FAIR VALUE ACCOUNTING AND EARNING MANAGEMENT: THE IMPACT OF UNOBSERVABLE INPUTS ON EARNING QUALITY. EVIDENCE FROM THE US

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Abstract

Accounting standard boards (IASB and FASB) are aimed at designing high-quality standards able to increase transparency and comparability of financial reporting. They have chosen fair value accounting (FVA) approach to improve the quality of financial reporting and at the same time help financial reporting users in the decision-making process. During recent years, an intense debate has arisen about the trade-off between relevance and reliability of accounting information using this approach. Many authors outline problems related to the fair value hierarchy valuation of financial instruments, in particular, the discretionary use of unobservable inputs in financial instruments valuation process in support of earnings management. Tutino and Pompili (2018) have identified a general negative correlation between the extent of FVA and earning quality. Stating this, the main objective of the paper, using the same approach of the previous one, is to identify the specific impacts of unobservable inputs on earning quality. Theory and previous literature suggest a major negative impact of unobservable inputs than observable ones on the quality of information provided within financial reporting. Results show a negative and strong relationship between FVA and earning quality for US banks that do not depend on the hierarchy of input used in the evaluation process. These results suggest new considerations on the reliability of fair value concerning the possibilities of manipulation given to the management with this approach.

Keywords: Fair Value Accounting, Fair Value Hierarchy, Earning Management, Earning Quality, Banking

1. INTRODUCTION

High-quality accounting standards were introduced by IASB and FASB in order to improve worldwide the quality of financial reporting. High-quality standards allow to amplify financial reporting transparency and comparability. US GAAP and IFRS, define a unique set of accounting rules, respectively for the US and Europe, which exceeds differences existing between local GAAPs obtaining comparable financial information that could be easily read by investors and analysts. Moreover, international standards rule some aspects that were not defined at a local level before their introduction (Mechelli & Cimini, 2013).

High-quality accounting standards also play a role in relation to the financial market. Financial information is related to market and investors, therefore accounting standards must give an appropriate and transparent disclosure about firms' conditions and results of their operations. The transparency achieved with high-quality standards leads to a reduction of information asymmetry and at the same time brings major efficiency (Brown & Hillegeist, 2007; Ertimur, 2007).

Therefore, it is possible to say that financial reporting is useful in the decision-making process, so it helps investors, and this is precisely the main objective of the financial statements prepared in accordance with IFRS and US GAAP. Fair value accounting (hereafter "FVA") has been chosen by IASB and FASB in order to reach this scope.

FVA, using market values in financial statements preparation, leads to an income statement that highlights also a potential income not fully realized. Fair value, incorporating expected cash flows from assets and liabilities, seems able to capture shares of income accruing for the year (Tutino & Pompili, 2013; Tutino & Venuti, 2016). Moreover, fair value seems to have the advantage of increased transparency and comparability (Barth, 1994) even if the reliability of this criterion can be modified by many factors, so not always FVA approach provides a set of quality accounting information useful for the full range of stakeholders (Tutino, 2016).

According to that, often the literature has criticized a full utilization of FVA approach because of the resulting less reliability of the reporting compared with the case of historical cost criterion application (Landsman, 2007; King, 2008; Ronen, 2008). This is true in case of the illiquid market, that is when prices are not observable in the markets or they do not represent the real fair value of assets or liabilities and managers have to estimate these values, with potential errors due to discretionary items. Over the years, many authors have shown concerns related to the reliability of fair value, that seems to depend on the hierarchy of inputs used, in other words, the reliability of this criterion seems to be connected to the observability of the inputs and more generally to the degree of transparency in the valuation process. This is mainly deriving from the use of unobservable inputs that could allow opportunistic behavior by the management; they could provide biased estimates of fair value with the aim of achieving their own compensation goals. In this sense, an intensive use of unobservable inputs could bring errors due to the estimation process and to management manipulations (Benston, 2008).

The main objective of this paper is to expand the analysis started in Tutino and Pompili (2018) analyzing the relationship between earning management and FVA approach more in deep. Tutino and Pompili (2018) have adopted the Šodan Model (Šodan, 2015) in order to investigate the effect of FVA on earning quality on a sample of banks listed in the US and Europe. Adopting a specially constructed earning quality measure, Tutino and Pompili's (2018) results confirm the hypothesis of a negative impact of FVA on earning quality.

This paper, based on the same sample of banks and related to the previously defined model, investigates different impacts resulting in the use of observable and unobservable inputs in terms of quality. We expect that the less presence of values directly observable in the market could bring the worst consequence in terms of earning quality, involving to the classic problems of adverse selection and moral hazards. Generally, when there are estimates highly dependent on management choice and on private information, errors in estimation as an increased information asymmetry are more commons.

So, it is possible to affirm that earning quality is lower in case of use of unobservable inputs than in the case of observable and objective inputs.

The paper proceeds as follows. Section 2 presents the theoretical framework and literature review at the base of the paper. Sections 3 focuses on research design while Section 4 shows the result reached by running regressions. Last, Section 5 contains the conclusion of the paper.

2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

According to the communication theory, financial statements are one of the main management tools to communicate information about a firm's financial conditions and economics results to the market. Therefore, high-quality accounting standards are required, standards able to grant a truthful and faithful representation of firms. The economic theory also suggests that a company's commitment to disclose private information, even if purely with accounting instruments, results in significant benefits in terms of capital cost (Leuz & Verrecchia, 2000; Ertimur, 2004; Lambert, Leuz & Verrecchia, 2007, 2012; Armstrong, Core, Taylor, & Verrecchia, 2011).

To achieve accounting quality, international standards setters have introduced a set of high-quality accounting standards. IASB and FASB have also identified the primary users of financial reports as actual and potential investors, and in such scenario fair value represents one of the main criteria to help them in resource allocation decisions. As stated before, over the past years in literature many criticisms have been moved to fair value and its reliability. This aspect of fair value seems to depend on the magnitude of unobservable inputs adopted in the evaluation process. An intensive use of unobservable inputs could lead to biased values estimation and so to earning management practice (Benston, 2008). Such evidence could lead to: 1) a lower quality of accounting information to stakeholders thus reflecting on the efficiency of the decision process in investment allocation (Lev & Zhou, 2009; Song, Thomas, & Yi, 2010; Goh, Ng, & Young, 2009; Siekkinen, 2016; Laghi, Pucci, Tutino, & Di Marcantonio, 2012) and to 2) information asymmetries problems (Riedl & Serafeim, 2009; Ball, Jayaraman, & Shivakumar, 2012). Information asymmetries have a great importance in the banking sector, an industry where there are many non-transparent assets, like financial instruments for which lack of information makes the estimation process difficult in terms of value and risk (Liao, et al., 2013).

Despite the many efforts made by IASB and FASB to realize standards that can improve accounting quality, during recent years in literature authors questioned the success of their project. The present system allows for too many accounting alternatives and requires use of criterions like a fair value that present a high level of subjectivity, creating a path for counterproductive opportunistic behaviors (Nobes & Parker, 2010; Callao & Jarne, 2010; Mechelli & Cimini, 2013).

As per Healy and Wahlen's (1999) definition "Earnings management occurs when managers use judgment in financial reporting and in structuring

transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers".

As stated above, fair value accounting, specifically the non-transparent inputs of Level 3, could bring to an increase of information asymmetries that generally has a positive correlation with earning management (Lobo & Zhou, 2001; Degeorge, Patel, & Zeckhauser, 1999; Kin Lo, 2008). Because there is a great correlation between earning quality and earning management, generally, highly managed earnings have low quality. Tutino and Pompili (2018) have analyzed the relationship between FVA and earning quality finding a negative correlation, results show that a greater portion of fair value gains and losses through net income leads to a lower earning quality.

Tutino and Pompili (2017), a large part of the literature, have shown how a hierarchy of fair value inputs results on different investors' perception of reported value. In particular, a lower degree of inputs observability is associated with a less reliable fair value because of investors' concerns on management estimation process and on errors or manipulations. Stated this and giving the results reached in literature, it is clear that Level 3 inputs need a deeper attention. In this paper, so our aim is to search for a possible relationship between the level of observability of inputs adopted for fair value estimation and management ability to influence their value, and analyze the resulting impact on earning quality. More generally, we want to define a general relationship between earning management practices and management opportunism.

In literature, it is possible to find many kinds of research that analyze the relationship between management manipulations and FVA. One of the main objectives of the authors is to understand if managers have the possibilities and incentives for this kind of behavior under the FVA approach. Authors have conducted researches on companies compliant with FVA, both under IFRS and US GAAP.

Milbradt (2012), analyzing the Over-The-Counter market, found some positive results about the management's incentives to keep assets off-market in order to benefit for the discretionary given by Level 3 valuation inputs. McEwen, Mazza, and Hunton (2008) analyzed the ability of financial analysts to manage with fair value estimates. A goal of the research was to understand if analysts, that expect biased fair value estimates, manipulated by the management, are able to reflect in their evaluations these distortions. Results show that prices estimated by the analysts do not correctly consider these adjustments. Fargher and Zhang (2014), considering the discretion granted to the standards issued by the FASB, found how the possibility given to the management results in a lower earning disclosure. Furthermore, authors found that the more discretionary are fair value measurements the more earning management behaviors are manifested. Similarly, Šodan (2015) performed a research with the aim of comprehending the difference existing in terms of earning quality between a fair value estimated through a valuation process and a fair value calculated using market prices. On a sample of Eastern European listed firms, author founds that firms with higher exposure to FVA have a lower level of earning quality due to the opportunity given to managers to exhibit manipulated values in the financial reporting. Estimation biases have been also found by Hanley, Jagolinzer, and Nikolova (2016). The research conducted on insurance companies show how, under some conditions, managers have some incentives to report a lower level of fair value in order to benefit from a major flexibility in fair value estimates. Similar results are reached by Badia, Duro, Penalva, and Ryan (2017) that found how firms exhibit conditional conservatism estimating Level 2 and Level 3 fair value measurements when instruments are not traded in a liquid market. Quagli and Ricciardi (2010) found a positive relationship between the re-classification of a non-derivative financial asset out of the FVTPL category, under the Amendment to IAS 39 issued by IASB on 2008, and past earning management behavior. So, using the discretion granted by the accounting standards, it is possible to avoid the use of fair value measurement and therefore avoid earning losses due to the adverse market conditions. Also, Kohlbeck, Smith, and Valencia (2016) analyzed changes in fair value classification finding that managers have been involved in opportunistic transfers into the Level 3 classification if the firm had some incentives in doing this.

In literature, it is also possible to find contributions arguing that discretion in fair value evaluation process should be considered as an advantage. Discretion can help in defining a proxy of market value of securities not traded in active markets, without observable market input at the reporting date: for these instruments, private information represents a useful tool in the fair value evaluation process (Laux & Leuz, 2010; Altamuro & Zhang, 2013; Barth & Taylor, 2010).

3. RESEARCH DESIGN

3.1. Previous research

In Tutino and Pompili (2018) we have analyzed whether exist a negative correlation between fair value accounting and earning quality due to the discretion granted to managers in the estimation process. The analysis done was based on results previously reached in literature and above described.

We have used the same model of Šodan (2015) who found that fair value accounting has a negative impact in terms of earning quality for firms operating in 17 Eastern European countries over the 2002-2011 period. The choice of this sample of firms, composed of both banks and industrial companies, is based on the assumption that in those countries financial market is not developed enough and therefore managers estimate fair value according to valuation techniques rather than market inputs.

In our previous paper, we have extended the Šodan (2015) analysis also to firms outside East Europe and we have taken into consideration only banks. We have done this with the aim of verifying the existing negative relationship between fair value accounting and earning quality also for firms operating in the rest of Europe and in the US, firms that have available more developed financial

markets. Moreover, we have chosen banks because of the large FVA application in their financial reporting mostly composed of financial instruments.

Stated this, we tested separately the two different sub-sample, for Europe and US, in order to verify the relationship between use of fair value accounting for financial instruments and the firms' earning quality. The objective of our research has been also to identify the type of the relationship found, specifically if the FVA have a positive impact or a negative effect in term of quality.

As for the Šodan (2015) model, our results confirm a negative impact of FVA on earning quality for the US firms. For the Europe sample instead, we found a lack of significance that did not permit us to confirm the same correlation identifier for the US market. Explanation of these results could be found in the different condition of the financial market in Europe and in the US. In the tested period European financial market, differently from the USA, was still struggling with the consequences of the financial crisis of 2008 with negative effects in terms of stability and growth.

3.2. Research questions

Given our first results on US banks, we decided to analyze more in deep the relationship between the extent of FVA in financial reporting and earning quality. Literature suggests that unobservable inputs lead to more concerns between users of financial reporting because of the major discretion granted to management in the estimation process of reported values. Management could utilize internal information not available at the stakeholders to furnish biased estimates to the market with the aim of meeting their own interest, i.e. reaching the financial targets defined in their annual bonus program.

Hence, we have designed this analysis with the aim of contributing to the present literature searching for a relationship between specific fair value inputs and impact on earning quality, considering the management ability to influence these values.

Considering the results reached and the mentioned literature, we think that banks with a portfolio highly composed of financial instruments whose fair value is assessed with Level 3 inputs will show a lower level of earning quality measures than banks that held assets and liabilities with observable fair value, directly or not. For this reason, testing only the US sub-sample for which we have had significant results, the hypothesis is as follows:

H1: The higher the portion of not transparent and not readily verifiable fair value the lower the earning quality of the sample.

From this hypothesis we can define the following research question:

RQ1: Does Level 3 fair value have a major negative impact in terms of earning quality than Level 1 and 2?

3.3. Models, sample and variables

In Tutino and Pompili (2018) we defined our model starting from Šodan Model (2015) with the aim of extending the author's results. Differently, the present work, using only the sub-sample of banks for US markets, looks for any differences between levels of fair value inputs, observable or not, in terms of their relationships with earning quality.

We start from a sample composed of 186 US listed banks observed for the period 2011-2016. We collected our data from database Orbis Bank Focus. As for the previous part of our research, we have chosen data from 2011 in order to have financial reporting completely compliant with the adoption of FVA rules and to avoid distortions related to the financial crisis. We define different final samples for each tested model excluding companies for which calculate quality measures or fair value levels has not been possible. Therefore, the final sample could be different for every single model tested.

We use values of fair value gains and losses through net income with the aim of estimating FVA impact. We chose to focus on net income because we believe that net income is more exposed to fair value impacts than the other comprehensive income.

Differently from the past, in this paper, we are considering fair value gains and losses through net income taking into consideration the different level of inputs utilized to determine fair value. With the aim of identifying one share of net income for each level of fair value we introduced a proxy; for each level, we have considered, as a proxy of net income, the annual change in the stock value of the different class of trading instruments classified on the level of fair value. We chose to consider only trading financial instruments for two different reasons: (i) changes of fair value are recorded in net income in accordance with US GAAP; (ii) trading portfolios are more susceptible to earning management practices and management opportunism.

According to previous research (Tutino & Pompili, 2018), the model for testing the relationship between earning quality and fair value accounting assumes the following form:

$$AEQ_{i-us} = \beta_0 + \beta_1 FVI_{i-us} + \beta_2 MC_{i-us} + \varepsilon_{i-us,t} \quad (1)$$

First of all, we introduce a new control variable (leverage) and furthermore in order to capture any difference existing between different levels of fair value we derive from the equation (1) the following two relations:

$$AEQ_{i-us} = \beta_0 + \beta_1 FVI(1/2)_{i-us} + \beta_2 Lev_{i-us} + \varepsilon_{i-us,t} \quad (2)$$

$$AEQ_{i-us} = \beta_0 + \beta_1 FVI(3)_{i-us} + \beta_2 Lev_{i-us} + \varepsilon_{i-us,t} \quad (3)$$

The meaning of variables is summarized in the following table, with all values that relate to year-end date.

Table 1. Variables

Variable	*Label*	*Meaning*
Dependent	AEQ	Aggregate Earning Quality
Independent	FVI	Absolute value of fair value gains and losses through net income / (absolute value of net income without value of fair value gains and losses through net income + absolute value of fair value gains and losses through net income)
Independent	FVI (1/2)	Absolute value of fair value (Level 1 and Level 2) gains and losses through net income / (absolute value of net income without value of fair value (Level 1 and Level 2) gains and losses through net income + absolute value of fair value (Level 1 and Level 2) gains and losses through net income)
Independent	FVI (3)	Absolute value of fair value (Level 3) gains and losses through net income / (absolute value of net income without value of fair value (Level 3) gains and losses through net income + absolute value of fair value (Level 3) gains and losses through net income).
Independent	LEV	Mean accounting leverage (total liabilities/total assets)

The FVI (Fair Value Impact) variable is the periodical change of fair value recognized into net income. As stated above, it is calculated as an annual change in fair value of trading instruments divided for each different level of fair value. This variable can measure the exposure to fair value accounting. We decided to divide fair value changes into two categories considering Level 1 and Level 2 together and Level 3 separately because of the different degree of observability of inputs. Level 1 and Level 2 include inputs that are observable in the market directly or indirectly, Level 3 instead refers to private information owned by management and not shared with stakeholders. Moreover, we run two different models considering Level 1 and 2 separately to Level 3 in order to avoid any possible distortion due to the correlation between variables.

To measure the earning quality, as for the past, we use the AEQ (Aggregate earning quality) computing this proxy for each firm as the average of (i) predictability, (ii) persistence, (iii) volatility, (iv) value relevance and (v) conservatism. Construction of this quality measure is based on some previous papers as Šodan (2015), Gaio (2010), Francis, et al. (2004), Lipe (1990) and it is the same of Tutino and Pompili (2018). Specifically, single quality indicator is defined as described in Appendix.

4. RESULTS

With the support of the MATLAB software, first, we run the model previously tested in Tutino and Pompili (2018) in order to check the validity of the proxy introduced to measure fair value gains and losses for each level of fair value. We utilize an independent variable FVI, calculated as a change of fair value of a total portfolio of trading instruments. As stated above, the following analysis requires to run a model for US sub-sample, the only one that we have identified as significant in our last research. Differently from the previous paper, we change the control variable that was not significant and we introduce "Lev", as defined in the previous paragraph 3.3. The following table reports results obtained for US sub-sample. Our final sample, in this case, is composed of 63 observations for which both FVI and AEQ are available.

Table 2. Model 1 – AEQ, FVI and Lev

Variable	*Predicted sign*	*Coefficient*	*t-stat*	*P-value*
Intercept	?	45.37827064	1.159355262	0.250904504
FVI	+	37.26620806	2.992908699	0.004007802
LEV	?	-14.85413833	-0.335776414	0.738210824

Note: Number of observations: 63, error degrees of freedom: 60
Root mean squared error: 15.6
R-squared: 0.146, adjusted R-squared 0.117
F-statistic vs. constant model: 5.12, p-value = 0.00885

Results show a model overall statistically significant with R-squared 14.6%, close to our previous model and to the results obtained by Šodan (2015). The positive coefficient of FVI confirms the hypothesis of a negative relationship between FVA and earning quality also with the FVI calculated with the above-explained proxy. These results allow us to continue the analysis using this proxy, looking for any difference in terms of observability of inputs utilized to assess fair value.

Verified the reliability of the proxy, we run models on the same sample of the above model and the following tables report the obtained results.

Table 3. Model 2 – AEQ, FVI (1/2) and Lev

Variable	*Predicted sign*	*Coefficient*	*t-stat*	*P-value*
Intercept	?	49.57015561	1.271250956	0.208545637
FVI (1/2)	-	33.89780041	2.897195168	0.005248606
LEV	?	-19.37673915	-0.439157956	0.662124625

Note: Number of observations: 63, error degrees of freedom: 60
Root mean squared error: 15.6
R-squared: 0.139, adjusted R-squared 0.11
F-statistic vs. constant model: 4.83, p-value = 0.0113

Table 4. Model 3 – AEQ, FVI (3) and Lev

Variable	*Predicted sign*	*Coefficient*	*t-stat*	*P-value*
Intercept	?	38.98006519	0.957389487	0.342212612
FVI (3)	+	24.94062521	2.712015222	0.008711868
LEV	?	-6.554433414	-0.142578871	0.887100504

Note: Number of observations: 63, error degrees of freedom: 60
Root mean squared error: 15.8
R-squared: 0.125, adjusted R-squared 0.0963
F-statistic vs. constant model: 4.3, p-value = 0.0179

Both models are overall statistically significant with R-squared equal 13.9% and 12.5% respectively. The FVI coefficient has a positive sign in both cases meaning that different levels of inputs have the same impact in term of earning quality. Results do not allow us to confirm our initial hypothesis with the hierarchy of inputs that seems to not have any advantage for the users of financial reporting, given an overall deterioration of earning quality associated with the FVA.

We run some more models in order to check the robustness of our results. First of all, we attempt to exclude the indicator of "conservatism" in calculating the AEQ. We try it because the construction of this indicator results in a loss of observations. So in the following models, the AEQ is composed only by the following four indicators: (i) predictability, (ii) persistence, (iii) volatility, (iv) value relevance and we named it "AEQ4". After this change made on the AEQ, the sample is composed of 88 observations. The following tables report all the above-mentioned models tested again with the AEQ4 instead of the AEQ.

Table 5. Model 4 – AEQ4, FVI and Lev

Variable	*Predicted sign*	*Coefficient*	*t-stat*	*P-value*
Intercept	?	157.6503972	1.24328329	0.217181823
FVI	+	143.0214045	3.742002927	0.000330873
LEV	?	-180.7179002	-1.262451737	0.210238967

Note: Number of observations: 88, error degrees of freedom: 85
Root mean squared error: 52
R-squared: 0.185, adjusted R-squared 0.165
F-statistic vs. constant model: 9.63, p-value = 0.000171

Table 6. Model 5 – AEQ4, FVI (1/2) and Lev

Variable	*Predicted sign*	*Coefficient*	*t-stat*	*P-value*
Intercept	?	167.3103748	1.331041248	0.186734689
FVI (1/2)	-	136.5606898	3.801157519	0.000270111
LEV	?	-191.5405677	-1.348736606	0.181004051

Note: Number of observations: 88, error degrees of freedom: 85
Root mean squared error: 51.9
R-squared: 0.188, adjusted R-squared 0.169
F-statistic vs. constant model: 9.86, p-value = 0.000141

Table 7. Model 6 – AEQ4, FVI (3) and Lev

Variable	*Predicted sign*	*Coefficient*	*t-stat*	*P-value*
Intercept	?	115.9435052	0.889288282	0.376358062
FVI (3)	+	108.155405	3.742846841	0.000329921
LEV	?	-131.2127913	-0.892199031	0.374805106

Note: Number of observations: 88, error degrees of freedom: 85
Root mean squared error: 52
R-squared: 0.185, adjusted R-squared 0.166
F-statistic vs. constant model: 9.63, p-value = 0.00017

All tested models are overall statistically significant with an average R-squared 18%. Results confirm what we have obtained with Model 1, 2 and 3. Also, in this case, there is no difference between the three levels of fair value.

We do another check related to the control variable used, in fact, "Lev" seems to have not any relationship with AEQ; deleting this control variable we obtain an improvement in the significance of the model without loss of adaptation. Results are reported in the following tables.

Table 8. Model 7 – AEQ4, FVI

Variable	*Predicted sign*	*Coefficient*	*t-stat*	*P-value*
Intercept	?	-2.402990565	-0.364417806	0.716420257
FVI	+	152.9023417	4.128185577	8.28972E-05

Note: Number of observations: 90, error degrees of freedom: 88
Root mean squared error: 52.3
R-squared: 0.162, adjusted R-squared 0.153
F-statistic vs. constant model: 17, p-value = 8.29e-05

Table 9. Model 8 – AEQ4, FVI (1/2)

Variable	*Predicted sign*	*Coefficient*	*t-stat*	*P-value*
Intercept	?	-2.202477092	-0.33633312	0.737420364
FVI (1/2)	-	145.7479186	4.157401782	7.45193E-05

Note: Number of observations: 90, error degrees of freedom: 88
Root mean squared error: 52.2
R-squared: 0.164, adjusted R-squared 0.155
F-statistic vs. constant model: 17.3, p-value = 7.45e-05

Table 10. Model 9 – AEQ4, FVI (3)

Variable	*Predicted sign*	*Coefficient*	*t-stat*	*P-value*
Intercept	?	-0.520439594	-0.082793267	0.93420396
FVI (3)	+	115.3952504	4.251441379	5.27E-05

Note: Number of observations: 90, error degrees of freedom: 88
Root mean squared error: 52
R-squared: 0.17, adjusted R-squared 0.161
F-statistic vs. constant model: 18.1, p-value = 5.27e-05

Results are once again similar to those previously obtained. There are no differences between the three levels of fair value in this case too.

We do another attempt using the following measures of earnings quality: predictability, persistence, volatility and value relevance as independent variables; and the FVI as a dependent variable. We try this for two reasons: firstly because the previous models do not show any difference between levels of fair value, and secondly, because considering single measures of earning quality, it is possible to acquire greater information from the statistics. The AEQ, in fact, is a synthetic indicator that is useful for an overall evaluation of earning quality but averaging the singles measures of quality, some of the information is lost. Furthermore, given the lack of significance of the previous control variable considered, we introduce the value of the total asset of each firm at the year-end as a new control variable. In this case, as in the previous models we do not consider the conservatism measures given the reduced amount of observation available after its calculation. As for Models 4, 5 and 6, the next models are run on a sample composed of 88 observations. The following tables report all the new models tested.

Table 11. Model 10 – FVI, predictability, persistence, volatility, value relevance, total asset

Variable	*Predicted sign*	*Coefficient*	*t-stat*	*P-value*
Intercept	?	-0.45220962	-2.549655943	0.012644822
Persistence	+	0.004148903	0.164273026	0.869920467
Log(predictability)	+	0.02447993	2.031556611	0.045437196
Log(volatility)	+	0.009383446	1.753071797	0.083326963
Value relevance	+	0.077550295	1.674005356	0.097940047
Total assets	?	1.46E-13	3.046693568	0.003112107

Note: Number of observations: 88, error degrees of freedom: 82
Root mean squared error: 0.12
R-squared: 0.401, adjusted R-squared 0.365
F-statistic vs. constant model: 11, p-value = 4.05e-08

Table 12. Model 11 – FVI (1/2), predictability, persistence, volatility, value relevance, total asset

Variable	*Predicted sign*	*Coefficient*	*t-stat*	*P-value*
Intercept	?	-0.437990791	-2.396029379	0.01885016
Persistence	-	0.003789394	0.145575447	0.884613807
Log(predictability)	-	0.027660549	2.227229325	0.028672618
Log(volatility)	-	0.008282191	1.501301513	0.137118618
Value relevance	-	0.086739356	1.816665465	0.072922244
Total assets	?	1.75624E-13	3.56317061	0.000613892

Note: Number of observations: 88, error degrees of freedom: 82
Root mean squared error: 0.124
R-squared: 0,429, adjusted R-squared 0.394
F-statistic vs, constant model: 12.3, p-value = 6.34e-09

Table 13. Model 12 – FVI (3), predictability, persistence, volatility, value relevance, total asset

Variable	*Predicted sign*	*Coefficient*	*t-stat*	*P-value*
Intercept	?	-0.5961981	-2.414321118	2.788110861
Persistence	+	0.019528227	-2.414321118	0.580174435
Log(predictability)	+	0.041584904	2.478660939	0.015238408
Log(volatility)	+	0.010516352	1.411123759	0.161991018
Value relevance	+	0.095232746	1.476462282	0.143649949
Total assets	?	0.095232746	2.788110861	0.143649949

Note: Number of observations: 88, error degrees of freedom: 82
Root mean squared error: 0.167
R-squared: 0.372, adjusted R-squared 0.333
F-statistic vs, constant model: 9.69, p-value = 2.67e-07

Tested models are overall statistically significant. Overall results show that FVI has a positive relationship with predictability, volatility and value relevance while coefficient associated with persistence is not significant enough to affirm any possible stable relation. Moreover, there is a decrease in the significance of coefficients obtained in the model with the FVI of Level 3 as the dependent variable. From the results of these models, it seems possible to confirm a negative relationship between the FVA and earning quality, specifically in terms of its predictability, volatility and value relevance, but there is no evident and marked difference between the hierarchies of inputs.

However, our models have some limitations. Tested models, given the process needed for the construction of the quality indicators, show a strong dependence on the number of observations available. We also have a reduced number of observations available for FVI (for all levels). Another limitation is given by the similarity showed by the FVI for each level of inputs that do not allow us to test all the levels together in order to avoid problems of correlation.

5. CONCLUSION

The goal of international standards setters (mainly, FASB and IASB) is to define a set of high-quality standards that can improve disclosure providing comparable and transparent information to the users of financial reporting. In their view main users of financial reporting are investors, and IASB and FASB have chosen the criterion of fair value in order to help them in the decision-making process. Fair value could be considered, as generally affirmed in literature, as a relevant criterion but many doubts emerge about its reliability. Fair value accounting, in fact, is able to furnish representative information on reporting firms and this generally improve the financial market conditions, nevertheless, in case of not liquid and not efficient markets, it could be difficult to apply and to satisfy GAAP requirements. Given that, trying to preserve the faithful representation, IASB and FASB introduced an input hierarchy, based on observability, and obligation of its disclosure. Information on degrees of observability of inputs should be read by the investors as an indicator of reliability, making them able to better understand the goodness of the recorded values. Inputs hierarchy acquires importance because inputs estimated by management are susceptible to accounting manipulation made with earning management purposes. In spite of the many contributions by several authors, a unique conclusion hasn't been reached yet.

In this context, we tried in Tutino and Pompili (2018) to understand if the use of fair value accounting, and more specifically the adoption of inputs hierarchy, potentially entails earning management practices in European and US banks.

At that time, our results came out of the application of Šodan model (2015) at European and US banks observed for the period 2011-2016, showed the existence of a negative relationship between FVA and earning quality. Given these results, we have drawn the conclusion that fair value accounting could permit earning management practices that compromise the quality of the earning reported by the firms, first of all in terms of its reliability and with direct consequences for investors, managers, policy makers and stakeholders.

With this paper, given previous results and general concerns exhibited in literature against Level 3 inputs, we want to continue to develop the analysis, investigating impacts of FVA on earning quality depending on levels of inputs of fair value estimates. Using the same US sub-sample of the previous work, we find that impacts of FVA on earning quality does not depend on the level of fair value used for evaluation. Results show the same effect on earning quality for all level of inputs. So, despite our original hypothesis, inputs of Level 3 do not have a major negative effect comparing with observable inputs. Results confirm an overall negative impact of FVA and do not show any positive adjustment related to the hierarchy of inputs introduced by standard setters with the aim of improving the reliability of this criterion.

Results allow us to formulate some conclusions referring to fair value without criticizing this evaluation techniques but rather focusing on the concept behind this criterion. In fact, we find less earning quality associated with FVA, depending on earning management possibilities, which instill doubt on the usefulness of fair value. This is because a criterion that permits manipulation made by management could not be a criterion able to provide a faithful representation and safeguard the quality of financial reporting. According to the literature the main problems arise in case of inactive markets so when managers resort to using not observable and not objectively measurable inputs to assess fair values so compromising comparability of financial reporting. As a consequence, financial reporting seems to lose its explanatory power for the stakeholders.

The focus of this research, as for Tutino and Pompili (2018), is on the impact of FVA in terms of earning quality and not just on fair value relevance for investor's decision-making process, contributing to the discussion on the general validity of this evaluation criterion.

This paper adds to the previous one the proof on the uselessness of hierarchy inputs. The hierarchy, introduced by the standard setters with the aim of improving the reliability of fair value, has, in fact, no positive impacts on earning quality. A fair value assessed with observable inputs, nevertheless preserving the relevance of this criterion (Tutino & Pompili, 2017), loses any informative advantage in relation to a synthetic quality indicator.

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Appendix

AEQ (Aggregate Earning Quality), as in Tutino and Pompili (2018), assumes the following equation:

$$AEQ_i = \frac{[RANK\ (PERS_i) + RANK\ (PRED_i) + RANK\ (VOL_i) + RANK\ (REL_i) + RANK\ (CONS_i)]}{5} \quad (4)$$

PRED (Predictability) and *PERS* (Persistence) derive from the autoregressive equation of net income of firm i, scaled by the average number of outstanding shares during year *t*.

$$NPS_{i,t} = \beta_0 + \beta_1 NPS_{i,t-1} + \varepsilon_{i,t} \quad (5)$$

Specifically, *PRED* is measured as:

$$PRED_i = \sqrt[2]{\sigma^2\ (\varepsilon_i)} \quad (6)$$

and, *PERS* as:

$$PERS_i = -\beta_{1,i} \quad (7)$$

VOL (Volatility), that indicates the presence of temporary variations in net income, is measured as:

$$VOL_i = \sigma\ (N)_{i,t} \quad (8)$$

The fourth indicator included in *AEQ* is *REL* (Value relevance) defined as the ability of net income to predict the stock returns. In order to this, we use the value of the regression's explanatory power of the following equation:

$$P_{i,t} = \beta_0 + \beta_1 N_{i,t} + \beta_2 \Delta N_{i,t} + \varepsilon_{i,t} \quad (9)$$

with *REL* measured as:

$$REL_i = -R_i^2 \quad (10)$$

CONS (Conservatism) represents the ability to earn to incorporate economic losses (measured by negative stock returns) more quickly than economic gains (measured as positive). In order to determinate this indicator we start to the following:

$$\Delta N_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 \Delta N_{i,t-1} + \beta_3 D_{i,t} \Delta N_{i,t-1} + \varepsilon_{i,t} \quad (11)$$

Where $\Delta N_{i,t}$ and $\Delta N_{i,t-1}$ are, respectively, change in net income for a bank "*i*" from the year "*t-1*" to year "*t*", scaled by beginning market capitalization and change in net income from the year "*t-2*" to year "*t-1*" scaled by beginning market capitalization. With $D_{i,t}$ we introduce a dichotomous variable which takes the value of "*1*" when $\Delta N_{i,t-1}$ is negative and "0" otherwise. Since, according to the main literature, earning increase are

persistent we assume that $\beta_2 = 0$, moreover if conservatism exists income decreases are transitory and so $\beta_2 + \beta_3 < 0$. As a consequence, if there is conservatism, with management that recognizes losses more quickly than gains, it is true that $\beta_3 < 0$. Given this, *CONS* is measured as:

$$CONS_i = \beta_{3,i} \tag{12}$$

All the indicators above described are defined so that high values correspond to a lower level of income quality. In order to compose the *AEQ*, banks considered in our sample are ranked according to each of the five indicators. In order to compute an aggregate quality measure for each bank considered in our sample, we have made an average of its ranking over the five individual quality measures.