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Via Po, 53 – 10124 Torino (Italy)
Tel. (+39) 011 6704043 - Fax (+39) 011 6703895
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Fair Value Measurement under IFRS 13:
A Faithful Representation of Real-World Economic Phenomena?

Vera Palea and Renato Maino

Dipartimento di Economia “S. Cognetti de Martiis”

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Fair Value Measurement under IFRS 13: A Faithful Representation of Real-World Economic Phenomena?

VERA PALEA*, Department of Economics, University of Turin, Italy
RENATO MAINO, Department of Finance, Bocconi University, Milan, Italy

Abstract

In this paper, we discuss IFRS 13 with regard to private equity valuation

We raise issues on the fair value definition as an exit price and question the reliability of valuation techniques which are categorized into Level 2 fair value hierarchy.

Our paper questions whether fair value as defined by IFRS 13 is an appropriate measure for private equities and can contribute to enhancing transparency and comparability in financial statements, which is one of the purposes of the IASB and the European Union Regulation 1606/2002.

KEYWORDS: Fair Value Accounting, IFRS 9, IFRS 13, Private Equity, Market Multiples, Transaction Multiples.

JEL CLASSIFICATION: M41, G20

*Corresponding Author: Vera Palea, University of Turin, Department of Economics "Cognetti de Martiis", via Po 53, Turin, 10100 Italy. E-mail addresses: vera.palea@unito.it.

1. Introduction

Standard setters and extensive academic literature believe that fair value accounting provides the most relevant information to financial statement users (Barth, Beaver and Landsman, 2001). Fair value accounting should ensure a higher degree of transparency of financial statements, which should lead to a higher value-relevance of accounting data and a better capability of financial markets to reflect the actual value of a firm. An extensive use of fair value measurement should increase the quantity of private information brought into public domain, thus leading to a more efficient resource allocation and capital formation.

In 2009 IASB issued IFRS 9, *Financial Instruments*, which will come into effect on January, 1 2015. Such a standard has removed the rule that equities which do not have prices quoted in an active market and whose fair value cannot be measured reliably shall be measured at cost. As a result, private equities shall be measured at fair value with no exceptions.

In 2011 IASB issued IFRS 13, *Fair Value Measurement*, which is the result of a joint project conducted by IASB together with FASB. IFRS 13 sets out a single framework for measuring fair value and provides comprehensive guidance on 'how' to measure fair value, whereas it does not set out requirements on 'when' to apply fair measurement. IFRS 13 also increases the convergence between IFRS and US GAAP through the same definition of fair value as well as an alignment of measurement and disclosure requirements. IFRS 13 will become effective in January 2013.

Neither IFRS 9, nor IFRS 13 have yet been endorsed in the European Union. In order to come into force in the European Union, IFRSs must go through an endorsement process. The endorsement process consists in several steps and involves many institutions at the European level. One of these is the European Financial Reporting Advisory Group (EFRAG), which holds consultation with interest groups and then delivers its advice to the European Commission on whether the new standard meets the criteria of endorsement.

EFRAG evaluates whether the standard is compliant with the principle of 'true and fair view' set out in the IV and VII European Directives and meets the criteria of understandability, relevance, reliability and comparability stated both in the IASB Framework and in the European Union Regulation 1606/2002. In addition, even if it is not specific to report on, EFRAG also gives advice on whether the IFRS under endorsement is conducive to the European public good and, therefore, it is of overall interest to the European Union.

The purpose of this paper is to raise several issues on IFRS 13 related to private equity valuation which, in our opinion, should be taken into account in its endorsement process.

We raise relevant issues on fair value definition as an exit price and on the reliability of market-based valuation techniques.

In fact, we claim that the fair value definition as an exit price does not suit private equities, which are usually held with a strategic intent, with no expectation of capital gains. A market-based, rather than entity specific, fair value measurement fails to consider the financial instrument liquidity and investors' horizons which, instead, are key to private equity valuation.

We also claim that market-based valuation techniques could be misleading for private equities, whose performance is relatively different from publicly traded companies.

We then show that estimation errors related to valuation techniques bear significant economic consequences. As a rule, fair value measurement based on valuation techniques leads to less reliable information, higher expected returns by investors and lower ability to monitor managerial behavior.

Finally, we provide an example which shows the weaknesses of fair value estimates based on market and transaction multiples. According to IFRS 13, market and transaction multiples must have the highest priority in valuation techniques as they are corroborated by market data and, hence, supposed to be highly unbiased. We show that, even if we accepted the fair value definition as an exit price, market-based valuation techniques would not able to provide a faithful representation of the real-world economic phenomena they purport to represent.

In conclusion, we show that the IFRS 13 fair value definition as an exit price does not result in reliable and decision-useful information.

For such a reason, we question whether IFRS 13 is compliant both with the European Union Regulation 1606/2002, whose main purpose is to ensure a high degree of transparency and comparability in financial information, and the IASB Framework, which states that fair value accounting is expected to provide investors with useful information to predict the capacity of firms to generate cash flow from their assets.

Our conclusion is that, should IFRS 13 be endorsed as currently stated, then an exemption to fair value private equities should also be set out in IFRS 9.

However, not only does our discussion have European relevance, but it also provides guidance of a more international nature relating to the fair value measurement through valuation techniques.

Our findings are also of direct interest to banking regulators as bank capital requirement is largely based on financial report. Fair value measurement using valuation techniques deserves careful analysis due to its potential effects on the credit cycle and real economy financing.

Moreover, they are of interest to market securities authorities. For instance, private equity firms have come under increased inspection by the SEC in conjunction with possible exaggerations in the values of their portfolios.

The remainder of this paper is organized as follows. Section 2 introduces IFRS 13 main requirements which are of our interest, whereas Section 3 discusses the main problems related to IFRS 13 adoption for private equity valuation. Section 4 provides an example of fair value measurement based on market-based techniques, while Section 5 concludes.

2. IFRS 13 fair value definition and measurement

IFRS 13 defines fair value as the price that would be received to sell an asset in an orderly transaction between market participants at the measurement date. The definition of fair value in IFRS 13 reflects an exit price notion, that is the market price from the perspective of a market participant who holds the asset.

IFRS 13 points out that fair value must be a market-based, not an entity-specific measurement. Therefore, the firm's intention to hold an asset is completely irrelevant. For instance, the application of blockage factors to a large position of identical financial assets is prohibited given that a decision to sell at a less advantageous price because an entire holding, rather than each instrument individually, is sold represents a factor which is specific to the firm.

If observable market transactions or market information are not directly observable, the objective of fair value measurement still remains the same, that is to estimate an exit price for the asset, and the firm shall use valuation techniques.

Valuation techniques shall be consistent with the market approach, income approach or cost approach. The market approach uses prices and other relevant information generated by market transactions involving identical or comparable assets. The income approach uses valuation techniques to convert future amounts (e.g. cash flows or income and expenses) to a single present amount. According to IFRS 13, such valuation techniques include present value

techniques, option pricing models - such as the Black-Scholes-Merton formula and the binomial model – and the multi-period excess earnings method. The cost approach, instead, reflects the current replacement cost, that is the amount that would currently be required to replace the service capacity of an asset.

IFRS 13 categorizes inputs to valuation techniques into a fair value hierarchy which gives the highest priority to quoted prices (unadjusted) in active markets for identical assets (Level 1 inputs) and the lowest priority to unobservable inputs (Level 3 inputs).

Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets that the firm can access at the measurement date. With Level 1 inputs information asymmetry between management and investors is very low. Hence, quoted prices in active markets must be used whenever available.

Level 2 inputs are inputs, other than quoted prices, that are observable - either directly or indirectly - for the asset. Level 2 inputs include quoted prices for similar assets in active markets; quoted prices for identical or similar assets in markets that are not active; inputs other than quoted prices that are observable for the asset, such as interest rates and yield curves observable at commonly quoted intervals, volatilities, prepayment speeds, loss severities, credit risks, default rates; inputs that are derived principally from or corroborated by observable market data by correlation or other means. Level 2 inputs should have great reliability as they are corroborated by observable market data. As such, IFRS 13 require maximum use of observable inputs in determining fair value.

Adjustments to Level 2 inputs that are significant to the entire measurement result in a fair value measurement categorised within Level 3. Level 3 inputs are unobservable inputs for an asset fair value measurement. Unobservable inputs are inputs for which market data are not available and, therefore, need to be developed on the basis of the best information available about the assumptions that market participants would use when pricing the asset. Level 3 inputs are subject to the highest degree of information asymmetry between preparers and users.

3. Main issues related to fair value measurement for private equities

In this section, we discuss the main reasons why we question whether fair value as defined by IFRS 13 is an appropriate measure for private equities and can effectively improve transparency and comparability in financial reporting.

One important issue relates to the strategic intent of private equity investments.

According to IFRS 13, fair value is a market-based measurement, which reflects the price that would be received to sell an asset in an orderly transaction between market participants at the measurement date.

However, private equities are usually held with strategic intent as, in almost every case, they are not held for trading but part of a long-term investment devoted to exploit business opportunities or commercial/entrepreneurial relationships, with no expectation of any capital gain.

As a consequence, fair values based on market prices could be inappropriate to represent the real values of private equity investments as they do not necessarily reflect the manner in which cash flows associated with an asset will be realized.

According to the IASB, financial statements should provide users of financial statements (present and potential investors, creditors and others) with information that is useful in making decisions about buying, selling or holding equity or debt instruments and providing or settling loans or other forms of credit.

But, in the case of private equities held with a strategic intent, fair values expressed as exit values will be useful primarily to creditors and shareholders of companies that face likely liquidation. For stakeholders in going concerns, though, the relevant asset values for investment decisions are values in use, that is the present value of the net cash flows which the assets are expected to generate within the firm. Exit values clearly are not relevant to these parties, except in those instances where the assets are to be sold soon.

As pointed out by Whittington (2008), fair value should instead reflect the opportunities related to the investment actually available to the reporting entity and entity-specific assumptions should also be made. The Financial Stability Board, which shares such a view, in its July 2010 Report to G20 Leaders claims that "*while reaffirming the framework of fair value accounting, we have agreed that the accounting standards setters should improve standards for the valuation of financial instruments based on their liquidity and investor's holding horizons*".

Investors are aware of that and, in fact, Koonce et al. (2011) document investors reluctance to embrace fair values for items not to be sold soon.

In some cases, pivate equities held with a strategic intent might even be considered closer to subordinated credits rather than to equity ownership. The Basel Committee (2001) discusses such an issue and reaches the very same conclusion. As a consequence, it allows banks which

use a recognized internal rating based approach to use an alternative method for regulatory capital calculation, called PD/LGD, for equity investments – even if public - that are part of a long-term customer relationship in which returns on investment are based on regular and periodic cash flows not derived from capital gains and where there is no expectation of future capital gain or of realising any existing gain in the long term[1]. In most cases, the estimated probability of default is readily available as the financial institution has also lending and/or general banking relationships with the portfolio company.

Another issue relates to the decision-usefulness of fair values based on valuation techniques.

Prior research shows that the decision-usefulness of fair value estimates is very low. Several studies document that investors are aware of estimation errors and, therefore, assign less relevance to numbers which are less trustworthy (Petroni and Wahlen 1995, Nelson 1996, Eccher et al. 1996). Some papers, which focus directly on the value relevance of the three level inputs in the fair value hierarchy, show that investors are likely to decrease the weight they place on less reliable fair value measurements in their equity-pricing decisions due to information risk, inherent estimation errors and possible reporting bias (Kolev 2009; Goh et al. 2009; Song, Thomas and Yi 2010). In particular, Kolev (2009) and Goh et al. (2009) document that investors value Level 2 less than Level 1 assets, but value Level 2 and Level 3 fair value estimates similarly. Song, Thomas and Yi (2010) also show that value relevance of Level 2 and Level 3 items worsen as markets become less liquid and economic crises deepen.

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[1] The Basel Committee, in its Working Paper on *Risk Sensitive Approach for Equity Exposure in the Banking Book for IRB Banks* (2001), details a definition of private equities held with strategic intent which includes the following:

(a) Direct Holdings – Holdings in securities, and other financial assets whose principal values are directly related to the value of ownership interests in a commercial endeavour, whether voting or non-voting, that convey a residual interest in the assets and income of the enterprise.

(b) Indirect Holdings and Fund Investments – Holdings in a corporation, partnership, limited liability company or other type of enterprise (including any form of special purpose vehicle) that issues ownership interests and is engaged in the business of investing in the instruments defined above.

(c) Residual Interests – Holdings in residual ownership interests of commercial enterprises that allow the enterprise to waive or defer interest or other contractual remuneration to the holder, such as perpetual preferred shares.

(d) Any security (other than convertible bonds) that ranks pari passu in liquidation with any element included in (a), (b) or (c) above.

The fact that investors are likely to decrease the weight they place on less reliable fair value measurements has to do with their awareness that it could be very difficult, or even impossible, to measure private equity fair value without making subjective judgements. As a result, their fair value is not considered as reliable and, hence, decision-useful. Gathering information and estimating their fair value is also very costly and, probably, would not exceed benefits. Hence, a grounded analysis of costs and benefits should be done before imposing fair value measurement for private equities with no exception. A part from very theoretical statements, no sound empirical work has been produced on this issue yet.

Another issue we raise relates more specifically to the use of market multiples in private equity valuation.

As mentioned above, IFRS 13 states that Level 2 inputs - such as transaction and market multiples - must have the highest priority in valuation techniques as they are corroborated by observable market data. Market multiples in particular are supposed to be highly unbiased and, hence, to provide the best fair value estimates.

However, a certain number of studies show that the performance of private equities is relatively different from that of publicly traded companies. Quigley and Woodward (2002) and Moskowitz and Vissing-Jorgensen (2002), for instance, report lower returns for private than for public equity. Cochrane (2005) also documents a extraordinary skewness of returns since most returns are modest, but there is a long right tail of extraordinary good returns. In contrast, Liungqvist and Richardson (2003) document that private equity generates excess returns on the order of five to eight percent per annum relative to the aggregate public equity market.

On the other hand, Kim and Ritter (1999) focus directly on the predictive ability of market multiples for private equity valuation and test price-to-earnings, price-to-sales, enterprise value-to-sales and enterprise value-to-operating cash flow ratios, which are widely recommended by academics and commonly used by practitioners. They find that such ratios do a relatively poor job especially when they are based on historical numbers and that relevant adjustments for differences in growth and profitability should be necessary, given the wide variation of such ratios within an industry.

Hence, the risk is that investors rely on fair value estimates based on market multiples which, instead, are not reliable.

Finally, we point out that estimation errors bear important economic consequences.

Archival research, for instance, documents that estimation errors inherent to accounting information have a cost in terms of investors' adverse selection, liquidity risk and information-processing costs, all of which increase a firm's cost of capital.

Diamond and Verrecchia (1991) and Baiman and Verrecchia (1996) document that the cost of capital for firms increases as quality of information decreases. As the cost of capital increases, the value of a firm's assets decreases. In fact, investors, to the extent that they perceive greater uncertainty of accounting numbers, adjust upward the discount rate applied to the reported amount, resulting in less than a one-to-one valuation. Accounting amounts that are less reliable are assigned a higher cost of capital and, therefore, are valued less than a more reliable amount.

Moreover, investors, to the extent that they perceive reported assets to be biased upward, adjust downward for a cash flow effect. By cash flow effect, we mean that investors perceive management estimates of future cash flows to differ systematically from realized future cash flow.

When certain accounting information is subjective in nature, and managers are allowed to exercise a degree of discretion over it, managers are more likely to generate intentional biases in their estimations (Aboody et al. 2006; Bartov et al. 2007). To the extent that these biases are expected on average, investors are likely to adjust such estimates in valuing the firm. Again, this adjustment results in less than one-to-one valuation of the reported amount.

Song, Thomas and Yi 2010 show that if investors are concerned about possible overstatement of Level 2 and Level 3 fair value assets, then they adjust their valuation of management-reported assets to less than 1.

Less reliable accounting information also reduces the ability of investors to monitor managerial behaviour, potentially reducing the firm's operating performance and future cash flows. Many studies discuss the important role of financial accounting information as a mechanism to discipline managerial behaviour and show that as financial information quality deteriorates, investors lose their ability to link manager activities to firm performance (Bushman and Smith 2001; Lombardo and Pagano 2002; Bens and Monahan 2004; Kanodia et al. 2004; Biddle and Hilary 2006; Hope and Thomas 2008). Without the disciplining mechanism afforded by reliable financial accounting information, managers are held less accountable for their actions and therefore operate the firm less efficiently or extract private benefits directly, both of which are detrimental to firm value. Mark-to-Model fair values are less observable, making it difficult for

investors to link their performance to managerial decisions and, therefore, reducing the efficiency of these activities. Hence, several doubts can be raised over the capability of mark-to-model fair values to provide information useful to assess the stewardship of management.

Benston (2006 and 2008) shows that fair values other than those taken from quoted prices can be readily manipulated by opportunistic and overoptimistic managers, thus creating monitoring problems to auditors and financial statement users. He also shows that an extensive use of level 2 and 3 estimates accounted for Enron's demise.

Finally, estimation errors increase volatility in accounting data. Volatility in accounting data is a relevant issue especially for banks as capital requirements are largely derived from financial report. As highlighted by Enria et al. (2004), volatility in financial reporting causes procyclical effects on capital requirements and real economy financing. Therefore, it can consistently affect public goods such as financial stability (Enria et al. 2004). Valuation uncertainty related to valuation techniques is also one of the main concerns of the regulators. The Financial Stability Board - in the November 2011 *Report to G20 Leaders* – also recommends that standard setters require firms to adjust valuations in order to avoid overstatement of income when significant uncertainty about valuation exists.

4. Fair value measurement for private equities using Level 2 inputs: a field test.

As already stated, valuation techniques introduce estimation errors and make financial reporting more volatile.

Barth (2004) points out that in a semi-strong form of market efficiency, volatility from period-to-period in fair values and, therefore, in financial statements derives from two sources. One is the firm's activity during the period and changes in economic conditions. This volatility, called *inherent volatility*, derives from economic, not accounting forces. Inherent volatility is the volatility of the asset itself.

However, there is another source of volatility, which is called *estimation error volatility*. Estimation error volatility is related to the fact that accountants usually do not observe the fair value of an asset and need to estimate it. Fair values obtained by valuation techniques entail

mation errors and the resulting asset volatility is attributable not only to inherent changes in economic conditions, but also to measurement errors[2].

In this section, we show that transaction and market multiples, which are corroborated by observable market data and therefore considered to be highly unbiased, can, on the contrary, introduce great estimation errors in financial reporting.

Our field test supports the claim that, even if a fair value definition based on an exit price were accepted, market based valuation techniques could not anyway provide a faithful representation of the real-world economic phenomena they purport to represent.

More specifically, we show that market multiples elide the idiosyncratic component of risk, thus increasing fair value estimates. We document that transaction multiples also lead to higher fair values as they include only successful transactions and incorporate synergy expectations as well as other positive factors taken into account in the transactions themselves.

In our field test, we replicate the best practice followed by practitioners in private equity valuation. We form a portfolio of listed companies which we assume to be private and evaluate according to IFRS 13. We evaluate such a portfolio over a period of 5 years, from the beginning of 2006 to the end of 2010. We focus on the financial market crisis which started in 2007 since during periods of turmoil stakeholders seek higher financial information quality, which, on the contrary, is difficult for firms to guarantee.

We set up an equally weighted portfolio at the starting date, which we evaluate by using transaction and market multiples. We compare the results with one another as well as with market capitalization and book value at the same measurement date. Consistently with IFRS 13, we assume that quoted prices in active market provide the most reliable fair value. Finally, we use book value as a proxy for the equity method of accounting prescribed by IAS 28.

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[2] To see these sources of volatility, consider an asset to be measured at fair value. x is the fair value of the asset. The mean of x is $\bar{x}$ and the variance of x is σ_x^2. Thus, at any point in time, the realization of x is drawn from a distribution. The variance of x, σ_x^2, is its inherent volatility. Usually, accountants do not observe x and need to estimate it. Thus, the amount recognized in the financial statements is $X = x + \varepsilon$, where ε is the estimation error, which has a variance of σ_ε^2. In a simple setting, ε has mean zero, which indicates that the recognized amount, X, is an unbiased measure of x. In such a setting, the estimation error, $X - x$, equals ε and σ_ε^2 is the estimation error volatility of x. Assuming X and x are uncorrelated, $\sigma_X{}^2 = \sigma_x^2 + \sigma_\varepsilon^2$. Thus, the volatility of the recognized amount, X, is greater than the volatility of the underlying amount, x.

We focus on European non-financial firms operating in high investment-intensive or cyclical industries such as chemicals, energy, aerospace and defence, technology, automobiles, telecom, healthcare, natural resources, homebuilding and related sectors. The high level of risk related to their business makes their evaluation particularly challenging.

The sample is randomly selected and includes the following firms: Finmeccanica, Sanofi-Aventis, Eni, Fiat, Edf, Iberdrola, Upm, Rhodia, Clariant, Telefonica, Nokia, Sap, Volkswagen, Telecom, HeidelbergCement, Xstrata, Statoil, SaintGobain, Bayer and Storaenso.

Market multiples and transaction multiples are obtained from Fitch Ratings and are based on historical earning figures. We select multiples which closely match the characteristics of our sample firms.

We implement valuation models consistently with best practice. Therefore, the market and the transaction multiples are applied to the EV/EBITDA margin and the equity fair value is obtained by subtracting the net financial debt from - or summing the net cash and cash equivalent to - the enterprise value. Transaction multiples used in this paper are a mean between transaction multiples relative to the measurement year and the previous year.

Fair values computed under our transaction multiples include a control premium, while we are investigating the effect of IFRS 13 in relation to IFRS 9. IFRS 9 applies to minority investments, whereas interests in subsidiaries, associated and joint ventures are accounted for under IAS 27, IAS 28 and IAS 31.

Minority investments require a discount factor to be applied in order to determine their fair values. For this reason, we assume an average 35% control premium which, according to past empirical evidence, is rather large, yet realistic (Hanouna et al. 2001). Hence, fair values obtained by assuming such a control premium are rather conservative.

We also assume different control premiums, up to 50%, as a robustness check (not tabled), but the overall results do not change significantly.

Market and transaction multiples are in Table 1 and Table 2, respectively.

Accounting figures (EBITDA, Book Value, Net Financial Position) are extracted from companies' financial reportings and standardised on common criteria basis.

(Please insert Table 1 and 2 about here)

Table 3 reports descriptive statistics for fair values computed under market and transaction multiples. The first two columns from left report book value and market capitalization as references.

The Appendix reports a per year and firm breakdown of fair values computed according to the transaction and market multiples as well as book and actual values.

As results from Table 3, transaction and market multiples provide, in general, very different fair values. Differences are relevant not only between market and transaction multiples but also if compared with the actual values.

(Please insert Table 3 about here)

Fair values based on market and transaction multiples outperform, on average, actual values given by market capitalization.

Transaction multiples more than double actual values. These results are not surprising given that transaction multiples include only successful transactions and incorporate premium controls as well as synergy expectations and other positive factors taken into account by the buyers, which contribute to increase transaction prices.

Transaction fair values net of the 35% control premium still remain significantly higher than actual values, thus proving such fair values to be an entity-specific measurement, whereas IFRS 13 states that fair value shall be a truly market-based measurement.

Also market multiples more than double actual values. Moreover, market multiple and transaction values are, on average, more than 4 times the book value. Transaction multiple values net of the 35% control premium are still, on average, more than 3 times book value, while market capitalization is only twice.

Such results for market multiples could be explained by the fact that market multiples are computed on a certain number of comparables and, therefore, tend to elide the idiosyncratic component of risk.

In order to draw some inference from our numbers, we perform the Wilcoxon and the *t*-test, which indicate that differences between market and transaction multiples, on the one hand, and market capitalization, on the other hand, are statistically significant at 0.01 level (two-tail test). Therefore, our statistical analysis supports the claim that market and transaction multiples cannot provide a faithful representation of the real-world economic phenomena they purport to

represent. Consistently with Kim and Ritter (1999), market and transaction multiples perform very poorly.

The breakdown per firm reported in the Appendix shows that Iberdrola is the only firm whose fair values are on average lower than the actual ones both under the market and transaction multiples.

Fair values computed under the transaction and market multiples are, on average, higher than the actual values for Eni, Finmeccanica, Sanofi-Aventis, Upm, Rhodia, Clariant, Telefonica, Fiat, Telecom, Xstrata, Statoil, Saint-Gobain and Storaenso and Heidelbergcement. Therefore, financial statements would overstate such investments and report a value creation which is not there.

Bayer, Nokia and Sap have lower fair values under the market multiples, but higher fair values under the transaction multiples. Edf, instead, shows a lower fair value under the transaction multiples, but a higher fair value under the market multiples. As a consequence, fair values would be either overstated or understated, depending on the selected valuation techniques.

Table 3 also shows that market and transaction multiples have a higher volatility than market capitalization, which makes fair value estimates fluctuate more than firms' fundamentals would suggest. Standard deviation related to transaction multiples more than doubles the actual one, while volatility related to market multiples is even more than three times higher.

As outlined by Barth (2004), standard deviation differences between valuation techniques and actual values are good proxies for measurement errors.

Table 4 provides Pearson's correlation coefficients between fair values based on market multiples, transaction multiples, on the one hand, and market capitalization, on the other hand.

(Please insert Table 4 about here)

Both valuation techniques show a high and statistically significant correlation with market capitalization. However, market multiples show a slightly stronger correlation with market capitalization.

A stronger correlation between market multiples and market capitalization is expected given that market multiples capture non-diversifiable risk factors which simultaneously affect our portfolio value and the value of comparables. Transaction multiples, instead, show a lower correlation with actual values, coherently with the fact that they are based on past transactions and, therefore, lag market price development. Subsequent analysis confirms this interpretation.

We also assess the portfolio fair values as they would be reported in the balance sheet at the end of each financial year.

(Please insert Table 5 about here)

As shown in Table 5, the portfolio fair value estimates outperform the current market prices in each reporting year and none of them reflects the severity of the financial market crisis. While market capitalization has reduced by about 20 percent since 2006, the portfolio value has increased both under the market multiples (+26 percent) and the transaction multiples (+7,8 percent).

The portfolio actual value has quoted below its book value since 2008 and, at the end of 2010, is much lower (-36,9 percent). In contrast, at the same date, portfolio fair values under market multiples and transaction multiples are nearly the same, they outperform book value and nearly double actual values (+88.6 percent for market multiples, + 85.4 percent for transaction multiples).

Furthermore, using valuation techniques, fair values in the balance sheet are much more volatile values than the actual ones.

Figure 1 depicts our portfolio values per year and their polynomial interpolation[3].

(Please insert Figure 1 about here)

One of the main concerns for management and shareholders is also in the financial year income statement. Investment choices, value creation and management compensation are based on profit and loss analysis and result comparisons.

(Please insert Table 6 about here)

In our example, income statement based on valuation techniques would report, on average, a value creation which the actual values do not. Table 6 displays that, on average, market and transaction multiples show a profit, whereas actual values report a loss. Moreover, portfolio results under the transaction multiples - which are by nature time and cycle- specific - show a higher volatility and, therefore, lead to a more swinging value creation than actual values.

(Please insert Figure 2 about here)

[3] In numerical analysis, polynomial interpolation is the interpolation of a given data set by a polynomial: given some points, it finds out a polynomial which goes exactly through these points. In empirical research, polynomials are used to approximate trends. For analytical specifications see Powell (1981).

The same conclusions could be drawn by observing portfolio returns over the holding period.

(Please insert Table 7 and Figure 3 about here)

As shown in Table 7, shareholders would observe a portfolio return which is, on average, 10 times the actual one under the transaction multiples and more than 3 times under the market multiples. However, in 2008 all the portfolio returns, including those computed on book value, are negative. In 2009 market capitalization shows a recovery, while transaction multiples still report a negative return, consistently with the fact that they lag market development. At the same date, the portfolio return under market multiples is slightly negative, which is consistent with the fact that market multiples tend to elide the idiosyncratic component of risk.

Finally, we compute the portfolio price-to-book value ratios per each year.

(Please insert Table 8 and Figure 4 about here)

As show in Table 8, none of the valuation techniques reflects the portfolio actual losses incurred during the crisis. Only in 2009 transaction multiples indicate a loss compared to portfolio book value, whereas market multiples still show value creation.

5. Conclusions

In this paper, we discuss IFRS 13, *Fair Value measurement*, with regard to private equity valuation.

We raise relevant issues on the fair value definition as an exit price and on the reliability of market-based valuation techniques.

IFRS 13 states that fair value must be a market-based measurement and the firm's intention to hold the asset is irrelevant.

We discuss such a definition and claim that, in almost all cases, private equities are not held for trading purposes as they are part of long term investments devoted to exploit particular business opportunities, with no expectation of any future capital gain. A market-based, rather than an entity-specific, fair value measurement fails to consider both the financial instrument liquidity and investors' holding horizons which, instead, are key to private equity valuation. As such, a market-based fair value measurement would deter financial statement preparers from analyzing the relevant underlying parameters for their valuation.

Moreover, the fair value expressed as an exit price will be useful only to some creditors and shareholders that face likely liquidation. On the contrary, for stakeholders in going concerns, the relevant asset value for investment decisions is the value in use, that is the present value of

the net cash flows that the asset is expected to generate. Exit values clearly are not relevant to these parties, except in those instances where the assets are to be sold soon.

We also document that the historical performance of private equities is relatively different from publicly traded companies. Therefore, even if we accepted a fair value expressed as exit price, market prices could not be predictive of private equity fair values.

For these reasons, we claim that, should IFRS 13 be endorsed as currently stated, then an exemption to fair value private equities should be set out in IFRS 9.

We also perform a field test which shows the potential effect on private equity valuation of market-based valuation techniques, such as market and transaction multiples, which are considered to be highly unbiased and, for such a reason, IFRS 13 includes in Level 2 inputs.

We form a portfolio of equities which we evaluate by implementing market and transaction multiples according to best practice. Consistently with previous research, we show that such multiples do a poor job because they ignore firm-specific risk factors and, as a result, fail to provide fair values which are a faithful representation of the economic real world phenomena they purport to represent.

Our numbers show that transaction multiples provide the highest fair values, coherently with the fact that they are cases of 'revealed preferences'. In fact, transaction multiples refer only to successful transactions and incorporate synergy expectations as well as other positive factors which increase transaction prices.

Market multiples, instead, are average values which tend to elide the idiosyncratic component of risk.

Transaction and market multiples also lead to highly volatile fair values, thus proving that market-based techniques are largely affected by the economic cycle as well as by market trends, which amplify effects and value appraisals.

As a result, assessing private equity fair values by using market-based valuation techniques can mislead performance analysis and appraisals as well as management choices and compensation and it also alters comparison among financial reports. Value creation largely varies depending on the selected valuation technique.

Such issues should be carefully taken into consideration by regulators. In fact, the risk is that fair value estimates based on transaction and market multiples may mislead investors in perceiving the financial data as highly reliable.

In conclusion, our paper questions whether IFRS 13 fair value definition is able to effectively enhance transparency and comparability of accounting data, especially when private equities are not held for trading purposes.

Evidence on this point is of direct interest to accounting policy makers since the explicit purpose of the European Union Regulation 1606/2002, which has introduced the IAS/IFRS accounting system in the European Union, is to ensure a high degree of transparency and comparability in financial statements as well as the efficient functioning of the capital market.

The IASB Framework also states that fair value accounting is expected to provide investors with useful information to predict the capacity of firms to generate cash flow from their assets.

Furthermore, we show that estimation errors bear important economic consequences. They increase volatility in accounting data, which – in turn - has important effects on bank capital requirements and real economy financing. For this reason, we also question whether IFRS 13, as currently stated, is really conducive to the European public good.

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TABLE 1

Market Multiples

INDUSTRY	2005	2006	2007	2008	2009	2010
Aerospace and Defense	11,1	11,9	10,7	8,9	8,7	10,5
Auto and Related	7,3	7,8	6,3	7,0	7,3	7,5
Chemicals	8,2	8,7	10,4	6,4	8,6	7,7
Energy	7,7	6,7	7,5	4,5	9,9	9,3
Healthcare	10,7	9,6	9,7	7,0	8,4	9,1
Homebuilding, Building Materials and Construction	6,3	9,2	12,8	20,5	24,8	15,2
Natural Resources	8,8	8,1	8,5	5,9	7,9	9,2
Technology	10,4	11,9	8,2	11,3	9,2	9,9
Telecom and Cable	13,1	17,0	11,3	7,2	12,1	11,2
Utilities	9,6	8,5	8,2	6,4	6,5	7,7

TABLE 2

Transaction Multiples

INDUSTRY	2005	2006	2007	2008	2009	2010
Aerospace and Defense	16,55	20,90	23,40	24,20	17,70	13,55
Auto and Related	10,25	8,15	13,25	10,70	8,55	12,10
Chemicals	16,45	15,05	14,95	12,90	15,70	14,90
Energy	10,80	12,00	12,40	12,40	9,55	8,65
Healthcare	20,35	24,30	25,30	26,95	26,70	16,25
Homebuilding, Building Materials and Construction	11,15	14,80	17,45	15,80	13,55	9,35
Natural Resources	12,40	16,65	21,95	12,45	14,75	18,85
Technology	22,15	24,75	24,85	22,90	18,70	17,15
Telecom and Cable	12,55	13,65	16,85	15,9	14,35	12,6
Utilities	8,8	9,75	14,25	14,65	13,5	8

TABLE 3

Asset Fair Values

	Book Value	Market Capitalization	Market Multiples	Transaction Multiples	Transaction Multiples net of a 35% control premium
Mean	25,748***	52,930	115,541***	116,752***	86,397***
Median	14,436***	27,082	37,160***	44,854***	33,192***
Standard Deviation	38,481***	89,593	275,442***	264,915***	196,037***
Minimum	-719	455	981	3,197	2,365
Maximum	226,000	538,881	1,679,400	1,761,500	1,303,510
25 percentile	7,156	8,112	11,283	12,319	9,166
75 percentile	27,298	62,575	97,776	93,549	69,226
Asimmetry	3.75	3.63	4.39	4.40	4.40
Kurtosis	15.24	13.96	19.94	20.35	20.35
Observations	120	120	120	120	120

*** Differences with Market Capitalization are statistically significant at 0,01 level (two tails).

TABLE 4

Asset Value Correlations

	Market Multiples	Transaction Multiples
Book Value	0.944***	0.935***
Market Capitalization	0.974***	0.939***
Observations	120	120

***Correlation coefficients are statistically significant at 0,01 level (two tails).

TABLE 5

Portfolio Fair Values (€, equally weighted at 2006 year beginning)

End of financial year report:	Book Value	Market Capitalization	Market Multiples	Transaction Multiples
2005	2,000	2,000	2,000	2,000
2006	2,301.27	2,518.41	2,991.72	3,439.80
2007	2,729.68	2,972.09	3,645.59	5,260.64
2008	2,703.16	1,567.72	3,243.71	4,204.96
2009	2,906.60	1,911.49	3,193.96	2,759.64
2010	3,165.95	1,999.00	3,770.18	3,707.07
Mean	2,634.44	2,161.45	3,140.86	3,562.02
Standard deviation	420.45	500.40	630.56	1,132.99

Fair values based on transaction multiples are net of a 35% control premium.

TABLE 6

Portfolio Profits and Losses (€)

End of financial year report:	Book Value	Market Capitalization	Market Multiples	Transaction Multiples
2006	301.27	518.41	991.72	1,439.80
2007	428.41	453.68	653.87	1,820.84
2008	-26.52	-1,404.37	-401.88	-1,055.68
2009	203.44	343.78	-49.75	-1,445.32
2010	259.35	87.50	576.22	947.43
Mean	216.17	-129.85	194.62	66.82
Standard deviation	167.15	801.98	565.76	1,492.20

Fair values based on transaction multiples are net of a 35% control premium.

TABLE 7

Portfolio Returns

End of financial year report:	Book Value	Market Capitalization	Market Multiples	Transaction Multiples
2006	15.1%	25.9%	49.6%	72.0%
2007	18.6%	18.0%	21.9%	52.9%
2008	-1.0%	-47.3%	-11.0%	-20.1%
2009	7.5%	21.9%	-1.5%	-34.4%
2010	8.9%	4.6%	18.0%	34.3%
Mean	9.8%	4.6%	15.39%	46.2%
Standard deviation	7.5%	30.1%	23.5%	46.2%

Portfolio Returns are computed on transaction multiples values net of a 35% control premium.

TABLE 8

Portfolio Price-to-Book Value Ratios (x)

End of financial year report:	Book Value	Market Capitalization	Market Multiples	Transaction Multiples
2006	1.00	1.1	1.3	1.5
2007	1.00	1.1	1.3	1.9
2008	1.00	0.6	1.2	1.6
2009	1.00	0.7	1.1	0.9
2010	1.00	0.6	1.2	1.2
Mean	1	0.84	1.19	1.35
Standard Deviation	0.00	0.24	0.12	0.38

Fair values based on transaction multiples are net of a 35% control premium.

FIGURE 1

Portfolio Fair Values, Current Market Values and Polynomial Interpolation

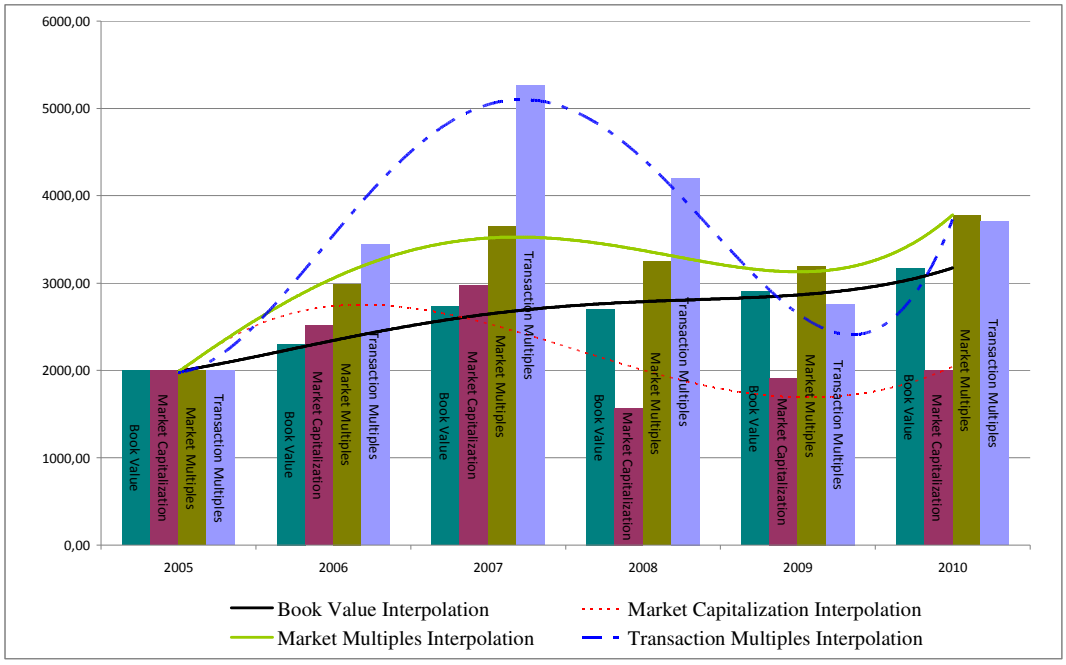


FIGURE 2

Portfolio Profits and Losses and Polynomial Interpolation (€)

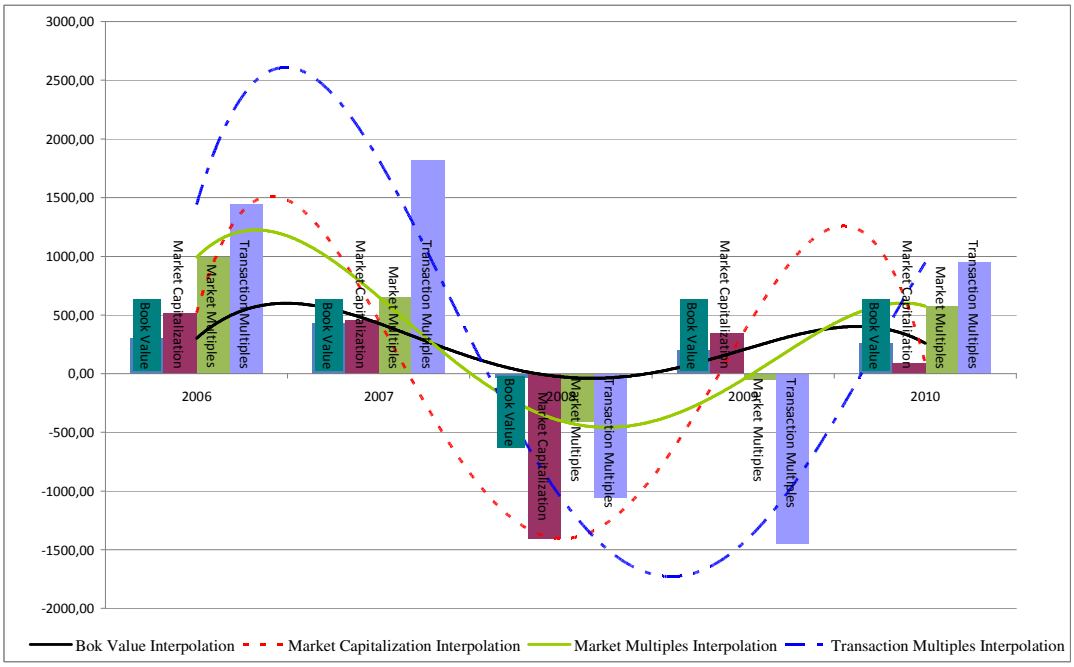


FIGURE 3

Portfolio Returns

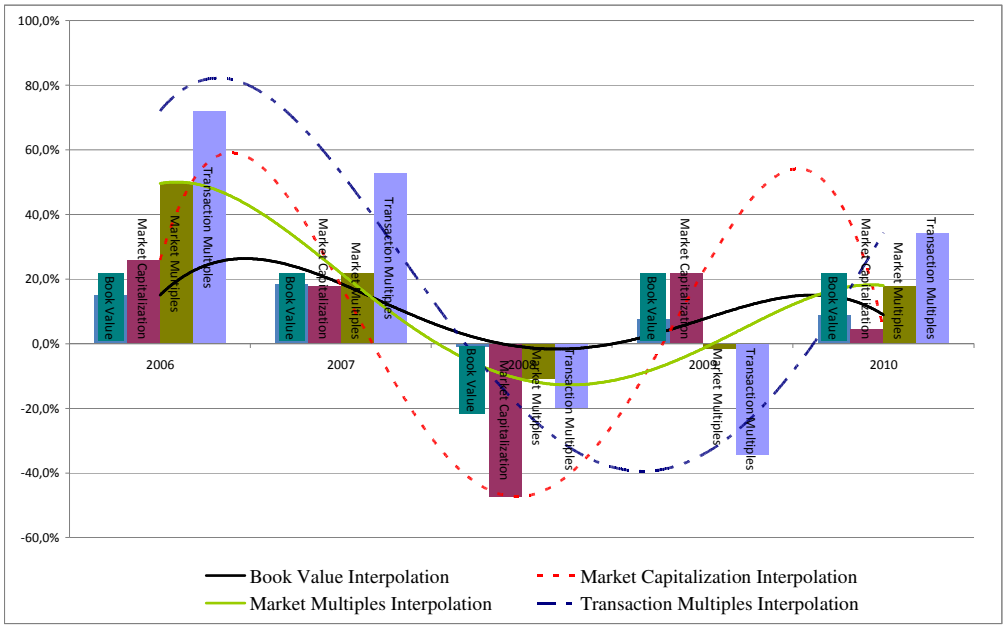
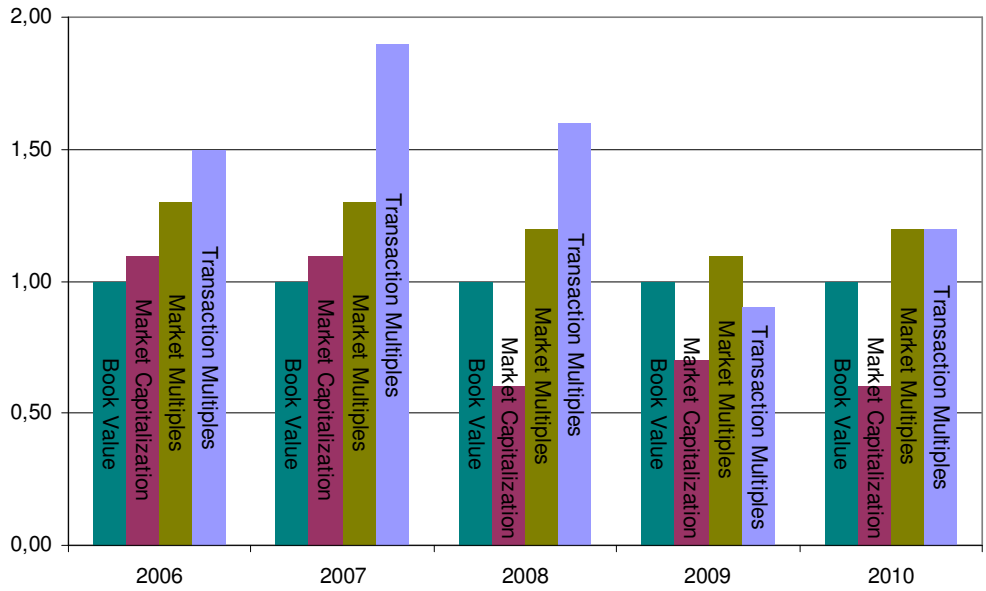


FIGURE 4

Portfolio Price-to-Book Value Ratios



APPENDIX
Fair Values per Sample Firm and Year

Sample Firms	Year	Book Values	Market Capitalization	Market Multiples	Transaction Multiples	Transaction Multiples net of 35% control premium
ENI	2005	39,217	93,845	169,235	162,234	120,053
	2006	41,199	102,056	173,537	208,521	154,306
	2007	42,867	100,334	180,473	204,089	151,026
	2008	48,510	67,050	123,028	217,297	160,799
	2009	50,051	71,295	204,002	113,408	83,922
	2010	55,728	65,687	218,731	139,747	103,413
	Mean	46,262	83,378	178,168	174,216	128,920
	Standard deviation	6,258	17,155	33,045	42,319	31,316
FINMECCANICA	2005	4,598	6,914	11,465	12,144	8,987
	2006	5,320	8,717	10,352	12,377	9,159
	2007	5,432	8,371	10,024	15,771	11,671
	2008	6,130	6,296	8,232	16,453	12,175
	2009	6,459	6,429	10,737	15,181	11,234
	2010	7,098	4,908	13,552	9,976	7,382
	Mean	5,840	6,939	10,727	13,650	10,101
	Standard deviation	898	1,415	1,754	2,533	1,874
NOKIA	2005	12,360	68,502	65,066	62,792	46,466
	2006	11,968	63,384	84,174	84,014	62,170
	2007	14,773	104,461	87,189	138,131	102,217
	2008	14,208	42,191	82,416	93,583	69,251
	2009	13,088	33,405	41,950	46,639	34,513
	2010	14,384	29,566	48,914	42,761	31,643
	Mean	13,464	56,918	68,285	77,987	57,710
	Standard deviation	1,159	28,122	19,435	35,641	26,374
SANOFI-AVENTIS	2005	46,317	103,656	84,651	121,333	89,787
	2006	45,820	94,965	99,243	174,188	128,899
	2007	44,719	86,012	98,348	172,373	127,556
	2008	45,071	59,705	70,851	193,842	143,443
	2009	48,580	72,484	91,439	177,335	131,228
	2010	53,288	62,659	99,342	120,968	89,516
	Mean	47,299	79,913	90,646	160,006	118,405
	Standard deviation	3,234	17,825	11,289	31,045	22,973
UPM	2005	7,348	8,665	7,730	9,487	7,020
	2006	7,289	10,043	9,544	12,782	9,459
	2007	6,783	7,084	9,168	11,533	8,535
	2008	6,120	4,680	2,794	7,775	5,754
	2009	6,602	4,326	4,660	6,465	4,784
	2010	7,109	6,302	9,070	9,607	7,109
	Mean	6,875	6,850	7,161	9,608	7,110
	Standard deviation	470	2,233	2,793	2,325	1,721

EDF	2005	20,274	58,273	117,212	67,028	49,600
	2006	24,799	100,584	101,493	85,741	63,448
	2007	28,796	148,470	104,460	120,655	89,285
	2008	24,998	75,620	71,524	130,024	96,218
	2009	34,667	76,839	59,613	76,107	56,319
	2010	36,903	60,772	116,254	90,821	67,207
	Mean	28,406	86,760	95,092	95,063	70,346
	Standard deviation	6,361	33,790	24,000	25,010	18,507
IBERDROLA	2005	9,415	20,817	19,522	6,012	4,449
	2006	10,567	29,859	19,421	14,947	11,061
	2007	27,832	51,935	23,721	30,920	22,881
	2008	25,708	32,715	15,332	40,341	29,852
	2009	29,030	35,033	15,269	22,425	16,595
	2010	31,663	31,080	26,302	16,516	12,222
	Mean	22,369	33,573	19,928	21,860	16,177
	Standard deviation	9,786	10,225	4,433	12,259	9,072
RHODIA	2005	-666	2,130	2,118	3,298	2,440
	2006	-628	3,179	3,993	5,086	3,764
	2007	-368	2,649	6,399	5,641	4,174
	2008	-356	455	2,939	4,698	3,477
	2009	-719	1,275	3,159	4,085	3,023
	2010	-288	1,825	5,775	7,494	5,546
	Mean	-504	1,919	4,064	5,050	3,737
	Standard deviation	187	973	1,689	1,446	1,070
SAP	2005	5,782	48,500	30,240	71,278	52,745
	2006	6,123	51,000	35,187	79,556	58,871
	2007	6,478	44,300	26,901	92,702	68,599
	2008	7,171	30,900	35,953	95,893	70,961
	2009	8,941	40,500	29,981	82,522	61,066
	2010	9,824	46,700	30,088	82,275	60,884
	Mean	7,387	43,650	31,392	84,038	62,188
	Standard deviation	1,637	7,208	3,475	8,988	6,651
CLARIANT	2005	2,591	4,454	5,011	6,840	5,061
	2006	2,433	4,200	5,883	7,251	5,365
	2007	2,372	2,424	7,084	6,272	4,641
	2008	1,987	1,641	3,802	5,877	4,349
	2009	1,896	2,813	3,712	4,653	3,443
	2010	1,806	3,268	6,812	8,524	6,307
	Mean	2,181	3,133	5,384	6,569	4,861
	Standard deviation	325	1,071	1,457	1,311	970
TELEFONICA	2005	16,158	62,548	170,049	95,960	71,010
	2006	20,001	79,329	272,997	133,377	98,699
	2007	22,855	104,545	212,627	208,062	153,966
	2008	19,562	74,574	122,284	199,062	147,306
	2009	24,274	89,089	229,945	163,266	120,817

	2010	31,684	78,090	233,109	167,378	123,860
	Mean	22,422	81,362	206,835	161,184	119,276
	Standard deviation	5,342	14,227	53,174	41,719	30,872
FIAT	2005	9,413	12,504	7,684	3,197	2,365
	2006	10,036	15,816	26,610	19,217	14,220
	2007	11,279	19,333	26,873	41,673	30,838
	2008	11,101	5,013	25,215	21,206	15,693
	2009	11,115	11,196	12,601	9,673	7,158
	2010	12,461	11,163	22,981	23,233	17,193
	Mean	10,901	12,504	20,327	19,700	14,578
	Standard deviation	1,061	4,842	8,158	13,196	9,765
VOLKSWAGEN	2005	23,647	14,314	31,632	17,649	13,060
	2006	26,959	24,087	44,403	27,345	20,235
	2007	31,938	44,892	54,552	92,574	68,505
	2008	37,388	72,863	47,037	37,457	27,718
	2009	37,430	22,585	24,497	16,460	12,180
	2010	48,712	23,329	76,385	77,247	57,162
	Mean	34,346	33,678	46,417	44,789	33,143
	Standard deviation	8,944	21,718	18,264	32,355	23,942
TELECOM	2005	26,896	32,891	123,861	63,391	46,909
	2006	26,702	30,642	175,266	84,031	62,183
	2007	26,494	28,434	91,761	89,502	66,231
	2008	26,328	15,388	45,322	82,474	61,030
	2009	27,120	14,558	100,543	67,753	50,137
	2010	32,610	14,105	107,546	75,896	56,163
	Mean	27,692	22,670	107,383	77,174	57,109
	Standard deviation	2,426	8,871	42,478	10,074	7,455
HEIDELBERGCEMENT	2005	5,058	8,675	6,201	8,444	6,249
	2006	5,828	12,792	14,307	16,670	12,335
	2007	7,519	12,715	16,406	12,893	9,541
	2008	8,261	3,984	48,827	19,514	14,441
	2009	11,003	8,951	43,707	8,919	6,600
	2010	12,884	6,740	25,887	6,184	4,576
	Mean	8,426	8,976	25,889	12,104	8,957
	Standard deviation	3,015	3,422	17,060	5,196	3,845
XSTRATA	2005	8,137	8,602	22,834	29,971	22,178
	2006	19,722	24,050	47,461	58,661	43,409
	2007	25,214	34,494	112,136	100,236	74,175
	2008	24,399	6,257	45,414	70,854	52,432
	2009	34,919	32,946	46,190	59,110	43,741
	2010	42,021	34,387	72,442	92,202	68,229
	Mean	25,735	23,456	57,746	68,506	50,694
	Standard deviation	11,811	13,024	30,934	25,472	18,849
STATOIL	2005	108,000	339,386	880,700	845,600	625,744
	2006	124,000	361,829	867,400	1,044,200	772,708

	2007	179,000	538,881	1,294,500	1,452,900	1,075,146
	2008	216,000	363,187	1,038,500	1,761,500	1,303,510
	2009	200,000	461,716	1,659,500	968,250	716,505
	2010	226,000	403,045	1,679,400	1,115,400	825,396
	Mean	175,500	411,341	1,236,667	1,197,975	886,502
	Standard deviation	49,013	75,922	368,913	343,498	254,188
SAINT GOBAIN	2005	12,318	17,349	15,985	22,622	16,740
	2006	14,487	22,335	38,366	45,155	33,415
	2007	15,267	24,125	66,654	57,979	42,904
	2008	14,530	12,852	97,586	44,553	32,969
	2009	15,912	19,527	83,960	22,229	16,449
	2010	17,686	17,124	63,542	22,605	16,728
	Mean	15,033	18,885	61,016	35,857	26,534
	Standard deviation	1,777	4,041	29,809	15,414	11,406
BAYER	2005	11,157	25,730	27,103	39,748	29,413
	2006	12,851	31,208	15,898	39,730	29,400
	2007	16,340	47,672	29,384	59,393	43,951
	2008	16,821	31,636	16,194	67,647	50,059
	2009	18,896	46,466	44,674	93,537	69,218
	2010	18,951	41,926	56,702	70,549	52,206
	Mean	15,836	37,440	31,659	61,767	45,708
	Standard deviation	3,197	9,121	16,187	20,480	15,155
STORAENSO	2005	7,548	7,262	4,948	6,350	4,699
	2006	7,903	7,337	9,697	13,019	9,634
	2007	7,313	6,267	9,414	11,640	8,613
	2008	5,651	3,380	981	3,855	2,853
	2009	5,182	2,988	2,577	3,689	2,730
	2010	6,257	4,327	8,623	9,102	6,736
	Mean	6,642	5,260	6,040	7,942	5,877
	Standard deviation	1,107	1,944	3,747	3,953	2,925