

# **Fair Value Accounting and the Business Model of Banks \***

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Bank lobbyists and regulators frequently argue that fair value measurement inadequately mirrors a ‘banking book’ business model aimed at originating and holding financial instruments. As an outcome of this political position, existing and currently proposed accounting rules for financial instruments can be characterized as an option-based mixed measurement model. Using a comprehensive global sample of IFRS reporting banks, we study the reporting practice and consequences for capturing banks’ risk-taking under this accounting regime. First, we find that operating characteristics (e.g. trading vs. banking book business) and the risk exposures of banks are only weakly related. Second, we show that the current application of fair value measurement is primarily determined by a bank’s operating business model and reporting incentives, but not by its risk-taking. Third, we document the risk-relevance of individual components of mixed measurement income. While comprehensive fair value income from trading book activities is significantly associated with stock returns, an equivalent association can only be observed for those portions of banking book income which are (voluntarily) measured at fair value. Overall, our findings suggest that risk exposure of banks operating under a ‘banking book’ business model can be severe and that such risk-taking is more adequately reflected by fair value accounting than by amortized cost accounting.

JEL classification: G 21, M 41

Key Words: Bank Accounting, Business Model, Fair Value, IAS 39, Risk Taking.

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## *1. Introduction*

Bank lobbyists, such as the European Banking Federation (e.g. EBF, 2009), and bank regulators, most importantly the Basel Committee on Banking Supervision (e.g. Basel Committee, 2009), frequently postulate that accounting rules for financial instruments should consider differences in the business model of banks. IAS 39 and, explicitly, IFRS 9 are largely based on this notion. The standards take an operations-based view on a bank's business model and primarily distinguish between trading activities and an 'originate and hold' business model. While there is wide consensus that the first business model is best represented by fair value accounting (Power, 2010), the major controversy pertains to the measurement basis for assets and liabilities arising from the latter model. Opponents of fair value accounting argue that fair value induces artificial volatility of net income and equity that cannot be explained by the economic underlyings of the long-term banking book business (e.g. Enria et al., 2004). Advocates of fair value accounting, on the other hand, bring forward the idea that risk-taking in banks is independent of an operating business model because open positions can be as severe under an originate and hold strategy, and that such risks are not adequately pictured by measurement bases other than fair value (e.g. Barth, 2004; Gebhardt et al., 2004; Ryan, 2007).

This debate raises three research questions that will be addressed by this study. First, it is unclear how well the two hypothetical business models reflect operations in the global banking industry and to what extent there exist systematic differences in the level of risk exposures associated with business models observed in practice. Second, measurement practices of banks under the option-based mixed attributes model are largely unknown, at least on a global scale. Thus, it is an empirical question whether and to what extent heterogeneity in business models in the global banking industry explains differences in the usage and reporting of fair values versus historical

costs. Third, it is the question whether such heterogeneity in accounting measurement has consequences for the relevance of income measures to investors.

We observe an extreme heterogeneity in the application of fair value measurement of banks around the world. While our results indicate that fair value measurement plays a minor role for balance sheet and income statement of a majority of banks, there exists a small group of banks that extensively uses fair values. A descriptive cluster analysis using operating characteristics of banks reveals that most banks in this group are either globally active universal banks (global players) or small and specialized investment and securities firms, i.e. banks with a substantial focus on non-banking book activities. However, we also document differences in fair value usage across banks that cannot be explained by differences in their operating business model, but by firm-specific and country-specific reporting incentives. These incentives drive the classification of financial instruments into categories with different measurement bases (e.g., held-to-maturity vs. available-for-sale) and the application of the fair value option.

In the next step of our analysis, we relate the extent of fair value measurement to the level of risk exposure. We should expect a positive association if the differences in operating characteristics of banks adequately reflect differences in their risk-taking, as alleged by the banking associations. We compute market-based risk measures capturing three dimensions of banking risks for which fair value accounting could theoretically produce useful information (precisely, market risk, interest rate risk and credit risk). The results suggest that a bank's risk-taking is, at best, imperfectly associated with its operating business model. To be specific, some banks with a banking book-related business model open more severe risk positions than other banks with a business model that focuses on non-banking book activities. These findings cast doubt on the current regulation of bank accounting for financial instruments if accounting numbers are expected to reflect economic risks.

In a third step, we exploit the observed heterogeneity of fair value measurement to study the relevance of fair value-based components of comprehensive income versus amortized cost-based components. Consistent with prior evidence from the US banking industry suggesting that fair value income is relevant for the market assessment of banks' risk (Barth et al., 1996; Hodder et al., 2006), we document a significantly positive association of fair value-based *trading book income* with stock returns. Moreover, we show that those *recognized components* of the *banking book income* that are based on fair values show equivalently positive associations. However, amortized cost components of the banking book income are *not* associated with stock returns. Finally, we examine whether footnote disclosures of fair values of banking book components recognized at amortized costs can mitigate this relation. When we artificially adjust reported income for fair value changes as disclosed in the footnotes of international banks, fair value components in the footnotes contribute to the explanation of market returns *only* if disclosure is accompanied by high quality regulatory oversight and if the reporting bank is exposed to high risks. Taken together, our findings are consistent with risk exposures in the banking book being more adequately reflected by recognized fair values, rather than by amortized cost accounting.

In addition to direct policy implications, we contribute to the academic literature in several ways. First, we provide evidence against the validity of the 'business model' argument which has played a vital role in the revision of accounting for financial instruments following the financial crises (e.g. Hodgkinson and Singleton-Green, 2010). Our evidence shows that the level of risk exposure of banks is independent of its operating activities, i.e. that banks which run a banking-book business can be as risky as those which run a trading business. This result also provides insights into how lobbying associations argue in order to achieve a certain outcome in the standard-setting process. Second, we introduce a comprehensive global dataset on fair value measurement by IFRS-reporting banks from 48 different countries into the academic debate about fair value accounting

which is so far almost exclusively relying on evidence from the US (e.g. Laux and Leuz, 2010). We document severe heterogeneity in the application of fair value accounting, which can be explained by differences in the operating business models banks run *and* their relative incentives for the application of fair value measurement. Third, we exploit this heterogeneity in measurement to study the risk relevance of banking book income components, and show that only those components which are recognized at fair value are associated with stock returns. We contribute to the literature on risk-relevance of fair values (Barth et al., 1996; Hodder et al., 2006) not only by explicitly distinguishing between trading book and banking book income components, but also by exploiting variation in measurement within recognized income (instead of using artificially calculated fair value components from footnote disclosures).

The remainder of the paper is structured as follows: In the next section, we summarize the arguments brought forward in the political debate about the role of the business model in fair value accounting by banks. Our hypotheses development in section 3 is based on this discussion. Section 4 describes data collection and reporting practices. Section 5 presents results for the analysis of the association between operating characteristics and risk taking. Section 6 relates these findings to the causes and consequences of fair value accounting. Section 7 concludes.

## *2 The Role of Banks' Business Models in the Political Fair Value Debate*

When standard setters propose the implementation of a full fair value model for financial instruments, bank lobbyists as well as bank regulators frequently argue that fair value measurement inadequately mirrors a business model aimed at originating and holding financial instruments. As a first example, the Joint Working Group of Standard Setters (JWG) recommended a full fair value model for all financial assets and financial liabilities in 1999. The Joint Working Group of Banking

Associations (JWGBA), representing banking associations from Australia, Canada, the EU, Japan and the US, claimed in response to the JWG's Draft Standard that it is a 'mixed measurement approach' which best reflects the differences between trading book and banking book activities. Fair value, the major argument goes, is only useful for information about market risk (i.e. the primary risk factor of the trading book) but not for information about credit and interest rate risk (i.e. the primary risk factors of the banking book). This view is shared by bank regulators (e.g. Basle Committee, 2000) and central banks (e.g. Enria et al., 2004).

As a second example, the American Bankers Association (ABA) recently launched a mail campaign against the exposure draft on accounting for financial instruments issued by the FASB in May 2010 which proposed the measurement of all financial assets and liabilities at fair value with changes being recorded either through net income or through OCI. The ABA argues that fair value accounting for a business model designed to hold loans until maturity would result in artificial volatility, thus creating incentives for banks to shift towards an investment banking business model.

Current IFRS rules already reflect the demand for a mixed measurement model that is openly articulated by preparers (Hodgkinson and Singleton-Green, 2011). Trading book activities, including all derivative transactions except for those designated as hedging instruments in cash flow hedges, are measured at fair value through profit or loss, whereas traditional banking book activities are typically measured at amortized cost. In addition, IAS 39 offers accounting choices for non-trading activities, most importantly the fair value option and the available for sale category (AFS). Designation in the AFS category requires measurement at fair value through other comprehensive income. The application of the fair value option results in financial instruments being accounted for like trading activities.

During the financial crisis, IAS 39 came under political pressure especially from Europe and the IASB initiated a major project to replace the standard. European politicians and banking regulators got involved in the due process and repeatedly insisted, in accordance with the requests by banking associations, on the restriction of fair value measurement to situations where it reflects “the reality of the business model of banks” (ECOFIN, 2009; see also Basel Committee, 2009). Indeed, the eventually adopted standard IFRS 9 *explicitly* requires aligning the measurement attribute of a financial instrument to the business model. Financial instruments are to be measured at amortized cost only if “the asset is held within a business model whose objective is to hold assets in order to collect contractual cash flows” (para. 4.2). For the remaining instruments, particularly those held for trading, measurement at fair value is mandatory. In general, this mixed measurement approach finds support by banking associations (EBF, 2009; IBFed, 2009).

This debate is particularly interesting because it provides insights into the line of argument used by banking associations to support the position against fair value measurement of banking book activities. A persistent pattern in the argumentation is the association of banking book activities as low-risk activities, in contrast to trading activities assumed to be of high risk. Using this illustration, banking associations portray fair value measurement as being absolutely redundant for a constant, almost perfectly secure and rarely fluctuating stream of cash flows from the banking book business model. This thread becomes evident in several statements by banking associations. For instance, the International Banking Federation (in some sense the permanent institutionalization of the Joint Working Group of Banking Associations) comments on the initial IFRS 9 Exposure Draft in July 2009:

“The business model approach should be the first and primary driver for classification as this reflects how entities manage their businesses and thus provides more useful information for investors and other stakeholders. For the purposes of this discussion, the “business model” basis of classification refers to determining the classification of a financial instrument based on the

bank's strategy and intent regarding its exposure to the risks inherent in the instrument. Accordingly, a distinction would be made and a different classification recorded for two instruments that are otherwise similar but which are held for different business purposes. An instrument held for trading and generating short term value gains would be measured at fair value, while an instrument held for generating cash flows and longer term interest income would be held at amortized cost."

In August 2009, the European Banking Federation circulates a public letter to the IASB arguing in a similar vein:

"In a business model where the underlying strategy is to draw a benefit from short-term variations in the value of the instruments and where the entity is actively engaging in opening and closing market risk positions, it is appropriate for the entity to fair value such instruments and this is the most relevant information for financial statements users. However, when an entity does not manage instruments on a fair value basis, amortized cost including impairment is the most appropriate way to estimate future cash flows. If the instrument is held for use in the business to generate cash flows and there is no current or future intention to sell, the aim is to achieve a stable income flow earned on an ongoing basis over a certain period. In this case, there is no intention to profit from the expected short-term market movements. The instrument will be held until maturity (or at least until prepayment without change of the terms), and this means that the future cash flows are readily identifiable."

Advocates of fair value accounting counter those critics by referring to risk positions potentially associated with long-term banking book activities, such as lending at fixed rates using variable rate funding (interest rate risk), granting loans to customers that might default (credit risk), or lending long-term using short-term funding (liquidity risk). These risk positions arising from a bank's asset-liability or risk management, the alternative argument goes, are adequately pictured only by fair value measurement which reflects a bank's comprehensive asset-liability management (e.g. Gebhardt et al., 2004).

This line of argument is often illustrated by the example of a bank holding a portfolio of fixed-rate interest-bearing financial assets (e.g. loans) until maturity. This bank faces an upward shift in the yield curve. The shift causes, *ceteris paribus*, a negative change in current value of the asset

portfolio which is reflected in net income under fair value accounting but not under amortized cost accounting. If the asset portfolio was fully funded by variable rate debt instruments and if the maturity gap was not hedged by other instruments, the shift in the yield curve would cause a real decrease in the interest margin, i.e. a loss of economic value. Since the fair value of variable rate instruments does not change in response to changes in the yield curves, full fair value accounting would result in the bank reporting a net loss for the period, while the bank could report a zero profit under amortized cost accounting. Thus, only fair value accounting provides a timely report of the decrease in the interest margin. If funding were, on the other hand, by fixed rate debt instruments, the interest rate margin would be safeguarded against changes in the yield curve. The closed position does not affect net income under fair value accounting because the change in the fair value of the asset portfolio is offset by the change in the fair value of the funding instruments – at least to the extent this natural interest rate hedge is effective. This point of view is best summarized by the JWG (2000, BC1.10):

“Many banks strongly advocate cost-based accounting in preference to fair value measurement for financial assets and liabilities managed in their banking books. The JWG [...] concluded that accounting for these financial assets and liabilities on a cost basis cannot provide as relevant a measure of their matched and mis-matched cash flow positions as can fair value measurement. In so concluding, the JWG observes that difficult issues arise in assessing the extent to which financial asset and liability positions are matched at any given time, taking into account expectations with respect to credit risk, complex payment options and other uncertainties relating to the timings and amounts of cash flows to result from these positions. It believes that comprehensive fair value measurement of financial assets and liabilities will provide a consistent current market measure of the effects of mis-matched positions, and consequently will provide relevant reporting of the effectiveness of netting strategies.”

A similar argument in favor of fair value accounting is made with respect to the reporting of credit risk. The fair value of loans reflects current cash flow expectations, current interest rates and current credit risk margins. Compared to amortized cost, fair value measurement thus results in the more timely recognition of all expected losses. If, for example, prices for real estate in a region are

predicted to fall in the future, the resulting increase in future defaults on mortgages is anticipated only by fair values. These examples also illustrate that the risk of banking book activities arises from intended or unintended risk taking choices in the combination of assets and funding instruments (asset-liability management) or in the credit approval process (credit risk management), rather than from the decision whether to hold or trade a *single* financial instrument.

Taken together, this political debate raises three research questions. First, it is an unresolved issue to what extent there exist systematic differences in the risk associated with certain business models of banks as alleged by the banking associations. Second, actual accounting practices of IFRS adopting banks under the option-based mixed attributes model are largely unknown, at least on a global scale. Thus, it is an empirical question whether heterogeneity in business models in the global banking industry explains differences in the use of fair values. Third, it is the question whether such heterogeneity in accounting measurement has consequences for the relevance of income measures.

### *3 Literature Review and Hypotheses Development*

#### *3.1 Operating Business Model and Risk Taking*

The banking literature emphasizes two key dimensions of the business models of banks: operating activities and risk taking (e.g. Ryan, 2007; Saunders and Cornett, 2003). The distinction in the accounting debate between trading book and banking book business models relates to banks' choice of products and funding instruments. Banks' exposure to several types of risk is the result of decisions about a level of risk taking (intended and unintended). In the following, we will use these two dimensions to categorize financial institutions in the global banking industry.

##### *Operating Activities: Product Mix and Funding*

The choice of the operating business model is mainly a choice of products and funding instruments. *Banking book* business models are characterized by investments in loan-like products (consumer loans, mortgages, etc.). Banks specialized in wholesale banking book business are more likely to rely on money market funding and large commercial deposits, whereas funds for retail banking book business are typically raised through small deposits (Demirgüç-Kunt and Huizinga, 2010; Ryan, 2007). *Trading book* business models are characterized by investments in marketable products (securities, securitized loans, etc.). Funding strategies are diverse, in most cases, however, also market-based.

### *Risk Taking*

A bank's overall exposure to risk is not the mechanical result of the choice of operating activities. Only the *types* of risk a bank is exposed to depend on the products invested in and the funding instruments used. Credit risk and interest rate risk are most important for banking book business models, whereas market price risk is most important for trading book business models. In both models, liquidity risk may arise from a mismatch of maturities of investments and funding. Prior research indicates that exposure to these different types of risk is priced on equity markets (e.g. Choi et al., 1992). The *level* of risk exposure is, however, an outcome of the bank's risk management (e.g. the asset-liability management or the use of hedging derivatives) that accompanies these operating activities. By means of its risk management policies, a bank decides whether to run open, speculative positions (not only market risk positions) with upside and downside potential or to close positions in order to generate a constant stream of income. The banking literature is equivocal on this issue. On the one hand, evidence suggests that expansion of banking book business into trading activities offers at least a limited risk reduction as a result of diversification benefits (Demirgüç-Kunt and Huizinga, 2010). On the other hand, a diversification of banking book activities, e.g. by generating higher non-interest income, has been shown to increase

overall risk taking (Acharya et al., 2006; Baele et al., 2007) and to reduce market valuation (Laeven and Levine, 2007). DeYoung and Roland (2001) document a positive association between the size of fee-based activities (as compared to interest income-generating activities) and the volatility of total revenues. In contrast to the assertions of banking associations summarized in section 2, this discussion suggests that the level of risk is not uniform within banking book and trading book business models, respectively.

(H1) A bank's level of risk exposure is independent of the choice of the operating business model.

### *3.2 The Operating Business Model as a Determinant of Fair Value Accounting*

The extent to which banks around the world apply fair value measurement is likely to vary substantially across firms and across countries. In explaining such differences, we have to take into account that, under current accounting rules for financial instruments, fair value measurement can either be the result of a binding requirement or of a voluntary choice. The most important requirements to apply fair value accounting exist for financial derivatives and non-derivative trading instruments (assets and liabilities). Since the type of products invested in depends on the operating business model, operating activities directly determine the extent of a bank's requirement to apply fair value measurement. In contrast, risk taking decisions are not a direct source of mandatory fair value measurement. For example, a trading book (banking book) bank with open positions and a trading book (banking book) bank with closed positions do not face different measurement requirements. Consistent with the operating business model being a major determinant of fair value measurement, Laux and Leuz (2010) provide descriptive evidence for a US sample showing that the

fraction of balance sheet assets recorded at fair value is substantially higher for investment banks than for bank holding companies.

IAS 39 offers several choices to voluntarily apply fair value measurement for additional instruments. The most important ones are the fair value option for financial assets and liabilities as well as the AFS category for financial assets. This choice depends on incentives at the bank- and at the country-level and is not necessarily related to the operating business model. Prior literature has analyzed some of the incentives of firms to classify financial instruments. Godwin et al. (1998) and Hodder et al. (2002) study determinants of the choice to use the AFS category. The results indicate that banks' classification discretion in the mixed attributes model is strategically used to recognize cumulative unrealized gains but avoided if the potential volatility of equity endangers the institutions' regulatory capital. Hodder et al. (2002) provide further evidence suggesting that banks tend to conceal open risk positions by applying amortized cost measurement. Chang et al. (2009) and Fiechter (2011) study determinants of the use of the fair value option. Both studies find that the option is used by banks to reduce income volatility from economic hedge relationships that do not qualify for hedge accounting. This literature suggests that voluntary application of fair value measurement is more likely if accounting mismatches result from mandatory fair value measurement, i.e. if the operating business model requires fair value accounting only for specific instruments. We contribute to this literature by introducing a comprehensive dataset of measurement practices by all IFRS-adopting banks around the world.

For our international sample the literature suggests additional incentives that are independent of the operating business model. Market demand for fair value information is likely to be heterogeneous across countries due to differences in analyst following and analysts' experience with fair value information (e.g. Bae et al., 2008; Hirst et al., 2004). In addition, it is likely that differences in the strength of regulatory oversight affect the accounting choice (e.g. Fonseca and

Gonzalez, 2008; Shen and Chih, 2005). The stronger those external audits are, the more reliable will fair values be perceived by investors which, in turn, increases the economic benefits from voluntarily providing investors with fair value information. These benefits will be largest in countries where ownership is most dispersed and private control benefits from concealing fair value information are lowest (e.g. Leuz et al., 2003; Leuz, 2010). Besides those differences in the benefits of fair value measurement, the costs of fair value measurement are also likely to vary across firms. For example, banks from countries with less developed capital markets encounter more difficulties to estimate fair values because level 1 market prices or level 2 market input will be lacking more frequently.

(H2) The operating business model and reporting incentives of a bank are the major determinants of the extent of fair value measurement under the current option-based mixed attributes model.

### *3.3 Differences between Business Models in the Association of Accounting Numbers with Economic Risk*

#### *Recognized Fair Values*

The literature summarized above leads us to predict that IAS 39's mixed measurement approach does not result in a bank's risk taking being directly associated with the measurement bases used in the bank's accounting system. Specifically, a bank with the operating characteristics of a trading book business model might be exposed to the same level of risk as another bank running a banking book business model. Yet, both banks are likely to compute their net income differently with the first bank applying fair value measurement to a substantially larger extent than the second bank. In

this section, we discuss the potential implications of this difference for the risk relevance of income measures reported in accordance with IAS 39.

The analysis is most closely related to a stream of prior literature that compares the usefulness of accounting numbers primarily based on fair values and accounting numbers primarily based on amortized cost. Hodder et al. (2006) benchmark three different income measures against measures of economic risk and find the highest risk relevance for full fair value income. Bhat (2008) documents that the incremental risk relevance of full fair value income compared to net income is increasing in the quality of fair value disclosures and corporate governance. Blankespoor et al. (2010) evaluate the association of different balance sheet leverage ratios with market measures of credit risk. The strongest association is observed for leverage ratios calculated on the basis of fair values. These three studies compare different accounting measures that are computed for US commercial banks and exploit fair value disclosures to estimate full fair value measures. In contrast, the international heterogeneity of operating business models and incentives to apply fair value measurement voluntarily offers the opportunity to study differences in the risk relevance of income measures *as reported* across different banks, i.e. to benchmark a fair value-based net income against an amortized cost-based net income.

A large number of studies document a higher value relevance of fair value as compared to amortized cost information (e.g. Barth et al., 1996; Ahmed et al., 2006). Gebhardt et al. (2004) simulate in a model-bank framework the accounting consequences of different risk management approaches and show theoretically that economic risk positions are best reflected by full fair value accounting. Consistent with this prediction, we expect to find cross-sectional differences in the relevance of net income calculated in accordance with IAS 39. Specifically, we predict relevance to be an increasing function of the degree to which a bank applies fair value measurement. As argued above, the application of fair value measurement will primarily depend on a bank's operating

characteristics. Thus, net income of banks with a trading book business model is predicted to be of higher relevance than net income of banks with a banking book business model. However, the difference in relevance is mitigated if the fair value option is used for banking book assets and liabilities, i.e. if trading book and banking book business do not differ in the extent to which fair value measurement is applied.

*(H3a)* The relevance of a bank's comprehensive income calculated under IAS 39's mixed accounting model is negatively associated with the bank's use of a banking book business model.

*(H3b)* The relevance of a bank's banking book income is positively associated with the bank's election of the fair value option.

#### *Disclosed Fair Values*

The differences in the calculation of net income across operating business models result from variation in the recognition of fair values. In order to mitigate potential informational deficiencies, standard setters mandate footnote disclosures for all financial assets and liabilities not recognized at fair value on the balance sheet (e.g. IFRS 7, para. 25). Evidence for the US suggests that investors consider those footnote disclosures of fair values in the valuation of banks (e.g. Barth et al., 1996; Song et al., 2010), but that recognition versus disclosure does not necessarily have equivalent pricing consequences (e.g. Barth et al., 2003; Ahmed et al., 2006). It is, thus, an empirical question whether and to which extent a lack of risk relevance of reported income measures derived from amortized cost measurement can be mitigated by footnote disclosures. Extant evidence leads us to predict that disclosed fair values are particularly relevant for the market valuation of banks with a high level of risk exposure.

However, a lack of reliability is likely to mitigate the potentially positive effects from footnote disclosures. This is particularly an issue in the global banking industry. Global differences in institutional incentives, enforcement and prudential oversight manifest in substantially different levels of transparency of banks across countries (e.g. Bushman and Williams, 2011). Internationally, the compliance with disclosure requirements is of particular concern (e.g. Glaum and Street, 2001), which is likely to also affect the reliability of fair value disclosures by banks. Therefore, the relative risk relevance of artificial full fair value measures of IFRS banks computed from fair values in the footnotes relative to reported measures computed from recognized fair values is another empirical question.

(H3c) The incremental relevance of a bank's full fair value income derived from footnote disclosures over amortized cost income is positively associated with the level of a bank's risk exposure and the quality of regulation at the country level.

#### *4 Sample Selection and Descriptive Statistics*

##### *4.1 Data Collection*

Our sample comprises all financial companies included in the Bureau van Dijk Bankscope database for the financial years 2006 to 2009. In the first step, the sample selection retains all 1,100 banks that (1) are publicly listed (Bankscope item LISTINS) and (2) apply accounting standards equivalent to IFRS 7 and IAS 39 (Bankscope item ACCSTAND)<sup>1</sup>. In the second step, all banks are eliminated from the sample that (3) do not publicly provide financial statements for all financial

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<sup>1</sup> Consistent with the approach in Daske et al. (2009), we confirm the Bankscope ACCSTAND coding on the basis of the financial report. The coding is systematically altered in two respects: First, we treat banks from Taiwan as IFRS adopters even if they are classified as Local GAAP adopters, because Taiwanese SFAS 34 and 36 largely correspond to IAS 39 and IFRS 7, respectively, and both standards have been effective since 2006. Second, we change the classification of banks from Malaysia from IFRS to Local GAAP, because the Malaysian Accounting Standards Board has decided that FRS 139 and FRS 7, which are the equivalent standards to IAS 39 and IFRS 7, were not effective before 2010.

years in English language, and (4) are not subject to capital oversight. In the final step, the subset is matched with capital market data from Thomson Financial Datastream for the period of interest between January 2006 and December 2009 (for stock returns). The final sample comprises 378 banks from 48 different countries. For the financial year 2009, this sample covers 68.05% of the book value of total assets of all listed banks from the global Bankscope universe that report under IFRS. Basic financial data for these banks is derived from BvD Bankscope. Thomson Financial Datastream is the primary source of capital market data.

The basic financial data is amended by detailed information about a bank's application of fair value measurement as well as the fair value effects on the income statement. Both the balance sheet and income data distinguishes between trading book securities, derivatives not designated for cash flow hedge accounting, instruments elected for the IAS 39 fair value option (at fair value through P/L), available-for-sale financial assets and derivatives designated for cash flow hedge accounting (at fair value through OCI). The fair value data is collected from annual financial statements for the financial years 2006 to 2009. The year 2006 is used as the starting point because it is the first financial year for which IFRS 7 information is available. IFRS 7 adoption extended the disclosure requirements for banks and particularly mandated the disclosure of the measurement bases both for the balance sheet (IFRS 7, para. 8) and for the income statement (IFRS 7, para. 20). Before IFRS 7 adoption, the disclosure of the measurement bases of balance sheet and income statement items was for the most part voluntary. Even after IFRS 7 adoption, the lack of disclosure standardization and severe non-compliance are issues which explain the limited availability of fair value information from standard databases and the focus of the academic fair value debate on U.S. settings where S.E.C. filings and regulatory reports are largely standardized. We observe three different presentation formats for the measurement bases. A first group of banks reports measurement bases directly on the balance sheet, i.e. presents its financial instruments by IAS 39 measurement

category. A second group of banks uses a separate footnote to reconcile balance sheet items with measurement categories in tabular format. Eventually for a third group of banks, the information about measurement bases of balance sheet items is dispersed across different footnotes.

#### *4.2 Fair Value Accounting by International Banks*

Table 1 presents descriptive statistics for the total sample over the financial years 2006 to 2009. Panel A shows the relevance of fair value measurement for bank balance sheets. On average, only 15.9% of a bank's total assets and 5.2% of total liabilities and equity are measured at fair value. Approximately 51.6% of fair value assets (8.2% of total assets) are measured at fair value through profit or loss with the remaining portion (AFS assets and derivatives designated for cash flow hedging) being measured at fair value through OCI. The average impact of fair value measurement on bank income statements reported in Panel B is similarly low. On average, 20.7% (28.7%) of a bank's net income (comprehensive income) comes from unrealized fair value gains and losses.

The distribution of fair value measurement reveals substantial differences within our sample. For a large number of banks, fair value measurement is negligible in relative terms. The fair value option is rarely elected (the median is 0.1% for financial assets and 0.0% for liabilities) and the trading portfolio is fairly small (the median is 0.0% for both assets and liabilities). At the median, AFS assets are the only fair value instruments representing more than a non-substantial fraction of total assets (4.8%). The Spanish Banco de Sabadell with a proportion of total fair value assets of 12.3%, representing the sample median, is an illustrative example. The AFS category comprises 9.9% of total assets, while the trading portfolio (including derivatives) is small (1.4%) and the fair value option is applied for only 0.2% of total assets. Derivatives (1.5%) are the only liabilities measured at fair value.

There is, however, a small group of banks (beginning with approximately the 90th percentile of total fair value assets) that uses fair value measurement to a large extent. At the extreme, there are a few banks which have almost implemented a full fair value model for financial instruments. At the 99th percentile, 64.1% of total assets and 49.9% of total liabilities and equity are measured at fair value. The observations in the tails are even more extreme for the income statement where, at the 99th percentile, 91.8% of published net income and 94.3% of comprehensive income comprise unrealized fair value changes. The Swedish Swedbank is an illustrative example for this group of banks. The bank heavily applies the fair value option for both financial assets (29.5%) and liabilities (27.5%) resulting in total fair value assets (liabilities) of 45.7% (42.2%) equal to the 95<sup>th</sup> percentile. Note that the bank does not elect the AFS category; thus, fair value changes are all reflected in net income.

## *5 Operating Business Models and Risk Taking*

### *5.1 Descriptive Cluster Analysis of Operating Business Models*

The descriptive evidence in Table 1 raises the question about the reasons for the skewed distribution. The debate about fair value accounting suggests that the banking industry is diverse with respect to the underlying business model. Therefore, we perform a k-means cluster analysis using six distinct variables that proxy for different operating characteristics of the banking business. The variables relate to three dimensions of a bank's operations: product activities, funding strategy and cost structure. Descriptive statistics for all variables as well as for general economic characteristics (size and return) are summarized in Table 2, Panel A.

The first group of variables captures differences in the product mix: *Trading Income / Interest Income* and *Commission & Fee Income / Interest Income* proxy for the relative importance of a

bank's activities generating non-interest revenues, i.e. for the range and diversification of financial activities beyond the traditional banking book business (Baele et al., 2007; Demirgüç-Kunt and Huizinga, 2010; DeYoung and Roland, 2001; Laeven and Levine, 2007; Stiroh, 2006). Trading income represents the contribution of a bank's own trading portfolio, while commission and fee income results from service activities (e.g. brokerage). *% Mortgage Loans* is the ratio of mortgages to book value of total assets and a proxy for the importance of activities in the mortgage sector. *% Wealth Management* is the ratio of assets under management to book value of total assets and a proxy for the importance of private banking and wealth management.

In addition, a variable *Funding* (equal to the book value of customer deposits divided by book value of total short-term funding) captures a bank's financing activities and shall distinguish business models based on market-based (wholesale) financing and banking book business models based on customer-related financing via deposits (Demirgüç-Kunt and Huizinga, 2010). Non-deposit short-term funding primarily includes interbank borrowings, certificates of deposit and short-term bonds. Eventually, a variable *Operations* (equal to the sum of non-interest expenses, i.e. personnel, administrative and other operating expenses, scaled by book value of total assets) shall identify differences in customer relationships. Non-interest expenses are typically higher for retail or consumer banks with a large branch network or extensive service activities (Ryan, 2007).

Based on these variables, we identify six clusters with distinct operating characteristics. A first cluster of global players comprises large universal banks with substantial investment banking activities. The French BNP Paribas is a representative bank for this cluster. A second cluster consists of small specialized investment and securities firms with little traditional banking book activities. The Swiss Bellevue Group is a representative firm. A third cluster unites institutions that are specialized in financing activities (e.g. of municipalities, reconstruction and development, leasing, or agriculture) and that almost exclusively rely on wholesale funding. The Italian Banca Italease is

typical for this cluster. A fourth cluster comprises banks with a universal banking model which are more regional in character compared to the global players and also less extensively engaged in investment banking. Many of these banks can be described as wholesale banks. The German Commerzbank is a representative bank for this cluster. A fifth cluster pools mortgage banks such as the Dutch SNS Reaal. The sixth and largest cluster represents traditional credit institutions and retail banks that are relatively small and very often only active in their home regions. These banks rely almost exclusively on deposit financing and have extensive branch networks. The Union Bank from the Philippines is a representative bank for this cluster.

In summary, the results suggest that a large number of IFRS-reporting banks focus their operating activities on the banking book business. Still, the degree of diversification is relatively high: Even for retail banks with a traditional banking book business model, the ratio of non-interest income to interest income is as high as 30.7% on average. For only a small number of banks, the non-banking book activities are the most important source of income. Only small specialized investment firms report, on average, larger non-interest income than interest income. Global players with substantial trading book activities still generate more than 50% of total income from the banking book business. A clear-cut distinction between a banking book and a trading book business model is thus not possible at the firm level. As the result of diversification and a widespread tradition of universal banking, most banks are materially involved in both types of operating activities. This descriptive evidence gives a first indication that the cross-sectional variation in the types of risk exposure does not depend on the business model chosen but on the outcome of bank-specific risk management.

Table 2, Panel B relates fair value variables to each cluster and, thus, provides initial descriptive evidence on the relevance of the operating business model as a determinant of fair value accounting. The descriptive statistics indicate that there exists a small group of banks with substantial trading

book activities in the clusters for global players and specialized investment firms which extensively apply fair value measurement. On average, fair value assets make up 35.8% (26.3%) of total assets of global players (specialized investment firms) and unrealized fair value changes account for 48.1% (38.6%) of comprehensive income. Thereby, fair value is relevant for both assets and liabilities (the median ratio is as high as 71.8% for the global players). The observations beyond the 90<sup>th</sup> percentile reported in Table 1 can be traced back to those banks with substantial non-banking book activities. For banks in the other four clusters which, to different degrees, run traditional banking book business models, fair value accounting is of minor importance. Yet, there is some heterogeneity in the extent of voluntary fair value accounting within these clusters. This becomes particularly evident for specialized financing institutions and regional universal banks where, on average, 5.6% and 3.8% of total assets are elected for the fair value option.

A comparison of our findings with observations from the US is interesting. Laux and Leuz (2010, Table 1) distinguish between bank holding companies and investment banks. While more than 33% of investment banks' assets are measured at fair value through profit or loss, this ratio amounts to only 0.71% (12.22%) for 412 bank holding companies (the 27 largest bank holding companies). This dichotomous distinction between investment banks and non-investment banks is not adequate internationally where most countries have a tradition of universal banking. Therefore, banks with large investment banking activities (such as BNP Paribas, Deutsche Bank and Royal Bank of Scotland) still have substantial banking book activities. There is no international counterpart to an institution like Goldman Sachs. In our sample, only some small specialized firms are "pure" investment banks (the largest one being the French Natixis). On the other hand, it is very common for international commercial banks (both wholesale and retail) to have at least a small trading portfolio. The average fraction of assets measured at fair value through profit or loss is

therefore substantially higher for both regional universal banks (12.2%) and even local retail banks (3.9%) than the 0.71% reported by Laux and Leuz (2010).

Moreover, the tradition of universal banking is a major reason why the clustering approach presented in Table 2, Panel A, is more useful for our analysis than the banking type classification provided by BvD Bankscope (item SPECIAL). The Bankscope coding does not allow to distinguish reliably between global players, on the one hand, and regional universal banks as well as local retail banks on the other hand, since most of these banks are classified as either commercial banks or bank holding companies. However, as the evidence in Table 2 suggests, the distinction between these clusters is vital for the understanding of the association between a bank's business model and fair value accounting.

## *5.2 The Association of the Operating Business Model with Risk Taking*

The descriptive evidence suggests that fair value measurement is closely linked to a business model that is defined, in accordance with the standard-setting approach, on the basis of a bank's operating activities. In this section, we analyze whether the operating business model is associated with banks' risk-taking. This analysis shall address the validity of the justifications for extant accounting rules (and of future IFRS 9) that are most prominently brought forward by banking lobbyists (see the discussion in section 2). To this end, we compare market-based measures of risk exposures across the business models identified in table 2.

### *Research Design*

Following the approach in prior accounting literature (Schrand, 1997; Guay, 1999; Wong, 2000; Zhang, 2009), we use model (1) to estimate the exposure to market price risk, interest rate risk and credit risk:

$$R_{it} = \beta_0 + \beta_1 R\_MI_t + \beta_2 R\_IBOR_t + \beta_3 R\_ITRAXX_t + \varepsilon \quad (1)$$

where  $R_{it}$  is the buy-and-hold stock return for portfolio (bank)  $i$  in week  $t$ ,  $R\_MI_t$  is the return for a market-wide stock index in week  $t$ ,  $R\_IBOR_t$  is the percentage change of the 3-month interbank offered rate in week  $t$ , and  $R\_ITRAXX_t$  is the percentage change of the Markit iTraxx Crossover index in week  $t$ . In a first set of tests, we run model (1) separately for each of the six equal-weighted portfolios derived from the clustering by operating business models in table 2 over the period 2005 to 2010. The MSCI World index is chosen as the relevant market index, the 3-month LIBOR (Euro) as the relevant interbank offered rate. In a second set of tests, we compare the risk exposures across the individual banks. Model (1) is estimated separately for each of the 378 banks where  $R\_MI_{jt}$  is the return for country  $j$ 's local stock index in week  $t$  and  $R\_IBOR_{jt}$  is the percentage change of country  $j$ 's local 3-month interbank offered rate in week  $t$ . The local stock index is defined in accordance with Pukthuanthong and Roll (2009). All stock price data is taken from Thomson Financial Datastream. The local interbank offered rate is derived from Thomson Financial Datastream. The 3-month LIBOR (Euro) is taken for the nine countries for which no local rate is available (Austria, Cyprus, Kazakhstan, Liechtenstein, Lithuania, Luxembourg, Malta, Portugal, Slovenia, and Ukraine). The 5-year mid quote is chosen for the Markit iTraxx Crossover index (source: Bloomberg). In both tests,  $\beta_1$  represents the exposure to market price risk,  $\beta_2$  the exposure to interest rate risk and  $\beta_3$  the exposure to credit risk. We do not estimate the exposure to liquidity risk, another important dimension of banks' overall risk taking, because fair value accounting provides only limited information about liquidity risk.

To validate these findings, we benchmark our market-based measures of risk exposure against alternative risk measures for overall risk, market risk, interest rate risk and credit risk which are frequently used in the banking literature. We use the z-score and the volatility of net income to proxy for a bank's overall risk exposure. *Z-Score* is the sum of the mean return on assets and the mean capital buffer scaled by the standard deviation of the return on assets over a 5-year rolling time window (source: BvD Bankscope). The capital buffer is the difference between the regulatory capital ratio and the country-specific minimum capital requirement. The variable is an established proxy for a bank's risk to violate regulatory capital requirements (Laeven and Levine, 2009; Demirgüç-Kunt and Huizinga, 2010; Houston et al., 2010; Barry et al., 2011). *Income Volatility* is the standard deviation of income before taxes over a 5-year rolling time window (source: BvD Bankscope). Since net income is calculated under the mixed accounting model, the usefulness of income volatility as a measure of risk exposure is, however, questionable (Hodder et al., 2006; Bhat, 2009).

The volatility of trading income and the open derivative position are used as alternative proxies for exposure to market risk. *Trading Income Volatility* is the standard deviation of trading income over a 5-year rolling time window (source: BvD Bankscope). Under IAS 39, trading income is calculated on a full fair value basis and its volatility should therefore reflect risk exposure of the trading book (Hodder et al., 2006). *Open Derivative Position* is the absolute value of the difference between non-hedging derivative assets and non-hedging derivative liabilities. We use the net position of non-hedging derivatives because hedging derivatives are an effective means to reduce risk exposure (Guay, 1999; Hentschel and Kothari, 2001). The measure is imperfect because only a subset of a bank's economic hedge relationships is designated for hedge accounting under IAS 39.

The volatility of the interest margin, the extent of off-balance sheet commitments and the short-term maturity gap are alternative proxies for the exposure to interest rate risk. *Interest Margin*

*Volatility* is the standard deviation of the difference between interest income and interest expenses scaled by interest income over a 5-year rolling time window (source: BvD Bankscope). The variable indicates the outcome of a bank's asset-liability management (Houston et al., 2010). *Off-Balance Sheet Liabilities / Shareholders' Equity* are total contingent liabilities (acceptances, documentary credits, guarantees plus other commitments) divided by the book value of shareholders' equity (source: BvD Bankscope). *Liquid Assets / Short-Term Funds* is the percentage of customer and short term funds a bank could meet if they were withdrawn suddenly. The ratio indicates the short-term maturity gap in a bank's asset-liability management which is an important source of interest rate risk (Flannery and James, 1984; Schrand, 1997).

Eventually, the 5-year CDS spread, the proportion of problem loans, and the loan loss provisions are taken as alternative proxies for exposure to credit risk. *CDS Spread* is the average spread of a 5-year credit default swap on the bank's senior debt over the financial year (source: *Markit [Bloomberg]*). In the accounting literature, CDS spreads are considered to be the debt instrument providing the least noisy measure of credit risk (Callen et al., 2009). However, frequent CDS data is available for only 94 banks in our sample. *% Problem Loans* are a bank's total problem loans (overdue loans, restructured loans plus other non-performing loans) divided by book value of shareholders' equity (source: BvD Bankscope). The ratio indicates the weakness of the loan portfolio relative to the bank's capital (Knaup and Wagner, 2008). *LLP / Net Interest Income* is the ratio of loan loss provisions to net interest income (source: BvD Bankscope). A high value indicates a low quality of the loan portfolio. Since this measure can only be interpreted in combination with the interest margin, it is a weak measure of credit risk.

## *Results*

Table 3, Panel A, reports the results of the portfolio-level analysis of banks' risk exposures. The results indicate that exposure to market risk, interest rate risk as well as credit risk does not depend on the operating business model. The exposure to market risk and credit risk is significant in the expected direction for all six portfolios. The exposure to interest rate risk is not significant for specialized investment firms being consistent with the relative importance of fee income over interest income in the operating activities of these banks. However, the results also indicate that the size of the risk exposures varies across the different types of operating business models. For the portfolio of local retail banks with a focus on a banking book business model, the exposure to market risk is significantly lower than for all other portfolios ( $p < 0.01$ ) and the exposure to credit risk is significantly lower than for the portfolios of global players and of mortgage banks. Yet, the results do not imply a clear association between a bank's risk exposure and its reliance on banking book activities. For example, the credit risk exposure of investment firms with a focus on trading book activities is significantly smaller than the credit risk exposure of mortgage banks with a focus on banking book activities ( $p < 0.1$ ). This latter observation supports the view that the business models differ in the types rather than in the size of risk exposure.

Table 3, Panel B, summarizes the results of the firm-level regressions. As expected, the differences in the size of exposure to the different types of risk across the business models become evident in the mean and median coefficients for each cluster. It is more interesting to look at the cross-sectional variation in risk exposure within each cluster expressed by the maximum values, the standard deviation as well as the interquartile range. Consistent with risk exposure being the result of the risk management rather than of the operating business model, this variation is substantial for each cluster and, particularly, it is not significantly smaller for local retail banks or mortgage banks with the largest engagement in banking book activities. Consistent with hypothesis (1), these findings suggest that there exist a substantial number of banks with an operating business model that

relies on banking book activities which are strongly exposed to market risk, interest rate risk or credit risk.

The Spearman correlations of the three market-based risk measures with the alternative proxies for banks' risk exposures are summarized in Table 3, Panel C. The correlations are calculated on a firm-year basis. Overall, the results lend credibility to the market-based measures. The market risk betas are significantly positively associated with almost all alternative risk variables (except for *LLP / Net Interest Income*) suggesting that the market risk beta not only captures a bank's trading book risk. The market risk beta can rather be interpreted as a measure of a bank's overall risk. The interest rate risk beta is significantly positively associated with all three alternatives measures of interest rate risk. The credit risk beta is significantly negatively associated with two out of the three alternative measures of credit risk. In addition, it is correlated with two proxies for interest rate risk suggesting that especially the interest margin volatility does not provide a clear distinction between interest rate and credit risk.

## *6 The Business Model of International Banks and Fair Value Accounting*

### *6.1 Determinants of Fair Value Accounting: Multivariate Regression at Firm Level*

Table 4 presents descriptive statistics for the composition of the banking industry and the application of fair value measurement by countries. The statistics highlight particularly two points. First, the composition of the banking industry varies across countries. Investment banking-related business models in the global player and investment firm clusters dominate the industry in some countries (an extreme cases is Switzerland), whereas traditional credit institutions and banking book-related business models dominate the industry in many other countries. Second, fair value measurement is very heterogeneously applied across countries. This variation cannot be exclusively

explained by differences in business models. Relatively large proportions of fair value assets can be identified, for example, in Denmark (24.2%) and Ireland (20.4%), where no firm-year observations come from the global player or investment firm clusters. The large proportions rather result from the extensive use of the fair value option. Since Danish GAAP and Irish GAAP have a fair value tradition, this observation suggests that there are country-specific factors beyond the business model that determine the application of fair value measurement.

### *Research Design*

We use model (2) to analyze the determinants of fair value accounting at the firm level:

$$FV\ Measurement = \beta_0 + \sum \beta_i Incentive_i + \sum \beta_j Business\ Model_j + \sum \beta_k Risk\ Taking_k + \varepsilon \quad (2)$$

We estimate three different specifications with regard to the dependent variable. In the first specification, we use total fair value assets at fair value through P/L and at fair value through OCI scaled by book value of total assets. In the second specification, the dependent variable only includes optional fair value assets and equals the sum of financial assets designated for the IAS 39 fair value option and available-for-sale financial assets. The last specification uses only financial assets designated for the IAS 39 fair value option as dependent variable.

The following independent variables are used to control for the country-specific and bank-specific incentives to apply fair value measurement. *Fair Value Tradition* is a dummy variable equal to 1 if fair value disclosures of financial assets and financial liabilities were required under Local GAAP before IFRS adoption (source: Nobes, 2001). Evidence from other industries indicates that Local GAAP reporting practice is likely to persist after IFRS adoption not least due to implementation costs (Muller et al., 2011). *Islamic Tradition* is a dummy variable equal to 1 if the majority of the population in a country is Islamic (source: CIA World Factbook). Due to the specifics of Islamic banking, cultural pressure impedes the application of fair value accounting in

those countries (Fiechter, 2011). *Regulatory Oversight* is a country-specific governance score from Kaufmann et al. (2009). The variable proxies for disclosure incentives arising from a bank's regulatory environment, most particularly the quality of supervisory scrutiny. *Analyst Following* is the natural logarithm of the average number of 1-year EPS estimates (plus 1) issued during one month in the respective financial year (source: IBES). The variable represents the market demand for transparent accounting. *Regulatory Capital Restriction* defined as the difference between the minimum capital ratio at country level (as presented in Table 4) and the individual bank's total capital ratio and takes a value of 1 if the difference is smaller than one percentage point, 0 otherwise (source: BvD Bankscope, own data). Tightness of the regulatory capital restriction is a widely observed factor that alters banks' accounting practice (e.g. Beatty et al., 1995). *Hedge Accounting* is a dummy variable that takes a value of 1 if a bank applies the IAS 39 hedge accounting option during the financial year, 0 otherwise (source: own data). We expect the election of the IAS 39 fair value option to substitute the application of the restrictive hedge accounting rules and, thus, a negative association between both accounting choices (Chang et al., 2009).

A second set of independent variables controls for the effects of a bank's operating business model as identified in the cluster analysis (Table 2). The global player cluster is used as the base case and, therefore, omitted in the analysis. A third set of independent variables controls for a bank's risk taking and uses the beta factors for exposure to market risk, interest rate risk and credit risk computed in Table 3, Panel B.

### *Results*

The results presented in Table 5, Panel B confirm the importance of the operating business model for fair value accounting and are similar for mandatory and voluntary fair value measurement. The proportion of fair value assets is significantly lower in all banking book-oriented

business models (especially mortgage banks and local retail banks) relative to the more trading book-oriented business model of global players. Risk taking, on the other hand, is only weakly associated with fair value measurement. This finding is consistent with the operating business model being imperfectly related to a bank's risk exposure. There exist credit institutions with a banking book business model that are more strongly exposed to economic risk than well-hedged investment banks. Moreover, fair value accounting is associated with a country's local GAAP tradition of fair value disclosures and it is underrepresented in Islamic countries. Fair value accounting is increasing in analyst coverage and the strength of regulatory oversight, and decreasing in the tightness of the regulatory capital restriction. The use of the IAS 39 fair value option is a substitute for the application of the complex hedge accounting rules. Taken together, the results indicate that, in accordance with the demand of bank lobbyists, the operating business model is the primary explanation of fair value measurement. However, there remain substantial differences in fair value measurement across banks that cannot be explained by differences in the composition of the banking industry, but by firm-specific reporting incentives. Overall, these findings are in conformity with hypothesis (2).

While Christensen and Nikolaev (2010) argue that an infrequent application of fair value measurement is indicative of little market demand for fair value accounting, our analysis suggests that there are heterogeneous demands. On the one hand, our findings are consistent with bank managers having incentives to avoid costs associated with the implementation of fair value accounting. Therefore, when bank managers lack outside incentives (particularly from external investors or supervisory bodies), these costs are explanatory for their choice to avoid fair value measurement. On the other hand, the positive association of the voluntary choice to apply fair value accounting with the existence of strong market forces (such as analyst following) or of strong

banking regulation suggests that users of financial statements are interested in fair value information. Obviously, these users benefit from fair value information.

## *6.2 Effect of Fair Value Accounting on the Relevance of Income Components*

The results presented in Table 5 suggest that the extent of fair value accounting varies across operating business models but not systematically across levels of risk exposure. In this section, we address the consequences of this finding for the relevance of fair value-based components of comprehensive income versus amortized cost-based components in order to test hypotheses (H3a)–(H3c).

### *Research Design*

In accordance with prior accounting research on the relevance of fair value gains and losses (Barth, 1994; Nelson, 1996; Bhat, 2009), we use model (3) to estimate the relevance of the different components of comprehensive income:

$$R_{it} = \beta_0 + \beta_1 \text{CFVI\_TB}_{it} + \beta_2 \text{CMMI\_BB}_{it} + \varepsilon \quad (3)$$

where  $R_{it}$  is the buy-and-hold stock return for bank  $i$  in financial year  $t$ ,  $\text{CFVI\_TB}_{it}$  is bank  $i$ 's comprehensive fair value income from trading book activities in financial year  $t$  and  $\text{CMMI\_BB}_{it}$  is bank  $i$ 's comprehensive mixed measurement income from banking book activities in financial year  $t$ . Accounting income is scaled by book value of shareholders' equity. If proponents of the mixed accounting model were correct in stating that the relevance of the measurement basis is a function of the operating business model, we should find  $\beta_1 = \beta_2$ .

In additional specifications,  $\text{CMMI\_BB}_{it}$  is split up in its individual components which differ in the underlying measurement basis. Thus, we are able to distinguish between the portion of

comprehensive banking book income that stems from fair value measurement and the portion that results from amortized cost accounting. We use model (4) to estimate the differences in the relevance of these portions:

$$R_{it} = \beta_0 + \beta_1 CFVI\_TB_{it} + \beta_2 CFVI\_BB\_AFS_{it} + \beta_3 CFVI\_BB\_FVO_{it} + \beta_4 CACI\_BB_{it} + \varepsilon \quad (4)$$

where  $CFVI\_BB\_AFS_{it}$  is bank  $i$ 's comprehensive fair value income from available-for-sale financial assets in financial year  $t$ ,  $CFVI\_BB\_FVO_{it}$  is bank  $i$ 's comprehensive fair value income from financial instruments elected for the IAS 39 fair value option in financial year  $t$ , and  $CACI\_BB_{it}$  represents the portion of bank  $i$ 's banking book income that results from the amortized cost measurement of held-to-maturity financial assets, loans & receivables and other liabilities in financial year  $t$ .

Eventually, we replace  $CACI\_BB_{it}$  by fair value income from the respective instruments as calculated from footnote disclosures ( $CFVI\_BB\_L\&R+HTM+OL$ ). To calculate fair value income,  $CACI\_BB_{it}$  is adjusted by the change in the excess of disclosed fair value over book value of the instruments in the financial year (Hodder et al., 2006). Since the relevance of fair value income for banks with relatively high risk exposure in the banking book is of particular interest for our research question, we interact fair value income with a dummy variable ( $Market\ Risk_{it}$ ) that equals 1 if bank  $i$ 's market risk beta in financial year  $t$  is larger than the sample median for the financial year. Consistent with our findings in section 5, market risk beta is used as a proxy for overall risk. Thus, we obtain the following equation:

$$R_{it} = \beta_0 + \beta_1 CFVI\_TB_{it} + \beta_2 CFVI\_BB\_AFS_{it} + \beta_3 CFVI\_BB\_FVO_{it} + \beta_4 CFVI\_BB\_L\&R+HTM+OL_{it} + \beta_4 CFVI\_BB\_L\&R+HTM+OL_{it} * Market\ Risk_{it} + \varepsilon \quad (5)$$

## *Results*

The results of the estimation of models (3)–(5) are shown in Table 6. Panel A summarizes descriptive statistics by financial year. The mean values reflect the substantial fluctuation in bank share prices over the period 2006–2009 which coincides with the recent financial crisis. It becomes evident that book returns, even when completely based on fair values, have been substantially less volatile than market returns over this period of crisis. The descriptive evidence suggests that there is a lag in the reaction of amortized cost income as compared to fair value income. Fair value return on trading book, AFS portfolio as well as instruments elected for fair value option reaches the low in 2008 and slightly recovers in 2009 simultaneously with stock returns, whereas amortized cost return still continues to drop in 2009. This observation is consistent with fair value accounting reporting impairment losses timelier than amortized cost accounting.

Panel B reports the basic regression results. In specification (1), the fair value income from the trading book portfolio is significantly positively associated with stock return. The coefficient is significantly larger than the coefficient for the mixed measurement income from the banking book portfolio which is not significantly different from zero. In specification (2), the return on the banking book is split up into the fair value and the amortized cost portions. The results indicate a significantly positive association of both fair value components (AFS and fair value option) with stock returns, whereas the coefficient for the amortized cost component remains insignificant and significantly lower than the coefficients for all fair value components of comprehensive income. These findings support the predictions in hypothesis (3a) and (3b). The results do not change when amortized cost income is adjusted by the fair value changes derived from corresponding IFRS 7 footnote disclosures for amortized cost instruments (specification (3)) suggesting that fair value disclosures for banking book instruments are not relevant per se. However, our analysis in Table 3 has documented substantial cross-sectional differences in risk exposure of banks using a banking book business model. In specification (4), we include an interaction term to capture the difference in

the relevance of banking book fair value income between high risk and low risk banks. The coefficient is weakly significant in the expected direction lending initial support to hypothesis (3c).

In Panel C, we repeat analysis with two subsamples partitioned by the country-level quality and strength of regulatory oversight (proxied for by the Kaufmann et al. (2009) score). We find our hypotheses confirmed for the subsample of countries with high quality regulation, whereas low quality regulation severely mitigates the relevance of fair value income not only for the banking book but also for the trading book portfolio. The results further indicate that low quality regulation adversely affects the relevance of both disclosed and recognized fair values. Yet, we are not able to causally infer whether this finding is due to severe capital market imperfections in these countries which bias the stock return or due to shortcomings in the determination of fair values at the firm level.

## *7 Policy Implications and Conclusions*

This study analyzes the role of the business model for fair value accounting of banks. Using a comprehensive global dataset, we find that differences in operating characteristics as well as country-level reporting incentives explain the observed extreme heterogeneity in the application of fair value measurement by banks. However, the operating characteristics are only imperfectly related to a bank's risk exposure. This observations question the validity of the arguments brought forward by the banking industry in the standard-setting debate. These political arguments typically describe non-banking book activities as being exposed to low risk, thus undermining the relevance of fair value accounting for this business model.

Our findings imply that the common approach by standard-setters to measure income by discriminating between a trading book business model and lending activities (i.e., an 'originate and

hold' business model) is not useful for the identification of a bank's risk exposure. The risk exposure from trading and derivative activities becomes transparent via fair value accounting under IAS 39's mixed measurement approach. However, the level of risk exposure from lending activities might be even higher than the exposure from trading activities (though resulting from different sources), but is not reflected in income measurement. A more useful approach, albeit difficult to implement, could be discrimination between high-risk activities (characterized by open risk positions) and low-risk (well hedged) activities.

## REFERENCES

- Acharya, V. V., Hasan, I., Saunders, A., 2006. Should banks be diversified? Evidence from individual bank loan portfolios. *Journal of Business*, Vol. 79, No. 3, pp. 1355–1412.
- Ahmed, A. S., Kilic, E., Lobo, G. J., 2006. Does Recognition versus Disclosure matter? Evidence from Value-relevance of Banks' Recognized and Disclosed Derivative Financial Instruments. *The Accounting Review*, Vol. 81, No. 3, pp. 567–588.
- Bae, K.-H., Tan, H., Welker, M., 2008. International GAAP differences: The impact on foreign analysts. *The Accounting Review*, Vol. 83, No. 3, pp. 593–628.
- Baele, L., De Jonghe, O., Vander Venet, R., 2007. Does the stock market value bank diversification? *Journal of Banking and Finance*, Vol. 31, No. 7, pp. 1999–2023.
- Barry, T. A., Lepetit, L., Tarazi, A., 2011. Ownership structure and risk in publicly held and privately owned banks. *Journal of Banking and Finance*, Vol. 35, No. 5, pp. 1327–1340.
- Barth, J. R., Caprio, G., Levine, R., 2001. The regulation and supervision of banks around the world – a new database. World Bank.
- Barth, M. E., 1994. Fair value accounting: Evidence from investment securities and the market valuation of banks. *The Accounting Review*, Vol. 69, No. 1, pp. 1–25.
- Barth, M. E., 2004. Fair values and financial statement volatility. In: *Market discipline across countries and industries*, ed. by C. Borio et al. Cambridge, MA: MIT Press, pp. 323–333.
- Barth, M. E., Clinch, G., Shibano, T., 2003. Market effects of recognition and disclosure. *Journal of Accounting Research*, Vol. 41, No. 4, pp. 581–609.
- Barth, M. E., Landsman, W. R., Wahlen, J. M., 1996. Fair value accounting: Effects on banks' earnings volatility, regulatory capital, and value of contractual cash flows. *Journal of Banking and Finance*, Vol. 19, pp. 577–605.
- Basel Committee on Banking Supervision, 2000. Report to G7 Finance Ministers and Central Bank Governors on International Accounting Standards. Basel, April.
- Basel Committee on Banking Supervision, 2009. Guiding principles for the replacement of IAS 39. Basel, August 27.
- Beatty, A., Chamberlain, S. L., Magliolo, J., 1995. Managing financial reports of commercial banks: The influence of taxes, regulatory capital, and earnings. *Journal of Accounting Research*, Vol. 33, No. 2, pp. 231–261.
- Bhat, G., 2008. Risk relevance of fair value gains and losses, and the impact of disclosure and corporate governance. Working Paper, University of Toronto.
- Blankespoor, E., Linsmeier, T. J., Petroni, K., Shakespeare, C., 2010. Fair value accounting for financial instruments: Does it improve the association between bank leverage and credit risk? Working Paper, University of Michigan.

- Bushman, R. M., Williams, C. D., 2011. Accounting discretion, loan loss provisioning, and discipline of banks' risk-taking. Working Paper, University of North Carolina-Chapel Hill.
- Callen, J. L., Livnat, J., Segal, D., 2009. The impact of earnings on the pricing of credit default swaps. *The Accounting Review*, Vol. 84, No. 5, pp. 1363–1394.
- Chang, Y.-L., Liu, C.-C., Ryan, S. G., 2009. SFAS No. 159's fair value option: Eventually used as intended. Working Paper, National Taiwan University.
- Choi, J. J., Elyasiani, E., Kopecky, K. J., 1992. The sensitivity of bank stock returns to market, interest and exchange rate risks. *Journal of Banking and Finance*, Vol. 16, No. 5, pp. 983–1004.
- Christensen, H. B., Nikolaev, V., 2010. Does fair value accounting for non-financial assets pass the market test? Working Paper, University of Chicago.
- Demirgüç-Kunt, A., Huizinga, H., 2010. Bank activity and funding strategies: The impact on risk and returns. *Journal of Financial Economics*, Vol. 98, No. 3, pp. 626–650.
- DeYoung, R., Roland, K.P., 2001. Product mix and earnings volatility at commercial banks: Evidence from a degree of total leverage model. *Journal of Financial Intermediation*, Vol. 10, pp. 54–84.
- ECOFIN, 2009. Council conclusions on pro-cyclicality. 2954<sup>th</sup> Economic and Social Affairs. Brussels, July 7.
- Enria, A. et al., 2004. Fair value accounting and financial stability. European Central Bank Occasional Paper Series No. 13. Frankfurt.
- European Banking Federation (EBF), 2009. Preliminary views on the IASB ED IAS 39 "Financial Instruments: Classification and Measurement". Ref. D1386E. Brussels, August 27.
- Fiechter, P., 2011. The effects of the fair value option under IAS 39 on the volatility of bank earnings. *Journal of International Accounting Research*, Vol. 10, No. 1, pp. 85–108.
- Flannery, M. J., James, C. M., 1984. The effect of interest rate changes on the common stock returns of financial institutions. *Journal of Finance*, Vol. 39, No. 4, pp. 1141–1153.
- Fonseca, A. R., Gonzalez, F., 2008. Cross-country determinants of bank income smoothing by managing loan loss provisions. *Journal of Banking and Finance*, Vol. 32, No. 2, pp. 217–228.
- Gebhardt, G., Reichardt, R., Wittenbrink, C., 2004. Accounting for financial instruments in the banking industry: Conclusions from a simulation model. *European Accounting Review*, Vol. 13, No. 2, pp. 341–371.
- Glaum, M., Street, D. L., 2003. Compliance with the disclosure requirements of Germany's New Market: IAS versus US GAAP. *Journal of International Financial Management and Accounting*, Vol. 14, No. 1, pp. 64–100.
- Godwin, N., Petroni, K., Whalen, J., 1998. Fair value accounting for property-liability insurers and classification decisions under FAS 115. *Journal of Accounting, Auditing and Finance*, Vol. 13, No.3, pp. 207–239.
- Guay, W., 1999. The impact of derivatives on firm risk: An empirical examination of new derivative users. *Journal of Accounting and Economics*, Vol. 26, pp. 319–351.

- Hentschel, L., Kothari, S. P., 2001. Are corporations reducing or taking risks with derivatives? *Journal of Financial and Quantitative Analysis*, Vol. 36, No. 1, pp. 93–118.
- Hirst, D. E., Hopkins, P. E., Wahlen, J. M., 2004. Fair values, income measurement, and bank analysts' risk and valuation judgments. *The Accounting Review*, Vol. 79, No. 2, pp. 453–472.
- Hodder, L. D., Hopkins, P. E., Wahlen, J. M., 2006. Risk-Relevance of Fair-Value Income Measures for Commercial Banks. *The Accounting Review*, Vol. 81, No. 2, pp. 337–375.
- Hodder, L., Kohlbeck, M., McAnally, M. L., 2002. Accounting choices and risk management: SFAS No. 115 and U.S. Bank Holding Companies. *Contemporary Accounting Research*, Vol. 19, No. 2, pp. 225–270.
- Hodgkinson, R., Singleton-Green, B., 2010. Business models in accounting: The theory of the firm and financial reporting. ICAEW Report.
- Houston, J. F., Lin, C., Lin, P., Ma, Y., 2010. Creditor rights, information sharing, and bank risk taking. *Journal of Financial Economics*, Vol. 96, pp. 485–512.
- International Banking Federation (IBFed), 2009. Re: Replacement of IAS 39 Financial Instruments: Recognition and Measurement. Letter to IASB Chairman Sir David Tweedie. Ref. D1284A-2009. London, July 13.
- Kaufmann, D., Kraay, A., Mastruzzi, M., 2009. Governance Matters. Working Paper, The World Bank.
- Knaup, M., Wagner, W., 2008. A market-based measure of credit quality and banks' performance during the subprime crisis. Working Paper, Tilburg University.
- Laeven, L., Levine, R., 2007. Is there a diversification discount in financial conglomerates? *Journal of Financial Economics*, Vol. 85, No. 2, pp. 331–367.
- Laeven, L., Levine, R., 2009. Bank governance, regulation and risk taking. *Journal of Financial Economics*, Vol. 93, No. 2, pp. 259–275.
- Leuz, C., 2010. Different approaches to corporate reporting regulation: how jurisdictions differ and why. *Accounting and Business Research*, Vol. 40, No. 3, pp. 229–256.
- Laux, C., Leuz, C., 2010. Did Fair-Value Accounting Contribute to the Financial Crisis? *Journal of Economic Perspectives*, Vol. 24, No. 1, pp. 93–118.
- Leuz, C., Nanda, D., Wysocki, P. D., 2003. Earnings management and investor protection: an international comparison. *Journal of Financial Economics*, Vol. 69, pp. 505–527.
- Muller III, K. A., Riedl, E. J., Sellhorn, T., 2011. Mandatory fair value accounting and information asymmetry: Evidence from the European real estate industry. *Management Science*, forthcoming.
- Nelson, K. K., 1996. Fair value accounting for commercial banks: An empirical analysis of SFAS No. 107. *The Accounting Review*, Vol. 71, No. 2, pp. 161–182.
- Nobes, C. W., 2001. GAAP 2001: A survey of national accounting rules benchmarked against International Accounting Standards. Available at: [www.ifad.net](http://www.ifad.net).

- Plantin, G., Sapra, H., Shin, H. S., 2009. Marking-to-Market: Panacea or Pandora's Box? *Journal of Accounting Research*, Vol. 46, No. 2, pp. 435–460.
- Power, M., 2010. Fair value accounting, financial economics and the transformation of reliability. *Accounting and Business Research*, Vol. 40, No. 3, pp. 197–210.
- Pukthuanthong, K., Roll, R., 2009. Global market integration: An alternative measure and its application. *Journal of Financial Economics*, Vol. 94, pp. 214–232.
- Ryan, S., 2007. *Financial Instruments and Institutions*. Hoboken, NJ: John Wiley & Sons.
- Saunders, A., Cornett, M. M., 2003. *Financial institutions management: A risk management approach*. Boston, MA: McGraw-Hill Irwin
- Schrand, C. M., 1997. The association between stock-price interest rate sensitivity and disclosures about derivative instruments. *The Accounting Review*, Vol. 72, No. 1, pp. 87–109.
- Shen, C.-H., Chih, H.-L., 2005. Investor Protection, Prospect Theory, and Earnings Management: An International Comparison of the Banking Industry. *Journal of Banking and Finance*, Vol. 29, No. 10, pp. 2675–2697.
- Song, C. J., Thomas, W., Yi, H., 2010. Value Relevance of FAS 157 Fair Value Hierarchy Information and the Impact of Corporate Governance Mechanisms. *The Accounting Review*, Vol. 85, No. 4, pp. 1375–1410.
- Stiroh, K. J., 2006. A portfolio view of banking with interest and noninterest activities. *Journal of Money, Credit and Banking*, Vol. 38, No. 5, pp. 1351–1361.
- Wong, F., 2000. The association between SFAS No. 119 derivatives disclosures and the foreign exchange risk exposure of manufacturing firms. *Journal of Accounting Research*, Vol. 38, No. 2, pp. 387–417.
- Zhang, H., 2009. Effect of derivative accounting rules on corporate risk-management behavior. *Journal of Accounting and Economics*, Vol. 47, pp. 244–264.

**TABLE 1**

*Financial Instruments by IAS 39 Measurement Categories*

*Panel A. Balance Sheet*

	Mean (m EUR)	Mean	p25	Median	p75	p90	p95	p99	Median Bank (Sabadell, Spain)	P95 Bank (Swedbank, Sweden)
<i>Financial Assets</i>										
<b>Total Fair Value Assets</b>	<b>33,539</b>	<b>15.9%</b>	<b>6.1%</b>	<b>12.3%</b>	<b>21.6%</b>	<b>35.0%</b>	<b>45.7%</b>	<b>64.1%</b>	<b>12.3%</b>	<b>45.7%</b>
Total Fair Value Assets (Through P&L)	25,504	8.2%	0.6%	2.9%	10.6%	22.3%	39.0%	58.6%	1.6%	45.6%
Fair Value Option Assets	3,883	2.7%	0.0%	0.1%	2.1%	7.9%	14.1%	35.9%	0.2%	29.5%
Trading Assets	10,504	3.7%	0.0%	0.8%	4.5%	11.0%	16.6%	38.1%	0.0%	13.8%
Derivatives (Non-hedging)	11,095	1.8%	0.0%	0.2%	1.4%	4.9%	8.9%	23.7%	1.4%	2.3%
Total Fair Value Assets (Through OCI)	8,029	7.6%	1.5%	5.7%	10.9%	18.5%	23.2%	35.2%	10.7%	0.1%
Derivatives (Hedging)	402	0.2%	0.0%	0.0%	0.1%	0.5%	0.8%	2.3%	0.8%	0.1%
AFS Assets	7,626	7.5%	1.4%	5.5%	10.7%	18.2%	22.9%	35.2%	9.9%	0.0%
<b>Total Amortized Cost Assets</b>	<b>58,214</b>	<b>76.9%</b>	<b>69.4%</b>	<b>81.1%</b>	<b>88.8%</b>	<b>93.0%</b>	<b>95.5%</b>	<b>98.3%</b>	<b>81.6%</b>	<b>47.0%</b>
Cash & Cash Equivalents	3,291	7.2%	1.3%	3.7%	10.5%	18.7%	24.0%	35.7%	2.2%	1.3%
HTM Assets	1,832	3.1%	0.0%	0.5%	3.8%	9.9%	15.2%	24.2%	0.0%	0.1%
Loans & Receivables	53,090	66.6%	56.9%	69.1%	79.1%	86.4%	88.7%	93.5%	79.4%	45.6%
<i>Financial Liabilities &amp; Equity</i>										
<b>Total Fair Value Liabilities (Through P&amp;L)</b>	<b>20,155</b>	<b>5.2%</b>	<b>0.0%</b>	<b>0.6%</b>	<b>4.4%</b>	<b>17.5%</b>	<b>29.2%</b>	<b>49.9%</b>	<b>1.5%</b>	<b>42.2%</b>
Trading Liabilities	5,341	0.8%	0.0%	0.0%	0.0%	2.0%	5.8%	12.4%	0.0%	12.4%
Derivatives (Non-hedging)	10,702	1.9%	0.0%	0.2%	1.4%	5.0%	9.9%	27.2%	1.4%	2.3%
Derivatives (Hedging)	493	0.2%	0.0%	0.0%	0.1%	0.6%	1.0%	2.7%	0.1%	0.0%
Fair Value Option Liabilities	3,620	2.4%	0.0%	0.0%	0.8%	6.8%	12.9%	39.9%	0.0%	27.5%
<b>Other Liabilities (At Amortized Cost)</b>	<b>69,095</b>	<b>80.9%</b>	<b>78.4%</b>	<b>85.8%</b>	<b>89.8%</b>	<b>92.7%</b>	<b>94.4%</b>	<b>97.6%</b>	<b>90.5%</b>	<b>44.1%</b>
<b>Shareholders' Equity</b>	<b>4,651</b>	<b>10.3%</b>	<b>5.9%</b>	<b>8.8%</b>	<b>12.6%</b>	<b>17.2%</b>	<b>22.9%</b>	<b>42.2%</b>	<b>6.4%</b>	<b>4.2%</b>

*Panel B. Income Statement*

	Mean	Standard Deviation	p1	p10	p50	p90	p99
<b>Full Amortized Cost Income</b>	1.3%	2.5%	-3.8%	-0.1%	1.1%	2.9%	10.6%
<b>IFRS Net Income</b>	1.5%	2.6%	-3.6%	0.1%	1.3%	3.2%	11.0%
% Unrealized Fair Value Changes	20.7%	23.2%	0.0%	0.8%	11.6%	57.8%	91.8%
<b>Comprehensive Income</b>	1.5%	2.6%	-4.2%	-0.2%	1.3%	3.2%	11.0%
% Unrealized Fair Value Changes	28.7%	24.7%	0.1%	3.1%	21.4%	68.5%	94.3%
<b>Full Fair Value Income</b>	1.3%	3.5%	-8.8%	-1.2%	1.2%	3.7%	12.7%

Table 1 presents financial instruments by measurement categories in accordance with IAS 39 for a global sample of 1,512 firm years. Panel A reports balance sheet categories. Banco de Sabadell (Spain) is the firm with a proportion of total fair value assets equal to the sample median. Swedbank (Sweden) is the firm with a proportion of total fair value assets at the 95<sup>th</sup> percentile of the sample. All proportions in Panel A are scaled by book value of total assets. Panel B reports the income statement categories. *Full Amortized Cost Income*, *IFRS Net Income*, *Comprehensive Income*, and *Full Fair Value Income* are scaled by book value of total assets. *% Unrealized Fair Value Changes* indicates the proportion of unrealized fair value changes included in IFRS Net Income and Comprehensive Income, respectively. It is calculated as the absolute value of unrealized fair value changes divided by the sum of the absolute values of unrealized fair value changes and all other components of net income (comprehensive income).

**TABLE 2**

*Descriptive Cluster Analysis of Operating Business Models*

*Panel A. Operating Characteristics*

	Global Player		Specialized Investment Firms		Specialized Financing Institutions		Regional Universal Banks		Mortgage Banks		Local Retail Banks		Total Sample	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Representative Bank	BNP Paribas (France)		Bellevue (Switzerland)		Banca Italease (Italy)		Commerzbank (Germany)		SNS Reaal (Netherlands)		Union Bank (Philippines)			
N	21		20		12		87		10		228		378	
<i>General Characteristics</i>														
Size (Log Total Assets)	10.45	10.13	8.67	7.98	9.42	9.48	10.22	10.40	10.20	10.17	8.40	8.35	9.11	8.97
Return on Equity	10.5%	11.5%	14.7%	15.5%	10.6%	11.4%	10.1%	12.9%	7.9%	9.9%	13.0%	14.2%	11.9%	13.3%
<i>Business Model Characteristics (Cluster Analysis)</i>														
Non-interest Income / Interest Income	83.0%	92.6%	104.4%	97.9%	23.8%	21.8%	31.4%	31.6%	23.8%	21.5%	30.7%	29.4%	36.5%	31.1%
Trading Income / Interest Income	29.4%	26.8%	41.2%	43.3%	7.4%	3.3%	6.8%	4.7%	4.2%	1.5%	6.1%	3.9%	9.3%	5.1%
Commission & Fee Income / Interest Income	55.3%	54.1%	64.1%	64.3%	15.9%	14.6%	24.6%	25.8%	19.0%	16.4%	24.2%	23.5%	27.1%	24.8%
% Mortgage Loans	2.3%	0.0%	4.1%	0.0%	2.4%	0.0%	3.0%	0.0%	57.7%	54.3%	2.0%	0.0%	5.6%	0.0%
% Wealth Management	86.4%	100.0%	1.2%	0.0%	1.3%	0.0%	3.8%	0.0%	2.1%	0.0%	0.1%	0.0%	4.7%	0.0%
Funding (Deposits / Total Short-Term Funding)	56.7%	54.1%	67.9%	67.1%	21.3%	23.5%	58.8%	59.9%	54.4%	58.2%	90.0%	91.2%	73.1%	81.4%
Operations (Non-interest Expense / Total Assets)	3.2%	2.7%	3.9%	2.6%	1.8%	0.7%	2.1%	1.8%	1.1%	1.1%	2.6%	2.2%	2.5%	1.9%

*Panel B. Fair Value Measurement*

Total Fair Value Assets	35.8%	33.6%	26.3%	24.0%	16.1%	14.8%	19.2%	16.1%	13.1%	13.6%	11.8%	9.4%	15.9%	12.3%
Total Fair Value Assets (Through P&L)	27.9%	21.8%	18.5%	14.9%	9.3%	2.3%	12.2%	7.8%	7.2%	7.9%	3.9%	1.3%	8.2%	2.9%
Fair Value Option Assets	9.7%	1.9%	3.2%	0.2%	5.6%	0.0%	3.8%	0.9%	2.2%	0.3%	1.4%	0.0%	2.7%	0.1%
Total Fair Value Assets / Total Fair Value Liabilities	58.1%	66.9%	46.2%	49.3%	32.4%	26.4%	53.0%	56.5%	51.7%	57.3%	30.2%	14.4%	38.7%	31.1%
Comprehensive Fair Value Income / Total Assets	24.9%	23.2%	43.1%	36.2%	-24.9%	-4.9%	7.7%	9.8%	9.3%	8.8%	10.8%	14.3%	11.9%	13.1%
Comprehensive Fair Value Income / Comprehensive Income	48.1%	43.8%	38.6%	30.8%	21.0%	12.1%	29.7%	22.8%	19.3%	12.9%	25.8%	19.4%	28.7%	21.4%
Fair Value Net Income / Total Assets	22.7%	13.5%	54.1%	38.0%	-15.5%	0.0%	6.2%	6.3%	9.7%	7.1%	16.3%	9.9%	15.5%	9.1%
Fair Value Net Income / Net Income	42.1%	32.5%	35.9%	34.1%	13.2%	3.2%	20.6%	14.3%	10.5%	7.0%	17.5%	9.0%	20.7%	11.6%

Table 2 summarizes results of a k-means cluster analysis using six distinct clusters and six variables related to operating characteristics of banks. Panel A reports means and medians of all variables used in the cluster analysis as well as of size and return for each cluster. *Size* is calculated as the natural logarithm of book value of total assets. *Return on Equity* is the ratio of published net income to book value of shareholders' equity (source: BvD Bankscope). *Non-interest Income / Interest Income* is the sum of trading, commission, and fee income divided by interest income (source: BvD Bankscope). In the cluster analysis, the variable is split up in *Trading Income / Interest Income* and *Commission & Fee Income / Interest Income*. *% Mortgage Loans* is the book value of mortgage loans and securities scaled by book value of total assets (source: BvD Bankscope). *% Wealth Management* is the proportion of assets under management to book value of total assets (source: P&I / Towers Watson Top 500). *Funding* is the ratio of customer deposits to book value of total short-term funding (source: BvD Bankscope). *Operations* is the ratio of non-interest expenses (personnel expenses, administrative expenses and other operating expenses) to book value of total assets (source: BvD Bankscope). Panel B reports means and medians of fair value ratios by clusters. *Total Fair Value Assets* represents the sum of the book values of trading assets, derivative assets not designated for cash flow hedges, fair value option assets and available for sale assets scaled by book value of total assets. *Total Fair Value Assets (Through P&L)* is defined as total fair value assets less available for sale assets scaled by book value of total assets. *Fair Value Option Assets* are reported as a proportion of the book value of total assets. *Total Fair Value Assets / Total Fair Value Liabilities* is the ratio of total fair value assets to the sum of the book values of trading liabilities,

**TABLE 2 [cont.]**

derivative liabilities not designated for cash flow hedges and fair value option liabilities. *Comprehensive Fair Value Income (Fair Value Net Income) / Total Assets* are total unrealized gains and losses from fair value changes included in comprehensive income (net income) scaled by the book value of total assets. *Comprehensive Fair Value Income / Comprehensive Income (Fair Value Income / Net Income)* is the share of unrealized fair value gains and losses in total comprehensive income (total net income). All variables reported in Panel B are calculated from own data.

**TABLE 3**

*Operating Business Model and Risk Taking*

*Panel A. Risk Taking by Operating Business Model (Portfolio Analysis)*

	Global Player	Specialized Investment Firms	Specialized Financing Institutions	Regional Universal Banks	Mortgage Banks	Local Retail Banks
Market Risk (MSCI World)	0.9676 *** (0.0434)	0.6738 *** (0.0395)	0.6441 *** (0.0370)	0.7501 *** (0.0330)	0.5916 *** (0.0475)	0.4455 *** (0.0277)
Interest Rate Risk (EONIA)	0.0098 * (0.0057)	0.0037 (0.0052)	0.0105 ** (0.0049)	0.0133 *** (0.0044)	0.0143 ** (0.0063)	0.0089 ** (0.0037)
Credit Risk (iTraxx Crossover)	-0.0636 *** (0.0172)	-0.0452 *** (0.0156)	-0.0323 ** (0.0147)	-0.0469 *** (0.0131)	-0.0773 *** (0.0188)	-0.0299 *** (0.0110)
Constant	-0.0004 (0.0009)	0.0000 (0.0009)	-0.0005 (0.0008)	-0.0011 (0.0007)	-0.0007 0.0010	0.0002 (0.0006)
R <sup>2</sup>	0.7579	0.6476	0.6460	0.7644	0.5486	0.6231
N	314	314	314	314	314	314

*Panel B. Risk Taking by Operating Business Model (Bank Level Analysis)*

	Market Risk Beta					Interest Rate Risk Beta					Credit Risk Beta				
	Mean	Median	Max	SD	IQR	Mean	Median	Max	SD	IQR	Mean	Median	Min	SD	IQR
Global Player	0.980	1.036	2.401	0.718	0.751	0.135	0.071	1.630	0.238	0.090	-0.048	-0.055	-0.682	0.140	0.136
Specialized Investment Firms	0.805	0.752	2.204	0.545	0.816	0.111	0.061	0.895	0.152	0.117	-0.020	-0.013	-0.251	0.116	0.125
Specialized Financing Institutions	0.582	0.608	1.704	0.507	0.893	0.077	0.030	0.736	0.132	0.073	-0.028	-0.020	-0.401	0.085	0.105
Regional Universal Banks	0.711	0.684	2.375	0.515	0.804	0.068	0.046	0.548	0.072	0.080	-0.043	-0.029	-0.280	0.104	0.105
Mortgage Banks	0.524	0.463	1.424	0.319	0.468	0.077	0.038	0.768	0.130	0.074	-0.055	-0.060	-1.527	0.108	0.135
Local Retail Banks	0.686	0.675	3.258	0.463	0.669	0.074	0.041	1.573	0.104	0.074	-0.037	-0.019	-0.322	0.140	0.128
Total	0.717	0.702	3.258	0.499	0.702	0.079	0.043	1.630	0.117	0.081	-0.039	-0.023	-1.527	0.131	0.132

**TABLE 3 [cont.]**

*Panel C. Correlation of Betas with Alternative Risk Variables*

Expected Direction	N	Market Risk	Interest Risk	Credit Risk
		Beta	Beta	Beta
		+	+	-
<i>Overall Risk</i>				
Z-Score	1402	0.0915 ***	0.0526 **	0.0089
Income Volatility	1462	0.1529 ***	0.0365	-0.0288
<i>Market Risk</i>				
Trading Income Volatility	1460	0.1351 ***	0.0398	-0.0139
Open Derivative Position	1457	0.1103 ***	-0.0346	-0.0164
<i>Interest Risk</i>				
Interest Margin Volatility	1462	0.0392	0.0607 **	-0.0499 *
Off-Balance Sheet Commitments	1185	0.1421 ***	0.0501 *	-0.0337
Liquid Assets / Short-Term Funds	1481	0.1030 ***	0.1082 ***	0.0630 **
<i>Credit Risk</i>				
CDS Spread	375	0.1329 **	-0.1163	-0.1471 ***
% Problem Loans	1484	0.1395 ***	0.0511 **	-0.0657 **
LLP / Net Interest Income	1481	0.0422	0.0403	0.0137

Table 3 presents the analysis of the association between the operating business model and risk taking of all sample banks. Panel A summarizes results of portfolio-level regressions of stock return on three different risk factors. The portfolios are constructed using the results from the cluster analysis presented in Table 2. The equal-weighted portfolio return is calculated on a weekly basis for the period from 2005 to 2010 (314 weeks). *Market Risk* is the percentage change in the MSCI World index (source: Thomson Financial Datastream). *Credit Risk* is the percentage change in the iTraxx Crossover index provided by Markit (source: Bloomberg). *Interest Rate Risk* is the percentage change in the 3-month Euro-LIBOR. The table reports OLS coefficient estimates and robust standard errors (in parentheses). Panel B summarizes results of firm-level regressions of stock return on the identical three risk factors. Summary statistics (mean, median, maximum/minimum, standard deviation and interquartile range) are reported for each operating business model. The independent variables are the local stock market index (*Market Risk Beta*), the local interbank offering rate (*Interest Risk Beta*) and the iTraxx Crossover index (*Credit Risk Beta*). Panel C reports Spearman correlations of the three beta factors with alternative proxies for risk taking which are commonly used in the literature. Correlations are calculated on a yearly basis for the period 2006–2009. *Z-Score* is the sum of the mean return on assets and the mean capital buffer scaled by the standard deviation of the return on assets over five-year rolling time windows and multiplied by -1 (source: BvD Bankscope). The capital buffer is the difference between the regulatory capital ratio (source: BvD Bankscope, own data) and the country-specific minimum capital requirement (see Table 2, source: WorldBank, own data). *Income Volatility* is the standard deviation of net income scaled by book value of equity over five-year rolling time windows (source: BvD Bankscope). *Trading Income Volatility* is the standard deviation of net trading income scaled by net interest income over five-year rolling time windows (source: BvD Bankscope). *Open Derivative Position* is the absolute value of the difference between non-hedging derivative assets and non-hedging derivative liabilities (source: own data). *Interest Margin Volatility* is the standard deviation of the interest margin scaled by total interest income over five-year rolling time windows (source: BvD Bankscope). *Off-Balance Sheet Commitments* is the sum of contingent liabilities (acceptances, documentary credits, guarantees, and other commitments) scaled by book value of equity (source: BvD Bankscope). *Liquid Assets / Short-Term Funds* is the short-term maturity gap calculated as the ratio of short-term liquid assets to deposits and short-term money market funds (source: BvD Bankscope). *% Problem Loans* relates a bank's total problem loans (overdue loans, restructured loans, and other non-performing loans) to book value of equity (source: BvD Bankscope). *LLP / Net Interest Income* is the ratio of loan loss provisions to net interest income (source: BvD Bankscope). *CDS Spread* is the mean spread of a 5-year CDS on the bank's senior debt over the year (source: *Markit [Bloomberg]*). \*\*\*, \*\*, \* indicate statistical significance at the 1%, 5% and 10% levels (two-tailed), respectively.

**TABLE 4**

*Summary Statistics at Country Level*

N	Composition of Banking Industry							Fair Value Measurement												Control Variables			
	Global Player	Specialized Investment Firms	Specialized Financing Firms	Regional Universal Banks	Mortgage Banks	Local Retail Banks	Total FV Assets				Optional FV Assets				Optional FV Assets (excl. AFS)				FV Tradition	Islamic Tradition	Regulatory Oversight (CGI)	Minimum Capital Ratio	
							mEUR (2009)	% TA (mean)	% TA (median)	% TA (p95)	mEUR (2009)	% TA (mean)	% TA (median)	% TA (p95)	mEUR (2009)	% TA (mean)	% TA (median)	% TA (p95)					
AUSTRALIA	36	0.0%	0.0%	11.1%	22.2%	55.6%	11.1%	98,554	12.2%	12.9%	30.0%	42,295	6.1%	3.7%	22.1%	16,227	4.2%	0.3%	19.0%	1	0	1.710	8.0%
AUSTRIA	32	0.0%	0.0%	12.5%	37.5%	0.0%	50.0%	47,810	15.8%	15.3%	24.5%	30,107	11.2%	9.7%	22.0%	7,933	4.2%	2.2%	12.1%	0	0	1.678	8.0%
BAHRAIN	36	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	8,496	16.9%	16.2%	38.9%	8,183	16.5%	15.7%	35.2%	367	2.6%	0.0%	21.1%	0	1	0.453	12.0%
BELGIUM	8	50.0%	0.0%	0.0%	50.0%	0.0%	0.0%	280,403	41.1%	42.6%	53.6%	192,787	27.1%	26.2%	37.3%	33,989	6.5%	4.8%	17.7%	0	0	1.237	8.0%
BULGARIA	16	0.0%	0.0%	25.0%	25.0%	0.0%	50.0%	275	6.1%	4.8%	16.6%	278	5.1%	3.3%	16.1%	0	0.0%	0.0%	0.0%	0	0	0.188	12.0%
CHINA	44	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	305,223	8.4%	7.2%	17.9%	288,373	7.5%	6.8%	16.5%	4,591	0.1%	0.0%	1.0%	0	0	-0.214	8.0%
CYPRUS	16	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	8,877	11.2%	10.9%	29.2%	8,462	10.4%	9.5%	28.0%	351	0.5%	0.5%	1.2%	1	0	1.018	10.0%
CZECH REPUBLIC	4	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	5,664	19.2%	19.4%	21.6%	4,324	13.7%	13.2%	16.3%	0	0.0%	0.0%	0.0%	1	0	0.860	8.0%
DENMARK	48	0.0%	0.0%	0.0%	25.0%	0.0%	75.0%	218,178	24.2%	17.2%	55.5%	114,630	6.7%	2.5%	22.6%	99,777	6.6%	2.5%	19.8%	1	0	1.858	8.0%
FINLAND	8	50.0%	0.0%	0.0%	50.0%	0.0%	0.0%	9,774	16.9%	14.7%	26.2%	6,948	10.4%	10.6%	18.6%	2,515	6.2%	6.3%	9.6%	0	0	1.822	8.0%
FRANCE	72	11.1%	11.1%	5.6%	5.6%	0.0%	66.7%	2,481,078	19.5%	11.1%	57.0%	761,487	9.7%	9.7%	16.1%	166,172	1.2%	0.2%	6.2%	1	0	1.241	8.0%
GERMANY	56	7.1%	14.3%	7.1%	42.9%	7.1%	21.4%	1,437,215	32.3%	28.6%	72.2%	306,586	18.4%	15.6%	50.6%	166,994	5.6%	1.1%	40.4%	0	0	1.537	8.0%
GREECE	48	0.0%	8.3%	0.0%	16.7%	0.0%	75.0%	54,899	13.0%	10.3%	34.7%	43,083	9.9%	7.7%	32.7%	4,051	1.3%	0.2%	7.0%	0	0	0.507	8.0%
HONGKONG	40	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	67,790	17.1%	15.2%	36.9%	55,970	14.7%	12.6%	32.5%	5,272	1.7%	1.2%	4.6%	0	0	1.670	8.0%
HUNGARY	8	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	6,446	8.3%	7.5%	16.8%	5,437	6.8%	5.4%	16.4%	0	0.0%	0.0%	0.0%	0	0	0.775	8.0%
IRELAND	16	0.0%	0.0%	25.0%	75.0%	0.0%	0.0%	97,656	20.4%	19.5%	36.3%	83,675	17.7%	14.0%	34.8%	31,562	7.2%	0.4%	32.1%	1	0	1.636	8.0%
ITALY	84	19.1%	0.0%	9.5%	57.1%	0.0%	14.3%	423,183	19.0%	17.9%	39.6%	152,370	8.1%	5.5%	27.2%	40,771	1.1%	0.1%	4.1%	0	0	0.464	8.0%
JORDAN	44	0.0%	0.0%	0.0%	9.1%	0.0%	90.9%	10,928	12.6%	12.1%	24.7%	10,410	11.4%	9.8%	24.6%	119	0.0%	0.0%	0.3%	0	1	0.238	12.0%
KAZAKHSTAN	24	0.0%	0.0%	0.0%	33.3%	0.0%	66.7%	3,245	6.7%	6.1%	16.4%	1,926	3.7%	1.0%	13.3%	0	0.0%	0.0%	0.0%	0	1	-0.409	12.0%
KENYA	28	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	585	6.7%	3.2%	18.2%	494	5.9%	0.9%	18.2%	11	0.1%	0.0%	0.7%	1	0	-0.785	8.0%
KUWAIT	36	0.0%	0.0%	0.0%	11.1%	0.0%	88.9%	6,695	6.3%	6.1%	11.2%	6,251	5.9%	5.6%	11.1%	104	0.4%	0.0%	4.3%	0	1	0.360	12.0%
LEBANON	20	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	8,951	20.2%	19.0%	47.2%	8,351	18.6%	16.9%	46.7%	70	0.2%	0.0%	1.4%	0	1	-0.868	12.0%
LIECHTENSTEIN	8	0.0%	50.0%	0.0%	0.0%	0.0%	50.0%	3,925	13.3%	13.2%	18.0%	3,284	12.0%	11.6%	17.5%	2,793	8.6%	7.4%	17.5%	0	0	1.466	8.0%
LITHUANIA	16	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	563	6.6%	5.9%	20.4%	460	4.3%	3.8%	13.3%	310	1.5%	0.0%	9.3%	0	0	0.654	8.0%
LUXEMBOURG	4	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	15,271	18.5%	18.4%	19.6%	10,325	12.3%	12.3%	12.9%	1,273	2.5%	2.6%	3.2%	0	0	1.745	8.0%
MALTA	16	0.0%	25.0%	0.0%	0.0%	0.0%	75.0%	874	17.1%	14.3%	34.1%	773	10.3%	6.0%	30.7%	265	6.2%	4.1%	22.3%	0	0	1.265	8.0%
NETHERLANDS	24	16.7%	33.3%	0.0%	33.3%	16.7%	0.0%	359,658	25.8%	24.4%	52.9%	234,638	17.3%	14.9%	51.8%	7,266	1.8%	0.5%	9.7%	1	0	1.703	8.0%
NORWAY	52	7.7%	0.0%	0.0%	92.3%	0.0%	0.0%	106,841	16.4%	10.8%	61.1%	82,643	12.6%	8.3%	57.2%	79,271	11.1%	6.9%	52.4%	1	0	1.693	8.0%
OMAN	20	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	1,169	4.3%	2.6%	18.1%	484	2.9%	2.0%	13.1%	32	0.2%	0.0%	1.3%	0	1	0.688	12.0%
PHILIPPINES	56	0.0%	0.0%	0.0%	7.1%	0.0%	92.9%	8,559	17.2%	15.6%	37.4%	6,965	14.3%	14.1%	25.0%	161	0.4%	0.0%	2.3%	0	0	-0.540	10.0%
POLAND	52	0.0%	7.7%	0.0%	7.7%	0.0%	84.6%	35,178	18.8%	18.0%	37.4%	25,754	12.7%	12.1%	24.3%	4,529	2.4%	0.0%	11.3%	0	0	0.582	8.0%
PORTUGAL	20	0.0%	0.0%	0.0%	80.0%	0.0%	20.0%	31,401	11.4%	8.3%	22.6%	21,256	6.9%	5.2%	15.5%	1,323	1.2%	0.7%	4.0%	0	0	1.065	8.0%
QATAR	32	0.0%	0.0%	12.5%	0.0%	0.0%	87.5%	2,589	6.1%	6.0%	12.0%	2,553	6.1%	5.9%	12.0%	7	0.0%	0.0%	0.0%	0	1	0.890	10.0%
ROMANIA	12	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	1,507	8.1%	4.6%	39.7%	1,466	7.7%	4.1%	38.6%	0	0.0%	0.0%	0.0%	1	0	0.118	12.0%
RUSSIAN FEDERATION	36	0.0%	0.0%	0.0%	11.1%	0.0%	88.9%	38,804	9.7%	9.8%	16.8%	24,978	2.7%	1.7%	8.1%	3,357	0.8%	0.0%	5.0%	0	0	-0.678	10.0%
SAUDI ARABIA	40	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	21,358	10.3%	8.2%	26.0%	18,005	8.6%	6.8%	25.8%	323	0.4%	0.0%	2.4%	0	1	0.045	8.0%
SINGAPORE	20	0.0%	0.0%	0.0%	20.0%	0.0%	80.0%	69,968	16.2%	17.6%	29.3%	47,789	11.9%	13.1%	20.6%	6,149	1.6%	0.0%	8.4%	1	0	1.970	10.0%
SLOVAKIA	12	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	1,959	6.6%	7.5%	13.0%	1,205	2.9%	2.4%	10.1%	209	1.3%	0.0%	5.2%	0	0	0.754	8.0%
SLOVENIA	12	0.0%	33.3%	0.0%	0.0%	0.0%	66.7%	1,849	18.0%	17.9%	22.9%	1,741	14.1%	14.5%	19.5%	35	0.2%	0.0%	0.7%	0	0	0.967	8.0%
SOUTH AFRICA	32	0.0%	0.0%	12.5%	50.0%	0.0%	37.5%	102,028	17.1%	12.9%	45.8%	59,750	10.6%	8.8%	26.4%	53,079	9.6%	6.8%	25.9%	1	0	0.352	9.5%
SPAIN	36	22.2%	0.0%	0.0%	77.8%	0.0%	0.0%	471,714	13.7%	12.3%	25.9%	235,020	8.0%	7.7%	12.2%	44,131	0.9%	0.3%	3.4%	0	0	0.915	8.0%
SWEDEN	28	14.3%	42.9%	0.0%	42.9%	0.0%	0.0%	407,011	31.4%	33.6%	50.2%	181,022	9.6%	7.2%	32.4%	170,160	8.3%	3.7%	32.4%	0	0	1.788	8.0%
SWITZERLAND	32	56.3%	43.8%	0.0%	0.0%	0.0%	0.0%	516,378	31.5%	27.0%	78.8%	73,617	16.1%	11.9%	56.1%	13,610	6.6%	0.2%	53.2%	0	0	1.794	8.0%

**TABLE 4 [cont.]**

	Composition of Banking Industry							Fair Value Measurement												Control Variables			
	N	Global Player	Specialized Investment Firms	Specialized Financing Firms	Regional Universal Banks	Mortgage Banks	Local Retail Banks	Total FV Assets				Optional FV Assets				Optional FV Assets (excl. AFS)				FV Tradition	Islamic Tradition	Regulatory Oversight (CGI)	Minimum Capital Ratio
								mEUR (2009)	% TA (mean)	% TA (median)	% TA (p95)	mEUR (2009)	% TA (mean)	% TA (median)	% TA (p95)	mEUR (2009)	% TA (mean)	% TA (median)	% TA (p95)				
TAIWAN	40	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	7,577	5.8%	4.2%	17.6%	5,403	3.3%	2.5%	9.8%	988	0.8%	0.2%	4.7%	1	0	0.798	8.0%
TURKEY	52	0.0%	0.0%	7.7%	38.5%	0.0%	53.9%	58,085	14.4%	11.2%	36.1%	55,224	12.7%	10.0%	30.0%	236	0.1%	0.0%	0.0%	0	1	-0.025	8.0%
UKRAINE	4	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	31	0.9%	0.9%	0.9%	31	0.9%	0.9%	0.9%	3	0.1%	0.1%	0.1%	0	0	-0.468	8.0%
UNITED ARAB EMIRATES	76	0.0%	0.0%	0.0%	5.3%	0.0%	94.7%	15,182	5.8%	4.3%	14.6%	11,401	4.4%	3.6%	9.7%	600	0.7%	0.0%	4.2%	0	1	0.782	10.0%
UNITED KINGDOM	56	14.3%	21.4%	7.1%	35.7%	14.3%	7.1%	2,812,848	25.1%	25.2%	57.6%	827,212	13.3%	14.4%	33.3%	226,529	6.7%	1.2%	29.7%	1	0	1.508	8.0%
Total	1512	5.4%	5.4%	3.2%	23.0%	2.7%	60.3%	10,674,254	16.0%	12.6%	45.7%	4,065,373	10.2%	8.0%	27.9%	1,197,516	2.7%	0.1%	13.9%	30.3%	24.5%	0.796	8.9%

Table 4 presents summary statistics at the country level. The first columns *Composition of Banking Industry* describe the distribution of the operating business models identified in Table 2 across countries. The columns *Fair Value Measurement* report the average book value in million Euros (*m EUR*), the average book value scaled by total assets (*% TA (mean)*), the median book value scaled by total assets (*% TA (median)*) as well as the 95<sup>th</sup> percentile of the book value scaled by total assets (*% TA (p95)*). *Total FV Assets* are the total book value of financial assets at fair value through P/L and at fair value through OCI. See Table 1 for details. *Optional FV Assets* are the total book value of financial assets designated for the IAS 39 fair value option and available-for-sale financial assets. *Optional FV Assets (excl. AFS)* are the total book value of financial assets designated for the IAS 39 fair value option. *FV Tradition* is a dummy variable equal to 1 if fair value disclosures of financial assets and financial liabilities were required under Local GAAP before IFRS adoption (source: Nobes, 2001). *Islamic Tradition* is a dummy variable equal to 1 if the majority of the population in a country is Islamic (source: CIA World Factbook). *Regulatory Oversight (CGI)* is a country-specific governance score from Kaufmann et al. (2009). *Minimum Capital Ratio* is the total capital ratio (tier 1 plus tier 2) required for commercial banks by national regulators (source: The World Bank / own data).

**TABLE 5***Firm-Level Determinants of Fair Value Measurement**Panel A. Descriptive Statistics*

	Mean	SD	P1	Median	P99
Total Fair Value Assets	0.159	0.139	0.000	0.123	0.641
Optional Fair Value Assets	0.101	0.095	0.000	0.078	0.468
Optional Fair Value Assets (excl. AFS)	0.027	0.067	0.000	0.001	0.359
Fair Value Tradition	0.301	0.459	0.000	0.000	1.000
Islamic Tradition	0.252	0.434	0.000	0.000	1.000
Regulatory Oversight	0.776	0.773	-0.868	0.782	1.970
Analyst Following	1.033	1.177	0.000	0.693	3.458
Regulatory Capital Restriction	0.071	0.256	0.000	0.000	1.000
Hedge Accounting	0.518	0.500	0.000	1.000	1.000
Business Model: Specialized Investment Firm	0.230	0.421	0.000	0.000	1.000
Business Model: Specialized Financing Firm	0.031	0.174	0.000	0.000	1.000
Business Model: Regional Universal Bank	0.054	0.226	0.000	0.000	1.000
Business Model: Mortgage Bank	0.604	0.489	0.000	1.000	1.000
Business Model: Local Retail Bank	0.027	0.161	0.000	0.000	1.000
Trading Book Risk: Market Risk	0.717	0.499	-0.213	0.702	1.883
Banking Book Risk: Interest Risk	0.079	0.117	0.000	0.043	0.549
Banking Book Risk: Credit Risk	-0.039	0.131	-0.410	-0.023	0.234

Panel B. Regressions

	Total Fair Value Assets				Optional Fair Value Assets				Optional Fair Value Assets (excl. AFS)			
	Univariate	(1)	(2)	(3)	Univariate	(1)	(2)	(3)	Univariate	(1)	(2)	(3)
<i>Incentives</i>												
Fair Value Tradition	0.021 ** (0.01)	-0.021 ** (0.01)	0.000 (0.01)	-0.000 (0.01)	-0.002 (0.01)	-0.015 ** (0.01)	-0.009 (0.01)	-0.009 (0.01)	0.026 *** (0.00)	0.012 ** (0.00)	0.017 *** (0.01)	0.016 *** (0.01)
Islamic Tradition	-0.075 *** (0.01)	-0.042 *** (0.01)	-0.016 ** (0.01)	-0.017 ** (0.01)	-0.016 *** (0.01)	-0.007 (0.01)	-0.002 (0.01)	-0.002 (0.01)	-0.029 *** (0.00)	-0.011 *** (0.00)	-0.004 (0.00)	-0.005 * (0.00)
Regulatory Oversight	0.050 *** (0.00)	0.037 *** (0.01)	0.017 *** (0.01)	0.017 *** (0.01)	0.015 *** (0.00)	0.012 *** (0.00)	0.009 ** (0.00)	0.009 ** (0.00)	0.025 *** (0.00)	0.021 *** (0.00)	0.017 *** (0.00)	0.019 *** (0.00)
Analyst Following	0.027 *** (0.00)	0.018 *** (0.00)	0.018 *** (0.00)	0.014 *** (0.00)	0.006 *** (0.00)	0.002 (0.00)	0.002 (0.00)	-0.002 (0.00)	0.004 *** (0.00)	0.003 ** (0.00)	0.002 (0.00)	0.000 (0.00)
Hedge Accounting	0.064 *** (0.01)	0.028 *** (0.01)	0.023 *** (0.01)	0.022 *** (0.01)	0.027 *** (0.00)	0.020 *** (0.01)	0.019 *** (0.01)	0.018 *** (0.01)	0.010 *** (0.00)	-0.007 * (0.00)	-0.012 *** (0.00)	-0.011 *** (0.00)
Regulatory Capital Restriction	-0.043 *** (0.01)	-0.022 * (0.01)	-0.009 (0.01)	-0.014 (0.01)	-0.018 * (0.01)	-0.010 (0.01)	-0.007 (0.01)	-0.011 (0.01)	-0.018 *** (0.00)	-0.012 *** (0.00)	-0.009 ** (0.00)	-0.009 * (0.00)
<i>Operating Business Model</i>												
Business Model: Specialized Investment Firm	0.110 *** (0.02)		-0.071 ** (0.03)	-0.071 ** (0.03)	0.004 (0.01)		-0.063 *** (0.02)	-0.066 *** (0.02)	0.003 (0.01)		-0.071 *** (0.02)	-0.071 *** (0.02)
Business Model: Specialized Financing Firm	0.009 (0.02)		-0.163 *** (0.03)	-0.161 *** (0.03)	0.031 * (0.02)		-0.036 (0.03)	-0.036 (0.03)	0.041 *** (0.01)		-0.026 (0.02)	-0.027 (0.02)
Business Model: Regional Universal Bank	0.042 *** (0.01)		-0.161 *** (0.03)	-0.161 *** (0.03)	0.004 (0.01)		-0.068 *** (0.02)	-0.068 *** (0.02)	0.016 *** (0.00)		-0.053 *** (0.02)	-0.054 *** (0.02)
Business Model: Mortgage Bank	-0.033 *** (0.01)		-0.231 *** (0.03)	-0.220 *** (0.03)	-0.021 ** (0.01)		-0.093 *** (0.02)	-0.086 *** (0.02)	-0.010 * (0.01)		-0.088 *** (0.02)	-0.087 *** (0.02)
Business Model: Local Retail Bank	-0.101 *** (0.01)		-0.201 *** (0.03)	-0.199 *** (0.03)	-0.023 *** (0.01)		-0.068 *** (0.02)	-0.068 *** (0.02)	-0.033 *** (0.00)		-0.069 *** (0.02)	-0.070 *** (0.02)
<i>Risk Taking</i>												
Trading Book Risk: Market Risk	0.051 *** (0.01)			0.021 ** (0.01)	0.023 *** (0.00)			0.018 *** (0.01)	0.007 * (0.00)			0.004 (0.00)
Banking Book Risk: Interest Risk	0.037 (0.04)			-0.052 (0.04)	-0.028 (0.02)			-0.066 ** (0.03)	-0.011 (0.01)			-0.045 *** (0.01)
Banking Book Risk: Credit Risk	0.008 (0.03)			0.008 (0.03)	-0.008 (0.02)			-0.017 (0.02)	-0.022 (0.01)			-0.028 ** (0.01)
Constant		0.115 *** (0.01)	0.293 *** (0.03)	0.285 *** (0.03)		0.087 *** (0.01)	0.15 *** (0.02)	0.146 *** (0.02)		0.01 *** (0.00)	0.074 *** (0.02)	0.074 *** (0.02)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>		0.15	0.28	0.28		0.04	0.07	0.08		0.10	0.17	0.18
N		1,456	1,454	1,398		1,456	1,454	1,398		1,456	1,454	1,398

Table 5 presents results from univariate and multivariate regressions that relate the reclassification choice to various bank variables. Panel A summarizes descriptive statistics. The dependent variables *Total Fair Value Assets*, *Optional Fair Value Assets* and *Optional Fair Value Assets (excl. AFS)* are defined in accordance with Table 4 and scaled by book value of total assets. The independent variables *Fair Value Tradition*, *Islamic Tradition* and *Regulatory Oversight* are defined in Table 4. *Analyst Following* is the natural logarithm of the average number of 1-year EPS estimates (plus 1) issued for the respective bank during one month (source: IBES). *Hedge Accounting* is a dummy variable that takes a value of 1 if a bank applies the IAS 39 hedge accounting option during the financial year, 0 otherwise (source: own data). *Regulatory Capital Restriction* defined as the difference between the minimum capital ratio at country level (as presented in Table 4) and the individual bank's total capital ratio and takes a value of 1 if the difference is smaller than one percentage point, 0 otherwise (source: BvD Bankscope, own data). *Business Model* is a dummy variable indicating the operating business model as identified in the cluster analysis (Table 2). *Risk Taking* refers to the firm-level betas reported in Table 3, Panel B. Each specification includes year-fixed effects. The table reports OLS coefficient estimates and robust standard errors (in parentheses). \*\*\*, \*\*, \* indicate statistical significance at the 1%, 5% and 10% levels (two-tailed), respectively.

**TABLE 6***Association of Fair Value Income with Stock Returns**Panel A. Descriptive Statistics*

	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>
Market Return	14.87%	6.10%	-73.23%	28.86%
CFVI Trading Book	5.19%	4.30%	-1.55%	4.36%
CMMI Banking Book	14.45%	13.91%	1.14%	5.14%
CFVI Banking Book (FVO)	0.64%	-0.16%	-1.28%	0.33%
CFVI Banking Book (AFS)	2.97%	3.07%	-3.47%	5.39%
CACI Banking Book (L&R + HTM + OL)	10.84%	11.00%	5.89%	-0.58%
CFVI Banking Book (L&R + HTM + OL)	-	8.48%	8.92%	-0.90%

*Panel B. Regressions of Market Return on Income Measures*

	Dependent Variable = Market Return			
	(1)	(2)	(3)	(4)
$\beta_1$ CFVI Trading Book	0.563 ** (0.25)	0.457 * (0.26)	0.336 (0.22)	0.314 -0.250
$\beta_2$ CMMI Banking Book (Total)	0.241 (0.18)			
$\beta_3$ CFVI Banking Book (AFS)		0.861 *** (0.24)	0.971 *** (0.29)	1.089 *** -0.240
$\beta_4$ CFVI Banking Book (FVO)		0.657 *** (0.21)	0.563 *** (0.13)	0.563 *** -0.130
$\beta_5$ CACI Banking Book (L&R + HTM + OL)		0.108 (0.18)		
$\beta_6$ CFVI Banking Book (L&R + HTM + OL)			0.008 (0.09)	-0.077 -0.100
$\beta_7$ CFVI Banking Book * Market Risk				0.219 * (0.13)
Constant	-0.110 *** (0.03)	-0.110 *** (0.03)	-0.165 *** (0.02)	-0.164 *** (0.02)
$R^2$	0.05	0.08	0.07	0.08
N	1,167	1,167	883	874
<i>F Statistics</i>				
$\beta_1 = \beta_2$	3.09 *			
$\beta_1 = \beta_5$		3.07 *		
$\beta_3 = \beta_5$		12.26 ***		
$\beta_4 = \beta_5$		19.91 ***		

Panel C. Effect of Strong Regulation versus Weak Regulation

	Dependent Variable = Market Return	
	Strong Regulation	Weak Regulation
$\beta_1$ CFVI Trading Book	1.295 *** (0.19)	0.013 (0.14)
$\beta_3$ CFVI Banking Book (AFS)	1.228 *** (0.29)	1.287 *** (0.29)
$\beta_4$ CFVI Banking Book (FVO)	0.755 *** (0.12)	0.759 (0.85)
$\beta_6$ CFVI Banking Book (L&R + HTM + OL)	0.080 (0.09)	-0.144 ** (0.07)
$\beta_7$ CFVI Banking Book * Market Risk	0.340 ** (0.17)	0.179 (0.11)
Constant	-0.227 *** (0.03)	-0.130 *** (0.03)
$R^2$	0.17	0.06
N	463	411

Table 6 presents the results from multivariate regressions of stock returns on individual components of comprehensive income. *Market Return* is the buy-and-hold return of the bank's stock over the financial year (source: Thomson Financial Datastream). *CFVI Trading Book* is the comprehensive fair value income of the trading book. *CMMI Banking Book* is the comprehensive mixed measurement income of the banking book and comprises income from financial assets elected for the IAS 39 fair value option, available-for-sale financial assets, held-to-maturity financial assets, loans & receivables, and other liabilities. *CFVI Banking Book (FVO)* is the comprehensive fair value income of financial instruments elected for the IAS 39 fair value option. *CFVI Banking Book (AFS)* is the comprehensive fair value income of available-for-sale financial assets. *CACI Banking Book (L&R+HTM+OL)* is the comprehensive amortized cost income of held-to-maturity financial assets, loans & receivables, and other liabilities. *CFVI Banking Book (L&R+HTM+OL)* is the comprehensive fair value income of held-to-maturity financial assets, loans & receivables, and other liabilities and is calculated from footnote disclosures of fair values for these assets. All accounting variables are based on own data and scaled by book value of shareholders' equity. *Market Risk* is a dummy variable which takes a value of 1 if a bank's market risk beta (see Table 3, Panel B) exceeds the sample median. *Regulation* is defined as strong (weak) for countries with a CGI score above (below) the sample median, see Table 4. The table reports OLS coefficient estimates and robust standard errors (in parentheses). \*\*\*, \*\*, \* indicate statistical significance at the 1%, 5% and 10% levels (two-tailed), respectively.