FAIR VALUE HIERARCHY ASSET VALUATION. DOES IT HAVE ANY PREDICTIVE POWER? AN INTERNATIONAL RESEARCH ON THE INSURANCE SECTOR

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Abstract

The objective of the work is to identify any significant relationships between different levels of fair value hierarchy for the valuation of financial assets and two main variables: market capitalization and net income. We considered a sample of 506 insurance companies in two main areas –in the US and in Europe - all listed between 2013 and 2008. Results confirm the hypothesis of correlation between fair value hierarchy adopted in assessing the asset value and market capitalization of the companies, consistently with previous results of Laghi et al. (2012). Moreover, introducing the market-to-book ratio, results show a problem of undervaluation for insurance companies with a relatively larger amount of Level 2 and Level 3 financial assets than Level 1 assets. Nevertheless, results for companies listed in European markets do not provide strong evidence. Moreover, the relationship between different levels of fair value assets and net income is confirmed for the US market but not strongly enough for European companies to consider Level 3 as anti-cyclical instruments for financial reporting.
The research results can be useful in helping investors to assess the impact of fair value hierarchy practice on financial reporting of insurance companies. However, a limitation of the analysis is represented by the use of aggregate data for each class of fair value asset, without considering the specific impact related of composition of each category of financial asset evaluated with fair value hierarchy in financial portfolios.

Keywords: Fair Value Hierarchy, Insurance, IFRS 13

1. INTRODUCTION

For the last decade academics and professionals have been engaging in an intense debate on the concept and application of fair value valuation. Fair value represents one of the most important and impacting innovations introduced by the use of international accounting standards in listed EU companies. Since the introduction of fair value and the extent to which it must be used, market values at the date of financial statement have been provided.

Compared with historical cost criterion, fair value provides quite evident differences. With the former approach to valuation, company income can be defined as "realized income", while with the use of fair value accounting the financial statement also shows unrealized income components, leading to "potential income". This evidence has consequences in terms of distributable profits and capital preservation since many EU financial statements rules connect the distributable profit directly to the recognized earnings.

The distance between the two accounting models can be initially attributed to the different roles assigned to the financial statements. In an international perspective such as the fair value approach, the financial statement assumes the role of instrument used by investors in the decision process for asset allocation. In the historical cost approach, the statement is an instrument of protection of company creditors. In synthesis, international standards adopt a configuration of income allowing to show the "potential" value creation of the business and, hence, the entity's ability to create value over time; conversely, historical cost, focused on events occurred during the last year, informs on the economic effect produced by the use of corporate resources by management. The differences reported enable to understand the reason why and ways how the origins of the debate arose on the usefulness of the two accounting models. Whittington (2008b) summarizes the approaches in a "fair value view" and an "alternative view".

An in-depth analysis of the international standards corpus doesn't merely highlight a different meaning and usefulness of the financial statements but also a different meaning of entrepreneurship itself: for IAS-IFRS business is different from is intended by the traditional approach to enterprises of many EU countries. For example, in the Italian tradition, the use of the same word "impresa" points out a specific pattern that the IAS-IFRS scheme could not match, especially in recent years and regarding the FV approach.

Anyway, it is rather interesting to understand the specific issues emerging as a result of the application of fair value, especially in light of the recent financial crisis and the changes brought about by the standard setters in international accounting principles. In recent years the fair value approach has been the subject of extensive draft amendment which led to the adoption of IFRS 13 "Fair value measurement" in 2011, applied from 2013, it can be considered an extensive review of IAS 39 "Financial Instruments". This review was concluded with the adoption of IFRS 9 "Financial Instruments" with application from 2018 that completes the above mentioned replacement of IAS 39.

The objective of the paper is to illustrate some of the problems arisen in recent years around this evaluation criterion as a prosecution of the study of Tutino and Pompili (2013). In particular, the paper shows the results of a comparison analysis on a sample of companies operating in the insurance sectors (EU versus US) adopting the model of Laghi et al (2012), and highlights the impact on some profitability dynamics originating from the use of the three levels provided by the FV Hierarchy.

2. LITERATURE REVIEW

Duh et al (2012) present an empirical study on a sample of non-US commercial banks listed in the US market, considering 302 firm-year observations for the years 2000 to 2009 in order to test the hypothesis of an increase in earnings volatility associated with the introduction of fair value under IAS 39. Once the results confirmed a positive relation, the authors checked whether this incremental volatility could be considered risk relevant. The results of the empirical analysis show that this is an explanatory factor in the credit rating given by Standard & Poor. Empirical evidence allows authors to confirm the assumptions about the risk relevance of fair value measurements.

Blankespoor et al (2013) investigated on the ability of the leverage ratio to reflect the credit risk of the entity, using a sample of US banks. The results of this analysis show that the leverage ratio, calculated using fair value to assess all financial instruments held by the entity, is more explanatory of the credit risk than the leverage ratio calculated using a mixed approach or a cost only approach. In addition, the leverage ratio calculated with a prevalence of cost evaluations, in line with the capital requirements Tier 1, has the lowest correlation with the risk indicators and in some cases this correlation is negative.

Lev and Zhou (2009) add that the different levels of input used to measure the fair value can be considered a proxy for the risk of liquidity. The results for financial enterprises show that investors perceive them as riskier securities measured through input of Level 3, in other words ones used for assets not traded in active markets which are, therefore, less liquid.

Hodder et al (2006) present an analysis on the ability of the fair value accounting to express the full risk held by a bank. Using a sample of 202 US commercial banks in the period between 1996 and 2004 the authors compared the risk-relevance of three different configurations of income: (i) net income; (ii) comprehensive income; (iii) income from the fair value of all financial instruments held (Full Fair Value Income). The results show that the last category of income, in line with the hypothesis stated by the authors, is more volatile than the other two configurations; this incremental variability is explained by the authors by the fact that the particular configuration of income used provides a better representation of the results of risk-management and, therefore, can be considered more indicative of the underlying risks of a bank. Another aim of the paper is to examine whether the three different measures of income, namely their volatility, are associated with the market-based risk measures, in order to determine which of the three can be used as a proxy for risk measurement. The results of the empirical analysis show that "[...] Full Fair Value Income volatility for banks captures important and value-relevant elements of risk that are priced by the capital markets. In addition, Full Fair Value Income volatility appears to reflect the elements of risk that are not captured by volatility in net income or comprehensive income, or disclosed by measures of market risks. "(p. 370).

Barth (1994), Eccher et al (1996), Barth et al (1996) and Nelson (1996), using data before and after the introduction of SFAS 107, investigated the value relevance of fair value for the main categories of bank asset and liabilities. Regarding investment instruments all the authors found, albeit with some limitations, greater explanatory power of the fair value over the cost and, therefore, a positive correlation with stock prices. The effects in terms of value relevance of fair value measurements have been observed even after the introduction of the fair value hierarchy (three levels of inputs used). Goh et al (2009) analyze the impact of the adoption of SFAS 157, which introduces in America the three levels of input, on a sample of 516 banks observed in the first three quarters of 2008. The results show a significant change in the market price depending on the level of fair value; specifically, price is reduced for assets valued using a mark-to-model, i.e. assets with lower liquidity and higher risk information due to the estimates carried out for evaluation. The situation worsens during 2008, in line with the increase of market volatility during the crisis. Moreover, by comparing the banks in the sample, the authors also found that the market price of assets valuated through mark-to-model are higher for banks with higher capital adequacy and for those with the better auditors (i.e. PWC, EY, KPMG, or Deloitte & Touche).

Song et al (2010) investigated the value relevance of fair value on a sample of banks adopting SFAS 157 in the first three quarters of 2008, for a total of 1,260 firm-quarter observations. The results confirmed the previous ones: value relevance of fair value of Level 1 and 2 are greater than the fair value of Level 3. Further evidence found by the authors consists of greater value relevance for companies with higher level in corporate governance, even more for the fair value of Level 3.

A similar analysis was also carried out by Kolev (2009) who used a sample of big financial firms instead of banks, observing them in the first and second quarter of 2008. The author found that all three levels of fair value are significantly correlated with the prices of the company shares. However, the input obtained from the use of a mark-to-model (levels 2 and 3) show smaller value in the coefficients than those arising directly from the market (level 1), and that the difference is significant only for those of level 3, in line with the analysis of Goh et al (2009) and Song et al (2010).

As for derivatives and their value relevance, there is different evidence in the literature. Many studies focus on the estimates of the fair value of derivatives provided in application of SFAS 107 and SFAS 119, and found that these values have little or no ability to explain the stock price of financial firms (Eccher et al, 1996; Barth et al, 1996; Nelson, 1996; Wong, 2000; Simko, 1999).

On the contrary, the results of Venkatachalam (1996) suggest that the estimates of the fair value of derivatives are helpful in explaining the cross-sectional variation in the prices of bank stocks and how these estimates have incremental explanatory power. Same results have been reached by Wang et al (2005) and Siregar et al (2013) analyzing the values of fair value provided in application of SFAS 133, demonstrating the value relevance of such disclosure.

Ahmed et al (2006) by analyzing the effect, in terms of value relevance of the transition to SFAS 133 found that the introduction of this principle has led to an increase in the transparency of derivatives. Specifically, the authors' analysis focuses on the different assessment made by investors depending on whether the fair value of the derivative is only reported or recognized in the financial statements. Their results show that if the fair value is also recognized (as after SFAS 133) rather than just reported (as before SFAS 133), the relative evaluation coefficient is significant. Therefore, for American banks in the investigated sample, the transition to the new standards can be interpreted as an increase in value relevance of this type of asset.

3. RESEARCH QUESTIONS

Given the above mentioned literature, the aim of the paper is to test the existence of a relationship between the options for different FV hierarchy techniques and some business variables. As underlined in several researches previously examined, the choice of a lower level of FV could not be a zero impact option, even if the underlying reason of the choice is of course due to the ability to fit the FV standard requirements.

The selected variable to test the above relationship is market evaluation, for it is a simple and effective proxy of the feeling of investors towards the FV level selection.

RQ1: Is there any relationship between the three levels of fair value of the assets of the company and the market capitalization of the companies?

Since a possible size effect, due to the different dimensions of the companies included in the sample, could impact the results, a sized level of the variables has to be explored as well.

RQ2: Do the three levels of the fair value of the assets of the company have different effects on the company market valuation expressed in terms of market to book ratio?

Moreover, another FV level related element has to be explored: the effects on the earnings of the changing value of assets under the three FV levels.

The selected variable to test the above relationship is the net income, since it is the more comprehensive line in which all the effects of accounting choices flow.

RQ3: Is there any relationship between the changes in fair value of the assets and the net income of the companies?

4. THE MODEL

The analysis has been conducted adopting the model reported in Laghi et al (2012) in order to determine the existence of a relationship between the fair value hierarchy valuation techniques and the above described business variables: market capitalization and net income. Hence, the main goal is to provide evidence on the impact of the use of the fair value hierarchy approach.

The first hypothesis tested is the relationship between market capitalization and book value of assets valued adopting the three levels of fair value according to fair value hierarchy valuation.

$$MktCap_t^i = \beta_0 + \beta_1(FV1Asset)_t^i + \beta_2(FV2Asset)_t^i + \beta_3(FV3Asset)_t^i + \varepsilon_t^i \quad (1)$$

The second hypothesis tested is the relationship between the net income and the change of the three levels of the fair value of the assets of the companies.

$$NetInc_t^i = \beta_0 + \beta_1(\Delta FV1Asset)_t^i + \beta_2(\Delta FV2Asset)_t^i + \beta_3(\Delta FV3Asset)_t^i + \varepsilon_t^i \quad (2)$$

With reference to the first, Laghi et al (2012) shows that assets valued at level three have high correlation with the market capitalization. However, observing the second model, results indicated that in many cases the coefficient associated with the change in fair value of the assets of level 3 is negative, while the sign of the assets of level one is often positive. These findings allow authors to state that the fair value option, in particular considering level 3, can be considered as a factor, among others, that influences the net income value and, so it can be considered as a useful tool to mitigate the effects of the countercyclical trend in bad years (Laghi et al, 2012, p. 30).

4. RESEARCH HYPOTHESES

Considering the adopted model, the present work extends the model focusing on three hypotheses.

Hypothesis 1. The first hypothesis investigates on a possible relationship between the market capitalization and the three levels of fair value of assets even in the assurance-insurance industry. The relation of RQ1a assumes the following form.

$$MktCap = \beta_0 + \beta_1(FV1Asset)_t^i + \beta_2(FV2Asset)_t^i + \beta_3(FV3Asset)_t^i + \varepsilon_t^i \quad (3)$$

Hypothesis 2. To take into account a possible size effect due to different dimension of the companies included in the sample, the variables of the Hip 1 equation have been expressed in relative terms. The dependent variable used has been the Market-to-Book Ratio (MTB) as expression of the approval of the market; the independent variables are the different levels in the fair value asset of Level 2 and Level 3 on the total fair value of the portfolio assets.

Since several studies show that the fair value calculated, using inputs that are not directly observable in the market, is more associated than others to the level of the company information asymmetry (Liao et al 2013; Bland, 2011) as it has a lower value relevance (Goh et al 2009; Song et al 2010; Kolev, 2009), in this investigation we expect the fair value assets at Level 3 to have a negative influence on the approval of the market; that would mean that investors under-valuate companies whose financial statements show a larger quantity of assets evaluated at Level 3. Moreover, the investor's reaction to a specific composition of portfolio assets of a company may be different, depending on other specific factors (geographical origin, degree of development of the stock market and so on). For this reason the model has also been analyzed separately for US and EU companies. Moreover, the annual profitability is a key element to understand the higher or lower MTB ratio, so the ROE as a control variable has been included in the current exploration. The relation of RQ2 assumes the following form:

$$MTB_t^i = \beta_0 + \beta_1 FV2_t^i + \beta_2 FV3_t^i + ROE_t^i + \varepsilon_t^i \quad (4)$$

Hypothesis 3. The third hypothesis is related to net income. In particular, the main goal is to test if, as reported by Laghi et al (2012) for the banking sample, a negative relationship between the change in value of the assets evaluated with the three levels of fair value and the net income for the year can be assumed. The relation of RQ3 assumes the following form:

$$NetInc = \beta_0 + \beta_1(\Delta FV1Asset)_t^i + \beta_2(\Delta FV2Asset)_t^i + \beta_3(\Delta FV3Asset)_t^i + \varepsilon_t^i \quad (5)$$

5. THE APPLIED METHODOLOGY

5.1. The sample and the variables used

The sample consists of 133 insurance companies listed in US and European markets in the 2008-2013 period, in total the sample is composed by 506 year-firm observations. Data have been collected from the database Bloomberg, amongst the companies that belong to the large insurance sector.

The following Table 1 shows the distribution of the sample in terms of geographical area.

Table 1. Geographic breakdown of the sample

Market	Britain	France	Germany	Ireland	Italy	Netherlands	Switzerland	US	***Total***
Sample	30	6	13	14	4	7	18	414	***506***

The variables used in the tested models, and the explanation of method of calculation, are summarized in the following Table 2.

Table 2. Variables used: description

Model 1		
Variable	***Symbol***	***Meaning***
Dependent	MKTCAP	Market capitalization as of 31/12/xt
Independent	FVA1	Fair value asset Level 1
Independent	FVA2	Fair value asset Level 2
Independent	FVA3	Fair value asset Level 3
Model 2		
Variable	***Symbol***	***Meaning***
Dependent	MTB	Market capitalization/Book value as of 31/12/xt
Independent	FVA2	Fair value asset Level 2 / Total fair value asset
Independent	FVA3	Fair value asset Level 3 / Total fair value asset
Independent	ROE	Net Income / Book value of equity as of 31/12/xt
Model 3		
Variable	***Symbol***	***Meaning***
Dependent	NETINC	Net Income as of 31/12/xt
Independent	ΔFVA1	Fair value asset Level 1 as of 31/12/xt+1 – Fair value asset Level 1 as of 31/12/xt
Independent	ΔFVA2	Fair value asset Level 2 as of 31/12/xt+1 – Fair value asset Level 2 as of 31/12/xt
Independent	ΔFVA3	Fair value asset Level 3 as of 31/12/xt+1 – Fair value asset Level 3 as of 31/12/xt

The variables in the above models have been subjected to a process of "Winsorising" to a level of 1%, so the outliers - that are the extreme values of the distribution which differ significantly from the average values of the same - have been removed in order to obtain more stable results. Specifically, the tails of the distribution are not fully deleted, but equalled to the value of the last percentile of the analysis.

5.2. The econometric model and the results

Each model has been run using Ordinary Least Squares method (OLS). In order to verify the compliance (if any) with the main assumptions underlying the use of this method the necessary tests and statistics have been carried out and based on the findings, where necessary, appropriate adjustments have been taken to achieve the best possible estimates. The choice of using an estimation model based on OLS rather than a panel model with fixed or random effects is due to the need to highlight the differences between European and American companies, considering a limited number of observations.

The following paragraphs set out only the principal and significant results of the statistical elaborations, conducted with the support of STATA. The full results for each of the six years included in the observation period as well as for the two geographic areas considered (Europe and US area) are reported in "Statistical Appendix."

5.2.1. Model 1: Market Capitalization

Model 1 tests the relationship between the three levels of the fair value of the assets of the company and its market capitalization.

$$MktCap = \beta_0 + \beta_1(FV1Asset)_t^i + \beta_2(FV2Asset)_t^i + \beta_3(FV3Asset)_t^i + \varepsilon_t^i \quad (6)$$

The model, estimated by OLS, has been controlled for multicollinearity and homoscedasticity.

To verify the presence of multicollinearity VIF (*Variance Inflation Factor*) has been worked out. To exclude the presence of a linear relationship between the independent variables, this value must be less than 4; in the present case, a VIF average of 2.6 underlines the absence of any considerable multicollinearity.

Considering the hypothesis of homoscedasticity, the Breusch-Pagan test has been adopted: a P- value equal to 0.00 allows to reject the null hypothesis of constant variance. The existence of heteroscedasticity requires appropriate corrections. For this purpose, robust standard errors have been used. The results of the estimation of the model are shown in Table 3 below.

Table 3. Model 1: Robust standard errors

Variables	*Beta*	*P-Value*	*Std Errors*
FVA1	0,0542	***	0,0105
FVA2	0,0058		0,0153
FVA3	0,8460	***	0,2200
Constant	2,80E+09	***	-2,75E+11
Num. Obs	506		
R-squared	49,30%		

*Note: *** p<0.01, ** p<0.05, * p<0.1*

With a R^2 close to 50%, the results show that the fair value assets of Level 1 and 3 have a positive correlation with the capitalization; specifically, the fair value of Level 3, although a high variability, has a greater coefficient than Level 1. Fair value of Level 2 highlights that there is no relation considering the low significance of the coefficient (P-value > 0.1).

The model has been run also using robust regression, which assigns specific weights to each observation and - through an iterative process – excludes outliers from the estimate (or, rather, a weight inversely proportional to Cook's distance is assigned to the observations). The results obtained with robust regression are shown in the following table.

Table 4. Model 1: Robust regression

Variables	*Beta*	*P-Value*	*Std Errors*
FVA1	0,0148	***	0,0016
FVA2	0,0672	***	0,0019
FVA3	0,0898	***	0,0242
Constant	8,81E+08	***	-8,18E+10
Observations	506		
R-squared	92,20%		

*Note: *** p<0.01, ** p<0.05, * p<0.1*

With the use of robust regression, R2 increases and despite all the coefficients assume high significance their value is reduced.

Even if the three levels assume less value, it is interesting to underline that - as for the banks - also the insurance companies sample confirm that fair value assets of Level 3 have greater importance in explaining the market capitalization.

5.2.2. Model 2: Market-to-Book Ratio

Model 2 tests how the different composition of the company portfolio asset, related to the different levels of fair value assets, influences the market valuation.

$$MTB_t^i = \beta_0 + \beta_1 FV2Asset_t^i + \beta_2 FV3Asset_t^i + ROEAsset_t^i + \varepsilon_t^i \quad (7)$$

As for the Model 1, OLS has been run and the hypotheses have been tested. The average value of the 1.01 taken by VIF allows to exclude the presence of multicollinearity between the variables used; otherwise, the Breusch-Pagan test shows the presence of heteroscedasticity. Therefore, the model was first estimated using robust standard errors and, then, the robust regression. The results are shown in Table 5.

Table 5. Model 2: Full Sample - Robust standard errors vs. Robust regression

Variables	*Beta*	*P-Value*	*Std Errors*
Model 2 Robust standard errors			
FVA2	-0,7110	***	0,1200
FVA3	-1,8930	***	0,5760
ROE	0,8140	***	0,2750
Constant	1,5230	***	0,1060
Observations	503		
R-squared	17,10%		
Model 2: Robust regression			
FVA2	-0,2950	***	0,0649
FVA3	-1,2650	***	0,4250
ROE	0,8260	***	0,1260
Constant	1,0980	***	0,0512
Observations	503		
R-squared	14,00%		

*Note: *** p<0.01, ** p<0.05, * p<0.1*

Despite a low value of the R2, the model is more stable than the previous one, showing significant coefficients in both cases and a substantially similar magnitude. ROE has been introduced as a control variable and the value assumed by the related coefficient is consistent with the assumptions. ROE variable positively influences the assessment of the market.

The analysis shows that, excluding the variable relative to the fair value of Level 1, investors negatively associate the presence of assets measured at fair value of Level 2 and 3 to market capitalization, therefore, to the shares' market value. This applies in particular to the fair value of level 3 - which is associated to not directly observable market inputs, thus less transparent - which have a very high negative value. The results, therefore, seem to confirm the initial hypothesis.

In order to observe the possible differences referring to the geographical area, a dummy variable associated with US companies has been included in the model. The variable takes the value of "1" if the company is listed in the United States, "0" if the company is listed in one of the European markets. The model has been run separately for two sub-samples.

For the US sub-sample the tests have ruled out the multicollinearity (average VIF = 1:02) but not heteroscedasticity. For this reason, the model was estimated using the robust standard errors and robust regression.

Table 6. Model 2: US sample - robust standard errors vs. robust regression

Variables	*Beta*	*P-Value*	*Std Errors*
Model 2 Robust standard errors			
FVA2	-0,9410	***	0,1620
FVA3	-2,1510	***	0,6330
ROE	0,7580	***	0,2760
Constant	1,7450	***	0,1460
Observations	414		
R-squared	20,40%		
Model 2: Robust regression			
FVA2	-0,4740	***	0,0822
FVA3	-1,5750	***	0,4480
ROE	0,6450	***	0,1340
Constant	1,2780	***	0,0687
Observations	414		
R-squared	15,30%		

*Note: *** p<0.01, ** p<0.05, * p<0.1*

The results for US companies show a greater R2 compared to the whole sample; the coefficients associated with the levels of the fair value assets are also higher. According to the signs for the coefficients, the result highlights that the investors evaluate more negatively the US insurance companies showing the fair value of Levels 2 and 3 compared to the sample as a whole.

In synthesis, the liquidity risk related to financial instruments highly illiquid in the US market are "priced" at a substantial discount especially when the input adopted for the valuation is not very transparent (such as Level 2 and 3).

For the sub-sample of European companies results obtained testing for multicollinearity and heteroscedasticity are the same as those of the models outlined above. Coefficient estimates are shown in the following table.

Table 7. Model 2: EU sample - robust standard errors vs. robust regression

Variables	*Beta*	*P-Value*	*Std Errors*
Model 2 Robust standard errors			
FVA2	-0,6230	***	0,2420
FVA3	-1,6570		1,3610
ROE	1,1120		0,8260
Constant	1,2870	***	0,1790
Observations	89		
R-squared	15,30%		
Model 2: Robust regression			
FVA2	-0,2310		0,1900
FVA3	-0,6490		1,7240
ROE	1,7560	***	0,4010
Constant	0,9210	***	0,0891
Observations	89		
R-squared	21,30%		

*Note: *** p<0.01, ** p<0.05, * p<0.1*

European coefficients seem not to be significant; nevertheless, the tests are not strong enough to confirm these results. The absence of significant results may depend on the small number of observations in the sub-sample (composed by only 89 observations). The small number of observations could not verify the significance of relationships between observed variables, or even the absence of relationships.

5.2.3. Model 3: Net Income

Model 3 investigates on the relationship between each change on each level of fair value and net income.

$$NetInc = \beta_0 + \beta_1(\Delta FV1Asset)_t^i + \beta_2(\Delta FV2Asset)_t^i + \beta_3(\Delta FV3Asset)_t^i + \varepsilon_t^i \quad (8)$$

The model has been run with OLS and statistical tests show that there are no problems; neither with multicollinearity (average VIF = 1.11) nor with heteroscedasticity (p-value = 0.64). The results are shown in following Table 8.

Table 8. Model 3: Full sample - OLS vs. robust regression

Variables	*Beta*	*P-Value*	*Std Errors*
Model 3 OLS			
ΔFVA1	0,0279	***	0,0081
ΔFVA2	0,0082	*	0,0044
ΔFVA3	0,0746		0,0477
Constant	5,42E+08	***	6,49E+07
Observations	388		
R-squared	5,30%		
Model 3: Robust regression			
ΔFVA1	0,0320	***	0,0014
ΔFVA2	0,0256	***	0,0008
ΔFVA3	0,0155	*	0,0082
Constant	1,15E+08	***	1,12E+07
Observations	387		
R-squared	80,60%		

*Note: *** p<0.01, ** p<0.05, * p<0.1*

The results obtained with the simple regression (OLS) are lacking in significance; conversely, the results obtained with the robust regression are highly significant and reliable. Nevertheless, despite the hypothesis assumed in Laghi et al (2012) on the fair value of assets of Level 3 as an anti-cyclical tool used by banks and financial institutions, it cannot be confirmed for insurance companies: the change in the fair value of assets of Level 3, although associated with a lower coefficient than others, does not show a negative sign.

Table 9. Model 3: US sample - OLS vs. robust regression

Variables	*Beta*	*P-Value*	*Std Errors*
Model 3: United States, OLS			
ΔFVA1	0,0573	***	0,0145
ΔFVA2	0,0114	**	0,0055
ΔFVA3	0,0745		0,0562
Constant	4,59E+08	***	7,09E+07
Observations	320		
R-squared	5,70%		
Model 3: United States, Robust Regression			
ΔFVA1	0,0430	***	0,0020
ΔFVA2	0,0249	***	0,0007
ΔFVA3	0,0098		0,0073
Constant	8,11E+07	***	8,78E+06
Observations	317		
R-squared	82,50%		

*Note: *** p<0.01, ** p<0.05, * p<0.1*

The results obtained in the analysis on the two sub-samples are rather similar. Moreover, in many cases the coefficients lose significance, especially those related to European companies (Table 9 and Table 10)[27].

Table 10. Model 3, EU sample - robust standard errors vs. robust regression

Variables	*Beta*	*P-Value*	*Std Errors*
Model 3: Europe, Robust Standard Errors			
ΔFVA1	0,0078		0,0156
ΔFVA2	0,0059		0,0121
ΔFVA3	0,1430		0,0884
Constant	9,30E+08	***	1,45E+08
Observations	68		
R-squared	10,80%		
Model 3: Europe, Robust Regression			
ΔFVA1	0,0103		0,0079
ΔFVA2	-0,0119	**	0,0059
ΔFVA3	0,1130	*	0,0629
Constant	6,35E+08	***	1,07E+08
Observations	67		
R-squared	13,90%		

*Note: *** p<0.01, ** p<0.05, * p<0.1*

6. CONCLUSION

The empirical analysis conducted on a sample of listed insurance companies in the US and Europe between 2008 and 2013 has been conducted to identify the possible relationship between the different levels of the fair value of the assets of a company and two of their business variables: market capitalization and net income. The work is developed on the results previously obtained by Laghi et al (2012), which, however, conduct their research on a sample of companies listed by banks in 2009-2011.

The results of the analysis confirm the hypothesis of the authors about the existence of a significant correlation between the fair value hierarchy used for the assessment of financial assets and market capitalization of the company. Deepening such evidence and introducing the market-to-book ratio in the analysis, in order to exclude possible size effect due to different dimensions of the companies included in the sample, however, the results illustrate that the market evaluates worse the insurance companies that hold a greater amount of assets with fair value of Level 2 and 3 than Level 1. Therefore companies with more assets with fair value of level 2 and 3 suffer from potential undervaluation due to the discount applied by the market for liquidity risk related to those assets. This is more evident for the companies listed in the US market. For those companies whose shares are traded in the European markets, the analysis does not lead to the determination of a significant relation between market capitalization and different levels of fair value of assets. However values of test associated with the coefficients are not robust enough to confirm the absence of significance in the observed relationship. Therefore, given the results obtained in this second case, it is not possible to draw a unique conclusion: the question is if this is due to the reduced size of the sample or if it may depend on third factors that were not considered in the analysis.

For what concerns the relationship between the levels of fair value of financial assets and net income, there are some significant correlations between the values. However, the results obtained from the analysis and the related statistical tests do not allow us to affirm that the fair value of Level 3 can be considered as a useful tool to mitigate the effects of the countercyclical trend in bad years.

The results of the research are especially interesting to understand the usefulness of the fair value hierarchy in the investors' perspective. However, a limitation of the analysis is represented by the use of aggregate data of fair value that doesn't permit to identify the specific financial instruments that contribute to these results.

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[27]For US sub-sample statistical tests show no problem with heteroscedasticity so the model has been run with OLS, instead for EU sub-sample the model has been run with robust standard errors regression.

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STATISTICAL APPENDIX

Model 1. Market capitalization (Part 1)

2008-2013	**Full Sample**			**Europe**			**USA**		
	OLS	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**
VARIABLES	**MKTCAP**	**MKTCAP**	**MKTCAP**	**MKTCAP**	**MKTCAP**	**MKTCAP**	**MKTCAP**	**MKTCAP**	**MKTCAP**
FVA1	0.0542***	0.0542***	0.0148***	0.0237*	0.0237	0.0186*	0.0538**	0.0538	0.0969***
	(0.00644)	(0.0105)	(0.00156)	(0.0131)	(0.0148)	(0.0106)	(0.0252)	(0.0418)	(0.00520)
FVA2	0.00576	0.00576	0.0672***	0.0975***	0.0975***	0.0395	-0.00900	-0.00900	0.0641***
	(0.00762)	(0.0153)	(0.00185)	(0.0302)	(0.0353)	(0.0244)	(0.00731)	(0.0136)	(0.00151)
FVA3	0.846***	0.846***	0.0898***	-0.0625	-0.0625	0.175	1.062***	1.062***	-0.0990***
	(0.0998)	(0.220)	(0.0242)	(0.291)	(0.252)	(0.235)	(0.126)	(0.205)	(0.0260)
Constant	2.803e+09***	2.803e+09***	8.814e+08***	5.042e+09***	5.042e+09***	4.081e+09***	2.496e+09***	2.496e+09***	6.613e+08***
	-3,38E+11	-2,75E+11	-8,18E+10	-1,34E+12	-1,10E+12	-1,08E+12	-3,16E+11	-2,63E+11	-6,53E+10
Observations	506	506	506	92	92	92	414	414	414
R-squared	0.493	0.493	0.922	0.366	0.366	0.247	0.525	0.525	0.956
Vif	2,6			2,33			4,2		
Breusch-Pagan	0			0,0006			0		

2008	**Full Sample**			**Europe**			**USA**		
	OLS	***Robust SE***	***Robust RE***	***OLS***	***Robust SE***	***Robust RE***	***OLS***	***Robust SE***	***Robust RE***
VARIABLES	***MKTCAP***	***MKTCAP***	***MKTCAP***	***MKTCAP***	***MKTCAP***	***MKTCAP***	***MKTCAP***	***MKTCAP***	***MKTCAP***
FVA1	0.0727***	0.0727***	0.0331***	0.0389	0.0389	0.0116	0.138**	0.138	0.348***
	(0.0160)	(0.0273)	(0.00382)	(0.0244)	(0.0316)	(0.0210)	(0.0667)	(0.145)	(0.0185)
FVA2	-0.00215	-0.00215	-0.000256	0.131*	0.131***	0.161**	-0.0169	-0.0169	-0.0392***
	(0.0130)	(0.0151)	(0.00311)	(0.0601)	(0.0391)	(0.0516)	(0.0130)	(0.0158)	(0.00570)
FVA3	0.271*	0.271	0.465***	-0.451	-0.451**	-0.474	0.309	0.309	-0.112
	(0.162)	(0.231)	(0.0385)	(0.340)	(0.156)	(0.292)	(0.267)	(0.376)	(0.0780)
Constant	3.099e+09***	3.099e+09***	1.023e+09***	3,42E+12	3,42E+12	2,18E+12	2.794e+09***	2.794e+09***	9.260e+08***
	-8,45E+11	-6,67E+11	-2,01E+11	-3,25E+12	-2,62E+12	-2,79E+12	-8,25E+11	-6,67E+11	-1,74E+11
Observations	89	89	89	14	14	14	75	75	73
R-squared	0.324	0.324	0.861	0.559	0.559	0.600	0.258	0.258	0.898
Vif	1,7			1,88			3,21		
Breusch-Pagan	0			0,5994			0		

2009	**Full Sample**			**Europe**			**USA**		
	OLS	***Robust SE***	***Robust RE***	***OLS***	***Robust SE***	***Robust RE***	***OLS***	***Robust SE***	***Robust RE***
VARIABLES	***MKTCAP***	***MKTCAP***	***MKTCAP***	***MKTCAP***	***MKTCAP***	***MKTCAP***	***MKTCAP***	***MKTCAP***	***MKTCAP***
FVA1	0.0639***	0.0639***	0.0262***	0.0388	0.0388	0.0262	-0.0700	-0.0700	0.0490***
	(0.0124)	(0.0204)	(0.00313)	(0.0294)	(0.0330)	(0.0355)	(0.0532)	(0.0596)	(0.0166)
FVA2	-0.0137	-0.0137	0.0808***	0.0798	0.0798	0.0660	-0.0423**	-0.0423	0.0821***
	(0.0214)	(0.0456)	(0.00732)	(0.0806)	(0.0872)	(0.0973)	(0.0195)	(0.0439)	(0.00660)
FVA3	1.048***	1.048*	-0.0131	0.273	0.273	0.310	1.794***	1.794**	-0.0578
	(0.268)	(0.603)	(0.0915)	(0.899)	(0.879)	-1.086	(0.331)	(0.695)	(0.107)
Constant	2.465e+09***	2.465e+09***	8.132e+08***	3,89E+12	3.890e+09*	3,52E+12	2.258e+09***	2.258e+09***	4.750e+08***
	-7,39E+11	-5,46E+11	-1,79E+11	-2,99E+12	-1,93E+12	-3,61E+12	-6,36E+11	-5,75E+11	-1,29E+11
Observations	102	102	100	24	24	24	78	78	75
R-squared	0.562	0.562	0.924	0.458	0.458	0.275	0.585	0.585	0.949
Vif	3,63			3,54			6		
Breusch-Pagan	0			0,0431			0,0087		

Model 1. Market capitalization (Part 2)

2010	Full Sample			Europe			USA		
	OLS	*Robust SE*	*Robust RE*	*OLS*	*Robust SE*	*Robust RE*	*OLS*	*Robust SE*	*Robust RE*
VARIABLES	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*
FVA1	0.0410***	0.0410**	0.0144***	0.0297	0.0297	0.0324	0.0359	0.0359	0.245***
	(0.0127)	(0.0179)	(0.00352)	(0.0331)	(0.0264)	(0.0376)	(0.0474)	(0.0678)	(0.0170)
FVA2	-0.00333	-0.00333	0.0205***	-0.0898	-0.0898	-0.144	-0.00131	-0.00131	0.0535***
	(0.0192)	(0.0300)	(0.00692)	(0.130)	(0.134)	(0.147)	(0.0168)	(0.0332)	(0.00378)
FVA3	1.415***	1.415***	1.108***	3.376	3.376	3.871	1.363***	1.363**	0.211***
	(0.255)	(0.440)	(0.0964)	(2.047)	(2.050)	(2.324)	(0.266)	(0.523)	(0.0697)
Constant	2.708e+09***	2.708e+09***	8.890e+08***	4,23E+12	4,23E+12	3,95E+12	2.383e+09***	2.383e+09***	4.327e+08***
	-6,82E+11	-5,57E+11	-1,88E+11	-3,27E+12	-2,79E+12	-3,71E+12	-6,05E+11	-5,17E+11	-1,03E+11
Observations	104	104	103	20	20	20	84	84	82
R-squared	0.637	0.637	0.947	0.412	0.412	0.297	0.711	0.711	0.988
Vif	3,53			7,09			4,62		
Breusch-Pagan	0,0003			0,0305			0,0993		

2011	Full Sample			Europe			USA		
	OLS	*Robust SE*	*Robust RE*	*OLS*	*Robust SE*	*Robust RE*	*OLS*	*Robust SE*	*Robust RE*
VARIABLES	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*
FVA1	0.0385***	0.0385**	0.00717**	0.0171	0.0171	0.0145	0.0322	0.0322	0.302***
	(0.0123)	(0.0169)	(0.00337)	(0.0294)	(0.0275)	(0.0226)	(0.0508)	(0.0654)	(0.0257)
FVA2	-0.0209	-0.0209	0.0624***	0.00441	0.00441	0.0158	-0.0242*	-0.0242	0.0295***
	(0.0149)	(0.0202)	(0.00586)	(0.121)	(0.0835)	(0.0890)	(0.0139)	(0.0204)	(0.00475)
FVA3	1.415***	1.415***	0.137	1.657	1.657	3.013*	1.456***	1.456***	-0.0292
	(0.204)	(0.262)	(0.0860)	-2.183	-1.371	-1.607	(0.240)	(0.331)	(0.0886)
Constant	2.474e+09***	2.474e+09***	7.260e+08***	3,64E+12	3,64E+12	2,43E+11	2.286e+09***	2.286e+09***	5.627e+08***
	-6,14E+11	-5,55E+11	-1,65E+11	-2,75E+12	-2,75E+12	-2,01E+12	-5,88E+11	-5,32E+11	-1,37E+11
Observations	101	101	100	18	18	17	83	83	81
R-squared	0.628	0.628	0.932	0.341	0.341	0.682	0.690	0.690	0.965
Vif	2,99			6,42			4,39		
Breusch-Pagan	0,0571			0,1022			0,2818		

2012	Full Sample			Europe			USA		
	OLS	*Robust SE*	*Robust RE*	*OLS*	*Robust SE*	*Robust RE*	*OLS*	*Robust SE*	*Robust RE*
VARIABLES	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*
FVA1	0.0713***	0.0713***	0.0741***	0.0347	0.0347	0.0572	0.128**	0.128	0.280***
	(0.0154)	(0.0229)	(0.00340)	(0.0371)	(0.0343)	(0.0331)	(0.0531)	(0.0975)	(0.0206)
FVA2	-0.0187	-0.0187	0.0657***	-0.132	-0.132	-0.144	-0.0150	-0.0150	0.0355***
	(0.0197)	(0.0325)	(0.00545)	(0.136)	(0.106)	(0.122)	(0.0186)	(0.0313)	(0.00456)
FVA3	1.313***	1.313***	-0.0196	4.458*	4.458***	4.018*	1.088***	1.088**	-0.107
	(0.273)	(0.449)	(0.0771)	(2.420)	(1.259)	(2.161)	(0.304)	(0.505)	(0.0723)
Constant	2.940e+09***	2.940e+09***	6.867e+08***	5,70E+12	5,70E+12	3,04E+12	2.553e+09***	2.553e+09***	5.911e+08***
	-7,07E+11	-6,24E+11	-1,52E+11	-3,33E+12	-3,34E+12	-2,97E+12	-6,75E+11	-5,65E+11	-1,26E+11
Observations	99	99	98	14	14	14	85	85	83
R-squared	0.607	0.607	0.967	0.574	0.574	0.616	0.621	0.621	0.968
Vif	3,97			7,66			5,15		
Breusch-Pagan	0,0047			0,653			0,007		

2013	Full Sample			Europe			USA		
	OLS	*Robust SE*	*Robust RE*	*OLS*	*Robust SE*	*Robust RE*	*OLS*	*Robust SE*	*Robust RE*
VARIABLES	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*	*MKTCAP*
FVA1	0.318	0.318	0.554	-	-		-0.0231	-0.0231	-0.467
	(0.499)	(0.512)	-1.535				(0.138)	(0.122)	(0.812)
FVA2	0.401**	0.401***	0.463***	-4.894	-4.894	omitted	0.519***	0.519***	0.377**
	(0.147)	(0.0959)	(0.0819)	0	0		(0.0385)	(0.0372)	(0.103)
FVA3	-9.484	-9.484	-4.524	-	-	omitted	-6.888***	-6.888***	-3.686
	(5.771)	(5.489)	(2.939)				(1.649)	(1.578)	(2.637)
Constant	6,61E+12	6,61E+12	5,79E+11	2,58E+13	2,58E+13		9,68E+11	9,68E+11	1,43E+12
	-3,64E+12	-5,44E+12	-2,78E+12	0,00E+00	0,00E+00		-1,03E+12	-9,62E+11	-1,31E+12
Observations	11	11	10	2	2		9	9	7
R-squared	0.569	0.569	0.883	1.000	1.000		0.975	0.975	0.882
Vif	10,58			1			13,48		
Breusch-Pagan	0,6004			NO[28]			0,306		

[28] No observation.

Model 2. Market-to-book ratio (Part 1)

2008-2013	Full Sample			Europe			USA		
	OLS	Robust SE	Robust RE	OLS	Robust SE	Robust RE	OLS	Robust SE	Robust RE
VARIABLES	MTB	MTB	MTB	MTB	MTB	MTB	MTB	MTB	MTB
FVA2TA	-0.711***	-0.711***	-0.295***	-0.623**	-0.623**	-0.231	-0.941***	-0.941***	-0.474***
	(0.0904)	(0.120)	(0.0649)	(0.262)	(0.242)	(0.190)	(0.111)	(0.162)	(0.0822)
FVA3TA	-1.893***	-1.893***	-1.265***	-1.657	-1.657	-0.649	-2.151***	-2.151***	-1.575***
	(0.591)	(0.576)	(0.425)	(2.381)	(1.361)	(1.724)	(0.606)	(0.633)	(0.448)
ROE	0.814***	0.814***	0.826***	1.112**	1.112	1.756***	0.758***	0.758***	0.645***
	(0.176)	(0.275)	(0.126)	(0.554)	(0.826)	(0.401)	(0.182)	(0.276)	(0.134)
Constant	1.523***	1.523***	1.098***	1.287***	1.287***	0.921***	1.745***	1.745***	1.278***
	(0.0713)	(0.106)	(0.0512)	(0.123)	(0.179)	(0.0891)	(0.0930)	(0.146)	(0.0687)
Observations	503	503	503	89	89	89	414	414	414
R-squared	0.171	0.171	0.140	0.153	0.153	0.213	0.204	0.204	0.153
Vif	1,01			1,23			1,02		
Breusch-Pagan	0			0,0855			0		

2008	Full Sample			Europe			USA		
	OLS	Robust SE	Robust RE	OLS	Robust SE	Robust RE	OLS	Robust SE	Robust RE
VARIABLES	MTB	MTB	MTB	MTB	MTB	MTB	MTB	MTB	MTB
FVA2TA	-0.468*	-0.468	-0.180	-0.0743	-0.0743	0.182	-0.824**	-0.824*	-0.636*
	(0.266)	(0.311)	(0.246)	(0.638)	(0.468)	(0.615)	(0.345)	(0.464)	(0.335)
FVA3TA	-1.072	-1.072	-1.249	-1.475	-1.475	-5.287	-1.627	-1.627	-1.800
	(1.448)	(1.462)	(1.337)	(3.830)	(1.711)	(10.21)	(1.639)	(1.783)	(1.592)
ROE	1.018***	1.018***	0.680**	0.846	0.846	0.826	0.970**	0.970***	0.766**
	(0.347)	(0.338)	(0.320)	(1.047)	(0.938)	(1.095)	(0.380)	(0.360)	(0.369)
Constant	1.528***	1.528***	1.230***	1.125***	1.125***	0.943**	1.859***	1.859***	1.663***
	(0.214)	(0.262)	(0.198)	(0.298)	(0.331)	(0.319)	(0.294)	(0.407)	(0.285)
Observations	88	88	88	13	13	12	75	75	75
R-squared	0.166	0.166	0.095	0.144	0.144	0.155	0.197	0.197	0.150
Vif	1,11			1,57			1,15		
Breusch-Pagan	0,0023			0,512			0,0017		

2009	Full Sample			Europe			USA		
	OLS	Robust SE	Robust RE	OLS	Robust SE	Robust RE	OLS	Robust SE	Robust RE
VARIABLES	MTB	MTB	MTB	MTB	MTB	MTB	MTB	MTB	MTB
FVA2TA	-0.765***	-0.765***	-0.342***	-0.328	-0.328	-0.162	-1.204***	-1.204***	-0.852***
	(0.160)	(0.195)	(0.108)	(0.442)	(0.213)	(0.110)	(0.193)	(0.274)	(0.161)
FVA3TA	-2.172**	-2.172**	-1.963***	-4.043	-4.043	-0.921	-2.313**	-2.313**	-2.664***
	(1.008)	(1.041)	(0.683)	(5.436)	(3.074)	(1.354)	(0.952)	(1.128)	(0.791)
ROE	1.526***	1.526**	1.273***	2.706*	2.706***	1.895***	1.345***	1.345**	0.879***
	(0.390)	(0.590)	(0.264)	(1.337)	(0.785)	(0.333)	(0.380)	(0.557)	(0.316)
Constant	1.445***	1.445***	1.085***	1.036***	1.036***	0.832***	1.845***	1.845***	1.574***
	(0.122)	(0.163)	(0.0826)	(0.221)	(0.156)	(0.0550)	(0.158)	(0.231)	(0.131)
Observations	101	101	101	23	23	23	78	78	78
R-squared	0.334	0.334	0.324	0.242	0.242	0.654	0.459	0.459	0.412
Vif	1,01			1,22			1,01		
Breusch-Pagan	0			0,2919			0,001		

2010	Full Sample			Europe			USA		
	OLS	Robust SE	Robust RE	OLS	Robust SE	Robust RE	OLS	Robust SE	Robust RE
VARIABLES	MTB	MTB	MTB	MTB	MTB	MTB	MTB	MTB	MTB
FVA2TA	-0.592***	-0.592**	-0.229**	-0.458	-0.458	-0.447	-0.979***	-0.979***	-0.342***
	(0.180)	(0.241)	(0.103)	(0.431)	(0.294)	(0.494)	(0.222)	(0.338)	(0.115)
FVA3TA	-2.591*	-2.591**	-0.765	-6.315	-6.315	-5.921	-2.632*	-2.632**	-0.643
	(1.431)	(1.199)	(0.819)	(6.256)	(5.705)	(7.165)	(1.432)	(1.082)	(0.739)
ROE	2.493***	2.493**	3.524***	5.527***	5.527***	5.200***	2.314***	2.314**	3.377***
	(0.477)	(1.203)	(0.445)	(1.492)	(1.510)	(1.709)	(0.484)	(1.108)	(0.438)
Constant	1.303***	1.303***	0.799***	0.747***	0.747***	0.755***	1.672***	1.672***	0.913***
	(0.144)	(0.234)	(0.0919)	(0.215)	(0.180)	(0.247)	(0.186)	(0.318)	(0.106)
Observations	103	103	102	19	19	19	84	84	83
R-squared	0.313	0.313	0.433	0.514	0.514	0.418	0.381	0.381	0.504
Vif	1,01			1,36			1		
Breusch-Pagan	0,08			0,2578			0,0021		

Model 2. Market-to-book ratio (Part 2)

2011	Full Sample			Europe			USA		
	OLS	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**
VARIABLES	**MTB**	**MTB**	**MTB**	**MTB**	**MTB**	**MTB**	**MTB**	**MTB**	**MTB**
FVA2TA	-0.667***	-0.667**	-0.188	-0.484	-0.484	0.306	-0.962***	-0.962***	-0.283
	(0.211)	(0.269)	(0.162)	(0.690)	(0.652)	(0.925)	(0.272)	(0.364)	(0.199)
FVA3TA	-1.767	-1.767	0.214	-4.470	-4.470	-26.85	-2.283	-2.283*	0.0748
	(1.436)	(1.221)	(1.104)	(7.318)	(4.254)	(20.17)	(1.457)	(1.353)	(1.069)
ROE	-0.115	-0.115	0.151	3.660	3.660**	4.589	-0.211	-0.211	0.00830
	(0.371)	(0.593)	(0.332)	(2.467)	(1.685)	(2.686)	(0.360)	(0.524)	(0.265)
Constant	1.445***	1.445***	0.923***	0.975**	0.975**	0.949**	1.738***	1.738***	1.022***
	(0.170)	(0.250)	(0.134)	(0.341)	(0.348)	(0.356)	(0.231)	(0.343)	(0.170)
Observations	101	101	100	18	18	17	83	83	83
R-squared	0.101	0.101	0.018	0.253	0.253	0.290	0.144	0.144	0.027
Vif	1,03			1,39			1,06		
Breusch-Pagan	0			0,168			0,001		

2012	Full Sample			Europe			USA		
	OLS	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**
VARIABLES	**MTB**	**MTB**	**MTB**	**MTB**	**MTB**	**MTB**	**MTB**	**MTB**	**MTB**
FVA2TA	-0.912***	-0.912***	-0.631***	-1.580	-1.580**	-0.709	-0.770***	-0.770**	-0.508***
	(0.197)	(0.263)	(0.127)	(0.909)	(0.559)	(0.630)	(0.216)	(0.306)	(0.145)
FVA3TA	-3.808**	-3.808***	-3.040***	-2.019	-2.019	-5.399	-3.748**	-3.748***	-2.809***
	(1.464)	(1.046)	(0.948)	(8.521)	(1.828)	(5.362)	(1.452)	(1.238)	(0.974)
ROE	1.365**	1.365	2.745***	1.164	1.164	6.444**	1.671**	1.671	2.238***
	(0.604)	(1.081)	(0.391)	(1.588)	(2.439)	(2.788)	(0.698)	(1.189)	(0.468)
Constant	1.629***	1.629***	1.251***	1.939***	1.939***	0.997*	1.488***	1.488***	1.178***
	(0.153)	(0.257)	(0.0991)	(0.395)	(0.474)	(0.476)	(0.182)	(0.281)	(0.122)
Observations	99	99	99	14	14	12	85	85	85
R-squared	0.231	0.231	0.416	0.283	0.283	0.579	0.206	0.206	0.309
Vif	1,06			1,34			1,05		
Breusch-Pagan	0			0,2142			0		

2013	Full Sample			Europe			USA		
	OLS	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**
VARIABLES	**wMTB**	**wMTB**	**wMTB**	**wMTB**	**wMTB**	**wMTB**	**wMTB**	**wMTB**	**wMTB**
FVA2TA	-2.211***	-2.211***	-1.152	-3.754	-3.754		-1.350	-1.350	-1.538*
	(0.327)	(0.240)	(0.919)	0	0		(0.879)	(0.735)	(0.719)
FVA3TA	-3.745*	-3.745*	-2.375	-	-	omitted	-1.020	-1.020	-0.473
	(1.709)	(1.934)	(2.338)				(2.472)	(1.713)	(2.008)
ROE	-0.0807	-0.0807	1.710	-	-		-0.624	-0.624	5.546
	(1.285)	(0.837)	(3.909)				(1.278)	(0.740)	(2.857)
Constant	3.106***	3.106***	2.024*	3.302	3.302	omitted	2.378**	2.378**	1.875**
	(0.302)	(0.201)	(0.827)	0	0		(0.738)	(0.625)	(0.619)
Observations	11	11	9	2	2		9	9	8
R-squared	0.880	0.880	0.262	1.000	1.000		0.371	0.371	0.646
Vif	1,02			1			1,09		
Breusch-Pagan	0,6132			No observation			0,9688		

Model 3. Net income (Part 1)

2008-2013	Full Sample			Europe			USA		
	OLS	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**
VARIABLES	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**
ΔFVA1	0.0279***	0.0279*	0.0320***	0.00777	0.00777	0.0103	0.0573***	0.0573	0.0430***
	(0.00812)	(0.0168)	(0.00140)	(0.0105)	(0.0156)	(0.00791)	(0.0145)	(0.0371)	(0.00204)
ΔFVA2	0.00816*	0.00816	0.0256***	0.00592	0.00592	-0.0119**	0.0114**	0.0114	0.0249***
	(0.00444)	(0.0116)	(0.000796)	(0.00771)	(0.0121)	(0.00593)	(0.00545)	(0.0159)	(0.000738)
ΔFVA3	0.0746	0.0746	0.0155*	0.143	0.143	0.113*	0.0745	0.0745	0.00982
	(0.0477)	(0.121)	(0.00822)	(0.0900)	(0.0884)	(0.0629)	(0.0562)	(0.157)	(0.00733)
Constant	5.417e+08***	5.417e+08***	1.149e+08***	9.301e+08***	9.301e+08***	6.349e+08***	4.593e+08***	4.593e+08***	8.107e+07***
	-6,49E+10	-7,21E+10	-1,12E+10	-1,52E+11	-1,45E+11	-1,07E+11	-7,09E+10	-8,36E+10	-8,78E+09
Observations	388	388	387	68	68	67	320	320	317
R-squared	0.053	0.053	0.806	0.108	0.108	0.139	0.057	0.057	0.825
Vif	1,11			1,3			1,11		
Breusch-Pagan	0,64			0,0059			0,3202		
2008	**Full Sample**			**Europe**			**USA**		
No observation									
2009	**Full Sample**			**Europe**			**USA**		
	OLS	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**
VARIABLES	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**
ΔFVA1	0.0159	0.0159	0.0492***	-0.0321	-0.0321	0.00309	0.0978***	0.0978**	0.0201**
	(0.0130)	(0.0250)	(0.00378)	(0.0261)	(0.0300)	(0.0116)	(0.0161)	(0.0371)	(0.00897)
ΔFVA2	0.00157	0.00157	0.000466	-0.00855	-0.00855	-0.00987	0.0153**	0.0153	0.0425***
	(0.00665)	(0.0103)	(0.00175)	(0.0136)	(0.0140)	(0.00547)	(0.00704)	(0.0123)	(0.00240)
ΔFVA3	0.236***	0.236	0.0513***	0.289*	0.289	0.102	0.433***	0.433**	-0.0234
	(0.0649)	(0.154)	(0.0176)	(0.143)	(0.181)	(0.0588)	(0.0712)	(0.196)	(0.0271)
Constant	4.272e+08***	4.272e+08***	1.273e+08***	9.482e+08**	9.482e+08**	2,85E+11	3.466e+08***	3.466e+08***	7.060e+07***
	-1,25E+11	-1,25E+11	-2,83E+10	-3,89E+11	-3,99E+11	-1,63E+11	-1,04E+11	-1,07E+11	-2,12E+10
Observations	86	86	82	14	14	13	72	72	68
R-squared	0.210	0.210	0.805	0.317	0.317	0.545	0.488	0.488	0.838
Vif	1,35			2,18			1,25		
Breusch-Pagan	0			0,123			0		
2010	**Full Sample**			**Europe**			**USA**		
	OLS	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**
VARIABLES	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**
ΔFVA1	0.0165	0.0165	0.0386***	0.00471	0.00471	0.0225*	-0.0274	-0.0274	0.0512***
	(0.0185)	(0.0311)	(0.00324)	(0.0241)	(0.0169)	(0.0123)	(0.0304)	(0.0660)	(0.0109)
ΔFVA2	0.00119	0.00119	0.0523***	0.134***	0.134***	0.153***	-0.00987	-0.00987	0.0513***
	(0.0102)	(0.0316)	(0.00464)	(0.0387)	(0.0343)	(0.0198)	(0.0113)	(0.0355)	(0.00578)
ΔFVA3	-0.0923	-0.0923	-0.122***	0.596*	0.596	1.240***	-0.0848	-0.0848	-0.120***
	(0.121)	(0.129)	(0.0203)	(0.326)	(0.407)	(0.167)	(0.128)	(0.176)	(0.0209)
Constant	6.833e+08***	6.833e+08***	8.021e+07***	5.693e+08*	5.693e+08*	2,16E+11	5.973e+08***	5.973e+08***	7.673e+07***
	-1,51E+11	-2,04E+11	-2,04E+10	-3,14E+11	-3,07E+11	-1,61E+11	-1,63E+11	-1,98E+11	-1,75E+10
Observations	97	97	94	20	20	20	77	77	74
R-squared	0.015	0.015	0.867	0.501	0.501	0.882	0.034	0.034	0.835
Vif	1,14			1,18			1,32		
Breusch-Pagan	0,296			0,7364			0,0164		
2011	**Full Sample**			**Europe**			**USA**		
	OLS	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**
VARIABLES	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**
ΔFVA1	-0.0348	-0.0348	-0.0321***	-0.00333	-0.00333	0.00399	0.0542	0.0542	-0.0318***
	(0.0222)	(0.0518)	(0.00327)	(0.0215)	(0.0157)	(0.0237)	(0.0435)	(0.173)	(0.00715)
ΔFVA2	0.0367***	0.0367	0.0467***	-0.0218	-0.0218	0.0402	0.0614***	0.0614*	0.0376***
	(0.0122)	(0.0327)	(0.00217)	(0.0304)	(0.0227)	(0.0461)	(0.0140)	(0.0340)	(0.00685)
ΔFVA3	0.156	0.156	0.00186	0.336	0.336	0.512	0.208**	0.208	0.000684
	(0.0997)	(0.287)	(0.0144)	(0.570)	(0.471)	(0.640)	(0.0989)	(0.248)	(0.0119)
Constant	4.340e+08***	4.340e+08***	5.607e+07***	6.892e+08***	6.892e+08**	5.191e+08*	3.466e+08**	3.466e+08***	4.385e+07***
	-1,33E+11	-1,55E+11	-1,56E+10	-2,29E+11	-2,40E+11	-2,55E+11	-1,40E+11	-1,23E+11	-1,35E+10
Observations	100	100	97	18	18	17	82	82	78
R-squared	0.147	0.147	0.891	0.049	0.049	0.170	0.305	0.305	0.446
Vif	1,36			9,14			1,07		
Breusch-Pagan	0,0005			0,9775			0		

Model 3. Net income (Part 2)

2012	Full Sample			Europe			USA		
	OLS	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**
VARIABLES	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**
ΔFVA1	0.0796***	0.0796*	0.0456***	0.0148	0.0148	-0.00645	0.0219	0.0219	0.0431***
	(0.0164)	(0.0459)	(0.00565)	(0.0289)	(0.0257)	(0.0366)	(0.0397)	(0.0906)	(0.00883)
ΔFVA2	0.0377***	0.0377**	0.0750***	0.154*	0.154**	0.119	0.0403***	0.0403***	0.0766***
	(0.0110)	(0.0147)	(0.00419)	(0.0768)	(0.0610)	(0.0856)	(0.00935)	(0.0102)	(0.00290)
ΔFVA3	-0.703***	-0.703**	0.173***	0.518	0.518	0.251	-0.988***	-0.988***	0.145***
	(0.128)	(0.312)	(0.0372)	(0.458)	(0.426)	(0.535)	(0.126)	(0.203)	(0.0276)
Constant	3.633e+08***	3.633e+08***	5.662e+07***	2,21E+11	2,21E+11	3,77E+11	3.626e+08***	3.626e+08***	3.646e+07***
	-1,00E+11	-9,25E+10	-1,55E+10	-3,45E+11	-3,35E+11	-3,97E+11	-8,70E+10	-9,14E+10	-9,18E+09
Observations	94	94	90	14	14	13	80	80	76
R-squared	0.399	0.399	0.911	0.692	0.692	0.296	0.522	0.522	0.912
Vif	1,15			1,99			1,32		
Breusch-Pagan	0			0,4238			0,1073		
2013	**Full Sample**			**Europe**			**USA**		
	OLS	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**	**OLS**	**Robust SE**	**Robust RE**
VARIABLES	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**	**NETINC**
ΔFVA1	1.170	1.170	5.273*		-		1.275	1.275	5.844
	(0.875)	(1.321)	(2.356)				(1.041)	(1.397)	(4.227)
ΔFVA2	-0.433	-0.433	-1.038*	2.874	2.874	omitted	-0.475	-0.475	-1.017
	(0.337)	(0.504)	(0.458)	0	0		(0.400)	(0.533)	(0.785)
ΔFVA3	-0.673	-0.673	-2.167	-	-	omitted	-0.508	-0.508	-4.548
	(1.775)	(0.742)	(1.481)				(2.076)	(0.786)	(11.24)
Constant	5,15E+11	5.154e+08**	6,64E+11	1,47E+12	1,47E+12		4,18E+11	4,18E+11	6,29E+11
	-4,26E+11	-2,10E+11	-4,05E+11	0,00E+00	0,00E+00		-5,60E+11	-2,21E+11	-7,24E+11
Observations	11	11	9	2	2		9	9	6
R-squared	0.214	0.214	0.688	1.000	1.000		0.237	0.237	0.713
Vif	63,54			1			66,07		
Breusch-Pagan	0,0022			NO			0,009		