Mark-to-market Accounting and Implications for Banks Trading Portfolios: the case of IFRS adoption in Europe

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Abstract

We analyze an extensive database of EU15 banks for 1999-2007. From the banks reports adopting IFRS in 2004 and presenting their results as both local and IFRS, we discover that fair value accounting application reveals riskier portfolios than the image presented if they would have been continued to present the results according to the historic cost accounting. The trading portfolios profits are higher with fair value accounting than with the historic cost accounting regime. After IFRS adoption, the banks are adjusting their portfolios year by year towards more conservative portfolios, coherent with the predictions of the recent analytical literature.

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1 Introduction

The debate on the relative merits of fair value accounting (or mark-to-market) for financial instruments with respect to historical cost accounting has attracted a lot of attention in the recent years. This matter was really controversial in Europe before the mandatory adoption in 2005 of IAS/IFRS for consolidated accounts of listed companies. At the time, many financial institutions resited the introduction of IAS 39 because of the expected effects of extending the use of mark-to-market accounting for financial instruments. More recently the debate has resurged in the wake of the financial crisis that started in August 2007. Mark-to-market accounting has been blamed for exacerbating the crisis by amplifying the fall of market prices for financial instruments (cf. Economist, (Sept 2008); G20 London Summit, (2009)). Finally the accounting for financial instruments has been one of the most critical issues for the convergence project implemented by the IASB and the FASB.

As Plantin et al. (2008) note, those in favour of fair value (FV) accounting maintain that the use of market prices or models to value financial instruments in accounting reports benefits investors and regulators because FV conveys more relevant and timely information on the current risk profile than the use of historic cost accounting (HC). Consequently, FV reporting should induce a higher market discipline that, in turn, allows financial statements users to make better capital allocations. Moreover, the models internally used by the firms are assumed to better explain the reality of the firm to its outsiders, as opposed to the previous HC-based book value system. This is even more true, it is argued, in the case of derivatives. The HC of such instruments is often close to zero while the actual exposure can be very high. A FV system represents this situation more realistically than HC.

On the other hand, the opponents of FV accounting points to the unreliability of the new accounting numbers and blame the artificial volatility and the pro-cyclical effects induced by this system. As the ECB (2004) and Plantin et al. (2008) have argued, when the secondary markets for firm's assets and liabilities are not deep and liquid, the use of market based FV accounting would decrease rather than increase the reliability of the financial statements. One common example is the OTC market for loans. The situation is even more problematic for the credit risk models and valuation methods of illiquid or non-traded instruments developed to

the date. A second argument against the use of FV accounting is that it will bring "artificial", or additional volatility into the financial reports, hence in financial markets (Plantin et al. (2008); ECB (2004)). The practical relevance of this second argument can be understood by looking at the example of Danish regulators that feared that the induced "artificial volatility" could even destabilise their financial system (as reported by Bernard et al (1995) and The Economist (2004)). The third argument against FV accounting for financial instruments is that this reporting system is not properly reflecting the way in which financial institutions manage their core business, dedicated especially to long-term decisions, and less concerned with short-term variations (Geneva Association (2004)).

The purpose of this paper is to test the effects of IAS/IFRS adoption on the financial reporting and on the banks' choice of portfolios. We use a sample of European banks from 1999 to 2007. We interpret the adoption of IAS/IFRS in 2005 as a shift from local systems of accounting standards for financial instruments based more on Historical Cost (HC) to a set of international standards for financial instruments more based on mark-to- market Fair Value (FV). We find that, keeping the composition of the portfolio constant, the reporting under IAS/IFRS presents a riskier image of the portfolio than under local GAAP. This accounting effect may induce a change in the way financial managers make their portfolio decisions. We find evidence that, after IAS/IFRS adoption and taking into accounting the possibility of rebalancing the portfolio, European banks have switched to less risky portfolio choices.

These results question the possibility of accounting regulation being "neutral" with respect to the choices made by economic agents. That neutrality should be one of the objectives of accounting regulation is exemplified by, for example, Leisenring (1990) saying that "*unfortunately, it is once again fashionable to suggest that the FASB should abandon the notion that decision-useful information must be neutral and should consider the 'economic consequences' of its decisions".* Barth (2006), Beatty (2007) and Shin (2007) all reject this idea of neutrality and point out the importance of studying how economic behavior is affected by a greater use of FV in financial reporting[1].

The rest of the paper is structured in the following way. In Section 2 we

[1]The same idea is defended within the regulatory arena as well, as the recent draft paper issued by the European Financial Reporting Advisory Group clearly shows (cf. EFRAG, 2011).

review the relevant literature. In Section 3 we present a simple analytical model of portofolio choice under different accounting regimes and develop our hypotheses. In the following section we present our research design and the sample used. In Section 5 we start our analysis with the univariate tests. In Section 6 we extend the analysis and present some multivariate models. Section 7 discusses our results and present some directions for future research.

2 Review of the literature

The literature on the effects of the adoption of FV accounting for financial instruments and derivatives on portfolio choice decisions has developed only very recently and it tends to focus on the financial industry, the main user of financial instruments.

From an analytical point of view few papers are important for motivating our analysis.

In a seminal paper, O'Hara (1993) studies how FV accounting may affect loans maturity. She finds that, when asymmetric information exists, FV reporting introduces a bias into asset valuation against longer-term illiquid assets (such as loans). This bias arises because of difficulty in establishing market prices for assets in presence of private information, a well-known characteristic of banks activity, requiring specific information and expertise. Burkhardt and Strausz (2009) also analyze bank loans subject either to a pure HC or to a Lower of Cost or Market (LCM) rule. The paper, similar to O'Hara (1993), is an analytical extension of the classical Akerlof's lemons problem and finds that a pure HC regime may be superior to LCM when the debt level of the reporting company is sufficiently high. Freixas and Tsomocos (2004) study the effects of fair value accounting on the banking system and its capacity to act as a facilitator of intertemporal smoothing. The study adopts a banking supervision approach and views profit "smoothing" as a desirable action. This explains the support for HC accounting, because this is the system that allows managers to manipulate firm performance by "smoothing" profits in order to present a more stable activity. Plantin et al. (2008) study of the costs and benefits of the two accounting regimes: HC and FV. The authors present a model able to explain why financial institutions may oppose the intro-

duction of a mark-to-market regime. Induced "artificial volatility" affects more institutions whose portfolio consists of long-term, illiquid, and senior (i.e. limited upside risk, but a possible downside risk) assets. One can identify these qualities as the major characteristics of bank assets (loans) or insurance liabilities (in the reinsurance market), explaining why banks and insurance companies were the most vocal opponents of the introduction of IFRS in Europe in 2005. Allen and Carletti (2008) also tackle the issue of the link between the accounting regime and the functioning of financial markets. They highlight the possibility that fair value can hinder the stability of these markets. More recently Glavan and Trombetta (2010a) presents a model of dynamic portfolio choice for a financial institution. Two assets are available: a risky asset and a risk free asset. No dividend can be distributed if no increase in equity is reported by the accounting system. In such a setting the authors show that a FV regime induces a less risky portfolio choice than a HC regime[2].

Notwithstanding the different settings, these papers collectively question the alleged superiority of the "new" FV regime with respect to the "old" HC regime. In contrast, Bleck and Liu (2007) support the superiority of FV as an incentive device in an agency setting. The use of HC allows "bad" managers to hide the results of their ill strategy, whereas FV enables a quicker revelation to the shareholders.

From an empirical point of view few studies are closely related to our analysis.

Zhang (2009) adopts an archival approach to study the effect of the adoption of SFAS 133 in the US on corporate risk-management behavior. The SFAS 133 standard requires the use of FV accounting for derivatives. Using a sample of US companies that use derivative as part of their risk management strategy, the study divides them into "Effective Hedgers" and "Ineffective Hedgers/Speculators". The analysis shows that volatility of cash flows and risk exposures related to interest rate, foreign exchange rate, and commodity price decrease significantly for "Ineffective Hedgers/Speculators" firms but not for "Effective Hedgers" firms.

Lins et al. (2011) study the same topic through a worldwide survey with 358 valid responses from non-financial firms. They find that a significant amount of the respondent companies have altered their risk-management strategies as a consequence of the introduction of FV accounting for derivatives. According to

[2]In a related paper, a similar result is obtained with a decision tree model of portfolio choice (cf. Glavan and Trombetta, 2010b).

their results, the overall level of hedging activities decreased together with the use of non-linear hedging instruments[3].

As pointed out before, the interest in the effects of FV accounting on banks has been revamped by the financial crisis that started in 2007. One of the key questions to be answered regarded whether the use of FV accounting has actually made the crisis worst by forcing pro-cyclical fire sales of assets, prompted by the need to maintain adequate capital ratios. Two studies reject this hypothesis by analysing the balance sheet and selling activities of large bank holding companies in the US. Laux and Leuz (2010) show how the institutional features of US financial reporting regulation limit the amount of FV adjustments that bank holding companies are forced to make in times of falling prices. The emprical evidence that they present confirm that the FV adjustments after 2007 were limited and were not likely to have exacerbated the turmoil in the markets.

Badertscher et al. (2012) also study the trading behavior of US bank holding companies in the US after the crisis. Similarly to Laux and Leuz (2010), their empirical analysis show little effects of FV accounting on financial markets. The overall level of sales of financial instruments after 2007 did not vary in a substantial way. However these authors find some evidence of a change in the composition of the portfolio of banks after the crisis. Before 2007 Treasury holdings declined steadily, whereas in 2008 this decline reversed and treasury holdings increased.

3 A simple model of portfolio choice for financial institutions

Let us consider a financial institution endowed with I_0 at time $T = 0$ and interested in investing in the next accounting period. There are available two financial instruments to invest in: a risky asset and a risk-free one (a bond). Both types of instruments cost 1 at $T = 0$, but the values after one period are different. The risky asset value at $T = 1$ can be either $u > 1$ in *good time* or $0 < d < 1$ in

[3] A similar result was obtained in a suvey conducted by the Geneva Association before the adoption of IFRS in 2005 (Geneva Association, 2004). This association conducted a survey with insurance firms'CEOs. The results predicted that FV would reduce risk appetite, especially for life insurers (long term investment concerns).

bad time. According to the information available at $T = 0$, the two states of the nature *good time* and *bad time* will appear at $T = 1$ with probabilities p and $1 - p$ respectively. The bond value at $T = 1$ is $1 + R$ in both states of the nature. We assume that $u > 1 + R$ and that the financial institution requires a positive risk premium $M = pu + (1 - p)d - (1 + R) \geq 0$ to invest in the risky asset.

At $T = 0$ the financial institution chooses a portfolio (X_0, Y_0) of risky, respectively bonds units, using the entire available endowment, hence fulfilling $X_0 + Y_0 = I_0$. The number of assets involved is always ≥ 0 and no short-selling or future loans are allowed. At $T = 1$, the financial institution can realize additional operations with the instruments in the portfolio. We introduce a cost $0 \leq c < u - 1$ for the financial institution when selling each unit of the risky instrument at $T = 1$. The role of c is twofold: first, to capture the opportunity cost. When selling a risky asset at $T = 1$ in order to benefit from the operation at that time, the financial institution renounce possible future benefits from holding a risky asset for the next periods. As our objective function will optimize for simplicity only one accounting period decisions, the role of c is to capture the future costs not treated by the objective function, hence to correctly rank the solutions.

The second interpretation is the following: the cost c captures the illiquidity of the risky assets in the financial industry. A financial asset has a superior value for its owner, but the buyer cannot extract the same information due to the information asymmetry, hence the financial institution will sell the risky asset at a discount.

The cost c is smaller than the gross return $u - 1$ of the risky asset in *good time*, otherwise there will be no incentive to buy the asset at $T = 0$. We assume that there is no similar cost for selling the risk-free asset at $T = 1$, because it matures at this moment and its value is always $R + 1$ (selling the risk-free asset is equivalent with receiving the promised quantity $R + 1$).

Before discussing any portfolio allocation problem, we remark that the balance sheet and income values associated to the two types of financial instruments used for investing depend on the accounting regulation in force. Let us consider the proportion of the endowment invested in risk-free assets in a given portfolio, as measured using the balance sheet values, in case of HC (pure or with impairment test) and FV accounting respectively: $ProportionSafe_{HC} = \frac{BondsValue_{HC}}{BondsValue_{HC} + RiskyAssetsValue_{HC}}$ and $ProportionSafe_{FV} = \frac{BondsValue_{FV}}{BondsValue_{FV} + RiskyAssetsValue_{FV}}$.

Assume that the relationships between the fair value and historical cost balance sheet values for bonds and risky instruments are $BondsValue_{FV} = aBondsValue_{HC}$ and $RiskyAssetsValue_{FV} = bRiskyAssetsValue_{HC}$.

Then $\frac{ProportionSafe_{FV}}{ProportionSafe_{HC}} = \frac{aBondsValue_{HC}+aRiskyAssetsValue_{HC}}{aBondsValue_{HC}+bRiskyAssetsValue_{HC}}$, hence $\frac{ProportionSafe_{FV}}{ProportionSafe_{HC}} > 1$ if $a > b$ and $\frac{ProportionSafe_{FV}}{ProportionSafe_{HC}} \leq 1$ if $a \leq b$.

The interpretation is the following: if, when reported under fair value accounting, the risky assets increase in value more than the bonds ($b \geq a$), then the $ProportionSafe$ indicator will decrease ($ProportionSafe_{FV} \leq ProportionSafe_{HC}$) after changing the accounting regime, and conversely.

Assuming that the accounting regimes change happened in a good period of the economy, when the risky assets return was higher than the risk-free one (*good time* of the model, hence $b \geq a$), we formulate the following hypothesis:

Hypothesis 1a) **FV accounting adoption results in reporting riskier trading portfolios than under HC accounting**

When deciding the portfolio (X_0, Y_0) at $T = 0$, we assume that the financial institution is interested in maximizing the expected accounting income obtained at $T = 1$. Also, it negatively values the future income variability. We assume hereinafter that the financial institution is maximizing the following objective function $Obj = E_0\{\pi_1 - kVar(\pi_1)\} = p\pi_{1u} + (1-p)\pi_{1d} - kp(1-p)(\pi_{1u} - \pi_{1d})^2$.

We study hence the following portfolio allocation problem:

$$Max\ Obj = MaxE_0\{\pi_1 - kVar(\pi_1)\} \tag{1}$$

The optimization problem (1) represents a "mean-variance" portfolio allocation problem, expressed in terms of accounting income values. The parameter $k > 0$ is a measure of the financial institution risk aversion against the income values variability. We assume k is sufficiently small[4], in order to assure non-patological allocations (for big values of k, the risk aversion is so big that the financial institution will not choose any risky instruments at $T = 0$).

The income values used in the objective function depend on the accounting reg-

[4] We assume $k < 1/[2(1-p)I_0(u-d)]$.

ulation in force. We discuss three possible cases of accounting regulation for financial instruments: the pure historical cost accounting, the historical cost accounting with application of the impairment test, and finally the fair value accounting.

a) Pure Historical Cost Accounting

Under this accounting regime, the only possibility to register a nonzero income at $T = 1$ is to sell assets from the initial portfolio (X_0, Y_0). The income value at $T = 1$ is equal with the selling value less the acquisition value of the sold package, less the selling costs efforts with the risky assets (c times the number of risky assets sold at $T = 1$).

$$\pi_1^{HCpure} = \begin{cases} X_u(u - c - 1) + Y_u R & \text{in } \textit{good time} \\ X_d(d - c - 1) + Y_d R & \text{in } \textit{bad time} \end{cases}$$

where $X_u \in [0, X_0]$, $Y_u \in [0, Y_0]$, $X_d \in [0, X_0]$, $Y_d \in [0, Y_0]$ represent the units of risky, respectively bonds sold at $T = 1$ in *good*, respectively *bad time*.

For (X_0, Y_0) chosen at $T = 0$, we remark that π_1^{HCpure} depends on the financial institution decisions X_u, Y_u, X_d, Y_d at $T = 1$ with respect to these instruments. Taking into account our optimization problem (1), the optimal decisions at $T = 1$ are to maximize the π_1^{HCpure} values corresponding to the specific state of the nature[5]. Hence, in *good time*, the optimal decisions at $T = 1$ are to sell all the risky assets and all the bonds available ($X_u = X_0$, $Y_u = Y_0$). In *bad time*, the optimal decisions at $T = 1$ are to sell all the bonds available and nothing of risky assets ($X_u = 0$, $Y_u = Y_0$). We can write hence the optimal decisions at $T = 1$ under the pure historical cost regime.

$$\boldsymbol{\pi}_1^{HCpure} = \begin{cases} X_0(u - c - 1) + Y_0 R & \text{in } \textit{good time} \\ Y_0 R & \text{in } \textit{bad time} \end{cases} \tag{2}$$

b) Historical Cost Accounting with Impairment Test

The difference between this accounting regime and the pure historical cost accounting consists in the application of the impairment test for the risky assets

[5]The Obj^{HCpure} is an increasing function in both π_{1u}^{HCpure} and π_{1d}^{HCpure}, because $\partial Obj^{HCpure}/\partial \pi_{1u}^{HCpure} = p[1 - 2k(1-p)(\pi_{1u}^{HC} - \pi_{1d}^{HC})] > p[1 - 2k(1-p)I_0(u-d)] > 0$ for $k < 1/[2(1-p)I_0(u-d)]$ and $\partial Obj^{HCpure}/\partial \pi_{1d}^{HCpure} = (1-p)[1 + 2kp(\pi_{1u}^{HC} - \pi_{1d}^{HC})] > 0$.

in the *bad time*. The bonds are always increasing their value at maturity in our model, hence the impairment is not affecting them. So, in *bad time*, the financial institution recognizes an expense $X_0(d-1)$ with all the risky assets in the portfolio. Additional losses associated with the cost of selling risky assets appear when the financial institution decides to sell risky assets in *bad time* ($X_d c$).

$$\pi_1^{HCimpairment} = \begin{cases} X_u(u-c-1) + Y_u R & \text{in } \textit{good time} \\ X_0(d-1) - X_d c + Y_d R & \text{in } \textit{bad time} \end{cases}$$

where $X_u \in [0, X_0]$, $Y_u \in [0, Y_0]$, $X_d \in [0, X_0]$, $Y_d \in [0, Y_0]$ represent the units of risky, respectively bonds sold at $T = 1$ in *good*, respectively *bad time*.

As long as $Obj^{HCimpairment}$ is an increasing function in both $\pi_{1u}^{HCimpairment}$ and $\pi_{1d}^{HCimpairment}$ because the two derivatives are the same as in the previous accounting regime analyzed, we obtain identical optimal decisions at $T = 1$ with the pure historical cost case. So, in *good time*, the optimal decisions at $T = 1$ are to sell all the risky assets and all the bonds available ($X_u = X_0$, $Y_u = Y_0$), while in *bad time*, the optimal decisions at $T = 1$ are to sell all the bonds available and nothing of risky assets ($X_u = 0$, $Y_u = Y_0$). We can write hence the optimal decisions at $T = 1$ under the historical cost with impairment regime.

$$\boldsymbol{\pi}_1^{HCimpairment} = \begin{cases} X_0(u-c-1) + Y_0 R & \text{in } \textit{good time} \\ X_0(d-1) + Y_0 R & \text{in } \textit{bad time} \end{cases} \tag{3}$$

c) Fair Value Accounting

Under the fair value accounting regulation, the income is equal to the difference of the market values of the portfolio at the end and the beginning of the period:

$$\boldsymbol{\pi}_1^{FV} = \begin{cases} X_0(u-1) + Y_0 R & \text{in } \textit{good time} \\ X_0(d-1) + Y_0 R & \text{in } \textit{bad time} \end{cases} \tag{4}$$

By comparing the income values at $T = 1$ (results (2)-(4)) under different accounting regimes, assuming that the same portfolio was chosen at $T = 0$, we can infer the following income effects obtained in the *good* and the *bad time*:

Lemma 1 *In good time, switching from the historical cost accounting (pure or with impairment) to fair value accounting is beneficial to the financial institution,*

while in bad time, the switching is negatively affecting the financial institution only in case it was previously using the pure historical cost accounting, otherwise there is no change.

As long as the change in accounting regulation was realized in a good moment of the economy (*good time*), we expect the following hypothesis to be true:

Hypothesis 1b). **Accounting profits of trading portfolios are higher when measured under FV accounting than under HC accounting**

With the results (2)-(4), the objective function (1) can be written as a second degree polynomial in X_0. One has to $Max\ Obj = \underset{X_0 \in [0, I_0]}{Max} (AX_0^2 + BX_0 + C)$, with the coefficients A, B and C depending on the regime in force.[6] We assume for simplicity that $p > 2M/(u-d)$ $(*)$. The reason for this assumption is that the following two regimes, historical cost with impairment and fair value, are different only during the *good time*, hence in order to obtain relevant differences in portfolio allocations we should assume that the probability of this event is sufficiently high. We compare the optimal portfolio allocation decisions under different accounting regimes and we obtain the following.

Proposition 1 *The optimal number of risky assets units X_0 in the portfolio depends on the accounting regime and satisfies the following relationship*:

$$\mathbf{X}_0^{HCimpairment} \leq \mathbf{X}_0^{FV} \tag{5}$$

$$\begin{aligned} \mathbf{X}_0^{FV} &\leq \mathbf{X}_0^{HCpure} \text{ for low values of } c \text{ and} \\ \mathbf{X}_0^{FV} &> \mathbf{X}_0^{HCpure} \text{ for high values of } c \end{aligned} \tag{6}$$

Proof (Annex).

[6] $A^{HCpure} = -kp(1-p)(u-c-1)^2$; $B^{HCpure} = p(u-c-1) - R$; $A^{HCimpairment} = -kp(1-p)(u-c-d)^2$; $B^{HCimpairment} = p(u-c-1) + (1-p)(d-1) - R$; $A^{FV} = -kp(1-p)(u-d)^2$; $B^{FV} = p(u-1) + (1-p)(d-1) - R$; $C^{HCpure} = C^{HCimpairment} = C^{FV} = I_0 R$.

We assume the pre-IFRS local regimes used before 2004 were more close to a pure historical cost than to a historical cost with impairment regime (see Calvo González-Vallinas (2006) and the liquidation cost c to be small (very liquid financial markets at that time) hence we expect the following hypothesis to hold:

Hypothesis 2) **FV adoption reduces the risk appetite of banks.**

An interesting policy implication can be drawn from Proposition 1: the optimal allocation for the fair value accounting case coincides with the solution of the mean-variance portfolio allocation problem from finance $Obj^{MV} = Max\ E_0\{MV_1 - kVar(MV_1)\}$, hence the fair value accounting regime has a disciplinatory role for the financial institutions, by inducing the same portfolio allocation as the classical finance.

4 Research Design and sample description

4.1 Sample description

We focus on European banks because those listed were mandated in 2005 to adopt IFRS. We focus on the countries belonging to the European Union of 15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and United Kingdom. The analyzed period is 9 years: 1999-2007. By starting before the critical year 2005 we can check for potential anticipation of the accounting rules change.

Banks activity can be divided into "traditional banking", collecting deposits and granting loans, and "trading" activity, representing the portion of the activity where the banks are operating as brokerage houses or institutional investors. In this work we focus on banks' trading activity.

The principal data source used in the present work is Bankscope. However, data collection represented a major challenge for the realization of this study. The difficulty comes from the fact that the variables needed for our analysis are fixed income instruments, risky instruments and income from trading portfolio. These variables are not directly available in the Bankscope database. The original

data base provides Global Items referring to relevant categories of data from the financial reports of the banks. These Global Items contain standardized information, computed directly by the provider from the original reports of the banks. These items have advantage of being homogeneous across all countries analyzed and across years, but the drawback is that these items are too general and do not allow us to separate out what we need. To address this problem we processed the original data from the Bankscope database and a second and a third sub-data base, both containing more detailed items. The second sub-data base, called Global Detailed, is a generalization of the data base of Global Items. It preserves the main structure of the database Global Items but contains more items. The third sub-data base, called Raw Detailed, is a step further from Global Detailed, where even more detailed items are added. In this case the information is not preserving the structure from Global Items, but this sub-data base is useful in case we need a particular item not found in Global Detailed. These two new sub-data bases have the advantage of allowing us to access the detailed accounting items needed for our analysis. However they consist in a huge number of different items, because of the different formats of presenting the data (apart of the IFRS format, the banks are presenting the detailed results as Local GAAP for the pre-adoption years, and the names of the items are changing in time and are also different across countries). There are 3,563 distinct items names for the Global Detailed sub-data base and even more, 5,382 distinct items names for the Raw Detailed format. We constructed the variables needed for our analysis from the items of these two sub-data bases.

We collected detailed items for the financial reports of all the banks from the countries belonging to EU15 during the period 1999-2007. At this point we had an unbalanced panel data with 7,350 bank entities, some with Consolidated Reports and others with Unconsolidated Reports. The same entity can present both consolidated and unconsolidated reports, however we do not mix the two types of reports in our analysis. Moreover we have both listed and unlisted banks in the sample. Unlisted companies and listed companies for their unconsolidated accounts did not have to adopt IFRS in 2005. So we have both adopters and non-adopters in our sample.

In a second stage we eliminate from the initial sample some banks: 2 banks with incoherence about standards (in the Bankscope database these banks present incorrectly years with IFRS reports followed by years with Local GAAP), 11 banks

listed and consolidated (hence mandatory adopters) that did not adopt, according to our database, until 2006 (inclusive), which are data base errors, and 1,899 non-adopters banks with insufficient data, i.e. those banks that remain local and have coverage until 2004 or earlier; their coverage did not arrive at 2005 year, the mandatory adoption year.

After eliminating these 1,912 banks, we ended up with 5,438 banks in the database of which 4,497 have Unconsolidated reports and 941 have Consolidated reports.

We analyze these 5,438 banks around the IFRS adoption event. As Consolidated, there is only one bank that adopted IFRS in 2007; the rest of the adopters did this before or in 2006. As Among the Consolidated and Listed, there are 8 banks that adopted in 2006, even if they had to adopt IFRS in 2005. We kept them in the database because some local rules allowed late IFRS adoption. Moreover 8 banks represent a small number of entities that could not significantly change our results. None of the Consolidated and Listed adopt in 2007. Only one Unconsolidated firm adopted IFRS in 2007, the rest of the adopters did this before 2007.

A detailed description of the adoption years' distribution is presented in the next three tables:

	Consolidated	**Unconsolidated**
Adoption year	No. of banks	No. of banks
Nonadopters	299	3356
1999	13	4
2000	8	1
2001	6	1
2002	3	0
2003	5	1
2004	412	268
2005	143	833
2006	51	32
2007	1	1
Total	**941**	**4497**

Table 1. Distribution of adoption years

	Banks	Adopters	Non-adopters
Unconsolidated	4497	1141	3356
Uncons. Listed	246	92	154
Uncons. Unlisted	4251	1049	3202
Consolidated	941	642	299
Cons. Listed	191	191	0
Cons. Unlisted	750	451	299

TOTAL 5,438

Table 2. Sample composition

We present also the distribution of banks by type of activity for both the Consolidated and the Unconsolidated reports in our sample:

	Consolidated	Unconsolidated
Commercial Bank	369	1037
Savings Bank	94	771
Cooperative Bank	110	1819
Bank Holding & Holding Company	79	67
Central Bank	0	15
Investment Bank/Securities House	99	269
Islamic Bank	1	2
Medium & Long Term Credit Bank	18	38
Non-banking Credit Institution	86	293
Real Estate / Mortgage Bank	69	154
Specialised Governmental Credit Inst.	16	32
Total	***941***	***4497***

Table 3. Distribution of the institutions by type of activity

4.2 Research design

Though we are interested in banks portfolio decisions, we do not have direct information about the financial transactions. Instead, we base our analysis on the financial statements items issued by the banks.

In order to test our hypotheses, we identify in the banks' balance sheets the accounting values of both fixed and variable income financial instruments from the trading portfolio. We use these two values to construct our proxy for the portfolio composition as the ratio between fixed income instruments and the sum of fixed and variable income instruments. We call this variable the *proportion safe* ratio.

We also look separately at the accounting income corresponding to the trading activity of the bank in order to identify the performance of the trading portfolio as reflected in the financial statements.

When comparing financial instruments balance sheet values at different moments in time we have to take into account that the following three effects are at work.

First, the balance sheet values can be distinct at different moments in time because of the market prices of the corresponding instruments change in time. We call this effect the *price effect*. Assuming that the accounting system in force is the same at both moments, and the portfolio composition is also the same, there can be differences in the balance sheet values of the financial items only because the market values of the financial assets change. Depending on the accounting regime in place (HC or FV) the market price changes can be reflected differently in the balance sheet. In the case of FV accounting, the entire change is reflected in the balance sheet, while in case of the HC accounting only downward moves are captured in the balance sheet, and the magnitude depends on the enforcement of the specific impairment rule.

A second case is the opposite phenomenon. Due to transactions (buying or selling decisions) with financial instruments, the balance sheet value of a given category (fixed income or risky instruments) can change in time even if the accounting regime remains the same and the market values of the instruments stay the same. We call this the *composition effect*.

As long as we do not have information about the transactions realized, we cannot distinguish between the price effect and the composition effect.

Finally, the third phenomenon arises when the accounting regime changes through time. The balance sheet values can be different even if the portfolio is exactly the same and the market prices are identical. In this case the difference

is simply due to the accounting regime in force. We will call this the *accounting effect*.

To disentangle these three effects is very difficult and is one of the major difficulties and limitations while conducting an analysis such as the one conducted here.

We start with univariate analyses, to eliminate the first two effects described above and to study a case of pure accounting effect. We present a special sample of banks that issued two financial reports at the same moment in time (the IFRS adoption year). For these two reports there are no differences with respect to portfolio composition or market prices. The only difference is the accounting regime applied. Then we extend the univariate analysis to a longer time horizon in order to be able to also include the price and the composition effects.

The multivariate analyses will alow us to capture also the trends after IFRS adoption. Finally, the third set of regressions analyze possible heterogeneity of the IFRS impact for different countries composing the EU15.

We will interpret IFRS adoption in 2005 as a shift from an HC based local accounting regime to a more FV oriented international accounting regime. Ramirez and Calvo González-Vallinas (2006) explains how impairment tests made under the local (pre-IFRS) standards took place only when the market value of the financial instruments decreased within a significantly large proportion from the acquisition value and when this devaluation was perceived as permanent. Hence pre-IFRS local accounting regimes were more close to pure HC than to a LCM rule.

5 Univariate Analyses

5.1 Descriptive statistics

We first perform a descriptive analysis of the variables that we are using in our work. We consider the accounting values of both fixed income instruments (*Fixed Income*) and risky ones (*Risky Assets*) from the trading portfolio, their sum (*Total*

Instruments), the proportion of the portfolio invested in fixed income instruments (*Proportion Safe Ratio= Fixed Income/ Total Instruments*) and the accounting profits of the trading portfolios operations (*Results of Financial Operations*). We analyze also two control variables, *Leverage* and *Size*, which we will use in the multivariate regressions. Except for variables with natural lower or upper bounds (i.e. the indicator variable we will introduce in our study), we truncate all variables at the first and 99th percentile.

In Table 4 (Panel A) we present the descriptive statistics of the main variables used in the analyses, whereas in Table 4 (Panel B) we present the control variables. As we can see the Proportion Safe ratio can be greater than 1. This is due to the fact that when a bank position in derivative trading is on the liability side, it is considered as a negative entry on the assets side. For this reason *Total Instruments* may become smaller than *Fixed Income* instruments making the *Proportion Safe* ratio greater than 1.

Comparing the means and medians, we see that our main variables are highly skewed, except for the *Proportion Safe Ratio.* This is not the case for the control variables.

Consolidated

	N	Mean	Std.Dev.	P1	P25	P50	P75	P99
Fixed Income	6117	8050	22888	0	35	373	2648	141732
Risky	6117	1997	8184	-302	1	47	377	65377
Total Portfolio	6117	10386	30496	-14	96	600	3550	201631
Proportion Safe Ratio	6117	0.712	0.352	0.000	0.532	0.885	0.990	1.024
Res. of Financ. Oper.	6117	172.6	647.8	-111.9	0.0	3.4	33.8	4716.0

Unconsolidated

	N	Mean	Std.Dev.	P1	P25	P50	P75	P99
Fixed Income	27431	869	3601	0	18	59	230	28392
Risky	27431	164	755	0	0	6	50	6464
Total Portfolio	27431	1109	4345	0	26	83	335	33228
Proportion Safe Ratio	27431	0.772	0.300	0.000	0.664	0.909	0.995	1.000
Res. of Financ. Oper.	27431	5.5	29.6	-12.8	0.0	0.0	0.5	251.4

Table 4 (Panel A). Descriptive statistics for the variables used in analyses. Main variables

Consolidated

	N	Mean	Std.Dev.	P1	P25	P50	P75	P99
Leverage	6117	0.90	0.12	0.18	0.90	0.93	0.96	0.99
Size	6117	8.76	2.11	3.82	7.34	8.70	10.05	13.57

Unconsolidated

	N	Mean	Std.Dev.	P1	P25	P50	P75	P99
Leverage	27431	0.90	0.11	0.23	0.90	0.94	0.95	0.99
Size	27431	6.57	1.85	2.93	5.29	6.32	7.66	11.93

Table 4 (Panel B). Descriptive statistics for the variables used in analyses. Continuous control variables

5.2 Banks with double representation (local and IFRS)

The first analysis of our study is done with a particular sample of banks that switched to IFRS in 2004 and which present their financial results both under Local standards (i.e. HC) and IFRS (i.e. FV). This analysis can isolate the accounting effect on the portfolio without interfering with any portfolio transactions or market prices change, given that the last two variables remain constant. It provides two snapshots of the same economic reality (the same trading portfolio) viewed with different accounting regimes.

We identify 318 banks in our database for which we have this double representation in 2004 (consolidated reports). We have to restrict the analysis to the sample of 287 banks for which we have both *Fixed Income* and *Risky Assets* (the main variables for this analysis) valid values as both Local and IFRS. To the best of our knowledge, this is the first analysis of this type in the literature, probably because of the difficulty in extrapolating the right data. Previously only some simulations were available, perfomed on a small number of firms, focusing only changes in income and equity due to the accounting regime switch, but with no discussion of portfolio effects (see *The Economist*, (Sept. 2008)). The next tables report mean values of the variables of interest and the number of observations. The stars *, ** and *** indicate statistical significance of differences in means at the 10%, 5% and 1% levels, respectively, based on two-sided t-tests.

EUROPE	N	Value as Local	Value as IFRS	Difference IFRS-Local	*p-value*	Difference as %
Fixed Income	287	7,777	5,144	-2,633	0.0976 *	-33.85%
Risky	287	1,376	2,332	956	0.1277	69.47%
Total Instruments	287	9,293	8,409	-884	0.6924	-9.51%
Proportion Safe	287	**0.81**	**0.58**	**-0.24**	0.0000 ***	-29.10%
Results Fin Oper	287	109	178	69	0.1397	63.57%

Table 5. Indicators of interest presented according to both Local and IFRS accounting. EU15

We look first at the *Proportion Safe Ratio* in Table 5, which indicates us how much of the trading portfolio is invested in fixed income instruments, according to the information available in the banks' balance sheet reports, and at the performance measurement indicator (i.e. *Results of Financial Operations*).

The conclusions of the analysis at the EU15 level provide us with some important results. First, there is a significant reduction of the *Proportion Safe Ratio* if it is presented under FV instead of under HC accounting. FV (IFRS) accounting reports that only 58% of the portfolio is invested in fixed income, while the image offered by the old HC (local) regime was that banks had 81% of the portfolio invested in this type of assets. Also, the switch to FV (IFRS) accounting is beneficial in terms of *Results of Financial Operations* (178 instead of 109), even if this difference is not significant.

These results support our *Hypothesis 1a).* For the same economic reality, FV (IFRS) accounting reveals a significantly riskier trading portfolio than the image presented under HC (local) accounting. *Hypothesis 1b)* is only weakly consistent with the results, because accounting profits of trading portfolios are higher with FV accounting than with the HC accounting regime, but not in a significant way.

The direction of the changes observed in our case and supporting *Hypothesis 1* is due to the fact that the accounting change happened in a good period of the economy. According to Glavan and Trombetta (2010b), opposite results would have been obtained if the accounting change had happened in a bad moment of the economy.

By looking at each component of the *Proportion Safe Ratio* separately, we discover the following. At the European level, the *Fixed Income* instruments reduce

their value from an average of 7,777 to 5,144 (millions of Euro). We can conclude that an important characteristic of the Local standards (i.e. the old HC system) was that the impairment rule, even if in force, was not sufficiently effective. The downward adjustment of the *Fixed Income* value when applying the Fair Value accounting represents the proof for the impairment ineffectiveness. On the other hand, the higher value for the *Risky Assets* when presented as IFRS (2,332, instead of 1,376 with Local) is due to the fact that the local standards (as HC regimes) were not allowing for the recognition of asset appreciation in the balance sheet. As a net value, the IFRS application has a negative effect, the total value of instruments reduces from 9,293 to 8,409 with the IFRS application.

However, we expect the impact of the fair value accounting not to be uniform amongst the European countries. For example, French authorities resisted very fiercely the adoption of IAS 39 within the EU. This behavior could be consistent with banks from this country being most affected by the FV accounting introduction. If this is the case, the differences between the historic cost and the fair value accounting profits for the same economic reality should be more pronounced for the French banks with respect to the rest of the European countries. In Figures 1 and 2 we show the results of our univariate analysis at the country level for those countries for which we have sufficient data.

As expected from Hypothesis 1a) the *Proportion Safe Ratio* decreases in each country. This reduction is more pronounced in the case of France.

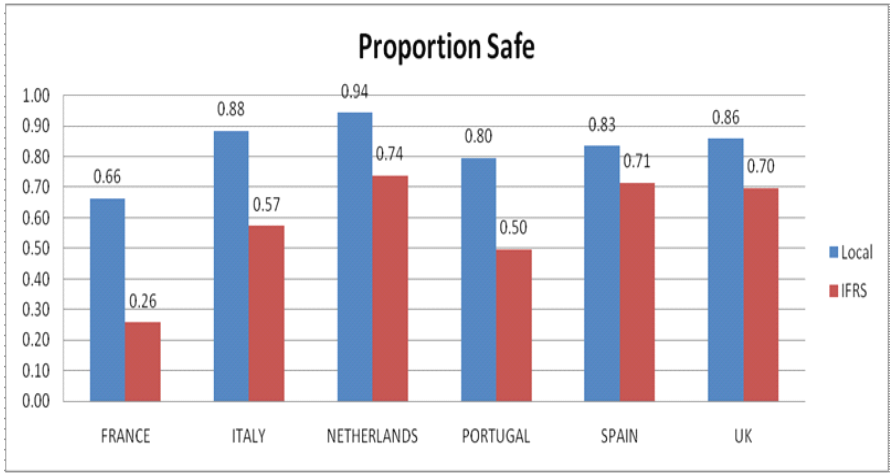

Figure 1. The *Proportion Safe Ratio* presented as both Local and IFRS accounting. Individual countries

We also expect to see an increment of the income from the trading portfolio. However, this is not the case for all countries. All the countries present increments but France. For French banks, the FV accounting application implies a decrease for this variable. Again, this result is coherent with the fact that French banks were the strongest opponents to IFRS adoption.[7]

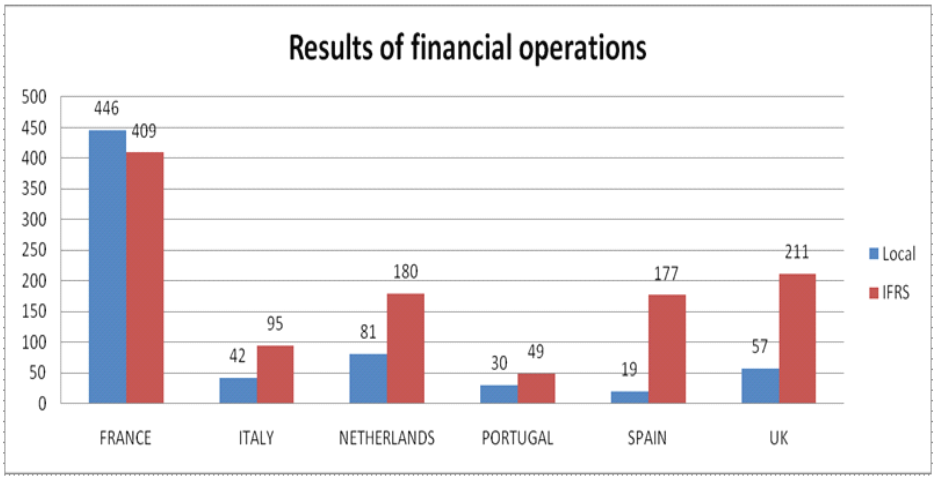

Figure 2. The *Results of Financial Operations* presented as both Local and IFRS accounting. Individual countries

5.3 Complete horizon analysis

We now extend the time horizon and study changes before and after the accounting switch.

[7] According to Financial Times (31 March, 2004), the ex-president Chirac "made an unusual foray into accounting last year to say the lASB's rules could have "nefarious consequences" for Europe's economies". J. Laurent, CEO of Credit Agricole, France's second largest listed bank, says it will not implement IAS 39 without changes. "You are going to have banks where no one will understand the accounts," he says. "The managements are not going to be able to manage the business." D. Bouton, chairman of Societe Generate, France's third largest listed bank, says: "The IASB adopted rules that are not only inappropriate and misleading for users of financial statements but also will have a very significant negative impact on the financial statements and possibly on the economy as a whole."

We are aware that while doing an analysis covering different moments in time the composition of the trading portfolio and market prices could change. In other words we now observe price, composition and accounting effect all at the same time. However, with fair value reports, the accounting values of fixed income instruments, variable income instruments and income from financial operations reflect actual market values or the valuations made by the bank. We don't know whether the manager modifies the portfolio and/or the market values of the instruments have changed, but we can assume that the *Proportion Safe Ratio* represents the actualized, market based image of the portfolio risk profile, and that this portfolio is by and large controlled by the manager. Hence we claim that this variable should reflect his/her preferences at that moment in time. In case of FV accounting we can use this ratio to proxy for the risk appetite of the manager and observe its trends in time.

We present (Figures 3 and 4) the evolution of *Proportion Safe Ratio* and the *Results of Financial Operations* for the consolidated reports of banks adopting IFRS in 2004, during the period 2002-2005 (i.e. 2 years before and 2 years after adoption). The sample is kept constant, in order to guarantee the comparability of the results.

First we observe how the previous section results remain valid. For the first year for which we have IFRS numbers (2004), the *Proportion Safe Ratio* is lower with IFRS (FV) accounting than with local (HC) cost accounting. Moreover, financial results are better with fair value accounting, except again for the special case of France. French banks have riskier than average portfolios, viewed both as local and IFRS standards, and are negatively impacted by the IFRS adoption, in terms of financial results of the trading portfolios.

Then we observe that in the second year with IFRS values, the banks adjust their trading portfolios toward less risky ones, i.e. reduce their risk appetite. The *Proportion Safe Ratio* increases in 2005 with respect to the IFRS 2004 value, for the EU15 total and for all individual countries except for Spain where it remains almost constant. This result supports *Hypothesis 2*: after IFRS adoption, the banks are adjusting their portfolio toward more conservative ones.

As we said before, we cannot make precise inferences for the years with local accounting reports because we don't know the actualized risk exposure of the trading portfolios, as long as it cannot be correctly inferred from the balance

sheet values and the lack of knowledge of financial transactions and market prices. However, we can conclude that no particular trends with respect to the portfolio composition can be observed for the pre-adoption period.

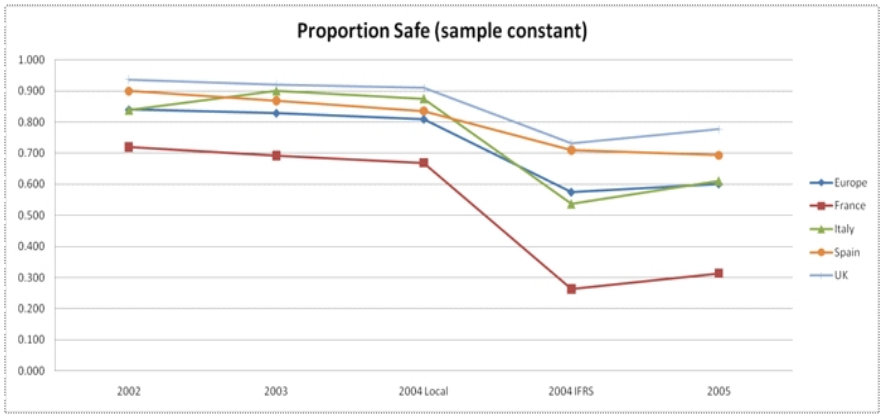

Figure 3. The *Proportion Safe Ratio* evolution in time. EU15

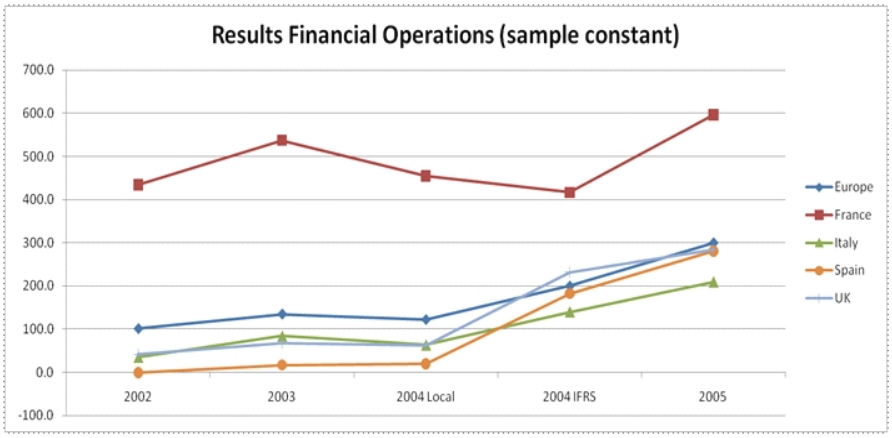

Figure 4. The *Results of Financial Operations* evolution in time. EU15

The detailed values of the graphs plotted above can be found in the next tables.

Consolidated Reports. Sample constant for 2002-2005

Proportion Safe Ratio		2002	2003	2004 Local	2004 IFRS	2005
Europe	N=250	0.840 ***	0.829 ***	0.809 ***	0.575 ***	0.601 ***
France	N=47	0.719 ***	0.692 ***	0.669 ***	0.263 ***	0.314 ***
Italy	N=32	0.838 ***	0.900 ***	0.875 ***	0.536 ***	0.610 ***
Netherlands	N=18	0.947 ***	0.961 ***	0.940 ***	0.767 ***	0.664 ***
Portugal	N=17	0.865 ***	0.856 ***	0.795 ***	0.497 ***	0.600 ***
Spain	N=50	0.899 ***	0.868 ***	0.835 ***	0.710 ***	0.693 ***
UK	N=31	0.937 ***	0.919 ***	0.909 ***	0.732 ***	0.776 ***

Results Fin Oper		2002	2003	2004 Local	2004 IFRS	2005
Europe	N=250	101.0 ***	134.7 ***	122.1 ***	199.8 ***	300.2 ***
France	N=47	434.4 ***	537.4 ***	455.0 ***	416.5 **	596.2 ***
Italy	N=32	34.6	83.7 *	63.2 *	139.9 *	209.4 **
Netherlands	N=18	28.2	43.9	84.6 **	189.8	418.5
Portugal	N=17	22.5 **	27.8 **	30.2 *	48.6	155.7 *
Spain	N=50	-0.8	16.8 ***	19.6 ***	182.6 ***	280.6 ***
UK	N=31	41.3 **	67.2 **	62.7 **	231.2	283.9 *

Table 6. The *Proportion Safe Ratio* and *Results of Financial Operations* evolution in time. EU15

A similar analysis of the portfolio allocations trend after the IFRS adoption can be observed when the time horizon is the entire period 1999-2007 and the sample is not restricted only to the entities for which we have the entire period of values, but uses all the information available. Similarly to the 2002-2005 analysis, we observe that banks are slowly adjusting their trading portfolios, year by year, after IFRS adoption. Again, this evidence can be interpreted as supporting *Hypothesis 2*. The financial results are improving after adoption year by year.

We provide the numerical values and the number of entities used in each of the years of the analysis.

Consolidated adopters in 2004

EUROPE

Proportion Safe Ratio	1999	2000	2001	2002	2003	2004 Local	2004 IFRS	2005	2006	2007
N	279	298	311	328	337	307	374	399	374	242
Proportion Safe	0.859 ***	0.830 ***	0.829 ***	0.834 ***	0.824 ***	0.794 ***	0.546 ***	0.564 ***	0.566 ***	0.640 ***

EUROPE

Results Fin Oper	1999	2000	2001	2002	2003	2004 Local	2004 IFRS	2005	2006	2007
N	279	298	311	328	337	307	374	399	374	242
Results Fin Oper	151.2 ***	183.8 ***	193.4 ***	146.2 ***	192.1 ***	114.7 ***	258.7 ***	367.9 ***	459.5 ***	495.7 ***

Consolidated adopters in 2005

EUROPE									
Proportion Safe Ratio	1999	2000	2001	2002	2003	2004	2005	2006	2007
N	88	95	103	106	108	108	125	119	61
Proportion Safe	0.820 ***	0.798 ***	0.757 ***	0.761 ***	0.781 ***	0.776 ***	0.490 ***	0.513 ***	0.585 ***

EUROPE									
Results Fin Oper	1999	2000	2001	2002	2003	2004	2005	2006	2007
N	88	95	103	106	108	108	125	119	61
Results Fin Oper	39.4 ***	51.6 ***	51.3 **	60.1 **	57.2 ***	105.9 **	176.8 ***	213.8 ***	188.8 **

Table 7. The *Proportion Safe Ratio* and the *Results of Financial Operations* evolution in time. Full horizon. Consolidated reports. EU15

To perform a robustness check for the entire horizon analysis, we compute also the similar unconsolidated values, for adopters in 2004 and 2005 respectively. From Table 8 we observe that the financial results are always improving after IFRS adoption. The trend of risk appetite reduction is followed for the adopters in 2004, for the period 2004-2006, but it is not observed for the adopters in 2005. We interpret this last result in the following way. The unconsolidated reports presented as IFRS for the first time in 2005 correspond to banks that adopt IFRS in a mandatory manner, in the last moment, because they are forced to do it (otherwise would have anticipate the change). Switching to IFRS in a mandatory instead of a voluntary manner suggest that these banks were not sufficiently prepared to the fair value accounting regime; for various reasons they could not rebalance very easy the portfolios towards more conservative portfolios, as the fair value accounting adoption induces. Consequently, the portfolio adjustment trend is not observed for the unconsolidated reports of the banks adopting IFRS in 2005.

Unconsolidated adopters in 2004

EUROPE									
Proportion Safe Ratio	1999	2000	2001	2002	2003	2004	2005	2006	2007
N	125	131	140	154	149	206	226	203	68
Proportion Safe	0.866 ***	0.847 ***	0.875 ***	0.899 ***	0.880 ***	0.462 ***	0.513 ***	0.515 ***	0.498 ***

EUROPE									
Results Fin Oper	1999	2000	2001	2002	2003	2004	2005	2006	2007
N	125	131	140	154	149	206	226	203	68
Results Fin Oper	11.8 ***	12.0 ***	13.3 ***	4.7 ***	12.3 ***	12.7 ***	23.7 ***	25.7 ***	29.6 ***

Unconsolidated adopters in 2005

EUROPE									
Proportion Safe Ratio	1999	2000	2001	2002	2003	2004	2005	2006	2007
N	556	575	615	638	644	647	769	759	101
Proportion Safe	0.906 ***	0.920 ***	0.875 ***	0.907 ***	0.912 ***	0.921 ***	0.640 ***	0.614 ***	0.499 ***

EUROPE									
Results Fin Oper	1999	2000	2001	2002	2003	2004	2005	2006	2007
N	556	575	615	638	644	647	769	759	101
Results Fin Oper	3.0 ***	3.5 ***	2.0 ***	1.7 **	3.3 ***	3.1 ***	8.8 ***	10.9 ***	15.1 ***

Table 8. The *Proportion Safe Ratio* and the *Results of Financial Operations* evolution in time. Full horizon. Unconsolidated reports. EU15

To conclude our complete horizon analysis, we can infer that after IFRS adoption, banks are slowly adjusting their trading portfolios, year by year, supporting *Hypothesis 2*. Also, the financial results are improving after adoption year by year, even if the portfolios are less risky.

The explanation for the improvements of the financial results after IFRS adoption is the following. Due to fair value accounting, there is no need to carry similar risky portfolios to the historic cost era in order to recognize profits; the new accounting system translates all the upper moves of the assets, corresponding to the good period of the economy during 2004-2007, into the financial accounts. The fact that the accounting benefits are increasing very quickly in the IFRS period 2004-2007 is also important for another aspect: there can be alternatively argued that the previously observed reduction in the exposure to risky instruments during the IFRS period happens because the risky assets are reducing their market value (i.e. "bad" financial assets), not because the manager renounces to part of them. In other words, it can be argued that the reduction of the *Proportion Safe Ratio* is not voluntarily realized by banks when adopting fair value accounting, but it is a consequence of the market value reduction during the period 2004-2007. This argument is not feasible as long as the financial results are increasing very much during this period: this would not be compatible with the existence of the "bad assets" in their portfolios.

We make a final comment on this subsection. The portfolio adjustments after IFRS adoption are in line with the predictions from the theoretical literature,

however their magnitude is not very pronounced. We could interpret this slow adaptation of the portfolio to at least three factors. The first one is the difficulty to liquidate big amounts of risky assets without destroying their price (to avoid fire-sale selling). Second, the trading portfolio represents only a part of the banks' assets; hence the manager is not concerned only with the trading portfolio results, but also with the traditional banking part. Finally, the managers' risk aversion may not be sufficiently high and/or the career concern short-termism could be more important than the theoretical models assumptions. If this is the case, the manager would prefer a riskier than optimal portfolio because it advantages him in the short run when the economic situation is good.

5.4 Difference-in difference analysis

The third univariate analysis that we perform is the difference-in-difference type, "*a simple way to account for unobserved differences between treatment and control firms and to adjust observed changes for the treatment firms by concurrent changes that are also experienced by the control firms*", as Daske et al. (2008) calls it.

The difference-in-difference analyses is a very simple technique, where we compare the means of the subpopulations under analysis, before and after an event. The treatment and the benchmark groups used in the following comparisons are chosen to be as similar as possible between them, and the bank samples are held constant in time in order to correctly test the means (i.e. in order to eliminate the impact of sample composition).

The first approach uses as treatment the entities that adopt IFRS in the second year of the analysis and as benchmark the entities that remain as local in both years. The objective of this analysis is to detect whether there are changes for the banks that adopt IFRS as compared with those that remain local.

The second analysis uses as treatment the entities that adopt IFRS in the second year and as benchmark those entities that already report as IFRS in the first year. With this analysis we want to detect the changes after IFRS adoption.

However, we have to be cautious because the three phenomena discussed in section 4.2 are all at work here. There are comparisons of portfolios realities at

different moments in time, hence both the portfolio composition and the market price effect could influence the results. Moreover, in case of the treatment sample, the accounting system in force also changes. Hence the accounting effect is present as well. Despite of these complications, correct inferences can be realized from the comparison of some indicators.

The results of the analyses are presented in Tables 9 (analysis 1) and 10 (analysis 2). Similar to the previous analyses, the tables report mean values of the variables of interest and the number of observations. The stars *, ** and *** indicate statistical significance of differences in means at the 10%, 5% and 1% levels, respectively, based on two-sided t-tests. We assess the statistical significance of the difference-in-differences values by comparing means of yearly changes across treatment and benchmark samples.

The first analysis is done under 2 scenarios and the results are similar (Table 9, Panels A-B): the first scenario analyzes consolidated reports where the treatment sample adopts IFRS in 2005, and the second one is for the corresponding unconsolidated reports.

We observe in the two cases how the *Proportion Safe Ratio* decreases, as expected, for the banks that adopt IFRS. In case of scenario 1 (Table 9, Panel A), it decreases in a significant manner from 0.780 to 0.493, a reduction of 36.74% versus the reduction of only 2.84% for the banks that remain local in both years. Moreover, in the pre-adoption year the banks that prepare to adopt IFRS are safer (0.780 versus 0.729 in case of the banks that will remain local). The first conclusion of this analysis is that IFRS application reduces the *Proportion Safe Ratio*, as it can be computed from the balance sheet. This represents an additional support for *Hypothesis 1a.* Despite the fact that we compare two moments in time, we can infer that the market based risk profile (the complement of the *Proportion Safe Ratio*), revealed by the IFRS application, is significantly higher than that presented by the old historic cost regime. The *Proportion Safe Ratio* reduction is caused by the new accounting application. The possibility that the portfolio is intentionally riskier in the first year after adoption is discarded, taking into account the results of the previous univariate analyses in this section. The second conclusion is inferred by comparing the pre-adoption year ratios. Even if there are historic cost ratios and they are not very precise about the actualized market positions of the portfolios, we can infer how the banks that are preparing for switching to IFRS

(the treatment sample) are more conservative than the non-adopters, an additional support for *Hypothesis 2*: the IFRS application anticipation forces the imminent adopters to adjust their portfolios towards more conservative ones; the adjustment happens before IFRS adoption, and it was clearly observed after IFRS adoption, what *Hypothesis 2* predicts.

With respect to the income from financial operations, its changes are not statistically significant.

These results remain the same for the other scenario, i.e. when the first scenario is repeated for unconsolidated reports, sustaining our conclusions.

Difference-in difference: Analysis 1

Scenario 1.1. Analysis for the period 2004-2005. Consolidated Reports

Treatment: are Listed and Unlisted that adopt exactly in 2005

Benchmark: Listed and Unlisted; Unlisted that never adopt + Listed and Unlisted that adopt in a year>2005

Proportion Safe Ratio	N	2004	2005	2005-2004	diff. as %
Treatment	105	0.780	0.493	-0.287 ***	-36.74%
Benchmark	265	0.729	0.709	-0.021	-2.84%
Difference		0.051	-0.215 ***	-0.266 ***	

Results of Financ. Oper.	N	2004	2005	2005-2004	diff. as %
Treatment	105	108.9	204.2	95.3	87.55%
Benchmark	265	32.8	33.4	0.7	2.04%
Difference		76.1 *	170.8 ***	94.7 **	

Table 9 (panel A). Difference-in-differences analysis of the "portfolio effects" around the IFRS Mandate. Adopters in 2005 vs non-adopters. Analysis for the period 2004-2005. Consolidated Reports

Scenario 1.2. Analysis for the period 2004-2005. Unconsolidated Reports

Treatment: are Listed + Unlisted that adopt exactly in 2005

Benchmark: Listed and Unlisted; Unlisted that never adopt + Listed and Unlisted that adopt in a year>2005

Proportion Safe Ratio	N	2004	2005	2005-2004	diff. as %
Treatment	631	0.923	0.669	-0.254 ***	-27.56%
Benchmark	2430	0.745	0.727	-0.018 **	-2.46%
Difference		0.178 ***	-0.058 ***	-0.236 ***	

Results of Financ. Oper.	N	2004	2005	2005-2004	diff. as %
Treatment	631	3.2	9.8	6.6 ***	203.70%
Benchmark	2430	3.7	4.0	0.3	7.81%
Difference		-0.5	5.8 ***	6.3 ***	

Table 9 (panel B). Difference-in-differences analysis of the "portfolio effects" around the IFRS Mandate. Adopters in 2005 vs non-adopters. Analysis for the period 2004-2005. Unconsolidated Reports

For the second analysis the treatment sample is represented by the banks that adopt IFRS in 2005 and the benchmark by the banks that already adopted IFRS in 2004. The analysis is done under two different scenarios (Table 10, Panels A-B), for consolidated and for the unconsolidated reports and provides us interesting results.

Looking at the *Proportion Safe Ratio*, we observe that for the benchmark samples of both panels this ratio slightly increases after IFRS adoption, but this increase is not statistically significant. Hence *Hypothesis 2* is not supported. The same ratio, for the treatment samples, decreases, as we saw in the previous difference-in-difference analysis, due to the accounting regime switch. We look now with special attention at two ratios where the comparability is perfect because they are expressed in terms of fair value accounting, even if there are different years. From the consolidated reports analysis, we find that the banks that adopt IFRS earlier (in 2004) start the IFRS era with more conservative portfolios than those adopting IFRS in 2005 in a mandatory manner (the *Proportion Safe Ratio* of 0.546 instead of 0.493, respectively). The possible motivation is the same as we signaled before: the banks that adopt IFRS in the last moment just because it is mandatory are the least prepared and they can have difficulties in adjusting their portfolios towards more conservative one. However, this result is not sustained by the unconsolidated reports analysis.

Difference-in difference: Analysis 2

Scenario 2.1. Analysis for the period 2004-2005. Consolidated Reports

Treatment: are Listed + Unlisted that adopt exactly in 2005

Benchmark: are Listed + Unlisted that adopt exactly in 2004

Proportion Safe Ratio	N	2004	2005	2005-2004	diff. as %
Treatment	105	0.780	0.493	-0.287 ***	-36.74%
Benchmark	374	0.546	0.573	0.028	5.05%
Difference		0.234 ***	-0.080 *	-0.314 ***	

Results of Financ. Oper.	N	2004	2005	2005-2004	diff. as %
Treatment	105	108.9	204.2	95.3	87.55%
Benchmark	374	258.7	378.1	119.4 *	46.15%
Difference		-149.8 *	-173.9 *	-24.1	

Table 10 (panel A). Difference-in-differences analysis of the "portfolio effects" around the IFRS Mandate. Adopters in 2005 vs adopters in 2004. Analysis for the period 2004-2005. Consolidated Reports

Scenario 2.2. Analysis for the period 2004-2005. Unconsolidated Reports

Treatment: are Listed + Unlisted that adopt exactly in 2005

Benchmark: are Listed + Unlisted that adopt exactly in 2004

Proportion Safe Ratio	N	2004	2005	2005-2004	diff. as %
Treatment	631	0.923	0.669	-0.254 ***	-27.56%
Benchmark	204	0.466	0.531	0.064	13.84%
Difference		0.457 ***	0.138 ***	-0.319 ***	

Results of Financ. Oper.	N	2004	2005	2005-2004	diff. as %
Treatment	631	3.2	9.8	6.6 ***	203.70%
Benchmark	204	12.8	24.8	12.0 **	93.71%
Difference		-9.6 ***	-15.1 ***	-5.5 **	

Table 10 (panel B). Difference-in-differences analysis of the "portfolio effects" around the IFRS Mandate. Adopters in 2005 vs adopters in 2004. Analysis for the period 2004-2005. Unconsolidated Reports

6 Multivariate analysis (regressions)

The present section discusses the multivariate tests of our hypotheses. The first tests are focused on *Hypothesis 1*: we want to check whether by applying fair value accounting, the *Proportion Safe Ratio* diminishes and the *Results of Financial Operations* increase.

The second test intends to reveal the trends after IFRS adoption with the two mentioned indicators, in other words whether *Hypothesis 2* is supported.

Finally, the third series of tests analyze the possible heterogeneity of the impacts for the countries composing the EU15.

6.1 The IFRS adoption impact (*Hypothesis 1*)

We start our discussion of the first series of tests for the IFRS impact on balance sheets. The basic model to be tested is similar to Daske et al. (2008):

$$PortfolioEfects = \alpha_0 + \alpha_1 * EarlyAdopter + \alpha_2 * LateAdopter + \alpha_3 * EarlyAdopter * IFRS + \alpha_4 * LateAdopter * IFRS + \alpha_5 * Leverage + \alpha_6 * Size + \alpha_7 * Listed$$

The variable *Portfolio Effects* stands for *Proportion Safe Ratio* and *Results of Financial Operations*. These portfolio effects are tested for the population of consolidated and unconsolidated reports, respectively, under different scenarios. We mark every IFRS adopter bank inside the analyzed populations as *EarlyAdopter* or *LateAdopter*, depending on the adoption year. *EarlyAdopter* marks the banks that adopt IFRS between 2002 and 2004.[8] *LateAdopter* marks the banks that adopt IFRS in 2005. The variables *EarlyAdopter* and *LateAdopter* are equal to 1 for all years for the banks that adopted in a voluntary manner, before mandated deadline and in the last year 2005, respectively. They are constant inside of a company. The variable *IFRS* marks the firm-years with IFRS reports. It is equal to 1 for IFRS years and 0 otherwise. The interaction terms *EarlyAdopter*IFRS*

[8] We are not considering in this category the banks adopting IFRS before 2002 because the national announcements that the countries will adopt IFRS as a mandatory standard were done in 2002 (see Daske et al (2008), table 6). Moreover the IFRS version for periods before 2002 was not contemplating the fair value adoption for the financial instruments.

and *LateAdopter*IFRS* mark the impacts of IFRS adoption for the two categories of adopters. The rest of the variables are control ones. *Leverage* = total liabilities/total assets, *Size* = log of total assets and *Listed* = binary variable marking the listed companies, 1 for listed companies and 0 otherwise.

We run the previous model regression for the following three scenarios (models). Model 1, or the base model, is the analysis for the entire population of consolidated reports, and country fixed effects are imposed. The second model is a sensitivity analysis, repeating the base model for institution profiles fixed effects instead of country fixed effects. The third model is the second alternative to the base model and it repeats the first model (the base model) but for the population of unconsolidated reports instead of consolidated ones. The portfolio effects for adopters are evaluated relative to banks that have not yet switched to IFRS.

Tables 11 and 12 report the regressions results. We tabulate ordinary least squares coefficient estimates and, in parentheses, t-statistics based on robust standard errors that are clustered by firm. The coefficients for fixed effects are not shown, neither the constant terms.

	Model 1 Main	*Model 2* Institution type fixed effects	*Model 3* Unconsolidated
Proportion Safe Ratio			
Early Adopter	0.05 **	0.08 ***	0.12 ***
	(2.05)	(3.99)	(4.39)
Late Adopter	0.01	0.04	0.11 ***
	(0.46)	(1.48)	(4.03)
Early Adopter*IFRS	-0.27 ***	-0.27 ***	-0.38 ***
	(-15.73)	(-15.63)	(-15.3)
Late Adopter*IFRS	-0.28 ***	-0.27 ***	-0.28 ***
	(-7.74)	(-7.54)	(-23.42)
Leverage	0.41 ***	0.40 ***	0.55 ***
	(4.25)	(3.86)	(9.94)
Size	0.03 ***	0.02 ***	-0.01 ***
	(5.31)	(4.81)	(-4.97)
Listed	-0.07 ***	-0.06 ***	-0.05 **
	(-3.07)	(-2.96)	(-2.26)
Fixed effects	Country	Institution type	Country
No. of observations	6117	6117	27431
No. of unique banks	883	883	4118
R-squared	0.18	0.16	0.17

Table 11. Regressions results for the IFRS adoption impact. *Proportion Safe*

Ratio

We observe the impact of IFRS adoption for the *Proportion Safe Ratio* and for the *Results of Financial Operations*. The *Proportion Safe Ratio* decreases with the fair value accounting adoption for both early adopters and late adopters (the coefficients of both *EarlyAdopter*IFRS* and *LateAdopter*IFRS* are negative and significant) under the three analyzed scenarios. Interesting conclusions can be inferred from the control variables analysis. Highly leveraged firms are investing safer, an intuitive result. Also, bigger firms are opting for safer portfolios, a result we can infer from the consolidated results but contrary to the unconsolidated results (model 3). However, the magnitude of the *Size* coefficient, even if it significant, it is not sufficiently large to support a conclusion.

The quoted companies invest riskier than the unlisted ones. An explanation is their higher visibility by the market induces them to compete more and to be pressed to adopt riskier portfolios able to offer superior returns to the shareholders.

The results support *Hypothesis 1a*: the *Proportion Safe Ratio* is reduced, as it can be computed from the accounting balance sheets, once the fair value accounting is used.

	Model 1 Main	*Model 2* Institution type fixed effects	*Model 3* Unconsolidated
Results of Fin. Oper.			
Early Adopter	-163.05 ***	-114.88 ***	-12.56 ***
	(-4.16)	(-3.58)	(-3.75)
Late Adopter	-124.33 ***	-51.17 *	-8.25 ***
	(-3.25)	(-1.67)	(-3.35)
Early Adopter*IFRS	159.47 ***	144.24 ***	8.42 ***
	(4.8)	(4.35)	(2.81)
Late Adopter*IFRS	47.29	41.48	5.08 ***
	(0.78)	(0.68)	(4)
Leverage	-622.61 ***	-673.18 ***	-4.30
	(-5.27)	(-5.69)	(-1.28)
Size	149.04 ***	149.14 ***	5.30 ***
	(9.32)	(9.15)	(11.18)
Listed	155.95 **	68.09	14.41 ***
	(2.47)	(1.23)	(3.27)
Fixed effects	Country	Institution type	Country
No. of observations	6117	6117	27431
No. of unique banks	883	883	4118
R-squared	0.24	0.23	0.15

Table 12. Regressions results for the IFRS adoption impact. *Results of Finan-*

cial Operations

The regressions results for the *Results of Financial Operations* variable are supporting *Hypothesis 1b* that the fair value accounting impact increases the profits, in case of the *EarlyAdopter* banks. The coefficients of *EarlyAdopter*IFRS* are all positive and significant. In case of the coefficient *LateAdopter*IFRS,* it is significant only for the model 3, hence we cannot affirm the hypothesis is sustained in this analysis by the late adopters banks. The explanation for this result is similar to that for the unconsolidated reports of banks adopting in a mandatory way in 2005 (Table 8) and for the difference in difference analysis (Table 10): the banks that adopt IFRS in the last moment just because it is mandatory are the least prepared and they could not be advantaged by the IFRS adoption.

Also, higher profits are obtained by bigger and/or listed banks, and higher leverage works against the profits (in case of consolidated reports), again intuitive results.

The R^2 values are sufficiently large in both regression analyses from above.

We repeated the analysis using only the population of banks that adopt IFRS and the previous results were reinforced.

6.2 Post-adoption trends (*Hypothesis 2*)

Our objective with the present study is to distinguish the portfolio effects around the IFRS adoption. The regressions in section 6.1 proved that the impact of IFRS (i.e. comparing all the local vs. all the IFRS computed portfolio indicators) on the *Proportion Safe Ratio* and the *Results of Financial Operations* are those expected in our *Hypothesis 1.* We are aware that the portfolio indicators computed under the local standards are not reflecting the actualized values of the variables, because they are measured with the historic cost accounting. Consequently, we concentrate in this section only to the post adoption period indicators, measured with fair value accounting, hence reflecting the market based portfolio effects. We expect that the IFRS adoption changes the portfolio selection behavior and we want to detect this intention in the years after IFRS adoption. In order to detect the portfolio strategy during the post adoption years we measure the portfolio effects trend after

adoption. The regressions we use check first for the time fixed-effects with respect to post adoption years, in case of adopters banks:

$$PortfolioEfects = \gamma_0 + \gamma_1 * Leverage + \gamma_2 * Size + \gamma_3 * Listed + \gamma_4 * PostAdoption1 + \gamma_5 * PostAdoption2 + \gamma_6 * PostAdoption3$$

The variables *PostAdoption* are indicating the first, the second and respectively the third year after adoption (are equal to 1 for the respective post adoption years and zero otherwise).

In order to detect whether the possible post adoption trends are a characteristic of the IFRS adoption, we have to analyze in a similar manner the non-adopters banks population. For non-adopters, we check whether there are similar portfolio effects during the period 2005-2007, coinciding basically with the three years after adoption in the EU15 population of banks. We are eliminating the *Listed* indicator due to the collinearity problems it caused. Symmetrically to the previous regression indicators, the variables *Year* are indicating the years 2005, 2006 and 2007.

$$PortfolioEfects = \gamma_0 + \gamma_1 * Leverage + \gamma_2 * Size + \gamma_3 * Year2005 + \gamma_4 * Year2006 + \gamma_5 * Year2007$$

It is important to mention that for non-adopters, the indicators are still using historic cost accounting; hence they do not present the same degree of reliability as the indicators for the adopters during the post adoption period. However, we expect the regressions for non-adopters would capture, (even in a smaller proportion, due to the lack of reliability), the trends if they would be present in this population.

We run the two regressions for the consolidated reports and then for the unconsolidated reports population, as a robustness check.

	Proportion Safe Ratio	Results of Fin. Oper.
Leverage	0.55 ***	-832.99 ***
	(5.22)	(-5.42)
Size	0.02 ***	189.35 ***
	(4.07)	(9.12)
Listed	-0.04 *	108.11 *
	(-1.84)	(1.85)
Postadoption1	-0.27 ***	69.92 ***
	(-15.81)	(3.28)
Postadoption2	-0.25 ***	110.08 ***
	(-15.97)	(4.46)
Postadoption3	-0.23 ***	154.38 ***
	(-13.51)	(4.71)
No. of observations	4441	4441
No. of unique banks	624	624
R-squared	0.19	0.25

Table 13. Regressions results for the trends after IFRS adoption. Consolidated Reports. Adopters.

Looking at the *PostAdoption* coefficients (Table 13), we observe first that they have the expected signs supporting *Hypothesis 1*: the impact of IFRS adoption is the reduction of *Proportion Safe Ratio* and the increment of the *Results of Financial Operations*. Moreover, we can distinguish the trends with the portfolio effects after fair value accounting adoption: the reduction of *Proportion Safe Ratio* is year after year less pronounced (the coefficients of *PostAdoption* are decreasing in time, in absolute values) compared with the pre-adoption period. Hence we found evidence in favour of *Hypothesis 2.* The *Results of Financial Operations* are increasing year after year during the post adoption period.

When we apply the regressions for the non-adopters (Table 14), the trends could not be observed. This result give a bit more support for *Hypothesis 2*, i.e. that the portfolio adjustments are realized only by the adopters; hence they are a consequence of the fair value accounting adoption.

The control coefficients from the two regressions are conserving the signs from the base model.

	Proportion Safe Ratio	Results of Fin. Oper.
Leverage	0.17	-150.49
	(0.91)	(-1.21)
Size	0.04 ***	8.38 **
	(2.89)	(2.41)
Year2005	-0.06 ***	8.26
	(-4.35)	(1.13)
Year2006	-0.06 ***	-8.93
	(-2.81)	(-0.79)
Year2007	-0.09 *	5.32
	(-1.92)	(0.4)
No. of observations	1676	1676
No. of unique banks	259	259
R-squared	0.05	0.07

Table 14. Regressions results for the trends during 2005-2007 period. Consolidated Reports. Non-adopters.

We repeat the two regressions for the unconsolidated population (Tables 15 and 16). For IFRS adopters, the trends in the coefficients are now the opposite for the *Proportion Safe Ratio* with respect to the previous case. The tendency is not very clear in the case of the *Results of Financial Operations*. No trends are observed for the non-adopters, as expected. The risk appetite reduction is not observed hence in case of the unconsolidated reports.

	Proportion Safe Ratio	Results of Fin. Oper.
Leverage	0.66 ***	-3.54
	(7.58)	(-0.52)
Size	-0.04 ***	5.22 ***
	(-10.38)	(8.26)
Listed	0.01	11.44 **
	(0.28)	(2.01)
Postadoption1	-0.29 ***	3.18 ***
	(-24.69)	(3.1)
Postadoption2	-0.30 ***	6.52 ***
	(-26.48)	(5.36)
Postadoption3	-0.32 ***	5.18 *
	(-14.89)	(1.72)
No. of observations	6851	6851
No. of unique banks	1065	1065
R-squared	0.26	0.15

Table 15. Regressions results for the trends of *Proportion Safe Ratio* after IFRS adoption. Unconsolidated Reports. Adopters.

	Proportion Safe Ratio	Results of Fin. Oper.
Leverage	0.59 ***	-17.69 ***
	(9.87)	(-5.28)
Size	-0.01 ***	5.73 ***
	(-3.37)	(8.83)
Year2005	-0.04 ***	0.16
	(-9.38)	(0.5)
Year2006	-0.04 ***	1.41 ***
	(-8.96)	(3.67)
Year2007	-0.002	-2.38 *
	(-0.14)	(-1.71)
No. of observations	20580	20580
No. of unique banks	3053	3053
R-squared	0.06	0.12

Table 16. Regressions results for the trends during 2005-2007 period. Unconsolidated Reports. Non-adopters.

6.3 Heterogeneity in the portfolio effects (Cross-sectional variation)

The case of French origin countries and particularly French banks suggest us the idea of different impacts of the IFRS adoption for the EU15 banks, depending on the differences between the local standards and the IFRS ones. For this reason we now check for possible cross-sectional variation across countries.

We first partition the observations by groups of countries, depending on their legal origin, by using La Porta et al. (1998) classification. The procedure consists in applying the base model to each one of the country groups separately. The disadvantage of this analysis is that the comparisons between country groups are realized by comparing regression coefficients from distinct regressions.

As an alternative approach we proceed like Daske et al. (2008) by realizing a partition of the IFRS firm-year observations by countries' institutional frameworks using country-level factors. In particular we use two indicators: "the rule of law" in 2005 and the "summary score" of how local GAAP differ from IAS/IFRS.

We start our analysis by following the first approach based on La Porta et al. (1998) classification. We group the countries as having English Origin (United Kingdom, Ireland), French origin (France, Greece, Italy, Netherlands, Portugal, Spain, Belgium, Luxembourg[9]), German Origin (Austria, Germany) and Scandinavian Origin (Denmark, Finland, Sweden). Applying the base model for each legal group in part we obtain the following results.

[9]Luxembourg is not included by La Porta et al. (1998), but cited by this work as having French origin from Glendon et al. (1994)

Proportion Safe Ratio	English	French	German	Scandinavian
Early Adopter	0.19 ***	0.01	0.07	-0.05
	(3.16)	(0.45)	(0.98)	(-0.64)
Late Adopter	0.15 *	-0.05	0.16 ***	0.10
	(1.96)	(-1.23)	(5.61)	(1.43)
Early Adopter*IFRS	-0.24 ***	-0.28 ***	-0.18 *	-0.30 ***
	(-6.02)	(-14.31)	(-1.93)	(-4.8)
Late Adopter*IFRS	-0.33 ***	-0.24 ***	-0.35 **	-0.49 ***
	(-3.49)	(-5.89)	(-2.2)	(-3.46)
Leverage	0.37	0.32 **	0.63 ***	0.57 ***
	(1.49)	(2.38)	(2.89)	(3.33)
Size	0.02	0.03 ***	0.03 **	0.04 ***
	(1.24)	(4.05)	(2.28)	(3.07)
Listed	-0.14 **	-0.06 **	-0.01	0.10
	(-2.31)	(-2.17)	(-0.11)	(1.48)
No. of observations	1166	3347	1065	539
No. of unique banks	182	481	145	75
R-squared	0.14	0.17	0.14	0.25

Table 17. Regressions results for the groups of legal origin. Consolidated Reports. *Proportion Safe Ratio*

The adjustments for *Proportion Safe Ratio* are more pronounced for the *Early Adopters* in case of French and Scandinavian origin as compared with English and German origin countries, an expected result in line with the results from the section 5. On the other hand, the French origin countries are adjusting less the portfolio when they are *Late Adopters*. The interpretation is that the French *Late Adopters* banks that adopt IFRS in a mandatory manner represent the French banks that are not prepared for the fair value accounting. This explains why they find difficult to adjust the portfolios after IFRS adoption.

Regarding the *Results of Financial Operations* (Table 18), when partitioning the sample by country groups, only the *Early Adopter* coefficients for the IFRS impact of the English and French origin countries are positive and significant, hence only these categories of banks are affected by the IFRS adoption. Moreover, the French origin countries are less advantaged by the fair value accounting adoption than the English origin ones, a result coherent with the negative impact of IFRS adoption in 2004 for the French banks.

The conclusion of this analysis constitutes an additional support for the French

banks' opposition: on aggregate, they are the least advantaged by the fair value accounting adoption.

	English	French	German	Scandinavian
Results of Fin. Oper.				
Early Adopter	-265.62 ***	-182.36 ***	-176.51 **	-57.04 *
	(-2.78)	(-3.66)	(-2.45)	(-1.77)
Late Adopter	-249.42 ***	-92.44 *	-169.66 **	128.13
	(-2.96)	(-1.91)	(-2.44)	(0.84)
Early Adopter*IFRS	330.92 ***	114.94 ***	36.95	32.00
	(3.15)	(2.94)	(1.11)	(1.11)
Late Adopter*IFRS	-3.30	69.68	111.87	-190.05
	(-0.07)	(0.79)	(0.99)	(-1.06)
Leverage	-701.05 **	-939.04 ***	-220.26 *	-72.53 *
	(-2.3)	(-4.83)	(-1.7)	(-1.78)
Size	178.91 ***	201.40 ***	65.32 ***	34.56 ***
	(5.1)	(7.36)	(3.02)	(4.14)
Listed	120.32	126.92	146.78	57.17
	(0.74)	(1.51)	(1.54)	(1.61)
No. of observations	1166	3347	1065	539
No. of unique banks	182	481	145	75
R-squared	0.23	0.29	0.14	0.11

Table 18. Regressions results for the groups of legal origin. Consolidated Reports. *Results of Financial Operations*

For the second analysis, similarly to Daske et al. (2008), we realize a partition of the IFRS firm-year observations by countries' institutional frameworks using two different indicators as country-level factors.

The first indicator, "rule of law" in 2005, is computed by Kaufmann, Kraay and Mastruzzi (2007). Higher values of the indicators represent countries with stricter enforcement regimes. As Daske et al. (2008), table 6, we use the original values from the cited study for the countries of EU15.

In a similar manner, to capture the degree to which the accounting rules change with the switch to IFRS, we use as a second indicator the Bae, Tan and Welker (2008) "summary score" of how local GAAP differ from IAS on 21 key accounting dimensions. Higher scores represent more differences between standards. However, the values for the "summary score" indicators we are using are not the original

Bae, Tan and Welker (2008) values. Similar to Daske et al. (2008), we are concerned about the fact that the country-level institutional variables are all highly correlated and they are outcomes of more fundamental qualities of countries' institutional frameworks. The procedure Daske et al. (2008) use to address this concern is to orthogonalize the differences with respect to more fundamental country characteristics. That is, they first regress the raw values of differences on countries' legal origin (La Porta et al. (1998)) and the log transformed average gross domestic product per capita (World Bank) and then use as indicators the residuals from those regressions to form partitions in the cross-sectional analyses. In our study we use as indicators the residuals of Daske et al. (2008) regressions presented in table 6 of their research study.

In case of the first proxy, the legal enforcement, measured as "rule of law", Daske et al. (2008) does not apply the same orthogonalization procedure because they consider it is more likely to be a fundamental element and we make the same assumption.

We transform these two continuous institutional factors into binary variables (0 or 1) splitting by the country medians of our EU15 sample. Then we interact these binary *ConditionalVariables* created (*RuleofLaw* and *DifferenceLocalIFRS*) with each of the IFRS indicator from the base model leading to the following empirical model.

$$PortfolioEfects = \delta_0 + \delta_1 * EarlyAdopter + \delta_2 * EarlyAdopter * ConditionalVariable + \delta_3 * LateAdopter + \delta_4 * LateAdopter * ConditionalVariable + \delta_5 * EarlyAdopter * IFRS + \delta_6 * EarlyAdopter * IFRS * ConditionalVariable + \delta_7 * LateAdopter * IFRS + \delta_8 * LateAdopter * IFRS * ConditionalVariable + \delta_9 * Leverage + \delta_{10} * Size + \delta_{11} * Listed$$

The interpretation of the coefficients for this regression is different from the base model. The coefficients on *EarlyAdopter*, *LateAdopter* and *EarlyAdopter*IFRS*, *LateAdopter*IFRS* apply only to IFRS adopters from countries where the conditional variable is below (i.e. $<$) the median. The interaction terms with the *ConditionalVariable* represent the incremental portfolio effects for banks from countries where the conditional variable is above (i.e.$>$) the median. In order to determine the total effects for those latter countries, we have to sum the two corresponding coefficients. We provide the statistical significance of the corresponding joint coef-

ficients (p-values from the Wald tests). The control variables, the sample and the fixed effects are the same as for the base model.

We present first the lists of countries according to the categories induced by the two indicators. The countries with higher coefficients of "rule of law" are Austria, Denmark, Finland, Germany, Ireland, Luxembourg, Netherlands, Sweden and United Kingdom. In other words, they are the English, German, Scandinavian origin countries and from the French origin-Luxembourg and Netherlands, hence without France, Greece, Italy, Portugal, Spain, Belgium.

The countries with higher differences of "summary score" between the local and IFRS standards are Austria, Belgium, Finland, Germany, Greece, Luxembourg, Portugal, Spain. They are the German, one Scandinavian (Finland), and the French origin countries- without France, Italy and Netherlands.

We expect the portfolio effects after IFRS adoption to be evident in countries with a relatively weak "rule of law". In these countries it was easier before the IFRS adoption to benefit from the possibility offered by the historic cost accounting to avoid the rigorous impairment adjustments. For the banks from these countries the impact to the *Proportion Safe Ratio* and the *Results of Financial Operations* after the IFRS application it should be the most pronounced. In other words we expect negative incremental portfolio (i.e. opposed sign coefficients than the main ones) effects in countries with stronger "rule of law" coefficients.

We discuss now the predictions with respect to the effects of the IFRS adoption for the banks in the countries with higher differences between local standards and IFRS. The intuition says that these countries should face the most pronounced effects for the change of the accounting indicators computed. However, by looking at the list of the countries with this characteristic we discover that France and Italy, two countries where the preliminary analyses show that they are the most affected by the IFRS adoption, are not included in the category of greater difference between local GAAP and IFRS. Their exclusion makes us uncertain about the conclusion regarding the effects of IFRS application on the category of countries with higher differences between the local standards and IFRS.

Unfortunately, the results of the regressions are showing that there are no incremental post adoption effects for countries with stronger "rule of law" and with larger differences between local GAAP and IFRS. We conclude this because

the coefficients (6) and (8) are not significant, while (5) and (7) are significant (except the case of (7) *Results of Financial Operations* for the *Late Adopters*).

	Proportion Safe Ratio		**Results of Fin. Oper.**	
	Rule of Law	*Difference* *Local vs. IFRS*	*Rule of Law*	*Difference* *Local vs. IFRS*
(1) Early Adopter	0.07 ***	0.07 ***	-83.43 **	-65.97 *
	(3.16)	(2.9)	(-2.25)	(-1.76)
(2) Early Adopter*Conditional*	0.05 **	0.06 **	-54.26	-100.53 **
	(2.11)	(2.52)	(-1.01)	(-2.5)
Test of (1)+(2)=0 [p-value]	[0.00]	[0.00]	[0.00]	[0.00]
(3) Late Adopter	0.002	0.04	-12.91	-64.21
	(0.07)	(0.94)	(-0.4)	(-1.58)
(4) Late Adopter*Conditional*	0.14 ***	0.01	-125.00 **	34.60
	(3.23)	(0.29)	(-2.27)	(0.75)
Test of (3)+(4)=0 [p-value]	[0.00]	[0.18]	[0.01]	[0.40]
(5) Early Adopter*IFRS	-0.29 ***	-0.29 ***	148.66 ***	146.35 ***
	(-13.49)	(-12.84)	(3.74)	(3.32)
(6) Early Adopter*IFRS*Conditional*	0.04	0.04	-2.16	5.52
	(1.04)	(1.25)	(-0.03)	(0.08)
Test of (5)+(6)=0 [p-value]	[0.00]	[0.00]	[0.01]	[0.00]
(7) Late Adopter*IFRS	-0.24 ***	-0.31 ***	114.26	-17.21
	(-5.79)	(-6.23)	(1.21)	(-0.33)
(8) Late Adopter*IFRS*Conditional*	-0.10	0.10	-150.06	156.47
	(-1.36)	(1.45)	(-1.37)	(1.11)
Test of (7)+(8)=0 [p-value]	[0.00]	[0.00]	[0.52]	[0.29]
(9) Leverage	0.41 ***	0.41 ***	-697.23 ***	-693.23 ***
	(3.99)	(4.01)	(-6.18)	(-6.18)
(10) Size	0.02 ***	0.02 ***	149.59 ***	147.22 ***
	(4.6)	(5.01)	(9)	(9.11)
(11) Listed	-0.07 ***	-0.06 ***	109.99 *	107.01 *
	(-3.08)	(-2.83)	(1.91)	(1.87)
No. of observations	4441	4441	4441	4441
No. of unique banks	624	624	624	624
R-squared	0.15	0.15	0.22	0.22

Table 19. Regressions results for the institutional factors. Consolidated Reports.

The conclusion of this last analysis is that the previously introduced institutional factors at the country level are not explaining the variety of the IFRS impacts. Instead, the specificity of the local regulations with respect to the severity of the impairment rules and the possibility to recognize the upward moves of the financial instruments are important determinants for the diversity of the IFRS adoption effects. Such a detailed analysis will constitute the subject of our future research.

7 Conclusions

The recent literature advocates that the adoption of fair value accounting is not neutral for the portfolio selection decisions of the financial institutions. In the present research we have proven analytically that the accounting regulation is not indifferent for a portfolio manager: the balance sheet and respectively income values are not identical for the same economic reality, when different accounting systems are in force. In our simple model, in environments where the accounting numbers matter, financial institutions adjust their portfolios when the regulation imposes a change from a Historical Cost regime (pure or with impairment) to Fair Value accounting. The change to Fair Value accounting leads to a more conservative portfolio, depending on the severity of the impairment rule in force during the Historical Cost regime.

Secondly, we have realized some empirical tests of the hypotheses developed in the analytical model. In order to do that, we tried to capture the decisions regarding the trading portfolios of EU15 financial companies -banks and similar- around the adoption of IFRS framework in the period surrounding the year 2005. We analyze an extensive database composed by 4,497 banks (unconsolidated accounting reports) and respectively 941 banks (consolidated reports) for the period 1999-2007. We interpret the shift from local GAAP to IAS/IFRS as a move from a more Historical Cost oriented regime to a more Fair Value oriented accounting regime.

The first empirical result found is that the fair value accounting adoption around the year 2005 reveals a significantly riskier trading portfolio than the image presented if the banks would have continued to present the results according to a more historic cost oriented local accounting regime. Also, the accounting profits of the trading portfolio are higher with fair value accounting than with the historic cost accounting regime. This result is due to the specificity of the period when the IFRS adoption became mandatory. The adoption happens around the year 2005, a good period of the economy, when the risky instruments increase more in value than the fixed income ones and it ends before the recent major financial crisis commence.

Also, we discover that the impact of the fair value accounting is not uniform amongst the European countries. The previous institutional positions of the French

authorities against the IAS 39 adoption suggested us that they would be the most affected by the fair value accounting introduction. We find that the differences between the reported profits under historic cost and fair value accounting for the same economic reality are more pronounced for the French origin countries and in particular disadvantage the French banks, contrary to the rest of the European countries. In other words, our analysis proved that the French banks are negatively affected by the fair value accounting adoption.

We also provided evidence that the IFRS adoption is not neutral and induces more conservative portfolios, i.e. it reduces banks risk appetite, as the analytical models predict. The adjustments to more conservative portfolios once IFRS is adopted are significant because the previous accounting regime before IFRS adoption was closer to a pure historic cost accounting than to a lower of the cost and the market and it incentivized the risk taking attitude of the banks.

Overall the conclusions of this study support the general hypotheses developed in the analytical literature regarding real effects of accounting regulation on banks' risk taking.

Annex

Proof of Proposition 1: Let us consider the global maxima (i.e. on whole $\mathbb{R}$, not only restricted to $[0, I_0]$) of the objective function for the three accounting regimes analyzed: $argmax^{HCpure} = \frac{p(u-c-1)-R}{2kp(1-p)(u-c-1)^2}$; $argmax^{HCimpairment} = \frac{M-pc}{2kp(1-p)(u-c-d)^2}$; $argmax^{FV} = \frac{M}{2kp(1-p)(u-d)^2}$. We study the relationships between the global maxima, because they will remain the same when restricting to $[0, I_0]$.

We show that the first part of the inequality is true. $argmax^{HCimpairment} \leq argmax^{FV} \Leftrightarrow c \geq 2(u-d) - \frac{p(u-d)^2}{M}$. But $2(u-d) - \frac{p(u-d)^2}{M} < 0$ if and only if $p > \frac{2M}{u-d}(*)$, hence $argmax^{HCimpairment} \leq argmax^{FV}$. It implies $\mathbf{X}_0^{HCimpairment} \leq \mathbf{X}_0^{FV}$.[10]

We also study the relationship between $argmax^{FV}$ and $argmax^{HCpure}$. Consider $H(c) = argmax^{HCpure} - argmax^{FV} = \frac{[p(u-c-1)-R](u-d)^2 - M(u-c-1)^2}{2kp(1-p)(u-d)^2(u-c-1)^2}$ on $[0, u-1)$.

[10] We are also aware of the particular case, with a very low probability to occur in practice, when $p \leq 2M/(u-d)$. Then there exists a threshold value for c, $Threshold_c = 2(u-d) - p(u-d)^2/M$ such that $argmax^{HCimpairment} > argmax^{FV}$ for $c < Threshold_c$ and $argmax^{HCimpairment} \leq argmax^{FV}$ for $c \geq Threshold_c$.

We have $H(0) > 0$ and $\lim_{c \to u-1} H(c) = -\infty$. Moreover there exists a unique value of c, called $c_{critical} = (u-1)-(u-d)[p(u-d)-\sqrt{p^2(u-d)^2 - 4MR}]/(2M) \in (0, u-1)$, such that $argmax^{HCpure} \geq argmax^{FV}$ for $c \leq c_{critical}$ and $argmax^{HCpure} < argmax^{FV}$ for $c > c_{critical}$. Hence $argmax^{HCpure} \geq argmax^{FV}$ for small values of c and $argmax^{HCpure} < argmax^{FV}$ for big values of c. The same relationships remain true when they are restricted to $[0, I_0]$.

Q.E.D.

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