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ARTICLE



Corporate governance, legal systems and value relevance of fair value estimates. Empirical evidence from the EU banking sector

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ABSTRACT

Scholars agree that the role played by corporate governance mechanisms is likely to be affected by the quality of the legal systems in which firms operate. This paper investigates whether the quality of firm-level corporate governance is more valuable in countries with a high- or low-quality legal system. To do so, the paper focuses on the value relevance of fair value hierarchy disclosed by the European financial entities listed in 14 stock markets over the period 2011–2015. Findings show that differences in the quality of legal systems positively affect the value relevance of fair value estimates and provide evidence that the effect of firm-level corporate governance on the value relevance of fair value assets and liabilities is stronger in countries with high-quality legal systems. Our study contributes to the literature to the extent to which it shows that the ability of corporate governance to improve the value relevance of fair value measurements depends on the quality of the legal system under which firms operate. For this reason, our results complement findings reported by prior studies that have separately investigated the effect of the quality of corporate governance and of investor protection on the value relevance of fair value measurement.

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Value relevance; price model; fair value hierarchy; corporate governance; legal systems

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Gobierno corporativo, sistemas legales y relevancia de valor de las estimaciones de valor razonable. Evidencia empírica del sector bancario de la ue

Los académicos coinciden en que el papel desempeñado por los mecanismos de gobierno corporativo es presumiblemente afectado por la calidad de los sistemas legales en los que operan las empresas. Este paper investiga si la calidad del gobierno corporativo a nivel empresarial es más valiosa en países con un sistema legal de alta o baja calidad. Para hacerlo, el artículo se focaliza en la relevancia del valor de la jerarquía de valor razonable revelada por las entidades financieras europeas, listadas en 14 bolsas de valores durante los años 2011–2015. Los resultados muestran que las diferencias en la calidad de los sistemas legales afectan positivamente la relevancia del valor de las estimaciones de valor razonable, y proporcionan evidencia de que el efecto del gobierno corporativo a nivel empresarial sobre la relevancia de valor de los activos y pasivos de valor razonable es más fuerte en países con alta calidad de sistemas

legales. Nuestro estudio contribuye a las publicaciones en la manera que muestra que la capacidad del gobierno corporativo, para mejorar la relevancia del valor de las mediciones del valor razonable, depende de la calidad del sistema legal bajo el cual operan las empresas. Por esta razón, nuestros resultados complementan los hallazgos reportados por estudios precedentes, los cuales investigaron separadamente el efecto de la calidad del gobierno corporativo y de la protección del inversionista en la relevancia del valor de la medición del valor razonable.

1. Introduction

The Financial Accounting Standards Board (FASB) in Financial Accounting Standard (FAS) 157 and the International Accounting Standards Board (IASB) in International Financial Reporting Standard (IFRS) 7 and IFRS 13 require entities to disclose fair value in the so-called fair value hierarchy according to the inputs used to estimate it. The hierarchy is composed of three levels, where level 1 refers to observable inputs from quoted prices in active markets, level 2 applies to indirectly observable inputs from quoted prices of comparable items in active markets, identical items in inactive markets, or other market-related information, and level 3 to unobservable firm-generated inputs. The requirement of accounting standards to disclose the fair value hierarchy has enabled investors to distinguish the level of relevance and reliability of fair value estimates. It has also increased scholars' interest in investigating the value relevance of level 1, level 2 and level 3 fair values and how corporate governance quality (Siekkinen, 2017; Song, Thomas, & Yi, 2010) or investor protection (Siekkinen, 2016) can reduce investors' concerns regarding the less reliable fair value estimates (i.e. levels 2 and 3). Indeed, when moving from level 1 to level 3, fair value estimates become more opaque and the risk of both unintentional and intentional mistakes due to accounting discretion or managers' opportunistic behaviour increases (Ronen, 2008, 2012).

Our research is motivated by the lack of studies investigating the effect that the interactions between corporate governance and the quality of the legal system have on the value relevance of fair value measurement. Our purpose is to assess whether and how the quality of country-level legal systems influences the ability of firm-level corporate governance to affect the value relevance of fair value estimates. In this regards, a fervent debate exists in literature about whether firm-level corporate governance is more valuable in countries with high- or low-quality legal systems. Some papers show that the payoffs to firms adopting better governance are more likely to be positive in developed economies with stronger institutions (e.g. Doidge, Karolyi, & Stulz, 2007; Francis, Khurana, Martin, & Pereira, 2008; Hope, Kang, & Thomas, 2006). Other studies argue that the benefits of firm-level corporate governance are higher in countries with a lower level of enforcement (e.g. Chen, Chen, & Wei, 2009).

The disclosure requirements of the above-mentioned accounting standards (i.e. FAS 157 and IFRS 7 and 13) raise two research questions concerning the value relevance of fair value measurement. The first question is the following: does the quality of country-level legal systems affect the value relevance of fair value estimates? This research question leads to the second, regarding the possible interactions between the quality of corporate governance and that of legal systems: do differences in the country-level legal systems influence the

capability of firm-level corporate governance to affect the value relevance of fair value estimates?

We base our analysis on a sample of European financial entities that disclose the fair value hierarchy for financial instruments over the period 2011–2015 according to the requirements of IFRS 7 and IFRS 13. The European Union (EU) is a suitable setting for understanding the interactive effect of country-level legal systems and firm-level corporate governance. This is due to the common disclosure requirements and the fact that prior studies have shown that significant differences in the quality of legal environments exist in the European context (Nobes & Parker, 2010).

Our paper provides the following results. First, in the EU, high-quality legal systems positively affect the value relevance of fair value estimates. This could be due both to the capability of the quality of legal systems to reduce earnings management behaviour (e.g. Goldman & Slezac, 2006; Leuz, Nanda, & Wysocki, 2003; Nagar & Petacchi, 2005) and to the high sanctions imposed because of intentional and unintentional mistakes (Ernstberger, Stich, & Vogler, 2012). Second, the ability of corporate governance mechanisms to improve the value relevance of fair value estimates depends on country-level institutional forces. In particular, our findings suggest that the effect of firm-level corporate governance on the value relevance of fair value assets and liabilities is stronger in countries with a high-quality legal system than in those with a weak legal system. Specifically, high-quality corporate governance makes level 3 fair value assets and liabilities value relevant only in countries with high-quality legal systems, supporting the hypothesis that interactions between the quality of corporate governance and legal systems really matter because of the weight placed by investors on fair value estimates.

All these findings extend previous literature, which separately investigates the effect of the quality of corporate governance and investor protection on the value relevance of fair value measurement (Siekkinen, 2016, 2017; Song et al., 2010). Furthermore, our paper contributes to the debate on corporate governance effectiveness in different institutional legal systems by showing that firm-level corporate governance is more valuable in countries with high-quality legal systems. This research has practical implications. In particular, it suggests to the international standard setters that not only the quality of accounting standards but also other dimensions – such as the quality of corporate governance and the legal system which standard setters and regulators cannot control – affect the value relevance of fair value estimates.

The paper continues as follows: [Section 2](#) provides a literature review and the hypotheses; [Section 3](#) deals with the research design; [Section 4](#) is dedicated to the sample selection and descriptive statistics; [Section 5](#) illustrates the empirical findings and [Section 6](#) concludes the paper, acknowledging its limitations and indicating possible future developments.

2. Literature review and hypothesis development

In recent years, accounting literature has extensively examined the value relevance of fair value hierarchy to distinguish how investors price fair value estimated by using different kinds of inputs.

Goh, Li, Ng, and Yong (2015) focused on a sample period from 2008 to 2011 and found that each of the three levels is value relevant. They concluded that investors are more

concerned with fair value level 3, consistent with the assumptions that mistakes in fair value estimates are more frequent and that managers may manipulate accounts to pursue their interests. To assess information asymmetries and possible mistakes concerning fair value estimates, prior research also investigated the value relevance of the fair value hierarchy, studying the effects that the quality of corporate governance or the legal system have on the weight investors place on fair value estimates. While Song et al. (2010) and Siekkinen (2017) studied the impact of corporate governance, Siekkinen (2016) focused on investor protection.

Song et al. (2010) analysed the value relevance of level 1, level 2 and level 3 estimates in the U.S. by using the first three quarterly reports of banks in 2008. They found that levels 1 and 2 are significantly more value relevant than level 3. This conclusion was confirmed when the authors analysed the effect of corporate governance mechanisms, whose quality has a significant impact on levels 2 and 3 but not on level 1. For levels 2 and 3, this is because corporate governance appears to decrease the information asymmetry generated by relatively less reliable fair value inputs. For level 1, the use of prices in active markets significantly reduces the ability of higher quality corporate governance mechanisms to increase the reliability of fair value estimates. Despite the interest in corporate governance mechanisms, Song et al. (2010) did not examine the influence of the legal system on the value relevance of each fair value level because they used a sample of entities belonging to a single country (USA), where different levels of corporate governance exist within a common legal system.

Focusing on the European context, Siekkinen (2017) found that all hierarchical levels are value relevant and that the quality of corporate governance makes the less reliable level 3 value relevant. The main factor that justifies this result is that the increased monitoring from stronger boards (and in particular independent boards and boards with high gender diversity) is expected to decrease the incentives for opportunism, leading to higher trust in fair value estimates, which ultimately leads to higher value relevance. Siekkinen (2017) did not analyse the effect of country-level legal systems on the value relevance of fair value estimates. However, Siekkinen (2016) investigated the effect that different investor protection environments have on the value relevance of fair value estimates without considering the quality of corporate governance. Using a sample of firms listed in 34 IFRS countries, Siekkinen (2016) found that value relevance changes according to the quality of such environments. In fact, earnings management practices, which impair the relevance and reliability of fair value estimates, vary among investor protection environments (Siekkinen, 2016).

The quality of legal systems plays a role in increasing investor confidence in fair value estimates. Several studies have found earnings management behaviour less probable in regimes with high-quality legal systems (e.g. Goldman & Slezak, 2006; Leuz et al., 2003; Nagar & Petacchi, 2005). This is because legal regimes that provide greater investor protection are posited to lead to financial reporting behaviour that reflects greater disclosure and less earnings management (Francis et al., 2008, p. 336). In addition, the literature suggests that strong enforcement regimes prevent accounting errors, other than frauds and earnings management (Ernstberger et al., 2012, p. 222), from happening. This is due to high sanctions for the detection and publication of material errors, to an increase in the efforts of other enforcement institutions (e.g. supervisory boards and audit committees) and to a rise in auditors' bargaining power in discussions with management about questionable accounting treatments. Finally, studies that have investigated the value relevance of fair value estimates have found that

the value relevance of fair value increases in a more protective environment (Siekkinen, 2016), leading us to formulate the following hypothesis:

H1: The quality of country-level legal systems affects the value relevance of fair value estimates.

The quality of country-level legal systems does not only affect the value relevance of fair value measurement but also the effectiveness of firm-level corporate governance mechanisms. Prior studies document that firm-level corporate governance rules are not completely independent of institutional setting (Klapper & Love, 2004) and that the effectiveness of corporate governance mechanisms is affected by the differences in institutional variables (Bruton, Filatotchev, Chahine, & Wright, 2010). What is not yet clear is whether the quality of firm-level corporate governance is more valuable in countries with high- or low-quality legal systems. The literature offers studies supporting the hypothesis that the benefits of firm-level corporate governance are higher in countries with a low level of enforcement. For instance, according to Chen et al. (2009, p. 275), better firm-level and self-disciplined corporate governance should be more valuable in countries with weak legal protection of minority shareholders, as investors cannot rely on legal systems alone to prevent expropriation by corporate insiders. Similar conclusions are reached by Durnev and Kim (2005), according to whom good corporate governance driven by private incentives plays a more important role in alleviating the harmful effects of an ineffective legal framework when regulation is weak (Durnev & Kim, 2005, 1462). In their paper, they demonstrate that firms adapt to poor legal environments to establish efficient governance practices.

Other studies, however, support the opposite hypothesis that the quality of firm-level governance mechanisms is more valuable in high-quality institutional settings. For instance, Francis et al. (2008) demonstrate that firm-level incentives appear to play a relatively more important role than country-level factors in explaining the IAS adoption decision in countries that are more economically developed and have stronger contracting parties (Francis et al., 2008, p. 356). This is because the institutions fundamentally shape governance structures. Consequently, the benefits of financial reporting choices that reduce managerial discretion and improve disclosure will be limited if a firm is located in a country with weak institutions (Francis et al., 2008, p. 336). These theories support the conclusions of Doidge et al. (2007) according to whom the payoffs for firms with better corporate governance mechanisms are more likely to be positive in developed economies with stronger institutions. The same authors argue that in countries with low financial and economic development, firms find it optimal to invest less in governance (Doidge et al., 2007, p. 3) coherently with Klapper & Love's statement that 'firms are unable to completely replicate a good legal environment on their own' (2004, p. 715).

Even though the debate about whether corporate governance is more valuable in countries with a high or low level of enforcement is open, the literature seems to support the idea that the effectiveness of firm-level corporate governance varies according to the quality of country-level legal systems and, therefore, it should also affect the effectiveness of the corporate governance mechanism in improving the value relevance of accounting amounts. This leads us to formulate the following hypothesis:

H2: The effect of corporate governance on the value relevance of fair value estimates depends on the quality of a country-level legal system.

3. Research design

3.1 Value relevance model

To test our research hypotheses, we used a modified version of the price model (Ohlson, 1995). Variables are deflated by the number of outstanding shares, as in prior studies investigating the value relevance of fair value measurement (e.g. Chung, Goh, Ng, & Ow Yong, 2017; Goh et al., 2015; Siekkinen, 2016; Song et al., 2010), and winsorised at 1% to reduce the risk that outliers may influence research results.

The specification that we used is the following:

$$\begin{aligned}
 P_{it} = & \varphi_0 + \varphi_1 FVA_{L1it} + \varphi_2 FVA_{L2it} + \varphi_3 FVA_{L3it} + \varphi_4 FVL_{L12it} + \varphi_5 FVL_{L3it} \\
 & + \varphi_6 \overline{BV}_{it} + \varphi_7 NI_{it} + \varphi_8 L_{it} + \varphi_9 LxNI_{it} + \varphi_{10} \ln TA_{it} + \sum_t \beta_t \text{Year} \\
 & + \sum_j \beta_j \text{Country} + \varepsilon_{it}
 \end{aligned} \tag{1}$$

where P_{it} are the closing prices three months after the end of the fiscal year; FVA_{L1it} are the financial assets per-share measured at fair value by using observable inputs, whose fair value has been disclosed in level 1; FVA_{L2it} are the financial assets per-share measured at fair value by using observable inputs, whose fair value has been disclosed in level 2; FVA_{L3it} are the financial assets per-share measured at fair value by using unobservable inputs, whose fair value has been disclosed in level 3; FVL_{L12it} are the financial liabilities per-share measured at fair value by using observable inputs; FVL_{L3it} are the financial liabilities per-share measured at fair value by using unobservable inputs; $\overline{BV}_{it}$ is the book value per-share purged by those financial assets and liabilities measured at fair value disclosed in one of the levels of the fair value hierarchy; NI_{it} is net income per-share; L_{it} is a dummy variable that controls for the presence of loss firms in the sample (it takes the value of one if earnings are negative, and otherwise it is zero); $\ln TA_{it}$ is the natural logarithm of total assets, which controls for the size of the entity; Year and Country are dummy variables that control for temporal and country effects; ε_{it} is the error term.

The model allows us to study the value relevance of level 1, level 2 and level 3 financial assets and of financial liabilities measured at fair value using observable (level 1 and level 2) and unobservable (level 3) inputs. Following Song et al. (2010), we aggregate levels 1 and 2 fair value liabilities with the aim of alleviating potential multicollinearity problems. In addition, financial liabilities measured at fair value are not so common in the annual reports of US or European banks. The choice to control for loss firms (e.g. Chambers, Linsmeier, Shakespeare, & Sougiannis, 2007) and size (e.g. Zeng, Lee, & Zhang, 2016) is supported by descriptive statistics tabulated in the next section and is due to the presence in our sample of banks with negative earnings and different dimensions. For loss firms, we differentiate the intercept and the coefficient of earnings to avoid biases due to the presence of loss firms (Hayn, 1995). Prior value relevance studies have used specifications with corrections for loss firms (e.g., Balachandran & Mohanran, 2011; Chambers et al., 2007; Core, Guay, & Van Buskirk, 2003; Mechelli & Cimini, 2014; Veltri & Ferraro, 2012). In the price models, corrections range from solutions that allow loss firms to have a different intercept to solutions that allow them to have not only a different intercept but also different slopes for the coefficients of earnings and/or book value. Our choice to include a dummy and only its interaction with the earning coefficient has been used in accounting

studies (e.g. Mechelli & Cimini, 2014; Veltri & Ferraro, 2012). It is used to avoid an increase of multicollinearity due to the consideration in the regression models of all the interaction terms with the equity values.

Following the accounting literature, value-relevant accounting amounts have statistically significant regression coefficients that, for equity values measured at fair value, should decrease moving from level 1 to level 3. For statistically significant regression coefficients, we test whether they are statistically equivalent to each other in order to investigate if the difference between the value relevance of the hierarchical levels changes moving from level 1 to level 3. Due to possible heteroskedasticity, the t-statistics of the regression coefficients have been adjusted employing robust standard deviations (White, 1980).

3.2 Corporate governance and legal system measures

Testing our research hypotheses requires computing two metrics that refer to the quality of corporate governance and the legal system. To do so, this study summarises several variables with principal component analysis (PCA) to calculate synthetic measures of the quality of firm-level corporate governance (GOVSCORE_{it}) and of a country-level legal system (LEGALSORE_{ct}).

For the quality of corporate governance, GOVSCORE_{it} is computed by summarising four variables that control for ownership concentration (OWCON_{it}), independence of the board directors (%INDIR_{it}), chief executive officer (CEO) duality (CEOD_{it}) and audit quality (AUQ_{it}).

Ownership concentration is considered a key variable in corporate governance studies (Kumar & Zattoni, 2015, p. 469). Although concentrated ownership mitigates managerial expropriation, it engenders another agency problem: the potential expropriation of minority shareholders (Guedhami & Pittman, 2006). Previous research has also found that, unlike systems characterised by widely dispersed share ownership and separation of ownership from control, concentrated ownership is associated with low audit committee activity (Méndez & Garcia, 2007) and less share-related information (Broberg, Tagesson, & Collin, 2010). This study uses the indicator provided by Orbis Bank Focus as a proxy for the concentration/diffusion of ownership.

As to the percentage of independent directors, according to the literature, board independence is a good feature of corporate governance (Boone, Field, Karpoff, & Raheja, 2007; Coles, Daniel, & Naveen, 2008; Linck, Netter, & Yang, 2008; Pathan & Skully, 2010). In literature, there are also scholars that consider the number of independent directors to be a measure of the independence of the audit committee (e.g. Klein, 2002; Menon & Williams, 1994; Piot, 2004; Sierra García et al., 2012; Song & Windram, 2004). According to Ivashkovskaya and Stepanova (2011), this independence is related to firm performance. Assuming the ratio of independent directors to total board members as a proxy for board independence, we collected this information in part by using the Bloomberg database and in part by analysing information available on the websites of the financial entities analysed.

Regarding the CEO duality, we assume that the CEO and the chair of the board of directors should be different people to ensure the quality of corporate governance mechanisms. This is consistent with Cerbioni and Parbonetti (2007), who preferred a separation of duties in line with the agency theory. According to this theory, modern

corporation CEOs have decision rights but no control rights over shareholder capital (Yang & Zhao, 2014). Hence, we use a dummy that is equal to 1 for entities whose CEO and managing director are different people and 0 in the case of CEO duality. Also, this variable has been downloaded from the Bloomberg database and hand-collected in the case of missing data.

As to audit quality, the consensus in literature is that entities audited by the Big 4 are also those with the lowest cost of capital (Karjalainen, 2011) and with a higher level of assurance and credibility (Hsien-Li & Hua, 2013), which leads investors to perceive the accounting amounts audited by these audit firms as more value relevant. In addition, previous research has found both a high audit quality (e.g. Kent, Routledge, & Stewart, 2010) and an effective audit committee (e.g. Chang, Chen, & Zhou, 2013) when the annual report is audited by one of the Big 4. To control for this dimension, we use a dummy according to the information available in the Bloomberg database, which is equal to 1 if the consolidated financial statement has been audited by one of the Big 4, or otherwise 0.

With regards to the quality of legal systems, we have collected the following variables from the World Bank's Worldwide Governance Indicators database, which is updated yearly. Voice and Accountability (VA_{ct}) reflect perceptions of the extent to which a country's citizens can participate in selecting their government, as well as freedom of expression, freedom of association and free media. Political Stability and Absence of Violence ($PSAV_{ct}$) reflect perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism. Government Effectiveness (GE_{ct}) reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation and the credibility of the government's commitment to such policies. Regulatory Quality (RQ_{ct}) reflects perceptions of the government's ability to formulate and implement sound policies and regulations that permit and promote private sector development. Rule of Law (RL_{ct}) reflects perceptions of the extent to which agents have confidence in and abide by the rules of society and, in particular, the quality of contract enforcement, property rights, the police and the courts, as well as the likelihood of crime and violence. Control of Corruption (CC_{ct}) reflects perceptions of the extent to which public power is exercised for private gain.

These variables are chosen because they represent the most up-to-date information available on the quality of legal systems (i.e. they refer to the same period 2011–2015 as the rest of the information used in our analysis). The same variables have been used in several World Bank policy research working papers (e.g. Kaufmann, Kraay, & Mastruzzi, 2010) as well as in accounting research (e.g. Callao, Cimini, & Jarne, 2016; Sforza & Cimini, 2017). Since the enforcement concept adopted in the main analysis is broad, in our sensitivity analyses we re-run our regression using a synthesis of the RQ_{ct} , the RL_{ct} and the CC_{ct} as a metric of the quality of the legal system.

The variables that control for the quality of corporate governance and legal systems have been summarised using PCA. This technique identified the factors that, after a varimax rotation, generated two synthetic indicators we called $GOVSCORE_{it}$ and $LEGALSCORE_{ct}$ because they proxy for the quality of corporate governance mechanisms (the former) and legal system (the latter).

To test our first hypothesis that differences in the quality of legal systems affect the value relevance of fair value estimates, we split the variable $LEGALSCORE_{ct}$ at the median to cluster entities into two groups and to study the value relevance of fair value estimates in countries with low-quality legal system (cluster 1a) and high-quality legal system (cluster 2a). Running Equation (1) over the two clusters, we expect to find a higher value relevance of fair value estimates over the cluster of financial entities that operate in high-quality legal systems. We also expect to find similar results for earnings and book value purged by fair value assets and liabilities.

For the second hypothesis, we split $GOVSCORE_{it}$ and $LEGALSCORE_{ct}$ at the median to cluster entities into four groups:

- (i) Low-quality corporate governance and legal systems (cluster 1b);
- (ii) Low-quality corporate governance and high-quality legal systems (cluster 2b);
- (iii) High-quality corporate governance and low-quality legal systems (cluster 3b);
- (iv) High-quality corporate governance and legal systems (cluster 4b).

To test our second research hypothesis, we run Equation (1) over the four clusters and we expect to find that the effect of corporate governance on the value relevance of fair value estimates changes according to the quality of the country-level legal system.

4. Sample selection and descriptive statistics

To investigate whether and to what extent the interaction between the quality of corporate governance and legal system affects the value relevance of financial assets and liabilities measured at fair value, we used the Orbis Bank Focus database. Data refer to the consolidated accounts issued over the period 2011–2015 by the financial entities listed in the European Union (EU) 15 stock markets. We have focused on financial entities because they measure a larger amount of financial instruments at fair value in relation to their core business than companies belonging to other industries (Maffei, 2009).

According to the Orbis Bank Focus database, the number of financial entities listed in the 15 EU countries at the end of the fiscal year 2015 is 177, of which this study has excluded entities not listed over the entire period analysed (22 entities), as in Tsalavoutas, André, and Evans (2012) entities not reporting on 31 December (12 entities), entities involved in the real estate sector (3 entities), and financial entities with missing data (49 entities). Therefore, our final sample consists of 91 financial entities with 455 form-year observations.

Table 1 summarises the sample selection strategy (panel a) and presents the distribution of entities by countries (panel b). The table shows that despite our initial intent to study 15 EU countries, we had to exclude Luxembourg because of the absence of data regarding entities listed in this country.

Table 2 provides some descriptive statistics regarding accounting data. The methodological choice to use a share-deflated model is due to the divergence between the mean of such variables and their median values. Indeed, the dissimilarity is because of size differences between the entities that form our sample. The presence of big financial entities raises the mean over the median in all the cases. The percentiles suggest that at least 95% of the entities used observable inputs of level 1 and level 2 for financial assets' fair value estimates (96.48% and 98.24%, respectively). Fair value level 3 is used to estimate financial assets by

Table 1. Sample selection strategy and geographical distribution of the entities analysed.

Panel a) Sample selection strategy		No. of financial entities			
No. of publicly traded financial entities from Orbis Bank Focus		177			
Less financial entities not listed over the entire period analysed (2011–2015)		22			
Less financial entities not reporting on 31 December		12			
Less entities involved in the real estate sector		3			
Less financial entities with missing data		49			
Final sample		91			
Panel b) Geographical distribution of the entities analysed					
Countries	No. of country-banks (FY0)	Countries	No. of country-banks (FY0)	Countries	No. of country-banks (FY0)
Austria	5 (25)	Germany	8 (40)	Netherlands (The)	4 (20)
Belgium	1 (5)	Greece	6 (30)	Portugal	3 (15)
Denmark	7 (35)	Ireland	3 (15)	Spain	8 (40)
Finland	2 (10)	Italy	19 (95)	Sweden	6 (30)
France	7 (35)	Luxembourg	0 (0)	U.K.	12 (60)

The table describes the sample selection strategy. Moving from an initial sample of 177 financial entities, this study excludes groups unlisted over the entire period 2011–2015, those not reporting on 31 December, those involved in the real-estate sector and entities with missing data. After all these eliminations, the final sample numbers 91 entities. The table also describes the geographical distribution of the financial entities analysed, splitting them into the European countries that belong to the EU at the time of the issuance of Regulation 1606/2002. The problem of missing data leads us to exclude Luxembourg from the countries under analysis. The table distinguishes the number of country-banks and the number of firm-year observations (FYO).

Table 2. Descriptive statistics of accounting data.

(M/€)	Percentiles									Mean
	1%	5%	10%	25%	50%	75%	90%	95%	99%	
MV_{it}	46	86	156	500	2,048	11,400	33,700	49,000	105,000	10,700
NI_{it}	–8,842	–2,352	–634	5	66	403	2,274	3,811	10,600	284
BV_{it}	–1,022	98	184	591	2,480	13,100	53,400	75,300	128,000	14,600
$\overline{BV}_{it}$	–271,000	–160,000	–70,200	–8,786	–1,123	244	2,187	7,827	83,200	–121,000
FVA_{L1it}	0	1	43	638	3,578	23,500	112,000	178,000	341,000	34,100
FVA_{L2it}	0	4	18	191	1,914	20,100	179,000	380,000	600,000	583,000
FVA_{L3it}	0	0	0	11	169	2,200	11,000	21,400	5,526	4,084
FVL_{L1it}	0	0	0	0	34	3,463	28,300	45,000	110,000	149,000
FVL_{L2it}	0	0	0	51	1,479	20,200	155,000	360,000	743,000	52,300
FVL_{L12it}	0	0	1	84	2,153	28,000	180,000	433,000	790,000	201,300
FVL_{L3it}	0	0	0	0	0	308	6,627	140,000	625,000	4,243
TA_{it}	568	1,183	1,903	6,970	42,200	245,000	1,100,000	1,509,000	2,040,000	272,000

The table reports the main descriptive statistics of accounting amounts downloaded from the Orbis Bank Focus database over the period 2011–2015. MV_{it} is the market value three months after the closing date. NI_{it} is the net income. BV_{it} is the book value of equity. $\overline{BV}_{it}$ is the book value purged by those financial assets and liabilities measured at fair value disclosed in one of the levels of the fair value hierarchy. FVA_{L1it} are the financial assets measured at fair value by using observable inputs, whose fair value has been disclosed in level 1. FVA_{L2it} are the financial assets measured at fair value by using observable inputs, whose fair value has been disclosed in level 2. FVA_{L3it} are the financial assets measured at fair value by using unobservable inputs. FVL_{L1it} are the financial liabilities measured at fair value by using observable inputs, whose fair value has been disclosed in level 1. FVL_{L2it} are the financial liabilities measured at fair value by using observable inputs, whose fair value has been disclosed in level 2. FVL_{L12it} are the financial liabilities measured at fair value by using observable inputs. FVL_{L3it} are the financial liabilities measured at fair value by using unobservable inputs. TA_{it} is the total assets.

88% of the entities analysed. As to liabilities, 91.86% of the entities have used level 1 or level 2 inputs to estimate fair value liabilities and 44.83% level 3 inputs.

Table 3 tabulates the correlation coefficients among the variables used to estimate Equation (1). The table shows that most correlation coefficients are statistically significant at 1%.

Table 3. Correlation coefficients and multicollinearity diagnostics.

	P_{it}	$FVA_{1,it}$	$FVA_{2,it}$	$FVA_{3,it}$	$FVL_{12,it}$	$FVL_{3,it}$	$\overline{BV}_{it}$	NI_{it}	L_{it}	$L_{it} \times NI_{it}$	$\ln TA_{it}$
P_{it}	+1.00										
$FVA_{1,it}$	+0.79***	+1.00									
$FVA_{2,it}$	+0.79***	+0.90***	+1.00								
$FVA_{3,it}$	+0.52***	+0.54***	+0.55***	+1.00							
$FVL_{12,it}$	+0.73***	+0.86***	+0.95***	+0.53***	+1.00						
$FVL_{3,it}$	+0.02	+0.04	+0.01	+0.64***	-0.01	+1.00					
$\overline{BV}_{it}$	-0.65***	-0.79***	-0.70***	-0.39***	-0.59***	+0.01	+1.00				
NI_{it}	-0.76***	-0.78***	-0.81***	-0.44***	-0.73***	+0.02	+0.77***	+1.00			
L_{it}	+0.13***	+0.23***	+0.21***	+0.10**	+0.18***	+0.02	-0.21***	-0.26***	+1.00		
$L_{it} \times NI_{it}$	-0.77***	-0.78***	-0.81***	-0.45***	-0.73***	+0.16	+0.77***	+0.90***	-0.26***	+1.00	
$\ln TA_{it}$	+0.11**	+0.14***	+0.16***	+0.05	+0.16***	-0.01	-0.09*	-0.07	+0.06	-0.07	+1.00
Mean V.I.F. (including also dummy variables that control for time and countries' fixed effects)											4.51
Mean Condition number (including also dummy variables that control for time and countries' fixed effects)											14.72

The table shows the Pearson correlation coefficients of the variables used to estimate Equation (1). Considering the presence of high correlated regression coefficients, the table shows the most common statistics for multicollinearity diagnostics, that is, the VIF and the condition number. Variable definitions: P_{it} are the closing prices three months after the closing date. $FVA_{1,it}$ are the financial assets per-share measured at fair value by using observable inputs, whose fair value has been disclosed in level 1. $FVA_{2,it}$ are the financial assets per-share measured at fair value by using observable inputs, whose fair value has been disclosed in level 2. $FVA_{3,it}$ are the financial assets per-share measured at fair value by using unobservable inputs; $FVL_{12,it}$ are the financial liabilities per-share measured at fair value by using observable inputs. $FVL_{3,it}$ are the financial liabilities per-share measured at fair value by using unobservable inputs; $\overline{BV}_{it}$ is the book value per-share purged by those financial assets and liabilities measured at fair value disclosed in one of the levels of the fair value hierarchy. NI_{it} is net income per-share. L_{it} is a dummy variable that controls for the presence in the sample analysed of loss firms that is equal to 1 if earnings are negative and 0 otherwise. $\ln TA_{it}$ is the natural logarithm of total assets that controls for the size of the entity. ***denotes 1% level of significance; **denotes 5% level of significance; *denotes 10% level of significance.

Table 4. Descriptive statistics of governance and legal system variables.

Panel a) Corporate governance variables						
Panel a ₁) Correlation matrix						
	OWCON _{it}	%INDIR _{it}	CEOD _{it}	AUQ _{it}		
OWCON _{it}	+1.00					
% INDIR _{it}	+0.23	+1.00				
CEOD _{it}	+0.03	+0.20	+1.00			
AUQ _{it}	+0.14	+0.10	+0.09	+1.00		
Panel a ₂) Principal Component Analysis (PCA)						
Bartlett (1937) test of sphericity (Chi-square: 55.60***)						
Eigenvalue	+1.40					
Explained σ ²	+0.35					
	OWCON _{it}	%INDIR _{it}	CEOD _{it}	AUQ _{it}		
Factor loadings	+0.61	+0.72	+0.51	+0.50		
Panel a ₃) Averaged scores by countries						
Countries	GOVSCORE _{it}					
Austria	+0.42					
Belgium	−1.17					
Denmark	−0.36					
Finland	+1.46					
France	−0.86					
Germany	−0.63					
Greece	−0.46					
Ireland	−0.13					
Italy	+0.14					
Netherlands (The)	+0.38					
Portugal	−0.69					
Spain	+0.34					
Sweden	+0.41					
U.K.	+0.46					
Panel b) Legal system variables						
Panel b ₁) Correlation matrix						
	VA _{ct}	PSAV _{ct}	GE _{ct}	RQ _{ct}	RL _{ct}	CC _{ct}
VA _{ct}	+1.00					
PSAV _{ct}	+0.83	+1.00				
GE _{ct}	+0.92	+0.67	+1.00			
RQ _{ct}	+0.92	+0.69	+0.93	+1.00		
RL _{ct}	+0.91	+0.67	+0.98	+0.94	+1.00	
CC _{ct}	+0.94	+0.68	+0.98	+0.95	+0.97	+1.00
Panel b ₂) Principal Component Analysis (PCA)						
Bartlett (1937) test of sphericity (Chi-square: 5,644.01***)						
Eigenvalue	+5.34					
Explained σ ²	+0.89					
	VA _{ct}	PSAV _{ct}	GE _{ct}	RQ _{ct}	RL _{ct}	CC _{ct}
Factor loadings	+0.97	+0.79	+0.97	+0.96	+0.98	+0.97
Panel b ₃) Averaged scores by countries						
Countries	LEGALSORE _{ct}					
Austria	+0.74					
Belgium	+0.35					
Denmark	+1.20					
Finland	+1.36					
France	−0.02					
Germany	+0.67					
Greece	−1.76					
Ireland	+0.62					
Italy	−1.22					

(Continued)

Table 4. (Continued).

<i>Panel b₃) Averaged scores by countries</i>	
Countries	LEGALSCORE _{ct}
Netherlands (The)	+1.09
Portugal	−0.38
Spain	−0.66
Sweden	+1.28
U.K.	+0.49

The table shows the correlation coefficients between the governance variables (panel a₁) and legal system variables (panel b₁), which we summarised with the PCA. Panel a₂ and b₂ provide the Bartlett's sphericity test (1937), the eigenvalue of the principal factor, the explained variance as well as the factor loadings of governance and legal system metrics. Panel a₃ and b₃ provide, at a country-level, the mean of GOVSCORE_{it} and LEGALSCORE_{ct}. Variables definition: OWCON_{it} is the ownership concentration. %INDIR_{it} is the percentage of independent directors to the total board members. CEOD_{it} is a dummy that controls for CEO duality. AUQ_{it} is a dummy that controls for audit quality. VA_{ct} is the Voice and Accountability. PSAV_{ct} is the Political stability and absence of violence. GE_{ct} is the Government Effectiveness. RQ_{ct} is the regulatory quality. RL_{ct} is the Rule of law. CC_{ct} is the control of corruption. (***) denotes 1% level of significance.

Because some of the explicative variables are highly correlated, we calculated the variance inflation factor (VIF) and the condition number to test whether multicollinearity problems might bias the research results. Considering a rule of thumb that the VIF should not exceed 10 and that Greene (2003, p. 58) argues that values of the condition number in excess of 20 indicate a problem, the results of our tests do not suggest the existence of multicollinearity problems. While the mean value of VIF is 4.51, the one of the condition numbers is 14.72.

Table 4 tabulates useful statistics of the variables employed in computing the proxies for corporate governance (GOVSCORE_{it}) and legal system quality (LEGALSCORE_{ct}). The table distinguishes the statistics of corporate governance variables (panel a) and those regarding the legal systems (panel b). Panels a₁ and b₁ report the correlation coefficients among the variables that are summarised with PCA. Since – especially for the governance metrics – it is difficult to understand if there is enough intercorrelation between the variables, panels a₂ and b₂ tabulate the Bartlett's (1937) sphericity test as well as other statistics such as the eigenvalues of the principal factors, the explained variance and the factor loadings of governance and legal system metrics. Findings suggest that the test of sphericity rejects the null hypothesis (at 1 per cent) that no intercorrelation exists among the variables. Therefore, considering that a statistical significance under 5% is sufficient to proceed with PCA (Hair, Black, Babin, & Anderson, 2010), this test provides evidence that PCA can be correctly performed for both governance and legal system variables. Running PCA separately for these variables, we retained only the first factor, based on the Kaiser criterion, because we found its eigenvalue to be higher than 1 (i.e. 1.40 for governance variables and 5.34 for legal system variables). The factor loadings show that all the initial variables are positively correlated with the factor retained. It is interesting to observe that the percentage of independent directors (for the corporate governance variables) and the rule of law (for the legal system variables) are the most relevant in defining the factor's dimensionality. Panels a₃ and b₃ show our aggregate scores (LEGALSCORE_{ct} and GOVSCORE_{it}), whose values are reported at a country level. While the values of LEGALSCORE_{ct} are the same for each entity that operate in a certain country, the values of GOVSCORE_{it} are the average values of entities that operate in each country

analysed. Statistics show countries where both the scores have a negative sign (France, Greece and Portugal), countries where the signs are not concordant (Belgium, Denmark, Ireland, Germany, Italy and Spain) and countries where both the scores have positive signs (Austria, Finland, The Netherlands, Sweden and the U.K.).

5. Empirical findings

5.1 Main analysis

Table 5 presents the results of the estimation of Equation (1) for the full sample and for the subsamples of low- and high-quality legal systems.

Consistent with the evidence provided by prior literature (e.g. Goh et al., 2015; Siekkinen, 2016, 2017; Song et al., 2010), we find that Level 1, Level 2 and Level 3 fair value measures of financial instruments are value relevant. Test statistics do not provide evidence that coefficients of the financial assets are statistically different from each other at the 5% level of significance. The t-statistics of regression coefficients decrease moving from level 1 to level 3. As to financial liabilities, while the valuation coefficients are statistically different from each other, the absolute values of t-statistics decrease moving from level 1 to level 3.

Table 5. Value relevance of fair value financial instruments under low- and high-quality legal systems.

	FULL SAMPLE		CLUSTER 1A LOW-QUALITY LEGAL SYSTEM		CLUSTER 2A HIGH-QUALITY LEGAL SYSTEM	
	Coefficients	T-statistics	Coefficients	t-Statistics	Coefficients	t-Statistics
FVA_{L1it}	+0.34	+4.91***	+0.08	+5.77***	+0.06	+2.54**
FVA_{L2it}	+0.33	+3.25***	+0.12	+0.68	+0.02	+1.76*
FVA_{L3it}	+0.84	+2.69***	+0.54	+1.48	+0.01	+0.26
FVL_{L12it}	-0.33	-3.35***	-0.07	-0.58	-0.01	-4.06***
FVL_{L3it}	-0.76	-2.14**	-0.40	-1.31	-0.02	-0.27
BV_{it}	+0.25	+3.77***	+0.12	+1.88	+0.04	+2.19**
NI_{it}	+1.20	+2.89***	+3.41	+2.67***	+6.87	+11.68***
L_{it}	-2.85	-0.78	+2.51	+0.30	-2.73	-1.42
$L_{it} \times NI_{it}$	-1.27	-1.54	-3.62	-2.84***	-9.87	-7.77
$\ln TA_{it}$	-0.41	-0.64	-0.63	-0.79	-0.50	-2.00**
Intercept	+11.72	+1.41	+44.01	+2.06**	+4.33	+0.34
N° FYO	455		229		226	
R ²	88%		86%		76%	
	$FVA_{L1} = FVA_{L2} (+0.27)$				$FVA_{L1} = FVA_{L2} (+2.87^*)$	
	$FVA_{L1} = FVA_{L3} (+3.03^*)$					
	$FVA_{L2} = FVA_{L3} (+2.65)$					
	$FVL_{L12} = FVL_{L3} (+57.95***)$					

The table shows the regression parameters of Equation (1) for the full sample and for the clusters of low- and high-quality legal systems. The table also shows the t-statistics of tests used to compare the magnitude of statistically significant regression coefficients of financial assets and liabilities disclosed in the fair value hierarchy. Due to possible heteroskedasticity, the t-statistics of the regression coefficients have been adjusted employing robust standard deviations (White, 1980).

Variable definitions: FVA_{L1it} are the financial assets per-share measured at fair value by using observable inputs, whose fair value has been disclosed in level 1. FVA_{L2it} are the financial assets per-share measured at fair value by using observable inputs, whose fair value has been disclosed in level 2. FVA_{L3it} are the financial assets per-share measured at fair value by using unobservable inputs; FVL_{L12it} are the financial liabilities per-share measured at fair value by using observable inputs. FVL_{L3it} are the financial liabilities per-share measured at fair value by using unobservable inputs. BV_{it} is the book value per-share purged by those financial assets and liabilities measured at fair value disclosed in one of the levels of the fair value hierarchy. NI_{it} is net income per-share. L_{it} is a dummy variable that controls for the presence in the sample analysed of loss firms that is equal to 1 if earnings are negative and 0 otherwise. $\ln TA_{it}$ is the natural logarithm of total assets that controls for the size of the entity. (***) denotes 1% level of significance; (**) denotes 5% level of significance; (*) denotes 10% level of significance.

When we re-estimate Equation (1) for the subsamples of low- and high-quality legal systems, we find evidence consistent with our first hypothesis. In the cluster of firms that operate in low-quality legal systems (cluster 1a), only earnings and level 1 fair value assets are value relevant at a 1% level of significance. In the cluster of firms that operate in high-quality legal systems (cluster 2a), investors price also level 2 fair value assets (p -value = 0.08) and the first two levels of fair value liabilities (p -values $\leq 1\%$). The results also suggest that the value relevance of the earnings of firms that do not report a loss in the income statement (NI_{it}) is higher in countries with high-quality legal systems than in those with low-quality legal systems. Similarly, the book value, purged by financial assets and liabilities measured at fair value ($\overline{BV}_{it}$), is value relevant only in countries with high-quality legal systems.

To test whether the quality of legal systems affects the ability of corporate governance to affect the value relevance of fair value estimates, we run Equation (1) over the four clusters that allow the study of the interactions between corporate governance and the quality of legal systems. As in Table 5, the results reported in Table 6 suggest that level 1 fair value assets are always value relevant, independently of the quality of both

Table 6. Value relevance of fair value financial instruments under low- and high-quality corporate governance and legal system.

	CLUSTER 1B		CLUSTER 2B		CLUSTER 3B		CLUSTER 4B	
	LOW-QUALITY GOVERNANCE LOW-QUALITY LEGAL SYSTEM		LOW-QUALITY GOVERNANCE HIGH-QUALITY LEGAL SYSTEM		HIGH-QUALITY GOVERNANCE LOW-QUALITY LEGAL SYSTEM		HIGH-QUALITY GOVERNANCE HIGH-QUALITY LEGAL SYSTEM	
	Coefficients	t-Statistics	Coefficients	t-Statistics	Coefficients	t-Statistics	Coefficients	t-Statistics
FVA_{L1it}	+0.21	+2.67***	+0.26	+3.24***	+0.47	+7.28***	+0.66	+5.07***
FVA_{L2it}	+0.16	+1.14	+0.29	+3.22***	+0.57	+5.74***	+0.54	+4.32***
FVA_{L3it}	+0.17	+1.48	-0.01	-0.25	+1.02	+1.16	+0.76	+3.79***
FVL_{L12it}	-0.15	-1.25	-0.28	-3.18***	-0.53	-5.97***	-0.56	-4.34***
FVL_{L3it}	-0.08	-0.55	-0.07	-0.83	-0.93	-1.14	-0.55	-2.57***
$\overline{BV}_{it}$	+0.14	+2.01**	+0.32	+3.56***	+0.45	+9.75***	+0.56	+4.33***
NI_{it}	+2.36	+2.50**	+4.77	+4.12***	+0.54	+2.90***	+2.39	+1.82*
L_{it}	-8.20	-1.68*	-2.95	-0.87	-2.40	-0.91	-0.87	-0.61
$L_{it} \times NI_{it}$	-2.45	-2.62**	-6.37	-2.64**	-0.56	-2.28**	-2.03	-0.99
$\ln TA_{it}$	-0.86	-1.55	+1.19	+2.39**	-1.24	-2.75***	-1.49	-5.98***
Intercept	+38.80	+3.01***	-8.92	-0.79	+22.16	+1.45	+16.43	+3.07***
N° FYO	123		104		106		122	
R^2	93%		85%		94%		80%	
			$FVA_{L1} = FVA_{L2}$ (0.61)		$FVA_{L1} = FVA_{L2}$ (0.74)		$FVA_{L1} = FVA_{L2}$ (22.80***)	
							$FVA_{L1} = FVA_{L3}$ (0.50)	
							$FVA_{L2} = FVA_{L3}$ (2.10)	
							$FVL_{L12} = FVL_{L3}$ (0.01)	

The table shows the regression parameters of Equation (1) estimated over the clusters that control for different interactions between corporate governance and legal systems. In the table, there are also the t-statistics of tests used to compare the magnitude of statistically significant regression coefficients of financial assets and liabilities disclosed in the fair value hierarchy. Due to possible heteroskedasticity, the t-statistics of the regression coefficients have been adjusted employing robust standard deviations (White, 1980). Variable definitions: FVA_{L1it} are the financial assets per-share measured at fair value by using observable inputs, whose fair value has been disclosed in level 1. FVA_{L2it} are the financial assets per-share measured at fair value by using observable inputs, whose fair value has been disclosed in level 2. FVA_{L3it} are the financial assets per-share measured at fair value by using unobservable inputs; FVL_{L12it} are the financial liabilities per-share measured at fair value by using observable inputs. FVL_{L3it} are the financial liabilities per-share measured at fair value by using unobservable inputs. $\overline{BV}_{it}$ is the book value per-share purged by those financial assets and liabilities measured at fair value disclosed in one of the levels of the fair value hierarchy. NI_{it} is net income per-share. L_{it} is a dummy variable that controls for the presence in the sample analysed of loss firms that is equal to 1 if earnings are negative and 0 otherwise. $\ln TA_{it}$ is the natural logarithm of total assets that controls for the size of the entity. (***) denotes 1% level of significance; (**) denotes 5% level of significance; (*) denotes 10% level of significance

corporate governance and legal systems. This is likely because the fair value is estimated by using observable inputs referring to the same assets, with a very low probability of intentional and unintentional mistakes in fair value estimates.

Regarding level 2 and level 3 fair value assets, value relevance changes according to how the quality of firm-level corporate governance and country-level legal system interact, validating our second hypothesis that the effect of corporate governance on the value relevance of fair value estimates depends on the country-level legal system. More specifically, findings suggest that firm-level corporate governance is more valuable in countries with high-quality legal systems. Comparing clusters 1b and 3b, we find that in countries with low-quality legal systems, high-quality corporate governance makes level 2 fair value assets and levels 1 and 2 fair value liabilities value relevant. The coefficients of fair value assets and liabilities measured by using unobservable inputs are not value relevant, suggesting that in low-quality legal systems, firm-level corporate governance is not sufficient to make the opaquest fair value estimates value relevant. Results change when we examine the high-quality legal system sub-samples (i.e. clusters 2b and 4b). Level 3 fair value assets and liabilities become value relevant in cluster 4b, when strong corporate governance is accompanied by a high-quality legal system. The results tabulated in [Table 6](#) also provide evidence that using the t-statistics as measures of value relevance, in clusters 2b, 3b and 4b, where at least two categories of financial assets and liabilities are value relevant, their absolute value decreases, moving from level 1 to level 3. The test of differences between statistically significant regression coefficients suggests that where either the quality of corporate governance or legal system act (i.e. clusters 2b and 3b), investors consider value relevant fair value assets estimated by using observable inputs (levels 1 and 2) in the same manner (the difference between fair value level 1 and level 2 is not significant at 5%). In cluster 4b, the tests suggest that while the coefficient of fair value assets level 1 is statistically different from that of level 2 at the 1% level of significance, the coefficient of fair value assets level 3 is not different from the coefficients of levels 1 and 2. As to fair value liabilities, the coefficients of liabilities measured with observable inputs are not different from the one measured using unobservable inputs.

5.2 Sensitivity analyses

To test the robustness of our findings, we have implemented three sensitivity analyses.

In the first test, we have used a price model with undeflated variables. In the second test, we have re-estimated the regression parameters of Equation (1) without the control variables L_{it} , $L_{it} \times NI_{it}$ and $\ln TA_{it}$. All the findings obtained in the main analysis are confirmed in these robustness checks. Findings validate the hypothesis that differences in the quality of legal systems positively affect the value relevance of fair value estimates and that the effect of firm-level corporate governance on the value relevance of fair value assets and liabilities is stronger in countries with high-quality legal systems.

In the last test, we have used the World Bank's variables, RQ_{ct} , RL_{ct} and CC_{ct} as a measure of the quality of legal systems. This indicator is less broad than the one used in the main analysis. The results shown in [Table 7](#) confirm those achieved in the main analysis. Panel (a) shows that the quality of a legal system positively affects the value relevance of fair value estimates and in particular of level 2, validating our first hypothesis. In addition, the

Table 7. Sensitivity analyses: new metric for LEGALSCORE_{ct}.

Panel a)	CLUSTER 1A		CLUSTER 2A	
	LOW-QUALITY LEGAL SYSTEM		HIGH-QUALITY LEGAL SYSTEM	
	Coefficients	t-Statistics	Coefficients	t-Statistics
FVA_{L1it}	+0.09	+5.77***	+0.07	+3.41***
FVA_{L2it}	+0.12	+0.67	+0.07	+2.16**
FVA_{L3it}	+0.54	+1.49	+0.01	+0.25
FVL_{L12it}	-0.07	-0.58	-0.01	-1.43
FVL_{L3it}	-0.41	-1.32	-0.02	-0.27
$\overline{BV}_{it}$	+0.12	+1.88*	+0.37	+2.45**
L_{it}	+2.51	+0.30	-2.73	-1.42
$L_{it} \times NI_{it}$	-3.63	-2.84***	-9.87	-7.77***
$\ln TA_{it}$	-0.63	-0.79	-0.50	-2.00**
Intercept	+44.01	+2.06**	+4.33	+0.96
N° FYO	229		226	
R ²	86%		74%	
FVAL1 = FVAL2 (+0.25)				

Panel b)	CLUSTER 1B		CLUSTER 2B		CLUSTER 3B		CLUSTER 4B	
	LOW-QUALITY GOVERNANCE LOW-QUALITY LEGAL SYSTEM		LOW-QUALITY GOVERNANCE HIGH-QUALITY LEGAL SYSTEM		HIGH-QUALITY GOVERNANCE LOW-QUALITY LEGAL SYSTEM		HIGH-QUALITY GOVERNANCE HIGH-QUALITY LEGAL SYSTEM	
	Coefficients	t-Statistics	Coefficients	t-Statistics	Coefficients	t-Statistics	Coefficients	t-Statistics
FVA_{L1it}	+0.21	+2.65***	+0.32	+3.45***	+0.47	+7.32***	+0.54	+4.15***
FVA_{L2it}	+0.16	+1.14	+0.34	+3.35***	+0.57	+5.72***	+0.42	+3.40***
FVA_{L3it}	+0.16	+1.47	-0.03	-0.98	+1.05	+1.20	+0.65	+3.04***
FVL_{L12it}	-0.15	-1.25	-0.33	-3.30***	-0.53	-5.93***	-0.43	-3.39***
FVL_{L3it}	-0.09	-0.66	-0.04	-0.56	-0.96	-1.19	-0.44	-1.98**
$\overline{BV}_{it}$	+0.14	+2.00***	+0.37	+3.72***	+0.46	+9.76***	+0.44	+3.38***
NI_{it}	+2.39	+2.55**	+4.38	+3.51***	+0.58	+2.85***	+3.57	+3.41***
L_{it}	-7.85	-1.54	-2.44	-0.79	-2.79	-1.01	-0.41	-0.34
$L_{it} \times NI_{it}$	-2.47	-2.67***	-5.54	-2.23***	-0.62	-2.29**	-3.55	-1.88***
$\ln TA_{it}$	-0.88	-1.52	+1.11	+2.48**	-1.08	-2.04**	-1.41	-6.47***
Intercept	+24.69	+2.28**	-27.61	-3.02***	+16.10	+1.34	+24.74	+6.24***
N° FYO	125		102		105		123	
R ²	94%		86%		94%		81%	
		FVAL _{L1} = FVAL _{L2} (+0.25)		FVAL _{L1} = FVAL _{L2} (+0.75)		FVAL _{L1} = FVAL _{L2} (36.97***) FVAL _{L1} = FVAL _{L3} (0.48) FVAL _{L2} = FVAL _{L3} (2.15) FVL _{L12} = FVAL _{L3} (0.01)		

Panel (a) shows the regression parameters of equation (1) estimated over the clusters of high-quality and low-quality legal systems. With respect to the main analysis, the quality of legal systems has been assessed by splitting at the median an aggregate score calculated by summarising with the PCA the World Bank's variables, Regulatory Quality (RQ_{ct}), Rule of Law (RL_{ct}) and Control of Corruption (CC_{ct}). In the table, there are also the t-statistics of tests used to compare the magnitude of statistically significant regression coefficients of financial assets and liabilities disclosed in the fair value hierarchy. Panel (b) shows the regression parameters estimated running Equation (1) over the four clusters that allow investigating the effects that the interactions between corporate governance and the quality of legal systems have on the value relevance of fair value estimates. Other than the regression coefficients and the t-statistics, the table shows the test used to compare the regression coefficients. Variable definitions: FVA_{L1it} are the financial assets per-share measured at fair value by using observable inputs, whose fair value has been disclosed in level 1. FVA_{L2it} are the financial assets per-share measured at fair value by using observable inputs, whose fair value has been disclosed in level 2. FVA_{L3it} are the financial assets per-share measured at fair value by using unobservable inputs; FVL_{L12it} are the financial liabilities per-share measured at fair value by using observable inputs. FVL_{L3it} are the financial liabilities per-share measured at fair value by using unobservable inputs. $\overline{BV}_{it}$ is the book value per-share purged by those financial assets and liabilities measured at fair value disclosed in one of the levels of the fair value hierarchy. NI_{it} is net income per-share. L_{it} is a dummy variable that controls for the presence in the sample analysed of loss firms that is equal to 1 if earnings are negative and 0 otherwise. $\ln TA_{it}$ is the natural logarithm of total assets that controls for the size of the entity. (***) denotes 1% level of significance; (**) denotes 5% level of significance; (*) denotes 10% level of significance.

findings validate the second hypothesis that the effect of corporate governance on the value relevance of fair value estimates depends on the country-level legal system. In fact, panel b) shows that in countries with low-quality legal systems, high-quality corporate governance

makes level 2 fair value assets and fair value liabilities measured by using observable inputs value relevant (i.e. clusters 1b and 3b). Level 3 fair value assets and liabilities are value relevant only for financial entities with strong corporate governance operating in countries with high-quality legal systems (i.e. cluster 4b). The results also confirm that level 1 fair value assets are value relevant in all the clusters analysed.

6. Conclusions

This paper demonstrates that differences in the quality of country-level legal systems affect not only the value relevance of fair value estimates but also the ability of firm-level corporate governance to affect the weight investors place on such estimates. Our research confirms that the effectiveness of corporate governance mechanisms is affected by differences in institutional variables (Bruton et al., 2010).

The analysis of a sample of financial entities listed in European countries over the period 2011–2015 provides evidence that the quality of legal systems positively affects the value relevance of fair value estimates and in particular that of level 2. The findings also show that strong firm-level corporate governance is more valuable in countries with high-quality country-level legal system. Only in these countries, the fair value measured by using unobservable inputs is value relevant.

Our findings contribute to the debate about the effectiveness of firm-level corporate governance in different institutional settings. In particular, our findings concerning the effect of the quality of corporate governance and legal systems on the value relevance of fair value estimates are interesting to the extent they complement findings reported by papers that separately investigated the effect of the quality of corporate governance (Siekkinen, 2017; Song et al., 2010) and investor protection (Siekkinen, 2016) on the value relevance of fair value measurements, by showing that interactions between corporate governance and legal systems really matter for the weight investors place on accounting amounts.

This study suffers from several limitations that point to several avenues for future research. The first concerns the variables we selected to build our aggregate scores. Future research should focus on other elements that affect the quality of corporate governance, such as the size of the board, and other measures of the legal system of the country where firms operate. The second regards the sample analysed. Future studies should address the same research questions investigating the value relevance of fair value estimates by analysing financial entities listed in all the European countries. This will increase the sample size of the clusters used to test our second research hypothesis. Similarly, future research might extend the sample to non-financial entities that have to disclose the fair value hierarchy for all the assets and liabilities measured at fair value according to the requirement of IFRS 13.

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References

- Balachandran, S., & Mohanran, P. (2011). Is the decline in the value relevance of accounting driven by increased conservatism? *Review of Accounting Studies*, 16(2), 272–301.
- Bartlett, M. S. (1937). Properties of sufficiency and statistical tests. *Proceedings of the Royal Statistical Society*, 160(A), 268–282.
- Boone, A. L., Field, C. L., Karpoff, J. M., & Raheja, C. G. (2007). The determinants of corporate board size and composition: An empirical analysis. *Journal of Financial Economics*, 85(1), 66–101.
- Broberg, P., Tagesson, T., & Collin, S. O. (2010). What explains variation in voluntary disclosure? A study of the annual reports of corporations listed on the stockholm stock exchange. *Journal of Management and Governance*, 14(4), 351–377.
- Bruton, G., Filatotchev, I., Chahine, S., & Wright, M. (2010). Governance, ownership structure and performance of ipo firms: The impact of different types of private equity investors and institutional environments. *Strategic Management Journal*, 31(5), 491–509.
- Callao, S., Cimini, R., & Jarne, J. I. (2016). Value relevance of accounting figures in presence of earnings management. Are enforcement and ownership diffusion really enough? *Journal of Business Economics and Management*, 17(6), 1286–1299.
- Cerbioni, F., & Parbonetti, A. (2007). Exploring the effects of corporate governance on intellectual capital disclosure: An analysis of European biotechnology companies. *European Accounting Review*, 16(4), 791–826.
- Chambers, D., Linsmeier, T. J., Shakespeare, C., & Sougiannis, T. (2007). An evaluation of SFAS no. 130 comprehensive income disclosures. *Review of Accounting Studies*, 12(4), 557–593.
- Chang, H., Chen, X., & Zhou, N. (2013). Determinants and Consequences of Audit Committee Effectiveness: Evidence from China. *Working paper*.
- Chen, K. C., Chen, Z., & Wei, K. J. (2009). Legal protection of investors, corporate governance, and the cost of equity capital. *Journal of Corporate Finance*, 15(3), 273–289.
- Chung, S. G., Goh, B. W., Ng, J., & Ow Yong, K. (2017). Voluntary fair value disclosures beyond SFAS 157's three-level estimates. *Review of Accounting Studies*, 22(1), 430–468.
- Coles, J. L., Daniel, N. D., & Naveen, L. (2008). Boards: Does one size fit all? *Journal of Financial Economics*, 87(2), 329–356.
- Core, J. E., Guay, W. R., & Van Buskirk, A. (2003). Market valuations in the new economy: An investigation of what has changed. *Journal of Accounting and Economics*, 34(1), 43–67.
- Doidge, C., Karolyi, G. A., & Stulz, R. M. (2007). Why do countries matter so much for corporate governance? *Journal of Financial Economics*, 86(1), 1–39.
- Durnev, A., & Kim, E. H. (2005). To steal or not to steal: Firm attributes, legal environment and valuation. *Journal of Finance*, 60(3), 1461–1493.
- Ernstberger, J., Stich, M., & Vogler, O. (2012). Economic consequences of accounting enforcement reforms: The case of Germany. *European Accounting Review*, 21(2), 217–251.
- Francis, J. R., Khurana, I. K., Martin, X., & Pereira, R. (2008). The role of firm-specific incentives and country factors in explaining voluntary IAS adoptions: Evidence from private firms. *European Accounting Review*, 17(22), 331–360.
- Goh, B. W., Li, D., Ng, J., & Yong, K. O. (2015). Market pricing of banks' fair value assets reported under SFAS 157 since the 2008 financial crisis. *Journal of Accounting and Public Policy*, 34(2), 129–145.

- Goldman, E., & Slezak, S. L. (2006). An equilibrium model of incentive contracts in the presence of information manipulation. *Journal of Financial Economics*, 80(3), 603–626.
- Greene, W. H. (2003). *Econometric analysis*. Pearson Education India.
- Guedhami, O., & Pittman, J. A. (2006). Ownership concentration in privatized firms: The role of disclosure standards, auditor choice, and auditing infrastructure. *Journal of Accounting Research*, 44(5), 889–929.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis: A Global Perspective* (7th ed.). Upper Saddle River, NJ: Pearson Education.
- Hayn, C. (1995). The information content of losses. *Journal of Accounting and Economics*, 20(2), 125–153.
- Hope, O., Kang, T., & Thomas, W. (2006). International evidence on the association between excess auditor remuneration and the implied required rate of return. *Working Paper*, University of Toronto.
- Hsien, L. L., & Hua, L. (2013). Do Big 4 audit firms improve the value relevance of earnings and equity? *Managerial Auditing Journal*, 28(7), 628–646.
- Ivashkovskaya, I., & Stepanova, A. (2011). Does strategic corporate performance depend on corporate financial architecture? empirical study of European, Russian and other emerging market's firms. *Journal of Management and Governance*, 15(4), 603–616.
- Karjalainen, J. (2011). Audit quality and cost of debt capital for private firms: Evidence from Finland. *International Journal of Auditing*, 15(1), 88–108.
- Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010). The Worldwide Governance Indicators: A summary of methodology, data and analytical issues. *World Bank Policy Research Working Paper No. 5430*.
- Kent, P., Routledge, J., & Stewart, J. (2010). Innate and discretionary accruals quality and corporate governance. *Accounting and Finance*, 50(1), 171–195.
- Klapper, L., & Love, I. (2004). Corporate governance, investor protection and performance in emerging markets. *Journal of Corporate Finance*, 10(5), 703–728.
- Klein, A. (2002). Economic determinants of audit committee independence. *Accounting Review*, 77(2), 435–452.
- Kumar, P., & Zattoni, A. (2015). Ownership structure, corporate governance and firm performance. *Corporate Governance: An International Review*, 23(6), 469–471.
- Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: An international comparison. *Journal of Financial Economics*, 69(3), 505–527.
- Linck, J. S., Netter, J. M., & Yang, T. (2008). A large sample study on board changes and determinants of board structure. *Journal of Financial Economics*, 87(2), 308–328.
- Maffei, M. (2009). La disclosure sugli strumenti finanziari secondo gli IFRS. Principi generali e profili applicativi. *Rivista dei Dottori Commercialisti*, 3.
- Mechelli, A., & Cimini, R. (2014). Is comprehensive income value relevant and does location matter? A European study. *Accounting in Europe*, 11(1), 59–87.
- Méndez, C., & García, R. (2007). The effects of ownership structure and board composition on the audit committee meeting frequency: Spanish evidence. *Corporate Governance: An International Review*, 15(5), 909–922.
- Menon, K., & Williams, J. (1994). The use of audit committees for monitoring. *Journal of Accounting and Public Policy*, 13(2), 121–139.
- Nagar, V., & Petacchi, P. (2005). An economy-level model of earnings management with endogenous enforcement. In *SSRN.com/abstract* Vol. 806684.
- Nobes, C. W., & Parker, R. (2010). *Comparative International Accounting*. Upper Saddle River, NJ: Prentice Hall.
- Ohlson, J. A. (1995). Earnings, book values, and dividends in equity valuation. *Contemporary Accounting Research*, 11(2), 661–688.
- Pathan, S., & Skully, M. (2010). Endogenously structured boards of directors in banks. *Journal of Banking & Finance*, 34(7), 1590–1606.
- Piot, C. (2004). The existence and independence of audit committees in France. *Accounting and Business Research*, 34(3), 223–246.

- Ronen, J. (2008). To fair value or not to fair value: A broader perspective. *Abacus*, 44(2), 181–208.
- Ronen, J. (2012). What Do FAS 157 “Fair Values” really measure: Value or risk? *Accounting Perspectives*, 11(3), 149–164.
- Sforza, V., & Cimini, R. (2017). Central government accounting harmonization in EU member states: Will EPSAS be enough? *Public Money and Management*, 37(4), 301–308.
- Siekkinen, J. (2016). Value relevance of fair values in different investor protection environments. *Accounting Forum*, 40(1), 1–15. doi:10.1016/j.accfor.2015.11.001
- Siekkinen, J. (2017). Board characteristics and the value relevance of fair values. *Journal Of Management & Governance*, 21(2), 435–471. doi: 10.1007/s10997-016-9350-8
- Sierra Garcia, L., Ruiz Barbadillo, E., & Orta Perez, M. (2012). Audit committee and internal audit and the quality of earnings: empirical evidence from Spanish companies. *Journal of Management and Governance*, 16(2), 305–331.
- Song, C. J., Thomas, W. B., & Yi, H. (2010). Value relevance of FAS No. 157 fair value hierarchy information and the impact of corporate governance mechanisms. *The Accounting Review*, 85(4), 1375–1410.
- Song, J., & Windram, B. (2004). Benchmarking audit committee effectiveness in financial reporting. *International Journal of Auditing*, 8(3), 195–205.
- Tsalavoutas, I., André, P., & Evans, L. (2012). The transition to IFRS and the value relevance of financial statements in Greece. *The British Accounting Review*, 44(4), 262–277.
- Veltri, S., & Ferraro, O. (2012). La value relevance incrementale dell’other comprehensive income rispetto al net income. Un’analisi sulle società quotate in Italia. *Financial Reporting*, 3, 9–29.
- White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica*, 48(4), 817–830.
- Yang, T., & Zhao, S. (2014). CEO duality and firm performance: Evidence from an exogenous shock to the competitive environment. *Journal of Banking & Finance*, 49, 534–552.
- Zeng, Y., Lee, E., & Zhang, J. (2016). Value relevance of alleged corporate bribery expenditures implied by accounting information. *Journal of Accounting and Public Policy*, 35(6), 592–608.