-grade corporate bond market returns. In addition, aggregate cash-flow changes are positively related to high-yield corporate bond market returns but the regression coefficient is not statistically different from zero. The results of table 3.4, panels A and B are in contrast to prior literature that reports a negative relation between aggregate accruals changes and stock market returns and a positive relation between aggregate cash-flow changes and stock market returns (Hirshleifer et al. [2009]).[5]

Table 3.4, panel C presents the results of the regressions of corporate bond market returns on both components of aggregate earnings. Aggregate accruals changes are weakly and negatively related to investment-grade corporate bond market returns and aggregate cash-flow changes remain negatively and significantly related to investment-grade corporate bond market returns. Thus, in the case of corporate bonds, it is the information in aggregate cash flows that drives the negative aggregate earnings-returns relation. It is hard to reconcile my finding to those of Hirshleifer et al. [2009]. In other words, it is hard to explain why aggregate accruals drive the relation between aggregate earnings and stock market returns, while it is aggregate cash flows that drive the relation between aggregate earnings and corporate bond market returns. This issue is worth further investigation.

[5] I am able to replicate the findings of Hirshleifer et al. [2009] using annual frequency data. The sample extends from 1965 to 2005. I define aggregate accruals changes and aggregate cash-flow changes in the same way as Hirshleifer et al. [2009]. I delete firms with other than December fiscal year end. I measure annual value-weighted stock market returns using the NYSE/ AMEX/ NASDAQ index provided by CRSP. I measure annual returns from December of year $t-1$ to December of year t. When the value-weighted stock market returns are used as dependent, the coefficient of aggregate accruals changes is -1.213 with t-stat -2.08 and the coefficient of aggregate cash-flow changes is 0.896 with t-stat 1.45. When the value-weighted corporate bond market returns are used as dependent (i.e., $R\_all\_invest\_grade$), the coefficient of aggregate accruals changes is 0.520 with t-stat 2.44 and the coefficient of aggregate cash-flow changes is -1.018 with t-stat -3.00.

3.3.3 Aggregate Earnings and Discount Rates

There is an ongoing debate in the literature regarding the relation between aggregate earnings and discount rates. Sadka and Sadka [2009] argue that the negative relation between aggregate earnings and market returns is driven by a negative relation between expected earnings and expected returns. More specifically, the authors suggest that aggregate earnings are highly predictable. Assuming countercyclical risk premia, high expected aggregate earnings changes result in low risk aversion and/or low risk and subsequently cause low expected returns. However, there are a number of papers that argue that the negative relation between aggregate earnings and returns is driven by a positive relation between unexpected earnings and discount-rate news. Shivakumar [2007] suggests that the negative aggregate earnings-returns relation is driven by a positive relation between aggregate earnings surprises and inflation expectations and Patatoukas and Yan [2011] show that aggregate earnings surprises are positively correlated with interest rates and with the implied equity risk premium.

I attempt to contribute to this debate. To that end, first I augment the regression of corporate bond market returns on contemporaneous aggregate earnings changes by lagged aggregate earnings changes and by one, two, three, four, and five quarters lagged corporate bond market returns. In this way, I try to control for the expected component of aggregate earnings and I am more confident that the coefficient of $\Delta E/A$ captures new information. Second, I examine whether aggregate earnings can predict returns. If aggregate earnings changes contain news about discount rates, then they must be positive predictors of corporate bond market returns. To test this relation, I regress one-quarter-forward corporate bond market returns on aggregate earnings changes. Third, I directly examine the relation between aggregate earnings changes and discount rates by regressing aggregate earnings changes on various proxies for discount-rate news. And fourth, I regress corporate bond market returns on aggregate earnings changes after controlling for these discount-rate-news proxies.

Table 3.5 presents the results of the regressions of corporate bond market returns on contemporaneous aggregate earnings changes, lagged aggregate earnings changes, and lagged corporate bond market returns. Aggregate earnings changes remain negatively related to the returns of the investment-grade corporate bond indices (Columns 1 to 9). In addition, aggregate earnings changes become significantly positively related to contemporaneous high-yield corporate bond market returns (Column 10). Hence, the aggregate earnings-returns relation persists even after controlling for lagged aggregate earnings changes and lagged corporate bond market returns. This finding suggests that it is the news component in aggregate earnings that drives the negative aggregate earnings-returns relation.

Table 3.4

Corporate Bond Market Returns, Aggregate Accruals Changes, and Aggregate Cash-Flow Changes

Panel A: Corporate bond market returns and aggregate accruals changes										
	R_1-3_ AAA-AA$_t$	*R_1-3_ A-BBB*$_t$	*R_3-5_ AAA-AA*$_t$	*R_3-5_ A-BBB*$_t$	*R_5-10_ AAA-AA*$_t$	*R_5-10_ A-BBB*$_t$	*R_15+_ AAA-AA*$_t$	*R_15+_ A-BBB*$_t$	*R_all_ invest_grade*$_t$	*R_all_ high_yield*$_t$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.018***	0.019***	0.019***	0.020***	0.021***	0.022***	0.023***	0.023***	0.022***	0.024***
	(9.838)	(10.488)	(8.606)	(8.346)	(6.961)	(6.816)	(5.295)	(5.335)	(6.100)	(4.662)
$\Delta Acc/A_t$	−0.469	−0.403	−0.573	−0.560	−0.091	−0.117	−0.461	−0.430	−0.265	1.124
	(−0.822)	(−0.741)	(−0.704)	(−0.689)	(−0.165)	(−0.224)	(−0.551)	(−0.549)	(−0.419)	(0.835)
N	140	140	140	135	143	143	143	143	143	97
Adj. R^2	0.22%	0.05%	0.01%	−0.06%	−0.69%	−0.67%	−0.47%	−0.48%	−0.57%	−0.38%
Panel B: Corporate bond market returns and aggregate cash-flow changes										
	R_1-3_ AAA-AA$_t$	*R_1-3_ A-BBB*$_t$	*R_3-5_ AAA-AA*$_t$	*R_3-5_ A-BBB*$_t$	*R_5-10_ AAA-AA*$_t$	*R_5-10_ A-BBB*$_t$	*R_15+_ AAA-AA*$_t$	*R_15+_ A-BBB*$_t$	*R_all_ invest_grade*$_t$	*R_all_ high_yield*$_t$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.021***	0.022***	0.024***	0.024***	0.025***	0.025***	0.028***	0.028***	0.025***	0.021**
	(10.098)	(9.286)	(9.606)	(7.542)	(7.771)	(6.850)	(6.213)	(5.949)	(6.540)	(2.581)
$\Delta CF/A_t$	−0.790**	−0.688*	−1.304**	−0.998*	−1.004**	−0.792*	−1.399*	−1.113*	−0.886*	0.682
	(−2.094)	(−1.664)	(−2.527)	(−1.685)	(−2.181)	(−1.710)	(−1.875)	(−1.749)	(−1.705)	(0.580)
N	140	140	140	135	143	143	143	143	143	97
Adj. R^2	2.85%	2.29%	4.36%	2.25%	2.29%	1.22%	1.96%	1.19%	1.21%	−0.57%
Panel C: Corporate bond market returns, aggregate accruals changes, and aggregate cash-flow changes										
	R_1-3_ AAA-AA$_t$	*R_1-3_ A-BBB*$_t$	*R_3-5_ AAA-AA*$_t$	*R_3-5_ A-BBB*$_t$	*R_5-10_ AAA-AA*$_t$	*R_5-10_ A-BBB*$_t$	*R_15+_ AAA-AA*$_t$	*R_15+_ A-BBB*$_t$	*R_all_ invest_grade*$_t$	*R_all_ high_yield*$_t$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.021***	0.021***	0.023***	0.023***	0.025***	0.025***	0.029***	0.028***	0.025***	0.022***
	(8.977)	(8.664)	(8.387)	(7.030)	(7.211)	(6.453)	(5.815)	(5.538)	(6.121)	(3.052)
$\Delta Acc/A_t$	−0.824	−0.712	−1.139	−0.948	−1.420*	−1.199	−2.559*	−2.146*	−1.574*	1.190
	(−1.443)	(−1.276)	(−1.408)	(−1.153)	(−1.758)	(−1.487)	(−1.968)	(−1.930)	(−1.740)	(0.841)
$\Delta CF/A_t$	−1.007**	−0.876*	−1.605***	−1.219*	−1.840**	−1.498**	−2.905**	−2.377**	−1.812**	0.737
	(−2.234)	(−1.763)	(−2.631)	(−1.783)	(−2.554)	(−1.985)	(−2.516)	(−2.402)	(−2.240)	(0.649)

(Continued)

Table 3.4 – *Continued*

	$R\_1\text{-}3\_AAA\text{-}AA_t$	$R\_1\text{-}3\_A\text{-}BBB_t$	$R\_3\text{-}5\_AAA\text{-}AA_t$	$R\_3\text{-}5\_A\text{-}BBB_t$	$R\_5\text{-}10\_AAA\text{-}AA_t$	$R\_5\text{-}10\_A\text{-}BBB_t$	$R\_15+\_AAA\text{-}AA_t$	$R\_15+\_A\text{-}BBB_t$	$R\_all\_invest\_grade_t$	$R\_all\_high\_yield_t$
N	140	140	140	135	143	143	143	143	143	97
Adj. R^2	4.79%	3.79%	6.31%	3.36%	4.42%	2.59%	5.48%	3.82%	3.36%	−0.88%

Panel A of this table presents the results of the regressions of the returns of various corporate bond indices on aggregate accruals changes. Panel B presents the results of the regressions of the returns of various corporate bond indices on aggregate cash-flow changes. Panel C presents the results of the regressions of the returns of various corporate bond indices on aggregate accruals changes and aggregate cash-flow changes. All variables are as defined in Appendix D. My sample extends from January 1973 to December 2010. I use Ordinary Least Squares for the calculation of the regression coefficients and Newey-West heteroscedasticity and autocorrelation consistent standard errors. The *t*-statistics are reported in parentheses below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Next, I test whether aggregate earnings changes can predict corporate bond market returns. If aggregate earnings are positively related to discount-rate news, then they must be positively related to future corporate bond market returns. Table 3.6, panel A presents the results of the regressions of one-quarter-forward corporate bond market returns on aggregate earnings changes. All the coefficients of $\Delta E/A$ are negative and three out of ten are marginally significant. One-quarter-forward returns are the corporate bond returns of the earnings announcement quarter. Consequently, the negative aggregate earnings-returns relation of table 3.6, panel A can be due to the release of information during the earnings announcement quarter. Thus, I also regress two, three, four, and five quarters forward corporate bond market returns on aggregate earnings changes and the untabulated results are similar; aggregate earnings changes are not positive predictors of corporate bond market returns.

In table 3.6, panel B, I augment the regressions of table 3.6, panel A by changes in inflation expectations, lagged aggregate earnings changes, and lagged corporate bond market returns. In line with Patatoukas and Yan [2011], I control for changes in expected inflation to mitigate the confounding effect of inflation expectations on future returns. Sharpe [2002] reports a negative relation between expected inflation and future stock and bond returns. It is possible that the negative relation between expected inflation and forward returns attenuates the positive relation between aggregate earnings changes and forward returns. The analysis shows that the regression coefficients of aggregate earnings changes remain statistically nonsignificant. One plausible explanation for the negative and nonsignificant coefficients of $\Delta E/A$ in table 3.6 is that realized returns are a poor proxy for expected returns. The reason is that cash-flow news and discount-rate news might not cancel out on average (Elton [1999]). Nevertheless, the failure to find a positive relation between future returns and aggregate earnings changes casts doubt to the idea that the aggregate earnings-returns relation is driven by a positive relation between unexpected earnings and discount-rate news.

As a third set of tests, I directly examine the relation between aggregate earnings changes and a number of proxies for discount-rate shocks. Table 3.7 presents the results of the regressions of aggregate earnings changes on changes in the Cochrane and Piazzesi [2005] factor (ΔCP), changes in term premia ($\Delta term$), changes in default premia ($\Delta default$), changes in interest rates ($\Delta tbill$), changes in expected inflation (Δexp_infl), and growth in industrial production ($Gindpro$). Aggregate earnings changes are unrelated to changes in default premia. This result differs from the firm-level findings of a negative relation between firm-specific earnings and default risk (Callen et al. [2009]). Aggregate earnings changes are negatively and significantly related to changes in term premia and positively and significantly related to changes in inflation expectations and to growth in industrial production (Columns 2 and 3). The six proxies for discount-rate news explain 30.2% of aggregate earnings changes. Taken as a whole, the findings of table 3.7 provide conflicting evidence regarding the relation between

Table 3.5

Corporate Bond Returns, Contemporaneous and Lagged Earnings Changes, and Lagged Bond Returns

	R_1-3_ AAA-AA$_t$	*R_1-3_ A-BBB*$_t$	*R_3-5_ AAA-AA*$_t$	*R_3-5_ A-BBB*$_t$	*R_5-10_ AAA-AA*$_t$	*R_5-10_ A-BBB*$_t$	*R_15+_ AAA-AA*$_t$	*R_15+_ A-BBB*$_t$	*R_all_ invest_grade*$_t$	*R_all_ high_yield*$_t$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.014***	0.014***	0.020***	0.019***	0.024***	0.023***	0.026***	0.026***	0.023***	0.019**
	(3.270)	(3.040)	(4.123)	(3.601)	(4.472)	(4.024)	(4.098)	(3.768)	(4.187)	(2.603)
$\Delta E/A_t$	−1.440**	−0.827	−2.472***	−1.212	−3.507***	−1.860	−6.358***	−3.939***	−2.643**	3.795**
	(−2.547)	(−1.310)	(−3.190)	(−1.186)	(−3.419)	(−1.513)	(−3.959)	(−3.284)	(−2.226)	(2.267)
$\Delta E/A_{t-1}$	0.718	−0.007	1.209*	0.081	2.241***	0.464	4.525***	1.896	0.996	−3.690*
	(1.450)	(−0.011)	(1.894)	(0.082)	(2.728)	(0.402)	(3.210)	(1.625)	(0.986)	(−1.680)
R_{t-1}	0.024	0.154	−0.099	0.047	−0.077	0.057	−0.106	−0.019	−0.017	0.454***
	(0.133)	(0.894)	(−0.629)	(0.277)	(−0.666)	(0.404)	(−1.046)	(−0.165)	(−0.118)	(3.572)
R_{t-2}	0.021	0.087*	0.078	0.081	0.045	0.061	0.068	0.110	0.081	−0.413**
	(0.243)	(1.925)	(0.945)	(1.345)	(0.659)	(1.158)	(0.975)	(1.555)	(1.267)	(−2.110)
R_{t-3}	0.139	0.047	0.110	0.061	0.089	0.038	0.100	0.065	0.073	0.232**
	(1.565)	(0.408)	(1.327)	(0.698)	(1.191)	(0.467)	(1.385)	(0.910)	(0.937)	(2.365)
R_{t-4}	0.092	0.011	0.066	−0.008	0.038	−0.024	0.066	0.001	0.015	−0.128
	(1.330)	(0.174)	(0.791)	(−0.092)	(0.498)	(−0.287)	(0.794)	(0.012)	(0.174)	(−1.224)
R_{t-5}	0.021	0.060	−0.074	−0.030	−0.107	−0.079	−0.146	−0.130	−0.128	0.024
	(0.246)	(0.677)	(−0.663)	(−0.309)	(−1.155)	(−0.909)	(−1.611)	(−1.515)	(−1.369)	(0.323)
N	135	135	135	130	147	147	147	147	147	92
Adj. R^2	5.63%	3.99%	6.68%	−0.55%	6.06%	−0.13%	12.20%	3.65%	2.28%	22.51%

This table presents the results of the regressions of the returns of various corporate bond indices on contemporaneous and lagged aggregate earnings changes and lagged corporate bond market returns. All variables are as defined in Appendix D. R_{t-1}, R_{t-2}, R_{t-3}, R_{t-4}, and R_{t-5} are the lagged by one, two, three, four, and five quarters dependents of each model, respectively. My sample extends from January 1973 to December 2010. I use Ordinary Least Squares for the calculation of the regression coefficients and Newey-West heteroscedasticity and autocorrelation consistent standard errors. The *t*-statistics are reported in parentheses below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

aggregate earnings changes and discount-rate news.

I also test whether the relation between corporate bond market returns and contemporaneous aggregate earnings changes persists after controlling for the six aforementioned discount-rate proxies. As table 3.8 shows, all but one of the coefficients of $\Delta E/A$ decrease in absolute magnitude. However, the decrease in the coefficients is not statistically different from zero. Aggregate earnings changes and the proxies for discount rates explain between 43.9% and 66.2% of corporate bond market returns. The fact that the relation between aggregate earnings and corporate bond market returns persists even after controlling for the discount-rate news proxies casts doubt to the idea that aggregate earnings changes are negatively related to corporate bond market returns because they are positively related to discount-rate news.

Overall, the results of tables 3.5, 3.6, 3.7, and 3.8 provide conflicting evidence. On the one hand, aggregate earnings changes are related to corporate bond market returns even after controlling for lagged aggregate earnings changes and lagged corporate bond market returns. Moreover, aggregate earnings changes correlate positively with changes in expected inflation and with growth in industrial production. These results support the hypothesis that aggregate earnings are unpredictable and suggest that aggregate earnings surprises are positively related to discount-rate news. On the other hand, aggregate earnings changes do not have predictive power over corporate bond market returns, aggregate earnings changes are negatively related to changes in term premia, and the negative aggregate earnings-returns relation persists even after controlling for the various discount-rate shocks proxies. And these results call into question the idea that aggregate earnings surprises are positively related to discount-rate news. Therefore, my findings do not allow me to conclude whether it is the expected or the unexpected component of aggregate earnings that drives the negative aggregate earnings-returns relation for corporate bonds.

Table 3.6

Forward Corporate Bond Market Returns and Aggregate Earnings Changes

Panel A: Forward corporate bond market returns and aggregate earnings changes

	R_1-3_ AAA-AA$_{t+1}$	*R_1-3_ A-BBB*$_{t+1}$	*R_3-5_ AAA-AA*$_{t+1}$	*R_3-5_ A-BBB*$_{t+1}$	*R_5-10_ AAA-AA*$_{t+1}$	*R_5-10_ A-BBB*$_{t+1}$	*R_15+_ AAA-AA*$_{t+1}$	*R_15+_ A-BBB*$_{t+1}$	*R_all_ invest_grade*$_{t+1}$	*R_all_ high_yield*$_{t+1}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.020***	0.021***	0.021***	0.022***	0.022***	0.023***	0.023***	0.025***	0.023***	0.024***
	(9.893)	(9.862)	(8.463)	(7.935)	(6.577)	(6.545)	(4.897)	(5.181)	(5.981)	(3.395)
$\Delta E/A_t$	−0.458	−0.724*	−0.596	−0.888*	−0.431	−1.069	−0.432	−1.219	−1.147*	−1.008
	(−1.427)	(−1.790)	(−1.548)	(−1.718)	(−0.787)	(−1.654)	(−0.472)	(−1.448)	(−1.797)	(−0.582)
N	140	140	140	135	151	151	151	151	151	97
Adj. R^2	0.27%	2.04%	0.16%	1.29%	−0.42%	0.95%	−0.55%	0.37%	0.79%	−0.03%

Panel B: Forward corporate bond market returns and aggregate earnings changes controlling for changes in expected inflation, lagged aggregate earnings changes, and lagged corporate bond market returns

	R_1-3_ AAA-AA$_{t+1}$	*R_1-3_ A-BBB*$_{t+1}$	*R_3-5_ AAA-AA*$_{t+1}$	*R_3-5_ A-BBB*$_{t+1}$	*R_5-10_ AAA-AA*$_{t+1}$	*R_5-10_ A-BBB*$_{t+1}$	*R_15+_ AAA-AA*$_{t+1}$	*R_15+_ A-BBB*$_{t+1}$	*R_all_ invest_grade*$_{t+1}$	*R_all_ high_yield*$_{t+1}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.011***	0.015***	0.019***	0.021***	0.023***	0.026***	0.028***	0.028***	0.025***	0.027**
	(3.823)	(3.432)	(5.330)	(4.294)	(5.193)	(4.239)	(3.947)	(3.717)	(4.117)	(2.323)
$\Delta E/A_t$	−0.071	−0.250	−0.072	−0.391	0.466	−0.310	1.208	−0.141	−0.396	1.331
	(−0.207)	(−0.762)	(−0.155)	(−0.854)	(0.565)	(−0.440)	(0.841)	(−0.110)	(−0.552)	(1.164)
Δexp_infl_t	0.194	0.132	0.353	0.288	0.600	0.610	1.237*	1.242	0.806	−0.413
	(0.837)	(0.631)	(0.876)	(0.886)	(1.214)	(1.353)	(1.666)	(1.644)	(1.487)	(−0.499)
$\Delta E/A_{t-1}$	−0.325	−0.705	−0.709	−0.804	−1.158	−1.168	−1.846	−1.475	−1.016	−2.656
	(−0.585)	(−0.773)	(−1.040)	(−0.804)	(−1.203)	(−0.886)	(−1.210)	(−0.786)	(−0.867)	(−1.063)
R_{t-1}	0.069	0.064	0.055	0.047	0.048	0.029	0.063	0.068	0.062	−0.123
	(0.996)	(0.795)	(0.751)	(0.542)	(0.792)	(0.367)	(0.916)	(0.791)	(0.800)	(−0.910)
R_{t-2}	0.172*	0.051	0.102	0.056	0.106	0.028	0.094	0.035	0.053	0.039
	(1.753)	(0.438)	(1.067)	(0.580)	(1.279)	(0.304)	(1.181)	(0.402)	(0.583)	(0.261)
R_{t-3}	0.087	0.036	0.039	0.006	−0.020	−0.030	−0.017	−0.018	−0.003	−0.041
	(1.136)	(0.578)	(0.484)	(0.068)	(−0.264)	(−0.341)	(−0.187)	(−0.172)	(−0.032)	(−0.320)

(Continued)

Table 3.6 – *Continued*

	R_1-3_ AAA- AA$_{t+1}$	*R_1-3_ A-BBB*$_{t+1}$	*R_3-5_ AAA- AA*$_{t+1}$	*R_3-5_ A-BBB*$_{t+1}$	*R_5-10_ AAA- AA*$_{t+1}$	*R_5-10_ A-BBB*$_{t+1}$	*R_15+_ AAA- AA*$_{t+1}$	*R_15+_ A-BBB*$_{t+1}$	*R_all_ invest_ grade*$_{t+1}$	*R_all_ high_yield*$_{t+1}$
R_{t-4}	0.013	0.063	−0.084	−0.030	−0.135	−0.082	−0.214**	−0.150	−0.148	0.007
	(0.140)	(0.630)	(−0.782)	(−0.278)	(−1.351)	(−0.751)	(−2.171)	(−1.478)	(−1.377)	(0.069)
R_{t-5}	0.088	0.073	0.014	−0.009	−0.028	−0.025	−0.062	−0.028	−0.006	−0.033
	(0.723)	(0.584)	(0.111)	(−0.080)	(−0.260)	(−0.218)	(−0.626)	(−0.257)	(−0.051)	(−0.379)
N	130	130	130	129	130	130	130	130	130	91
Adj. R^2	2.82%	1.34%	−1.66%	−1.93%	−1.03%	−1.59%	2.12%	0.56%	−0.20%	−3.71%

Panel A of this table presents the results of the regressions of one-quarter-forward returns of various corporate bond indices on aggregate earnings changes. Panel B presents the results of the regressions when I extend the model in panel A by changes in expected inflation, lagged aggregate earnings changes, and lagged corporate bond market returns. All variables are as defined in Appendix D. R_{t-1}, R_{t-2}, R_{t-3}, R_{t-4}, and R_{t-5} are the lagged by one, two, three, four, and five quarters dependents of each model, respectively. My sample extends from January 1973 to December 2010. I use Ordinary Least Squares for the calculation of the regression coefficients and Newey-West heteroscedasticity and autocorrelation consistent standard errors. The *t*-statistics are reported in parentheses below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 3.7

Aggregate Earnings Changes and Discount-Rate Proxies

	$\Delta E/A_t$	$\Delta E/A_t$	$\Delta E/A_t$
	(1)	(2)	(3)
Intercept	0.001**	0.001**	0.001
	(2.194)	(2.265)	(0.876)
ΔCP_t	0.016	0.007	0.017
	(0.703)	(0.336)	(0.952)
$\Delta term_t$	−0.271	−0.359*	−0.272*
	(−1.445)	(−1.860)	(−1.891)
$\Delta default_t$	−0.024	−0.003	0.119
	(−0.186)	(−0.024)	(0.840)
$\Delta tbill_t$	0.117	0.067	0.014
	(1.317)	(0.825)	(0.230)
Δexp_infl_t		0.221**	0.188**
		(2.459)	(2.403)
$Gindpro_t$			0.119***
			(3.455)
N	115	115	115
Adj. R^2	11.98%	18.34%	30.17%

This table presents the results of the regressions of aggregate earnings changes on various proxies for discount-rate news. All variables are as defined in Appendix D. My sample extends from January 1973 to December 2010. I use Ordinary Least Squares for the calculation of the regression coefficients and Newey-West heteroscedasticity and autocorrelation consistent standard errors. The *t*-statistics are reported in parentheses below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 3.8

Corporate Bond Market Returns, Aggregate Earnings Changes, and Discount-Rate Proxies

	$R\_1\text{-}3\_AAA\text{-}AA_t$	$R\_1\text{-}3\_A\text{-}BBB_t$	$R\_3\text{-}5\_AAA\text{-}AA_t$	$R\_3\text{-}5\_A\text{-}BBB_t$	$R\_5\text{-}10\_AAA\text{-}AA_t$	$R\_5\text{-}10\_A\text{-}BBB_t$	$R\_15+\_AAA\text{-}AA_t$	$R\_15+\_A\text{-}BBB_t$	$R\_all\_invest\_grade_t$	$R\_all\_high\_yield_t$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.017***	0.018***	0.018***	0.019***	0.019***	0.021***	0.021***	0.023***	0.020***	0.021***
	(8.880)	(8.533)	(7.801)	(7.657)	(5.995)	(6.587)	(6.134)	(6.929)	(6.836)	(6.465)
$\Delta E/A_t$	−0.573**	−0.583*	−1.073***	−0.645*	−1.342**	−0.806*	−2.356**	−1.737***	−1.024**	2.462***
	(−2.143)	(−1.977)	(−2.772)	(−1.955)	(−2.428)	(−1.949)	(−2.566)	(−2.761)	(−2.228)	(2.699)
ΔCP_t	−0.054	−0.030	−0.186	−0.136	−0.278	−0.185	−0.344	−0.195	−0.154	0.233
	(−0.388)	(−0.231)	(−0.784)	(−0.656)	(−0.825)	(−0.666)	(−0.749)	(−0.605)	(−0.538)	(0.587)
$\Delta term_t$	−1.458***	−1.905***	−3.189***	−3.572***	−6.215***	−6.358***	−10.086***	−10.011***	−6.948***	−4.867***
	(−4.117)	(−3.645)	(−6.838)	(−5.736)	(−9.323)	(−8.003)	(−11.272)	(−10.607)	(−8.302)	(−3.778)
$\Delta default_t$	−1.447**	−3.136***	−2.258**	−4.261***	−3.726***	−6.550***	−5.841***	−9.034***	−5.885***	−14.147***
	(−2.595)	(−4.058)	(−2.592)	(−4.357)	(−2.854)	(−4.513)	(−3.332)	(−5.015)	(−4.420)	(−12.186)
$\Delta tbill_t$	−1.813***	−1.784***	−2.972***	−2.927***	−4.739***	−4.435***	−7.031***	−6.540***	−5.035***	−3.493***
	(−10.262)	(−7.662)	(−9.830)	(−9.651)	(−8.452)	(−8.859)	(−11.498)	(−11.158)	(−11.409)	(−4.325)
Δexp_infl_t	−0.064	0.171	−0.227	0.178	−0.495	−0.036	−1.193*	−0.627	−0.105	−0.115
	(−0.239)	(0.455)	(−0.683)	(0.351)	(−1.164)	(−0.055)	(−1.864)	(−1.034)	(−0.173)	(−0.094)
$Gindpro_t$	0.118	0.112	0.195	0.084	0.308	0.070	0.378	0.191	0.086	−0.397*
	(0.980)	(0.811)	(1.012)	(0.513)	(1.057)	(0.319)	(1.139)	(0.794)	(0.406)	(−1.801)
N	115	115	115	115	115	115	115	115	115	97
Adj. R^2	45.58%	43.89%	51.89%	48.26%	57.31%	55.04%	63.55%	66.21%	60.76%	65.12%

This table presents the results of the regressions of the returns of various corporate bond indices on aggregate earnings changes and various proxies for discount rate news. All variables are as defined in Appendix D. My sample extends from January 1973 to December 2010. I use Ordinary Least Squares for the calculation of the regression coefficients and Newey-West heteroscedasticity and autocorrelation consistent standard errors. The *t*-statistics are reported in parentheses below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

3.4 Robustness Tests

My main inferences are the same when I measure corporate bond market returns using the Barclays Capital U.S. Corporate Bond Indices downloaded from Datastream and when I use quarterly changes in the yields to maturity instead of quarterly total returns as dependent. My results are also qualitatively similar when I scale firm-specific earnings changes by lagged market value of equity, lagged absolute earnings, lagged absolute book value of equity, and lagged enterprise value instead of lagged total assets. Enterprise value is the sum of market value of equity plus book value of debt. My findings are robust to measuring aggregate earnings changes as the equal-weighted average of firm-specific earnings changes instead of the value-weighted average and they are robust to measuring earnings as operating income after depreciation instead of earnings before extraordinary items. In addition, my main inferences remain unchanged when I measure firm-specific earnings changes as the firm-specific analyst forecast errors. I measure analyst forecast errors as reported earnings minus the median of analysts' earnings forecasts announced at the end of the previous quarter. I download analyst forecasts from IBES. Further, my findings are not sensitive to any of the sample selection criteria imposed and they are not sensitive to the use of annual and daily instead of quarterly frequency data. For brevity purposes, I only present the results of the robustness tests when I use daily and annual instead of quarterly frequency data. All other untabulated tests are available upon request.

Following Cready and Gurun [2010], I use daily frequency data to ensure that the relation between aggregate earnings changes and corporate bond market returns does not merely reflect an association between aggregate earnings changes and other macroeconomic variables. The daily sample extends from November 3, 1986 to December 31, 2010. I define daily aggregate earnings changes as the value-weighted average of firm-specific earnings changes. I measure firm-specific earnings changes as earnings in the current quarter minus earnings four quarters ago scaled by lagged total assets. I only keep observations with more than seven earnings announcements per day to ensure that the idiosyncratic component of earnings is diversified away.

Table 3.9, panel A reports the results of the regressions. The relation between daily investment-grade corporate bond market returns and aggregate earnings changes is negative and statistically significant in seven out of nine regressions (Columns 1 to 9). In addition, the relation between high-yield corporate bond market returns and aggregate earnings changes is positive but statistically nonsignificant (Column 10). The nonsignificant regression coefficients in the case of the long-term corporate bond indices (i.e., *R_15+_AAA-AA* and *R_15+_A-BBB*) are most likely due to the high illiquidity of these indices. Less liquid bonds trade less frequently, incorporate information at a slower pace, and thus have a weaker relation to aggregate earnings changes.

Table 3.9, panel B presents the results of the regressions when I use annual frequency data. The annual sample period extends from 1973 to 2010. The results are similar to the findings using quarterly observations. Aggregate earnings changes are negatively related to investment-grade corporate bond market returns and positively but nonsignificantly related to high-yield corporate bond market returns. Moreover, this relation is lower for bonds with higher credit ratings and for bonds with longer maturities.

Table 3.9

Robustness Tests Using Daily and Annual Frequency Data

Panel A: Daily frequency data										
	$R\_1\text{-}3\_AAA\text{-}AA_t$	$R\_1\text{-}3\_A\text{-}BBB_t$	$R\_3\text{-}5\_AAA\text{-}AA_t$	$R\_3\text{-}5\_A\text{-}BBB_t$	$R\_5\text{-}10\_AAA\text{-}AA_t$	$R\_5\text{-}10\_A\text{-}BBB_t$	$R\_15+\_AAA\text{-}AA_t$	$R\_15+\_A\text{-}BBB_t$	$R\_all\_invest\_grade_t$	$R\_all\_high\_yield_t$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.023***	0.023***	0.026***	0.026***	0.029***	0.030***	0.033***	0.038***	0.029***	0.033***
	(13.712)	(11.062)	(8.766)	(8.430)	(5.791)	(6.105)	(4.525)	(4.071)	(6.324)	(4.430)
$\Delta E/A_t$	−0.366***	−0.374***	−0.560**	−0.576**	−0.675*	−0.720**	−0.541	−0.641	−0.626*	0.081
	(−2.656)	(−2.599)	(−2.214)	(−2.384)	(−1.827)	(−2.036)	(−0.842)	(−1.098)	(−1.902)	(0.157)
N	5,449	5,449	5,449	5,449	5,449	5,449	5,449	5,449	5,449	4,615
Adj. R^2	0.15%	0.14%	0.09%	0.10%	0.04%	0.06%	0.00%	−0.01%	0.05%	−0.02%
Panel B: Annual frequency data										
	$R\_1\text{-}3\_AAA\text{-}AA_t$	$R\_1\text{-}3\_A\text{-}BBB_t$	$R\_3\text{-}5\_AAA\text{-}AA_t$	$R\_3\text{-}5\_A\text{-}BBB_t$	$R\_5\text{-}10\_AAA\text{-}AA_t$	$R\_5\text{-}10\_A\text{-}BBB_t$	$R\_15+\_AAA\text{-}AA_t$	$R\_15+\_A\text{-}BBB_t$	$R\_all\_invest\_grade_t$	$R\_all\_high\_yield_t$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.090***	0.091***	0.099***	0.099***	0.106***	0.106***	0.119***	0.118***	0.108***	0.090**
	(6.855)	(6.151)	(6.638)	(5.538)	(5.783)	(5.371)	(4.967)	(4.831)	(5.058)	(2.755)
$\Delta E/A_t$	−1.949**	−1.565	−2.809**	−2.356*	−3.331**	−2.851*	−4.663**	−3.991*	−3.587*	1.805
	(−2.385)	(−1.668)	(−2.524)	(−1.740)	(−2.168)	(−1.702)	(−2.169)	(−1.886)	(−1.957)	(0.820)
N	35	35	35	33	38	38	38	38	38	24
Adj. R^2	13.28%	6.84%	21.60%	9.70%	17.90%	8.39%	17.64%	10.94%	13.57%	−3.05%

This table presents the results of the regressions of the returns of various corporate bond indices on aggregate earnings changes. Panel A presents the results of the regressions when daily frequency data are used. Panel B presents the results of the regressions when annual frequency data are used. All variables are as defined in Appendix D. My daily sample consists of observations from November 3, 1986 to December 31, 2010 and my annual sample consists of observations from 1973 to 2010. I use Ordinary Least Squares for the calculation of the regression coefficients and Newey-West heteroscedasticity and autocorrelation consistent standard errors. The *t*-statistics are reported in parentheses below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

3.5 Conclusion

I examine the relation between aggregate earnings changes and corporate bond market returns. I find that aggregate earnings changes are significantly negatively related to investment-grade corporate bond market returns and positively but nonsignificantly related to high-yield corporate bond market returns. My findings are in line with the idea that aggregate earnings move together with cash flows and with discount rates. The relation between aggregate earnings changes and market returns is lower for bonds with higher credit ratings and for bonds with longer maturities. Hence, corporate bond credit ratings and corporate bond maturities affect the sensitivity of corporate bond prices to cash-flow changes and to discount-rate changes. Previous literature shows that aggregate accruals drive the negative relation between aggregate earnings and stock market returns. Surprisingly, I find that in the case of corporate bonds, it is primarily the information in aggregate cash flows that drives the negative aggregate earnings-returns relation.

My findings have several implications. First, I show that the relation between earnings and corporate bond returns is different at market level compared to firm level. Firm-specific corporate bond returns are positively related to firm-specific earnings while corporate bond market returns are negatively related to market earnings. Second, prior literature shows that credit ratings have an impact on the earnings-returns relation at firm level. I show that both corporate bond credit ratings and corporate bond maturity matter at the aggregate level. Third, while firm-specific earnings contain information about default risk, aggregate earnings provide information about term premia and about future inflation. Finally, I uncover an interesting difference in the pricing of aggregate accruals and aggregate cash flows by the stock and corporate bond markets. This latter finding provides a fruitful avenue for future research.

My findings do not provide evidence on whether the aggregate earnings contain *new* information. My results merely suggest that aggregate earnings move together with cash flows and with discount rates. Future research should focus on isolating the news component of aggregate earnings and examining its relation to asset returns. This task is not trivial given that expectation models for aggregate earnings are not well developed. Another interesting avenue for future research is to examine whether aggregate earnings provide more or less timely and accurate information about future macroeconomic conditions than other macroeconomic variables, for example, gross domestic product or industrial production growth.

All in all, aggregate earnings are an overlooked and potentially invaluable source of information that merits further investigation.

Appendix D. Variables definition

Variable name	Variable description
R_1-3_AAA-AA	quarterly total returns of U.S. corporate bond index that includes bonds with remaining maturities between 1 and 3 years and with credit ratings between AAA and AA
R_1-3_A-BBB	quarterly total returns of U.S. corporate bond index that includes bonds with remaining maturities between 1 and 3 years and with credit ratings between A and BBB
R_3-5_AAA-AA	quarterly total returns of U.S. corporate bond index that includes bonds with remaining maturities between 3 and 5 years and with credit ratings between AAA and AA
R_3-5_A-BBB	quarterly total returns of U.S. corporate bond index that includes bonds with remaining maturities between 3 and 5 years and with credit ratings between A and BBB
R_5-10_AAA-AA	quarterly total returns of U.S. corporate bond index that includes bonds with remaining maturities between 5 and 10 years and with credit ratings between AAA and AA
R_5-10_A-BBB	quarterly total returns of U.S. corporate bond index that includes bonds with remaining maturities between 5 and 10 years and with credit ratings between A and BBB
R_15+_AAA-AA	quarterly total returns of U.S. corporate bond index that includes bonds with remaining maturities over 15 years and with credit ratings between AAA and AA
R_15+_A-BBB	quarterly total returns of U.S. corporate bond index that includes bonds with remaining maturities over 15 years and with credit ratings between A and BBB
R_all_invest_grade	quarterly total returns of U.S. corporate bond index that includes investment-grade bonds of all available maturities
R_all_high_yield	quarterly total returns of U.S. corporate bond index that includes high-yield bonds of all available maturities
$\Delta E/A$	quarterly aggregate earnings changes measured as the value-weighted average of firm-specific earnings changes. Firm-specific earnings change is the seasonally differenced income before extraordinary items scaled by lagged total assets
$\Delta Acc/A$	quarterly aggregate accruals changes measured as the value-weighted average of firm-specific accruals changes. Firm-specific accruals change is the seasonally differenced accruals scaled by lagged total assets. Accruals is the change in noncash current assets minus the change in current liabilities excluding the changes in short-term debt minus depreciation and amortization

(Continued)

Appendix D – *Continued*

Variable name	Variable description
$\Delta CF/A$	quarterly aggregate cash-flow changes measured as the value-weighted average of firm-specific cash-flow changes. Firm-specific cash-flow change is the seasonally differenced cash flows scaled by lagged total assets. Cash flows is the difference between income before extraordinary items and accruals
ΔCP	change in the Cochrane and Piazzesi [2005] factor measured as the change in the fitted value from a regression of equal-weighted excess returns of two, three, four, and five years bonds on a constant, the one-year yield, and the forward rates of two, three, four, and five years
$\Delta term$	change in the spread between the yield of a ten-year constant maturity Treasury note index and the yield of a one-year constant maturity Treasury note index
$\Delta default$	change in the spread between the yield of a U.S. corporate bond index that includes bonds with maturities greater than ten years and the yield of a U.S. Treasury bond index that includes bonds with maturities greater than ten years
$\Delta tbill$	change in the yield of the three-month Treasury bill
Δexp_infl	change in the University of Michigan Survey of Consumers inflation expectations
Gindpro	seasonally adjusted growth in industrial production

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Summary in English

The three chapters of this thesis belong to the area of capital markets research in accounting. Chapter 1 and chapter 2 examine the real consequences of changes in accounting regulation. Chapter 3 focuses on the information content of earnings and in particular on the information content of aggregate earnings.

Chapter 1 examines the effect of mandatory International Financial Reporting Standards (IFRS) adoption on the cost of equity and liquidity of European banks. This study is motivated by the ongoing debate on the benefits and costs of the new accounting standards particularly for banks. On the one hand, IFRS has increased the disclosure requirements and has enhanced the comparability of financial statements across firms in different countries. Increased disclosure requirements and increased comparability of financial statements can increase market liquidity and decrease a firm's cost of equity due to lower information asymmetry between a firm and its investors. On the other hand, there is an increase in the use of fair value accounting as a result of the adoption of IFRS. Fair value accounting is associated with increased earnings' volatility, higher procyclicality of financial institutions, and excessive managerial risk-taking and thus with higher cost of equity. Hence, the economic consequences of IFRS on banks are an empirical question. To answer this question, we use a sample of European banks for the period 2002–2007. Our analysis shows a statistically and economically significant decrease in the cost of equity of banks after the adoption of IFRS. These results are in line with the theory that suggests that increased disclosure requirements and increased comparability of financial statements can have capital market benefits for adopting firms. We find no evidence of lower capital market benefits for banks with large increases in the exposure to fair value accounting as a result of IFRS. These latter findings do not support the concerns of academics and practitioners that fair value accounting can be suboptimal for banks. Further, the decrease in cost of equity is more pronounced for banks with low pre-adoption quality of information environment. Regarding liquidity, the results are sensitive to the proxy used.

In chapter 2, we examine the impact of mandatory IFRS adoption on the risk exposure of banks in Europe. We use a sample of European banks for the period 1999–2010 and we measure risk exposure as the exposure of banks

to equity, interest rate, exchange rate, and commodity risk. Our results show an increase in the risk exposure of banks after the mandatory adoption of IFRS in 2005. These findings provide support to the theory that increased disclosure requirements for hedging activities and increased use of fair value accounting can induce suboptimal hedging of banks' risks and can encourage excessive managerial risk taking. We also provide limited evidence that the increase in risk exposure is more pronounced for banks operating in countries where accounting numbers are more likely to be used for contracting purposes.

Chapter 3 examines the relation between aggregate earnings changes and corporate bond market returns. Aggregate earnings are interesting because they provide different type of information than firm-specific earnings; firm-specific earnings contain primarily information about cash flows while aggregate earnings contain primarily information about discount rates. In addition, the relation between aggregate earnings and market returns is interesting over and above the relation between firm-specific earnings and firm-specific returns because well-diversified investors invest in the market portfolio. I use a sample of quarterly observations from 1973 to 2010 and I show that aggregate earnings changes are negatively and significantly related to investment-grade corporate bond market returns and positively but nonsignificantly related to high-yield corporate bond market returns. My results suggest that the discount-rate effect of aggregate earnings dominates the cash-flow effect for investment-grade corporate bonds and so the earnings-returns relation is negative. But the cash-flow effect of aggregate earnings swamps the discount-rate effect for high-yield corporate bonds and the earnings-returns relation is positive but statistically nonsignificant. The aggregate earnings-returns relation is lower for high-rated and long-term bonds. Hence, the sensitivity of corporate bonds to cash-flow changes and to discount-rate changes depends on corporate bond maturities and corporate bond credit ratings. I also find that the relation between aggregate earnings changes and corporate bond market returns is mainly driven by the information contained in aggregate cash flows. Prior literature shows that the negative earnings-returns relation for stocks is driven by aggregate accruals. This latter finding provides evidence of differential pricing of information by the corporate bond and stock markets.

The results of chapter 1 and chapter 2 suggest that changes in accounting standards can have economic consequences for adopting firms. These findings have standard setting implications and contribute to the ongoing debate on the global convergence of accounting standards. Chapter 3 highlights the difference in the information content of aggregate earnings compared to firm-specific earnings and provides evidence of value-relevance of aggregate earnings for well-diversified investors.

Summary in Dutch

De drie hoofdstukken in deze dissertatie behoren tot het veld van kapitaalmarktonderzoek in accounting. Hoofdstuk 1 en hoofdstuk 2 onderzoeken de werkelijke consequenties van veranderingen in accountingregels. Hoofdstuk 3 richt zich op het informatiegehalte van winst en in het bijzonder op het informatiegehalte van geaggregeerde winst.

Hoofdstuk 1 onderzoekt het effect van verplichte adoptie van International Financial Reporting Standards (IFRS) op de kosten van eigen vermogen en de liquiditeit van Europese banken. Dit onderzoek wordt gemotiveerd door het lopende debat over de voor- en nadelen van de nieuwe accountingstandaard, in het bijzonder voor banken. Aan de ene kant heeft IFRS de informatieverplichtingen verhoogd en de vergelijkbaarheid van de financile verslaggeving van bedrijven uit verschillende landen verbeterd. Hogere informatieverplichtingen en betere vergelijkbaarheid van financile verslaggeving kunnen de liquiditeit van de markt verhogen en de kosten van eigen vermogen verlagen door een afname van informatie-asymmetrie tussen de onderneming en de investeerder. Aan de andere kant is er als gevolg van de adoptie van IFRS een toename in het gebruik van fair value accounting. Fair value accounting wordt geassocieerd met een verhoogde winstvolatiliteit, een hogere procycliciteit van financile instellingen, en het overmatig nemen van bestuurlijke risico's en dus met hogere kosten van het eigen vermogen. Vandaar zijn de economische gevolgen van IFRS op de banken een empirische vraag. Om deze vraag te beantwoorden maken we gebruik van een steekproef van Europese banken in de periode 2002–2007. Onze analyse toont een statistisch en economisch significante afname van de kosten van het eigen vermogen van de banken na de invoering van IFRS. Deze resultaten zijn in lijn met de theorie die suggereert dat versterking van de openbaarmakingsverplichtingen en een verhoogde vergelijkbaarheid van de jaarrekeningen kapitaalmarktvoordelen kan hebben voor de adopterende bedrijven. We vinden geen bewijs van lagere kapitaalmarktvoordelen voor banken met grote toename in de blootstelling aan fair value accounting als gevolg van IFRS. Deze laatste bevindingen bieden geen ondersteuning voor de zorgen van academici en praktijkmensen dat fair value accounting subopti-

maal kan zijn voor banken. Verder is de daling van de kosten van het eigen vermogen meer uitgesproken voor banken met een lage pre-adoptie kwaliteit van de informatie-omgeving. Met betrekking tot liquiditeit zijn de resultaten gevoelig voor de gebruikte proxy.

In hoofdstuk 2 onderzoeken we de invloed van verplichte adoptie van IFRS op de risicoblootstelling van banken in Europa. We maken gebruik van een steekproef van Europese banken voor de periode 1999–2010 en we meten risicoblootstelling als de blootstelling van banken aan markt-, rente-, wisselkoers- en grondstoffenrisico's. Onze resultaten tonen een toename in de risicoblootstelling van banken na de verplichte adoptie van IFRS in 2005. Deze bevindingen ondersteunen de theorie dat verhoogde informatieverplichtingen van hedging-activiteiten en meer gebruik van fair value accounting kan leiden tot suboptimale afdekking van de risico's van banken en kunnen aansporen tot het overmatig nemen van risico. We bieden ook beperkt bewijs dat de toename van risicoblootstelling meer uitgesproken is voor banken die actief zijn in landen waar de boekhoudcijfers vaker worden gebruikt bij het sluiten van contracten.

Hoofdstuk 3 gaat in op de relatie tussen veranderingen in geaggregeerde winst en rendement in de markt voor bedrijfsobligaties. Geaggregeerde inkomsten zijn interessant omdat ze ander soort informatie bevatten dan bedrijfsspecifieke winsten; bedrijfsspecifieke winsten bevatten in de eerste plaats informatie over de kasstromen, terwijl de winst in de markt in de eerste plaats informatie bevat over verdisconteringsvoeten. De relatie tussen markt-inkomsten en marktrendement is meer interessant dan de relatie tussen bedrijfsspecifieke winsten en bedrijfsspecifiek rendement, omdat goed gediversifieerde beleggers investeren in de marktportefeuille. Ik gebruik een steekproef van waarnemingen per kwartaal tussen 1973 en 2010 en ik laat zien dat de geaggregeerde winstveranderingen negatief en significant gerelateerd zijn aan het marktrendement van investment-grade bedrijfsobligaties en positief maar niet significant gerelateerd aan het marktrendement van high-yield bedrijfsobligaties. Mijn resultaten suggereren dat het verdisconteringsvoet-effect van de geaggregeerde inkomsten het kasstroomeffect voor investment-grade bedrijfsobligaties domineert en dus de winst-rendement-verhouding negatief is. Maar het kasstroomeffect van de geaggregeerde winst overheerst het verdisconteringsvoet-effect voor high-yield bedrijfsobligaties en de winst-rendement-relatie is positief, maar niet significant. De totale winst-rendement-verhouding is lager voor obligaties met hoge rating en van lange termijn. Vandaar dat de gevoeligheid van bedrijfsobligaties voor kasstroomveranderingen en veranderingen in de verdisconteringsvoet afhangt van rating en termijn. Ik toon ook aan dat de relatie tussen de geaggregeerde winstveranderingen en marktrendement op bedrijfsobligaties voornamelijk wordt gedreven door de informatie in de totale kasstromen. De bestaande literatuur laat zien dat de negatieve winst-rendement-verhouding voor aandelen wordt gedreven door geaggregeerde accruals. Bijgevolg levert deze laatste bevinding het bewijs van differentile prijsstelling van informatie door de bedrijfsobligatie- en

aandelenmarkten.

De resultaten van hoofdstuk 1 en hoofdstuk 2 suggereren dat veranderingen in de standaarden voor accounting economische gevolgen kunnen hebben voor bedrijven. Mijn bevindingen hebben implicaties voor het stellen van standaarden en dragen bij aan het voortdurende debat over de wereldwijde convergentie van standaarden voor accounting. Hoofdstuk 3 benadrukt het verschil in de informatie-inhoud van geaggregeerde marktwinst in vergelijking met bedrijfsspecifieke winsten en levert het bewijs van de waarde-relevantie van geaggregeerde inkomsten voor goed gediversifieerde beleggers.

Summary in Greek

Τα τρία κεφάλαια της παρούσας διατριβής ανήκουν στο πεδίο της έρευνας κεφαλαιογορών στη λογιστική. Τα κεφάλαια 1 και 2 εξετάζουν τις επιπτώσεις των αλλαγών στη λογιστική νομοθεσία. Το κεφάλαιο 3 επικεντρώνεται στο πληροφοριακό περιεχόμενο των λογιστικών κερδών και πιο συγκεκριμένα στο πληροφοριακό περιεχόμενο των συνολικών λογιστικών κερδών.

Το κεφάλαιο 1 εξετάζει τις επιπτώσεις της υποχρεωτικής υιοθέτησης των Διεθνών Λογιστικών Προτύπων (ΔΛΠ) στο κόστος κεφαλαίου και στη ρευστότητα των Ευρωπαϊκών τραπεζών. Η μελέτη αυτή έχει σαν έναυσμα την τρέχουσα συζήτηση σχετικά με τα ωφέλη και κόστη των νέων λογιστικών προτύπων συγκεκριμένα για τις τράπεζες. Από τη μια πλευρά, τα ΔΛΠ επιβάλλουν τη γνωστοποίηση μεγαλύτερου όγκου πληροφοριών και έχουν ενισχύσει τη συγκρισιμότητα των οικονομικών καταστάσεων μεταξύ επιχειρήσεων σε διαφορετικές χώρες. Ο αυξημένος όγκος πληροφοριών και η ενισχυμένη συγκρισιμότητα των οικονομικών καταστάσεων μπορούν να αυξήσουν τη ρευστότητα στην αγορά και να μειώσουν το κόστος κεφαλαίου, εξαιτίας της μειωμένης ασυμμετρίας πληροφόρησης μεταξύ της επιχείρησης και των επενδυτών. Από την άλλη πλευρά, παρατηρείται αυξημένη χρήση της εύλογης λογιστική αξίας ως αποτέλεσμα της υιοθέτησης των ΔΛΠ. Η χρήση της εύλογης λογιστικής αξίας έχει συνδεθεί με αυξημένη μεταβλητότητα των καθαρών κερδών, αυξημένη προκυκλικότητα των χρηματοπιστωτικών ιδρυμάτων, και αυξημένη λήψη ρίσκων από τα τραπεζικά στελέχη και, κατά συνέπεια, με υψηλότερο κόστος κεφαλαίου. Ως εκ τούτου, οι οικονομικές συνέπειες των ΔΛΠ στις τράπεζες παραμένουν εμπειρικό ερώτημα. Για να απαντήσουμε το ερώτημα αυτό, χρησιμοποιούμε ένα δείγμα Ευρωπαϊκών τραπεζών για την περίοδο 2002–2007. Η ανάλυσή μας αναδεικνύει μια στατιστικά και οικονομικά σημαντική μείωση του κόστους κεφαλαίου των τραπεζών μετά την υιοθέτηση των ΔΛΠ. Τα αποτελέσματα αυτά είναι σύμφωνα με τη θεωρία που προτείνει ότι η αυξημένη παροχή πληροφοριών και η αυξημένη συγκρισιμότητα των οικονομικών καταστάσεων μπορούν να έχουν σημαντικά οικονομικά ωφέλη για τις υιοθετούσες επιχειρήσεις. Επιπλέον, δεν βρίσκουμε μεί-

ωση των οικονομικών ωφελών για τις τράπεζες με αυξημένη χρήση εύλογων αξιών ως αποτέλεσμα της υιοθέτησης των ΔΛΠ. Τα τελευταία αυτά ευρήματα δεν υποστηρίζουν τις ανησυχίες των ακαδημαϊκών και των τραπεζικών στελεχών ότι η χρήση της εύλογης λογιστικής αξίας μπορεί να έχει αρνητικές επιπτώσεις για τις τράπεζες. Επίσης, η μείωση του κόστους κεφαλαίου είναι πιο έντονη για τις τράπεζες με χαμηλή ποιότητα πληροφοριακού περιβάλλοντος. Όσον αφορά την τραπεζική ρευστότητα, τα αποτελέσματα εξαρτώνται από τη μέθοδο ποσοτικοποίησης της ρευστότητας.

Στο δεύτερο κεφάλαιο εξετάζουμε τις επιπτώσεις της υποχρεωτικής υιοθέτησης των ΔΛΠ στην έκθεση των Ευρωπαϊκών τραπεζών σε διάφορες μορφές ρίσκου. Χρησιμοποιούμε ένα δείγμα Ευρωπαϊκών τραπεζών για την περίοδο 1999–2010 και μετράμε τις ακόλουθες τραπεζικές εκθέσεις: έκθεση στην αγορά, έκθεση στις αλλαγές επιτοκίων, έκθεση στις αλλαγές συναλλαγματικών ισοτιμιών, και έκθεση στις αλλαγές τιμών στις πρώτες ύλες. Τα αποτελέσματά μας αναδεικνύουν αύξηση του τραπεζικού κινδύνου μετά την υποχρεωτική υιοθέτηση των ΔΛΠ το 2005. Τα ευρήματα αυτά είναι σύμφωνα με τη θεωρία ότι η αυξημένη παροχή πληροφοριών σχετικά με τις πράξεις αντιστάθμισης κινδύνου και η αυξημένη χρήση της εύλογης λογιστικής αξίας μπορούν να οδηγήσουν σε αύξηση της έκθεσης των τραπεζών σε διάφορες μορφές ρίσκων. Επίσης, παρέχουμε περιορισμένες ενδείξεις ότι η αύξηση στο ρίσκο των τραπεζών είναι πιο έντονη για τις τράπεζες που λειτουργούν σε χώρες όπου οι λογιστικοί αριθμοί είναι πιο πιθανόν να χρησιμοποιηθούν σε συμβόλαια.

Το τρίτο κεφάλαιο εξετάζει τη σχέση μεταξύ των συνολικών εταιρικών κερδών και της απόδοσης των εταιρικών ομολόγων. Τα συνολικά εταιρικά κέρδη παρουσιάζουν ερευνητικό ενδιαφέρον επειδή παρέχουν διαφορετικό είδος πληροφορίας στους επενδυτές σε σχέση με τα ατομικά εταιρικά κέρδη. Τα ατομικά εταιρικά κέρδη παρέχουν πρωτίστως πληροφορίες σχετικά με τις ταμειακές ροές των εταιριών ενώ τα συνολικά κέρδη παρέχουν κυρίως πληροφορίες για το κόστος κεφαλαίου. Επιπλέον, η σχέση μεταξύ των συνολικών κερδών και της αγοράς των εταιρικών ομολόγων είναι ενδιαφέρουσα για τους καλά διαφοροποιημένους επενδυτές που επενδύουν σε δείκτες. Χρησιμοποιώ ένα δείγμα τριμηνιαίων παρατηρήσεων για την περίοδο 1973–2010 και βρίσκω ότι τα συνολικά κέρδη σχετίζονται αρνητικά με τις τιμές των ομολόγων χαμηλού ρίσκου και δεν σχετίζονται με τις τιμές των ομολόγων υψηλού ρίσκου. Τα ευρήματά μου αναδεικνύουν ότι οι αλλαγές στο κόστος κεφαλαίου επικρατούν των αλλαγών στις ταμειακές ροές για τα ομόλογα χαμηλού κινδύνου, αλλά οι αλλαγές στις ταμειακές ροές επικρατούν των αλλαγών στο κόστος κεφαλαίου για τα εταιρικά ομόλογα υψηλού κινδύνου. Η μείωση στις τιμές των ομολόγων είναι μεγαλύτερη για τα μακροπρόθεσμα και για τα χαμηλού κινδύνου ομόλογα. Ως εκ τούτου, η ευαισθησία των εταιρικών ομολόγων στις αλλαγές των ταμεικών ροών και στις αλλαγές του κόστους κεφαλαίου

εξαρτάται από την ημερομηνία αποπληρωμής των ομολόγων και από το ρίσκο αποπληρωμής. Βρίσκω ότι η σχέση μεταξύ των συνολικών εταιρικών κερδών και της αγοράς των εταιρικών ομολόγων εξαρτάται από το πληροφοριακό περιεχόμενο του συνόλου των ταμειακών ροών. Η υπάρχουσα βιβλιογραφία καταδεικνύει ότι η αρνητική σχέση μεταξύ των τιμών των μετοχών και των συνολικών κερδών ωφείλεται στο πληροφοριακό περιεχόμενο του συνόλου των δεδουλευμένων. Τα τελευταία αυτά ευρήματα παρέχουν ενδείξεις διαφορετικής διατίμησης πληροφοριών για την αγορά των εταιρικών ομολόγων σε σχέση με τη αγορά των μετοχών.

Τα αποτελέσματα των κεφαλαίων 1 και 2 δείχνουν ότι οι αλλαγές στα λογιστικά πρότυπα έχουν σημαντικές οικονομικές συνέπειες για τις υιοθετούσες επιχειρήσεις. Τα ευρήματά μου συμβάλλουν στη συζήτηση σχετικά με τη σύγκλιση των διεθνών λογιστικών προτύπων. Το κεφάλαιο 3 αναδεικνύει τη διαφορά στο πληροφορικό περιεχόμενο των συνολικών έναντι των ατομικών λογιστικών κερδών και αποτελεί απόδειξη της σημασίας των συγκεντρωτικών κερδών για τους επενδυτές.

Biography

Xanthi Gkougkousi was born in Athens, Greece on February 15, 1984. In October 2005, she obtained her BSc in Marketing and Communication from Athens University of Economics and Business. Subsequently, she went on to work as a freelancer accountant for two years. In September 2007, she started her MSc in Business Administration with specialization in Finance and Investments at Rotterdam School of Management, Erasmus University, which she completed with distinction, in August 2008. Immediately after, she joined the Accounting and Control department of Rotterdam School of Management, Erasmus University as a PhD candidate in Financial Accounting. Her research focuses on the relation between accounting numbers and capital markets and on the real effects of changes in accounting regulations. During her PhD, Xanthi spent four months as a visiting scholar at Columbia Business School. In addition, she has presented her work at various international conferences, such as the European Accounting Association Annual Congress and the American Accounting Association Annual Meeting. Further, Xanthi has been involved in teaching financial accounting and in supervising bachelor and master thesis projects. Alongside her PhD, Xanthi passed the exams of all three levels of the Chartered Financial Analyst program.

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This dissertation contributes to the stream of literature that examines the role of accounting information in capital markets. The first two chapters deal with the economic consequences of changes in accounting regulations. The third chapter examines the relation between accounting earnings and asset prices. Chapter 1 studies the impact of International Financial Reporting Standards (IFRS) adoption on the cost of equity and liquidity of European banks. The adoption of IFRS is associated with lower cost of equity particularly for banks with low pre-adoption quality of information environment. Chapter 2 examines the effect of IFRS adoption on the risk exposure of banks in Europe. Our analysis shows an increase in the risk exposure of banks after the mandatory adoption of the new accounting standards. We provide limited evidence that the increase in risk exposure is more pronounced for banks that operate in countries where accounting numbers are more likely to be used for contracting purposes. Chapter 3 focuses on the relation between aggregate earnings changes and corporate bond market returns. Aggregate earnings changes are negatively related to investment-grade corporate bond market returns and unrelated to high-yield corporate bond market returns. Further, the earnings-returns relation is lower for high-rated and long-term corporate bonds. These findings suggest that aggregate earnings contain information about cash flows and discount rates. Overall, the essays in this thesis highlight the importance of changes in accounting regulations and the significance of accounting information for equity and debt investors.

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