Predictive Power of Fair Value Hierarchy in Asset Valuation.
An International Research on the Insurance Sector

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Abstract

The objective of the work is to analyze a sample of 506 insurance companies in US and in Europe, all listed between 2013 and 2008 in order to identify any relationships between different levels of fair value of the assets and two main variables: market capitalization and net income. Results confirm the hypothesis of correlation between fair value hierarchy adopted in assessing the value of assets and market capitalization of the company, as reported in Laghi et al (2012). However, introducing the market-to-book ratio, results show that the market undervalues insurance companies with a relative larger amount of Level 2 and Level 3 assets than Level 1 assets.

Nevertheless, results for US companies listed in European markets does not provide a strong evidence. Moreover, the relationship between different levels of fair value assets and the net income is strong but not enough to consider Level as anti-cyclical instruments for financial reporting.

The research results can be useful to help investor in 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 of fair value and not specific data for each level of fair value hierarchy.

I. Introduction

For the last decade an intense debate between academics and professionals has been arising about the concept and application of fair value valuation. The fair value ("FV") was established in Anglo-Saxon contexts and represents one of the most important and impacting innovations introduced by the use of international accounting standards in listed EU companies. Since the FV has been introduced and to the extent it has to be used, it provides the use of market values at the date hereof, especially in financial instruments. In this way in the financial statement potential values may impact the annual earnings modifying the previous structure of the income whose pillar was the need for values to be related to an actual exchange with a third economy.

Comparing to historical cost evaluation method, the FV use provides quite evident differences. With the former approach to valuation, company income can be defined "realized income" while the fair value leads to a "potential income". This has consequences in terms of distributable profits and of preservation of capital, since many EU financial statements rules provide effects to the distributable profit directly related to the recognized earnings.

The distance between the two accounting models can be at first 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 investment process. In the historical cost approach, the statement is an instrument of protection of creditors of the company. In synthesis, international standards adopt a potential value creation of the business and, therefore, the entity's ability to create value over time; conversely, historical cost accounting standards, focused on events occurred during the last year, inform on the economic effect produced by the use of corporate resources by the company management. The differences reported enable to understand the reason why and 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 standard corpus, therefore, highlights not only a different approach to the financial statements meaning and usefulness, but also a different meaning of the entrepreneurship itself: for IAS-IFRS business is something different to what the historical approach to enterprises of many EU countries traditions intends. For example, in the Italian tradition, the use of the same word “impresa” points out a specific patterns the Ias-IFRs scheme could not match, especially through 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 by the changes brought 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 "Evaluation of fair value" in 2011, with application from 2013 that can be considered an extensive review of IFRS 9 "Financial Instruments".

The objective of the paper is to illustrate some 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 onto some profitability dynamics of the different degree if use of the three levels provide by the FV Hierarchy.

II. 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. Getting a confirmation of a positive relation, authors checked whether this incremental volatility risk can be considered relevant. The results of the empirical survey 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 as the fair value for all financial instruments held by the entity is more explanatory of the credit risk for both the indicators used. In addition, the leverage ratio calculated with a prevalence of cost evaluations, in line with the capital requirements Tier 1, has the least correlation with the risk indicators and in some cases is even negative.

Lev and Zhou (2009) add that the different levels of inputs 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 as riskier securities measured through input of Level 3, such as ones used for assets not traded in active markets and, therefore, less liquid.

An analysis on the ability of the fair value method of expressing the full risk held by a bank, Hodder et al (2006), using a sample of 202 commercial bank American in the period between 1996 and 2004, compared the risk-relevance of three different configurations of income: (i) net income; (ii) the comprehensive income; (iii) income from the fair value of all financial instruments held, then the majority of the a financial statement of a commercial bank (Full Fair Value Income). The results show that the last category of income, in line with hypothesis stated by the authors, it is more volatile than the other two configurations; this incremental variability is explained by the authors through 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 banking. Another aim of the paper is to examine whether the three different measures of income, namely their volatility, are associated with the risk of market-based measures, in order to determine which of the three can be used as a proxy for risk measurement. The results of the empirical survey 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 additions, Full Fair Value Income volatility appears to reflect that 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 introduction of SFAS 107, investigated the value relevance of fair value for the main categories of income and expense accounts. 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 split the input into the three levels, 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 volatility the market during the crisis. Moreover, comparing the banks in the sample, the authors also found that the assets priced through mark-to-model valuation are higher for banks with higher capital adequacy and for those with the better auditors (i.e. PriceWaterhouseCoopers, Ernst & Young, 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 previous ones: value relevance of fair value of Level 1 and 2 are greater than the fair value of Level 3. Further evidences found by the authors consist of greater value relevance for companies with higher level in corporate governance, even more for the fair value of Level 3.

A similar survey was also held by Kolev (2009) that didn’t use a sample of banks but of large financial firms, observed in the first and second quarter of 2008. The author found that all three levels of the fair value estimate 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, different evidences have carried out in the literature. Many studies focuses 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 its effect, in terms of value relevance, the transition to SFAS 133 found that the introduction of the principle in question has led to an increase in the transparency of financial 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 relevant coefficient evaluation is significant. Therefore, for American banks in the sample investigated, the transition to the new standards can be interpreted as an increase in value relevance of this type of asset.

III. Research questions

Given the above mentioned literature, the aim of the paper is to test the existence of a relationship between the option 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 level 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 dimension of the companies included in the sample could impact the results, a sized level of the variables has to be explored also.

RQ2: Do the three levels of the fair value of the assets of the company have different effect 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 onto the earnings of the changing level 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 all the effects of accounting choices flow into.

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

IV. 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 evidences on the impact of the use of fair value hierarchy approach.

The sample is made up of 506 insurance companies all listed in European and US markets in the period 2008-2013; in order to catch up specific differences for each observed market, two sub-samples have been considered, an US sample and an European sample.

Finally, attention has been placed on the value relevance of the items of financial statements carried at Level 3 of the fair value from the perspective of making value hierarchy.

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.

$$\boldsymbol{MktCap_t^i = \beta_0 + \beta_1(FV1Asset)_t^i + \beta_2(FV2Asset)_t^i + \beta_3(FV3Asset)_t^i + \varepsilon_t^i}$$

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.

$$\boldsymbol{NetInc_t^i = \beta_0 + \beta_1(\Delta FV1Asset)_t^i + \beta_2(\Delta FV2Asset)_t^i + \beta_3(\Delta FV3Asset)_t^i + \varepsilon_t^i}$$

With reference to the first, Laghi et al (2012) show 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 three is negative, while sign of the assets of level one is often positive. These findings allow authors to state that the fair value option, in particular considering the level three, can be considered as a factor, among others, that influences the net income value and, so that, it can be considered as an useful tool to mitigate the effects of the countercyclical trend in bad years (Laghi et al, 2012, p. 30).

V. Research hypotheses

Considering the model adopted, 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 the fair value of the assets even in the assurance-insurance industry. The relation of RQ1a assumes the following form.

$$\boldsymbol{MktCap = \beta_0 + \beta_1(FV1Asset)_t^i + \beta_2(FV2Asset)_t^i + \beta_3(FV3Asset)_t^i + \varepsilon_t^i}$$

Hypothesis 2

To take into account for a possible size effect due to different dimension of the companies included in the sample, the variables of the Hip 1a 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 level in the fair value asset of Level 2 and Level 3 on the total fair value of the portfolio assets.

Since a number of studies show that the fair value calculated using inputs that are not directly observable in the market is more associated than the others at the level of the company information asymmetry (Liao et al 2013; Bland, 2011) and as it has been having 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 have 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 asset of a company may be different, depending on other specific factors (geographical origin, degree of development of the stock market and so on).

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 reported elements are synthesized by the following form.

$$\boldsymbol{MTB_t^i = \beta_0 + \beta_1 FV2_t^i + \beta_2 FV3_t^i + ROE_t^i + \varepsilon_t^i}$$

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 RQ2 assumes the following form:

$$\boldsymbol{NetInc = \beta_0 + \beta_1 (\Delta FV1Asset)_t^i + \beta_2 (\Delta FV2Asset)_t^i + \beta_3 (\Delta FV3Asset)_t^i + \varepsilon_t^i}$$

VI. The applied methodology

The sample and the variables used

The sample consists of 508 insurance companies listed in US and European markets in the period 2008-2013. 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.

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 equaled to the value of the last percentile of the analysis.

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. Based on the findings, the necessary tests and statistics have been carried out and, 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 has been due to the need to highlight the differences between European and American companies, considering a limited number of observations.

Table 2 - Variables used: description

	Model 1	Model 2	Model 3
Dependent variable	**MktCap**	**MTB**	**NetInc**
Description	*Market Capitalization as of 31/12/x $_t$*	*Market Capitalization/ Book Value as of 31/12/x $_t$*	*Net Income as of 31/12/x $_t$*
Independent Variables	**FV1Asset** Level 1 Fair Value Assets	**FV2** Level 2 Fair Value Assets / Total Fair Value Assets	**ΔFV1Asset** (Level 1 Fair Value Assets as of 31/12/x_{t+1}) – (Level 1 fair value of the assets as of 31/12/x_t)
	FV2Asset Level 2 Fair Value Assets	**FV3** Level 3 Fair Value Assets / Total Fair Value Assets	**ΔFV2Asset** (Level 2 Fair Value Assets as of 31/12/x_{t+1}) – (Level 2 fair value of the assets as of 31/12/x_t)
	FV3Asset Level 3 Fair Value Assets	**ROE** Net Income / Book Value Equity at 31/12/xt	**ΔFV3Asset** (Level 3 Fair Value Assets as of 31/12/x_{t+1}) - (Fair Value Level 3 Assets as of 31/12/x_t)

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.

$$\boldsymbol{MktCap = \beta_0 + \beta_1 (FV1Asset)_t^i + \beta_2 (FV2Asset)_t^i + \beta_3 (FV3Asset)_t^i + \varepsilon_t^i}$$

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

Considering the hypothesis of homoscedasticity, the test Breusch-Pagan 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 here below.

With a R2 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 has a greater coefficient than Level 1. Level 2 highlights that there is no relation looking at the low significance of the coefficient (P-value > 0.1).

Table 3 – Model 1, Robust standard errors

Variables	Beta	P-Value	Std Errors
Model 1: Robust standard errors			
ΔFV1Asset	0.0542	***	0.0105
ΔFV2Asset	0.00576		0.0153
ΔFV3Asset	0.846	***	0.22
Constant	2.80E+09	***	2.75E+08
Num. Obs	506		
R-squared	49.30%		

**** p<0.01, ** p<0.05, * p<0.1*

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

Table 4 – Model 1, Full Sample

Variables	Beta	P-Value	Std Errors
Model 1: Robust regression			
ΔFV1Asset	0.0148	***	0.00156
ΔFV2Asset	0.0672	***	0.00185
ΔFV3Asset	0.0898	***	0.0242
Constant	8.81E+08	***	8.18E+07
Observations	506		
R-squared	92.20%		

**** p<0.01, ** p<0.05, * p<0.1*

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

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

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.

$$\boldsymbol{MTB_t^i = \beta_0 + \beta_1 FV2Asset_t^i + \beta_2 FV3Asset_t^i + ROEAsset_t^i + \varepsilon_t^i}$$

As for the Model 1, OLS has been run to test for the hypotheses. The average value taken by of the 1.01 allows excluding 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

Variables	Beta	P-Value	Std Errors
Model 2 Robust standard errors			
FV2	-0.711	***	0.12
FV3	-1.893	***	0.576
ROE	0.814	***	2.75E-01
Constant	1.523	***	0.106
Observations	503		
R-squared	17.10%		
Model 2: Robust regression			
FV2	-0.295	***	0.0649
FV3	-1.265	***	0.425
ROE	0.826	***	1.26E-01
Constant	1.098	***	0.0512
Observations	503		
R-squared	14.00%		

**** 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. As stated above, ROE has been introduced as a control variable and the value assumed by the related coefficient is consistent with the assumptions. ROE variable influences positively the assessment of the market.

Since the variables were built in relation to fair value level one, the results for level 2 and level 3 have to be read in connection with this level: in other words the level two fair value of assets and the three level also are valued by investors in comparison to level one, so that in a better (or worse) way than the result of the assessment made for the assets of the level one. This occurs as far as the fair values are related to the matter inputs in the market. The obtained results are anyway consistent to the hypotheses.

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 equal to “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 subsamples.

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

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 two and three 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 are not very transparent (such as Level 2 and 3).

Table 6 – Model 2, United States Sample

Variables	Beta	P-Value	Std Errors
Model 2 Robust standard errors			
FV2	-0.941	***	0.162
FV3	-2.151	***	0.633
ROE	0.758	***	2.76E-01
Constant	1.745	***	0.146
Observations	414		
R-squared	20.40%		
Model 2: Robust regression			
FV2	-0.474	***	0.0822
FV3	-1.575	***	0.448
ROE	0.645	***	0.134
Constant	1.278	***	0.0687
Observations	414		
R-squared	15.30%		
**** p<0.01, ** p<0.05, * p<0.1*			

As for the sub-sample of European companies, the tools of estimation and verification of results through testing for multicollinearity and heteroskedasticity are the same as those of the models outlined above. Coefficient estimates are shown in the following table.

Table 7 – Model 2, Europe Sample

Variables	Beta	P-Value	Std Errors
Model 2 Robust standard errors			
FV2	-0.623	***	0.242
FV3	-1.657		1.361
ROE	1.112		0.826
Constant	1.287	***	0.179
Observations	89		
R-squared	15.30%		
Model 2: Robust regression			
FV2	-0.231		0.19
FV3	-0.649		1.724
ROE	1.756	***	0.401
Constant	0.921	***	0.0891
Observations	89		
R-squared	21.30%		
**** p<0.01, ** p<0.05, * p<0.1*			

European coefficients seem to be not significant; nevertheless, the tests are not strong enough to confirm these results. Since some results have been confirmed, this may depend on the small number of observations in the sub-sample or on the absence of a relationship

between the variables. In synthesis, this part of the analysis does not provide any significant results.

3) Model 3: Net Income

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

$$\mathbf{NetInc} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1}(\mathbf{\Delta FV1Asset})_t^i + \boldsymbol{\beta_2}(\mathbf{\Delta FV2Asset})_t^i + \boldsymbol{\beta_3}(\mathbf{\Delta FV3Asset})_t^i + \boldsymbol{\varepsilon_t^i}$$

The model has been run with OLS and statistical tests show that there are no problems with multicollinearity (VIF mean = 1.11) nor 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			
ΔFV1Asset	0.0279	***	0.00812
ΔFV2Asset	0.00816	*	0.00444
ΔFV3Asset	0.0746		0.0477
Constant	5.42E+08	***	6.49E+07
Observations	388		
R-squared	5.30%		
Model 3: Robust regression			
ΔFV1Asset	0.032	***	0.0014
ΔFV2Asset	0.0256	***	0.000796
ΔFV3Asset	0.0155	*	0.00822
Constant	1.15E+08	***	1.12E+07
Observations	387		
R-squared	80.60%		

**** p<0.01, ** p<0.05, * p<0.1*

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

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).

VII. Concluding remarks

The empirical analysis conducted on a sample of listed insurance companies in US and Europe between 2008 and 2013 has been meant 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: the market capitalization and the 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 banks in 2009-2011.

Table 9 - Model 3, Full Sample - OLS vs. Robust regression

Variables	Beta	P-Value	Std Errors
Model 3: United States, OLS			
ΔFV1Asset	0.0573	***	0.0145
ΔFV2Asset	0.0114	**	0.00545
ΔFV3Asset	0.0745		0.0562
Constant	4.59E+08	***	7.09E+07
Observations	320		
R-squared	5.70%		
Model 3: United States, Robust Regression			
ΔFV1Asset	0.043	***	0.00204
ΔFV2Asset	0.0249	***	0.000738
ΔFV3Asset	0.00982		0.00733
Constant	8.11E+07	***	8.78E+06
Observations	317		
R-squared	82.50%		
Model 3: Europe, Robust Standard Errors			
ΔFV1Asset	0.00777		0.0156
ΔFV2Asset	0.00592		0.0121
ΔFV3Asset	0.143		0.0884
Constant	9.30E+08	***	1.45E+08
Observations	68		
R-squared	10.80%		
Model 3: Europe, Robust Regression			
ΔFV1Asset	0.0103		0.00791
ΔFV2Asset	-0.0119	**	0.00593
ΔFV3Asset	0.113	*	0.0629
Constant	6.35E+08	***	1.07E+08
Observations	67		
R-squared	13.90%		

**** p<0.01, ** p<0.05, * p<0.1*

The results of the carried out analyzes confirm the hypothesis of the authors about the existence of a significant correlation between the fair value hierarchy used for the assessment of business assets and market capitalization of the company. Deepening such an evidence and introducing the market-to-book ratio in the analysis, however, the results illustrate that the market evaluates quite worse the insurance companies that hold a greater amount of assets of two three level than level one. This also is confirmed for the companies listed in the US market. For those companies, however, whose shares are traded in the European markets, the analysis does not lead to the determination of significant coefficients. 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, otherwise, may depend on third factors that were not considered in the analysis.

For what concerns the relationship between the levels of fair value and the net income, there are some but weak correlations between the values. However, given the findings, we cannot assert that the fair value of level three is a tool used by the anti-cyclical businesses.

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 and not specific ones for each level of fair value hierarchy.

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