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Covenant violation concern and investors' pricing of Level 3 fair value adjustments

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ABSTRACT

We examine the influence of concerns relating to violation of the borrowing covenant on the investors' valuation of Level 3 fair value adjustments. We reason that managerial bias in Level 3 fair value estimation is greater for firms approaching violation of the borrowing covenant. Based on a sample of Australian real estate firms, we find that managers report upward adjustments to Level 3 investment property values when they approach the threshold where the borrowing covenant is violated; and further find that this deliberate use of discretion is significant for firms closer to the interest coverage thresholds, but not for those approaching the gearing thresholds. We then find that, while fair value adjustments are priced positively, investors apply incremental discounts for firms closer to the violation threshold, or firms which are in technical default of borrowing covenants relative to those that are far from violation. Additionally, we show that the pricing discount on fair value adjustments attributable to the concern over covenant violation is significant only for the weaker governance sub-sample, indicating that effective monitoring mitigates faithful representation concerns about Level 3 fair value estimations.

Introduction

Level 3 fair value (FV) estimates and their market valuation have attracted extensive attention from academics, policymakers, practitioners and investors because of their complex nature and increasing prevalence in financial reporting (Bratten et al., 2013). Several factors contribute to the high measurement uncertainty of Level 3 FVs. These are the unavailability of market data, valuation models selected using multiple techniques, use of forward-looking assumptions and a heavy reliance on managerial discretion. Evidence from prior studies shows that investors question the faithful representation of Level 3 FVs when managers have incentives to behave opportunistically. For example, prior research reports lower market valuation of Level 3 FVs when the capital adequacy ratios of the banks are closer to the minimum required by the regulators (Goh et al., 2015; Robinson et al., 2018), the corporate governance mechanism is weaker (Huang et al., 2016; Song et al., 2010), and there are earnings management incentives or concerns over liquidity and disclosure opacity (Bagna et al., 2015). The high risk of violating borrowing covenants is yet another reason that might cause the capital market to discount values (Aboody et al., 1999) but this factor remains underexplored in FV accounting literature.

Debt provides leverage for acquiring assets. However, it also is a major reason for higher financial risk. Demerjian et al. (2016) find that FV reporting impacts the financial covenants used in borrowing contracts. Since the violation of a borrowing covenant is costly (Beneish & Press, 1993), managers are likely to use accounting discretion to avoid such violations (Watts & Zimmerman, 1986). Extant

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research provides evidence that debt contracting incentives, measured by leverage ratios, influence the decision of managers towards choosing FV over a cost model (Christensen & Nikolaev, 2013; Israeli, 2015) and places greater managerial bias on change in FVs (Cotter & Zimmer, 1995). However, debt contracting can be efficient, with lenders acting as disciplining devices against managerial bias and forcing the efficient exercise of accounting discretion (AbuGhazaleh et al., 2011; Rajan & Winton, 1995). Studies show that the association between asset revaluation amounts and future performance, prices, and returns is weaker for highly levered firms (Aboody et al., 1999; Easton et al., 1993). Some studies found no evidence that managers' decisions were influenced by high leverage (DeAngelo et al., 1994; Healy & Palepu, 1990).

Using the Australian real estate industry as our setting, we examine two research questions: (i) Do managers of real estate firms use their discretion to adjust Level 3 FVs of investment properties when firms are at a high risk of violating the borrowing covenant? (ii) Is investors' pricing of Level 3 FV adjustments to investment properties different for firms closer to violating or in technical default of borrowing covenants than firms that are far from the violation threshold? The focus on real estate industry setting allows us to remove the confounding effects of cross-industry variation and regulation, such as in the case of the banking industry where FV reporting is common, on the pricing of accounting information.

The Australian real estate sector provides an ideal setting for examining these issues because real estate firms are highly levered (Barclay et al., 2013; Doan & Nguyen, 2018; Muller et al., 2011), and interest charges constitute a significant portion of total expenditure (Ooi et al., 2010). For instance, we observe an average debt to asset ratio of 32 percent with a maximum ratio of 99 percent for the sample firms, indicating that incentives to influence debt contracting capacity can be prominent in this setting.[1] Further, Level 3 investment properties constitute a significant proportion of the total assets (e.g., on average, 72 percent in this sample), and adjustments made to the valuations are material and directly affect net income (e.g., on average, FV adjustments constitute 33 percent of the earnings before taxes in our sample). Consequently, FV adjustments are highly important for capital market participants, and the economic consequences of estimation errors are likely to be substantial. Yet, unlike the banking sector, the real estate sector is not heavily regulated, and unlike the US, Australia is less litigious (Bicudo de Castro et al., 2019), allowing greater opportunity for real estate managers to manipulate the FV adjustments. Therefore, debt contracting is likely to provide a powerful incentive for real estate managers to manage FV adjustments to investment properties.

Two studies examine the exercise of FV discretion in response to regulatory incentives in the US banking industry (i.e., Robinson et al., 2018; Beaver & Venkatachalam, 2003). We extend the findings of these studies to the illiquid non-current asset group and examine the managerial exercise of FV discretion in response to debt contracting incentives in the Australian real estate sector. Our analysis focuses on both upward and downward FV adjustments rather than just upward adjustments (e.g., Robinson et al., 2018). Thus, our paper provides evidence on whether the opportunistic exercise of discretion when determining FV, as documented in prior research for the US banking sector, can be generalised to other incentives and settings.

Using a sample of real estate firms listed in the Australian Securities Exchange (ASX) over 2007–2019, we find evidence consistent with managers reporting more (less) unrealised gains (losses) when firms are closer to the violation of covenant thresholds. Next, we separate the firms at high risk of violating gearing thresholds and firms at high risk of violating interest coverage thresholds. This allows us to examine the closeness to which covenant is more likely to drive the managerial bias. We find that managers' report more (less) unrealised gains (losses) when firms are closer to the violation of interest coverage thresholds, possibly to boost the coverage ratios and avoid the cost of violation. However, for firms approaching breach of the gearing thresholds, we find no significant evidence of intentionally using FV adjustments. Further, in the year of covenant violation, we find no evidence that FV adjustments are used in any specific direction, suggesting that in the year of technical default, managers are less likely to manipulate abnormal accruals (DeFond & Jiambalvo, 1994).

Finally, we find that FV adjustments are significantly positively associated with stock returns, but investors incrementally discount the FV adjustments for firms closer to violation or in technical default of their borrowing covenants. Results further indicate that this pricing discount on FV adjustment persists for firms approaching gearing thresholds as well as for firms closer to interest coverage thresholds. This is consistent with investors' concerns around faithful representation of Level 3 FV adjustments due to the high risk of covenant violation. It further supports the notion that perceived managerial intention can be a crucial consideration in the pricing of Level 3 FV estimates.

In additional analysis, we consider whether managerial bias in reporting FV adjustments and the market discounting of firms at a high risk of covenant violation is contingent upon the strength of the corporate governance. While we find no significant influence of governance strength on the managerial bias towards reporting higher (lower) unrealised gains (losses) closer to the violation of covenant thresholds, our sub-sample analysis implies that any incremental decline in valuation due to the high risk of violation is significant only in the weaker governance subsample but not in the stronger governance subsample.

Our study contributes in several ways to prior research examining the informativeness of Level 3 FV information. We build upon the works of Song et al. (2010), Demerjian et al. (2016), Robinson et al. (2018) and Israeli (2015) in further developing the understanding of the impact of closeness to borrowing covenant violation on the investors' valuation of FV estimates. First, we provide evidence that debt contracting reasons can influence managers to use Level 3 FV adjustments opportunistically. This supports earlier arguments in the literature that the provision of discretionary choices in FV accounting may lead to unintended consequences (Dyreng et al., 2020; Kothari et al., 2010). This also indicates that there is room for further improvement in the reporting of FV information.

Second, we show that investors consider Level 3 FV estimates of firms close-to-violation or in technical default of the borrowing

[1] Israeli (2015) reports that the mean leverage ratio for real estate firms adopting the FV model is 51 percent while the ratio for firms using the cost model is only 38 percent, indicating that highly geared firms are more likely to use the FV model.

covenant less trustworthy. While prior studies provide evidence of an incremental discount on FVs by investors in the presence of a lower capital adequacy ratio (Robinson et al., 2018), liquidity concerns (Bagna et al., 2015) and earnings management concerns (Chong et al., 2012), we extend the investigation to concerns about covenant violation as an added explanation. Our findings suggest that managers of real estate firms should be more careful when reporting changes in FV of properties, as investors are aware of such opportunism and factor that into their pricing decisions.

Finally, our findings that faithful representation concerns about Level 3 FV adjustments are significant in the context of weaker governance mechanisms, but not in the context of stronger governance mechanisms, suggest that in a real estate setting governance strength can mitigate concerns around FV adjustments arising due to the closeness to the borrowing covenant violation. Even though few studies document lower information asymmetry of Level 3 FVs for firms with stronger governance (e.g., Mechelli & Cimini, 2019; Siekkinen, 2017; Song et al., 2010), none of these examine this association in the presence incentives related to borrowing contracts. Our study extends the assumption of a positive association between corporate governance and accounting quality into the area of value relevance of FV information and debt contracting reasons.

The remainder of this paper is as follows. Section 2 discusses the institutional background of the study. Section 3 reviews the literature and provides the basis for the empirical predictions of the study. Section 4 describes the research design and empirical models. Section 5 presents the data and results, and Section 6 offers concluding remarks.

Institutional background

Reporting of fair value adjustments under IAS 40 and managerial discretion

Our focus on FV adjustments to investment properties is motivated by the provision of IAS 40 to recognise investment properties at fair values[2] (IAS 40.30) and the reporting of changes in values through earnings (IAS 40.35). Gains and losses flow through net income not only when they are realised but also when managers recognise any changes in an asset's value, i.e., unrealised gains/losses, which is permitted for only a few asset classes[3] by the IFRS. The International Accounting Standards Board (IASB) states that such accounting treatment is necessary for reporting the financial performance of investment properties in a meaningful way (International Accounting Standards Board, 2003, para BC44). If managers adopt efficient accounting choices, FV adjustments reflect their private information and improve the relevance of asset valuation (Bandyopadhyay et al., 2017). But if managers are opportunistic, they might use the discretion permitted to manipulate adjustments and hinder the faithful representation of reported amounts (Chen et al., 2020; Dietrich et al., 2000).

Real estate managers likely face motivations to use the discretion permitted in Level 3 FVs to avoid the violation of borrowing covenants for at least two reasons. First, following the violation of covenants, shareholders face substantial costs such as higher interest rates, tighter covenants, or new covenants and reduced access to credit (Beneish & Press, 1993; HassabElnaby, 2006; Nini et al., 2012). The use of managerial discretion to improve borrowing capacity could be beneficial to shareholders when the risk of violation is high. Second, since most investment properties are valued at Level 3, a relatively small change in a single assumption or model input (e.g., capitalisation rate, growth rate, future rent or occupancy rate) could materially impact the earnings, asset values and equity, which then affect the calculation of covenant ratios. The commonly used accounting ratios in borrowing contracts (i.e., gearing, interest coverage and loan to value) could easily be influenced by a slight tweak in the inputs to the Level 3 valuation. Although firms involve external valuers (periodically) and auditors to verify the model inputs, challenging the estimation is complex because the nature of FV is such that even well-intentioned valuers disagree on the adjustments (Bratten et al., 2013). Hence, investors' concerns about managers abusing the discretion permitted in the FV reporting of investment property for firms at high risk of borrowing covenant violation is valid in this setting.

Alternatively, in the Australian real estate setting, efficiency might dominate incentives in financial reporting because of the stronger institutional governance mechanism. Australian real estate firms have more transparent governance disclosures (ACGTI, 2020) and superior business ethics policies (Sustainalytics, 2020). Further, the measurement-related disclosures for investment property have been extensive since the adoption of IFRS 13[4] in 2013, and most firms use external valuers in the valuation process along with their managers.[5] Prior studies indicate that investors perceive lower measurement uncertainty of Level 3 FVs for firms with stronger governance (Song et al., 2010), firms that make detailed measurement-related disclosures (Laux & Leuz, 2009) and firms that use external valuation services (Kolev, 2019). Thus, our setting permits us to see whether the managerial bias in reporting FV adjustments and their valuations by the market is conditional on the concerns about borrowing covenant violation, in circumstances

[2] Effective since 2005, IAS 40 requires that investment properties initially be measured at cost (IAS 40.20) and subsequently recognised at fair values (IAS 40.30).

[3] For most cases, FV changes are included in "other comprehensive income", for example: unrealised gains and losses on available for sale investment securities and derivative contracts classified as cash flow hedges, foreign currency translation adjustments, and additional minimum pension liability adjustments. Further, any revaluation gain arising on account of an increase in property, plant and equipment value is shown under comprehensive income.

[4] IFRS 13 mandates disclosure on the valuation methods, details of assumptions, valuation process, reconciliation statement, transfers and sensitivity analysis of Level 3 valuations (IFRS 13, para 91–99).

[5] While the managers update the valuation on a regular basis, independent valuers appraise the value periodically, with the period not exceeding three years.

where there is strong governance system, measurement-related disclosures are detailed, and independent valuers are involved.

From the lender's perspective, valuation of property based on the discretion of managers can reduce the contractibility of financial information, which may induce managers to make less use of accounting values in debt contracts (Ball et al., 2015). However, our survey of covenant-related information reveals extensive use of accounting covenants by the sample real estate firms, of which only a few disclose the exclusion of adjustments to FVs from the restriction threshold calculations.[6] One plausible explanation could be that the practice of revaluing of properties had been accepted in Australia long before the adoption of IFRS, allowing managers to obtain extended experience in asset value estimation. This is likely to result in reduced measurement errors and, thereby, cause lenders less perceived uncertainty about Level 3 FVs. It is also possible that lenders consider the potential for manipulation earlier on and factor that into their determination of covenant thresholds. This is consistent with the study of Demerjian et al. (2016) that finds limited evidence on exclusion of FVs from covenant definitions and concludes that FV accounting is not detrimental for debt contracting. From the managerial perspective, FV adjustments may be used in the current period to avoid covenant violation and associated costs, with the intention to make reversals in the future periods. Managers might also consider how prone the market is to imposing penalties when there are incentives to manipulate, regardless of the actual manipulation. In such cases, using FV adjustments to avoid covenant violation would be a rational response.

Nature of borrowing arrangements - Australian real estate sector

In Australia, real estate firms typically use bank borrowings, commercial notes, commercial mortgage-backed securities, lease liabilities, domestic/foreign medium-term notes, loans payable to related parties, and miscellaneous credit facilities offered by banks (e.g., overdrafts) for financing. Borrowings are classified based on maturity (i.e., long term and current) and security (i.e., secured and unsecured). Table 1 shows the proportion of the different borrowing categories (Panel A), provides the descriptive statistics of each type (Panel B) and summarises information related to the borrowing covenant of the sample real estate firms by year (Panel C). Panel A shows that, on average, long-term borrowings constitute 82 percent of the total borrowing, representing their significance on the debt structure. A large proportion of the total borrowings, around 71 percent, are secured (i.e., backed by the security of tangible assets or investment properties), indicating that managers are motivated to maintain the values of those properties at a certain level (Cotter & Zimmer, 1995). Panel B shows that, on average, the borrowing to asset ratio is 32 percent, with a maximum ratio of 99 percent. The mean (median) interest coverage is 5.78 (3.64) times.

Panel C reports the summary of borrowing covenant information disclosed in the notes to financial statements by year. We identify (i) gearing; and (ii) interest coverage as the most widely used covenants[7] in our setting. Out of 445 firm-year observations, 300 observations disclosed covenant-related information, which is 68 percent of the sample. Although the number of covenants in the notes ranges from one to six, the median number is two. Of the two major covenants, interest coverage is the more commonly used, observed in 229 firm-year observations, whereas gearing ranks second in terms of the frequency of use, reported in 162 firm years. In most cases, coverage is paired with either gearing or loan to value ratio. The median coverage and gearing are 2:1 (minimum ratio) and 50 percent (maximum percentage), respectively, for the sample firms. We use these industry medians as the benchmark to identify firms at high risk of covenant violation in our analysis.

Prior research and development of hypotheses

Level 3 fair value controversy and market pricing

The debate on the relevance and reliability of FV measurements is long-standing in FV research (Landsman, 2007). If managers are efficient and convey private information, FV information has greater relevance, more accurately reflects volatility, and enhances financial reporting transparency (Barth, 2006; Barth et al., 2001). However, the increasing prevalence of FV reporting has the potential to decrease the usefulness of accounting information for contracting (Holthausen & Watts, 2001; Kothari et al., 2010) and increase the volatility of earnings (Barth et al., 1995). While previous studies conclude that FV information is decision-useful (Barth, 1994; Barth et al., 1996; Barth & Clinch, 1998), more recent studies show that the perceived informativeness may vary across the FV hierarchy.

Several studies document that investors consider Level 1 and Level 2 FV assets relevant and reliable because the market prices are observable (either directly or indirectly), and the information risk is lower (Goh et al., 2015; Kolev, 2019; Song et al., 2010). However, the evidence on market valuation of Level 3 FV is inconclusive. While Song et al. (2010) document that Level 3 FV estimates are priced at a discount relative to Level 1 and Level 2 FVs during the financial crisis of 2008, Goh et al. (2015) show that the discount is not significant when the market condition stabilises. Nonetheless, both studies report that Level 3 FVs are positively priced.

Measurement uncertainty is high for Level 3 estimates because they rely heavily on managerial discretion, use subjective and forward-looking assumptions and are difficult to verify (Bratten et al., 2013). Prior research indicates that managers use Level 3 FVs to achieve self-serving motives, such as attaining capital adequacy targets (Robinson et al., 2018), managing earnings (Barth et al., 2017; Chong et al., 2012), enhancing compensation (Livne et al., 2011) and improving borrowing capacity (Christensen & Nikolaev, 2013).

[6] In a majority of the cases there is no mention of the exclusion of adjustments.

[7] Other covenants include loan to value ratio, gearing on a look-through basis, credit rating, dividend payout restriction, capital adequacy, ratio of 'net cash inflow' to gross interest, ratio of debt to earnings before interest, taxes, depreciation and amortisation, priority indebtedness ratio, weighted average lease expiry and so on.

Table 1
Nature of borrowing arrangements in Australian real estate sector.

Panel A: Borrowing types

	Secured Borrowing (%)	Unsecured Borrowing (%)	Total (%)
Long-term Borrowing (%)	70	30	82
Current Borrowing (%)	69	31	18
Total (%)	71	29	100

Panel B: Descriptive statistics for borrowing types and interest coverage

	N	Mean	SD	Percentiles			Max
				25th	50th	75th	
GEARING	445	0.325	0.165	0.230	0.315	0.425	0.989
SECURED	445	0.239	0.203	0.010	0.253	0.391	0.759
UNSECURED	445	0.083	0.125	0.000	0.000	0.193	0.434
LONG	445	0.263	0.152	0.157	0.262	0.358	0.654
CURRENT	445	0.060	0.129	0.000	0.004	0.049	0.687
COVERAGE	445	5.782	11.469	1.579	3.641	6.423	74.527

Panel C: Summary statistics for two major borrowing covenants as disclosed in notes, by year

Year	No of firms disclosing covenant info	Median no of covenants disclosed	Gearing ratio		Interest coverage	
			n	Median	n	Median
2007	3	2	2	40%	0	
2008	11	2	9	42.5%	5	2 times
2009	13	2	8	45%	10	1.75 times
2010	19	2	12	45%	16	1.75 times
2011	20	2	11	50%	15	1.75 times
2012	22	2	12	52.50%	18	1.75 times
2013	23	2	11	50%	17	1.85 times
2014	27	2	15	50%	21	2 times
2015	30	2	15	50%	24	2 times
2016	33	2	17	50%	28	2 times
2017	33	2	17	50%	25	2 times
2018	34	2	19	50%	28	2 times
2019	32	2	14	52.50%	22	2 times
Total	300	2	162	**50%**	229	**2** times

Table 1 illustrates the nature of borrowing contracts in the Australian real estate sector. Panel A reports the percentage of the different borrowing categories relative to the total borrowing. Panel B provides the descriptive statistics of each borrowing type. *SECURED*, *UNSECURED*, *LONG* and *CURRENT* represents the ratio of total secured, unsecured, long-term, and current borrowings to total assets excluding FV adjustments to investment properties at *t*, respectively. Panel C summarises statistics for two major borrowing covenants, i.e., gearing ratio and interest coverage as disclosed in the notes to the financial statement, by year. Variables are defined in the Appendix.

However, findings also show investors recognise such opportunistic bias and discount the Level 3 valuations while pricing. For instance, Robinson et al. (2018) and Goh et al. (2015) find evidence which suggests investors apply an incremental discount on Level 3 assets for banks closer to their capital adequacy targets. Bagna et al. (2015) observe that the market negatively judges transfers from Levels 1 and 2 to Level 3 if they are larger. Riedl and Serafeim (2011) show that banks with greater exposure to Level 3 assets exhibit higher betas and that information risk is more pronounced for banks with ex-ante lower quality information environment. Song et al. (2010) document a lower valuation discount for Level 3 assets for firms with stronger corporate governance mechanisms. Thus, research suggests that although Level 3 FVs are generally value relevant, the incentives for managerial bias might raise questions regarding their informativeness.

Notably, most of these Level 3 FV studies focus on the financial assets of US banks, which are governed by unique regulations. Less attention has been given to non-current assets, such as investment properties or property, plant, and equipment. Researchers use the investment property context predominantly to test the drivers of FV versus cost model choice (Dietrich et al., 2000; Mäki et al., 2016) or relative value relevance under the two choices (Israeli, 2015; Müller et al., 2015) but remain silent as to whether managers use the permitted discretion on Level 3 property estimation to achieve self-serving motives and to what extent the perceived information risk influences investors property valuations. We attempt to address this issue empirically.

Value relevance of fair valued investment properties

In the context of investment properties, existing research suggests that FV amounts are relevant for future financial outcomes, and investors place positive valuation weights on FV estimates. Bandyopadhyay et al. (2017) find that FV adjustments are positively associated with future cumulative cash flows and concurrent stock price. Israeli (2015) documents a positive association between FV amounts and share price, stock return, and a higher market valuation of FV than historical cost. Similar findings are also reported by Müller et al. (2015). Even though the positive FV-return association is well established, most of these studies are conducted in

European contexts. The Australian setting is unique because revaluations of properties were permitted long before adopting the IFRS, indicating that measurement errors are less likely due to the long managerial experience with property valuations. Hence, following the previous findings, we begin our analysis with the prediction that positive market valuations of FV adjustments hold for the real estate market in Australia.

H_1: Fair value adjustments to investment properties are positively associated with stock return.

Contracting theory and impact of closeness to violation of borrowing covenant on manager behaviour and investor pricing

The contracting theory framework predicts a relationship between the existence of debt covenants and the use of accounting discretion. The underlying premise is that violation of covenants is costly to the shareholders (Beneish & Press, 1993). It imposes on firms substantial direct and indirect costs, e.g., higher interest rates, tighter covenants, or new covenants and reduced credit access (Beneish & Press, 1993; HassabElnaby, 2006; Nini et al., 2012). Following technical default, lenders use their control rights in ways that increase the likelihood of loan repayment but impose costs on shareholders, for example, forcing firms to reduce capital expenditures, net debt issuance or the number of acquisitions, which can further reduce the equity values (Demiroglu & James, 2010; Denis & Wang, 2014; Dyreng et al., 2020). Therefore, as with every costly activity, managers have an incentive to avoid covenant violations.

According to the agency cost and debt covenant hypothesis, managers of firms at high risk of covenant violation use accounting choices to avoid violation (Watts & Zimmerman, 1986). Numerous studies provide evidence supporting this hypothesis (e.g., Franz et al., 2014; Sweeney, 1994). DeFond and Jiambalvo (1994) document that managers manipulate abnormal accruals upward to increase reported income in the year before the covenant violation and, to a lesser extent, in the year of the covenant violation. Doing so could also be in the shareholders' best interest because studies show that shareholders are strictly better off when firms successfully avoid a breach using discretionary accruals (Dyreng et al., 2020). Riedl (2004) and Beatty and Weber (2006) show that highly leveraged firms are less likely to record goodwill impairment losses to avoid costly violations of debt covenants. Kallapur and Kwan (2004) document substantial differences in the extent of bias or error in intangible asset valuations of firms with different levels of contracting and provide evidence suggesting a negative influence of contracting incentives on the reliability of asset values.

Evidence in the FV accounting literature indicates the influence of debt contracting incentives on managers' choice of the FV model versus the cost model (Israeli, 2015), on the direction (i.e., upward or downward), on the timing of the reporting of change (Brown et al., 1992; Duh et al., 2009; Whittred & Chan, 1992) and on the magnitude of change (Kallapur & Kwan, 2004). For investment properties, consistent with debt contracting theory, Israeli (2015) and Christensen and Nikolaev (2013) document that real estate firms with higher leverage have a significantly higher probability of adopting the FV model. However, the extant literature does not address how closeness to the borrowing covenant violation or the violation itself introduces managerial bias in the estimation of FV adjustments. Given the highly leveraged nature of the real estate sector, managers of firms at high risk of violation may face higher incentives to use their discretion to manipulate the FV changes.

FV adjustments to investment properties can impact the accounting ratios used in borrowing contracts because of their direct impact on real estate asset value and reported earnings. For instance, reporting FV adjustments upward increases the book value of total assets and equity, thereby decreasing the gearing ratio. An increase in net income improves the interest expense coverage (net income being the numerator in the coverage ratio), indicating a higher margin of safety for borrowing repayment. Also, because a property could be used as collateral in support of borrowing, an increase in the property's book value affects the lenders assessment (Cotter & Zimmer, 1995) and the loan to value ratio.

However, there are several explanations for the possibility that closeness to violation causes no noticeable bias on the managers' estimation of FV adjustments in our setting. First, lenders have superior monitoring abilities relative to other investors and may act as disciplining devices against managerial manipulation and force the efficient exercise of accounting discretion (AbuGhazaleh et al., 2011; Beneish & Press, 1993). Specifically, a large proportion of borrowings in the Australian real estate sector are financed by commercial banks, insurance companies or finance companies, which are traditionally viewed as efficient monitors due to their superior access to inside information (Fama, 1985). Banks have scale economies and comparative cost advantages in information production that enable them to undertake superior debt-related monitoring (Diamond, 1984). Second, bias in reporting FV adjustments of investment properties can result in more costly scrutiny by auditors and regulators and increase the likelihood of shareholder litigation. Thus, the probability of triggering unexpected costs might restrain earnings management behaviour.

Considering the above two different lines of arguments, we state our second hypothesis in null form:

H_{2a}: Closeness to debt covenants and defaults are not significantly associated with fair value adjustments to investment properties.

Theory suggests information risk impacts the pricing of assets (Easley & O'Hara, 2004; Lambert et al., 2007). If managers are incentivised towards bias and enhance the estimation error, lack of verifiability affects the faithful representation and the value relevance of the accounting numbers (Holthausen & Watts, 2001). While Level 3 assets already involve a certain degree of measurement uncertainty, closeness to the violation of the borrowing covenant adds an additional layer to the information risk. Given the findings in earlier literature that the probability of adopting the FV model is higher for highly leveraged real estate firms (Israeli, 2015), managers may use the discretion permitted within that choice to adjust reported amounts (Chen et al., 2020) in an effort to improve borrowing capacity, resulting in deeper concerns from the perspective of investors regarding the faithful representation of FV adjustments. Thus, investors may discount the FV adjustments of firms that are at high risk of violating the debt covenants. However, if investors are convinced that firms closer to the violation of borrowing covenants are subject to higher scrutiny on their financial reporting process, then negative valuation implications may not be observed.

These differing reasons suggest that the concern over covenant violation may either negatively affect the investors' valuation of FV adjustments or simply have an insignificant impact. Given the implications of agency theory, the inconclusive findings of prior studies and the absence of direct evidence on the influence of concerns about borrowing covenant violations in the real estate setting, we state our next hypothesis in null form:

***H_{2b}*: The closeness to borrowing covenants does not affect the value relevance of fair value adjustments to investment properties.**

Sample and research design

Sample

Our sample comprises all real estate firms listed in the ASX from 2007 to 2019. The investment property-related data, details on borrowing and covenants, and part of the governance data were hand-collected. Because this study focuses on FV adjustments, we restrict our sample to only those firms that adopted the FV model for investment property valuation. We hand-collected the following data from financial statements: (i) FV of investment properties, (ii) FV adjustments to investment properties reported in earnings; (iii) information on total borrowings and borrowing types, i.e., secured, unsecured, long-term and current; (iv) borrowing covenant-related information; (v) governance variables,[8] such as the number of female board members, frequency of audit committee meetings, whether at least one audit committee member is a professional accountant, whether the firm has a risk committee, what percentage of independent board members have real estate expertise, and what percentage of audit committee members have real estate expertise. Market and accounting data are obtained from the Thomson Reuters Eikon database.

Table 2 presents the sample selection procedure. We began with an initial list of 78 firms listed as 'Real Estate' in ASX as of 16 June 2019 (obtained from Eikon database). We excluded firms that did not report investment property or did not adopt the FV model during the sample period. This resulted in a sample of 54 real estate firms with 496 firm-year observations. We then excluded 51 observations with missing data on key variables. This resulted in a sample of 445 firm-year observations for the period 2007–2019.

Firms at high risk of covenant violation and violating firm sub-samples

Our hand-collected data on the borrowing structure and covenants from the annual reports of Australian real estate firms shows that the gearing ratio (*GEARING*) and interest coverage ratio (*COVERAGE*) are the most widely used covenants.[9] Therefore, we use *GEARING* and *COVERAGE* to measure the proximity to violation of the borrowing covenant (Aboody et al., 1999; Israeli, 2015; Kallapur & Kwan, 2004).

We divide the sample of real estate firms into three sub-samples (e.g., Franz et al., 2014): (i) firm-years at high risk of violation of debt covenants (*CLOSE*). During these firm-years, either *GEARING* exceeds 50 percent, or *COVERAGE* falls below two, or both. (ii) firm-years during which the borrowing covenants were violated (*DEFAULT*),[10] and (iii) the remaining firm-years (*FAR*). *GEARING* is measured as total borrowings divided by total assets exclusive of FV adjustments to the investment properties. We classify firm-years with *GEARING* exceeding 50 percent as 'closer to the violation of gearing threshold' ($CLOSE\_GEAR = 1$). We calculate interest coverage (*COVERAGE*) as earnings before interest, taxes, depreciation, amortisation and FV adjustments (EBITDAFVA) to gross interest expense. If the *COVERAGE* of a firm-year is less than two, we identify the firm as 'closer to the violation of coverage threshold' ($CLOSE\_COV = 1$), otherwise 0.

Firm-years in the *FAR* subsample are well below the industry average covenant thresholds where managers are incentivised towards bias in the FV adjustments and investor concern over faithful representation is perceived to be lower. The *CLOSE* group comprises firms where managers are likely to face strong incentives to use FV adjustments to avoid violation of covenants. The *DEFAULT* sub-sample allows testing whether investors' evaluation of FV adjustments varies when the firm is in technical default. The *FAR* sub-sample serves as a control group for testing the implications of concerns related to proximity to a covenant violation. Together, these three sub-samples enable us to devise robust tests of the influence of closeness to the violation of a borrowing covenant on the opportunistic use of adjustments to Level 3 FVs and their value relevance.

Empirical models

Test of H_1

Following prior studies (Aboody et al., 1999; Barth & Clinch, 1998; Easton et al., 1993; Israeli, 2015), we use the stock return model to examine the value relevance of FV adjustments:

[8] Two governance variables, the ratio of total independent directors to total directors and Big 4 auditor information are obtained from Eikon database.

[9] This is consistent with prior surveys on Australian firm debt contracts (Cotter, 1998; Mather, 1999; Mather & Peirson, 2006) that shows gearing ratio, interest coverage, secured liabilities to tangible asset ratio and current ratio are the most frequently used borrowing covenants in public contracts.

[10] To find out whether any of the real estate firms violated borrowing covenants during the sample period, we manually search each annual report using a series of keywords likely to identify technical default (e.g., "default", "violation", "breach", "renegotiation"). We identified eight firm-year observations which mention borrowing covenant violation and renegotiation of contract. We identify this subsample as 'DEFAULT'.

Table 2
Sample selection process.

	Number of firms		Percentage of firms	
	Less	Remaining	Less (%)	Remaining (%)
ASX listed real estate firms in Thomson Reuters Eikon as of 16 June 2019		78		100 %
Excluding the firms:				
That did not adopt the fair value model during the sample period	4	74	5 %	95 %
With no investment property assets (or with investment properties equal to zero) during 2007 to 2019	20	54	26 %	69 %
Final sample				
Firms		54		69 %
Firm-years (for 2007 to 2019)		445		

$$RETURN_{it} = \beta_0 + \beta_1 NI + \beta_2 \Delta NI_{it} + \beta_3 FVA_{it} + \beta_4 VOLAT_{it} + \beta_5 MTB_{it} + \beta_6 LnMVE_{it} + \beta_7 LOSS_{it} + \beta_8 CFO_{it} + \beta_9 Z.Score_{it} + \beta_{10} INDEX_{it} + \beta_{11} GVSCORE_{it} + Yearfixedeffects + \varepsilon_{it}$$

RETURN is the stock market return of firm i in year *t*, measured from three months after year-end for year *t-1* to 3 months after year-end for year *t*. *NI* is earnings before FV adjustments, ΔNI is the annual change in earnings before FV adjustments, and *FVA* is FV adjustments recognised in earnings, all deflated by the beginning market value of equity. Our variable of interest for H_1 is β_3. A statistically significant positive value would suggest that investors place valuation weights on FV adjustments to investment properties.

We control for several variables that prior research indicates are associated with stock return. *VOLAT* is the volatility of returns, calculated as the standard deviation of monthly returns in period *t-1*; *MTB* is the ratio between the beginning market value of equity and the book value of equity; and *LnMVE* is the natural log of the beginning market value of equity and controls for size. To control for poorly performing real estate firms, we include *LOSS* as a binary variable coded 1 if a firm reports negative net income and *CFO* calculated as the cashflow from operations deflated by the beginning market value of equity. *Z_Score* is the Altman's Z_Score, which controls for the cost of debt. We also control for property price movements and macroeconomic trends (e.g., Chen & Tang, 2017) by including *INDEX,* which represents the annual percentage of property return during the fiscal year based on all assets as determined by the Property Council/IPD Australian property index obtained from Morgan Stanley Capital International (MSCI) index database. *GVSCORE* is the governance score based on the principal component factor analysis of eight major board variables, namely: (i) Board independence (*INDDIR*), measured by the percentage of independent board members on the board; (ii) Board real estate expertise (*REXP_INDDIR)*, measured by the percentage of the members on the board that are independent and hold experience in real estate sector; (iii) audit committee real estate expertise (*REXP_AUD)* measured by the percentage of the audit committee members that hold experience in real estate sector; (iv) audit committee accounting expertise (*ACEXP*), an indicator variable that takes a value of 1 if at least one audit committee member is a professional accountant; (v) *ACTIVITY*, measured as the number of annual audit committee meetings; (vi) gender diversity (*GENDER*), measured by the percentage of female board members on the board; (vii) *RISK*, a dummy variable that equals 1 if the firm has a risk committee; and (viii) *BIG4*, a dummy variable that takes a value of 1 if the auditor is a Big 4 audit firm.

Test of H_2

We test H_{2a} using the following model:

$$FVA_{it} = \beta_0 + \beta_1 NI + \beta_2 CLOSE_{it} + \beta_3 DEFAULT_{it} + \beta_4 FVIP_{it} + \beta_5 LIQUID_{it} + \beta_6 MTB_{it} + \beta_7 LnTA_{it} + \beta_8 LOSS_{it} + \beta_9 CFO_{it} + \beta_{10} Z\_Score_{it} + \beta_{11} INDEX_{it} + \beta_{12} GVSCORE + Year\,fixed\,effects + \varepsilon_{it}$$

Our primary variables of interest for H_{2a} are *CLOSE,* which captures the real estate firms at high risk of violating either gearing or interest coverage covenants or both, and *DEFAULT,* which captures those firms experiencing technical default. A positive coefficient estimate on $\beta_2(\beta_3)$ would indicate that real estate managers use their discretion on Level 3 properties to help them avoid breach of borrowing covenants (technical default).

Following prior studies (Israeli, 2015; Robinson et al., 2018), we control for factors that can influence the magnitude and direction of FV adjustments. *FVIP* is the year-end FV of investment properties before FV adjustments deflated by the beginning market value of equity; *LIQUID* is the ratio of current assets to current liabilities; and *LnTA* is the log of total assets at the beginning of the year. Other variables are defined as in model (1).

To test whether investors differentially price Level 3 FV adjustments of firms that are at high risk of violating borrowing covenants and firms that violated covenants relative to firms that are far from violation (H_{2b}), we use the following regression model:

$$RETURN_{it} = \beta_0 + \beta_1 NI + \beta_2 \Delta NI_{it} + \beta_3 FVA_{it} + \beta_4 CLOSE_{it} + \beta_5 CLOSE_{it} \times FVA_{it} + \beta_6 DEFAULT_{it} + \beta_7 DEFAULT_{it} \times FVA_{it} + \beta_8 VOLAT_{it} + \beta_9 MTB_{it} + \beta_{10} LnMVE_{it} + \beta_{11} LOSS_{it} + \beta_{12} CFO_{it} + \beta_{13} Z\_Score_{it} + \beta_{14} INDEX_{it} + \beta_{15} GVSCORE_{it} + Yearfixedeffects + \varepsilon_{it}$$

The primary variables of interest for Hypothesis 2b are $CLOSE_{it} \times FVA_{it}$, and $DEFAULT_{it} \times FVA_{it}$. A negative coefficient estimate on β_5 and β_7 would suggest that investors' pricing of Level 3 FV adjustments is lower for firms that are at high risk of violating borrowing covenants and firms that violated covenants relative to firms that are far from violation, and vice versa. Variables are defined as in models (1) and (2).

Table 3
Descriptive statistics for regression variables.

Panel A: Continuous variables

Variables	N	Mean	SD	Min	Percentiles			Max	Mean diff. (*CLOSE* = 0–*CLOSE* = 1)
					25th	50th	75th		
RETURN	445	0.094	0.306	−0.725	−0.033	0.112	0.246	1.447	0.127 ***
NI	445	0.033	0.274	−1.327	0.010	0.058	0.083	1.614	0.141***
Δ NI	445	−0.033	0.527	−3.807	−0.027	0.002	0.035	1.831	0.191***
FVA	445	−0.003	0.279	−1.761	−0.001	0.028	0.070	0.664	0.092**
VOLAT	445	0.073	0.076	0.000	0.034	0.049	0.073	0.445	−0.039***
MTB	445	1.341	1.691	−0.142	0.806	1.029	1.273	12.558	0.387**
LnMVE	445	19.907	2.176	11.149	18.885	20.088	21.280	25.235	2.141***
CFO	445	0.035	0.223	−1.176	0.035	0.067	0.092	0.610	0.104***
FVIP	445	2.160	3.813	0.000	0.891	1.348	1.902	30.313	−2.309***
LnTA	445	20.560	1.866	15.064	19.602	20.523	21.751	24.434	1.479***
LIQUID	445	1.648	2.031	0.015	0.430	1.064	2.038	12.710	−0.534**
Z_Score	445	1.215	1.812	−5.790	0.550	1.200	1.710	8.300	1.536***
INDEX	445	0.095	0.043	−0.023	0.092	0.103	0.118	0.166	0.020***
GVSCORE	445	−0.001	0.876	−2.077	−0.711	0.180	0.663	2.514	0.461***

Panel B: Dichotomous variables

Variables		Yes=1		No=0
	N	n	%	n
CLOSE	445	140	31%	305
CLOSE_GEAR	445	54	12%	391
CLOSE_COV	445	125	28%	319
DEFAULT	445	8	2%	437
LOSS	445	77	17%	368

Panel C: Correlation matrix

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*	*(15)*	*(16)*
(1) *RETURN*	1															
(2) *NI*	0.179*	1														
(3) *Δ NI*	0.084	0.293*	1													
(4) *FVA*	0.231*	−0.036	0.078	1												
(5) *CLOSE*	−0.193*	−0.240*	−0.168*	−0.154*	1											
(6) *DEFAULT*	−0.138*	−0.054	−0.064	−0.067	−0.092	1										
(7) *VOLAT*	−0.127*	−0.212*	0.037	−0.174*	0.241*	0.132*	1									
(8) *MTB*	−0.017	−0.043	0.011	0.149*	−0.106*	−0.014	−0.069	1								
(9) *LnMVE*	0.044	0.033	0.181*	0.264*	−0.457*	−0.133*	−0.382*	0.144*	1							
(10) *CFO*	0.123*	−0.025	0.148*	0.305*	−0.218*	0.057	−0.188*	0.019	0.406*	1						
(11) *FVIP*	−0.116*	−0.100*	−0.238*	−0.538*	0.281*	0.043	0.287*	−0.156*	−0.478*	−0.406*	1					
(12) *LnTA*	0.002	0.007	0.119*	0.078	−0.368*	−0.126*	−0.291*	−0.004	0.928*	0.366*	−0.249*	1				
(13) *LIQUID*	0.024	0.190*	−0.017	−0.037	0.122*	−0.059	0.017	−0.054	−0.201*	−0.049	−0.080	−0.217*	1			
(14) *Z_Score*	0.189*	0.346*	0.132*	0.192*	−0.394*	−0.056	−0.257*	−0.042	0.270*	0.207*	−0.365*	0.175*	0.295*	1		
(15) *INDEX*	0.349*	0.109*	0.077	0.238*	−0.218*	−0.136*	−0.199*	0.088	0.036	−0.121*	−0.074	−0.047	0.019	0.059	1	
(16) *GVSCORE*	0.052	0.086	0.039	0.023	−0.245*	−0.194*	−0.285*	0.119*	0.595*	0.181*	−0.088	0.615*	−0.179*	0.175*	0.046	1
VIF		1.59	1.26	1.59	1.83	1.18	1.95	1.11	2.60	1.55	1.45	2.11	1.31	1.43	8.10	1.73

* represents significance level at <0.05. Variables are defined in the Appendix.
*, ** and *** represent significance levels of 0.10, 0.05 and 0.01, respectively. Variables are defined in the Appendix.

Results

Descriptive statistics

Table 3 provides descriptive statistics for the main regression variables.[11] In Panel A, the mean and median values of *RETURN* (mean = 0.094 and median = 0.112) show that firms experience positive buy-and-hold returns during the sample period. The median *FVA* is 0.028. Untabulated results show that out of 445 firm-years, upwards adjustments were made in 369 firm-years, representing 83 percent of the sample. The upwards adjustment, on average, is about 48.70 million (untabulated), which is economically significant as it represents 42 percent of the average pre-adjusted net income of AUD 117 million. The results of two sample *t* test reveal that, on average, firms at high risk of violation (*CLOSE* = 1) have relatively lower stock return (*RETURN*), report less earnings before FV adjustments (*NI*), experience greater volatility in stock returns (*VOLAT*), are smaller in size (*LnMVE, LnTA*), report less cashflow from operations (*CFO*), have larger investment properties (*FVIP*), have lower Z scores (*Z_Score*), and operate with weaker governance mechanisms (*GVSCORE*). In Panel B, we report that 31 percent of the firm-years are classified as '*CLOSÉ* firms, 12 percent as *CLOSE_GEAR* and 28 percent as *CLOSE_COV*. About 70 percent of *CLOSE_GEAR* firms also have *CLOSE_COV* (untabulated), indicating that highly leveraged firms have relatively lower coverage for interest expenses. Panel C presents the Pearson correlation coefficients for the test variables. Overall, the variance inflation factor (VIF) for each explanatory variable is less than 10, which indicates that multicollinearity does not pose a serious problem for the analysis.

Regression results

Value relevance of fair value adjustments

The result from estimating model (1) is presented in Table 4. The result shows a positive association between *FVA* and *RETURN*, indicating that FV adjustments to investment properties are value relevant. This is in line with the findings of Israeli (2015) and Bandyopadhyay et al. (2017). The coefficient for *FVA* of 0.166 is higher than the coefficients for *NI* (0.121), meaning that stock returns are associated more with FV adjustments than with earnings excluding FV adjustments. The overall fit, as measured by the adjusted R^2, is 29.3 percent, which is consistent with the adjusted R^2 documented by Israeli (2015) and Bandyopadhyay et al. (2017).

Impact of covenant violation concern on managerial bias and market valuation of fair value adjustments

Table 5 reports the results for model (2). We report a positive and significant coefficient for *CLOSE* (coefficient = 0.085, t-stat = 3.079), indicating that real estate firms closer to the covenant thresholds report more (less) unrealised gains (losses). To further analyse the *CLOSE* firms, we extend Model (2), subdividing the sample into firms closer to the gearing thresholds (*CLOSE_GEAR = 1*) and firms closer to the interest coverage thresholds *(CLOSE_COV = 1)*. Our results show that the significant positive association holds for real estate firms closer to interest coverage thresholds, but not for those closer to the gearing thresholds. This indicates that managers are more inclined to use FV discretion deliberately when firms face a high risk of breaching the interest coverage threshold, potentially to boost the earnings and avoid the cost of violation.

However, we find no significant coefficient estimate for *DEFAULT* across the models. We tracked the *DEFAULT* firms to observe if there was any pattern in the reporting of FV adjustments in the pre- and post-violation years. We find that, out of the eight firms in this subgroup, in the year before the violation, 6 firms (75 percent), and after violation, 4 firms (50 percent), reported upward FV adjustments. Interestingly, 75 percent of *DEFAULT* firms made either no adjustments (4 out of 8) or downward adjustments (2 out of 8) in the year of violation. This indicates that either the *DEFAULT* firms exhausted the opportunity for upward adjustment in the pre-violation years or the violation of the covenants could not have been averted even if the firms had made upward adjustments in the violation year.

We further note that firms exposed to larger investment properties (*FVIP*) tend to report fewer upward adjustments. The negative coefficient estimate for *LOSS* suggests that poorly performing real estate firms are more (less) likely to report downward (upward) adjustments, suggesting a potential for taking a big bath using the discretionary option during the business downturns (e.g., Barth et al., 2017). The adjusted R^2 is 45.6 percent in Model (2), and this is higher than the adjusted R^2 reported in previous studies (e.g., Robinson et al., 2018, report an adjusted R^2 of 20 percent).

The result from estimating model (3) is presented in Table 6. The coefficient of *FVA* remains significantly positive at p-value < 0.01 across models, suggesting the informativeness of the FV adjustments. The coefficients for *CLOSE* × *FVA* (coefficient = −0.354, t-stat = −2.791) and *DEFAULT* × *FVA* (coefficient = −0.931, t-stat = −2.454) in model (3) are negative and significant, and imply that investors perceive greater concerns over faithful representation for *CLOSE* and *DEFAULT* than for *FAR* firms.[12] The higher coefficient of *DEFAULT* × *FVA* than the coefficient of *CLOSE* × *FVA* indicates that firms in technical default are the biggest concern for investors. Further, we examine the moderating influence of closeness to the gearing and interest coverage thresholds separately on the pricing discount of FV adjustments with the extended model (3). The coefficients for *CLOSE_GEAR* × *FVA* (coefficient = −0.287, t-stat =

[11] All continuous variables are winsorised at the 1 percent and the 99 percent levels.

[12] We undertook Propensity Score Matching (PSM) analysis for treatment (*CLOSE* and *DEFAULT* firms) and control (*FAR* firms) groups to check the robustness of the results. Since the sub-sample of firms at high risk of violation is small, applying the PSM to match left us with too few cases (i.e., only 38 matches) and low degrees of freedom for a robust analysis. Yet, we find an incremental discount on the FV adjustments for firms closer to covenant violation (*CLOSE* =1).

Table 4
Regression results-value relevance of FV adjustments.

DEP = *RETURN*	Pred.	Model (1)	
		Coeff	*t-stat*
Intercept		0.514***	2.696
NI		0.121**	2.171
Δ *NI*		0.000***	3.070
FVA	+	0.166***	2.940
VOLAT		−0.209	−0.950
MTB		−0.003	−0.335
LnMVE		−0.024***	−2.832
LOSS		−0.137***	−3.243
CFO		0.115*	1.703
Z_Score		0.011	1.456
INDEX		1.423*	1.762
GVSCORE		0.023	1.244
Year fixed effects		Yes	
N		445	
Adjusted R^2		0.293	
F-stat		9.365***	

*, ** and *** represent significance levels of 0.10, 0.05 and 0.01, respectively. Variables are defined in the Appendix.

Table 5
Regression of FV adjustments on real estate firms at high risk of borrowing covenant violation and in technical default.

DEP = *FVA*	Pred.	Model (2)		Extended Model (2)	
		Coeff	*t-stat*	*Coeff*	*t-stat*
Intercept		0.430**	2.540	0.479***	2.855
NI		−0.198***	−4.833	−0.189***	−4.608
CLOSE	+/-	0.085***	3.079		
CLOSE_GEAR				−0.033	−0.947
CLOSE_COV				0.105***	3.723
DEFAULT	+/-	0.025	0.318	−0.055	−0.716
FVIP		−0.032***	−10.402	−0.034***	−10.774
LIQUID		−0.008	−1.433	−0.009	−1.553
MTB		0.008	1.272	0.009	1.451
LnTA		−0.021***	−2.825	−0.023***	−3.060
LOSS		−0.279***	−8.734	−0.291***	−8.984
CFO		0.227***	4.410	0.207***	3.917
Z_Score		0.006	0.941	0.003	0.489
INDEX		0.976***	3.902	0.923***	3.706
GVSCORE		0.006	0.432	0.006	0.401
Year fixed effects		Yes		Yes	
N		445		445	
Adjusted R^2		0.456		0.461	
F-stat		32.02***		30.18***	

*, ** and *** represent significance levels of 0.10, 0.05 and 0.01, respectively. Variables are defined in the Appendix.

−2.604) and *CLOSE_COV* × *FVA* (coefficient = −0.233, t-stat = −1.764) are negative and significant, suggesting that faithful representation concerns persist for both firms, i.e., firms closer to gearing thresholds and firms closer to coverage thresholds, irrespective of managers' intentional use of FV adjustments.

Thus, we provide evidence that managers report higher (lower) levels of unrealised gains (losses) in earnings from Level 3 properties when firms are at high risk of violating interest coverage thresholds. However, the managerial bias is not significant for firms closer to the gearing thresholds and for firms experiencing technical default. Our value relevance tests show that investors incrementally discount FV adjustments of firms that are closer to breaching gearing or interest coverage thresholds (*CLOSE*), as well as *DEFAULT* firms, in contrast to *FAR* firms. This suggests that perceived managerial opportunism drives valuation discounts on adjustments to Level 3 properties, regardless of managers engaging in manipulation or not.

Table 6
Influence of investors' concerns about borrowing covenant violation on the market valuation of FV adjustments.

DEP = *RETURN*	Pred.	Model (3)		Extended Model (3)	
		Coeff	*Coeff*	*Coeff*	*t-stat*
Intercept		0.638***	3.186	0.502**	2.558
NI		0.163***	2.846	0.168***	2.848
Δ *NI*		0.000***	3.319	−0.001	−0.037
FVA		0.483***	3.954	0.453***	3.882
CLOSE		−0.029	−0.826		
CLOSE × *FVA*	+/-	−0.354***	−2.791		
CLOSE_GEAR				−0.020	−0.468
CLOSE_GEAR × *FVA*				−0.287***	−2.604
CLOSE_COV				0.003	0.085
CLOSE_COV × *FVA*				−0.233*	−1.764
DEFAULT		−0.282**	−2.572	−0.262**	−2.450
DEFAULT × *FVA*	+/-	−0.931**	−2.454	−0.870**	−2.348
VOLAT		−0.232	−1.065	−0.149	−0.681
MTB		−0.003	−0.397	0.002	0.274
LnMVE		−0.029***	−3.199	−0.023***	−2.627
LOSS		−0.113***	−2.617	−0.126***	−2.964
CFO		0.068	0.978	0.145**	2.019
Z_Score		0.012	1.553	0.016**	2.009
INDEX		1.118	1.394	1.093	1.392
GVSCORE		0.019	1.050	0.016	0.876
Year fixed effects		Yes		Yes	
N		445		445	
Adjusted R^2		0.312		0.303	
F-stat		8.759***		7.882***	

*, ** and *** represent significance levels of 0.10, 0.05 and 0.01, respectively. Variables are defined in the Appendix.

Robustness tests

Results excluding 2008 financial crisis year

In the aftermath of the 2008 global financial crisis, researchers debated the role of FV accounting in deepening the crisis (Barth & Landsman, 2010; Haswell & Evans, 2018; Menicucci & Paolucci, 2016). Several studies argued that FV accounting might have worsened the financial crisis by injecting excessive volatility and fragility into the financial markets (Laux & Leuz, 2010; Penman, 2007). Nonetheless, most studies find little or no direct evidence supporting this notion (Barth & Landsman, 2010; Laux & Leuz, 2010). Further, studies show that the value relevance of FV changes in a period of economic turmoil. For example, for European financial institutions, Liao et al. (2021) report that FV is relatively more value relevant than historical costs during financial crisis, but not before. Based on a sample of US banks, Goh et al. (2015) show that the discount on Level 3 financial instruments documented by Song et al. (2010) during the first three quarters of 2008 does not remain significant when the market conditions stabilise.

In assessing whether our results are driven by the financial crisis year, we repeated the regression analyses by excluding data for 2008. Table 7 presents the regression results. We find that all the findings remain qualitatively similar even after excluding 2008.

Price model

To ensure the robustness of our results,[13] we use the modified Ohlson (1995) model and examine the value relevance of FV adjustments (Aboody et al., 1999; Barth et al., 1996; Song et al., 2010). In model (4) $PRICE_{it}$ is the closing share price on the date the firm's annual report is announced. We deconstruct the earnings into current period FV adjustments (FVA_{it}^{*}) and earnings before FV adjustments (NI_{it}^{*}), and the year-end total assets into FV of investment properties ($FVIP^{*}$) and total assets excluding investment properties (TA) (e.g., Bandyopadhyay et al., 2017; Israeli, 2015). TL is the year-end total liabilities. All the independent variables are deflated by the number of shares outstanding. Thus, we estimate the following model:

[13] Additionally, following Israeli (2015), we examined whether earnings (exclusive of FV adjustments) and FV adjustment can predict future cash flow from operations. Consistent with Israeli (2015), we find earnings are significantly positively related to changes in cash flow from operations one and two-years ahead. However, contrary to the results of Israeli (2015), we find a statistically insignificant positive association between FV adjustments (FVA_{it}) and changes in cash flow from operations (ΔCFO_{it+1} and ΔCFO_{it+2}) one and two-years ahead. In fact, ΔCFO_{it+1} and FVA_{it} move in opposite directions in 2009, 2013, 2015, 2017 and 2018. A closer look at the financial statements reveals that the largest source of operating cash flow in the real estate sector of Australia is the 'rental cash flow', which comes predominantly from commercial/industrial properties. Statistics show that the change in rents did not keep pace with the change in property prices in Australia in the last decade (source: https://www.commercialpropertyguide.com.au; accessed: July 2023). This potentially explains the insignificant, positive association between ΔCFO_{it+1} and FVA_{it} in our setting.

Table 7
Results excluding 2008 financial crisis year.

Panel A: FV adjustments regressed on firms at high risk of borrowing covenant violation		
DEP = *FVA*	Model (2)	
	Coeff	*t-stat*
Intercept	0.411**	2.305
NI	−0.181***	−4.282
CLOSE	0.087***	3.026
DEFAULT	0.061	0.712
FVIP	−0.031***	−9.986
LIQUID	−0.008	−1.436
MTB	0.008	1.254
LnTA	−0.022***	−2.787
LOSS	−0.284***	−8.315
CFO	0.239***	4.490
Z_Score	0.007	0.936
INDEX	1.249***	4.029
GVSCORE	0.006	0.409
Year fixed effects	Yes	
N	420	
Adjusted R^2	0.465	
F-stat	31.36***	

Panel B: Influence of covenant violation concerns on the market valuation of FV adjustments				
DEP=*RETURN*	Model (1)		Model (3)	
	Coeff	*t-stat*	*Coeff*	*t-stat*
Intercept	0.572***	3.035	0.684***	3.454
NI	0.122**	2.239	0.156***	2.785
Δ NI	0.000***	3.186	0.000***	3.424
FVA	0.171***	3.151	0.440***	3.734
CLOSE			−0.026	−0.749
CLOSE ×FVA			−0.297**	−2.428
DEFAULT			−0.285**	−2.478
DEFAULT×FVA			−0.881**	−2.369
VOLAT	−0.251	−1.062	−0.333	−1.421
MTB	0.001	0.102	0.000	0.007
LnMVE	−0.027***	−3.154	−0.030***	−3.431
LOSS	−0.167***	−4.002	−0.144***	−3.340
CFO	0.172***	2.620	0.122*	1.817
Z_Score	0.010	1.294	0.010	1.343
INDEX	1.371*	1.775	1.106	1.438
GVSCORE	0.028	1.570	0.023	1.290
Year fixed effects	Yes		Yes	
N	420		420	
Adjusted R^2	0.224		0.241	
F-stat	6.744***		6.323***	

This table presents regression estimates after excluding the data for 2008. *, ** and *** represent significance levels of 0.10, 0.05 and 0.01, respectively. Variables are defined in the Appendix.

$$PRICE_{it} = \beta_0 + \beta_1 NI_{it}^{*} + \beta_2 FVA_{it}^{*} + \beta_3 TA_{it} + \beta_4 FVIP_{it}^{*} + \beta_5 TL_{it} + \beta_6 Z\_Score_{it} + \beta_7 INDEX_{it} + \beta_8 GVSCORE_{it} + Yearfixedeffects + \varepsilon_{it} \quad \textbf{(4)}$$

To test whether investors differentially price Level 3 FV adjustments among firms at high risk of violation or that have violated borrowing covenants relative to firms far from violation, we use the following regression model:

$$PRICE_{it} = \beta_0 + \beta_1 NI_{it}^{*} + \beta_2 FVA_{it}^{*} + \beta_3 CLOSE_{it} + \beta_4 CLOSE_{it} \times FVA_{it}^{*} + \beta_5 DEFAULT_{it} + \beta_6 DEFAULT_{it} \times FVA_{it}^{*} + \beta_7 TA_{it} + \beta_{10} FVIP_{it}^{*} + \beta_{11} TL_{it} + \beta_{12} Z\_Score_{it} + \beta_{13} INDEX_{it} + \beta_{14} GVSCORE_{it} + Yearfixedeffects + \varepsilon_{it} \quad (5)$$

Table 8 reports the regression results. We find that FVA^{*} is significantly positively associated with *PRICE* across the models, confirming the value relevance of FV adjustments. Model 5 reports that investors' pricing of FV adjustments is significantly lower for CLOSE firms and DEFAULT firms relative to FAR firms, confirming our previous results. Thus, our findings are consistent across the price and return models.

Table 8
Price model: Influence of covenant violation concerns on the market valuation of FV adjustments.

DEP = *PRICE*	Model (4)		Model (5)	
	Coeff	*t-stat*	*Coeff*	*t-stat*
Intercept	−0.961	−1.111	0.162	0.191
*NI**	0.155	0.645	−0.114	−0.490
*FVA**	0.269***	3.424	3.326***	4.938
CLOSE			−0.970***	−3.213
CLOSE × *FVA**			−3.028***	−4.481
DEFAULT			−1.049	−1.087
DEFAULT × *FVA**			−3.318***	4.878
TA	0.435***	14.302	0.449***	15.417
*FVIP**	0.048***	4.916	0.044***	4.675
TL	0.033***	3.509	0.033***	3.589
Z_Score	0.408***	5.740	0.310***	4.320
INDEX	34.071***	4.250	23.776***	2.987
GVSCORE	0.643***	4.546	0.476***	3.403
Year fixed effects	Yes		Yes	
N	445		445	
Adjusted R^2	0.912		0.920	
F-stat	243.0***		223.9***	

This table reports the regression results using price model. *, ** and *** represent significance levels of 0.10, 0.05 and 0.01, respectively. Variables are defined in the Appendix.

An alternative measure of CLOSE firms

To test the robustness of the results for *CLOSE* firms, following previous studies (Aboody et al., 1999; Christensen & Nikolaev, 2013; Kallapur & Kwan, 2004), we divide the firms based on the sample's median *GEARING* and median *COVERAGE* ratios. *HIGH_GEAR* is an indicator variable equal to 1 if the *GEARING* is above the sample median, otherwise 0; and *LOW_COV* is an indicator variable equal to 1 if the *COVERAGE* is below the sample median, otherwise 0. Table 9 Panel A reports the regression results for model (2) and Panel B reports the results for model (3), with *HIGH_GEAR* and *LOW_COV* added as the variables of interest. Consistent with our main results, Panel A shows a significant positive coefficient of *HIGH_COV*, indicating reporting of more (less) upward (downward) FV adjustments by firms that have relatively lower coverage for interest expenses. Furthermore, in Panel B, we find that investors pricing of FV adjustments is significantly lower among real estate firms with above-median gearing ratio (*HIGH_GEAR* × *FVA* = −0.393; t-stat = −3.554) and firms with below-median coverage for interest expenses (*LOW_COV* × *FVA* = −0.370; t-stat = −1.820). This is consistent with the previous results and provides further support for the findings of managerial bias in low-covered firms, and market discounting on FV adjustments for *CLOSE* firms.

Additional analysis

Influence of governance mechanism

The role of corporate governance is critical because it monitors the exercise of accounting discretion (Bowen et al., 2008; Kabir & Rahman, 2016), limits opportunistic behaviour by managers (Nazir & Afza, 2018), and increases the reliability of FV estimates (Habib & Azim, 2008; Siekkinen, 2017; Song et al., 2010). Monitoring by the board of directors and audit committee is expected to restrain managers from making biased decisions in difficult situations and to reduce measurement uncertainty, initiating increased trust in Level 3 FV estimates. For example, Song et al. (2010) find that as the strength of governance increases, investors' valuation of Level 3 FV assets goes up. Siekkinen (2017) reports board characteristics such as board independence and gender diversity are positively associated with the information quality of Level 3 estimates. In a similar vein, Huang et al. (2016) show that stronger corporate governance mitigates the positive relationship between Level 3 FV assets and the cost of equity capital. As per Kanagaretnam et al. (2009) and Lee and Park (2013), the discretionary items of clients of the Big 4 accounting firms contain greater information content to explain stock returns relative to non-Big 4 clients. For Chinese firms, Hsu and Wu (2019) find that firms which recognise investment property at FV experience an increase in crash risk, but this association is weaker if firms have strong corporate governance.

We extend the finding of a positive association between corporate governance and the informativeness of Level 3 FVs into the area of debt contracting reasons and examine whether managerial bias in reporting, and investors' discount on pricing Level 3 FV adjustments among firms closer to violating borrowing covenants is contingent upon the relative strength of corporate governance. Following prior studies, we focus on board characteristics (e.g., independence, real estate expertise, gender diversity, risk committee), audit committee characteristics (e.g., real estate expertise, accounting expertise, number of meetings) and auditor independence (Big 4) to construct our governance index.

We develop a governance score (*GVSCORE*) based on the principal component factor analysis of eight major board variables to mitigate the measurement error of individual variables and to avoid potential multicollinearity problems, (e.g., Huang et al., 2016; Siekkinen, 2017; Song et al., 2010). The eight variables analysed are: (i) Board independence (*INDDIR*); (ii) Board real estate expertise

Table 9
Alternative measure of *CLOSE* firms: Above (below) median gearing (interest coverage).

Panel A: FV adjustments regressed on real estate firms with above median gearing and interest coverage ratios		
DEP = *FVA*	Extended Model (2)	
	Coeff	*t-stat*
Intercept	0.449**	2.522
NI	−0.207***	−5.063
HIGH_GEAR	0.009	0.366
HIGH_COV	0.058**	2.380
DEFAULT	−0.027	−0.346
FVIP	−0.033***	10.450
LIQUID	−0.006	−1.175
MTB	0.005	0.737
LnTA	−0.022***	−2.836
LOSS	−0.269***	−8.432
CFO	0.211***	4.073
Z_Score	0.006	0.785
INDEX	0.945***	3.768
GVSCORE	0.005	0.311
Year fixed effects	Yes	
N	445	
Adjusted R^2	0.451	
F-stat	29.09***	
Panel B: Influence of investor concerns for firms with above median gearing and interest coverage ratios		
DEP=*RETURN*	Extended Model (3)	
	Coeff	*t-stat*
Intercept	0.563***	2.710
NI	0.154***	2.654
Δ *NI*	0.001	0.041
FVA	0.774***	3.995
HIGH_GEAR	−0.018	−0.599
HIGH_GEAR×FVA	−0.393***	−3.554
LOW_COV	−0.013	−0.410
LOW_COV×FVA	−0.370*	−1.820
DEFAULT	−0.257**	−2.403
DEFAULT×FVA	−0.530	−1.466
VOLAT	−0.194	−0.868
MTB	0.003	0.389
LnMVE	−0.025***	−2.627
LOSS	−0.121***	−2.864
CFO	0.081	1.171
Z_Score	0.013	1.562
INDEX	1.073	1.337
GVSCORE	0.016	0.889
Year fixed effects	Yes	
N	445	
Adjusted R^2	0.318	
F-stat	8.382***	

This table reports the regression results based on alternative measure of CLOSE firms. *, ** and *** represent significance levels of 0.10, 0.05 and 0.01, respectively. Variables are defined in the Appendix.

(*REXP_INDDIR)*; (iii) audit committee real estate expertise (*REXP_AUD)*; (iv) audit committee accounting expertise (*ACEXP*); (v) number of annual audit committee meetings *(ACTIVITY)*; (vi) gender diversity (*GENDER*); (vii) risk committee *(RISK)*; and (viii) appointment of Big 4 audit firm (*BIG4*). Variables are defined in section 4.3.

Descriptive statistics of the board variables are presented in Panel A of Table 10. The average board independence is 0.56, suggesting that 56 percent of the board members are independent members. On average, 21 percent of the independent board members and 32 percent of the audit committee members respectively have expertise in the property sector. For 71 percent of the firm-years, the audit committee includes at least one professional accountant member. Roughly 14 percent of the board members are female, and 86 percent are male. Eighteen sample firms (33 percent) did not appoint any female board member during 2007–2019 (untabulated). Audit committees meet on average four times per year, with the range being from 0 to 17 times; 61 percent of the firms have a risk committee. Finally, around 76 percent of the real estate firms are audited by Big 4 auditors.

Table 10
Descriptive statistics of corporate governance variables.

Panel A: Descriptive statistics

Variable	N	Mean	SD
INDDIR	445	0.56	0.24
REXP_INDDIR	445	0.21	0.18
REXP_AUD	445	0.32	0.26
ACEXP	445	0.71	0.46
ACTIVITY	445	3.99	2.45
GENDER	445	0.14	0.14
RISK	445	0.61	0.49
BIG4	445	0.76	0.43

Panel B: Correlations

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
(1) INDDIR	1							
(2) REXP_INDDIR	0.307*	1						
(3) REXP_AUD	0.101*	0.563*	1					
(4) ACEXP	0.132*	0.062	0.089	1				
(5) ACTIVITY	0.322*	0.282*	0.384*	0.243*	1			
(6) GENDER	0.253*	0.046	0.012	0.087	0.321*	1		
(7) RISK	0.322*	0.139*	0.147*	0.311*	0.474*	0.559*	1	
(8) BIG4	0.359*	0.125*	0.076	0.193*	0.236*	0.154*	0.341*	1

Panel C: Governance factor score analysis and sample adequacy

Variables	Factor Loading Coefficients	Kaiser-Meyer-Olkin Measure of Sampling Adequacy
INDDIR	0.17	0.71
REXP_INDDIR	0.17	0.59
REXP_AUD	0.16	0.56
ACEXP	0.08	0.73
ACTIVITY	0.23	0.79
GENDER	0.14	0.64
RISK	0.34	0.69
BIG4	0.12	0.76
Variation Explained	81%	Mean KMO= 0.68
Eigenvalue	2.08	

Panel D: Descriptive statistics of governance factor score

	GVSCORE
N	444
Median	0.18
SD	0.88
Min	−2.07
75th	0.66
Max	2.51

This table reports the descriptive statistics for the governance variables and governance factor score. Panel A reports the descriptive statistics for eight board variables. Panel B reports the correlation matrix. Panel C reports the factor loading coefficients of the governance variables based on varimax orthogonal rotation. Panel D shows the distribution of *GVSCORE*. * represents significance level at < 0.05. Variables are defined in the Appendix.

The correlation matrix presented in Panel B shows that firms with more independent boards tend to have higher board diversity, have a more active audit committee, have property experts and accounting experts, and are more likely to form a risk committee and appoint Big 4 auditors. The audit committee's real estate expertise is positively related to it being a more active committee and having a risk committee. The gender variable is positively correlated with a highly active audit committee, the appointment of a risk committee and engaging Big 4 auditors. Furthermore, firms with more frequent audit committee activity are more likely to have a risk committee, an accounting expert within the audit committee and engage Big 4 auditors. Overall, the board variables in this study are highly correlated.

Panel C presents the factor-loading coefficients of the eight variables based on varimax orthogonal rotation. The eigenvalue is 2.08, and 81 percent of variations in the eight variables are explained by this governance factor score. The Kaiser–Meyer–Olkin value approximates 0.68, indicating that our governance score is statistically representative of the common characteristics of the eight governance variables (Stewart, 1981). Panel D shows the distribution of *GVSCORE*. The median value of *GVSCORE* is 0.18.

In Table 11, we separately test models (2) and (3) with *CGI* added as an interaction variable to examine whether investors' concern about managerial bias varies between stronger governance and weaker governance sub-samples. *CGI* is a dummy variable that equals 1 if the *GVSCORE* is above the median score of 0.18 (stronger governance sub-sample) and 0 otherwise (weaker governance sub-sample).

Table 11
Influence of Corporate Governance.

Panel A: Impact of corporate governance factors on the managerial bias in firms at high risk of covenant violation

DEP = *FVA*	Extended Model (2)	
	Coeff	*t-stat*
Intercept	0.402**	2.486
NI	−0.193***	−4.698
CGI	0.020	0.711
CLOSE	0.103***	2.878
CGI × *CLOSE*	−0.039	−0.864
DEFAULT	0.028	0.360
FVIP	−0.032***	−10.419
LIQUID	−0.008	−1.415
MTB	0.008	1.323
LnTA	−0.021***	−2.747
LOSS	−0.278***	−8.688
CFO	0.236***	4.504
Z_Score	0.007	1.023
INDEX	0.975***	3.903
Year fixed effects	Yes	
N	445	
Adjusted R^2	0.456	
F-stat	29.59***	

Panel B: Results of regression analysis based on sub-sample of stronger versus weaker governance real estate firms - the influence of covenant violation concerns on the market valuation of FV adjustments

DEP=*RETURN*	Model (1)		Model (3)	
	CGI=1 *(t-stat)*	*CGI*=0 *(t-stat)*	*CGI*=1 *(t-stat)*	*CGI*=0 *(t-stat)*
Intercept	0.096	0.422	0.096	0.819**
	(0.497)	(1.232)	(0.470)	(2.170)
NI	0.754***	0.065	0.745***	0.116
	(4.918)	(0.791)	(4.795)	(1.351)
Δ *NI*	−0.191***	0.000**	−0.193***	0.000***
	(-3.551)	(2.250)	(-3.561)	(2.619)
FVA	0.352**	0.176**	0.484*	0.562***
	(2.406)	(2.253)	(1.966)	(3.336)
CLOSE			−0.003	−0.070
			(-0.078)	(-1.105)
CLOSE ×*FVA*			−0.160	−0.414**
			(-0.683)	(-2.337)
DEFAULT				−0.290**
				(-2.089)
DEFAULT×*FVA*				−1.002**
				(-2.093)
VOLAT	−0.430	−0.248	−0.385	−0.332
	(-1.108)	(-0.799)	(-0.969)	(-1.071)
MTB	0.002	−0.017	0.002	−0.020
	(0.414)	(-0.875)	(0.387)	(-1.013)
LnMVE	−0.003	−0.023	−0.003	−0.039**
	(-0.416)	(-1.451)	(-0.384)	(-2.279)
LOSS	0.083	−0.251***	0.081	−0.211***
	(1.548)	(-3.620)	(1.513)	(-2.935)
CFO	0.368***	0.074	0.359***	0.033
	(2.871)	(0.735)	(2.775)	(0.328)
Z_Score	0.018**	0.006	0.019**	0.008
	(2.176)	(0.493)	(2.117)	(0.568)
INDEX	0.622	2.107	0.562	1.614
	(0.822)	(1.462)	(0.730)	(1.129)
Year fixed effects	Yes	Yes	Yes	Yes
N	223	222	223	222
Adjusted R^2	0.506	0.221	0.503	0.248
F-stat	11.85***	3.987***	10.76***	3.912***

This table reports the test results for role of the strength of the governance system. None of the DEFAULT firms belong to the stronger governance sub-sample *, ** and *** represent significance levels of 0.10, 0.05 and 0.01, respectively. Variables are defined in the Appendix.

Panel A reports the regression results for model (2). We find that the coefficient estimate for *CGI* × *CLOSE* is not significant, indicating that the strength of the governance mechanism has no significant impact on the managers' intentional use of FVs closer to the violation. Panel B presents the regression results for model (1) in the first two columns and for model (3) in the following columns. Model (1) shows that FV adjustments are positively associated with the stock return, regardless of the strength of governance. However, the coefficient of the FV adjustments from the stronger governance sub-sample is higher than from the weaker governance sub-sample. Model (3) indicates that the implications of an incremental decline in valuation due to the closeness to the covenant threshold and being in technical default is significant in the weaker governance sub-sample, but not in the stronger governance sub-sample.

Overall, our results suggest that investors' faithful representation concerns about Level 3 FV adjustments due to closeness to borrowing covenant violation are more prominent in weaker monitoring environments.

Conclusion

In this study, we argue that the incentives for managers towards bias in the Level 3 FV adjustments is greater for firms that are closer to violating or have violated borrowing covenants than for firms that are far from violation, and we examine whether investors perceive a greater concern over faithful representation for these riskier adjustments and price them differentially.

Using a sample of Australian real estate firms from 2007 to 2019, first, we show that firms closer to the covenant thresholds report higher (lower) levels of unrealised gains (losses), indicating that managers use Level 3 discretion to avoid the violation of debt covenants. We further find that this intentional use of FV adjustments is predominant for firms that are closer to violating the interest coverage thresholds, and is not significant for firms closer to the gearing thresholds. One possible explanation could be that approximately 70 percent of firms closer to the gearing threshold also exhibit low interest expense coverage in our sample, enhancing the likelihood of heightened scrutiny from auditors and lenders. Consequently, managers of these firms might be more cautious about reporting excessive unrealised gains. Moreover, in the year in which the covenant violation occurred we find no evidence suggesting the intentional use of FV adjustments. This is consistent with the argument that managers are less likely to manipulate abnormal accruals in the year of the covenant violation, perhaps because managers have already adjusted as much as they could in the prior year/s to avoid violations and that no reasonable amount of manipulations in the current period would allow them to avoid violations.

The results of the value relevance tests indicate that while the FV adjustments are priced positively overall, investors incrementally apply a valuation discount for firms that are at high risk of violation or have violated their borrowing covenants, and this applies to both categories of firms, i.e., those closer to gearing thresholds and those closer to interest coverage thresholds. In additional analysis, we consider whether the discount on FV adjustments due to closeness to a borrowing covenant violation is contingent upon the strength of the corporate governance. We document that the implied incremental decrease in valuation due to covenant violation is significant in the weaker governance sub-sample, but not in the stronger governance sub-sample. Consistent with prior studies (Huang et al., 2016; Siekkinen, 2017; Song et al., 2010), this suggests that governance strength can mitigate concerns around FV adjustments arising due to the high risk of covenant violation in a real estate setting.

For investment properties, the issue of the relevance and faithful representation of FV is an ongoing debate. While the IASB mandates disclosure of the FV of investment properties, the US GAAP recommends use of the cost model and restricts any upward adjustments, fearing that mandating FV would enable a high degree of managerial discretion over financial statements and limit their relevance for decision-making. In this study, we provide evidence not only that changes in FV of investment properties are value relevant, but also that the market can see through the differences in faithful representation and are not misled by bias in managerial discretion. Findings in this study support the move towards FV reporting of the non-current asset-class, which is as yet an open question for the Financial Accounting Standards Board (FASB).

The results of this study need to be interpreted with caution due to some limitations. First, we concentrate on only two of the many possible borrowing covenants to identify the firms at high risk of violation. We do not consider the loan to value ratio, use of which is almost as common as gearing. However, considering the extensive use of gearing and coverage ratios in prior research in testing the debt covenant hypothesis (DeFond & Jiambalvo, 1994; Duh et al., 2009; Shivakumar, 2013) and the non-availability of a clear definition of loan to value and other ratios, we limit our analysis to gearing and coverage. Second, to separate out firms that are close to covenant violation, while we apply the median of the industry thresholds for gearing and coverage ratios to the entire sample, we acknowledge that using actual covenant ratio thresholds and the proximity to violation of each firm would provide a more accurate division of subsamples. However, limited disclosure on covenants by the sample firms prevented this approach. Future studies may consider exploring this. Third, because firms are not required to report covenant violation if it has been 'cured' by the filing date whereby the lender has agreed to waive the violation or a renegotiation has occurred (Dyreng et al., 2020), our close to covenant violation and far from covenant violation sub-samples may include some violation observations for firms that did not report a violation in their annual reports. Fourth, this study only addresses investors as financial statement users. It would be worthwhile for future research to focus on other stakeholders such as creditors or financial analysts. Finally, our results are based on an Australian real estate sample and might only be valid for this single industry and its regulatory environment. Moreover, the sample consists of firms that were listed as of June 2019 and, therefore, may be subject to survivorship bias. Despite these limitations, we believe our setting provides an interesting avenue for future research.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to

influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix A. Variables definition

Variables	Definition
Variables for main Analysis *(in order of appearance)*	
RETURN	Equity return measured from 3 months after year end for year t-1 to 3 months after year-end for year *t*.
NI	Earnings before fair value adjustments in period t deflated by the market value of equity at time *t-1*.
ΔNI	Annual change in earnings before fair value adjustments in period t deflated by the market value of equity at time *t-1*.
FVA	Fair value adjustments recognised in the year-end earnings, deflated by the market value of equity at time *t-1*.
VOLAT	Volatility of returns, calculated as the standard deviation of monthly returns in period *t-1*.
MTB	Ratio between the market value of equity and the book value of equity at *t-1*.
LnMVE	Natural log of the market value of equity at time *t-1*.
LOSS	One if firm reports negative net income for fiscal year *t* and zero otherwise.
CFO	Cashflow from operations in period *t*, deflated by the market value of equity at time $t-1$.
Z_Score	Altman's Z score at *t* collected from Osiris database.
INDEX	Annual percentage of property return during the fiscal year based on all assets by the Property council/IPD Australian property index obtained from MSCI's index database.
GEARING	Total borrowings divided by total assets excluding fair value adjustments to investment properties at *t*.
COVERAGE	Earnings before interest, taxes, depreciation, amortisation, and fair value adjustments divided by interest expense at *t*.
CLOSE	One if a firm-year's *GEARING* is above industry median *GEARING (*i.e., *50 %)* and/or *COVERAGE* is below industry median *COVERAGE (*i.e., *2 times)*; and zero otherwise.
CLOSE_COV	One if a firm-year's *COVERAGE* is below industry median *COVERAGE (*i.e., *2 times)*; and zero otherwise.
CLOSE_GEAR	One if a firm-year's *GEARING* is above industry median *GEARING (*i.e., *50 %)* and zero otherwise.
DEFAULT	One if a real estate firm violates borrowing covenant during the fiscal year *t* and zero otherwise.
FVIP	Fair value of investment properties exclusive of fair value adjustments in period t, deflated by market value of equity at time *t-1*.
LIQUID	Ratio of current assets to current liabilities at time *t-1*.
LnTA	Natural log of the total assets at time $t-1$.
Governance variables	
GVSCORE	Governance score based on the principal component factor analysis of eight governance variables including *INDDIR, REXP_INDDIR, REXP_AUD, ACEXP, ACTIVITY, GENDER, RISK & BIG4*.
INDDIR	Ratio of total independent directors to total directors.
REXP_INDDIR	Ratio of independent directors with real estate expertise to total directors.
REXP_AUD	Ratio of audit committee members with real estate expertise to total members in the committee.
ACEXP	One if at least one audit committee member is a professional accountant and zero otherwise.
ACTIVITY	The frequency of audit committee meetings.
GENDER	Ratio of female board members to total members in the board.
RISK	One if the firm has appointed a risk committee and zero otherwise.
BIG4	One if the auditor is a Big 4 auditor and zero otherwise.
CGI	Governance index measured as one if the *GOVSCORE* of the firm is above median *GOVSCORE* and zero otherwise.
Variables for additional analysis	
PRICE	The closing share price on the announcement date of annual report.
*NI**	Earnings before fair value adjustments to investment properties, deflated by the number of shares outstanding.
*FVA**	Fair value adjustments recognised in the end-of-year earnings, deflated by number of share outstanding.
TA	Total assets excluding fair value adjustments, deflated by number of share outstanding.
*FVIP**	Fair value of investment properties, deflated by the number of share outstanding.
TL	Total liabilities, deflated by number of share outstanding.
LOW_COV	One if a firm-year's *COVERAGE* is below sample median and zero otherwise.
HIGH_GEAR	One if a firm-year's *GEARING* is above sample median and zero otherwise.

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