ICAEW CHARITABLE TRUSTS

When does fair value accounting lead to artificial stock price volatility?

BRIEFING

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Summary

This project examines whether certain issues resulting from the implementation of fair value accounting lead to excess stock price volatility. This research is motivated by the concern of some regulators (eg, European Central Bank) and practitioners that fair value accounting and its implementation can make firms' businesses appear more volatile than they actually are. Extant literature shows that investors use earnings volatility in their risk assessment, and that earnings volatility and stock price volatility are strongly related. Fair value accounting is argued to facilitate investors' risk assessment through transparent reporting of underlying business. However, measurement issues and misunderstanding of fair value information by some investor groups may lead to excess stock price volatility.

This briefing uses the UK investment trust setting to derive the theoretical relationship between stock price volatility and the volatility of fair value earnings components. I then examine whether the effect of fair value earnings components on stock price volatility is consistent with theoretical predictions. I find that stock price volatility is higher than the volatility of fair value earnings, and that this effect is due to an unrealised (fair value) earnings component. This finding appears to be driven by the lack of accuracy of some fair value estimates and the artificial earnings volatility due to a mismatch between assets measured at fair value and liabilities measured at historical cost. I corroborate this result by showing that fair value earnings lead to greater stock price volatility when investment trust shares are traded by unsophisticated investors and are followed by fewer analysts.

The results of the project have several policy implications.

- Standard setters frequently use mixed measurement approaches; for example, they may use fair value accounting for certain assets and historical cost accounting for related liabilities. The project shows that the use of mixed measurement approaches can increase earnings volatility and can make firms' businesses appear more risky than they actually are.
- Some investors fail to recognise issues resulting from the implementation of fair value accounting. In this regard, supplementary disclosures that explain the origins of fair value changes may be useful in correcting some misperceptions. These disclosures need to be carefully designed in order to be noticed and understood by private investors.
- My investigation is conducted in a rather transparent fair value setting with few measurement problems. Given that I find excess stock price volatility in this setting, it is likely that other complex accounting measurement issues also lead to misperceptions of firm risk.
- Investment trusts that have substantial institutional ownership or are followed by analysts do not suffer from the artificial stock price volatility.

1. Introduction

The purpose of financial accounting is to facilitate investors' risk assessment. Extant literature shows that markets use a firm's accounting information to assess investment risk and that there is a high correlation between stock price volatility and earnings volatility (Beaver et al, 1970; Ryan, 1997). Reporting fair value adjustments in income is expected to increase transparency and to render income that is closely aligned with underlying economic activity. However, the introduction of fair value accounting is expected to substantially increase the volatility of a firm's income, and prior studies question whether this increased volatility facilitates investors' risk assessment (Ryan, 1997). As a result, regulators are concerned that fair value accounting can make firms' businesses appear more volatile than they actually are, which can increase stock price volatility (European Central Bank, 2004). As a result, the key issue in the fair value debate is whether fair value accounting makes stock prices too volatile.

A common line of argument among regulators and academics suggests that certain implementation issues that arise when a fair value regime is adopted can artificially increase the volatility of earnings. Two characteristics of fair value accounting can introduce noise in income measurement. First, any gains (losses) on fair-valued assets should be matched to offsetting losses (gains) on liabilities. For example, in a declining market, any decrease in asset value is followed by a decrease in the value of discounted liabilities due to increasing risk and interest rates. A decrease in asset value results in a loss, while a decrease in liabilities is a gain. If assets are carried at fair value and related liabilities are carried at historical cost, financial statements account only for changes in asset values, resulting in a mismatch that artificially increases the volatility of reported earnings (Hodder et al, 2006). Second, the use of valuation models and unobservable inputs in estimating fair values can lead to biased income (Landsman, 2007). The use of valuation models or comparable prices requires judgement; such valuations can lead to the inclusion of incorrectly estimated gains and losses into income. This leads to higher earnings volatility.[1]

There is little prior evidence regarding whether implementation of fair value accounting increases stock price volatility. The descriptive evidence provided by the European Central Bank (ECB) does not support the prediction that stock price volatility increases upon introduction of fair value accounting (European Central Bank, 2004). This briefing uses UK investment trusts to examine the effect of fair value accounting and its implementation on the volatility of stock market returns.

Next, I report the results of my analysis. The conclusions section of the briefing provides a less technical summary and discussion of main results.

1 Alternatively, firms may smooth income using their discretion in estimating fair values based on unobservable inputs. This results in a smoother income pattern that fails to reflect true underlying risks.

2. Investment trust setting

I use UK investment trusts to probe the relationship between stock price volatility and the volatility of fair value earnings. The UK investment trust industry is well developed, consisting of more than 450 investment trusts as of 31 December 2014, and managing assets of about £122bn. Investment trusts issue shares to investors – which are subsequently traded on the secondary market – and invest proceeds in a portfolio of financial instruments. As a result, the balance sheet of an investment trust has a simple structure and one major line item – investment in financial assets, which accounts for more than 90% of total assets. Investment trusts used in the sample predominantly invest in equity shares. Most of those equity investments are listed and are marked to observable market prices, while the fair value of unlisted investments is determined by reference to comparable market prices or by using a valuation model. Changes in the fair value of financial investments are reported in the income statement.

Using the investment trust industry offers three advantages, as listed below.

1. Investment trusts report assets predominantly at fair value, while liabilities are reported at historical cost.
2. There is variation in the use of fair value measurements, as investment trusts hold listed investments measured using observable prices and unlisted investments measured using valuation techniques.
3. The setting provides a methodological advantage over common approaches used to test stock price volatility. In the prior literature, the law of one price is used to show that the market value of an investment trust should equal its net asset value (Malkiel, 1977; Pontiff, 1995; Pontiff, 1997). I use this theoretical relationship as a starting point for an empirical model that links the volatility of earnings components to the volatility of stock returns.

The main financial performance measures for investment trusts are net asset value (NAV) and net income, which is used to calculate total return on net asset value (NAV return). NAV captures the current market value of the investment portfolio less liabilities. Net income consists of fair value gains/losses (capital income) and other non-fair value earnings components (revenue income) such as dividend income, administrative costs, management fees, and interest expense. Based on footnote disclosure, the fair value gains/losses can be further broken down into unrealised fair value gains/losses (ie, valuation increments) and realised gains/losses relative to the historical cost of securities sold during the period. I focus on the volatility of unrealised fair value adjustments so as to examine when fair value measurements affect stock price volatility. Realised and unrealised fair value gains/losses are major earnings components, constituting more than 90% of NAV returns.

3. Empirical model

As most of the investment trusts' assets are marked to observable market prices, the law of one price renders the share price of an investment trust equal to its net asset value. Pontiff (1997) further shows that in this case the volatility (variance) of share price changes *(var(Ret))* should be equal to the volatility of NAV returns *(var(NAV_ret))*:

$$var(Ret) = var(NAV\_ret). \qquad \text{(Model 1)}$$

Following the structure of the investment trusts' income statement, NAV returns can be broken down into fair value gains/losses *(FVGL)* and other income *(OI)*. Fair value gains/losses can be further decomposed into unrealised gains/losses *(UGL)* (ie, fair value adjustments) and realised gains/losses *(RGL)*, leading to the following equation:

$$NAV\_ret = FVGL + OI = (UGL + RGL) + OI. \qquad \text{(Model 2)}$$

I further use the variance decomposition framework to specify my empirical model as follows:

$$Ret\_var_{it} = \alpha_0 + \alpha_1\ UGL\_var_{it} + \alpha_2\ RGL\_var_{it} + \alpha_3\ OI\_var_{it} + \alpha_4\ cov(UGL;RGL)_{it} + \alpha_5\ cov(FVGL;OI)_{it} + \varepsilon_{it}, \qquad \text{(Model 3)}$$

where Ret_var_{it} is the variance of stock market returns of investment trust i during the measurement interval t. Stock market returns is equal to the percentage change in stock price during the fiscal year. UGL_var_{it} (RGL_var_{it}) is the variance of unrealised (realised) fair value gains/losses scaled by lagged net asset value. OI_var_{it} is the variance of other income. Other income is obtained as the difference between NAV returns (percentage change in net asset value) and fair value gains/losses scaled by lagged net asset value. $Cov(RGL;UGL)_{it}$ is the covariance between realised gains/losses and unrealised gains/losses. $Cov(FVGL;OI)_{it}$ is the covariance between fair value gains/losses and other income. Model 3 uses annual data and 10-year rolling windows to obtain stable variance estimates. The variance decomposition framework allows me to derive predicted values of coefficients (α) in case of 'normal' stock price volatility. Specifically, α_1 should equal 1 if fair value accounting does not lead to excess stock price volatility.

While the equivalence of price and NAV follows the law of one price, it is not consistent with the empirical evidence that investment trusts frequently trade at a discount or a premium relative to their NAV. As a result of this empirical regularity, the volatility of stock prices will be higher or lower than the volatility of stock returns. Thus, model 3 could be seen as an empirical attempt to link any differences between the stock price volatility and the volatility of underlying assets

to the individual earnings component. However, estimating the model 3 can lead to false inferences in regard to my research question if the model fails to control for factors that cause NAV discount/premium and that are correlated with fair value measurements. My research design controls for such factors in three ways: first, I allow model 3 to have a non-zero intercept that varies over time, to capture the effect of other determinants of incremental stock price volatility. Second, I extend model 3 to include a set of control variables because changes in market sentiment, management talent, and management fees can affect the stock prices of investment trusts (Lee et al, 1991; Berk and Stanton, 2007). I use management fees as a measure of management compensation and average returns as a proxy for management skills. Similarly to Lee et al (1991), I use the average NAV discount across funds as a proxy for market sentiment. Third, I use the fixed effects estimation to control for unobservable management skills and fund characteristics that remain stable over time. Results of these analyses do not change the inferences of this briefing and are available from the author upon request.

4. Predictions

Issues related to implementation of fair value measurements may lead the coefficient on fair value adjustments in model 3 to deviate from its predicted theoretical value. Investment trusts use a mixed measurement approach in their financial statements and use fair value (financial investments) and historical cost (liabilities, other assets) measurements. Measuring fair value increments on assets while carrying liabilities at historical cost can lead to greater income volatility (Barth et al, 2008). If investors adjust for this effect, they will apply a discount on the volatility of fair value adjustments to undo the bias induced by the use of mixed measurements. In this case, the volatility of stock prices should be lower than the volatility of accounting earnings. A failure to apply such discount will result in excess stock price volatility.

Investment trusts hold material investments in unlisted securities and use a considerable degree of judgement in estimating their value based on a valuation model or comparable prices. The use of judgement may lead to biased estimates of the increments in asset values (Ramanna and Watts, 2012), which can increase income volatility and stock price volatility. This is consistent with existing literature that documents higher measurement risk when assets are valued using unobservable inputs (Riedl and Serafeim, 2011). However, firms can also use their discretion in estimating fair values to smooth earnings. Such appraisal smoothing has been previously discussed in the context of valuing investment properties (Pagliari et al, 2003). In this case, stock price volatility should be higher than the volatility of smoothed earnings. High quality audits may deter some intentional and correct some unintentional estimation errors. Therefore, accuracy of fair value estimates and the resulting stock price volatility may be primarily a concern for firms with low quality audits.

Previous discussion frequently assumes investor ability to decompose income volatility into its components and to understand the sources of income volatility. This is a costly task. Information on earnings components is reported in the footnotes to financial statements and is not widely used or duplicated by media. Furthermore, information on what portion of earnings volatility is due to underlying economics or noise is not readily available. Previous studies show that, given that the costs of data collection and analysis are high, some investors ('noise traders') fail to fully incorporate implications of earnings components into stock prices (Sloan, 1996). If investors use aggregate earnings but underreact to information on earnings components, stock price volatility can deviate from the level implied by the volatility of underlying economic income. For example, the implementation of fair value measurements in an otherwise historical cost environment may result in excess stock price volatility if investors fail to account for any offsetting gains or losses in liabilities. I predict that any impact of fair value accounting on excess stock price volatility will be more pronounced for firms that are predominantly held by noise traders.

5. Stock price volatility and volatility of fair value earnings

5.1 Do fair value adjustments increase stock price volatility?

I collect financial statements of investment trusts that have at least 10 years of consecutive financial statements over the period 1990–2013. I collect information on earnings components, reconciliation of fair value balances, and categories of fair value investments from financial statements of 155 funds (2,417 fund-year observations), and use other accounting and market pricing data from Datastream and I/B/E/S. I estimate the volatility of earnings components over 10-year rolling windows, which results in the test sample of 1,059 observations.

Table 1 reports descriptive statistics for investment trusts included in the sample. I find that stock market returns (*Ret_var*) are more volatile than NAV returns (*NAV_var*) (0.103 v 0.093). To provide a formal test of excess stock return volatility, I estimate the average logarithm of the ratio of stock price volatility to volatility of NAV returns (see Pontiff, 1997). I find that the mean of the log ratio is 0.259, which corresponds to 28% higher volatility of stock price returns relative to NAV returns. I also find that the volatility of unrealised gains/ losses (*UGL_var*) contributes significantly to the volatility of NAV returns (0.075). The volatility of realised gains/losses (*RGL_var*) is substantially lower (0.019).

Table 1. Descriptive statistics

	Mean	Standard deviation	P25	Median	P75
Ret_var	0.103	0.133	0.039	0.066	0.120
NAV_var	0.093	0.106	0.036	0.059	0.109
FVGL_var	0.099	0.162	0.029	0.049	0.096
UGL_var	0.075	0.121	0.023	0.039	0.081
RGL_var	0.019	0.037	0.004	0.008	0.019
OI_var	0.085	0.187	0.001	0.016	0.084
Cov(UGL;RGL)	0.002	0.033	-0.003	0.001	0.005
Cov(FVGL;OI)	-0.045	0.146	-0.026	-0.003	0.001
Accounting mismatch	0.145	0.115	0.065	0.125	0.189
Accuracy of FV estimates	0.201	0.251	0.079	0.179	0.312
Unlisted investments	0.084	0.225	0.000	0.003	0.027
Closely held shares	15.503	16.744	0.425	11.345	22.745
Analyst following	0.283	2.440	0.000	0.000	0.000

Table 1 reports descriptive statistics for UK investment trusts over the period 1991–2013 (N = 1,059).

Ret_var is the variance of stock market returns.

NAV_var is the variance of the accounting returns (percentage change in NAV) of fund *i* during period *t*.

FVGL_var is the variance of the scaled fair value gains/losses of fund i during period *t*.

UGL_var (RGL_var) is the variance of the scaled unrealised (realised) fair value gains/losses of fund *i* during period *t*.

OI_var is the variance of the other income of fund *i* during period *t*. Other income is calculated as the difference between *NAV_ret* and *FVGL*.

Cov(RGL;UGL) is the covariance between the realised gains/losses and unrealised gains/losses of fund *i* during period *t*.

Cov(FVGL;OI) is the covariance between the fair value gains/losses and other income of fund *i* during period *t*.

Accounting mismatch is the median ratio of the liabilities to the fair value of the investments of fund *i* during period *t*.

Accuracy of FV estimates is the coefficient on current unrealised gains/losses in the regression of future realised gains/losses on current unrealised and realised gains/losses, estimated for each fund *i* during period *t*.

Unlisted investments is the median ratio of the unlisted investments to the total investments of fund *i* during period *t*.

Closely held shares is the median percentage of closely held shares in fund *i* during period *t*.

Analyst following is the number of analysts following fund *i* during period *t*. Variances, covariances, and medians are estimated over the 10-year rolling window.

I estimate a regression of stock return volatility on the volatility of fair value earnings components and compare empirical coefficients on regression variables to their theoretical values. Empirical coefficients will equal their theoretical value of 1 when fair values measure underlying value creation and when investors fully impound information regarding fair value earnings into stock prices.

Column 1 of Table 2 reports a regression of stock price volatility on the volatility of the fair value earnings component and the volatility of other income. I find that fair value earnings lead to excess stock price volatility (1.256). Column 3 further breaks down the variance of fair value gains/losses into the variance of unrealised gains/losses, the variance of realised gains/losses, and other variance components. I find that investors' pricing of unrealised earnings volatility (1.267) explains why the coefficient on fair value earnings exceeds its theoretical value. I further find that the coefficient on unrealised fair value volatility is further away from its theoretical value than the coefficient on realised earnings volatility (0.267 v 0.030). The fact that markets fully impound the volatility of realised gains/losses, but overreact to the volatility of unrealised gains/losses, suggests that some issues with implementation of fair value accounting may be causing excess stock price volatility. I next shed further light on the reasons for this finding.

Table 2. Stock price volatility and volatility of earnings components

	Predicted value	Fair value and gains other income	*F-test coef. = predicted value*	Realised and unrealised gains	*F-test coef. = predicted value*
Column		1	2	3	4
FVGL_var	1	1.256*** (211.09)	5.12**		
UGL_var	1			1.267*** (12.87)	7.35**
RGL_var	1			0.970*** (6.46)	0.04
OI_var	1	0.504* (1.93)	3.60*	0.488* (1.95)	4.18**
Cov(UGL;RGL)	2			2.913*** (10.01)	9.84***
Cov(FVGL;OI)	2	1.619*** (4.67)	1.20	1.609*** (4.79)	1.36
Intercept and period fixed effects?		Yes		Yes	
Adjusted R^2		76.1%		77.4%	

Table 2 reports results relating volatility of stock prices to volatility of fair value earnings components. The sample comprises UK investment trusts over the period 1991–2013 (N = 1,059). The table reports results of the OLS regression using the variance of stock market returns (*Ret_var*) as the dependent variable. All variables are defined in the note to Table 1. Columns 2 and 4 report the F-test that assesses whether a coefficient estimate is equal to its predicted theoretical value. ***, **, * represent significance at 1%, 5%, and 10% levels, respectively, of the two-tailed tests. t-statistics are reported in parentheses and are based on robust standard errors clustered at the firm level.

5.2 Role of measurement inputs

Previous results show that stock prices are too volatile and that this result seems to be due to the volatility of unrealised fair value earnings. In the next step I provide evidence to explain this finding. Investment trusts use amortised cost accounting for liabilities. I construct a ratio of liabilities to fair-valued assets to capture the extent of accounting mismatch between fair value and historical cost measurements and argue that a greater extent of mismatch will increase the volatility of funds' earnings. Table 3 assesses whether the use of the mixed measurement approach affects earnings volatility. Panel A compares earnings volatility of firms that are more severely affected by measurement differences (high ratio of historical cost to fair value) and firms that are less affected by measurement differences (low ratio of historical cost to fair value). I find that the volatility of unrealised gains/losses is higher when funds report a greater mismatch between fair value and historical cost measurements (0.085 v 0.064). This result is supported using the regression in Panel B of Table 3 that additionally controls for funds' turnover and year-fixed effects.

I next examine whether investors adjust for this excess volatility or whether this excess volatility goes unadjusted and translates into higher volatility of stock prices. Table 4 finds that investors do not adjust for excess earnings volatility induced by the accounting mismatch (coefficient -0.349; t-statistic 1.30). Thus, I conclude that the use of mixed measurement models explains why stock prices are too volatile.

Table 3. Fair value characteristics and volatility of unrealised gains/losses

Panel A. Univariate volatility analysis

	Volatility of unrealised gains/losses		t-test
Accounting mismatch	High Low	0.085 0.064	2.80***
Accuracy of FV estimates	High Low	0.066 0.083	2.21**
Unlisted investments	High Low	0.076 0.073	0.35

Panel B. Volatility of unrealised gains/losses

Column	Sign	1	2	3	4
Accounting mismatch	+	0.147* (1.68)			0.154* (1.73)
Accuracy of FV estimates	-		-0.066*** (2.44)		-0.069*** (3.79)
Unlisted investments	+			0.012 (0.34)	-0.006 (0.16)
Turnover	+	0.033* (1.87)	0.039** (2.23)	0.034* (1.87)	0.038** (2.38)
Intercept and period fixed effects?		Yes	Yes	Yes	Yes
Adjusted R^2		4.5%	4.4%	2.6%	6.3%

Table 3 examines how fair value implementation issues affect the volatility of fair value earnings. The sample comprises UK investment trusts over the period 1991–2013 (N = 1,059). Panel A compares the mean volatility of unrealised gains/losses (*UGL_var*) for subsamples based on the median split of *Accounting mismatch, Accuracy of FV estimates,* and *Unlisted investments.* Panel B reports OLS regressions using *UGL_var* as the dependent variable. *Turnover* is the median annual turnover of fund *i*'s fair value investments during period *t*, defined as the sum of investment purchases and investment sales divided by the fair value of investments. All other variables are defined in the note to Table 1. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively, of the two-tailed tests. t-statistics are reported in parentheses and are based on robust standard errors clustered at the firm level.

I use two proxies for the accuracy of fair value measurements. First, I follow Evans et al (2014) and conjecture that unrealised gains/losses have greater accuracy when they are more predictive about future realised gains/losses.

$$RGL_{it+1} = \beta_0 + \beta_1 UGL_{it} + \beta_2 RGL_{it} + u_{it+1} \qquad \text{(Model 4)}$$

where *RGL (UGL)* are realised (unrealised) gains/losses scaled by lagged NAV. Model 4 assesses how close fair values approximate realised gains/losses received from the sale of an asset in a subsequent period. The coefficient on current unrealised gains/losses (β_1) indicates the predictive ability of the current fair value adjustments for future realised income. Values of the β_1 coefficient that are closer to 1 indicate greater ex-post accuracy of the current valuations in measuring realised income. I estimate model 4 for each fund using 10-year rolling windows, similarly to my estimation of the variances in model 3.

Second, I use the exposure of the balance sheet to the use of unobservable fair value inputs (Goncharov et al, 2014). Particularly, investment trusts hold on average 8.4% of investments in shares of unlisted companies and in real estate. While these assets are also carried at fair value, the fair values in this case are derived using unobservable inputs. I obtain information on the type of fair value measurement from the footnotes to financial statements and construct a ratio of unlisted investments to total investments.

Table 3 shows that the ex-post accuracy of fair value estimates affects the volatility of fair value earnings. Panel A reports that funds with above-median accuracy report a lower volatility of fair value earnings (0.066 v 0.083); this result is further supported by the regression in Panel B that uses a continuous measure of fair value accuracy (coefficient -0.066; t-statistic 3.44). However, I do not find that the use of unobservable inputs per se affects the earnings volatility (coefficient 0.012; t-statistic = 0.34). One possible interpretation of these mixed results is that the estimates from model 4 provide a superior ex-post proxy for fair value accuracy.

Turning to the effect of fair value accuracy on stock price volatility, Table 4 reports the results for the interaction between fair value adjustments and the proxy for the ex-post accuracy of fair value estimates. I find that fair value estimates do not increase stock price volatility when the ex-post accuracy of fair value estimates is high. In this case, the coefficient on volatility of unrealised gains/losses is close to its predicted value of 1 (coefficient 1.359 - 0.463 = 0.896). Because low accuracy of fair value estimates unduly increases earnings volatility, one could expect that some investors may discount this artificial earnings volatility. This implies that the coefficient on volatility of unrealised gains/losses in the sample of funds with low quality of fair value estimates is less than 1. However, I find that stock price volatility increases (coefficient 1.359) when fair value quality is low. This finding is consistent with prior literature on the existence of measurement risk which can explain higher stock price volatility when assets are measured with greater error (Riedl and Serafeim, 2011).

Table 4. Determinants of excess stock price volatility

	Sign	*Fair value implementation issues*			*Market information processing*	
Column		1	2	3	4	5
UGL_var	+	1.341*** (11.82)	1.359*** (12.17)	1.290*** (12.10)	1.367*** (18.34)	1.268*** (12.80)
UGL_var x Accounting mismatch	+/-	-0.349 (1.30)				
UGL_var x Accuracy of FV estimates	+/-		-0.463** (2.10)			
UGL_var x Unlisted investments	+/-			-0.116 (0.72)		
UGL_var x Closely held shares	+/-				-0.009*** (3.51)	
UGL_var x Analyst following	+/-					-0.118*** (6.55)
RGL_var	+	0.998*** (7.07)	1.068*** (7.60)	0.934*** (5.99)	0.870*** (5.07)	0.981*** (6.57)
OI_var	+	2.864*** (9.92)	2.715*** (9.75)	2.918*** (9.81)	2.577*** (10.03)	2.906***) (9.94)
Cov(UGL; RGL)	+	0.480* (1.90)	0.451* (1.90)	0.485* (1.93)	0.472* (1.92)	0.493* (1.97)
Cov(FVGL; OI)	+	1.604*** (4.75)	1.594*** (4.93)	1.604*** (4.76)	1.462*** (4.29)	1.615*** (4.80)
Intercept, main effects and period fixed effects?		Yes	Yes	Yes	Yes	Yes
Adjusted R^2		77.7%	78.0%	77.4%	78.7%	77.9%

Table 4 examines the sources of excess volatility using the variance of stock market returns (*Ret_var*) as the dependent variable. The sample comprises UK investment trusts over the period 1991–2013 (N = 1,059). All variables are defined in the note to Table 1. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively, of the two-tailed tests. t-statistics are reported in parentheses and are based on robust standard errors clustered at the firm level.

Finally, I examine whether higher stock price volatility depends on audit quality. Because high audit quality can improve the quality of accounting estimates, finding a relationship between audit quality and stock price volatility would corroborate the finding that fair value accuracy affects stock price volatility. Following existing literature, I use an indicator variable to capture the perceived increase in audit quality when a firm uses Big N auditor. Untabulated results show that stock price volatility is too high in the sample of firms with low audit quality (1.459). Critically, I find some weak evidence that stock price volatility decreases in the sample of firms with high audit quality (coefficient -0.197, t-statistic 1.72).

5.3 Investor processing of accounting information and stock price volatility

Previous results suggest that implementation issues with fair value accounting increase stock price volatility. I predict that these results probably depend on the sophistication of financial statement users. I use a percentage of closely-held shares as a proxy for the presence of institutional investors who face fewer time constraints and conduct more sophisticated financial analysis (Lev and Nissim, 2006). This test speaks directly to regulators' concern that data collection and processing costs will increase stock price volatility. If some investors do not use information in earnings components, I expect that excess stock price volatility is going to be concentrated in investment trusts predominantly held by noise traders (low institutional ownership). Column 4 of Table 4 reveals that institutional investors reduce stock price volatility emanating from the unrealised fair value component (coef. -0.009, t-statistic 3.51). The estimated coefficient implies that stock price volatility returns to a normal level when the institutional ownership share exceeds 41%.

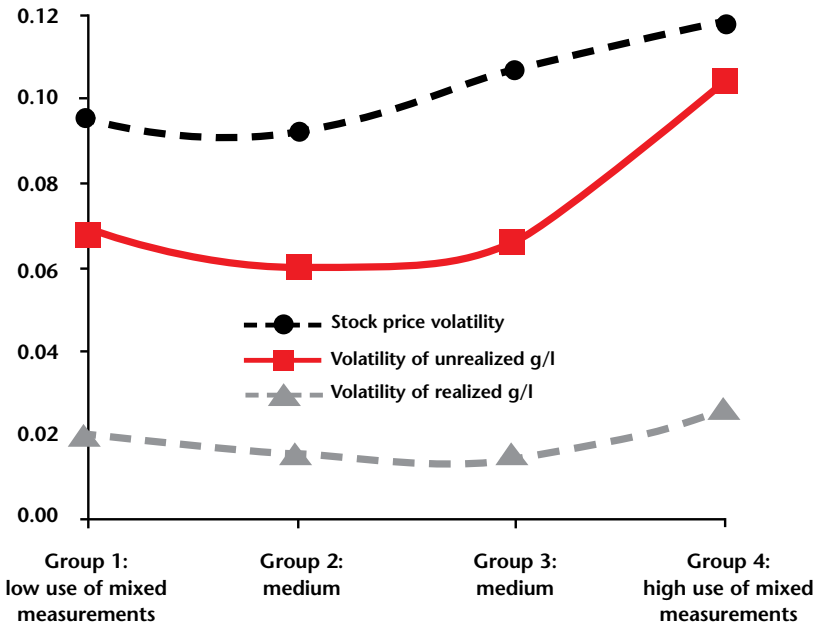
Column 5 of Table 4 shows that the results are similar using the alternative measure for investors' awareness of earnings components. Financial analysts issue forecasts of disaggregated financial information, which reduces mispricing of earnings components by making this information more easily available to investors (Mohanram, 2014). I predict and find that analysts reduce the effect of fair value volatility on stock price volatility; that is they reduce excess stock price volatility (coef. -0.118, t-statistic 6.55). This finding is consistent with the view that financial analysts improve market processing of accounting information by issuing forecasts of disaggregated accounting information. Turning to the magnitude of the effect, I find that it takes about two analysts to mitigate excess stock price volatility. Overall, these results suggest that in an opaque information environment, fair value volatility leads to excess stock price volatility.

6. Conclusion and discussion of results

I use financial statements and stock prices of investment trusts to show under which conditions fair value accounting may increase stock price volatility. Fair value accounting is normally implemented for some assets, while other assets and liabilities are frequently reported at historical cost. As a result, financial statements report on changes in unrealised appreciation of fair-valued assets. However, financial statements do not report on unrealised changes in the values of assets and liabilities carried at historical cost. This can lead to a poor matching of gains and corresponding losses: in some periods income will appear too high because it accounts for a fair value gain on an asset but not for an offsetting loss on a related liability. In other periods, income will appear too low. This leads to higher volatility of income, which may be perceived by some investors as evidence of higher investment risk. In this case, stock price volatility will be higher.

Graph 1 illustrates my main results by showing how volatility of stock prices and the volatility of unrealised and realised earnings components change depending on the mismatch between assets carried at fair value and liabilities carried at historical cost. The horizontal axis records groups of firms with low (group 1), medium (groups 2 and 3) and high (group 4) volume of historical cost liabilities relative to fair-valued assets. Higher values of the ratio indicate the presence of the matching issues. The graph shows that the volatility of fair value adjustments (unrealised g/l) increases when fair value accounting is applied selectively to assets but not liabilities. In turn, there are no major changes in the volatility of realised gains/losses across the groups. Critically, I find that the increase of earnings volatility is associated with the increase in stock price volatility. I conclude that stock price volatility is too high when firms use a mixed measurement model and carry assets at fair value and related liabilities at historical cost.

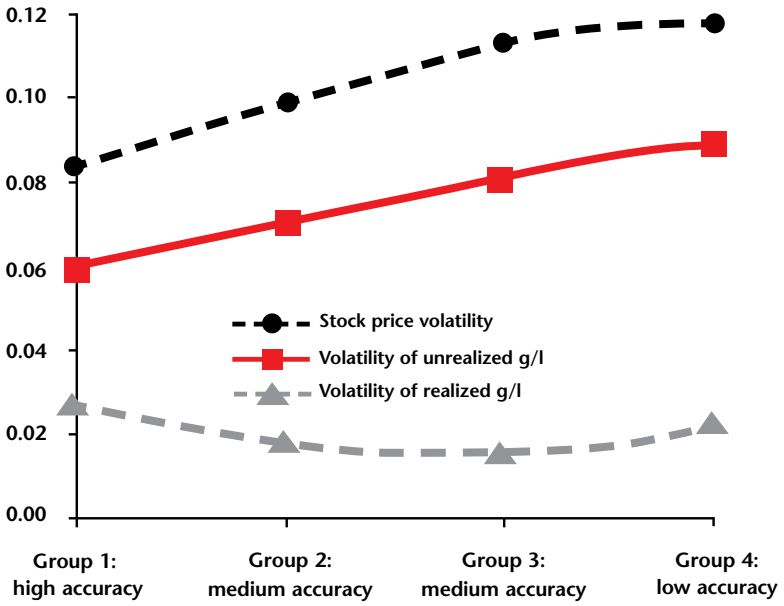
Graph 1. Stock price volatility and the use of mixed measurements



In the next step I ask whether the accuracy of fair value estimates increases stock price volatility. The reported earnings will be too high or too low when fair values are estimated with error. This may increase earnings volatility. Graph 2 illustrates my main findings and shows groups of firms based on the accuracy of fair value estimates. Fair values reported by group 1 firms closely match to price that can be realised upon sale of an asset, while fair values of group 4 firms measure future sale price with substantial error. I find that earnings volatility and stock price volatility are low when accuracy of fair value estimates is high. However, decreases in the quality of fair value estimates coincide with the increase in the volatility of earnings and the volatility of stock prices. Additionally, I show that stock price volatility is higher when the perceived audit quality is low. I conclude that fair value measurement errors result in higher stock price volatility when audit quality is low.

I further examine whether implementation issues with fair value accounting are recognised by sophisticated users of financial statements. Consistent with the view that institutional investors and analysts perform more sophisticated analysis of accounting information and devote more time to their analysis, I show that stock price volatility is low when investment trust shares are traded by sophisticated investors and are followed by a greater number of analysts. Thus, a better understanding of fair value reporting issues can return stock price volatility to the normal level.

Graph 2. Stock price volatility and accuracy of fair value estimates



The results of the project have several policy implications. First, standard setters frequently use mixed measurement approaches, for example, by requiring fair value accounting for certain assets and historical cost accounting for related liabilities. The project shows that the use of mixed measurement approaches can increase earnings volatility and can make firms appear more risky than they actually are. Second, the project shows that some investors fail to recognise issues resulting from the implementation of fair value accounting. In this regard, supplementary disclosures that explain the origins of fair value changes may be useful in correcting some misperceptions. These disclosures need to be carefully designed in order to be noticed and understood by private investors. Third, my investigation is conducted in a rather transparent fair value setting with few measurement problems. Given that I find excess stock price volatility in this setting, it is likely that other complex accounting measurement issues also lead to misperceptions of firm risk.

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