

**Fair Value Disclosures and Fair Value Hierarchy:
Literature Review on the Implementation of IFRS 13 and SFAS 157**

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Abstract: Fair Value Measurement accounting standards, i.e., IFRS 13 and SFAS 157, have been widely discussed and challenged by both academic literature and practitioners. In an attempt to provide a comprehensive understanding of the consequences of IFRS 13 and SFAS 157 implementation, we provide a critical analysis of the related academic literature. We identify and discuss five topics, i.e., value relevance, information content, managerial judgement, economic consequences, and common critiques to fair value estimates. We document that assets and liabilities estimated at fair value are usually value relevant and investors value additional firms' disclosure about fair value estimates. Past research supports the conjecture that fair value estimates may trigger opportunistic managers' behaviours, especially in the presence of significant managerial discretion. Fair value estimates are often associated with an increase in the cost of financing and audit effort. Empirical evidence also shows that bank regulation, and not fair value accounting, mostly stimulated the pro-cyclical leverage contributing to the financial crisis. The aforementioned results vary across Level's inputs, and they do not always follow the fair value hierarchy, i.e. the relative ordering of the three Level's inputs. In fact, multiple factors influence the impact of fair value estimates, such as type of underlying assets, managerial intent, market conditions, and institutional environment. Our results represent a support to researchers and regulators by providing an up-to-date state of knowledge of the implementation of fair value measurement accounting standards. Our comprehensive analysis provides evidence to foster changes aiming to improve financial reporting quality.

Keywords: Fair Value; IFRS 13; SFAS 157; Value Relevance; Fair Value Hierarchy; Financial Crisis; Corporate Governance

1. Introduction

Since its implementation in accounting standards, Fair Value Measurement (FVM) has been widely discussed and even challenged after the 2008 financial crisis. Some believe that FVM has a pro-cyclical effect, other questions the relevance of the recognition of available-for-sale (AFS) securities gains and losses in other comprehensive income, but not in earnings and FVM's relevance for firm value. This paper explores the academic literature about the post-implementation effects of the accounting standards about FVM (i.e. IFRS 13 and SFAS 157)¹. This paper aims to organically review the main research findings and to provide a discussion of their implications.

IFRS 13 and SFAS 157 present very similar characteristics because they are the result of the convergence process between the IASB (International Accounting Standards Board), a transnational accounting standard-setting body part of the IFRS Foundation, and the U.S. FASB (Financial Accounting Standards Board), the U.S. standard setting body.² The standard setting bodies use the notion of 'exit price', allowing firms to use three Levels of inputs for their fair value estimates of assets and liabilities. Level 1's inputs are 'market-based'. They are observable inputs from quoted prices in active markets; Level 2's inputs include indirectly observable inputs from quoted prices of comparable items in active markets, identical items in inactive markets, or other market-related information; and Level 3's inputs are 'model-based' and often referred as to 'mark-to-model'. They are unobservable, firm generated inputs. The standard setting bodies suggest a 'fair value hierarchy', such that Level 1 < Level 2 < Level 3. This ranking is based on the level of uncertainty associated with the different inputs used in the estimates. The core issue about the FVM concerns the level of reliability and relevance of the estimates.

¹ In the updated FASB classification, SFAS 157 is known as ASC 820.

² <http://www.fasb.org/cs/>. Accessed on April 11th, 2018.

This paper reviews 47 academic papers (39 published in academic journals and 8 working papers) on the implementation of fair value accounting standards, i.e., IFRS 13 and SFAS 157. We selected papers relevant to our review through a content analysis of the academic papers obtained by iterative searches on Scopus and Google Scholar. We restricted our analysis to the period 2008 – 2018 (first year of SFAS 157 implementation). Most papers are published between 2014 and 2018.

We identify and discuss five topics, i.e., value relevance, information content, managerial judgement, economic consequences and common critiques to fair value estimates. This analytical framework aims to provide a comprehensive understanding of the different aspects associated with the implementation of the fair value accounting standard. They could be summarized as follows.

Past research documents that Level 1 fair value estimates are on average more value relevant than Level 2 and Level 3 fair value estimates (Freeman et al. 2017; Tama-Sweet and Zhang, 2015). In addition, prior literature documents that the value relevance of fair value estimates depend on firm specific characteristics, the information environment, and the institutional context. Fair value disclosure plays a key role in informing investors and analysts about fair value estimates. Additional information about Level 3 fair value estimates contributes to reduce the uncertainty and risks generally perceived around this type of estimates. Managers also use Level 2 estimates to convey useful information to market participants (Magnan et al. 2015).

Managers often opportunistically exploit their discretion in fair value estimates, in particular for Level 3 fair value estimates. To minimize the risks of being penalized by the market for their opportunistic decisions, managers try to minimize the amount of assets reported in Level 3 or to slowly adjust their classifications to market changes.

Fair value estimates exhibit economic consequences. In particular, a higher amount of Level 3 fair value estimates is associated with higher cost of debt (Magnan et al. 2016), cost of capital (Huang et al. 2016), audit fees (Alexeyeva and Mejia-Likosova 2016) and lower credit rating (Ayres 2016).

Finally, we develop a critical reflection around multiple beliefs about fair value accounting. First, fair value estimates appear not being the triggering effect of the financial crisis. Second, banks use gains and losses on AFS securities to manage earnings and increase regulatory capital. Third, investors can use fair value earnings to value firms. Fourth, it could be useful to report net income associated with changes of liability's fair value due to changes in credit risk. Fifth, we discuss the Plantin and Tirole's paper (forthcoming) that show the limitations of fair value estimates over historical costs due to opportunistic managers behaviours and limited market liquidity.

This paper contributes to prior research on FVM accounting standards by providing an organic and up-to-date discussion of the main areas of research about FVM. This paper also contributes to the current discussion on the limitations of FVM (Plantin and Tirole, forthcoming; Filip et al. 2017). It tries to overcome some misconceptions associated with the fair value estimates, in particular about the relationship with the financial crisis and the usefulness to recognize certain items associated with FVM in the financial reports. In this way, this study provides support to policy makers to implement changes aiming to improve financial reporting quality.

The rest of this literature review proceeds as follows. Section 2 summarizes the technical characteristics of IFRS 13 and SFAS 157 and provides empirical evidence on the classification of fair value estimates. Section 3 discusses the value relevance of fair value estimates and Section 4 investigates the content of fair value estimates disclosure. Section 5 explores the role of managerial judgment in fair value estimates. Section 6 discusses the

economic consequences of fair value estimates. Section 7 discusses the common critiques to the fair value accounting standard. The final section concludes this literature review and provides future avenues for research and standard-setting processes.

2. Standards characteristics and methodology for literature review

a. The Characteristics of the FVM Accounting Standards

The IASB and the FASB separately started the revision of the fair value accounting standards. The FASB issued the Statement of Financial Accounting Standards No. 157 Fair Value Measurements (SFAS 157) in 2006, whereas the IASB started the process in 2006 by issuing a discussion paper. In 2009, the IASB prepared the exposure draft following the requirements of SFAS 157, but with few differences. The two Boards started the convergence process in 2010 to define a uniform framework for FVM.

The objective of the fair value accounting standard is to enhance comparability across entities of fair value estimates. The main change compared with the previous standard concerns the guidelines on *how* to provide fair value estimates rather than *when* an entity can use fair value estimates. The new standard also includes guidelines about entity's own equity instrument, aligning it to FVM of liabilities. Fair value estimates are market-based measurement and not entity-based. Managers should follow market participants' assumption on pricing assets or liabilities. In their valuations, managers should prefer observable inputs to non-observable inputs. Transaction costs are not included in FVM.

IFRS 13 is a wider application of IFRS 7³ because it extends FVM to non-financial assets and liabilities. IFRS 13 is part of the IASB's actions following the criticisms around the financial crisis. The additional disclosure requirements aim to provide financial reporting users relevant information about valuation techniques and the inputs of fair value estimates.

³ IFRS 7 'Financial Instruments: Disclosures' was originally issued in August 2005 and applies to annual periods beginning on or after 1 January 2007.

IFRS 13 Fair Value Measurement represents the principle-based framework guiding entities to measure or disclose the fair value of their assets, liabilities or equity instruments. It applies to annual periods beginning on or after January 1st, 2013. The accounting standard allows entities an early adoption. IFRS 13 is consistent with most of entities' practices, with few exceptions, e.g., the prohibition on blockage discounts for all FVM.

SFAF 157 is effective for financial statements issued for fiscal years beginning after November 15th, 2007. Table 1 presents a summary of the similarities and the (few) differences between IFRS 13 and SFAS 157. The two standards substantially converged with almost no differences in the key notions. The differences concern elements of second-order importance and do not appear to significantly impair the comparison between fair value estimates using IFRS 13 or SFAS 157.

[INSERT TABLE 1 ABOUT HERE]

b. Methodology of literature review

This section discusses the methods used for selecting and reviewing papers about the implementation of IFRS 13 and SFAS 157. We searched on Scopus and Google Scholar papers over the period 2008 – 2018. Our analysis starts in 2008 because it is the first period U.S. companies could use SFAS 157. Consistent with our scope of gathering empirical evidence about FVM, we focused on academic papers rather than on practitioners' articles which usually mostly discuss technical aspects of the accounting standards.

We perform four search rounds between March and April 2018. We started with a broad search for literature by using the following keywords, 'IFRS 13', 'SFAS 157', 'Fair Value Accounting', 'Financial Crisis and Fair Value'. We then read and analysed the papers obtained by trying to identify thematic areas of research. Each paper was summarized and labelled according to the topic of analysis (i.e., value relevance, information content, managerial judgement, economic consequences and common critiques to fair value

estimates), research method (i.e., archival, qualitative, and experimental), and context of analysis (i.e., U.S.A., International, Europe). We integrated our analysis with the presentation “Fair Value Accounting Commonly Held Beliefs: Insights from Research” by Mary Barth at the ESSEC FRAP conference (April 11th, 2018).

After the completion of this process, we obtained 47 papers. Most of papers selected are published between 2014 and 2018. We explain this result because we focus on archival research which usually needs few year-observations to gather robust evidence and the length of the publication process in the accounting journals.

3. Classification of Fair Value Estimates – Empirical Evidence

Level 1, 2 and 3 inputs exhibit significant different amounts and proportion within and across firms. Bhamornsiri et al. (2010) analyse Fortune-500 companies in 2008 and document that reporting entities mostly use Level 2 inputs for assets (70%), whereas Level 1 and Level 3 inputs are used by 23.5% and 6.5% of the fair value estimates. In a similar fashion, 82.7% of liabilities reported at fair value are based on Level 2 inputs. In a sample of U.S. commercial banks over the period 2008 - 2009, Du et al. (2014) find that the means of Level 1, 2, and 3 fair value assets (liabilities) relative to the total assets are 1% (0%), 14.3% (0.05%), and 0.5% (0.1%). Freeman et al. (2017) show that for a sample of U.S. banks between 2008 and 2014, the mean of assets measured at fair value is equal to \$34.37 per share, which is equal to 20.1% of the firms’ average total assets. Assets estimated with Level 2 inputs are the majority, with a mean value of \$32.21 per share and equal to 93.7% of the average total fair value assets. The amount of assets at Level 3 and Level 1 is almost not remarkable. Similarly, Goh et al. (2015) find that for a sample of U.S. banks over the period 2008 – 2011, the mean fair value for assets using Level 1 inputs, (Level 2 inputs/Level 3

inputs) per share is \$3.09 (\$26.93/\$3.60). With regards to the proportion to total assets, Level 1, Level 2, and Level 3 fair value assets represent 2.41%, 15.93% and 3.97% of total assets.

Magnan et al. (2015) report that for a sample of U.S. banks between 1996 and 2009, assets estimated at fair value represent 22.3% of all assets. AFS assets are 18.2% of assets, whereas only 1% of total assets are held for trading and loans. They find that Level 2 assets and liabilities are over 19% of all assets, while Level 1 (Level 3) only 1.9% (0.9%). In addition, more than 40% of banks do not report Level 3 assets and liabilities. For a sample of U.S. firms between 2007 – 2014, Badia et al. (2017) show that fair value financial instruments are mostly reported by financial firms. The ratio of fair value assets to fair value liabilities is over 7 to 1. Finally, Riedl and Serafeim (2011) document that U.S. financial institutions over the period 2007 – 2008 with the largest amount of Level 3 fair value assets are those with higher risk, i.e., higher equity betas.

For a sample of financial firms at international level between 2012 and 2014, Siekkinen (2016) finds that on average 40.91% of total assets are measured at fair value (20.55 % at Level 1, 13.17% at Level 2, and 7.19% at Level 3). Firms use less fair value estimates for liabilities relative to assets. On average, only 14.81% of total liabilities are reported at fair value (11.21% at Level 1 and Level 2, 3.60% at Level 3). In another study, Siekkinen (2017) investigates a sample of 29 European financial firms between 2012 and 2013. The author finds that the means of Levels 1, 2 and 3 fair value assets per share are 48.93, 35.20 and 9.98 euro. The means of Levels 1 and 2 together, and Level 3 fair value liabilities are 32.66 and 5.38 euro.

Overall, past research shows that Level 2 assets, and in certain cases Level 1 assets, represent most of fair value estimates. Level 3 assets and fair value estimates of liabilities are a small proportion of the total fair value estimates. However, the evidence gathered is

scattered both in terms of industries and time. Prior literature mostly focuses on financial institutions and covers a short period of time.

We thus provide some additional descriptive statistics about assets and liabilities estimated at fair value between 2008 and 2017 for a sample of U.S. firms (see Table 2). We gather data from Compustat Database and we winsorize all them at 1% level. Panel A of Table 2 shows that the largest proportion of fair value estimates concerns Level 1 and Level 2 assets. The proportion of fair value estimates to total assets is constant over time, except for Level 3 assets. Fair value estimates for liabilities are of small amount.

Panel B of Table 2 reports fair value estimates for the sub-sample of financial and insurance institutions (industry classification SIC code between 6000 and 6499). We document that Level 2 assets play a key role for this type of firms. Level 2 assets amount on average for about 20% of total assets, whereas Level 1 and Level 3 assets exhibit significantly lower amounts. The sum of liabilities estimated at fair value is lower than 2% of total assets.

[INSERT TABLE 2 HERE]

Level 1 and Level 2 include the largest portion of assets and liabilities reported at fair value. Financial institutions have the highest proportion of financial instruments to total assets estimated at fair value. In addition, they have a limited use of Level 1 inputs and of quoted prices available in active markets.

We complement our descriptive analysis of the amount and proportion of fair value estimates with data at international level by reporting Fiechter and Novotny-Farkas (2017) main descriptive statistics in Table 3. The objective is to provide a descriptive discussion of the levels of fair value categories for financial assets (i.e., held-for-trading, AFS, and fair value option) for each country in the sample.

[INSERT TABLE 3 HERE]

Fiechter and Novotny-Farkas (2017) find that fair value options significantly vary across countries. In their sample of 46 countries, they find that firms operating in 12 countries do not use fair value options for financial assets and in 19 for financial liabilities. Belgium and France exhibit the highest proportion of assets estimated at fair value. On average, companies in Belgium and France estimate 40% of their assets at fair value, mostly AFS in Belgium and held-for-trading in France. Companies operating in France and Sweden exhibit the largest proportion of liabilities estimated at fair value (around 27% of total liabilities). Given the variability across Levels in fair value estimates, we next question whether market participants value fair value estimates and the impact of fair value disclosure on investors' decisions.

4. Value Relevance of Fair Value Estimates

Assets and liabilities estimated at fair value are usually considered value relevant (Magnan 2009).⁴ Barth (2007) argues that estimates at fair value provide more value relevant information than those based on historical cost. Song et al. (2010) investigate the post-SFAS 157 implementation period in 431 U.S. banks. They find that investors discount more assets measured at Level 3 compared with assets measured at Level 1. Market participants appear to penalize, in terms of value relevance, those assets with lower degree of verifiability. However, the authors find higher value relevance for Level 3 fair value estimates in the

⁴ Value relevance is the statistical association between accounting numbers and stock market factors. We acknowledge that part of the accounting literature suggests that this type of analysis provides noisy and indirect evidence to evaluate standard-setting inferences (Holthausen and Watts 2001). We follow the approach of Barth et al. (2001) who articulate six points to explain why value relevance studies provide fruitful insights for standard setting and research: “(1) value relevance research provides insights into questions of interest to standard setters and other non-academic constituents. (2) A primary focus of the FASB and other standard setters is equity investment. The possible contracting and other uses of financial statements in no way diminish the importance of value relevance research. (3) Empirical implementations of extant valuation models can be used to address questions of value relevance despite their simplifying assumptions. (4) Value relevance research can accommodate conservatism, and can be used to study its implications for the relation between accounting amounts and equity values. (5) Value relevance studies are designed to assess whether particular accounting amounts reflect information that is used by investors in valuing firms' equity, not to estimate firm value. (6) Value relevance research employs well-established techniques for mitigating the effects of various econometric issues that arise in value relevance studies.”

presence of strong corporate governance.⁵ Similarly, Freeman et al. (2017) explore a set of U.S. banks over the period 2004 – 2008. They show that assets measured at Level 1 inputs are more value relevant relative to assets measures with Level 2 or Level 3 inputs, but they do not find any significant difference between these two last categories. Further differences emerge when the study takes into consideration the type of assets. After the exclusion of banks not engaging in securitization, all three Levels of fair value hierarchy exhibit similar value relevance. The analysis of the post-financial crisis period shows that Level 2 and 3 are not anymore value relevant for this set of banks.

Goh et al. (2015) show that assets estimated at fair value with Level 3 inputs exhibit lower value relevance compared with assets estimated with Level 1 or Level 2 inputs over the period 2008 – 2011. They find that in 2008 investors priced each dollar of Level 1, Level 2, and Level 3 assets at \$1.02, \$0.96, and \$0.87, respectively. The authors find that the differences in value relevance of the estimates across the three levels decrease in the aftermath of the financial crisis. In 2011, investors price each dollar of Level 1, Level 2, and Level 3 assets at \$1.00, \$0.95, and \$0.88, respectively. The value relevance of Level 1 and Level 2 estimates of assets are lower for banks with lower capital market capacity.

Conversely, Altamuro and Zhang (2013) find that Level 3 inputs better reflect the cash flows and risk characteristics of the underlying assets relative to fair value estimates based on Level 2 inputs. Their findings indicate that managers provide higher quality fair value estimates than market inputs. Managers have information advantage which is particularly relevant in the absence of a market for the underlying asset. In a similar fashion, Lawrence et al. (2015) find that Level 3 fair value estimates in U.S. investment funds provide

⁵ The definition of strong corporate governance by Song et al. (2010) includes proportion of independent board members, proportion of audit committee members with financial expertise, frequency of annual audit committee meetings, %age of institutional investor ownership, size of audit engagement office, no material weaknesses problem under Sarbanes-Oxley Act 302 or 404.

better information about future cash flows and future stock returns compared with Level 1 and Level 2 inputs.

The type of investment and corporate characteristics influence value relevance of fair value estimates. Fortin et al. (2018) show that the type of investment within each fair value level impacts closed-end funds' market valuations over the period 2009-2011. For instance, the presence of equity in Level 2 differently influences market valuation compared with the presence of bonds in Level 2. In addition, investors do not express a strong preference with regards to the Level of inputs when FVM concerns safer investments, but they follow 'the fair value hierarchy' for riskier assets. Tama-Sweet and Zhang (2015) document for a sample of U.S. financial firms that all three Levels of fair value estimates are value relevant, but Level 1 and Level 2 financial assets exhibit higher value relevance than Level 3 financial assets. However, firms with weak corporate governance experience higher value-relevance for assets estimated with Level 3 inputs relative to firms with strong corporate governance. Fair value estimates provide more relevant information to investors for firms with weak corporate governance.

By turning the attention to IFRS 13, Siekkinen (2016) finds Level 1 fair value assets more relevant than Level 2 or Level 3 fair values assets for a sample of financial firms from 34 countries. In a similar fashion, Level 1 and 2 fair value liabilities are more value relevant than Level 3 fair value liabilities. However, in countries with a weak investor protection environment, only Level 1 fair value assets are value relevant. Conversely, in countries with a strong investor protection environment, the difference between Level 1 or Level 3 fair value estimates with regards to value relevance is relatively small. In this context, Level 2 fair value estimates are more value relevant than either Level 1 or Level 3 fair value estimates. These results are consistent with the conjecture that managers can use fair value estimates to convey useful information to market participants. In a subsequent study, Siekkinen (2017)

explores the role of board characteristics on the value relevance of fair value estimates. By looking at a sample of European financial firms in the post-IFRS 13 implementation period, the author finds that all three Levels fair value estimates are value relevant. Board independence and gender diversity play a positive role on the value relevance of Level 3 fair value estimates. Better and more efficient monitoring of managers contributes to reduce the differences in terms of value relevance across the three Levels of fair value estimates.

Fiechter and Novotny-Farkas (2017) explore the impact of institutional differences across countries, such as information environment and market sophistication, on the value relevance of fair value estimates. They analyse a sample of 907 bank-year observations from 46 countries adopting IFRS between 2006 and 2009. They find that fair value options are less value relevant relative to held-for-trading and AFS assets. This result is stronger for bank-based economies compared with market-based economies. They find that investors' ability to process fair value information is firm-specific. Firms with stronger information environment exhibit higher value relevance of fair value options, suggesting that weaker country-level information impairs investors' ability to process fair value information. In addition, they document that the value relevance of fair value depends on institutional investors' experience in the use of fair value. Finally, they observe a larger discount to fair value estimates during the global financial crisis. Taken together, the authors question the reliability of fair value estimates, especially where financial markets are less developed. Wang et al. (2017) find that the Chinese stock exchange positively reacts to the different announcements about the new fair value accounting standard.⁶ However, the market reaction is negative for financial institutions. These results suggest that in a less-developed financial market, investors question the reliability of FVM.

⁶ In China, the accounting standard about FVM CAS 39 substantially converged to IFRS 13.

From the above results, we could conclude that concerning IFRS 13, Level 1 and Level 2 assets appear to be value relevant, whereas the value relevance of Level 3 fair value estimates depend on the context. The order of relevance across the three Levels also depends from the institutional environment. Finally, a growing number of studies questions the reliability of fair value estimates, especially in situations of high uncertainty, e.g., less developed financial markets, low investors protection, weak board monitoring.

Overall, it emerges that the value relevance of assets and liabilities measured at fair value depends on multiple elements. We can group them into the type of SFAS 157 fair value measurement model, the type of assets, the effectiveness of corporate governance, the financial market conditions, and the information environment.

5. Information Content of FVM

The information content of fair value assets and liabilities estimates may affect investors' ability to predict firms' future performance. Magnan et al. (2015) explore whether fair value estimates influence analysts' forecasts⁷ and whether the implementation of SFAS 157 affects firms' information environment for a sample of U.S. banks over the period 1996 - 2009. By looking at forecast accuracy and analysts' dispersions, Magnan et al. (2015) document that the disclosure of the Level inputs for fair value estimates contributes to improve the information environment. However, they find that banks with a larger proportion of assets and liabilities estimated at fair value experience more analysts' dispersion. The information properties of fair value disclosure decrease when estimates move from Level 2 to Level 3.

Chung et al. (2017) explore whether firms mitigate investors' concerns about fair value estimates by disclosing voluntary information. The authors find that managers with

⁷ In the accounting literature, it is well-accepted to proxy investors' decisions by looking at analysts' decisions (O'Brien 1988; Barron et al. 1998). This approach aims to overcome the difficulties to directly observe investors' decision-making process.

more opaque estimates release more voluntary disclosure, such as independent pricing of fair value estimates and proper classification according to the fair value hierarchy. For a sample of US companies over the period 2011–2014, Hoitash, Hoitash, and Yezegel (2017) find that accounting reporting complexity discourages financial analysts from covering a firm. Specifically, the complex areas are fair values, derivatives and pensions. They further find that analyst's earnings forecasts accuracy increases with an analyst's account-specific expertise. This study indicates that understanding complex accounts requires specialization and that this type of specialization plays an important role in mitigating the adverse effects of financial reporting complexity.

Several studies on real estate firms document that in the post-implementation period of IFRS 13 (2013-2014) the amount of disclosure related to FV marginally increased compared with the amount of disclosure prepared under IAS 40 (Feldmann 2017; Sundgren et al. 2016; Busso 2018). Feldmann (2017) and Sundgren et al. (2016) find that real estate companies provide more information about Level 3 FVM, both in terms of quality and quantity after the implementation of IFRS 13. Firm's institutional environment, such as regulation and level of enforcement, influences these disclosure changes. By looking at the implications of additional fair value disclosure, Feldmann (2017) fail to identify a significant relationship between fair value disclosure in the post-implementation of IFRS 13 and real estate firms' capitalization.

Cannon (2015), in an experimental study, find that investors have a lower perception of risk about fair value estimates when companies provide the quantitative sensitivity disclosure included in IFRS 13. The author finds that the results still hold even when companies exhibit high levels of management aggressiveness, measured as managers' decisions to choose input values more aggressive relative to those disclosed at industry level. In another experimental analysis, Majors (2015) finds that requiring disclosure for uncertain

estimates deters managers from aggressive reporting. Managers expect market participants to uncover their aggressiveness due to detailed disclosure. Finally, in a survey of 704 accounting professionals from Singapore, Lim et al. (2017) find that professionals exhibit significant high level of scepticism towards IFRS 13. They argue that Level 3 fair value estimates may bring down the level of trust in financial statements.

Taken together, these results show that disclosure about fair value estimates contributes to reduce the risk relative to the estimates. Managers can also convey relevant information to market participants, especially through Level 2 estimates. Finally, the type of financial users plays a key role in the value relevance of the content in fair value estimates.

6. Managerial Judgment in Fair Value Estimates.

Managerial judgement into the classification of Level 1, 2 and 3 inputs of fair value estimates has potential implications for financial reporting quality. Given that firms are usually considered as a nexus of contracts (Jensen and Meckling 1976), managers can use their discretion in fair value estimates either to convey useful information to market participants or to opportunistically extract private benefits. Watts (2003) supports the conjecture that fair value estimates may impair financial reporting reliability and that they provide significant room for managerial discretionary choices. The reliance on Level 2 and Level 3 inputs further exacerbates such discretion which may result in biased and not reliable financial reporting.

Magnan et al. (2015) find that Level 2 fair value estimates improve forecast accuracy, whereas Level 3 leads to an increase in earnings forecast dispersion. They interpret their results as Level 2 (Level 3) providing higher (lower) quality of private and public information. Analysts seem to consider that estimates based on Level 2 inputs a source of useful information, whereas Level 3 estimates are the result of managers' opportunistic

decisions. Barron et al. (2016) show that the implementation of SFAS 157 have contributed to reduce analyst earnings forecast errors and uncertainty in forecast. However, the implementation of SFAS 157 does not lead to a decrease in forecast dispersion. Badia et al. (2017) find that managers' conditional conservative approach to Level 3 FVM is stronger when governance mechanisms increase incentives to report conservatively, but they decrease with firms' earnings management incentives. They do not find asymmetric timelines for firms with Level 1 inputs. Managers' conservative approach aims to reduce investors' discounting of FVM.

Prior research mostly supports the conjecture that fair value estimates are often the result of managerial opportunistic decisions. Hsu and Lin (2016) find a positive association between the amount of FVM with Level 3 inputs and managers' measurement manipulations to meet or beat earnings targets. The authors do not identify a relationship between the amount of Level 1 and 2 fair value estimates and the likelihood to meet or beat financial analysts' earnings forecasts. Lin et al. (2017) examine accounting restatements as a measure for financial reporting quality. They find that the likelihood of restatements for Level 3 fair value assets estimates is significantly higher relative to (a) Levels 1 and 2 fair value assets and (b) in the two years after the first-time Level 3 fair value estimate disclosure. Their findings suggest that the presence of Level 3 fair value assets is associated with higher estimation errors and intentional managerial manipulations.

Curtis and Raney (2016) show managers tend to delay incorporating negative information into reported Level 3 fair value assets. They identify a positive association between the amount of fair value estimate of an asset to revise downwards and the delay of revision the value of the asset. In this light, Iselin and Nicoletti (2017) show that in the post-implementation process of SFAS 157, public banks tried to reduce the proportion of assets measured with Level 3 inputs. Finally, Goh et al. (2015) argue that managers may be

interested in managing Level 3 estimates to increase their earnings. Their findings document that Level 3 gains do not affect Level 3 estimates. In fact, investors appear to not price differently gains or losses due to Level 3 estimates.

Additional evidence shows that managers' classification change of measurement inputs affects the relevance of assets and liabilities. SFAS 157 requires to adjust valuation inputs to FVM when market conditions vary. Milbradt (2011) argues that the possibility of shifting assets across levels affects the value relevance of the estimates. Altamuro and Zhang (2013) study the determinants to Level 2 and Level 3 classification. They document that bank size, accounting choice and mortgage risk attributes influence the Levels classification. Du et al. (2014) show that assets increase their value relevance when they are moved out of Level 3 inputs. In their sample of U.S. commercial banks over the period 2008 – 2009, the authors find that the ratio of the amount of assets and liabilities transferred by a bank in/out of Level 3 during a quarter over the total of amount of fair value assets and liabilities range between 1% to 7.8%. Most of transfers concerns assets.

Finally, in an interview-based paper, Barker and Schulte (2017) explore FVM of non-financial assets in eleven large European firms. They find that managers mostly rely on their own perspective to prepare Level 3 estimates, in contradiction with the market participants' perspective envisaged by the IFRS 13. Interviewees argue that they use multiple techniques, i.e., strategic adaptation to IFRS 13 requirements, narrower issues to make them manageable, and outsource of the estimates problems in the implementation process of IFRS 13.

Overall, past literature shows that managers have incentives to manipulate estimates. This effect is stronger for Level 3 inputs. At the same time, managers are aware that market participants may negatively perceive Level 3 fair value estimates and they try to minimize the amount of assets reported in Level 3 or to adjust slowly the estimates after changes in market conditions (Curtis and Raney, 2016).

7. Economic Consequences of Fair Value Estimates

The use of different Level inputs in fair value estimates of assets and liabilities have economic consequences on firms. Magnan et al. (2016) document for a sample of financial institutions between 2007 and 2014 that a higher use of Level 2 and 3 fair value estimates is associated with higher cost of debt. In a similar fashion, Huang et al. (2016) find that during the 2008-2009 financial crisis, firms with a higher amount of Level 3 fair value estimates exhibit higher cost of capital. Conversely, firms with a higher amount of Level 2 and Level 1 fair value estimates experience lower cost of capital. Daly and Skaife (2015) find for a sample of 648 firm-year observations from 26 countries that a greater use of fair value estimates is associated with higher cost of debt. This result is stronger for firms with bearer biological assets. Ayres (2016) shows that the amount of Level 3 fair value estimates and firm's credit rating are negatively associated.

By looking at the implications of fair value estimates on auditing, Alexeyeva and Mejia-Likosova (2016) find that for a sample of banks from 24 European countries between 2008 and 2013, fair value assets are not associated with audit fees. However, the amount of Level 3 fair value estimates is positively associated with audit fees. Similarly, for a sample of U.S. banks between 2008 and 2011, Ettredge et al. (2014) find that the association between fair value estimates and audit fees is stronger for Level 3 inputs compared with the other two Levels. These results indicate that the Level 3 assets are associated with greater uncertainty, requiring more audit effort.

Finally, Alford, Luchtenberg, and Reddic (2016) focus on a 'real' consequence of fair value disclosure, i.e., portfolio balancing behaviour, between 1996 and 2013. They find that the likelihood of rebalancing towards taxable securities is not influenced unconditionally by the amount of Levels 1, 2, or 3 fair value assets. However, insurers with a public stock

ownership structure avoid following portfolio rebalancing theory when both operating and investment losses occur and they report Level 3 FV information. These findings suggest that managers of property and casualty insurers assess FV information differently when it comes to their operating and investment losses. Although these results are highly specific to the property and casualty insurance industry, they provide evidence that fair value estimates disclosure may have ‘real’ impact on managers’ behaviour, as reflected in firms’ investment decisions.

8. A Discussion of the Common Critiques to Fair Value Estimates

IFRS 13 and SFAS 157 explain how entities should perform fair value estimates and the type of disclosure required. Given the intrinsic tensions between relevance and reliability of fair value estimates, the accounting standard has been broadly criticized. In this Section, we discuss few beliefs about fair value accounting and we provide empirical evidence of the limitations of some of these arguments⁸.

First, fair value accounting has been indicated as one of the main causes of the financial crisis. A central question is whether fair value accounting or bank regulation contributes to pro-cyclical leverage.⁹ Amel-Zadeh et al. (2017) analytically show that banks with a binding regulatory constraint, absent differences in regulatory risk weights across, do not exhibit pro-cyclical leverage. Conversely, for banks without a binding constraint, both fair value and bank regulation can contribute to pro-cyclical leverage. To empirically test this latest scenario, the authors explore a sample of U.S. commercial banks between 2001 and 2013. They find that bank regulation and not fair value accounting contributes to pro-cyclical leverage.

⁸ The four beliefs are inspired by “Fair Value Accounting Commonly Held Beliefs: Insights from Research”, M. Barth’s, ESSEC FRAP conference, April 11, 2018.

⁹ ‘Pro-cyclical leverage is evidence of excessive asset purchases or sales by banks, which can have negative consequences to the financial system’ (Amel-Zadeh et al. 2017).

A second issue is whether other comprehensive income recognition reduces motivation to engage in earnings and regulatory capital management using realized gains and losses on AFS investments. Barth et al. (2017) find for a sample of listed and non-listed U.S. commercial banks between 1996 and 2011 that banks use realized AFS securities gains and losses to manage earnings. Banks use a multitude of techniques, e.g., earnings smoothing, loss avoidance, and big baths, in different situations to manage regulatory capital and earnings through realized gains and losses for AFS securities. These findings suggest that banks manage their earnings by using realized AFS securities and losses even when gains and losses are included in other comprehensive income.

A third concern is whether fair value earnings¹⁰ can provide relevant information to financial reporting users, in particular from a valuation perspective. The main concern is that fair value earnings merely reflect ‘shocks’ to value. Barth and Landsman (2018) provide evidence that by disaggregating fair value earnings into components, investors can gather relevant information to their valuation assessments. In addition, components of fair value earnings provide insights into various types of shock to value, for instance changes in expected cash flows.

Fourth, a long-standing question is whether fair value changes from changes in own credit risk should be reported in the income statement. Barth et al. (2008) find that credit risk changes on equity returns are attenuated by the presence of debt. This relationship is associated with changes in both expected cash flows and systematic risk. They provide descriptive evidence of the effects of recognizing currently unrecognized changes in debt value on firms’ earnings. They find that changes in credit risk affect a liability’s fair value. The associated net income would not be misleading when recognized.

¹⁰ Fair value earnings are defined as the difference between the fair values of the firm’s net assets at the end and beginning of the reporting period, adjusted for capital contributions and distributions.

Finally, IFRS 13 and SFAS 157 provide indications on how to perform fair value estimations, but they do not address the central question of what to measure at fair value.¹¹ In addition, fair value relies on market-measurements rather than on entity specific measurement. Plantin and Tirole (forthcoming) analytically examine the contractual and market implications of fair value accounting standard IFRS 13. They argue that the main limitations of IFRS 13 are associated with corporate governance and market liquidity. Only a very limited amount of fair value estimates uses market data, whereas the remaining estimates rely on similar transactions or model-based estimates. Fair value models appear to rely excessively on other firms' characteristics, distorting the attention from firm's own latent capital gains. Fair value estimates further exacerbate the information asymmetry between shareholders (principal) and managers (agents). They raise moral hazard costs due to the difficulties in monitoring managers' actions. Managers may use their discretion within the fair value estimates to extract personal rents to the detriment of shareholders or potential investors. Plantin and Tirole (forthcoming) argue that firms should rely more on historical value estimates and leave the fair value estimates only for the most liquid items. However, Plantin and Tirole (forthcoming) do not consider that managers may convey useful information to market participants through fair value estimates. Empirical evidence (Magnan et al. 2015)¹² shows that Level 2 fair value estimates provide relevant information to market participants. Only Level 3 fair value estimates appear associated with opportunistic managers' behaviour. In addition, prior literature (Amel-Zadeh et al. 2017) show that the inefficiency of fair value estimates described in Plantin and Tirole (forthcoming) are mostly due to inefficiencies in bank regulation than to fair value accounting.

9. Conclusion

¹¹ [http://www.ey.com/Publication/vwLUAssets/ey-applying-ifrs-fair-value-measurement/\\$FILE/ey-applying-ifrs-fair-value-measurement.pdf](http://www.ey.com/Publication/vwLUAssets/ey-applying-ifrs-fair-value-measurement/$FILE/ey-applying-ifrs-fair-value-measurement.pdf)

¹² See Section 5 for a complete discussion on disclosure of fair value estimates.

This review analyses the academic literature on the post-implementation of FVM. We gather evidence both on IFRS 13 and SFAS 157 by covering 47 academic papers. We first discuss the key characteristics of the two standards and we identify their similarities and differences. The two standards formally converged in 2011 and the fundamental issues are almost identical between standards. Most fair value estimates concern Level 1 and Level 2 assets. Financial institutions mostly use fair value estimates for Level 2 assets.

We identify five main areas of research around FVM, such as value relevance, disclosure, managerial judgement, economic consequences, and common critiques. We first find that assets and liabilities estimated at fair value are value relevant. Second, investors value additional disclosure about fair value estimates. Third, managers often opportunistically use their discretion in fair value estimates. Fourth, fair value estimates have economic consequences, especially on cost of capital, audit fees, and investment portfolio compositions. Finally, the critics to fair value of causing the financial crisis are not empirically supported.

Transversal to the five research areas is that the results vary across Level's inputs, without always following the fair value hierarchy. The impact of the three Level's inputs is sensitive to multiple firms' and contexts' characteristics, i.e., the nature of the underlying assets, the managerial intent, the market conditions, and the institutional environment.

In addition, differently from Plantin and Tirole (forthcoming), empirical evidence shows that managers may use Level 2 fair value estimates to convey useful information to investors. The latter value additional disclosure because it contributes to reduce uncertainties and risks associated with fair value estimates. Managers' opportunistic behaviour emerges around Level 3 fair estimates, where the lack of observable inputs prevents any monitoring role by market participants.

Finally, past research highlights the potential need to revise few aspects associated with fair value gains and losses. First, the recognition of unrealized gains and losses of AFS in other comprehensive income does not reduce the motivation for banks to engage in earnings and regulatory capital management. Second, net income of liability's fair value from changes in credit risk could be informative to market participants. Third, investors could gather further valuation information by obtaining a disaggregated disclosure of fair value earnings.

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Table 1 – Comparison between IFRS 13 and SFAS 157

Panel A - Similarities between IFRS 13 and SFAS 157	
Fair Value Definition	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 ¹³ . The definition of fair value focuses on assets and liabilities (as standalone or a group), but it also applies to instruments classified in stockholders' equity.
Exit Price	The price that would be received to sell an asset or paid to transfer a liability
Assumptions	Market participant perspective
Levels of Inputs	The inputs to valuation techniques can be either observable or unobservable. The first category encompasses data from sources which do not depend on the reporting entity. The second category includes assumptions of the reporting entity conditional to the set of information available. To ensure comparability and consistency in FVM and reporting, the accounting standards identifies three levels of inputs to valuation techniques.
Level 1 inputs	Quoted unadjusted prices in active markets for identical assets or liabilities accessible at the measurement date. The market should be sufficient liquid to observe a relevant number of frequent transactions to gather price information.
Level 2 inputs	Quoted prices, not falling within Level 1 category, which can be directly or indirectly observed. The accounting standard allows reporting entities to adjust Level 2 inputs following factors specific to the asset or liability.
Level 3 inputs	Inputs which are not observable for the asset or liability. They should be used only in the absence of active markets for the assets or liability. The reporting entity should include the best information available at the measurement date within reasonable costs and efforts.
Fair value hierarchy	Highest priority to (unadjusted) quoted prices in active price for identical assets or liabilities (Level 1). The lowest priority is assigned to unobservable inputs (Level 3).
Disclosure requirements	Classification within the fair value hierarchy for all FVM and not only for financial instruments. Entities should also disclose the valuation techniques adopted.
Additional Disclosure requirements	Only for Level 3 assets and liabilities, firms must disclose: (i) total gains or losses for the period, (ii) purchase, sales, issues, and settlements, and (iii) the amounts of any transfers into or out of Level 3 of the fair value hierarchy, the reasons for those transfers, and the policy for determining when transfers

¹³ The previous definition of fair value in the IFRS was 'the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction.' (IFRS 13.BC29)

	between levels are deemed to have occurred.
Non-Financial Assets	The Highest and best use of a non-financial asset
Proposed Valuation Techniques	The valuation techniques considered consistent with the notion of fair value are the market approach, income approach, and/or cost approach. In the market approach, preparers should rely on market transactions which concern comparable assets or liabilities. It is encouraged the use of market multiples, which can differ for each comparable. The matrix pricing is an example of market approach. The income approach relies on current market expectations of future amounts, e.g., cash flows or earnings. Two examples of this valuation technique are present value techniques and the Black-Scholes-Merton formula. Finally, the cost approach reflects the costs to replace the service capacity of an asset, also known as ‘current replacement cost’. It includes the costs associated with purchasing or building an asset of a comparable utility, taking into consideration the level of obsolescence, both functional/technological and economic/external.

Panel B - Differences between IFRS 13 and SFAS 157			
	IFRS 13	SFAS 157	Implications
Net Asset Value (NAV) Practical expedient for alternative investments	Not allowed	To measure the fair value of certain investments in investment companies, entities can use net asset value (NAV) without adjustment.	Difficulties and additional costs for investment companies in applying FVM.
Fair value of liabilities with a demand feature	The fair value of a liability with a demand feature cannot be less than the present value of the amount payable on demand	The fair value of a liability with a demand feature is described as the amount payable on demand at the reporting date	
Recognition of day-one gains and losses	The recognition of day-one gains and losses is restricted to when fair value is determined using unobservable inputs	The accounting standard does not specifically prohibit the recognition of day-one gains or losses even when the FVM is based on significant unobservable inputs	Day-one gains and losses are more common under U.S. GAAP than under IFRS
Disclosure/1	Quantitative sensitivity analysis disclosure for recurring FVM of Level 3 financial instruments	Not available	Limited information on Level 3's inputs for firms applying U.S. GAAP
Disclosure/2	No exceptions to its disclosure requirements for non-public entities (partially addressed in the IFRS for SMEs)	Few disclosure exceptions for non-public entities	Difficulties and additional costs for non-public entities in applying FVM.
Disclosure/3	Derivative assets and liabilities cannot be presented on a net basis	Derivative assets and liabilities can be presented on a net basis	Amounts disclosed for Level 3's inputs may differ

Table 2 – Fair Value Estimates

This table reports summary statistics about fair value estimates (assets and liabilities) for a sample of U.S. firms between 2008 and 2017. Values are scaled by total assets and winsorized at the 1% level.

Panel A – Full Sample

FULL SAMPLE = 50,526 firm-year observations										
Mean (Median)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
FV Assets										
<i>Level 1</i>	0.086 (0.002)	0.104 (0.007)	0.104 (0.007)	0.101 (0.002)	0.096 (0.004)	0.093 (0.003)	0.092 (0.003)	0.092 (0.003)	0.091 (0.004)	0.074 (0.003)
<i>Level 2</i>	0.080 (0.002)	0.071 (0.001)	0.078 (0.001)	0.076 (0.002)	0.079 (0.001)	0.082 (0.001)	0.089 (0.002)	0.091 (0.002)	0.089 (0.003)	0.097 (0.004)
<i>Level 3</i>	0.020 (0)	0.017 (0)	0.013 (0)	0.013 (0)	0.017 (0)	0.024 (0)	0.026 (0)	0.028 (0)	0.028 (0)	0.025 (0)
FV Liabilities										
<i>Level 1</i>	0.003 (0)	0.003 (0)	0.004 (0)	0.003 (0)	0.005 (0)	0.005 (0)	0.005 (0)	0.004 (0)	0.003 (0)	0.002 (0)
<i>Level 2</i>	0.015 (0)	0.015 (0)	0.014 (0)	0.017 (0)	0.023 (0)	0.023 (0)	0.023 (0)	0.014 (0)	0.013 (0)	0.011 (0)
<i>Level 3</i>	0.008 (0)	0.015 (0)	0.017 (0)	0.019 (0)	0.026 (0)	0.033 (0)	0.031 (0)	0.028 (0)	0.026 (0)	0.012 (0)

Source: Compustat

Panel B – Financial and Insurance firms

FINANCIAL and INSURANCE FIRMS (SIC CODE 6000 - 6499) = 9,392 firm-year observations										
Mean (Median)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
FV Assets										
<i>Level 1</i>	0.047 (0.001)	0.055 (0.001)	0.051 (0.001)	0.048 (0.001)	0.048 (0.001)	0.051 (0.001)	0.051 (0.002)	0.047 (0.001)	0.048 (0.001)	0.044 (0.001)
<i>Level 2</i>	0.188 (0.136)	0.191 (0.142)	0.201 (0.164)	0.216 (0.175)	0.219 (0.172)	0.201 (0.164)	0.206 (0.155)	0.194 (0.146)	0.190 (0.135)	0.197 (0.142)
<i>Level 3</i>	0.020 (0.001)	0.019 (0.000)	0.019 (0.000)	0.019 (0.001)	0.025 (0)	0.029 (0)	0.028 (0)	0.027 (0)	0.023 (0)	0.013 (0)
FV Liabilities										
<i>Level 1</i>	0.002 (0)	0.004 (0)	0.004 (0)	0.003 (0)	0.004 (0)	0.005 (0)	0.004 (0)	0.004 (0)	0.004 (0)	0.004 (0)
<i>Level 2</i>	0.010 (0)	0.011 (0)	0.012 (0)	0.014 (0)	0.018 (0)	0.015 (0)	0.017 (0)	0.015 (0)	0.015 (0)	0.015 (0)
<i>Level 3</i>	0.007 (0)	0.004 (0)	0.007 (0)	0.009 (0)	0.014 (0)	0.017 (0)	0.017 (0)	0.014 (0)	0.014 (0)	0.007 (0)

Source: Compustat

Table 3 – Fair value Estimates at International Level

This table presents mean values of the %age of fair value assets (liabilities) relative to total assets (liabilities) by fair value categories for each country in the sample. HFTA (HFTL) are Held-For-Trading Assets (Liabilities). FVOA (FVOL) are Fair Value Options Assets (Liabilities) under the FVO. AFS are Available-For-Sale financial assets. Total_FVA (Total_FVL) is the sum of financial assets (liabilities) measured at Fair Value. OA (OL) are Other Assets (Liabilities).

	N	Financial assets at fair value					Financial liabilities at fair value			
		HFTA	FVOA	AFS	Total_FVA	OA	HFTL	FVOL	Total_FVL	OL
Australia	4	8.09%	4.63%	0.50%	13.2%	86.8%	4.50%	3.59%	8.1%	91.9%
Austria	25	2.31%	2.46%	7.21%	12.0%	88.0%	0.58%	1.76%	2.3%	97.7%
Bahrain	36	1.72%	1.12%	20.26%	23.1%	76.9%	0.22%	0.00%	0.2%	99.8%
Belgium	11	9.89%	3.31%	27.04%	40.2%	59.8%	7.78%	4.57%	12.3%	87.7%
Botswana	4	1.53%	0.00%	21.00%	22.5%	77.5%	0.00%	0.00%	0.0%	100.0%
Bulgaria	11	1.19%	0.00%	3.69%	4.9%	95.1%	0.14%	1.22%	1.4%	98.6%
China	12	0.95%	0.30%	7.28%	8.5%	91.5%	0.40%	0.42%	0.8%	99.2%
Croatia	12	0.77%	0.49%	4.71%	6.0%	94.0%	0.18%	0.00%	0.2%	99.8%
Cyprus	12	1.10%	0.62%	13.18%	14.9%	85.1%	0.30%	0.01%	0.3%	99.7%
Czech Republic	2	6.54%	0.00%	13.52%	20.1%	79.9%	2.48%	0.00%	2.5%	97.5%
Denmark	59	8.41%	11.23%	0.26%	19.9%	80.1%	2.30%	3.89%	6.2%	93.8%
Egypt	8	1.02%	0.00%	7.54%	8.6%	91.4%	0.18%	0.00%	0.2%	99.8%
Finland	8	6.05%	5.38%	6.73%	18.2%	81.8%	1.77%	3.40%	5.2%	94.8%
France	19	30.61%	2.72%	6.43%	39.8%	60.2%	24.52%	3.32%	27.8%	72.2%
Germany	47	13.20%	5.09%	12.00%	30.3%	69.7%	7.55%	1.56%	9.1%	90.9%
Greece	47	3.16%	1.20%	8.78%	13.1%	86.9%	0.61%	0.63%	1.2%	98.8%
Hong Kong	4	0.53%	0.04%	6.57%	7.1%	92.9%	0.15%	0.03%	0.2%	99.8%
Hungary	8	1.48%	0.00%	6.82%	8.3%	91.7%	1.48%	8.63%	10.1%	89.9%
Ireland	6	5.09%	1.54%	13.34%	20.0%	80.0%	3.03%	1.29%	4.3%	95.7%
Israel	4	3.04%	0.00%	16.76%	19.8%	80.2%	2.65%	0.00%	2.6%	97.4%
Italy	102	11.38%	3.05%	6.48%	20.9%	79.1%	3.43%	4.19%	7.6%	92.4%
Jordan	40	1.59%	0.04%	12.20%	13.8%	86.2%	0.04%	0.00%	0.0%	100.0%
Kazakhstan	23	3.59%	0.01%	3.01%	6.6%	93.4%	0.36%	0.00%	0.4%	99.6%

Kenya	24	0.87%	0.01%	6.79%	7.7%	92.3%	0.01%	12.49%	12.5%	87.5%
Kuwait	34	0.17%	0.73%	5.18%	6.1%	93.9%	0.06%	0.00%	0.1%	99.9%
Latvia	4	0.08%	2.37%	0.04%	2.5%	97.5%	0.08%	0.00%	0.1%	99.9%
Lithuania	8	2.47%	0.39%	1.25%	4.1%	95.9%	0.02%	0.00%	0.0%	100.0%
Macedonia	2	0.23%	0.00%	0.76%	1.0%	99.0%	0.00%	0.00%	0.0%	100.0%
Malaysia	4	4.22%	0.00%	6.80%	11.0%	89.0%	0.21%	0.00%	0.2%	99.8%
Mauritius	8	0.20%	0.00%	4.11%	4.3%	95.7%	0.06%	0.00%	0.1%	99.9%
Norway	39	2.84%	10.16%	1.17%	14.0%	86.0%	3.02%	9.89%	12.9%	87.1%
Oman	20	0.61%	0.11%	1.92%	2.6%	97.4%	0.47%	0.00%	0.5%	99.5%
Pakistan	19	1.43%	0.00%	21.60%	23.0%	77.0%	1.25%	0.00%	1.2%	98.8%
Philippines	4	7.52%	1.32%	18.17%	27.0%	73.0%	1.60%	2.29%	3.9%	96.1%
Poland	56	5.81%	2.19%	10.09%	18.1%	81.9%	3.22%	0.22%	3.4%	96.6%
Portugal	12	3.77%	1.22%	5.52%	10.5%	89.5%	1.55%	5.92%	7.5%	92.5%
Romania	4	0.15%	0.00%	1.70%	1.9%	98.1%	0.31%	0.00%	0.3%	99.7%
Russia	14	4.76%	1.54%	2.09%	8.4%	91.6%	0.52%	0.00%	0.5%	99.5%
Saudi Arabia	28	1.89%	0.41%	7.73%	10.0%	90.0%	0.71%	0.11%	0.8%	99.2%
Slovakia	4	4.07%	0.00%	1.19%	5.3%	94.7%	0.55%	0.00%	0.6%	99.4%
South Africa	4	10.02%	11.26%	1.08%	22.4%	77.6%	10.50%	13.55%	24.0%	76.0%
Spain	32	6.23%	0.94%	6.66%	13.8%	86.2%	3.78%	0.78%	4.6%	95.4%
Sweden	20	15.39%	20.90%	2.06%	38.3%	61.7%	10.22%	15.72%	25.9%	74.1%
Switzerland	20	10.19%	6.61%	10.16%	27.0%	73.0%	7.49%	8.13%	15.6%	84.4%
Turkey	8	2.05%	0.01%	12.50%	14.6%	85.4%	0.45%	0.00%	0.4%	99.6%
United Kingdom	35	15.03%	2.97%	7.29%	25.3%	74.7%	11.78%	1.41%	13.2%	86.8%
<i>Total</i>	<i>907</i>	<i>6.2%</i>	<i>3.2%</i>	<i>7.7%</i>	<i>17.1%</i>	<i>82.9%</i>	<i>3.2%</i>	<i>2.7%</i>	<i>5.9%</i>	<i>94.1%</i>

Source: Fiechter and Novotny-Farkas 2017