



Fair value accounting from a distributed cognition perspective



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ABSTRACT

This study offers a unique interdisciplinary perspective on fair value accounting. The growing influence of esoteric financial instruments whose valuation is becoming increasingly complex makes it necessary to focus on actual valuation practices. Based on an extensive review, this paper regards fair value accounting for complex financial instruments as involving processes distributed among actors located inside and/or outside a reporting entity. It also draws attention to collaboration by organizations that apply their external and internal resources to perform complex financial valuations. Furthermore, it demonstrates that cases involving unusual market conditions underline the importance of human interactions to the valuation process.

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1. Introduction

After the revelation of the devastating effects of the recent global financial crisis, fair value accounting (FVA) has been under severe attack by politicians¹ and regulatory authorities.² Labeling of FVA as one of the causes of the massive damage that occurred during the financial crisis has rekindled the debate over appropriate accounting valuation.³

However, as some have cast doubts on the significance of FVA, the usefulness of FVA is still disputable.⁴ Both proponents and opponents of FVA have occasionally criticized the arguments of their counterparts⁵ because both have reached their respective conclusions on the basis of specific consequences of FVA.⁶ Although the previous literature has indicated various consequences of FVA,⁷ we still lack clear criteria for judging its appropriateness. Nonetheless, the fact that the International

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¹ For example, Andrew Haldane, the Executive Director for Financial Stability at the Bank of England, and member of the Financial Policy Committee, considered FVA a cause for concern from a financial stability perspective (Haldane, 2012: p. 3).

² For a recent review of the actions of the United States and the FASB (Financial Accounting Standards Board), see Bougen and Young (2012).

³ The impact of FVA on the recent financial crisis tends to be discussed in terms of pro-cyclicality. For a discussion of the matter, see IMF (2008: Chapter 3). This paper does not examine the economic consequences of the pro-cyclicality of FVA.

⁴ For example, when we performed a test search using the phrase “financial accounting” as the search term (in Title, Abstract ID & Keywords with All Dates) in the social science search engine Social Science Research Network (SSRN: <http://www.ssrn.com>), 738 papers were returned in the results (accessed 17 March, 2014). When we then performed a similar search using the term “fair value accounting,” 287 papers were returned in the results. This simply means that more than one third of the total amount of financial accounting papers can be considered equivalent to FVA-related papers.

⁵ Exceptionally, Bignon, Biondi, and Ragot (2012) adopted a balanced, neutral argument regarding FVA.

⁶ For one of the most comprehensive reviews of FVA studies, see Obinata (2011).

⁷ As for a summary of the pros and cons of FVA, see Nissim and Penman (2008: Appendix A) and Ryan (2008).

Accounting Standards Board (IASB) recently issued a set of standards for FVA (IFRS 13) implies its further global diffusion and penetration.

The question then arises as to why accounting standard setters such as the IASB and FASB have pursued FVA for various items. To address this question, an assumption of accounting standard setting is necessary. Assuming that accounting standard setting depends on the standard setter's assessment of the similarities and differences of corporate transactions, the crucial process "cannot be regarded as value-free judgments resulting from a strictly technical process" (Young & Williams, 2010: p. 511). Accounting standard setters might not fully recognize the clear advantages of FVA over other valuation methods because their political decisions have been based on subjective value-judgments rather than objective evidence. Based on this postulation, it is still uncertain whether FVA truly reflects the fair value of corporate assets/liabilities and is superior to traditionally accepted historical cost accounting (HCA). Even in one of the top-ranked accounting journals that has tended to favor economics/statistics-based research, Kaplan (2011: p. 377) warns that "all this [accounting] scholarship takes the 'fair value' as given and does not explore how fair values actually get estimated. The accounting profession is in danger of potentially outsourcing this critical measurement, and its valuation, to others." This provocative remark stresses the importance of investigating the practical as well as pragmatic aspects of FVA.

Based on this view, the present study focuses on particular aspects of FVA practice and takes the concept of distributed cognition as an interpretative framework. This unique framework particularly sheds light on the distributive aspect of FVA for complex financial instruments. The framework indicates that the practice of FVA with respect to complex financial instruments is to some extent distributed inside and/or outside of a reporting entity. It also points out that the practice of FVA with respect to certain complex financial instruments incorporates various tools and knowledge. Furthermore, based on a consideration of specific valuation cases, concern over FVA is highlighted from the perspective of distributed cognition. The paper thus aims to present an interdisciplinary perspective on FVA to highlight the intersection between FVA and the theory of distributed cognition, and to provide an alternative understanding of FVA. This can contribute to regulators and practitioners who seek an appropriate FVA framework for complex financial instruments.

This paper is organized as follows. The next section reviews recent controversies over FVA. Based on a review of FVA developments, current FVA issues are then pointed out. Section three introduces the concept of distributed cognition. Section four examines the actual practice of FVA from the perspective of distributed cognition, and also analyzes the distribution intention and mechanism. Then, considering the recent global financial crisis and the controversy over FVA, particular attention is paid to the FVA of complex financial instruments. Based on an analysis of FVA practices in areas where valuation appears to be relatively difficult, this study highlights cases in which knowledge of the actors and tools involved in FVA can be distributed both inside and/or outside a reporting entity. Section five considers a specific case of valuation in the early stage of a financial crisis. Subsequently, section six looks at the problematic uneven distribution of cognition beyond formal contractual relationships in FVA. The final section discusses the main findings and identifies future research directions.

2. How FVA has developed and become controversial

2.1. The development of FVA

FVA has been applied to various corporate assets and liabilities through the development of major accounting standards. The US SFAS (Statement of Financial Accounting Standards) 157 defines "fair value" as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date" (FASB, 2006: para. 5). The IASB recently issued "IFRS 13-Fair Value Measurement", which has similar requirements to SFAS 157.

FVA differs markedly from traditional HCA. According to the historical analysis of FVA (Georgiou & Jack, 2011),⁸ since 1990 more and more HCA-based accounting standards have been replaced by FVA-based ones. For example, not only SFAS 157 in the US, but also FRS (Financial Accounting Standards) 7: *Fair Values in Acquisition Accounting* in the UK and IASC's IAS 39: *Financial Instruments: Recognition and Measurement* are typical examples of such standards (Georgiou & Jack, 2011: p. 319). Recent movement has occurred based on the notion that "mark-to-market might be implemented not to solve a problem in private markets, but to remove regulatory discretion provided by historical-cost accounting" (Epstein & Henderson, 2011: p. 521). Currently, "a fundamental conceptual issue [facing accounting standard setters] is the extent to which the standard should move away from traditional cost based accounting to marking assets and liabilities to market, euphemistically referred to as 'fair value' accounting".⁹ Typically, proponents of FVA have emphasized its relative advantages, such as better reflecting corporate reality or risk management activity. They sometimes look at the HCA-based balance sheet and call it a disgrace: "Reporting assets at their historical cost is like driving down the road looking in the rear-vision mirror!" (Penman, 2011:

⁸ Few studies have comprehensively explained the adoption of FVA in major accounting standards such as the IFRS or the US FASB standards. Notably, Georgiou and Jack (2011) attempt to highlight the historical development of FVA in the UK and US using three time periods, 1930–1970, 1970–1990, and 1990–the present.

⁹ Speech by Paul, A. Volcker, Chairman of the Trustees of the International Accounting Standards Committee Foundation in a statement before the Capital Markets, Insurance and Government Sponsored Enterprises Subcommittee of the U.S. House of Representatives, Washington DC, June 7, 2001 (Penman, 2011: p. 167).

p. 169). Such worship of FVA is regarded as “the fair value paradigm (Hitz, 2007)” or “the full FVA ideology (Georgiou & Jack, 2011).” “The fair value paradigm rests on the decision usefulness paradigm, which was established as an official standard setting objective only with the formation of the FASB and the conceptual framework project” (Hitz, 2007: p. 327).

However, a historical study of the origin and development of the “decision usefulness” concept in selected English speaking countries found the core objectives of financial reporting to have been both equivocal and varied (Zeff, 2013). Besides, assertions in the conceptual foundation of modern financial reporting suggested multiple possible measurement bases (Zeff, 1999: p. 100). The Accounting Objectives Study Group chaired by Trueblood concluded several decades ago “that different valuation bases are preferable for different assets and liabilities” (AICPA, 1973: p. 41).¹⁰ The group also stated that several factors “should be weighted in the process of choosing the appropriate basis or combination of bases for fulfilling financial statement objectives as they relate to each of the assets or liabilities under consideration” (AICPA, 1973: p. 43).

The empirical literature on FVA, especially before the financial crisis, claimed “the relevance of fair value measurement can only be supported for securities traded on highly liquid markets, while the evidence reinforces the significance of the reliability objection both for financial and non-financial assets” (Hitz, 2007: p. 325). In short, the core of FVA is that it “finds its justification in efficient market theory; price summarizes all available information, so price supplies the accounting for value” (Penman, 2011: p. 170). Furthermore, some empirical research has documented correlations between fair value measurements and stock prices that are useful for understanding whether fair values are relevant to investors (Nissim & Penman, 2008: p. 7). Unfortunately, however, it does not provide much guidance on the policy question of whether fair values should be reported in place of HCA (Nissim & Penman, 2008: p. 7).

Thus, modern accounting regulation has so far maintained the “mixed-attribute accounting model” which accepts at least two types of measurement models (HCA and FVA) in a set of accounting standards.¹¹ The mixed-attribute model often allows firms to choose the measurement attribute they desire for a position through how they classify the position (Ryan, 2008: p. 8).¹² Accordingly, under current major accounting standards, unrealized gains and losses are included in accumulated other comprehensive income (or as a component of owners’ equity) or net income. In short, the classification of gains/losses arising from FVA can be said to be mixed.

Therefore, it can be inferred that neither FVA nor similar market value-based valuation nor HCA has fully dominated previous accounting practice. Rather, as the Trueblood Report envisaged four decades ago (AICPA, 1973), the use of mixed-measurement practices has long been accepted. Nevertheless, under the current accounting regulations by the IASB and FASB, which exert a dominant global influence, the objects subject to FVA are diverse and highly complex. Given that current economic and business conditions differ from earlier times, it is unclear whether such a mixed valuation model can systematically cope with current complex financial instruments. With respect to this point, Koga (2001) argued that in the era of a relatively finance-oriented economy, or what is called the ‘financialized world,’¹³ financial and intangible assets/liabilities are important, and it is essential that financial accounting reflects their volatility and corporate risk management activities in financial accounting are essential. In this sense, finance-oriented accounting regulations underpinned by FVA may be more acceptable. Alternatively, FVA can be said to be inextricably linked to financialization. “Under FVA rules, when assets are inflating and traded, goodwill is accumulated as the difference between market and book value. When asset values are depressed, fair value reporting amplifies financial adjustments, converting holding gains into losses and switching financial injections into withdrawals from current income. The porosity of these financial connections extends across all sectors of the economy- corporate, government, voluntary, charitable, and households- because we have all become accustomed to extracting holding gains from financially leveraged positions” (Haslam, Andersson, Tsitsianis, & Yin, 2012: p. 6).

2.2. The present FVA standards and the issue of unreliable inputs

As the role of financial activities has strengthened, as noted above, FVA has become more influential. Although the development of FVA has been tortuous, it has resulted in the establishment of SFAS 157, an independent comprehensive FVA standard in the US. Fig. 1 depicts the process for calculating the fair value of corporate assets/liabilities under SFAS 157. The standard was welcomed because a single standard would increase the efficiency and consistency of measuring fair value across the many standards that require fair value reporting and disclosure (AAA Financial Accounting Standards Committee, 2005: p. 188). It distinguishes between cases where market prices for identical assets or liabilities are readily available from active markets (so-called Level 1 measurements) and cases where hypothetical market prices have to be estimated (Level 2 and Level 3 measurements, differentiated by an increasing degree of subjectivity in making estimates). SFAS 157 has been effective for corporate financial statements issued in the US since November 2007. Although the IASB issued a comparable standard, IFRS 13, in May 2011, this study relies on the US standard because there is more evidence of its application.

¹⁰ The Study Group suggested four valuation bases: historical cost, exit values, current replacement cost, and discount cash flows.

¹¹ To put it another way, FVA is not yet fully institutionalized as an accounting practice (Georgiou & Jack, 2011: p. 313).

¹² In other words, fair value measurement guidance has been primarily contained in a cross-referenced patchwork of accounting standards related to financial instruments (AAA Financial Accounting Standards Committee, 2005: p. 187).

¹³ According to Epstein (2005: p. 3), “financialization means the increasing role of financial motives, financial markets, financial actors, and financial institutions in the operation of the domestic and international economies.”

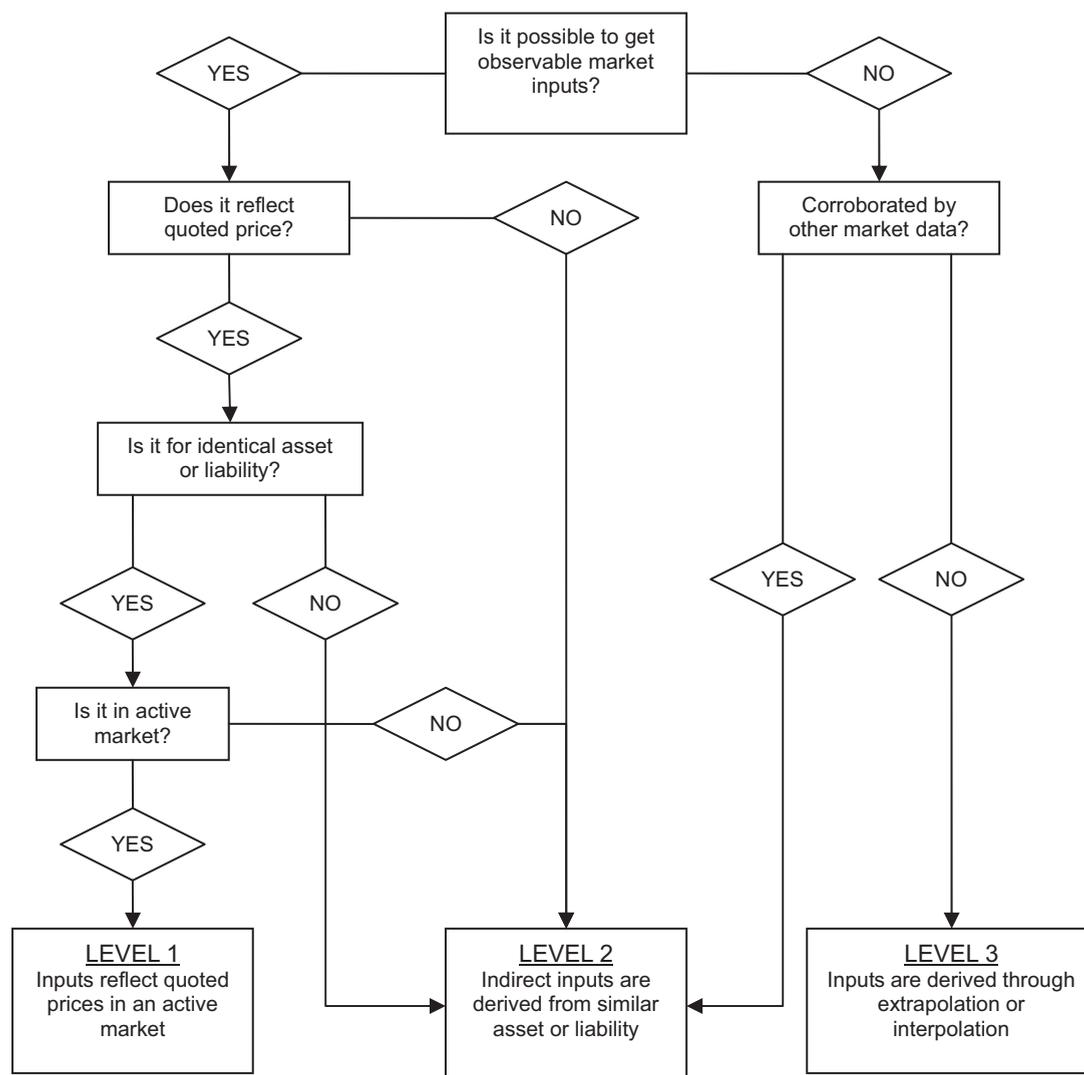


Fig. 1. Fair value hierarchy in SFAS 157.

Source: Based on Fig. 1 in Campbell, Owens-Jackson, and Robinson (2008).

Besides accounting standards, the role of auditors for FVA is also important. External auditors may object to the reporting company's FVA figures in the auditing process. Most auditors, however, have little training in valuation (Martin, Rich, & Wilks, 2006: p. 289). FVA makes it increasingly harder for auditors to feel and actually be in control of their own expertise (Smith-Lacroix, Durocher, & Gendron, 2012). Furthermore, "no amount of auditing can remove the underlying estimation uncertainty in reported values that are determined by management-derived estimation models that are hypersensitive to small changes in inputs (Christensen, Glover, & Wood, 2013: p. 37)." In addition, auditors prefer to follow appropriate guidance on FVA auditing (Fitzsimons, Satenstein, & Silliman, 2010).

Even so, the International Standard on Auditing 500: Audit Evidence (ISA500), published by the International Federation of Accountants, states that auditors may accept the findings of a specialist hired by management as appropriate audit evidence. This is not a natural process arising through the division of multiple-disciplinary labor; it may signify specific and often competing hierarchical relations between different bodies of expertise (Power, 1997: p. 140). Thus, "the specialization of tasks reinforces the auditor's role as conductor of an orchestra, and the need to acquire the necessary competence in valuation methods to be able to ensure there is good coordination between the specialists concerned (Jacquemard, 2007, p. 279)."

Therefore, it is useful to consider FVA from a perspective that assumes various professional actors collaborate to calculate fair value. It can be a theoretical stepping-stone to investigate the practical aspects of FVA. The next section discusses such a perspective.

3. Insight from the theory of distributed cognition

In some cases, particularly regarding the Levels 2 and 3 inputs, obtaining the fair value of complex financial instruments involves various types of professional knowledge and specific information. In other words, in situations involving complicated financial valuation, cognitive tasks tend to be performed by various actors. Such situations thus can be analyzed using the framework of distributed cognition.

One of the most prominent studies on distributed cognition is Hutchins' work (Hutchins, 1995a, 1995b), which is based on the extended studies of ship navigation and the cockpits of a commercial airline. It mainly focuses on the fact that "human cognition is always situated in a sociocultural world and cannot be unaffected by it (Hutchins, 1995a: p. xiii)." The concept of distributed cognition has attracted attention in several fields, ranging from law (e.g., jury decision making) and sociology (e.g., information processing in organizations) to computer science (e.g., GRID computing and medical informatics) and the philosophy of science (e.g., expert panels) (List, 2008: p. 285). Based on the previous literature, this perspective is likely to shed new light on two unconventional points of FVA.

The first point relates to the cognitive division of labor. According to Hutchins (1995a: 176), "all divisions of labor, whether the labor is physical or cognitive in nature, require distributed cognition in order to coordinate the activities of the participants." Callon and Muniesa (2005: p. 1245) also state that "economic calculation is not an anthropological fiction, precisely because it is not a purely human mechanical and mental competence; it is distributed among human actors and mental devices." So, "rather than simply assuming that all cognition is restricted to a specific individual, we are invited to think of some actual cognition as being distributed among several individuals" (Giere, 2007: p. 314). By doing so, the gap that exists between models of a general-purpose cognitive architecture and explanations of human performance in complex, real-world situations can be filled (Hazlehurst, Gorman, & McMullen, 2008: p. 230). This perspective can be an alternative to an individual-centered model of cognition (Hazlehurst et al., 2008: p. 227). According to Hazlehurst et al. (2008, p. 228), distributed cognition treats the activity system, rather than the individual, as the unit of cognitive analysis. An essential condition for distributed cognition in a group is the presence of an organizational structure that allows the group to produce collective judgments.

Such collective judgment is now necessary for complicated financial valuation because modern financial innovations have resulted in at least one critical side effect: the lack of intermediaries. According to a study on the diffusion of financial innovation (Redmond, 2013), most financial innovations are developed by investment banks which play an intermediary role in financial markets. For example, during the development of credit derivatives, while investment banks have acted primarily as protection buyers to hedge their own exposure, market developments have also allowed them to sell protection according to their estimation of the credit risk entailed by various reference entities (Huault & Montagner, 2009, p. 556). However, when the innovator is also the intermediary, an important independent control check is lost. Moreover, when the innovator/intermediary has financial innovation expertise, it also becomes extremely complicated for innovative financial products to circumvent other actors such as rival banks. This tendency has been accelerated by the limited legal protection, at least until very recently, of innovative financial products (for example, of derivatives pricing models) (MacKenzie, 2009: p. 72). This background underlines the significance of the introduction of the distributed cognition perspective.

The second point raised by this perspective concerns the extent to which the cognitive tasks are distributed. Bardone and Secchi (2009: 190) note that external resources, such as artifacts, tools, and objects, shape human cognition. MacKenzie (2009) also assumes that cognition and calculation can be distributed not only to human beings but also to artifacts, such as technical systems. Thus, in addition to human actors, the configuration of information-bearing tools, such as a database or pricing software, can play functional roles in this framework.

Nevertheless, if we envisage a specific task or activity, it can be difficult to delineate the extent of cognitive distribution. With regard to this point, Tuomela's (2007) view of group action is useful to understand the scope of distributed cognition. "An action is an action as a group member if and only if it is collectively accepted by (or is collectively acceptable to) the group members as an action that promotes, or is at least weakly conducive to, the satisfaction and maintenance of the ethos of the group, and where the ethos is at least a partial reason for the action in question (Tuomela, 2007: pp. 22–23). Tuomela (2007: p. 43) also regards a business corporation as an example of an organization of group members with a certain ethos, basic goals, values, standards, and so on. Based on this view, this study emphasizes the formal organizational boundaries of reporting entities.

However, it is also necessary to consider whether complicated FVA goes beyond the transactional or contractual relationships involved in the calculative processes. This is an intriguing point regarding the boundaries of the firm, particularly in terms of the Coasian perspective. According to Coase (1937: p. 392), if the organizing/governance costs of contractual transactions are lower in the firm, then it is assumed that transactions will congeal within the boundaries of the firm. In contrast, the distributed cognition framework concerns not only transactional or contractual relationships but also material artifacts, tools and group-based human cognition, the interactions among all of which can be essential. Therefore, with regard to FVA for complicated financial instruments in investment companies, it is useful to focus on a focal firm's business model (Haslam et al., 2012). This viewpoint differs from Coasian transaction cost economics where a sharp distinction is necessary between markets and the firm as a productive entity (Haslam et al., 2012: p. 30). Instead, adopting this viewpoint requires the consideration of the change of business models, which Haslam et al. (2012) described as follows: "From the mid-1970s on, US (and later European) banks have managed to disconnect their financing (from savings) through securitization, which facilitates the selling on of loans to other investors that raise their funds in the bond market (Haslam et al., 2012: p. 151)."

“This change reflects increased out-sourcing and disintermediation of the banking financial chain (Haslam et al., 2012: p. 152).” Actually, as shown below, the inclination to outsource complicated financial valuation is strong.

Based on this analysis, the next section investigates the actual process of the valuation of financial instruments in investment companies. As Kaplan (2011) implies, it is now more important than ever to pay attention to the peculiarities of current FVA practice in complex financialized corporate activities. An investigation of the pragmatic aspects of FVA for financial instruments can fill the gaps between practitioners coming to grips with FVA and accounting standard setters (or academic accounting researchers). The analysis of actual valuation practices consists of two strings. First, the following sections rely on various information sources to capture the current reality of accounting valuation. Second, a more detailed case analysis is conducted in the fifth section. In particular, a legal case concerning valuation in the recent financial crisis is chosen because FVA (or its ambiguous inputs) matters most in such unusual conditions, and the available legal documents offer detailed glimpses of reality and the voices of the practitioners.

4. Distributed cognition in the process of FVA for financial instruments

4.1. FVA matters in investment companies

Even though financial instruments are varied and have different natures, most are currently required to be valued at fair value for financial reporting purposes. This subsection examines the valuation of portfolio securities of investment companies (occasionally classified as funds). It is obvious that one of the most controversial aspects of the SFAS157 is its Levels 2 and 3 inputs for valuation. The fact that accounting firms (such as KPMG, 2011; PwC, 2011) provide services to support financial reporting by private investment companies indicates the growing significance of accountable calculations of those organizations to investors, particularly after the recent financial crisis.

Large quantities of various financial instruments are managed by several types of funds worldwide. According to TheCityUK (2011), there are generally three types of funds: conventional, alternative, and private wealth. Conventional funds include pension, mutual, and insurance funds, and managed assets in this category totaled \$79.3 trillion at the end of 2010.¹⁴ Alternative funds include hedge, private equity, exchange traded, and sovereign wealth funds, and managed assets in this category at the end of 2010 totaled \$10 trillion (TheCityUK, 2011). Private wealth funds manage a total \$42.7 trillion in assets, around one-third of which is incorporated in conventional investment management funds.

Each type of funds may have its own culture. For example, some funds have close connections with affiliated banks and even work as an in-house department. The differences among various organizations are not crucial because the purpose of this study is not to analyze practices in a specific fund type, but to find unique common aspects of FVA in those organizations. Information for the investigation comes from various sources, including journalists' detailed ethnographic case studies of the valuation of exotic financial instruments both in the US and France, and the results of eight consecutive investigations of asset managers' accounting practices. Assuming that it is difficult to enter the fiercely competitive world of trading financial instruments, those secondary research materials together still provide insights into FVA practice. With the exception of one French bank (Lépinay, 2011), the geographical context of these materials is limited to the US, which is natural given its long history of prosperity and regulation of investment companies.¹⁵ For instance, in 1969, the US SEC issued guidance on fair valuation determination in the context of restricted securities in its Accounting Series Release No. 113 (ASR 113) (October 21, 1969).¹⁶

As a result of the introduction of SFAS 157, the board (or manager) of each fund now also needs to take into account the framework of measuring fair value in conformity with generally accepted accounting principles. In addition to accounting treatments, even though the standards require greater quantitative and qualitative disclosures of the details concerning the pricing of complex and hard-to-value securities, this paper mainly focuses on the valuation process itself rather than the disclosure of FVA information.

4.2. Possibilities of distributed valuation practice

In the modern financial world, investment companies seek skillful traders (fund managers) able to strategically place large amounts of investors' money into lucrative financial instruments to make trading profits. The financial instruments involved are often complexly structured. Modern derivative contracts make the measurement of financial instruments

¹⁴ The US remained by far the biggest source of these funds in 2010, accounting for nearly one half of conventional assets under management, or some \$36 trillion (TheCityUK, 2011).

¹⁵ The information from the case of a French bank (Lépinay, 2011: pp. 196–203) does not fully indicate the type of accounting standards the bank used.

¹⁶ That release was followed by ASR 118 (December 23, 1970), in which the SEC sought to provide more general valuation guidelines. In 1999, the staff of the Division of Investment Management (the Staff) issued an interpretative letter to the Investment Company Institute (the 1999 Letter) (December 8, 1999) in an effort to clarify and provide additional guidance on pricing issues in the case of an emergency or other unusual situations, and issued follow-up advice in 2001 with regard to the valuation of foreign securities in the form of a second interpretative letter to the Investment Company Institute (the 2001 Letter) (April 30, 2001). More recently, the Staff provided “best practices” guidance in a speech by Lori Richards, Director of the Office of Compliance, Inspections and Examinations (the Richards Speech) (June 14, 2002). Each of these interpretations expanded the factors that investment company boards of directors must take into account when making fair value determinations (Ake & Hays, 2007: p. 3).

complex. Particularly, “the virtual character of a derivative contract matters: it can be settled only by the transfer of cash, with neither party able to demand or impose delivery of an underlying asset. The measure used to determine the amounts to be paid must therefore be a ‘fact’: it must be an acceptable representation of the reality of which it speaks, and not be subject to manipulation (MacKenzie, 2009: p. 66).” However, in practice, the factual value of complex financial instruments can be described as follows.

Nothing in the financial world happens in a vacuum these days, given the exponential growth of trillions of dollars of securities tied to the value of other securities—known as “derivatives”—and the extraordinarily complex and internecine web of global trading relationships. Accounting rules in the industry promote these interrelationships by requiring firms to check constantly with one another about the value of securities on their balance sheets to make sure that value is reflected as accurately as possible. Naturally, since judgment is involved, especially with ever more complex securities, disagreements among traders about values are common (Cohan, 2011: p. 4).

This quotation indicates that disagreements frequently occur among sophisticated traders over the values of some financial instruments. The [International Accounting Standards Board Advisory Panel \(2008\)](#) also accepts that professional valuations are often divergent at the organizational level, as follows:

As a result of applying judgment, two entities might arrive at different estimates of the fair value of the same instrument even though both still meet the objective of fair value measurement. This could be the case when, even if the two entities use the same model, the unobservable inputs used in the model are different (para. 26).

Then, a matter of concern is how individuals in those organizations determine the fair value of the financial instruments in their portfolio. Do traders who are actively trading their assets decide the fair value of traded assets? Or, do the members of the board who are generally in charge of the traders' business decide? Or, does a back office that provides administrative and support services decide?

With regard to the valuation of assets, especially those in investment companies, a key term is Net Asset Value (NAV), which represents the value per share of the funds effectively held by the fund as calculated at the end of each trading day.¹⁷ “The fund's NAV is used to process purchases, redemptions, and exchanges by shareholders. Proper valuation of securities ensures that all transacting fund shareholders pay or receive a price that represents their proportionate share of the fund's portfolio ([Investment Company Institute \(ICI\), Independent Directors Council, & ICI Mutual Insurance Company, 2006](#)).” However, while the board is ultimately responsible for the fair valuation process, that responsibility does not necessarily mean that the board itself must make fair value determinations ([ICI et al., 2006](#)). According to the guidance of the SEC, a board may direct members of fund management (who may or may not sit on the board) or others to make the actual fair value determinations so long as the board reviews and approves the methodology or methodologies by which fair value determinations are made, regularly reviews the appropriateness and accuracy of the valuation methodologies, and makes any necessary adjustments ([ICI et al., 2006](#)). Senior board members in those organizations thus may not need to be directly involved in FVA.

4.3. Distributed FVA: outside an organization

In reality, investment companies commonly use external professional services to value complex financial instruments. Financial (or market) data vendors currently provide data to investment companies and their traders. Based on a survey by [Streambase \(2010\)](#), almost half of all respondents (46%) currently support two to three market data providers. Some 18% dealt with only one provider, while 17% use six or more. Unsurprisingly, Bloomberg and Thomson Reuters were the most commonly used market data providers.¹⁸ But, if several funds received a feed from a common pricing service and did not exercise discretion in adjusting individual bond marks, then price clustering¹⁹ would result ([Cici, Gibson, and Merrick, 2011](#): p. 214). Some funds explicitly state that they mark bonds at mid-market prices (i.e., the average of the bid and ask prices), whereas other funds explicitly state that they mark bonds at bid prices ([Cici et al., 2011](#): p. 215). This may be because “different dealers experience different customer flows and therefore could form different opinions about the underlying value of any infrequently traded issue” ([Cici et al., 2011](#): p. 225).²⁰ Fair value guidance under SEC Accounting Series No. 118 is not extraordinarily restrictive, especially as it permits funds to use a valuation within the range of bid and ask prices considered most representative of value in the specific case in question.

Furthermore, it is useful to consider the results of a survey conducted by one of the Big 4 accounting firms ([Deloitte, 2010](#)). Industry professionals representing 67 asset managers completed a survey. Those asset managers advise more than

¹⁷ Besides accounting regulations, the US Investment Companies Act of 1940 stipulates that securities for which market quotations are not “readily available” must be valued at “fair value” as determined in good faith by a fund's board of directors ([ICI et al., 2006](#): p. 1).

¹⁸ The online survey was based on responses by over 215 people, of which over 200 were active market participants. Some 59% of these respondents were from buy-side firms, and 20% were from sell-side firms, while the rest hailed from exchanges, infrastructure companies, and other industry firms.

¹⁹ Cici, Gibson, and Merrick (2011) found evidence of clustering as well as a considerable spread of prices across funds.

²⁰ Although the present study does not, [Cici et al. \(2011\)](#) explore if there is a possibility for funds (or traders) to discretely manipulate marks to smooth their returns.

3000 mutual funds with assets under management exceeding \$2.2 trillion (Deloitte, 2010). The survey results show that disagreements are routine among asset managers.

One sign of the industry's focus has been its use of the price challenge process.

Approximately 97% indicated that they have challenged the valuations by the primary pricing vendor. Almost 34% have been issuing price challenges daily. The rise of the price challenge process is not unusual given the volatility and uncertainty in the investment marketplace and the general strengthening of fund policies and procedures. Fund groups are more successfully teaming within their organizations, sometimes on a daily basis, to assess valuations provided by others using traditional and newly developed internal tools. The challenge process and questions asked have become routine. Portfolio managers and traders have become more proactive in their assessment of the valuation process, and additional relevant information is being considered (Deloitte, 2010: 2).

The term “price challenge” indicates disagreements between an asset manager and his or her external pricing vendor. As stated, requesting that external vendors offer pricing services²¹ in the FVA process is now quite common. The survey results explicitly indicate the following tendencies.

- 73% of survey participants indicated that they feel the pricing services provide a more reliable valuation than brokers
- 97% indicated instances where they have challenged the valuations provided by the primary pricing vendor
- Pricing services are generally approved annually by 66% of fund groups
- Brokers are more likely to be approved on an as needed basis (54%)
- 34% of survey participants indicated that they issue price challenges to pricing vendors on a daily basis
- When performing due diligence on pricing sources, 81% of survey respondents are asking their pricing services and brokers whether prices reflect the most recent transactions, an increase of 22% from the previous year's survey (quoted from Deloitte, 2010)

Based on the above considerations, it is notable that marks used for pricing complex and thinly traded financial instruments differ markedly among valuers, which could create conflicts. Thus, many financial institutions or funds use valuations by external professionals, and price challenges happen occasionally in some funds.

4.4. Distributed FVA: inside an organization

So far, the above discussion has largely focused on the distributed aspect of varied valuation practice in investment companies and external pricing vendors. In other words, it does not fully consider the practice inside a reporting entity.

As a representative case, Lépinay (2011: pp. 196–203) illustrates the creation and valuation of complex financial instruments inside a French mega bank, especially from the accounting perspective.²² Based on the character of a particular financial instrument, the bank has three different configurations, each playing a different role in valuation: back office, front office, and accounting department. The back office has a database, model, and pricer,²³ and for the valuation of simple financial instruments, the accounting department does not need to rely on the front office traders' knowledge. The back office directly gives information to the accounting department, which transforms many calculations into a single figure, and the latter is simply an extension of the former (Lépinay, 2011, p. 197).

In contrast, for the valuation of new, complex and esoteric financial instruments, the checks and controls of the back office are insufficient. The accounting department relies on the front office for the valuation (i.e., the trader) (Lépinay, 2011: p. 199). Sometimes, the accounting department needs the back-office database in addition to the provision of valuation-related information from the front office (Lépinay, 2011: p. 198). The Deloitte survey results also indicated that the pricing committee²⁴ inside an organization tends to be independent of senior board members in the FVA process.

- 58% of survey participants indicated that the Board of Trustees has created a separate Fair Valuation Committee
- 48% of survey participants indicated that only non-interested trustees serve on the Board's Fair Valuation Committee. 39% indicated that the involvement is the same amongst interested and non-interested trustees (quoted from Deloitte, 2010)

²¹ Two main types of pricing services exist: (a) Pricing services that use a proprietary model to estimate a price, and (b) Consensus pricing services (International Accounting Standards Board Advisory Panel, 2008: para. 64).

²² It does not particularly mention whether the bank used external pricing vendors.

²³ Pricers are pieces of software that indicate the values of financial products and help traders run risk-analysis software. They work almost automatically and produce a price on demand. Without pricers, the values of the securities in a portfolio would be indeterminable (Lépinay, 2011: p. 48 and p. 75). Notably, the back office and the front office have their own pricers.

²⁴ Most funds have valuation committees, but practices vary widely as to their precise roles and compositions, and the frequency with which they meet (ICI et al., 2005).

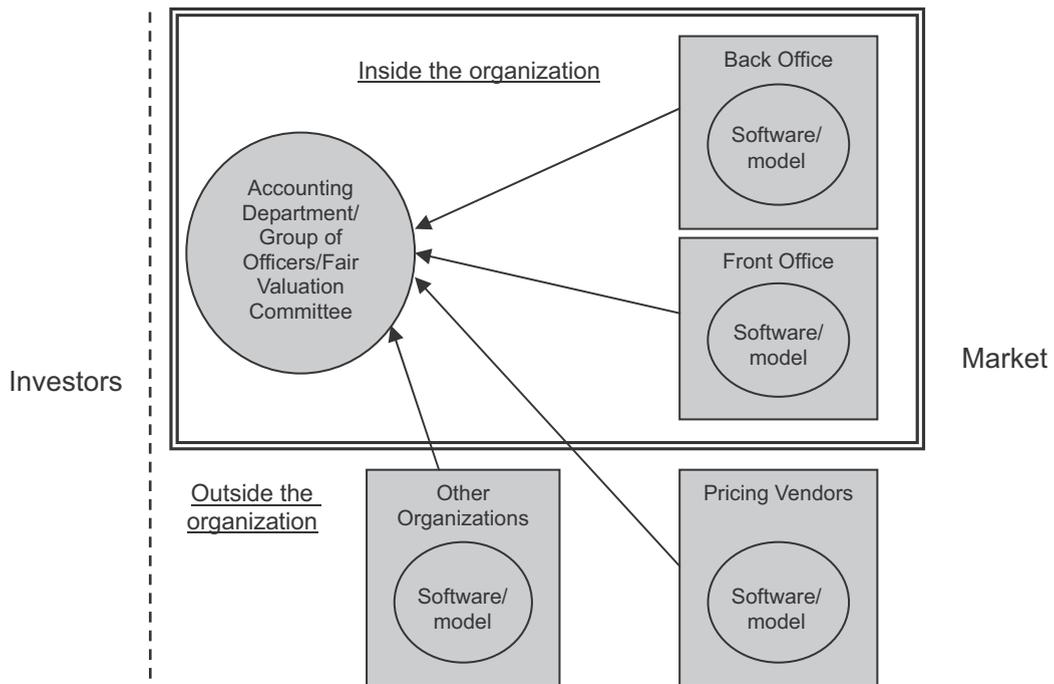


Fig. 2. Possible distribution of FVA for complex financial instruments.

Source: Based on Fig. 22 in Lépinay (2011).

4.5. Summary

Therefore, the valuation of some complex financial instruments can be distributed even inside an organization. As depicted in Fig. 2, those professionals may be located inside as well as outside the organization whose purpose is trading (and supporting) complicated financial instruments. Consequently, the distribution stimulates the provision of external professional valuation/pricing services through the expansion of outsourcing (Haslam et al., 2012). Besides, the use of various internal/external professional knowledge confers objectivity on the holding gains (or losses) of the financial statements of investment companies.

It might be possible in extreme cases that valuations are complicated and unevenly distributed to limited numbers of organizations, because in investment companies the valuation of some financial instruments cannot be decided by traders, a back office, or an accounting department in isolation, but must be done in conjunction with other departments or external organizations. Because prestige and fame could be important dimensions in markets (Lépinay, 2011: p. 250), important information for FVA might be distributed first to limited prestigious companies and then to other organizations and individuals. Because of the distributed knowledge of FVA, the valuation might not be fair because it may contradict the basic assumption of a fair and efficient market.

5. Analysis of unusual situation: valuation of CDO/CDS

In this section the valuation of CDOs and CDSs is analyzed. These financial instruments have drawn much attention since the financial crisis. A CDO (collateralized debt obligation) is an investment in a bundle of fixed income securities. The investor in a CDO is betting that the underlying securities will generate revenue. CDOs are commonly structured with multiple “tranches” with various level of risk. The riskier tranches incur first losses and have a higher rate of return, while the less risky tranches have a lower rate of return because they only incur losses after the liability of the riskier tranches has been exhausted. A CDS (credit default swaps) is a security that provides insurance on the default of asset-backed securities. The quotation below indicates how traders in a hedge fund actually valued CDOs and CDSs whose fair market value was not easily obtained.

According to SFAS 157, it is possible to get an instrument's fair value as an average of others' estimates of similar assets (FASB, 2006: C91).²⁵ However,

²⁵ Bid-ask spread pricing methods appropriate under ASR 118 are also appropriate under SFAS 157.

The way hedge funds—such as those run by Cioffi and Tannin²⁶—are required by the Securities and Exchange Commission to value the securities they own is pretty arcane.²⁷ But it is based on the idea of taking an average of the prices other Wall Street firms and other traders are finding in the market for similar securities, most of which are thinly traded from one firm to another and are rarely traded by retail investors or on exchanges, as with stocks. With these illiquid securities, hedge-fund managers had to wait until the end of each month to get the marks from other brokers and dealers, then average them, and then report the “net asset value,” or NAV as it is known on Wall Street, to investors (Cohan, 2011: p. 548).

The paragraph below reveals how FVA was being performed at the beginning of the financial crisis.

A week later, “knowing full well we’ve published our NAV,” according to this executive, Goldman Sachs sent, by e-mail, its April marks on the securities to Cioffi. “Now there’s a funny little procedure that the SEC imposes on you, which is that even if you get a late mark, you have to consider it,” he said. “Suddenly we get these marks. Except these marks are not marks from ninety-eight to ninety-seven. They go from ninety-eight to fifty and sixty. Okay? You get it? They give us these fifty and sixty prices. What we got from the other counterparties is ninety-eight. The SEC rules say that when you do this, you either have to average them—but they’re meant to be averaging ninety-sevens and ninety-eights, not fifties and ninety-eights—or you can go and ask if those are the correct marks (Cohan, 2011: p. 549).

In the above situation, how and why did Goldman Sachs (Goldman) alone give such low marks at that moment? It was likely that at that time Goldman expected the related illiquid mortgage market would continue to decline, and thus was also selling and shorting those securities (The Financial Crisis Inquiry Commission, 2011: p. 236). Unlike almost all other banks, Goldman hedged or liquidated its ABS and ABS CDO positions several months before the crisis (MacKenzie, 2011: p. 1832). Thus, “Goldman has been criticized—and sued—for selling its subprime mortgage securities to clients while simultaneously betting against those securities. . . . A structured finance expert. . . reportedly called Goldman’s practice ‘the most cynical use of credit information that I have ever seen’ and compared it to ‘buying fire insurance on someone else’s house then committing arson’ (The Financial Crisis Inquiry Commission, 2011: p. 236). The purpose of this paper is not to consider whether Goldman was acting ethically and legally, but rather to focus on the fact that Goldman recognized the impairment of critical financial instruments before others did, and consider how this was possible. The recent case of Basis Yield Alpha Fund versus Goldman Sachs & Co and affiliated companies can provide useful clues regarding this matter.

In October, 2012, New York Supreme Court Judge Shirley Werner Kornreich partly denied Goldman’s motion to dismiss the suit, dropping breach of contract and breach of the implied covenant of good faith and fair dealing claims by plaintiff Basis Yield Alpha Fund, but retaining other claims including those for fraud, fraudulent inducement, and fraudulent concealment.

Basis Yield Alpha Fund (BYAFM) brought an action against Goldman Sachs & Co. and affiliated companies (“Goldman”) for knowingly making materially false and misleading statements and omissions in connection with the sale of a security issued by a CDO based upon subprime residential home mortgages, known as Point Pleasant 2007-1, Ltd (Point Pleasant²⁸), and the entry into two CDSs that referenced AAA and AA rated securities from a similar CDO known as Timberwolf 2007-1, Ltd (i.e., Timberwolf). Goldman began to market and sell the Point Pleasant and Timberwolf securities in the first quarter of 2007. Within weeks of BYAFM buying these securities, they rapidly declined in value, as the Defendants knew and intended would occur. The explanation for how Goldman was able to promptly recognize the imminent decline in the value of those complex financial instruments backed by mortgages (Point Pleasant and Timberwolf), and how it got the inside information is as follows.²⁹

The market for securities based on subprime residential mortgages as it existed during the timeframe relevant to this dispute was highly complex, opaque, and concentrated. Only a few investment banks were significant issuers or traders in this market, which was characterized by illiquidity and a paucity of publicly available information. Goldman was a central participant in this market and was intimately involved in all phases of it, including working closely with banks and other lenders who made high-risk mortgage loans in the first instance, working with syndicators in bundling mortgages into RMBS (residential mortgage backed securities), creating and marketing both cash and synthetic CDOs, providing information to rating agencies to secure ratings on the securities it was offering and monitoring the performance of the securities and their constituent underlying securities post-issuance. As a consequence, Goldman was one of a very small group of market participants to have and acquire information about the current value and outlook for RMBS and CDO offerings (para. 21).

²⁶ These individuals are former Bear Stearns hedge fund managers who managed sub-prime-laden hedge funds (the Bear Stearns High Grade Structured Credit Strategies Master Funds Ltd and the Bear Stearns High Grade Structured Credit Strategies Enhanced Master Funds Ltd).

²⁷ The bankruptcy in the early summer of 2007 of two hedge funds run by Bear Stearns was the single most clearly identifiable trigger of the crisis (MacKenzie, 2011: p. 1819). According to the indictment, Bear Stearns Asset Management had an independent pricing committee that was a group of professionals who were charged with overseeing the ultimate calculation of the funds’ NAV. However, it was also bizarre that Cioffi could ask the committee to give him his desired number (<http://f11.findlaw.com/news.findlaw.com/hdocs/docs/crim/uscioffitannin61808ind.pdf>).

²⁸ Actually, it was a CDO squared security consisting of a portfolio of CDO assets and reference obligations.

²⁹ *Basis Yield Alpha Fund (Master) v. Goldman*, Index No: 652996/2011, Oct. 27, 2011.

Goldman and the other investment banks exercised substantial control over the flow of information, including pricing information, about these RMBS and CDO securities. As a result, the investors in the RMBS and CDO securities relied heavily on and reasonably expected the investment banks, such as Goldman, to provide truthful and complete information about the RMBS and CDO securities and the pricing and market for these securities (para. 22).

As the underwriter and sponsor of these securities, Goldman had far superior knowledge to BYAFM about the quality, value, pricing and likely performance over time of Point Pleasant and Timberwolf, as well as the criteria by which the underlying and reference securities on which these offerings were based were selected, information that was largely unavailable to BYAFM (para. 23).

On March 8, 2007, Daniel Sparks, the head of the Mortgage Department at Goldman, gave, in an internal Goldman e-mail, a lengthy statement of his views on RMBS. He referred to the Timberwolf deal, which at that point had not yet been issued, as one of Goldman's "most risky" CDOs. He reconfirmed Goldman's anticipation of a "dramatic credit environment downturn" and reiterated that Goldman is "still net short" (para. 34).

Goldman knew that the resulting Point Pleasant and Timberwolf securities were of much lower quality and value than represented. Goldman knew this because of its own due diligence investigations and the due diligence investigations, performed for Goldman's benefit but not for disclosure to customers Goldman was soliciting, by outside firms like Clayton Holdings, Inc. ("Clayton"). In addition to arranging CDOs, Goldman was also directly involved in acquiring or originating mortgage loans and then assembling, creating, and marketing RMBS that were backed by pools of these loans. As a direct result of this role, Goldman acquired a great deal of non-public detailed information about the quality or lack thereof of the mortgages that backed the RMBS. This information was highly material to assessing whether the RMBS would either perform as expected, or instead would fail to meet expectations and even go into default. Equally, this information was highly material as to the expected performance and risk of CDOs constructed out of these RMBS (paras. 131–133).

Goldman, either directly or through a third-party due diligence firm, routinely conducted due diligence review of the mortgage loan pools it bought from lenders or third party brokers for use in its RMBS securitizations. Thus, Goldman, including Sparks, had access to detailed non-public information concerning the true quality of the loans collateralizing the RMBS securitizations it sponsored. Goldman retained third-party due diligence providers such as Clayton to analyze the loans it was considering placing in its securitizations. Throughout 2006, Goldman was Clayton's largest client. For each quarter of 2006, and for the full year, Clayton reviewed more loans for Goldman than for any other investment bank. Clayton told the New York Attorney General "that starting in 2005, it saw a significant deterioration of lending standards and a parallel jump in lending expectations." As a key client of Clayton, Goldman had access to non-public reports and data by Clayton showing this significant deterioration. Clayton's reports to Goldman were confidential, and were not shared with purchasers of RMBS or CDOs underwritten and sold by Goldman. Nor were the reports shared with BYAFM. Documents released by Clayton confirm that Goldman was aware of the weakness in the loan pool and in the underwriting standards of the originators it used in its RMBS transactions (paras. 138–142).

Although the above might describe an exceptional circumstance occurring at the beginning of the financial crisis, it indicates that useful information for estimating the price of hard-to-value securities is limited to small number of market participants, or unevenly distributed. However, in retrospect, the information obtained through careful due diligence that Sparks (and Goldman) and Clayton had initially might have been sufficient to obtain a good estimate of the fair value of those securities.

Besides the disagreement within Goldman Sachs regarding the valuation,³⁰ a further consideration is that despite Goldman having information that indicated the likelihood of a decline in the value of certain CDOs, other market institutions failed to notice these signs. This raises the issue of whether it is acceptable for market participants not to share critical information under such unusual market conditions. The next section discusses this matter further.

6. Implications from the analysis: distributed valuation and human interaction

Based on the distributed cognition perspective, this study has so far pointed out that FVA in investment companies involves the operation of distributed systems and incorporates different tools such as models and databases. This is inevitable in a real-world, imperfect, market for complicated financial instruments. Thus, "not only is the production of company accounts beyond the powers of an individual, but the limited 'hardness' the resultant numbers possess is intrinsically bound up with the involvement of multiple human beings in roles that are structured in part technologically" (MacKenzie, 2009: p. 17). Furthermore, the final FVA figure tends to be determined by the negotiation skills and powers of the parties involved (Schmidt, 2009: p. 274). For example, the process of price challenging undoubtedly involves such negotiation. Various factors can be critical in such negotiation. For example, "various cultural phenomena—such as morals and related norms and values,

³⁰ In the case of the above valuation of Point Pleasant and Timberwolf, information that Sparks had obtained from Clayton was not simply accepted by the other members of Goldman.

religious and other beliefs, ideas, ideologies and ideals, traditions and customs, ethnicity and nationality, and so on—all have definite influences on market processes and outcomes, particularly on both product prices and factor prices (incomes)” (Zafirovski, 2000: p. 289).

Tuomela (2007) stated that group actions entail commitments by group members. If we consider market participants to be members of the same group in a weak sense, the uneven distribution of critical valuation information in unusual market conditions implies a lack of such commitments.

In the valuation of esoteric financial instruments, FVA (particularly Level 3 inputs) tends to be distributed to various artifacts such as models, software, and databases. Interactions of internal and external professionals through their distributed knowledge in current FVA entail fewer degrees of human connection and interaction than ever before. However, valuation is not always finalized with models, databases, and pricers. “It is the humans, and only the humans, that provide intentional, cognitive agency to scientific distributed cognitive systems” (Giere, 2007: p. 319). Human beings have a capacity for collective intentionality that makes them share intentional states such as beliefs, desires, and intentions (Searle, 1995: p. 23). This perspective is useful in understanding that a human actor implicitly or explicitly assumes that others’ cognition is similarly distributed to human beings and artifacts.³¹

Valuation practices in investment companies are currently based on sophisticated models and software. However, the manner in which professional individuals with unique reciprocity and docility interact with other individuals and materials, such as databases and models, nevertheless requires further elaboration. Callon (2004: 7) stated that “the more we recognize that non-humans have an active social role, the more we enrich human nature. A consequence of the rehabilitation of non-humans is thus the rehabilitation of humans.”

7. Conclusion

Many proponents of FVA implicitly assume that financial markets are efficient. “Fair valuations are supposed to both reflect and reinforce that efficiency, the latter by better diffusion of real time information on objective assets and liability valuations” (McSweeney, 2009: p. 837). However, there is no conclusive evidence that FVA should totally replace other valuation methods such as HCA, and the mixed-attribute valuation model has been long accepted in accounting regulation in major countries.

This study tentatively revealed, based on some illustrations of FVA practices for hard-to-value securities, that both the process and technical knowledge of FVA could be distributed among databases, models, and software, as well as among specialist individuals with their own market knowledge. This can be explained from the perspective of distributed cognition. Although this study assumes that knowledge could be distributed not only among different individuals but also among other models, databases, and software, it suggests that more interactions among individuals and organizations in the market can contribute to the need for the valuation of complex financial instruments particularly under unusual market conditions. In the case of modern complex financial markets, professionalism cannot promise accountants personal autonomy with respect to FVA. Such autonomy would be both impossible and counterproductive in the context of the collaborative and interpretative relationships through which accounting knowledge is produced (Gill, 2009: p. 108).

The distribution of the process of FVA may be inevitable, but it is also important that this process is underpinned by human interactions beyond the formal and contractual boundaries that exist inside and outside organizations. Based on these assertions, future studies could explore how the knowledge and processes of FVA distributed to individuals or organizations (such as traders in the front office, staff in the back office and the accounting department, professionals in external vendors, and auditors in accounting firms³²) interact in the market, and what measures we adopt to cope with these complex aspects of FVA.

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References

AAA (American Accounting Association) Financial Accounting Standards Committee. (2005). *Response to the FASB’s exposure draft on fair value measurements*. *Accounting Horizons*, 19(3), 187–196.

³¹ However, Giere (2005: 319) seems not to agree with this point by stating, “to understand how the members of the groups collectively make the system work, it is not necessary, and I think definitely unhelpful, to introduce the concept of a super, or collective, agent.”

³² According to Goncharov, Riedl, and Sellhorn (2011), “audit fees are decreasing in the firm’s exposure to assets reported at fair value, and increasing in the firm’s exposure to more difficult-to-measure (i.e., Levels 2 and 3) fair values.”

- Ake, J. N., & Hays, M. J. (2007). Regulatory and accounting standards on the valuation of portfolio securities by investment companies. *Wall Street Lawyer*, 11(1), 1–8.
- American Institute of Certified Public Accountants (AICPA). (1973). *Objectives of financial statements (Trueblood Report)*. New York: Accounting Objectives Study Group. <http://3197d6d14b5f19f2f440-5e13d29c4c016cf96cbbfd197c579b45.r81.cf1.rackcdn.com/collection/papers/1970/1973.1001-TruebloodObjectives.pdf>
- Bardone, E., & Secchi, D. (2009). Distributed cognition: a research agenda for management. *Current Topics in Management*, 14, 183–207.
- Bignon, V., Biondi, Y., & Ragot, X. (2012). An economic analysis of fair value: A critique of international financial reporting standards. In T. Clarke, & D. Branson (Eds.), *The SAGE handbook of corporate governance* (pp. 159–181). London: SAGE Publications.
- Bougen, P. D., & Young, J. J. (2012). Fair value accounting: Simulacra and simulation. *Critical Perspectives on Accounting*, 23(4–5), 390–402.
- Callon, M. (2004). The role of hybrid communities and socio-technical arrangements in the participatory design. *Journal of the Center for Information Studies*, 5(3), 3–10.
- Callon, M., & Muniesa, F. (2005). Economic markets as calculative collective devices. *Organization Studies*, 26(8), 1229–1250.
- Campbell, R. L., Owens-Jackson, L. A., & Robinson, D. R. (2008). Fair value accounting from theory to practice: Implementation of SFAS No. 157 will be tumultuous, painful, and require significant adjustment for U.S. accounting professional. *Strategic Finance*, 90(1), 31–37.
- Christensen, B. E., Glover, S. M., & Wood, D. A. (2013). Extreme estimation uncertainty and audit assurance. *Current Issues in Auditing*, 7(1), 36–42.
- Cici, G., Gibson, S., & Merrick, J. J., Jr. (2011). Missing the marks? Dispersion in corporate bond valuations across mutual funds. *Journal of Financial Economics*, 101(1), 206–226.
- Coase, R. D. (1937). The nature of the firm. *Economica*, 4(16), 386–405.
- Cohan, W. D. (2011). *Money and power*. New York: Penguin Books.
- Deloitte. (2010). *Springing forward: The eighth annual fair value pricing survey Executive summary and key trends and findings*.
- Epstein, R. (Ed.). (2005). *Financialization and the world economy*. Aldershot: Edward Elgar.
- Epstein, R., & Henderson, M. T. (2011). Do accounting rules matter? The dangerous allure of mark to market. *Journal of Corporation Law*, 36(3), 513–549.
- Financial Accounting Standards Board (FASB). (2006). *Statement of Financial Accounting Standard No. 157 Fair Value Measurement (Original pronouncements as amended)*.
- Fitzsimons, A. P., Satenstein, J. L., & Silliman, B. R. (2010). Fair value audit guidance of public and non-public companies in response to the credit crisis. *Review of Business*, 30(2), 40–49.
- Georgiou, O., & Jack, L. (2011). In pursuit of legitimacy: A history behind fair value accounting. *British Accounting Review*, 43(4), 311–323.
- Giere, R. N. (2005). *Scientific perspectivism*. Chicago: The University of Chicago Press.
- Giere, R. N. (2007). Distributed cognition without distributed knowing. *Social Epistemology*, 21(3), 313–320.
- Gill, M. (2009). *Accountants' truth*. Oxford: Oxford University Press.
- Goncharov, I., Riedel, E. J., & Sellhorn, T. (2011). *Fair value and audit fees*. <http://ssrn.com/abstract=1855628>. Accessed 15.07.13
- Haldane, A. G. (2012). *Accounting for bank uncertainty. Remarks given at the Information for Better Markets Conference*. Institute of Chartered Accountants in England and Wales (ICAEW).
- Haslam, C., Andersson, T., Tsitsianis, N., & Yin, Y. P. (2012). *Redefining business models: Strategies for a financialized world*. Oxon: Routledge.
- Hazlehurst, B., Gorman, P. N., & McMullen, C. K. (2008). Distributed cognition: An alternative model of cognition for medical informatics. *International Journal of Medical Informatics*, 77(4), 226–234.
- Hitz, J. (2007). The decision usefulness of fair value accounting – A theoretical perspective. *European Accounting Review*, 16(2), 323–362.
- Huault, I., & Montagner, R. (2009). Market shaping as an answer to ambiguities: The case of credit derivatives. *Organization Studies*, 30(5), 549–575.
- Hutchins, E. (1995a). *Cognition in the wild*. Cambridge: MIT Press.
- Hutchins, E. (1995b). How a cockpit remembers its speed. *Cognitive Science: A Multidisciplinary Journal*, 19(3), 265–288.
- International Accounting Standards Board Advisory Panel. (2008). *Measuring and disclosing the fair value of financial instruments in markets that are no longer active*.
- Investment Company Institute (ICI), Independent Directors Council and ICI Mutual Insurance Company. (2005). *Fair valuation series: An introduction to fair valuation*.
- Investment Company Institute (ICI), Independent Directors Council, & ICI Mutual Insurance Company. (2006). *Fair valuation series: The role of the board*.
- International Monetary Fund (IMF). (2008). *Global financial stability report: Financial stress and deleveraging macro financial implications and policy*.
- Jacquemard, R. (2007). Fair value and the auditor. In P. J. Walton (Ed.), *The Routledge companion to fair value and financial reporting* (pp. 278–299). UK: Routledge.
- Kaplan, R. S. (2011). Accounting scholarship that advances professional knowledge and practice. *The Accounting Review*, 86(2), 367–383.
- Koga, C. (2001). Financial instruments and finance-oriented accounting. *Kokumin Keizai Zasshi*, 183(5), 31–43 (in Japanese).
- KPMG. (2011). *IFRS illustrative financial statements: Investment funds*.
- Lépinay, V. A. (2011). *Code of finance*. Princeton: Princeton University Press.
- List, C. (2008). Distributed cognition: A perspective from social choice theory. In A. Max, S. Dieter, & V. Stefan (Eds.), *Scientific competition: Theory and policy. Conferences on new political economy* (Vol. 25) (pp. 285–308). Germany: Tübingen.
- MacKenzie, D. (2009). *The material markets-how economic agents are constructed*. Oxford: Oxford University Press.
- MacKenzie, D. (2011). The credit crisis as a problem in the sociology of knowledge. *American Journal of Sociology*, 116(6), 1778–1841.
- Martin, R. D., Rich, J. S., & Wilks, T. J. (2006). Auditing fair value measurements: A synthesis of relevant research. *Accounting Horizons*, 20(3), 287–303.
- McSweeney, B. (2009). The roles of financial asset market failure denial and the economic crisis: Reflections on accounting and financial theories and practices. *Accounting, Organizations and Society*, 34(6–7), 834–848.
- Nissim, D., & Penman, S. (2008). *Principles for the application of fair value accounting*. White Paper 2. Centre for Excellence in Accounting and Security Analysis (Columbia Business School).
- Obinata, T. (2011). *Misuses of fair value and financial crisis*. CARF Working Paper (J-073). Centre for Advanced Research in Finance, The University of Tokyo (in Japanese).
- Penman, S. (2011). *Accounting for value*. New York: Columbia Business School Publishing.
- Power, M. (1997). Expertise and construction of relevance: Accountants and environmental audit. *Accounting, Organizations and Society*, 22(2), 123–146.
- PricewaterhouseCoopers (PwC). (2011). *Illustrative IFRS financial statements 2011—Investment funds*.
- Redmond, W. (2013). Financial innovation, diffusion, and instability. *Journal of Economic Issues*, 47(2), 525–531.
- Ryan, S. G. (2008). *Fair value accounting: Understanding the issues raised by the credit crunch*. White Paper. The Council of Institutional Investors.
- Schmidt, M. (2009). Fair value: Your value or mine? An observation on the ambiguity of the fair value notion illustrated by the credit crunch. *Accounting in Europe*, 6(2), 271–282.
- Searle, J. R. (1995). *The construction of social reality*. New York: The Free Press.
- Smith-Lacroix, J., Durocher, S., & Gendron, Y. (2012). The erosion of jurisdiction: Auditing in a market value accounting regime. *Critical Perspectives on Accounting*, 23(1), 36–53.
- Streambase. (2010). *Special report: Market data management trends in 2010*. http://www.streambase.com/wp-content/uploads/downloads/StreamBase-Special_Report_Market_Data_Management_Trends_in_2010.pdf. Accessed 15.07.13
- TheCityUK. (2011). *Financial market series—Fund management*.
- The Financial Crisis Inquiry Commission. (2011). *The financial crisis inquiry report* Final report of the national commission on the causes of the financial and economic crisis in the United States.
- Tuomela, R. (2007). *The philosophy of sociality: The shared point of view*. Oxford: Oxford University Press.

- Young, J. J., & Williams, P. F. (2010). Sorting and comparing: Standard-setting and 'ethical' categories. *Critical Perspectives on Accounting*, 21(6), 509–521.
- Zafirovski, M. Z. (2000). An alternative sociological perspective on economic value: Price formation as a social process. *International Journal of Politics, Culture, and Society*, 14(2), 265–295.
- Zeff, S. A. (1999). The evolution of the Conceptual Framework for business enterprises in the United States. *Accounting Historians Journal*, 26(2), 89–131.
- Zeff, S. A. (2013). *The objectives of financial reporting: A historical analysis* Draft of paper January 1st. <http://www.icaew.com/~media/objectives-of-financial-reporting/objectives-of-financial-reporting.pdf>