



The compensation of CEOs and the relevance of fair value accounting

Impacto de la compensación de los CEOs en la pertinencia de la información contable: la utilización del valor razonable

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Abstract

The purpose of this article is to investigate the impact of executive compensation and its relation to the value relevance of fair value accounting. Using a sample of companies from 2007 to 2016 and based on a modified model of Ohlson (1995), we find that the bonus intensity in executive compensation provides a positive incentive for managers to disclose their insider information in financial reporting, which results in greater value relevance of fair value information. The results also show that this positive motivation only applies to Level 2 fair values, where there is still a comparative market price. However, when there is no information about the market price of an item reported in the financial statements, managers tend to manipulate the valuation of Level 3 fair value inputs, which results in less value relevance of fair value accounting. The results help to improve the knowledge of management incentives in the determination of valuation in financial reporting. The findings also shed light on the conditions of decision usefulness of fair value accounting. This study contributes to the literature by providing evidence of the moderating role that executive compensation plays in the usefulness of fair value accounting.

JEL Classification: J30, J33, J39, M52

Keywords: Accruals; CEO compensation, Bonus intensity, Fair value accounting, Value relevance and Decision-usefulness.

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Resumen

El propósito de este artículo es indagar sobre el impacto que la compensación de los ejecutivos tiene sobre la pertinencia de la valuación de la organización cuando ésta utiliza el valor razonable. Para evaluar las hipótesis, se emplea una muestra de 16.338 observaciones que comprende desde 2007 a 2016 y un modelo modificado de Ohlson (1995). Los resultados sugieren que la intensidad de la compensación del CEO brinda un incentivo positivo para que los gerentes divulguen su información privilegiada en la información financiera, lo que da como resultado una mayor pertinencia del valor de la información cuando se usa la contabilidad a valor razonable. Los resultados también muestran que esta motivación positiva sólo se aplica a los valores razonables del Nivel 2, en los que aún existe un precio de mercado comparativo. Sin embargo, cuando no hay información alguna sobre el precio de mercado de un elemento en los estados financieros, los gerentes tienden a manipular la valoración de los datos de valor razonable de Nivel 3, lo que da como resultado una menor pertinencia del valor razonable. Los resultados ayudan a mejorar el conocimiento de los incentivos de gestión (compensación de CEO) en la determinación de los valores razonables. Contribuye a la literatura al proporcionar evidencia de cómo la remuneración del ejecutivo juega un papel importante como variable moderadora en la valuación de empresas cuando éstas usan el valor razonable.

Código JEL: J30, J33, J39, M52

Palabras clave: Compensación de CEO, Intensidad de la compensación, Contabilidad de valor razonable, Pertinencia del valor y Utilidad para la decisión.

Introduction

This work studies the impact of CEO compensation on the value relevance of accounting information when fair value accounting is used. The recent deliberations of the International Accounting Standard Board (IASB) and of the Financial Accounting Standards Board (FASB) of the United States have demanded more reasonable fair value measurements for the assets and liabilities in financial information. As a result, determining if fair value accounting surpasses its alternative—historical cost accounting—has been the subject of heated discussions. To provide evidence on the decision usefulness of fair value accounting, several studies examine the value relevance of fair value accounting, that is, the capacity of the fair value numbers to explain the stock prices (Barth, 1994, Petroni and Wahlen, *et al.*, 1996, Nelson 1996, Barth *et al.*, 1996, Song *et al.*, 2010). The literature suggests that the value relevance of fair value accounting information is not consistent between the items that are being measured. In the same manner, Penman (2007) identifies, at a theoretical level, the circumstances under which the fair value should be a plus or a minus. This study expands the line of research above by identifying a possible scenario when the fair value may not be the best candidate as a measurement basis: the explanation of earnings management. Specifically, we investigate whether the value relevance of fair value accounting decreases for the companies with managers that have more incentives to manipulate income, measured by the CEO compensation of with a big bonus component based on the price of market shares.

Fair value accounting is a double-edged sword. On the one hand, under a fair value accounting system, the assets and liabilities are measured by their market prices or estimated market prices when the the market prices cannot be observed. In this regard, fair value's timely updates of the financial standing of the company satisfies the information needs of the decision makers, provided that it is reliably measured. However, fair value also has defects that damage

their relevance in the valuation of companies. For example, some fair value measures have low reliability. When certain assets or liabilities do not have an observable market value, the measure of the fair value of those assets or liabilities could entail administrative discretion (arbitrary decisions of the managers) and estimation errors. As a result, fair values could imply a lower reliability. On the other hand, historical cost accounting has the trait of objectivity, that is, it is easily verifiable and has a low susceptibility to assumptions and value judgements (Ijiri, 1967). This is a key reason why it has been the main method used in the preparation of financial information for centuries. However, the values and the historical costs differ when the market and the economic conditions change. Even if the reliable historical record of the financial situation of an entity provides verifiable records of the previous performance, it does not satisfy the needs for information of the investors (that is, shareholders and debt security holders) who are looking for relevant information that could help them predict the future performance of the companies.

This study is driven by the current debate regarding the pros and cons of fair value accounting against historical costs accounting. It is impossible to judge if fair value accounting improves the relevance of accounting information from a purely theoretical perspective, as it actually incurs in a loss of reliability in favor of more relevance. Fair value can surpass historical cost in certain scenarios when reliability is less important, but it is a less desirable measurement basis if there is a strong motivation to abuse the discretions of the management when determining fair value. In this article we argue that the compensation of CEOs with a big bonus component based on earnings gives managers motivation to manipulate the input of fair value, resulting in a lower value relevance or usefulness of the accounting information.

Following the line of Shalev *et al.* (2013), the intensity of bonuses paid to the executives is used as a measure of executive compensation. In general, the importance of deferred compensation through bonuses with different characteristics provides a positive incentive for managers to disclose their privileged information in the financial reports, which results in a greater value relevance of fair value information. Furthermore, our empirical results concerning the breakdowns of fair value show that this positive motivation is only applied to Level 2 fair value, in which there is a comparative market price. However, when there is no information on the market price of an element in the financial statement, managers tend to manipulate the assessment of elements that act as Level 3 fair value, which results in a lower value relevance of fair values.

The contribution of this study consists of identifying an important factor that affects the value relevance of fair value, which contributes to the debate in the literature on the use of fair value accounting on decision-making against historical cost accounting. Furthermore, this study contributes to the literature on the compensation of executives and on the role that the compensation structure for CEOs plays on the quality of financial reports.

The rest of this paper is organized in the following manner. Section 2 presents the institutional context of fair value accounting. Section 3 reviews the related literature and develops the hypotheses. Section 4 describes the methodology of the research, while Section 5 presents the empirical results and provides interpretations. Section 6 is the conclusion, which mentions the contributions, limitations, and future lines of research.

Evolution of fair value in accounting theory and the financial information systems

Although the definition and the fair value measurement guidelines were not formalized until 2006, the fair value concept has been in use since around 1440. Generally speaking, the evolution of the implementation of fair value in accounting theory and the regimes of financial information may be divided into three phases: 1) 1440 to 1970; 2) 1970 to 1990; and 3) 1990 to present day.

Phase 1: Early use of fair value in accounting theory and in financial information schemes (1440-1970)

Fair value was partially legitimate at the beginning, but it was always replaced by historical or incorporated cost accounting in mixed measurement practices (Georgiou and Jack, 2011). The earliest implementation of fair value dates back to the 15th century (during the period of 1436-1440), when market value began to be used in some accounts. During this period, “clear profit” was acknowledged when adding the market value of the increases in raw materials and partially finished products with respect to the previous year (Crossley, 1975). The references to market value, more than to cost, appeared in accounting manuals during the 15th and 18th centuries (e.g., Pacioli, 1494; Mellis, 1588; Carpenter, 1632; Dafforne, 1684; Stephens, 1735; Dodson, 1750; Hamilton, 1788).

An early version of the fair value measurement in balances was created when English corporation laws in 1844 and 1856 required that the “right and true image” of the state of things in the company was revealed by the assessment of assets with current date prices. The basis for this requirement was that the values of the balance needed to reflect the capacity to operate the business and to comply with pending debts (Georgiou and Jack, 2011).

The first legislated implementation of fair market values is in the Napoleonic Commercial Code of 1807, who demanded that the inventory be recorded by its value in the day of the balance (Walton, 2007). At that moment, the banking industry measured the particular properties by the assessments estimated at the current prices (Chambers and Wolnizer, 1991). However, the market values were restricted to the operating assets but there were none for long-lived assets (Walker, 1974).

The origin of the term “fair value” dates back to a case in the Supreme Court of the United States in 1898, in which it was stated that regulated industries had the right to obtain a “fair profit” on the “fair value” of the entity (Lee, 2008). As a result of the judicial acceptance of current values, the practice of asset market value was used in the financial information of public services companies in the 1920s and 1930s (Georgiou and Jack, 2011).

The Great Depression taught accountants that the values are temporary and that the value of the assets assessed can decrease significantly in a single day. This resulted in a strengthening of historical cost accounting (Scott, 2011). According to Zeff (2007), the strong opposition to asset revaluation maintained by Robert E. Healy, one of the five founding members of the Securities and Exchange Commission (SEC), dominated the Federal Trade Commission in the 1930s and 1940s and influenced a generation of SEC accountants. In 1941, the American Accounting Association (AAA) published a major monograph that established an elegant way to conceptually and rationally justify the use of historical accounting. This monograph became a standard text used in university accounting programs and was also widely read by professionals (Zeff, 2007).

The concept of fair value first entered into accounting theory with Bonbright (1937), in which the characteristics of fair value are used in the concept of deprivation value. Furthermore, MacNeal (1939) proposes that balance sheet items be measured at market values and that all changes in the value of assets and liabilities (including unrealized liabilities) be included in the income statement. However, this author does not specify whether the market value applied is the entry or exit price.

Post-war inflation and opposition voices to historical accounting led to the call made by regulatory bodies for the recognition of market value. In 1949, the American Institute of Accountants commissioned a series of essays on corporate performance, including “Five monographs on corporate performance”, which dealt mainly with the shortcomings of historical accounting in a world of changing prices (Georgiou and Jack, 2011). In 1966, the AAA committee recommended the use of historical and current cost information for financial information (AAA: A Statement of Basic Accounting Theory-ASOBAT, pp. 30-31). However, in practice, more emphasis was still placed on historical accounting.

Phase 2: Development of fair value in accounting regulations (1970-1990)

In 1973, FASB succeeded the Accounting Principles Board (APB) and published an early exposure draft titled “Financial Information in General Purchasing Power Units” (FASB, 1974). Shortly thereafter, in October 1973, the Trueblood Committee Report was published in response to the financial scandals and the continuing criticism of the shortcomings of historical accounting. This report, titled “Objectives of the Financial Statements”, covers the approach to decision-making and provides the basis for the conceptual framework for the FASB. It suggests a wide range of valuation bases such as historical cost, carrying values, current replacement cost, and discounted cash flows (Georgiou and Jack, 2011). Subsequently, the use of fair value was extended to fixed assets, revenue recognition, and accounting for leases (see APB Opinion 29, 1973, and FASB, 1976). In 1979, the FASB published SFAS No. 33, which required additional disclosure of historical cost and present value (FASB, 1979). However, SFAS No. 33 was withdrawn in 1986 due to doubts about comparability, relevance and reliability, and historical accounting regained its dominance.

A more significant step towards fair value accounting came in the early 1980s when the FASB recognized the deficiencies of the historical accounting approach and promoted the “statement of equity (balance sheet) approach” (Hitz, 2007). Researchers and regulators raised concerns about non-reporting balances prepared on the basis of historical accounting. In response, FASB adopted the new asset-liability approach in its “Statement of Financial Accounting Concepts” (SFAC) No. 3 in 1980, which strictly links income to changes in net assets. Since then, the debate on the merits of historical versus fair value accounting has been ongoing.

The crisis of savings and loan houses in the United States in the 1980s accelerated the shift to the fair value paradigm and opened the door to further unraveling the shortcomings of the historical cost accounting system. Accordingly, the SEC advised FASB to develop a standard for accounting for certain debt securities at market value rather than amortized cost (Wyatt, 1991; Cole, 1992; White, 2003). The reason for this initiative was that historical accounting allowed for performance management by company managers and prohibited the identification of the precarious financial situation of savings and loan houses. As Hitz (2007) comments, this initiative represents a major evolution in accounting thinking at the regulatory level.

Phase 3: Fair value advances (1990-2007)

Fair value accounting made rapid progress during the 1990s. In 1993, the FASB issued SFAS 115, "Accounting for Certain Investments in Debt and Equity Securities". This statement provides guidance on the valuation of 1) investments in shares with readily determinable fair values, and 2) all investments in debt securities (FASB, 1993). It also identifies three types of investment collateral: debt securities held to maturity, negotiable debt and equity securities, and debt and equity securities not classified in any of the above categories (i.e., securities available for sale). SFAS 115 requires that marketable and available-for-sale securities be measured at fair value, while securities held to maturity must be measured at historical cost. Gains and losses on held-to-maturity securities and unrealized gains and losses on marketable securities are recognized in earnings. Conversely, unrealized gains and losses on available-for-sale securities are recorded in other comprehensive income. In the late 1990s, the FASB issued a number of statements expanding the application of fair value to include: SFAS 119 "Disclosure of Derivative Financial Instruments and Fair Value of Financial Instruments"; SFAS 121 "Accounting for the Impairment or Disposal of Long-Lived Assets"; and SFAS 123 "Accounting for Stock-Based Compensation". During this period, the accounting experts added to the discussion on fair value fundamental questions concerning the validity and relevance of fair value accounting in the conceptual framework for financial reporting (e.g., Barth and Landsman, 1995).

In 2007, fair value had become increasingly important and controversial in the process of formulating accounting standards (Power, 2010). Fair value accounting serves as a solution to the growing intolerance of the inconsistency of mixed measurement systems. FASB issued SFAS 157 "Fair Value Measurements" and SFAS 159 "The Fair Value Option for Financial Assets and Financial Liabilities" in 2006 and 2007, respectively. These two statements expand the list of items to be reasonably valued by adding receivables and payables, equity investments, written loan commitments, firm commitments with respect to financial instruments, rights and obligations under insurance contracts, and financial instruments that are separate from embedded derivatives (Emerson *et al.*, 2010). Moreover, for the first time, fair value was officially defined and the measurement for fair value was specified. According to FASB, these pronouncements are intended to increase the consistency and comparability of fair value measurements, expand presentation of fair value measurements (FASB, 2006a), and improve financial reporting by reducing the volatility in the reported results (FASB, 2006b). The IASB (International Accounting Standards Board) developed a similar definition and measurement method in 2006 in its convergence project (IASB, 2006).

A vigorous debate about the usefulness of fair value accounting emerged in relation to the 2007-2009 financial crisis. U.S. business associations pressured the SEC and FASB to significantly alter or suspend fair value rules, claiming they undermine the effort of the government to stabilize the financial sector of the country (Emerson *et al.*, 2010). The American Bankers Association, in its letter to the SEC in September 2008, states that the problems that exist in current financial markets can be attributed to many different factors. One factor recognized as having exacerbated these problems is fair value accounting (Laux and Leuz, 2009). Wallison (2008) argues that fair value accounting has been the main cause of an unprecedented decline in asset values and an unprecedented increase in instability in financial institutions.

Despite strong opposition from the banking sector, FASB (2010) proposed that all financial instruments be measured at fair value in the financial statements. As Linsmeier (2010)

asserts, historical accounting leads to a consistent and dramatic underestimation of credit and impairment losses in both the most recent and previous crises in the banking sector. However, in 2011, the FASB provisionally waived the requirement to record loans held to maturity at fair value after receiving a large number of formal comments and strong opposition in global forums (Whitehouse, 2011).

The most recent FASB effort to address fair value measurement issues is the issuance of ASC Item 820 “Fair Value Measurements and Disclosures” and its amendment, “Fair Value Measurements”. This statement provides more detailed guidance on measuring fair value elements. In addition, this statement requires enhanced disclosures for fair value measurements categorized in Level 3 of the fair value hierarchy.

The evolution of fair value at the IASB follows a similar trajectory to that of the FASB. In 1989, the International Accounting Standards Committee (IASC) published the Conceptual Framework, which has similarities with the FASB framework. The first introduction of a mixed system for measuring historical cost/current value was through the issuance of Financial Reporting Standard 15, which allows for the choice of whether tangible fixed assets are recorded at cost or at revalued value. International Accounting Standard 39, “Financial Instruments: Recognition and Measurement”, provides a full fair value option and certain provisions related to hedge accounting, which is considered to consolidate IASB principles with respect to fair values (Georgiou and Jack, 2011). Two additional innovative steps were taken in 2000: IAS 40 “Investment in Property”, which applies fair value accounting for non-financial assets, and IAS 41 “Agriculture”, which requires that the fair value model be implemented by all companies engaged in agricultural activities. Apart from the above-mentioned IASC pronouncements, the effort of the IASC to promote fair value is in line with that of the FASB.

With regard Latin America studies, it may be mentioned that García *et al.* (2014) indicate that, in Argentina at the end of the 1990s, a process of convergence towards international financial reporting standards was initiated, which are mandatory for most of the companies listed on the stock exchange since 2012 and optional for other entities. Some sectors of the economy (including banking) are governed by specific rules and there is also a transition to international standards.

For its part, in Brazil, the open companies follow the rules established by the CVM (Comissão de Valores Mobiliários). This, in turn, adopts the rules issued by the CPC (Comitê de Pronunciamentos Contábeis), a collegiate comprised of representatives of open companies, investors, auditors, the São Paulo Stock Exchange (BM&FBovespa), the Conselho Federal de Contabilidade (CFC), as well as academics from the accounting area (Comitê de Pronunciamentos Contábeis, 2013). The standards issued by the CPC are fully compatible with the IFRS in the field of consolidated financial reporting, while for individual reports, the only incompatibility is in the valuation of investments in associates, which, under the Spanish Companies Act, must be carried out using the equity method, whereas IAS 27, “Separate Financial Statements”, determines that it is based on cost or fair value.

Looking back on the development of fair value in the financial reporting regime, it is obvious that fair value is increasingly favored by regulators. The trend towards fair value arises from deficiencies in the historical accounting method and the demand for timely and relevant information, especially during periods of economic downturn. However, both researchers and regulators recognize that fair value has its Achilles heels, just like any other accounting alternative. Therefore, it would be interesting to generate evidence about the usefulness of

fair value accounting numbers in decision-making for users of financial statements, which is precisely the purpose of this work.

Literature review and hypothesis development

Literature review

Accounting information is considered value relevant if it has the association predicted with the market value of equity (Barth *et al.*, 2001). The usefulness of accounting information exists, if it is relevant to investors and sufficiently reliable to be reflected in the prices of share (Song *et al.*, 2010). A large number of fair value accounting studies focus on the value relevance of fair value information.

A major trend of the above studies investigates the value relevance of financial instruments to the U.S. banking industry (Barth, 1994; Petroni and Wahlen, 1995; Ahmed and Takeda, 1995; Eccher *et al.*, 1996; Nelson, 1996; Barth *et al.*, 1996; Park *et al.*, 1999). One way to test the value relevance of fair value reporting is to examine whether fair value has incremental information content above historical cost. The results of these studies are mixed. Based on a sample of bank data from 1971 to 1990, Barth (1994) concludes that the fair value of equity securities is more valuable than their historical cost. Similar to Barth (1994), Petroni and Wahlen (1995) investigate the relevance and reliability of the fair values of equity and debt securities in insurance companies between 1985 and 1991. These authors find that only the fair values of items traded on active markets are relevant. In addition, and inconsistent with the results of Barth (1994), Petroni and Wahlen (1995) find a significant and positive relationship between the profitability of equity securities and changes in unrealized gains and losses in insurance companies, indicating that gains and losses measured at fair value are relevant to the valuation of companies in the insurance industry. This result is confirmed by Ahmed and Takeda (1995), who include more net assets in the estimation equations. Three other simultaneous studies examine the relationship between bank share prices and the fair value of financial instruments, as required by SFAS 107. Eccher *et al.* (1996) show that the fair value of investment securities is significantly relevant in valuation, but the results on the fair value of other variables of assets and liabilities are mixed and weak. Nelson (1996) concludes that in the period of 1992-1993, the fair value of financial instruments had no incremental explanatory power in the relationship between market value and book value, with the exception of investment securities in 1992. Conversely, Barth *et al.* (1996) provide evidence that the fair value of loans during the period of 1992-1993 is incrementally relevant to valuation beyond the related carrying values. In the same vein, Park *et al.* (1999) show that unrealized gains and losses on available-for-sale securities, held-to-maturity securities, and loans are incrementally relevant to the value of annual returns.

Following the issuance of SFAS 157, several studies examine the relevance of the usefulness of the three levels of fair value in the U.S. banking sector. Using similar approaches and data, Song *et al.* (2010), Goh *et al.* (2009) and Kolev (2009), find that investors are unaware of Level 3 fair value estimates due to reliability issues during the financial crisis. However, Song *et al.* (2010) show that the relevance of the value for Level 3 estimates is greater for banks with stronger corporate governance. Kolev (2009) and Goh (2009) find that the valuation ratio of Level 1 and Level 2 assets is also significantly lower than one, probably due to financial market instability and the uncertainty of investors regarding the assets of the banks.

In addition to financial instruments, several studies provide evidence regarding the relevance of the value of non-financial fair value assets, such as pensions under SFAS 87 (Barth, 1991; Barth *et al.*, 1992), derivatives under SFAS 119 (Venkatachalam, 1996; Ahmed *et al.*, 2006), and tangible long-lived assets under SFAS 33 (Beaver and Landsman, 1983; Beaver and Ryan, 1985; Lobo and Song, 1989). These studies show evidence that if there are no active markets for these assets and liabilities or the estimates are determined by management, investors tend to discount the recognition and disclosure of fair value and consider them less relevant and reliable.

These studies imply that the relevance of the use of fair value accounting is adversely affected by management manipulation in the numbers reported. However, none of them provide motivations for such managerial manipulation. One line of executive compensation research supports the argument that managers with compensation packages based on the earnings of the organization have a greater motivation to manage reported results in order to receive higher bonuses (e.g., Baker *et al.*, 2003; Shuto, 2007). Both Baker *et al.* (2003), like Shuto (2007), use some discretionary decisions as proxy for performance management measurement and find that managers use discretionary decisions in the context of employee stock options (ESOs). However, there is no evidence of how the motivation of compensation to manage results would affect the usefulness of financial reporting. Given that fair value has been blamed for its unreliability and for being vulnerable to manipulation when market values do not exist (Penman, 2007), it is argued that it can provide relevant information to study the impact of executive compensation in the context of fair value. Therefore, this study aims to fill this gap and examine whether executive bonuses based on market measures affect the relevance of the value of accounting information when using fair value.

Hypothesis development

This study argues that the impact that CEO compensation has on the value relevance of fair value accounting is a result of the actions and decisions of managers in the determination of fair value. In other words, if the inputs of fair value are reliable, the determination of fair values does not provide an opportunity for management manipulation. However, if certain elements of fair value are based on the estimates by management, management may make discretionary decisions in the estimation process by either disclosing inside information or maximizing their own utility. In theory, fair value is conceptually more reliable because, by definition, market-based numbers are free from manipulation; fair value numbers or market-based accounting numbers are more comparable across firms; and the concept of fair value outflow is more understandable than the application of complex hedge accounting (Penman, 2007). On the other hand, however, some elements of fair value (i.e., Level 2 and Level 3 data) are based on estimation and management decisions. Estimates based on management's inside information can add to the relevance of fair value. On the other hand, managerial manipulation may worsen the relevance of fair value (Song *et al.*, 2010). Therefore, it is questionable whether greater use of fair values in financial statements improves or impairs the usefulness of accounting information for decision-making. As a result, we present our first hypothesis in a null form:

H1: *Ceteris paribus*, the relevance of fair value is not associated with the bonus ratio in the CEO remuneration package.

According to FAS No. 157, the fair value of an asset or a liability depends on the market price of this item in an orderly transaction, that is, the fair value of Level 1. However, where market

prices for certain items do not exist, companies should provide the best estimate of market prices for similar items, i.e., Level 2 fair value, or model-based values, i.e. fair value Level 3 (FASB, 2006a). Although the pure market-based Level 1 input is not subject to reliability concerns, the process of estimating inputs of Level 2 and Level 3 requires professional judgment and an estimation process (Song *et al.*, 2010). In particular, Level 2 fair values are based on the market prices of similar items. The professional judgment involved at this level is to determine which is the comparative item that has an active market price to be used for the valuation basis. While managers may exercise discretion in selecting the comparison element for Level 2 fair value determination, the extent of their discretion is limited to the number of comparison elements in active markets. Therefore, the use of Level 2 fair value as a performance management tool may not achieve the best results. Alternatively, the choice of an appropriate comparison basis of valuation for Level 2 fair value may function as a good tool to reveal managers' inside information. As a result, more Level 2 fair values in the financial statements may improve the value relevance of fair value accounting. However, Level 3 fair values involve a great deal of administrative discretion in the choice of valuation models, as well as elements of models, providing a significant opportunity for earnings management. Previous research shows that profit-based bonuses, compared to other forms of compensation, provide a stronger motivation for CEOs to manage earnings (Shalev *et al.*, 2013). Therefore, we argue that companies whose compensation packages are based more on profit-dependent bonuses provide more incentives for managers to manipulate earnings via determining the inputs of Level 3 fair values. However, we do not anticipate any influence that CEOs may have on Level 1 fair values. Considering that the accounting numbers that have been manipulated should provide less predictability of future returns on shares, we propose the following hypotheses:

H2a: *Ceteris paribus*, the value relevance of the fair value of Level 1 is not associated with the proportion of bonuses in the CEO compensation package.

H2b: *Ceteris paribus*, the value relevance of the fair value of Level 2 is positively associated with the proportion of bonuses in the CEO compensation package.

H2c: *Ceteris paribus*, the value relevance of the fair value of Level 3 is negatively associated with the proportion of bonuses in the CEO compensation package.

Design of the research

Sample selection

The initial selection of the sample begins by downloading a list of companies containing data on bonuses paid to executives between 2007 and 2016 from ExecuComp. The year 2007 is determined as the starting year because detailed fair value accounting data has been available since 2007. We then retrieved a list of company-year observations containing accounting and net profit data from January 1st, 2007, to April 30th, 2017, from the Compustat database. We consolidated the two initial data sets and after eliminating the outliers, the sample was reduced to 16,338 observations. Table 1 presents the sample selection procedures and the distribution of observations in our sample.

Table 1
 Selection and Distribution of the Sample

Panel A: Selection of the sample procedures

	Amount of observations
ExecuComp executive observations between January 2007 and December 2016	107582
Less Missing information or bonus is zero	74604
Remaining executive year observations	32978
Less financial and inventory data from Compustat	15801
Remaining executive-year observations	17177
Less atypical values	839
Remaining executive-year observations	16338

Panel B: Distribution of the sample in time

Year	Amount of observations	Percentage of the sample
2007	48	0.29
2008	2204	13.49
2009	2381	14.57
2010	2370	14.51
2011	2079	12.72
2012	2067	12.65
2013	1598	9.78
2014	1498	9.17
2015	1293	7.91
2016	800	4.91

Empirical models

To assess the effect of executive compensation on the relevance of fair value, we used a modified Ohlson (1995) model. The regression is made between the share price at fair values of assets and liabilities with executive compensation, with the interaction between executive compensation and fair value, and with net income. Following Song *et al.* (2010), we divide the carrying amount into fair value (FV) and non-fair value (NFV) components (the definition of the variables is detailed in the next subsection).

$$PRC_{it} = \alpha_0 + \alpha_1 NFV_{it} + \alpha_2 FV_{it} + \alpha_3 NI + \alpha_4 COMP + \alpha_5 FV_{it} * COMP_{it} + \varepsilon_{it} \quad (1)$$

FAS No. 157 requires disclosure of the hierarchy of fair values, including Level 1, Level 2, and Level 3 fair values. In order to test the specific impact of each level of fair value, we use the following model for our empirical analysis (the definition of variables is detailed in the next subsection):

$$PRC_{it} = \alpha_0 + \alpha_1 NFV_{it} + \alpha_2 FV1_{it} + \alpha_3 FV2_{it} + \alpha_4 FV3_{it} + \alpha_5 NI + \alpha_6 COMP + \alpha_7 FV1_{it} * COMP_{it} + \alpha_8 FV2_{it} * COMP_{it} + \alpha_9 FV3_{it} * COMP_{it} + \varepsilon_{it} \quad (2)$$

Variable measurement

Following Shalev *et al.* (2013), we use the intensity of the executive bonus as a measure of executive remuneration. In particular, COMP is calculated as the ratio of the bonus of an

executive to their total salary for the same year (Shalev *et al.*, 2013). Following Song *et al.* (2010) we measure fair value, FV (and its three-tier breakdowns, FV1 / FV2 / FV3), as the percentage of fair value assets and liabilities (fair value assets and liabilities Level 1 / Level 2 / Level 3) over total assets and liabilities. We use earnings per share, PRC, as a proxy for the share price. NFV denotes all assets and liabilities that are not based on fair value. NI represents the income of a company (Song *et al.*, 2010)

Empirical results

Table 2 presents the descriptive statistics of all variables in our model. The average bonus as a proportion of total salary is of 34.96%, indicating that the bonus is an important component of the salary of the CEOs. Compared to Shalev *et al.* (2013), the companies in the sample have a higher proportion of bonuses, indicating a trend towards a higher proportion of bonuses in recent years. According to Song *et al.* (2010), the total fair value reported in the financial statements is approximately 12% on average, suggesting that fair value accounting is widely used after FAS No. 157. The means of the Level 1, Level 2, and Level 3 fair value disclosures are only 5.6%, 6.9% and 1%, respectively, which demonstrates that the information in the fair value hierarchy is not as widely available as the aggregate fair value information. The average net income of the companies in the sample is of 2.47%, lower than in Song *et al.*, (2010), which is consistent with the deterioration of the economy in recent years.

Table 2
Descriptive Statistics

Variable	n	Mean	Std	25%	50%	75%
PRC	16338	30.4395	22.0763	13.5000	25.5400	43.1600
FV	16338	0.1245	0.1594	0.0083	0.0525	0.1986
NFV	16338	0.8755	0.1594	0.8013	0.9475	0.9917
FV1	16338	0.0559	0.1428	0	0.0051	0.0577
FV2	16338	0.0689	0.1295	0.0006	0.0077	0.0742
FV3	16338	0.0098	0.0387	0	0	0.0042
COMP	16338	0.3496	0.2320	0.1592	0.3217	0.5067
NI	16338	0.0247	0.1535	0.0058	0.0310	0.0727

Tables 3 and 4 show the empirical results based on univariate analysis. In Table 3, the interest coefficient is the interaction between fair value and bonus intensity in executive compensation (FV * COMP). This coefficient is positive (0.0279) and highly significant (P value less than 0.0001). This result supports the performance management argument in the first hypothesis that managers with higher bonus intensity in their compensation packages have greater motivations to convey their internal information through fair value accounting. As a result, the relevance of fair value is increased. This finding is consistent with the theory of Scott (2011) regarding the positive view of results management. According to Scott (2011), the benefits of good results management make for higher quality financial reporting (i.e., positive reactions, higher reputation in the management labor market, etc.). In addition, the fair value (FV) ratio is significantly negative (-0.0526), indicating that fair value is not perceived as relevant for determining capital market value. This result is different from the finding in Song

et al. (2010). One possible reason is that our sample is based on annual observations in all industries during 2007-2016, while Song *et al.* (2010) uses a quarterly sample of financial institutions during the first three quarters of 2008. In comparison, our sample is more complete and, therefore, our result is more generalizable. Additionally, the bonus intensity coefficient (COMP) is significantly positive, which is consistent with the argument that compensation provides a motivation for management effort, resulting in higher returns in the stock market (Scott, 2011). The coefficient of the control variable, net income (NI), is significantly positive, consistent with previous findings on the positive association between earnings and stock performance (Ball and Brown, 1968).

Table 4 shows the results of the association between the share price, the three levels of fair value, the bonus intensity, and the interactions between the levels of fair value and the bonus intensity. The interest variables are the coefficients between the fair value levels and the bonus intensity (i.e., FV1 * COMP, FV2 * COMP, and FV3 * COMP). Consistently with the three H2a-H2c hypotheses, only the interaction between the bonus intensity and the fair values of levels 2 and 3 are statistically significant, with coefficients of 0.0423 and -0.03834, respectively. The coefficient in FV1 * COMP is not significant, which supports Hypothesis H2a. This finding indicates that, as Level 1 fair values do not imply managerial discretion (Penman, 2007), the motivation of compensation for the managers does not play any role in the effect of Level 1 fair value. The positive coefficient in FV2 * COMP supports Hypothesis H2b and suggests that managers tend to perform well in earnings management and transmit their insider information through their Level 2 fair value decisions, making fair values more useful in decision-making. This finding is consistent with the argument that managers use good performance management to convey their privileged information (Scott, 2011), resulting in greater relevance or usefulness for decision-making in the reported numbers. Conversely, the ratio in the term of interaction between the Level 3 fair value and the bond intensity is significantly negative. This result is compatible with Hypothesis H2c. The finding is consistent with the argument of mismanagement or result management (Scott, 2011) in which managers use their discretion in selecting Level 3 fair value elements to timely manipulate financial reporting, resulting in lower relevance of fair value numbers. In addition, the three levels of elements used to determine fair value (i.e., FV1, FV2, and FV3) have negative coefficients, a finding consistent with Table 3. Finally, the coefficients in COMP and NI are also consistent with the above test in Table 3.

Table 3
 Results of Univariate Regression
 Executive compensation bonuses and the relevance of fair values

	PRC	FV	COMP	FV*COMP	NI
PRC	1	-0.0526 (<.0001)	0.1481 (<.0001)	0.0279 (0.0004)	0.2673 (<.0001)
FV	-0.0526 (<.0001)	1	0.0231 (0.0031)	0.7579 (<.0001)	-0.0220 (0.0052)
COMP	0.1481 (<.0001)	0.0231 (0.0031)	1	0.4439 (<.0001)	0.0329 (<.0001)
FV*COMP	0.0279 (0.0004)	0.7579 (<.0001)	0.4439 (<.0001)	1	0.0003 (0.9662)
NI	0.2673 (<.0001)	-0.0220 (0.0052)	0.0329 (<.0001)	0.0003 (0.9662)	1

Table 4

Results of univariate regression

Compensation bonuses for executives and relevance of the three levels of reasonable values

	PRC	FV1	FV2	FV3	COMP	FV1 *COMP	FV2 *COMP	FV3 *COMP	NI
PRC	1	-0.04754 (<.0001)	-0.0012 (0.8802)	-0.0674 (<.0001)	0.1481 (<.0001)	-0.0102 (0.1923)	0.0423 (<.0001)	-0.03834 (<.0001)	0.2673 (<.0001)
FV1	-0.04754 (<.0001)	1	0.1760 (<.0001)	0.1760 (<.0001)	0.0073 (0.3557)	0.8824 (<.0001)	0.1505 (<.0001)	0.0073 (0.3508)	-0.0033 (0.6721)
FV2	-0.0012 (0.8802)	0.1760 (<.0001)	1	0.1170 (<.0001)	0.1110 (<.0001)	0.2181 (<.0001)	0.8410 (<.0001)	0.1587 (<.0001)	-0.0132 (0.0919)
FV3	-0.0674 (<.0001)	0.1760 (<.0001)	0.1170 (<.0001)	1	0.0375 (<.0001)	0.0139 (0.0766)	0.1151 (<.0001)	0.8719 (<.0001)	-0.0668 (<.0001)
COMP	0.1481 (<.0001)	0.0073 (0.3557)	0.1110 (<.0001)	0.0375 (<.0001)	1	0.2111 (<.001)	0.3499 (<.0001)	0.1737 (<.0001)	0.0376 (<.0001)
FV1	-0.0102 (0.1923)	0.8824 (<.0001)	0.2181 (<.0001)	0.0139 (0.0766)	0.2111 (<.001)	1	0.2566 (<.0001)	0.0358 (<.0001)	0.0117 (0.1376)
*COMP	(0.1923)	(<.0001)	(<.0001)	(0.0766)	(<.001)	(<.0001)	(<.0001)	(<.0001)	(0.1376)
FV2	0.0423 (<.0001)	0.1505 (<.0001)	0.8410 (<.0001)	0.1151 (<.0001)	0.3499 (<.0001)	0.2566 (<.0001)	1	0.21165 (<.0001)	-0.0100 (<.0001)
*COMP	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
FV3	-0.03834 (<.0001)	0.0073 (0.3508)	0.1587 (<.0001)	0.8719 (<.0001)	0.1737 (<.0001)	0.0358 (<.0001)	0.21165 (<.0001)	1	-0.0501 (<.0001)
*COMP	(<.0001)	(0.3508)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
NI	0.2673 (<.0001)	-0.0033 (0.6721)	-0.0132 (0.0919)	-0.0668 (<.0001)	0.0376 (<.0001)	0.0117 (0.1376)	-0.0100 (<.0001)	-0.0501 (<.0001)	1

Conclusions

This work examines the impact of the executive compensation structure on the value relevance of fair value accounting, based on the evidence of FAS No. 157. Since the bonus plans usually include formula based on earnings, bonuses create stronger incentives for managers to disclose their privileged information as a sign of good results management, or manipulate their discretionary decisions in the valuation to hide unfavorable results (Scott, 2011). As a result, depending on the type of performance management in place, we should note an increase or decrease in the value relevance of fair value accounting for companies with a higher bonus intensity in the compensation plan for managers.

Overall, the bonus intensity provides a positive incentive for managers to disclose their insider information in financial information, resulting in greater value relevance of fair value information. In addition, our empirical results on fair value breakdowns show that this positive motivation only applies to Level 2 fair values, where a comparative market price still exists. However, when there is no information about the market price of a reported item in the financial statements, managers tend to manipulate the valuation of Level 3 fair value inputs, resulting in lower value relevance of fair value.

The key contribution of the study is to extend understanding of the moderating role played by executive compensation in affecting the value relevance of fair value. Previous literature shows that fair value is associated with market valuation, and that executive compensation influences earnings management. In our opinion, this study is the first to examine the interactive roles of different performance management channels (good versus bad earnings management) through executive compensation structure and provides evidence of how compensation can affect the relevance of financial reporting in the context of fair value. Our finding that fair value provides both good and bad incentives for earnings management is useful for a number of financial

reporting users, including shareholders, bondholders, and standard setters. Given that both the issuer of international accounting standards and the issuer of U.S. accounting standards are making joint efforts to promote greater use of fair value accounting in financial reporting, the evidence in this study supports and warns of significant risk to be considered before promoting a more general application, particularly by regulatory bodies in Latin America. The preliminary results reported here are based on univariate analyses. Future research may extend this study by applying multivariate analysis to generate more robust evidence.

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