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When do firms revalue their assets upwards? Evidence from the UK

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Abstract

Purpose – The purpose of this paper is to investigate the timing of upward asset revaluations using large UK data.

Design/methodology/approach – A standard logistic model is used to examine the timing of upward asset revaluations. The result is further confirmed by using the ordinary least squares regression.

Findings – UK firms with higher industrial leverage and share performance two years before the revaluation year are inclined to write up their assets, suggesting that firms choose not to recognise good news unless it has been supported by their superior market performance and industry norm. This finding differs from the leverage reduction as well as the signalling objective suggested by previous literature.

Originality/value – This paper provides the first UK evidence on the timing of upward asset revaluation, which further enhance the understanding of the economic determinants of upward asset revaluations.

Keywords Asset valuation, United Kingdom

Paper type Research paper

1. Introduction

Countries such as Australia and the UK allow managers to write up fixed assets if their current values are greater than the carrying values. Upward revaluations of fixed assets increase the carrying values of fixed assets and revaluation reserves in shareholders' equity, but can reduce future earnings, return on total assets and return on equity (ROE)[1]. Although upward asset revaluation practice mitigate part of the fundamental problem in historical cost accounting[2] and provides users with more useful and relevant information (SSAP 12), it seems to contradict accounting conservatism in the sense that upward revaluations increase the carrying values of fixed assets before they are realised. Watts (2003a, b) argues that an important consequence of accounting conservatism is the persistent understatement of net asset values. Moreover, upward asset revaluations are widely believed to be subject to managerial discretion because current values of fixed assets are normally unavailable and any estimates are unverifiable. For example, Lin and Peasnell (2000) argue that upward revaluations in the UK tend to be discretionary in nature because managers are not only able to decide what assets and when these assets are revalued, but can also decide what revaluation amounts need to be recognised in financial statements[3]. As a

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result, prior research has mainly focused on investigating managerial motivations for the upward revaluation decision, and has provided consistent evidence indicating managers are opportunistic and also revalue assets upwards at their discretion to reduce contracting and political costs (Brown *et al.*, 1992; Whittred and Chan, 1992; Cotter and Zimmer, 1995; Lin and Peasnell, 2000).

Some studies (Easton *et al.*, 1993; Barth and Clinch, 1998; Aboody *et al.*, 1999) have investigated whether upward asset revaluations are recognised on a timely basis. Researchers suggest that upward revaluations are timely if they occur in the same year of an increase in underlying asset values. Using share return as a proxy for asset value increases, previous studies predict that upward revaluations reflect at least some changes in asset values on a timely basis if there is a positive and significant statistical association between current year share return and upward revaluation amount. However, prior empirical evidence on the above prediction appears to be limited and mixed. Using Australian data, Easton *et al.* (1993) find that the current year upward revaluation is statistically associated with share price (deflated by book value of equity), but are not associated with current year share return, suggesting the market already reflects upward revaluations in share price but managers do not write up fixed assets in a timely manner. The reason for this finding is not further investigated in their studies as well as those that followed. Easton *et al.* (1993), also find that an upward asset revaluation has significant explanatory power over current year share return and share price only for firms with a higher change in debt and higher balance in the asset revaluation reserve as a proportion of shareholders' equity.

Using UK data, Aboody *et al.* (1999) find a positive and significant association between current year share return and upward revaluation, but this association is much weaker than that between current year share return and net income, suggesting current year upward revaluations reflect only a portion of asset value changes on a timely basis. Their evidence also suggests that the positive and significant association between current year share return and upward revaluation is attributable to the revaluations before 1990; they find an insignificant association after 1990 due to the fact that UK economy appeared to be declining in early 1990s and therefore there were more asset devaluations than revaluations. Moreover, different from Easton *et al.* (1993), Aboody *et al.* (1999) find firms with higher debt-to-equity ratios have a weaker association between share price and current year revaluation.

In summary, previous studies find both UK and Australian firms do not always revalue their fixed assets upwards on a timely basis. But there is little empirical evidence on why upward asset revaluations are not recognised by managers on a timely basis. We believe that the timeliness of upward revaluations is an important financial reporting issue for the following three reasons. First, it could relate to managers' incentives for upward revaluations. Previous studies find that managerial incentives for upward revaluations could affect the extent to which the market reflects asset value increase in share price. For instance, Aboody *et al.* (1999) find upward revaluations appear to be less timely if firms aim to use them to reduce debt-to-equity ratios. Second, it sheds some light on how fair value accounting is implemented at management's discretion in practice, especially when the modern accounting practice is still dominated by accounting conservatism. More importantly, International Accounting Standard No. 16 "property, plant and equipment" allows firms to revalue their fixed assets at fair values with sufficient frequency. Aboody *et al.* (1999) argue firms with timelier upward

revaluations may aim to present true and fair financial statements. However, there is no study in the literature investigating why upward asset revaluations are not timely.

We predict why many UK firms do not wish to engage in (or prefer to delay) upward revaluations even when their asset values have increased. First, investors and creditors prefer firms that adopt conservative accounting practice (Watts, 2003a, b). As a result, firms may delay an upward revaluation until investors, creditors or the government[4] demand it. Second, an upward revaluation can reduce future net profit, return on total assets and return on shareholders' equity, and therefore only certain firms choose to recognise it (Lin and Peasnell, 2000). Furthermore, upward revaluation amounts may not be sufficient material to warrant recognition in the financial statements especially for firms with low fixed asset intensity.

Previous studies find that managers recognise upward revaluations when firms intend to reduce leverage and therefore contracting and political costs. Firms may delay upward revaluations if there is no immediate need for doing so. The above reasons may explain why only a small proportion of UK firms revalue their fixed assets upwards in practice. We find that only around 10 per cent of UK firms revalued their assets upwards during the test period of 1994-1998. Moreover, even for those firms that chose to do so, they only revalued their fixed assets approximately every five years (Aboody *et al.*, 1999; Lin and Peasnell, 2000). Different from the contracting cost and signalling hypotheses that have been examined in prior research, this study contributes to the literature by further investigating whether managers make the upward revaluation decision on a timely basis and the extent to which the decision is affected by accounting conservatism.

Using share return as a proxy for asset value increases, this study provides evidence consistent with previous findings in the sense that current year share return alone is not statistically associated with upward revaluation during the period 1994-1998. Further evidence indicates UK firms were inclined to revalue their assets upwards following two years of superior share performance and high industry leverage. This suggests UK firms do not want to recognise asset value increases until the market has reflected this good news in share price. This finding is further supported by the evidence that the cumulative shares return two years before an upward revaluation is statistically positively associated with the upward revaluation after controlling for firm size, growth opportunities and fixed asset intensity. Hence, our empirical evidence generally supports the accounting conservatism hypothesis, indicating that UK firms appear to have delayed the recognition of asset value increases. Our finding differs from the leverage reduction as well as the signalling objective suggested by previous literature.

The rest of the paper is organised as follows. Previous studies on upward revaluations are summarised in Section 2. Section 3 describes sample selection criteria. Section 4 discusses the research methodology used for our empirical tests. Section 5 reports the empirical results. Section 6 provides a summary of robustness tests. Section 7 concludes the paper.

2. Related literature

Several earlier studies on upward asset revaluations are based in Australia. Most of them assume managers are opportunistic and revalue their firms' assets upwards to achieve certain financial objectives. For instance, Whittred and Chan (1992) find revaluation firms (revaluers) have borrowing limits in place, higher leverage and more

growth opportunities than non-revaluation firms (non-revaluers). Further, companies with leverage approaching their borrowing limit are more likely to revalue their assets upwards. Brown *et al.* (1992) find revaluers normally have higher debt-to-total tangible asset ratios and property holdings (including land and buildings), lower tax-free reserves, and often declare a bonus issue or received a takeover bid in the revaluation year. Revaluers also appear to be larger and closer to violating their debt covenant constraints. Cotter and Zimmer (1995) argue asset revaluations increase the current value of any collateral security and are used to signal firms' available borrowing capacity. They find revaluers are more likely to have a higher ratio of total liabilities-to-total tangible assets and a less growth in operating cash flow in the revaluation year.

In a survey of upward asset revaluation, Easton *et al.* (1993) found 40 per cent of Australian companies making the respondents state that their primary objective is to reduce the debt-to-asset ratio and 45 per cent that it is to present true and fair financial statements. In the investigation of the timeliness of upward revaluations among Australian companies, Easton *et al.* (1993) show share price rather than current year share return is associated with upward revaluation, indicating the market already reflects upward revaluation in share price but that managers do not recognise an upward revaluation in the same year. The evidence also shows that cumulative upward revaluation over a three-year interval provides statistically significant explanatory power for cumulative share return over the same time period, implying upward revaluation is not recognised by managers on a timely basis. Easton *et al.* (1993) also find that an upward asset revaluation is positively associated with share return, but only when companies have a higher change in debt and the level of their revaluation activity to date is relatively high. In other words, upward asset revaluation is timely only for firms with a higher increase in debt and higher balance of revaluation reserve. The above results generally suggest that upward asset revaluations in Australia are not always timely.

Using UK data in 1989 and 1991, Lin and Peasnell (2000) examine what factors affect the upward revaluation decision. Consistent with their predictions, they find that larger firms and firms with higher asset intensity (ratio of fixed assets to total assets), higher leverage (debt-to-total assets) but lower liquidity (quick ratio) are more inclined to write up their fixed assets. They argue that companies with poor liquidity are more likely to revalue their assets upwards to provide more up-to-date information on cash that could be obtained from selling assets or increasing credit capacity. The evidence, however, shows revaluers have significantly lower market-to-book ratios than non-revaluers. This contradicts Australian studies in the sense that firms with higher market-to-book ratios are more likely to write up their fixed assets because they are growth firms that have been undervalued by the market. Lin and Peasnell (2000) argue firms with lower market-to-book ratios could be revaluing their assets to signal to the market that they are undervalued. Lin and Peasnell (2000) also find UK firms with relatively high capital depletion, caused by goodwill, foreign currency translation losses and other losses taken directly to reserves, are more inclined to write up their fixed assets. UK firms mostly wrote off acquired goodwill against reserves before 1998, which could lead to serious capital depletion and therefore higher leverage ratios. As a result, firms might have used upward asset revaluations to boost their depleted shareholders' equity to avoid increasing leverage. Lin and Peasnell (2000) further argue upward revaluations could be a costly accounting choice because they can reduce future earnings, return on

total assets and return on shareholders' equity, which have been widely used as key performance indicators. Hence, only certain firms choose to revalue their assets upwards. Following prior research, this study predicts the upward revaluation decision is positively associated with firm size, leverage, capital depletion and fixed assets intensity and is negatively associated with liquidity. We do not predict the sign of the market-to-book value ratio because findings in previous studies are mixed.

Aboody *et al.* (1999) use a UK sample to examine whether management use upward asset revaluations to signal their private information about superior future performance, measured by future change in operating income and cash flow from operating activities. After controlling for prior change in operating income, risk and growth and size effects, they find current year upward revaluation is positively associated with one-, two- and three-year-ahead changes in operating income and one- and three-year-ahead change in operating cash flow, respectively. After regressing share price on revaluation reserves, net profit and book value of equity, Aboody *et al.* (1999) find that the coefficient of revaluation balance (0.57) is much smaller than the coefficient of the book value of equity (1.00). They suggest investors could have discounted upward revaluation because of the estimation errors inherent in revaluation or management's incentive for upward revaluation other than to present true and fair financial statements. They also regress current year share return on current year upward revaluation after controlling for net profit and change in net profit, and find the coefficient of upward revaluation (0.09) is positive and statistically significant but is only a third that of net profit (0.31). They therefore conclude only part of asset value change is incorporated into current year share return, and some of asset value change occurs in another year. However, they do not further investigate this issue.

Aboody *et al.* (1999) also show the interaction between current year upward asset revaluation and the debt-to-equity ratio is significantly negatively associated with the change in future operating income and with share price. This finding indicates that the revaluation amount of a firm with a higher debt-to-equity ratio is less informative/value-relevant. The interaction between the debt-to-equity ratio and the upward revaluation is not significantly associated with share return. This finding is inconsistent with the Easton *et al.*' (1993) Australian evidence in the sense that they found upward asset revaluation is particularly informative for firms with a higher change in debt and a higher balance of asset revaluation reserve. In summary, both Easton *et al.* (1993) and Aboody *et al.* (1999) find managers do not always revalue their assets upwards on a timely basis in the UK or Australia.

O'Hanlon and Pope (1999) examine whether dirty surplus items, including upward asset revaluation, acquired goodwill, foreign currency translation gains and losses, exceptional items and extraordinary items are valued by UK investors. They find all other than exceptional items are not associated with share return even when using longer intervals of share return. Using more comprehensive UK data, Lin (2006) investigates whether items reported in the statement of total recognised gains and losses, including upward asset revaluation, are valued by investors and provide incremental price-relevant information beyond net income reported in the profit and loss account. He finds upward asset revaluation is not associated with share return during the period of 1994-1998.

Our study further investigates whether upward asset revaluation is timely. We use a UK sample over the period of 1994-1998, and partition companies into revaluers and

non-revaluers. Using logistic models, we observe revaluers have significantly higher share return around the revaluation year, which implies partial timeliness. We then investigate the influence of leverage by decomposing it into company-specific and industry norm components. We find that the impact of leverage on the timing of upward asset revaluation is mainly associated with the latter component. This is consistent with previous findings in the sense that upward revaluation is industry specific (Lin and Peasnell, 2000). We also find UK firms are more likely to write up their assets when their market performance one year and two years before the revaluation year and industry leverage in the revaluation year are high. We interpret this finding as the evidence that accounting conservatism plays a role in the upward revaluation decision. Companies are less likely to recognise asset value increases until after they have been confirmed by superior market performance and supported by industry norms.

3. Sample

This study includes all UK industrial firms with the required accounting and share return data available in Datastream during the period of 1994-1998. Firms in the oil, gas and utility industries are excluded because these industries have specialised accounting methods and operate in a regulated environment. We define revaluers as firms who revalued their assets upwards during the test period. Non-revaluers are defined as firms who did not revalue their assets upwards during the test period. As a result, there are around 563 revaluers and 6,159 non-revaluers[5]. Lin and Peasnell (2000) find their empirical results are sensitive to how revaluers and non-revaluers are defined. To further investigate this issue, we redefine revaluers as firms who "only" revalued their assets upwards during the test period. Non-revaluers are defined as those UK firms who did not revalue their assets either upwards or downwards throughout the test period. Results using these alternative definitions are reported in the robustness test section.

The five-year test period of 1994-1998 is chosen for this study for the following three reasons. First, previous studies find that on average UK firms revalue their assets approximately every five years. Second, using UK data, Aboody *et al.* (1999) find that the association between current year share return and asset revaluations is positively significant before 1990 but insignificant between 1991 and 1994. They argue that asset values in the UK increased significantly in the 1980s but decreased when the economy became volatile in the 1990s. The UK property market reached "rock bottom" in the early 1990s, but has experienced stable growth since the mid 1990s. The above test period allows us to examine our hypothesis in a relatively stable economic environment. However, upward asset revaluation can reduce future earnings, return on total assets and return on shareholders' equity. Managers therefore may have been more cautious about upward revaluation during the sample period. Third, changes in the accounting treatment of goodwill, as required by UK Financial Reporting Standard No.10, "Goodwill and intangible assets", may have affected managerial decisions about upward revaluation after 1998. Since then acquired goodwill must be capitalised as an intangible asset, which could avoid the capital depletion problem documented by Lin and Peasnell (2000) and may have reduced management's incentive to make an upward revaluation. In addition, Financial Reporting Standard No.15 ("Tangible assets"), effective from 1998, requires UK firms to revalue tangible assets on a consistent basis, which could have a significant effect on management's revaluation decision.

4. Research design

Following Aboody *et al.* (1999), we assume that upward revaluations are "at least" partially timely if they occur in the same year as an increase in underlying asset values, measured by a superior cumulative share return over the 12 months ended three months after the balance sheet date. This is consistent with Basu (1997) and Ball *et al.* (2000) in the sense that we assume that superior share return, reflecting underlying asset value increases, are used as an indicator of good news. Moreover, if previous findings are true, we should observe a positive correlation between changes in future operating income and cash flow from operation, and upward revaluations for revaluers. This is therefore described as the "timely" hypothesis.

However, Easton *et al.* (1993) find that current year upward revaluations are positively associated with share price significantly, but are not associated with current share return, indicating there is a delay in upward revaluations. Hence, if firms prefer to delay the recognition of assets value increases until the market has reflected this good news into share price, then we should observe a positive and significant association between past share return and current year upward revaluations. This prediction is therefore described as the conservatism hypothesis. Finally, we predict that if the market undervalues the information contained in upward revaluations for superior future operating performance for some reason, we should observe a positive and significant association between future share return and current year upward revaluations. This is therefore described as the "undervaluation" hypothesis. A logistic model is used to investigate the above hypotheses in relation to the timing of upward revaluations. We only consider share return for the revaluation year and two years before and after it because undocumented empirical results show there is no statistical association between them beyond this interval[6]. Following previous studies, we also control for debt-to-total assets, market-to-book value, natural logarithm of total sales, capital depletion caused by goodwill, quick ratio and fixed assets intensity. We allow for the possibility that hi-tech firms drive the negative association between market-to-book value of equity and the revaluation decision, documented by Lin and Peasnell (2000). These firms tend to have more unrecognised intangible assets and a high market-to-book value of equity, but they are less likely to revalue their assets. Thus, we control for firms in pharmaceutical, software, information technology and telecommunication industries, by adding a dummy variable. The model is as follows.

Model 1: logistic model used to investigate the timing of upward revaluation decision

$$\begin{aligned}\mathrm{DREV}_{it} = {} & \beta_0 + \beta_1 \mathrm{RET}_{-2,i} + \beta_2 \mathrm{RET}_{-1,i} + \beta_3 \mathrm{RET}_{0,i} + \beta_4 \mathrm{RET}_{+1,i} + \beta_5 \mathrm{RET}_{+2,i} \\ & + \beta_6 \mathrm{ADT}_{it} + \beta_7 \mathrm{MB}_{it} + \beta_8 \mathrm{LSA}_{it} + \beta_9 \mathrm{CDEP} + \beta_{10} \mathrm{QR}_{it} + \beta_{11} \mathrm{FAI}_{it} \\ & + \beta_{12} \mathrm{INDUM}_{it} + \varepsilon_i\end{aligned}$$

where:

- DREV_{it} – 1 if firm i revalued its assets upwards in year t, 0 otherwise;
- $\mathrm{RET}_{T,i}$ – annual share return of firm i for period T, measured by the cumulative share return of firm i over the 12 months ended three months after the fiscal year end. T ranges from -2 to $+2$, where $T = 0$ is the revaluation year;

ADT_{it} – adjusted debt-to-total assets ratio for firm i for year t, where total assets exclude any current year upward revaluation;

MB_{it} – market-to-book value of equity ratio for firm i for year t, where market value is the year end market capitalisation;

LSA_{it} – natural logarithm of total sales for firm i for year t;

$CDEP_{it}$ – 1 if total capital depletion, caused by goodwill, foreign current translation losses, and other recognised losses, >5 per cent of total capital employed, 0 otherwise;

QR_{it} – quick ratio for firm i for year t;

FAI_{it} – fixed assets intensity for firm i for year t; and

$INDUM_{it}$ – 1 if firms are in pharmaceutical, software, information technology and telecommunication industries, 0 otherwise.

As discussed previously, there are three different hypotheses relating to the timeliness of upward asset revaluations. They are the timely, conservative and undervaluation hypotheses. Consequently, we predict that if fixed assets are at least partially revalued on a timely basis, β_3 should be positive. If managers revalue their fixed assets with a delay (the conservative hypothesis), β_1 and β_2 likewise should be positive. Moreover, if managers revalue their fixed assets upwards before the market price fully reflects any increase in underlying assets values (i.e. the undervaluation hypothesis), β_4 or β_5 should be positive. Following previous studies, we also predict β_6, β_8, β_9 and β_{11} are positive and β_{10} negative. We do not predict the sign of β_7 because of mixed findings in earlier UK and Australian studies. Finally, we predict β_{12} is negative because hi-tech firms have higher unrecognised intangible assets and are less likely to engage in upward revaluations.

Model 1 is used to investigate whether revaluers are different from non-revaluers in terms of share performance around the revaluation year and other financial characteristics. It does not directly explain whether the extent of superior share performance is associated with the magnitude of the upward asset revaluation. Following previous studies, we investigate the statistical association between cumulative share return, calculated using different time horizons and the size of the upward revaluation. We predict that if upward revaluations are timely, there should be a positive and significant association between the current year share return and the revaluation amount.

Model 2: OLS model used to investigate the association between share return and upward revaluations

$$\mathrm{RET}_{it} = \beta'_0 + \beta'_1\mathrm{REV}_{it} + \beta'_2\mathrm{DT}_{it} + \beta'_3\mathrm{MB}_{it} + \beta'_4\mathrm{LSA}_{it} + \beta'_5\mathrm{CDEP} + \beta'_6\mathrm{QR}_{it} + \beta'_7\mathrm{FAI}_{it} + \beta'_8\mathrm{INDUM}_{it} + \varepsilon_i$$

where RET_{it} indicates the cumulative share return for period t. We define t as:

- the individual years in the five-year test period, including the revaluation year;
- a three-year interval including the revaluation year and the year before and after it;

- a two-year interval, comprising the two years before the revaluation year;
- a two-year interval, comprising the two years after the revaluation year; and
- the entire test period. REV_{it} indicates the current year upward revaluation recognised in the statement of total recognised gains and losses, deflated by the share price three months after prior year-end.

All the other control variables are defined as in Model 1. The timely hypothesis predicts the return in the revaluation year is positively associated with REV_{it}; the conservative hypothesis predicts return in one or both of the two years before the revaluation year is positively associated with REV_{it}; the undervaluation hypothesis predicts return in one or both of the two years after the revaluation year is positively associated with REV_{it}.

In summary, Model 1 examines whether firm share performance around the revaluation year could have motivated the upward revaluation decision. Model 2, however, is used to directly investigate whether the upward revaluation amount is associated with the size of share return. We predict that if upward asset revaluations are recognised by managers on a timely basis, the returns on revaluers should exceed other firms in the revaluation year (Model 1), and that the current year share return is positively correlated with the revaluation amount (Model 2). Empirical results are reported and discussed in Section 5.

5. Findings

Table I presents descriptive statistics of the share return around the revaluation year and other firm characteristics for both revaluers and non-revaluers. The mean share return for revaluers (non-revaluers) for two years before the revaluation year, one year before the revaluation year, the revaluation year itself, one year after revaluation year and two years after revaluation year are 0.09 (0.08), 0.13 (0.07), 0.04 (0.00), 0.09 (0.03) and 0.02 (0.05), respectively. Their differences are statistically significant only for the revaluation year (RET0) and one year before and after it. Panel B (medians) provides consistent results. Panel C shows that the standard deviations of share return for revaluers are consistently smaller than for non-revaluers. *F*-tests confirm revaluers have much smaller variances than non-revaluers in all cases except size (LSA) and the capital depletion dummy (DEPDUM). In summary, the above results indicate upward revaluation occurred one year after revaluers had higher share return than non-revaluers. This implies there is a one-year delay in the revaluation decision. Revaluers also appear to have higher share return than non-revaluers one year after the revaluation year, indicating the market did not fully incorporate the information contained in upward revaluations for future financial performance. The above preliminary result generally suggests UK firms do not always revalue their assets upwards on a timely basis, because we cannot reject any one of the hypotheses.

Panel A also shows that the mean adjusted debt-to-total assets ratios (ADT) for revaluers and non-revaluers are 0.21 and 0.18, respectively. Their difference is statistically significant. We further decompose ADT into industry (IADT) and company-specific (FIADT) components because upward revaluations tend to be industry specific (Lin and Peasnell, 2000). We find that the mean (median) IADT for revaluers is 0.17 (0.04), which is significantly different from the mean (median) IADT for non-revaluers (i.e. 0.15 and 0.03, respectively). This indicates that firms from

Table I. Descriptive statistics of the company characteristic and market performance for revaluers and non-revaluers

	ADT	IADT	FIADT	MB	LSA	CDEP	QR	FAI	INDUM	RET − 2	RET − 1	RET0	RET + 1	RET + 2	RET9498
Panel A: mean															
Revaluers	0.21	0.17	0.04	1.62	11.55	0.21	0.98	0.46	0.02	0.09	0.13	0.04	0.09	0.02	0.12
Non-revaluers	0.18	0.15	0.03	2.74	11.00	0.24	1.30	0.33	0.12	0.08	0.07	0.00	0.03	0.05	0.05
Difference	0.03	0.02	0.01	− 1.12	0.55	− 0.03	− 0.32	0.13	− 0.10	0.01	0.06	0.04	0.06	− 0.03	0.07
t-statistics	(3.98)	(6.17)	(2.05)	(− 13.88)	(5.98)	(− 1.33)	(− 5.74)	(10.45)	(− 14.58)	(0.42)	(3.76)	(2.66)	(3.24)	(− 1.56)	(6.18)
Observations[a]	532/ 5,511	532/ 5,511	532/ 5,511	552/ 5,786	554/ 5,447	563/ 6,159	558/ 5,729	527/ 5,506	563/ 6,159	490/ 4,780	512/ 5,236	541/ 5,628	539/ 5,320	511/ 5,320	509/5,642
Panel B: median															
Revaluers	0.20	0.16	0.02	1.35	11.41	0.00	0.78	0.43	0.00	0.09	0.13	0.08	0.11	0.02	0.13
Non-revaluers	0.15	0.14	0.00	1.74	10.96	0.00	0.93	0.28	0.00	0.10	0.08	0.03	0.06	0.06	0.07
Difference	0.05	0.02	0.02	− 0.39	0.45	0.00	− 0.15	0.15	0.00	− 0.01	0.05	0.05	0.05	− 0.04	0.06
Z-statistics	(6.76)	(8.77)	(3.46)	(− 8.50)	(6.19)	(− 1.28)	(− 7.17)	(10.93)	(− 7.33)	(0.01)	(3.05)	(2.09)	(2.35)	(− 2.01)	(5.18)
Panel C: SD															
Revaluers	0.16	0.05	0.16	1.27	2.07	0.41	1.14	0.27	0.13	0.42	0.36	0.36	0.37	0.38	0.25
Non-revaluers	0.22	0.07	0.21	4.52	2.02	0.43	2.22	0.24	0.32	0.48	0.46	0.47	0.53	0.55	0.36
F-statistics	(1.84)	(2.29)	(1.72)	(12.57)	(1.05)	(1.08)	(3.81)	(1.21)	(5.99)	(1.62)	(1.31)	(1.74)	(2.06)	(2.14)	(2.02)

Notes: [a]Revaluers/non-revaluers; this table presents the descriptive statistics of the revaluer and non-revaluer groups in this study; Panels A, B and C show the mean, median and standard deviation; Panel C shows the difference in mean between the two groups and the corresponding *t*-statistics; revaluers are companies that revalued their assets upward during the sample period of 1994-1998 and non-revaluers are companies that did not do so over the same period; ADT, firm-specific adjusted debt-to-total asset ratio, where total asset exclude current year revaluation; IADT, industry median adjusted debt-to-total asset ratio; FIADT, difference between firm-specific and industry median adjusted debt-to-total asset; MB, market value of equity and debt divided by book value of equity and debt; LSA, natural log of total sales; CDEP, 1 if capital depletion (including goodwill, foreign current translation losses, and other recognised losses), >5 of total capital employed and 0 otherwise; QR, quick assets by current assets; FAI, assets intensity deriving from dividing net assets by total assets; INDUM = 1 for companies in the high tech industry and 0 otherwise; RET − 2, prior two-year share return; RET − 1, prior one-year share return; RET0, current year share return; RET1, one-year-ahead share return; RET2, two-year-ahead share return; RET9498, mean share return during 1994-1998

industries with higher leverage or firms with higher leverage relative to their competitors in the same industry are more likely to engage in upward revaluations. The above findings are consistent with previous empirical evidence that firms with high leverage are more likely to revalue their assets upwards to avoid breaching their debt covenants. Panel C shows that the standard deviations of ADT and FIADT are almost the same, but they are much higher than the standard deviation of IADT. Moreover, revaluers appear to have significantly lower market-to-book value ratios (MB) than their non-revaluers counterparts. This is consistent with the undervaluation hypothesis suggested by Lin and Peasnell (2000). The revaluers in our sample also tend to be larger in size, measured by the nature logarithm of total sales (LSA). Previous studies apply size as a proxy for political cost, which is regarded as an underlying reason for upward revaluations. Differing from Lin and Peasnell (2000), we find that there is no significant difference in capital depletion between the revaluers and non-revaluers in our sample. This could be caused by two reasons. First, many UK companies in the early 1990s cut back their expansion through acquisitions and engaged in corporate restructuring due to the volatile economy. As a result, acquired goodwill had less of an impact on capital depletion. Second, in mid-1990s many UK academics and practitioners strongly supported the proposal that acquired goodwill should be capitalised and amortised instead of written off against reserves to align with international practice[7]. UK firms might have considered the potential impact of this change on their future earnings and deliberately reduced the amount of goodwill taken to reserves. We also find that revaluers have significantly lower liquidity, proxied by quick ratios and higher fixed asset intensity relative to the non-revaluers. Finally, as predicted, we find firms in high-tech industries (INDUM) are less likely to engage in upward revaluations because they are more R&D intensive and have more intangibles than tangibles.

Table II presents the correlation coefficients between the firm characteristics and share return in our sample. The correlation coefficients above (below) the diagonal are Pearson (Spearman) coefficients. We find that revaluers are positively correlated with ADT, IADT, LSA, FAI, RET $-$ 1, RET0, RET $+$ 1 and RET9498, but are negatively correlated with MB and INDUM at the conventional levels. CDEP and RET $-$ 2 are never significant. This is consistent with our findings in Table I in the sense that comparing with non-revaluers, revaluers are more likely to be larger firms, and belong to those industries with higher leverage. They also have higher leverage, fixed assets intensity and share return for around the revaluation year (i.e. higher RET0, RET $-$ 1, RET $+$ 1), and the average share return during the test period (i.e. RET9498). Revaluers are also more likely to have smaller market-to-book value ratios and are less likely to be in hi-tech industries. The Pearson and Spearman correlation coefficients between ADT and FIADT are high (0.94 and 0.88, respectively). However, IADT, which we use to proxy for the industry leverage norm, have very low correlations with all other variables except for FAI and INDUM. We find that firms with higher (lower) fixed assets intensity are moderately correlated with high (lower) leverage industries because these firms may have greater (smaller) collateral basis and borrowing capacity. In contrast, firms in high-tech industries normally have smaller fixed asset intensity. The correlation coefficients between share return and the average share return during 1994-1998 appear to be moderately correlated.

Table II. Correlation coefficients between the company characteristics and market performance

	Revaluers	ADT	IADT	FIADT	MB	LSA	CDEP	QR	FAI	INDUM	RET − 2	RET − 1	RET0	RET + 1	RET + 2	RET9498
Revaluers	1.00	0.04	0.05	0.02	−0.07	0.08	−0.02	−0.04	0.14	−0.09	0.01	0.04	0.03	0.03	−0.02	0.06
ADT	*0.09*	1.00	0.30	0.94	−0.09	0.06	0.08	−0.17	0.21	−0.09	−0.16	−0.12	−0.11	−0.04	−0.02	−0.12
IADT	*0.11*	*0.32*	1.00	−0.04	−0.16	0.14	−0.08	−0.14	0.43	−0.43	−0.07	−0.04	−0.02	−0.01	0.00	−0.03
FIADT	*0.05*	*0.88*	*−0.09*	1.00	−0.04	0.03	0.12	−0.12	0.07	0.06	−0.15	−0.12	−0.11	−0.03	−0.02	−0.12
MB	*−0.11*	*−0.21*	*−0.25*	*−0.10*	1.00	−0.08	0.05	0.09	−0.13	0.22	0.11	0.16	0.17	−0.01	0.00	0.10
LSA	*0.08*	*0.17*	*0.11*	*0.11*	*0.03*	1.00	0.08	−0.30	0.09	−0.19	0.10	0.09	0.10	0.03	−0.01	0.22
CDEP	*−0.02*	*0.08*	*−0.04*	*0.11*	*0.19*	*0.09*	1.00	−0.05	−0.12	0.06	0.03	0.08	0.05	−0.06	0.00	0.06
QR	*−0.10*	*−0.45*	*−0.22*	*−0.35*	*0.22*	*−0.19*	*−0.02*	1.00	−0.19	0.25	−0.01	0.00	0.00	−0.01	0.01	−0.06
FAI	*0.14*	*0.30*	*0.36*	*0.14*	*−0.18*	*0.11*	*−0.10*	*−0.32*	1.00	−0.19	−0.02	0.00	0.00	−0.02	−0.04	0.01
INDUM	*−0.09*	*−0.16*	*−0.46*	*0.09*	*0.25*	*−0.19*	*0.06*	*0.26*	*−0.21*	1.00	0.02	−0.01	0.01	0.09	0.06	0.00
RET − 2	*0.00*	*−0.09*	*−0.04*	*−0.08*	*0.19*	*0.11*	*0.04*	*0.06*	*−0.02*	*0.02*	1.00	0.01	0.04	0.03	−0.01	0.28
RET − 1	*0.04*	*−0.09*	*−0.04*	*−0.09*	*0.23*	*0.08*	*0.09*	*0.05*	*−0.02*	*0.00*	*−0.01*	1.00	0.07	0.01	0.00	0.39
RET0	*0.03*	*−0.12*	*−0.03*	*−0.11*	*0.27*	*0.08*	*0.06*	*0.06*	*−0.03*	*0.02*	*0.04*	*0.04*	1.00	0.04	−0.02	0.50
RET + 1	*0.03*	*−0.05*	*−0.02*	*−0.04*	*0.00*	*0.04*	*−0.04*	*0.03*	*−0.04*	*0.08*	*0.03*	*0.02*	*0.06*	1.00	−0.06	0.34
RET + 2	*−0.03*	*−0.03*	*−0.01*	*−0.02*	*−0.01*	*−0.01*	*−0.01*	*0.02*	*−0.06*	*0.06*	*0.01*	*0.00*	*0.00*	*0.01*	1.00	0.18
RET9498	*0.07*	*−0.08*	*0.00*	*−0.09*	*0.20*	*0.20*	*0.06*	*0.03*	*0.00*	*0.00*	*0.25*	*0.36*	*0.46*	*0.34*	*0.22*	1.00

Notes: This table presents the correlations of the variables applied in this study over the sample period of 1994-1998; Pearson correlation coefficients are above the diagonal; spearman correlation coefficients are in italic and reported below the diagonal; ADT, firm-specific adjusted debt-to-total asset ratio after excluding asset revaluation ratio; IADT, industry median adjusted debt-to-total asset ratio; FIADT, difference between firm-specific and industry median adjusted debt-to-total asset; MB, market value of equity and debt divided by book value of equity and debt; LSA, natural log of total sales; CDEP, 1 if capital depletion (including goodwill, foreign current translation losses, and other recognised losses), >5 of total capital employed and 0 otherwise; QR, quick assets by current assets; FAI, assets intensity deriving from dividing net assets by total assets; INDUM, 1 for companies in the high tech industry and 0 otherwise; RET − 2, prior two year share return; RET − 1, prior one year share return; RET0, current year share return; RET1, one-year-ahead share return; RET2, two-year-ahead share return; RET9498, mean share return during 1994-1998

Results reported in both Tables I and II are based on univariate tests, suggesting that revaluers generally have superior share return around the revaluation year in comparison with non-revaluers. This finding, however, does not reject any one of our hypotheses. We further investigate this finding using the multivariate logistic regressions. Dependent variable of Model 1 is a binary dummy variable (1 for revaluers and 0 for non-revaluers). The explanatory variables include share return around the revaluation year and other firm characteristics. All the variables are defined in Models 1 and 2.

Previous studies (Easton *et al.*, 1993; Aboody *et al.*, 1999) infer revaluation timeliness by observing the concurrent statistical association between revaluation amounts and share return. We expand the observation window up to two years before and after the event year to investigate the timing of upward revaluations. Consistent with Tables I and II, Table III shows revaluers have significantly positive coefficients with RET − 1, RET0, RET1 and RET9498 after controlling for other firm characteristics. Again we find revaluers have superior share return to non-revaluers in the revaluation year and the year before and after it. This is also true when all share returns are included in the model. Different from Table I, Table III reports the difference in ADT between revaluers and non-revaluers is significant only when RET + 2 and RET9498 are considered. Lin and Peasnell (2000) argue upward revaluations are generally industry-specific in the UK. To further control for the industry effect, we decompose ADT into IADT and FIADT components. The results reveal IADT is consistently significant in all cases but FIADT is never significant, suggesting that ADT is completely subsumed by IADT. Moreover, the coefficients of IADT are at least nine and seventeen times higher than those of ADT and FIADT, respectively. Wald χ^2 increases significantly when we replace ADT with IADT and FIADT. The above finding confirms Lin and Peasnell's argument that the industry norm is an important factor for the upward revaluation decision.

To further investigate the above finding, we examine whether revaluers are concentrated in certain industrial sectors. Unreported results show that, using Datastream level three industry classifications, 43 per cent of the revaluers are from leisure and hotels (21 per cent), construction (13 per cent) and transport (9 per cent) industries. These firms appear to have higher fixed asset intensity. We also find that 75 per cent of the revaluers are from eight industrial sectors, which contribute 60 per cent of the total observations in the sample. Six industrial sectors do not have any revaluer: diversified industry, information technology hardware, real estate, special facility, telecommunication service and tobacco industries. These firms, however, contribute only 10 per cent of the total observations. Moreover, only three of 164 pharmaceutical and biotechnology firms in our sample revalued their assets upwards. The above findings suggest that firms with high fixed asset intensity are more likely to revalue their assets but hi-tech firms do not normally revalue.

We also examine whether revaluers are more likely to be in industrial sectors with higher leverage. We regress the percentage of revaluers from individual industries on their industrial mean and median leverage, and find positive but insignificant coefficients. A positive coefficient would imply higher percentages of revaluers come from industrial sectors with higher mean and median leverage, but insignificant coefficients may indicate lower power because of the small number of observations. Finally, we reject the hypothesis that the probability of being a revaluer is independent

Table III. Logistic regressions to examine the company characteristic and market performance of revaluers

Intercept	ADT	IADT	FIADT	MB	LSA	CDEP	QR	FAI	INDUM	RET − 2	RET − 1	RET0	RET + 1	RET + 2	RET9498	R^2	Wald χ^2
−4.41	0.15			−0.05	0.14	−0.06	0.02	1.89	−1.35	0.00						0.08	149.54
(0.00)	(0.53)			(0.00)	(0.00)	(0.61)	(0.70)	(0.00)	(0.00)	(0.99)							
−4.97		4.85	−0.08	−0.05	0.13	−0.07	0.01	1.65	−1.01	−0.02						0.09	168.14
(0.00)		(0.00)	(0.75)	(0.00	(0.00)	(0.59)	(0.86)	(0.00)	(0.00)	(0.89)							
−4.55	0.30			−0.07	0.14	−0.09	0.03	1.98	−1.45		0.45					0.09	183.99
(0.00)	(0.17)			(0.00)	(0.00)	(0.42)	(0.51)	(0.00)	(0.00)		(0.00)						
−5.03		4.31	0.08	−0.07	0.13	−0.10	0.02	1.77	−1.16		0.46					0.10	199.17
(0.00)		(0.00)	(0.75)	(0.00)	(0.00)	(0.40)	(0.67)	(0.00)	(0.00)		(0.00)						
−4.33	0.32			−0.07	0.13	−0.15	0.00	1.95	−1.56			0.31				0.10	199.58
(0.00)	(0.15)			(0.00)	(0.00)	(0.21)	(0.94)	(0.00)	(0.00)			(0.01)					
−4.75		3.92	0.11	−0.07	0.12	−0.15	−0.01	1.76	−1.29			0.30				0.10	213.59
(0.00)		(0.00)	(0.66)	(0.00)	(0.00)	(0.20)	(0.90)	(0.00)	(0.00)			(0.01)					
−4.44	0.33			−0.07	0.13	−0.10	0.04	1.99	−1.56				0.39			0.10	202.36
(0.00)	(0.14)			(0.14)	(0.00)	(0.00)	(0.38)	(0.33)	(0.00)				(0.00)				
−4.86		3.76	0.11	−0.07	0.13	−0.11	0.03	1.81	−1.30				0.37			0.10	215.28
(0.00)		(0.00)	(0.65)	(0.00)	(0.00)	(0.36)	(0.44)	(0.00)	(0.00)				(0.00)				
−4.43	0.48			−0.06	0.13	−0.13	0.04	1.88	−1.69					−0.05		0.09	179.95
(0.00)	(0.04)			(0.00)	(0.00)	(0.26)	(0.22)	(0.00)	(0.00)					(0.67)			
−4.84		3.75	0.25	−0.06	0.13	−0.14	0.04	1.72	−1.42					−0.05		0.10	191.61
(0.00)		(0.00)	(0.30)	(0.00)	(0.00)	(0.25)	(0.32)	(0.00)	(0.00)					(0.64)			
−4.20	0.39			−0.07	0.11	−0.17	0.03	1.89	−1.72						0.69	0.10	197.11
(0.00)	(0.07)			(0.00)	(0.00)	(0.16)	(0.43)	(0.00)	(0.00)						(0.00)		
−4.59		3.61	0.21	−0.07	0.11	−0.17	0.03	1.71	−1.50						0.66	0.10	207.83
(0.00)		(0.00)	(0.37)	(0.00)	(0.00)	(0.16)	(0.53)	(0.00)	(0.00)						(0.00)		
−4.44	0.51			−0.06	0.14	−0.10	0.01	1.76	−1.78	0.05	0.40	0.28	0.38	−0.09		0.09	147.43
(0.00)	(0.07)			(0.00)	(0.00)	(0.44)	(0.90)	(0.00)	(0.00)	(0.70)	(0.00)	(0.04)	(0.00)	(0.45)			

Notes: Numbers of observations for revaluers range between 456 and 501; numbers of observations for non-revaluers range between 4,219 and 4,989; this table presents the coefficient (p-value), rescaled R^2, Wald χ^2 and percentage concordant from the logistic regressions; the dependent variable, 1 for revaluer and 0 for non-revaluer companies; revaluers are companies that revalued their assets upward during the sample period of 1994-1998 and non-revaluers are companies that did not do so over the same period; ADT, firm-specific adjusted debt-to-total asset ratio, where total asset excludes current year revaluation; MB, market value of equity and debt divided by book value of equity and debt; LSA, natural log of total sales; CDEP, 1 if capital depletion (including goodwill, foreign current translation losses and other recognised losses), > 5 of total capital employed and 0 otherwise; QR, quick assets by current assets; FAI, assets intensity deriving from dividing net assets by total assets; INDUM, 1 for companies in the high tech industry and 0 otherwise; RET − 2, prior two-year share return; RET − 1, prior one-year share return; RET0, current year share return; RET1, one-year-ahead share return; RET2, two-year-ahead share return; RET9498, mean share return during 1994-1998

of industrial sector (χ^2 statistic = 357.34, significant at the 1 per cent). This further confirms the above findings that upward revaluations appear to be industry specific.

Table III also shows, there is a negative and significant relationship between the likelihood of being a revaluer and the market-to-book value ratio (MB), indicating the negative association is not subsumed by other control variables, notably the high-tech industry dummy (INDUM), and that the relationship is not confined to the sample period examined by Lin and Peasnell (2000). We also find revaluers are likely to be companies that are larger, have greater fixed asset intensity and do not belong to high-tech or R&D intensive industries. Also similar to the result reported in Table I is the lack of significant association between revaluers and capital depletion (CDEP) as Lin and Peasnell (2000) observed using an earlier UK sample. As argued previously, capital depletion caused by acquired goodwill during our test period appears to be not as substantial as late 1980s and early 1990s in the UK[8]. More importantly, Table III provides evidence that UK firms with superior share return around the revaluation year and belonging to industries with higher leverage are more likely to revalue their assets upwards. We also carry out some robustness tests by excluding future share return, and find that RET − 1 and RET0 are consistently significant. As a result, we confirm that UK firms do not always revalue their assets upwards on a timely basis.

Aboody *et al.* (1999) argue upward revaluations are used to signal firms' superior future performance, which is better measured by changes in future operating income and cash flow. We follow their approach and replace share return with the change in future operating income and cash flow one year, two years and three years after the revaluation year. Undocumented results show no difference in changes in future operating income and cash flow between revaluers and non-revaluers around the revaluation year and during the entire test period. Thus, we find no evidence consistent with their signalling hypothesis.

To further explore this issue, we examine whether upward revaluations are timely by investigating the association between share return and the revaluation amount. Table IV presents the ordinary least squares (OLS) regression of share return on the revaluation amount, scaled by market value three months after the prior year-end. Previous studies implement a similar regression to investigate whether there is a contemporaneous relationship between the current year revaluation amount and share return. However, Aboody *et al.* (1999) applied a sample that contains only the revaluers. In our case, we include both the revaluers and non-revaluers in our sample. Undocumented results show that share return for current year, one year or two years before and one year or two years after the revaluation year alone are never associated with current year upward revaluations, indicating upward revaluations are not timely. Easton *et al.* (1993) finds a significant association between share return and the upward revaluation when using a three-year interval. Following their method, we find the current year upward revaluation and share return cumulated from the year before to the year after the revaluation year are statistically associated, after controlling for leverage, market-to-book value ratios and other control variables. This is consistent with our earlier finding that firms with higher returns over this period are more likely to engage in upward revaluations. We also follow previous studies to examine whether a higher debt-to-total assets ratio reduces the association between share return and upward revaluation. Consistent with Aboody *et al.* (1999), we find a negative but insignificant association between share return and the above interaction. Thus, we

Table IV. OLS regression of share return on revaluation and company characteristics

	Intercept	REV	ADT	IADT	FIADT	MB	LSA	CDEP	QR	FAI	INDUM	F-statistics	Adjusted R^2
RET − 1, −2	−0.22	0.00	−0.66			0.03	0.04	0.14	−0.01	0.04	−0.04	44.53	0.08
	(0.00)	(0.99)	(0.00)			(0.00)	(0.00)	(0.00)	(0.05)	(0.35)	(0.30)	(0.00)	
	−0.24	0.00		−0.52	−0.67	0.03	0.04	0.14	−0.01	0.04	−0.02	39.63	0.08
	(0.00)	(0.99)		(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.44)	(0.56)	(0.00)	
RET − 1, 0, +1	−0.30	0.73	−0.73			0.03	0.04	0.12	−0.01	0.00	0.12	38.27	0.07
	(0.00)	(0.02)	(0.00)			(0.00)	(0.00)	(0.00)	(0.36)	(0.99)	(0.01)	(0.00)	
	−0.40	0.72		0.09	−0.76	0.03	0.04	0.12	−0.01	−0.04	0.19	34.97	0.07
	(0.00)	(0.02)		(0.77)	(0.00)	(0.00)	(0.00)	(0.00)	(0.34)	(0.52)	(0.00)	(0.00)	
RET1,2	0.15	0.36	−0.16			0.00	0.00	−0.04	−0.02	−0.15	0.21	7.53	0.01
	(0.04)	(0.17)	(0.01)			(0.97)	(0.81)	(0.08)	(0.01)	(0.00)	(0.00)	(0.00)	
	0.05	0.35		0.60	−0.19	0.00	0.00	−0.04	−0.02	−0.19	0.27	7.78	0.01
	(0.48)	(0.18)		(0.02)	(0.00)	(0.98)	(0.95)	(0.08)	(0.01)	(0.00)	(0.00)	(0.00)	
RET9498	−0.25	0.16	−0.30			0.01	0.03	0.04	−0.01	0.03	0.04	51.21	0.09
	(0.00)	(0.16)	(0.00)			(0.00)	(0.00)	(0.00)	(0.00)	(0.14)	(0.03)	(0.00)	
	−0.29	0.16		0.05	−0.32	0.01	0.03	0.04	−0.01	0.02	0.07	46.84	0.09
	(0.00)	(0.17)		(0.65)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.49)	(0.00)	(0.00)	

Notes: This table presents the coefficient (p-value), F-statistics and adjusted R^2 from the OLS regressions of different return windows on the following independent variables: REV, level of revaluation scaled by market value; ADT, firm-specific adjusted debt-to-total asset ratio, where total asset excludes current year revaluation; IADT, industry median adjusted debt-to-total asset ratio; FIADT, difference between firm-specific and industry median adjusted debt-to-total asset ratio; MB, market value of equity and debt divided by book value of equity and debt; LSA, natural log of total sales; CDEP, 1 if capital depletion (including goodwill, foreign current translation losses and other recognised losses), >5 of total capital employed and 0 otherwise; QR, quick assets by current assets; FAI, assets intensity deriving from dividing net assets by total assets; INDUM, 1 for companies in the high tech industry and 0 otherwise; RET − 1, −2, share return over the prior two years; RET − 1, 0, 1, share return over year −1, 0 and 1; RET1, 1, share return over the subsequent two years; RET9498, mean share return during 1994-1998; 4,069 observations

have no evidence that revaluations aimed at reducing leverage affect the timeliness of the revaluation.

Table III clearly shows both share returns around the revaluation year and industry leverage are important in the revaluation decision. We further investigate the extent to which both factors jointly affect the upward revaluation decision by including the interaction term of share return and IADT in the logistic regressions[9]. Results reported in Table V show only $RET-2 \times IADT$ and $RET-1 \times IADT$ are significantly positive. The interaction terms of industry leverage with current and future share return are consistently insignificant. Moreover, the coefficients of $RET-2 \times IADT$ and $RET-1 \times IADT$ are higher than those of the interactions between current and further share return and IADT. The coefficients of $RET-1$, RET0 and $RET+1$ significant in Table III, are now subsumed by the above interactions. This indicates companies in our sample are more likely to revalue their assets upward when two conditions jointly exist. First, they are in industries with relatively high leverage. Second, they have experienced higher share returns in the past two years. Since changes in asset values are assumed to be captured by lagged instead of contemporaneous share return, the apparent delay implies managers tend to delay their upward revaluations for up to two years.

To further confirm this finding, we include all share returns and their interactions with IADT in the multivariate logistic models and find the interactive terms of industry leverage level and the past two and one year returns yield positive and statistically significant coefficients. This strongly supports the conservatism hypothesis indicating UK firms do not recognise asset values increases until the market has reflected this good news in share price. We confirm an up to two-year delay in upward asset revaluations. This delay could be caused by the fact that our test period coincides with a period of economic recovery in the UK. It is possible that UK firms tended to be conservative in revaluing their assets upwards during the test period, because upward revaluations can reduce ROE and return on assets and increase managers' uncertainty about future earnings.

We also find consistent results indicating industry leverage has influenced the revaluation decision. We provide three possible reasons for this finding. First, upward revaluations could simply be an industry-specific practice (Lin and Peasnell, 2000) that is more common for firms in industries with higher leverage. As mentioned early, revaluers are more likely to be in the leisure and hotel, construction and transport industries. Second, industry leverage may indicate the potential operating risk faced by firms in the same industry. They may be more likely to follow their industry norm when economic prospects are less predictable. Finally, revaluers may follow other firms in the same industry and revalue their assets to demonstrate they have maintained their competitive position.

6. Robustness tests

This study has so far defined revaluers as firms who revalued their assets upwards in any year during the test period. Since firms who revalued their assets upwards in one year might not revalue their assets again or may write down their assets in another year, they can be classified as revaluers in one year but as non-revaluers or even devaluers in another year. To investigate whether our previous findings depend on how we defined revaluers, we restrict revaluers to firms who revalued their assets

Table V.
Logistic regression to examine industry phenomenon

Intercept	IADT	FIADT	MB	LSA	CDEP	QR	FAI	INDUM	RET − 2	RET − 1	RET0	RET + 1	RET + 2
−4.93	4.49	0.00	−0.05	0.13	−0.06	0.01	1.61	−1.03	−1.04				
(0.00)	(0.00)	(0.99)	(0.00)	(0.00)	(0.63)	(0.88)	(0.00)	(0.00)	(0.01)				
−4.98	3.98	0.06	−0.07	0.13	−0.10	0.02	1.75	−1.16		−0.17			
(0.00)	(0.00)	(0.80)	(0.00)	(0.00)	(0.40)	(0.70)	(0.00)	(0.00)		(0.67)			
−4.73	3.82	0.11	−0.07	0.12	−0.15	−0.01	1.76	−1.29			0.13		
(0.00)	(0.00)	(0.65)	(0.00)	(0.00)	(0.20)	(0.90)	(0.00)	(0.00)			(0.71)		
−4.84	3.65	0.11	−0.07	0.13	−0.11	0.03	1.81	−1.30				0.27	
(0.00)	(0.00)	(0.64)	(0.00)	(0.00)	(0.36)	(0.44)	(0.00)	(0.00)				(0.39)	
−4.84	3.79	0.25	−0.06	0.13	−0.14	0.04	1.71	−1.42					−0.16
(0.00)	(0.00)	(0.32)	(0.00)	(0.00)	(0.25)	(0.33)	(0.00)	(0.00)					(0.61)
−4.55	3.39	0.21	−0.07	0.11	−0.17	0.03	1.71	−1.51					
(0.00)	(0.00)	(0.36)	(0.00)	(0.00)	(0.16)	(0.54)	(0.00)	(0.00)					
−4.78	3.74	0.32	−0.06	0.13	−0.09	−0.01	1.47	−1.53	−1.07	−0.43	0.10	0.44	−0.34
(0.00)	(0.00)	(0.33)	(0.00)	(0.00)	(0.47)	(0.85)	(0.00)	(0.00)	(0.01)	(0.35)	(0.82)	(0.26)	(0.36)

RET9498	*RET − 2 × IADT*	*RET − 1 × IADT*	*RET0 × IADT*	*RET + 1 × IADT*	*RET + 2 × IADT*	*RET9498 × IADT*	R^2	*Wald* χ^2
	6.33						0.09	172.67
	(0.01)							
		3.92					0.10	203.38
		(0.10)						
			0.99				0.10	214.05
			(0.64)					
				0.62			0.10	215.73
				(0.73)				
					0.65		0.10	191.57
					(0.71)			
0.44						1.34	0.10	208.55
(0.40)						(0.65)		
	6.95	5.29	0.96	−0.46	1.54		0.10	171.07
	(0.01)	(0.06)	(0.72)	(0.84)	(0.48)			

Notes: Numbers of observations for revaluers range between 456 and 501; numbers of observations for non-revaluers range between 4,219 and 4,989; this table presents the coefficient (p-value), rescaled R^2 and Wald χ^2 from the logistic regressions; the dependent variable, 1 for revaluer and 0 for non-revaluer companies; revaluers are companies that revalued their assets upward during the sample period of 1994-1998 and non-revaluers are companies that did not do so over the same period; ADT, firm-specific adjusted debt-to-total asset ratio, where total asset excludes current year revaluation; MB, market value of equity and debt divided by book value of equity and debt; LSA, natural log of total sales; CDEP, 1 if capital depletion (including goodwill, foreign current translation losses, and other recognised losses), > 5 of total capital employed and 0 otherwise; QR, quick assets by current assets; FAI, assets intensity deriving from dividing net assets by total assets; INDUM, 1 for companies in the high tech industry and 0 otherwise; RET − 2, prior two-year share return; RET − 1, prior one-year share return; RET0, current year share return; RET1, one-year-ahead share return; RET2, two-year-ahead share return; RET9498, mean share return during 1994-1998

upwards only. In other words, revaluers are firms with a positive assets revaluation only during the test period. Non-revaluers are restricted to firms who did not revalue their assets at anytime througout the test period. As a result, the sample size reduces significantly because we exclude all firms with both upward and downward revaluations.

We then re-run all the models reported in Tables IV and V, and report the results in Tables VI and VII. Consistent with previous findings, Table VI, Panel A shows that the interactions between IADT and RET − 2, RET − 1 and RET0 are positive and significant at the conventional levels. The interactions between future share return and industry leverage is never significant. Furthermore, the coefficients of IADT are consistently higher than those of FIADT; IADT, FIADT and ADT are significant at the 5 per cent level in all the cases. The interaction between IADT and RET9498 has the highest coefficient (around 21) and is significant at the 1 per cent level, indicating revaluers generally have higher market performance than non-revaluers. In summary, revaluers are likely to have higher leverage, higher average share return over the sample period and higher share return up to the revaluation year than their counterparts.

The OLS regression results are reported in Table VII, Panel B, indicating that current year upward revaluations are statistically associated with RET9498, RET − 1, −2 and RET − 2, −1, 0, respectively. However, future share returns are never associated with current year asset revaluations. This is consistent with a study by O'Hanlon and Pope (1999) in that asset revaluations are not statistically associated with future share return even when using long measurement intervals. In summary, our robustness tests indicate UK firms tend to delay their upward asset revaluations for up to two years, until the market has reflected their superior share performance and when their industry leverage is high. The above findings are generally consistent with the results reported in Tables IV and V.

7. Conclusion

Existing studies on upward asset revaluations mainly focus on their underlying management objectives and less on the timing issue. Easton *et al.* (1993) find upward asset revaluations are timely only when firms have higher change in debt and revaluation balance. Aboody *et al.* (1999) find revaluation balance has largely been reflected in share price but only part of the current year upward revaluation is incorporated into current year share return. Both studies suggest upward revaluations are not always timely, but offer no explanation regarding the underlying reason for this finding.

Using a UK sample over the period of 1994-1998, this study compares firm characteristics and share performance between revaluers and their non-revaluation counterparts. Revaluers have a significantly higher industry median debt-to-total asset ratio, larger total sales and fixed asset intensity and are less likely to be in a high tech or R&D intensive industries. Furthermore, revaluers have higher share return in the year before, the year of and the year after the revaluation. The finding that a current upward revaluation is associated with past share return indicates upward revaluations are not entirely timely. Further investigation finds revaluers are dominated by firms with both a higher share return in the past two years and higher industry leverage, indicating UK firms delay the recognition of increased asset values until this good

Intercept	IADT	FIADT	MB	LSA	CDEP	QR	FAI	RET9498	RET − 2	RET − 1	RET0
−2.64	6.58	1.52	−0.7	−0.04	−0.13	−0.05	1.25	−1.95			
(0.00)	(0.00)	(0.00)	(0.00)	(0.26)	(0.46)	(0.48)	(0.00)	(0.06)			
−2.58	7.24	1.43	−0.59	−0.08	0.17	−0.03	1.69		−2.44		
(0.00)	(0.00)	(0.04)	(0.00)	(0.12)	(0.45)	(0.73)	(0.00)		(0.00)		
−2.88	6.84	1.46	−0.79	−0.03	−0.01	0.02	1.48			−0.97	
(0.00)	(0.00)	(0.01)	(0.00)	(0.54)	(0.94)	(0.81)	(0.00)			(0.16)	
−2.96	7.83	1.45	−0.66	−0.03	−0.16	−0.03	1.28				−0.5
(0.00)	(0.00)	(0.00)	(0.00)	(0.40)	(0.36)	(0.63)	(0.00)				(0.37)
−3.19	8.89	1.53	−0.65	−0.01	−0.14	−0.03	0.96				
(0.00)	(0.00)	(0.01)	(0.00)	(0.78)	(0.48)	(0.74)	(0.01)				
−3.06	9.76	1.81	−0.57	−0.04	−0.15	0.00	0.94				
(0.00)	(0.00)	(0.00)	(0.00)	(0.26)	(0.45)	(0.97)	(0.01)				
−2.92	5.19	2.63	−0.87	0.00	0.11	0.16	1.21		−4.06	−2.07	−0.48
(0.00)	(0.15)	(0.00)	(0.00)	(0.95)	(0.69)	(0.69)	(0.02)		(0.00)	(0.03)	(0.63)

RET + 1	*RET + 2*	*RET9498 × IADT*	*RET − 2 × IADT*	*RET − 1 × IADT*	*RET0 × IADT*	*RET + 1 × IADT*	*RET + 2 × IADT*	R^2	*Wald* χ^2
		20.89						14.61	162.24
		(0.00)							
			17.56					14.63	96.32
			(0.00)						
				11.5				14.97	128.33
				(0.01)					
					6.79			13.59	150.25
					(0.05)				
−0.58						3.75		12.38	108.49
(0.33)						(0.29)			
	0.26						−1.16	12.36	107.66
	(0.61)						(0.71)		
−1.45	0.75		25.51	19.12	5.13	9.85	−6.11	20.02	74.42
(0.18)	(0.39)		(0.00)	(0.00)	(0.39)	(0.12)	(0.25)		

Notes: Numbers of observations for revaluers range between 348 and 410; numbers of observations for non-revaluers range between 3,366 and 4,207; this table presents the coefficient (*p*-value), rescaled R^2, Wald χ^2 and percentage concordant from the logistic regressions; the dependent variable, 1 for revaluer and 0 for non-revaluer companies; revaluers are companies that revalued their assets upward during the sample period of 1994-1998 and non-revaluers are companies that did not do so over the same period; ADT, firm-specific adjusted debt-to-total asset ratio, where total asset excludes current year revaluation; MB, market value of equity and debt divided by book value of equity and debt; LSA, natural log of total sales; CDEP, 1 if capital depletion (including goodwill, foreign current translation losses and other recognised losses), > 5 of total capital employed and 0 otherwise; QR, quick assets by current assets; FAI, assets intensity deriving from dividing net assets by total assets; INDUM, 1 for companies in the high tech industry and 0 otherwise; RET − 2, prior two-year share return; RET − 1, prior one-year share return; RET0, current year share return; RET1, one-year-ahead share return; RET2, two-year-ahead share return; RET9498, mean share return during 1994-1998

Table VI.
Robustness tests – Panel A: logistic regressions to examine the company characteristic and market performance of revaluers

Table VII.
Robustness tests – Panel B: OLS regression of share return on revaluation and company characteristics

	Intercept	REV	ADT	MB	LSA	CDEP	QR	FAI	F-statistics	Adjusted R^2
RET − 1, − 2	− 0.13	0.79	− 0.57	0.10	0.03	0.11	− 0.01	− 0.02	19.32*	10.75
	(0.22)	(0.07)	(0.00)	(0.00)	(0.00)	(0.00)	(0.30)	(0.81)		
RET − 2, − 1,0	− 0.08	1.17	− 0.99	0.11	0.03	0.2	− 0.04	− 0.08	22.88*	12.57
	(0.56)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.37)		
RET1,2	0.5	− 0.21	0.25	− 0.02	− 0.02	− 0.03	0.00	− 0.43	11.41*	6.41
	(0.00)	(0.70)	(0.10)	(0.07)	(0.08)	(0.58)	(0.93)	(0.00)		
RET9498	0.02	0.27	− 0.16	0.02	0.01	0.03	− 0.01	− 0.06	15.13*	8.5
	(0.55)	(0.06)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)		

Notes: *Significant at the 1% level; this table presents the coefficient (p-value), F-statistics and adjusted R^2 from the OLS regressions of different return windows on the following independent variables: REV, level of revaluation scaled by market value; ADT, firm-specific adjusted debt-to-total asset ratio, where total asset excludes current year revaluation; IADT, industry median adjusted debt-to-total asset ratio; FIADT, difference between firm-specific and industry median adjusted debt-to-total asset ratio; MB, market value of equity and debt divided by book value of equity and debt; LSA, natural log of total sales; CDEP, 1 if capital depletion (including goodwill, foreign current translation losses and other recognised losses), > 5 of total capital employed and 0 otherwise; QR, quick assets by current assets; FAI, assets intensity deriving from dividing net assets by total assets; INDUM, 1 for companies in the high tech industry and 0 otherwise; RET − 1, − 2, share return over the prior two years; RET − 2, − 1, 0, share return over year − 2, − 1 and current year; RET2, 1, share return over the subsequent two years;. RET9498, mean share return during 1994-1998; 3,274 observations

news has been confirmed by their superior market performance, and when industry leverage is high.

We argue that the above finding is consistent with the accounting conservatism principle in the sense that firms recognise good news with a delay. Our findings, however, do not support the argument from Aboody *et al.* (1999) that UK firms use upward revaluations to signal their superior future operating performance. Instead, this study finds evidence supporting Lin and Peasnell (2000) in the sense that UK firms delay their upward asset revaluations because they can reduce future net profit, returns on total assets and equity during an economy-recovering period. This study contributes to the literature by providing empirical evidence that accounting conservatism has played a role in managerial decision over upward revaluations.

Notes

1. Upward revaluation increases future depreciation expenses and therefore reduces future earnings and related financial ratios.
2. Historical cost accounting does not recognise any increase in asset values even when the current values of assets have increased. As a result, under the historical cost accounting, net asset values could be underestimated and net profit could be overestimated due to recognition of less depreciation.
3. In the UK, board of directors can decide the amount of upward revaluation.
4. During the East Asian financial crisis, the Japanese government encouraged banks to revalue their underestimated land holdings upwards to boost the book value of their shareholders' equity.
5. Numbers of observations in different tests vary. Details can be found in the tables.
6. These undocumented results are available from the authors.
7. Most of countries require that goodwill be capitalised as an intangible asset and amortised during its useful life. UK was one of the very few countries in the world allowing firms to write off acquired goodwill against reserves.
8. Unlike Lin and Peasnell (2000), our study applies panel data instead of cross-sectional data for the empirical tests. Unreported results show that after controlling for year dummy, our results from Table III remains consistent.
9. Undocumented results show the logistic regression coefficients of the interaction terms of share return with either company-specific debt-to-total asset value (ADT) or industry median adjusted debt-to-total asset value (FIADT) are insignificant.

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