# The decision usefulness of reported changes in fair values and fair value measurement-related disclosure for debtholders: evidence from Australian real estate industry

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## Abstract

**Purpose** – This paper aims to examine the information content of changes in fair values of investment property reported under international accounting standards (IAS) 40 and International Financial Reporting Standards (IFRS) 13 to debtholders. This study further examines the effect of fair value hierarchy inputs, valuer types and the quality of fair value measurement-related disclosure on the information usefulness of changes in fair value.

**Design/methodology/approach** – This paper performs a panel regression on the cost of debt capital and changes in fair value of investment properties, and fair value measurement features using data covering periods 2007–2015 from Australian real estate companies.

**Findings** – The findings suggest that changes in fair value of investment property are informative about the real estate firm's future cash flow to debtholders. Also, the findings show that the use of unobservable inputs in an active market (Level 3 inputs) and Level 2 has no different impacts on the cost of debts. Also, this paper documents that employing the directors solely in valuation may lead to a higher cost of debts. Furthermore, this paper reports that an extensive fair value disclosure appears no additional value in the debt decision.

**Originality/value** – Collectively, the findings indicate that although the use of unobservable inputs is common in the real estate sector, information on the changes of the fair value of investment properties are informative to debtholders. The findings have important implications for accounting standard setters to

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consider revisiting the IAS 40 and IFRS 13 on whether the independent valuation should be required and whether the extensive disclosure requirement is worthwhile.

**Keywords** Fair value, Cost of debt, Information content, Fair value hierarchy, Investment property, Real estate industry

**Paper type** Research paper

## 1. Introduction

This study examines the information content of changes in the fair value (hereafter, CFV) of investment property [1], reported and disclosed under the international accounting standards (IAS) investment property and the International Financial Reporting Standards (IFRS) 13 fair value measurement, for debtholders. This study is motivated by the fact that there has been scant empirical evidence regarding the information content of fair value information to debtholders in the context of the non-financial asset to support the long-standing debate on the usefulness of fair value information (Barth, 2018; He *et al.*, 2018). Specifically, we study the relationship between the CFV of investment property conditional on factors such as the choice of fair value inputs, and the choice of the valuer and the cost of debt.

Prior research on the fair value accounting and debt contexts includes Magnan *et al.* (2016), Demerjian *et al.* (2016), Wang and Zhang (2017) and Ball *et al.* (2015). These studies primarily investigate whether the extensive use of fair value accounting affects the cost of debt and whether fair value information has debt-design contractibility. The purpose of our research, however, is to investigate the information content of investment properties' value shock to debtholders. We also examine the effect of fair value features regarding the fair value hierarchy and the sources of valuers on the information-usefulness of CFV. Although, Magnan *et al.* (2016) report the effect of the fair value hierarchy on the information content of fair values in the banking industry context where liquid financial assets are primarily reported. However, investment property is illiquid due to the lack of the active market (Hilbers *et al.*, 2001; Ling and Archer, 2013), and thus, the predominant use of unobservable inputs [2] in the fair value estimates for investment properties. Hence, our study offers a shred of alternative evidence on the information content of fair value information in an illiquid asset context. Our study further explores whether a more extensive fair value disclosure improves the information content of CFV: a commonly debated question in this research stream.

Real estate items are generally the most critical balance sheet items, and debt capital raising are the most popular capital structure choice for real estate firms (Alcock *et al.*, 2014). Therefore, we select to study the effect of property value changes on the cost of debt capital in the context of the Australian real estate sector. The downward trend in the interest rate in Australia (Trading Economics, 2018) can drive the australian real estate industry (AREI) firms' leverage decision. As property holdings are the key source of debt collaterals [3], the information about property price shocks may have a significant impact on debt pricing decisions in the AREI. Therefore, these conditions make the AREI a reasonably suitable subject for studying the information content of CFV from debt market sentiment.

Using hand-collected data for the sample periods 2007–2015, we find that CFV has a statistically negative relationship with the cost of debt. Our primary results suggest that CFV is decision-useful in debt pricing as it depicts the relative desirability of the firms' properties, and hence, alleviates the information asymmetry borne by the debtholders regarding property values. We also find that the effect of the use of Level 3 inputs and Level 2 inputs in fair value measurement for an investment property on the cost of debts is not different. However, employing the stand-alone director valuation for fair value measurement introduces the higher cost of debts. Our findings further indicate that extensive fair value disclosure does not affect the cost of debt capital.

Our study should be interesting to researchers and standard-setters alike in several ways. Firstly, we enrich the value relevance research from the debtholder perspective, which is scant in the literature (Holthausen and Watts, 2001). Secondly, as Sangchan *et al.* (2020) demonstrate that auditors do not perceive Level 3 fair value as an additional risk, we further provide the insight into this argument by showing that the use of Level 3 inputs in fair value estimates is not always damaging to the information content of financial reporting. Thirdly, our findings encourage accounting standard-setters and australian securities exchange (ASX) regulatory authorities to consider requiring firms to at least use the mixed valuation approach in valuation monitoring of fair value estimates if the benefit of doing so exceeds the cost. Furthermore, this study points out that an extensive fair value disclosure appears a wasteful practice in the real estate industry where firms typically disclose information on properties' portfolio and values, which respond to the call from the International Accounting Standards Board [4].

The remainder of this paper proceeds as follows: The related literature and hypotheses development are discussed in Section 2. The research design, data and measurement description and descriptive statistics are provided in Section 3. Section 4 presents the results and discussion, while Section 5 concludes.

## 2. Literature review and hypotheses development

### *2.1 The information content of changes in the fair value on debt pricing decision-making*

According to IFRS 13, fair value valuation depends on the nature of the underlying asset. Prices of investment property, which is defined as property held for gaining rental income and/or capital appreciation should be equal to the discounted present value of expected rental income underpinned by the expected growth in income and related factors (e.g. taxes etc.) (Hilbers *et al.*, 2001). Managerially estimated values for investment properties based on the stabilised vacancy rate and contractual tenants (Born and Pyhrr, 1994; Hilbers *et al.*, 2001) seems to be fairly verifiable. As a consequence, changes in properties' values should be indicative of the relative attractiveness in the market. In other words, real estate price increases and returns are generally more indicative of portfolio management rather than adverse selection and asymmetric information is relatively low (Cooper *et al.*, 2000; Downs *et al.*, 2000).

Given that financial information is the primary verified source of inputs for capital providers, more up-to-date, transparent and accessible data can lead to the lower cost of capital (Easley and O'hara, 2004; Lambert *et al.*, 2007; Sengupta, 1998). Following the signalling theory (Ross, 1977), properties' value changes can alleviate the information-based risk by informing capital providers about the relative desirability of firms' properties: whether they are attractive to tenants and how these properties affect firms' prospects for growth. Therefore, changes in CFV could be useful information to debtholders for evaluating real estate firm's default risks. Our hypothesis is stated as follows:

*H1*. There is a negative relationship between the reported CFV of the investment and the cost of debt capital.

### *2.2 Aggregate Level 3 inputs and the information content of changes in the fair value*

The use of managements' assumptions in fair value estimates for investment property could make financial reporting more transparent, lessening capital providers' information disadvantage. In the real estate industry, Vergauwe and Gaeremynck (2018) show that firms using exclusive valuation models to estimate properties' fair values provide more accurate fair values and supply a higher level of information related to fair value measurements. Likewise, Bandyopadhyay *et al.* (2017) demonstrate that CFV of the property are informative about firms' future cash flows as it reflects managements' prospects. Barron *et al.* (2016) and Altamuro and Zhang (2013) also indicate that Level 3 fair values provide better information about firms' future performance than the Level 2 fair values. Also, the use of Level 3 inputs in fair value estimates do not increase audit risk and audit fees significantly (Sangchan *et al.*, 2020). The literature leads to the argument that the information content of CFV of investment property may not be affected by the use of the Level 3 inputs. Therefore, the non-directional hypothesis is stated as follow:

*H2*. The information content of reported CFV of investment property estimated with Level 3 inputs is not different from those estimated with Level 2 inputs.

### *2.3 The director valuation and the information content of changes in the fair value*

The reliability of fair value information depends on the valuation type (Cotter and Richardson, 2002). There are three types of valuation comprising the stand-alone director valuation, the independent valuation and the mixed valuation: the combination of the stand-alone director valuation and the independent valuation, being used in AREI (Ernst and Young, 2012). Although the stand –alone director valuation can benefit from asset-specific knowledge, having independent valuers as an extra layer of monitoring may mitigate debt holders' concern over the biased property valuations (Cotter and Richardson, 2002; Cotter, 1999). As there is no centralised market for investment properties leads to the difficulties in observing property values, banks may be concerned about the reliability of director-estimated fair values. Therefore, we posit that firms using director valuation to estimate fair values for investment property exclusively would be considered informationally biased and available information on it less decision-useful. The hypothesis is stated as follow:

*H3*. The reported change in fair value of investment properties is less information content when the valuation of investment properties is performed by the stand-alone director valuation, ceteris paribus.

### *2.4 The fair value measurement-related disclosure and the information content of changes in the fair value*

Despite the potential information overload caused by the extensive disclosure required by accounting standards (Singh and Peters, 2015), providing a greater level of aggregation of the disclosure may be desirable as such additional disclosure can help debtholders understand property valuations. In general, real estate firms use subjective and unobservable inputs to estimate the values of real estate and consequently, may possess high information-based risk. Therefore, additional disclosures required by stands for australian accounting standards board (AASB) 13 would give debtholders more detailed information for predicting the future cash flows generating by the properties' portfolio. Consequently, we hypothesise that CFV could be more decision-useful to debtholders if such values are reported by firms supplying high-quality fair value measurement-related disclosures versus firms providing low-quality disclosures. The hypothesis is stated as follow:

*H4*. The reported change in the fair value of investment properties is more information content when firms provide high-quality additional disclosures, ceteris paribus.

## 3. Research design

### 3.1 Measurement of variables

*3.1.1 Dependent variables.* The dependent variable in this study is the cost of debt (*COD*), which is estimated by dividing the reported interest expense by the average of the beginning and ending debt levels, following Minnis (2011) and Al-Hadi *et al.* (2017) [5]. Both interest expenses and debt levels are manually collected from the annual comprehensive income statement and the annual statement of financial positions, respectively. As uninformed debtholders can face information-based risk, the debtholders may compensate that risk by charging a higher cost of debt (Francis *et al.*, 2005). Therefore, interest expense represents debt-pricing decision-making made by debtholders (Kim *et al.*, 2011; Minnis, 2011).

*3.1.2 Independent variables.* The primary variable of interest in this study is the reported changes in fair values of investment property (*CFV*) measured by dividing the *CFV* by the total assets at year-end. The *CFV* and the total assets are manually obtained from the annual comprehensive income statement, and the annual statement of financial position, respectively. We then create a series of the reliability differences for the *CFV*: *LEVEL*3, *DIR_VAL* and *DISCLOSE*. *LEVEL* 3 is a dummy variable coded 1 firm use Level 3 inputs in fair value estimates for investment properties, and 0 otherwise. *DIR_VAL* is measured as a dummy variable coded 1 if fair value measurement for investment property is conducted by the director valuation stand-alone and 0 otherwise. *DISCLOSE* is a dummy variable coded 1 if firms have the sum of disclosure indices lower than the median of total samples, 0 otherwise. The fair value inputs, the valuer information, and the fair value measurement-related disclosure are manually collected from firms' annual reports.

*3.1.3 Control variables.* Following prior literature (Demerjian *et al.*, 2016; Magnan *et al.*, 2016; Minnis, 2011), a number of control variables are included in the regression equations. *SIZE* is the natural logarithm of the market value of equity at the year-end. A negative coefficient on *SIZE* is expected as the larger borrowing firms are less risky compared with that smaller size of borrowing firms (Magnan *et al.*, 2016). Working capital scaled by total assets (*WC*) is included in the model capturing liquidity (Demerjian *et al.*, 2016). Thus, a negative coefficient on *WC* is expected. *CAPINTENSE* is the capital intensity measured as the total carrying value of investment properties scaled by total assets. The negative coefficient on *CAPINTENSE* is predicted as the real estate firms with larger underlying assets is in a better position to secure debt (Bwembya, 2009).

We also included firm leverage (*LEV*) as a proxy for firms' financial risk measured as total interest-bearing liabilities scaled by total assets expecting a positive coefficient on *LEV* (Minnis, 2011; Standard and Poor's, 2018). The loan-to-value ratio (*LTV*) is measured as the mortgage amount divided by the value of the property and expected a positive association with the cost of debt (Standard and Poor's, 2018). *DISTRESS* is the distress/non-distress classification of McKeown *et al.* (1991), Hopwood *et al.* (1994) and Mutchler *et al.* (1997), categorised firms as distress firms if firms have negative working capital in the most recent year and/or a bottom-line net loss in the most recent year or both negative working capital and net loss experienced in the most recent year. The positive coefficient of *DISTRESS* is expected. *HEDGE,* which is the hedged percentage of the company's interest-bearing liabilities is included to control for the effect of hedging on the cost of debt and the negative coefficient on *HEDGE* is expected. Also, we include *INTCOV,* which is defined as the interest coverage estimated as earnings before interest and taxes divided by interest expenses for the fiscal year expecting a negative coefficient on *INTCOV* (Pittman and Fortin, 2004).

We further included *CAPRATE* represents the capitalisation rate, which is the fundamental rate of return of investment property calculated as net operating income divided by the market value of a property and obtained from firm annual reports (PropertyMetrics, 2013). Thus, we expect the negative coefficient on *CAPRATE*. *OPERATINGRISK* is included to capture the volatility of firms' operating cash flows estimated as the standard deviation of (three-year consecutive) operating cash flows. Hence, the positive coefficient on *OPERATINGRISK* is predicted. *ROA* is defined as the ratio of return on assets calculated as the ratio of the net operating income to a total value of assets predicting a negative coefficient on *ROA*, the higher profitability. *GROWTH* is measured as the market capitalisation of the firms divided by the book value of equity at the year-end. The negative association between *GROWTH* and cost of debt is predicted as debtholders would perceive firms experiencing growth as relatively less risky (Al-Hadi *et al.*, 2017; Minnis, 2011). *BIG*4 is a dummy variable coded 1 if the firm is audited by one the Big 4 firms, and 0 otherwise and is expected to be related to cost of debt negatively as *BIG*4 is commonly used to capture the audit quality (Eshleman and Guo, 2014).

We also include corporate governance variables following the findings of prior studies. We measured three corporate governance variables, namely, the existence of risk management committees (a dummy variable equal to 1 if firms have a risk management committee and 0 otherwise (*RC*), the frequency of audit committee meeting (*MEET*) and the percentage of institutional unitholders (*TOP*20). We expect a negative coefficient on corporate governance measurements. Additionally, the regression equation includes firm and year fixed effects.

### *3.2 Empirical models*

We first investigate the information content of *CFV* of investment property to debtholders (test of *H1*). In doing so, we estimate the following equation (1) and *CFV* is our variable of interest. The negative and significant coefficient on *CFV* indicates debt pricing decision-useful of the *CFV*.

$$\begin{aligned} COD_{i,t} = {} & \beta_0 + \beta_1 CFV_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 WC_{i,t} + \beta_4 CAPINTENSE_{i,t} + \beta_5 LEV_{i,t} \\ & + \beta_6 LTV_{i,t} + \beta_7 DISTRESS_{i,t} + \beta_8 HEDGE_{i,t} + \beta_9 INTCOV_{i,t} \\ & + \beta_{10} CAPRATE_{i,t} + \beta_{11} OPERATINGRISK_{i,t} + \beta_{12} ROA_{i,t} + \beta_{13} GROWTH_{i,t} \\ & + \beta_{14} BIG4_{i,t} + \beta_{15} RC_{i,t} + \beta_{16} TOP20_{i,t} + \beta_{17} MEET_{i,t} + FIRM_F X \\ & + YEAR_F X + \varepsilon_{i,t} \end{aligned} \tag{1}$$

Variable definitions are available in Appendix.

To test the difference in information content between *CFV* estimated with unobservable inputs in an active market (Level 3 inputs) and market-based inputs (Level 2 inputs) (test of *H2*), we include *LEVEL*3 variable and its interaction variable with *CFV (CFV* LEVEL*3*)*. That is, the variable of our interest is the interaction term. An insignificant coefficient on *CFV*LEVEL*3 would support *H2* as it is stated with the null hypothesis.

$$COD_{i,t} = \beta_0 + \beta_1 CFV_{i,t} + \beta_2 LEVLE3_{i,t} + \beta_3 CFV{*}LEVEL3_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 WC_{i,t} + \beta_6 CAPINTENSE_{i,t} + \beta_7 LEV_{i,t} + \beta_8 LTV_{i,t} + \beta_9 DISTRESS_{i,t} + \beta_{10} HEDGE_{i,t} + \beta_{11} INTCOV_{i,t} + \beta_{12} CAPRATE_{i,t} + \beta_{13} OPERATINGRISK_{i,t} + \beta_{14} ROA_{i,t} + \beta_{15} GROWTH_{i,t} + \beta_{16} BIG4_{i,t} + \beta_{17} RC_{i,t} + \beta_{18} TOP20_{i,t} + \beta_{19} MEET_{i,t} + FIRM_F X + YEAR_F X + \varepsilon_{i,t} \quad (2)$$

Variable definitions are available in Appendix.

We further develop a regression equation (3) to test *H3*, which hypothesise that the stand-alone director valuation will decrease the information content of *CFV*. In so doing, we include *DIR_VAL* variable and its interaction variable with *CFV (CFV*DIR_VAL)*. Thus, *CFV*DIR_VAL* captures the effect of the exclusive director valuation of the decision-usefulness of *CFV*. *H2* is evident if the coefficient on *CFV*DIR_VAL* is positive and significant.

$$COD_{i,t} = \beta_0 + \beta_1 CFV_{i,t} + \beta_2 DIR_V AL_{i,t} + \beta_3 CFV{*}DIR_V AL_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 WC_{i,t} + \beta_6 CAPINTENSE_{i,t} + \beta_7 LEV_{i,t} + \beta_8 LTV_{i,t} + \beta_9 DISTRESS_{i,t} + \beta_{10} HEDGE_{i,t} + \beta_{11} INTCOV_{i,t} + \beta_{12} CAPRATE_{i,t} + \beta_{13} OPERATINGRISK_{i,t} + \beta_{14} ROA_{i,t} + \beta_{15} GROWTH_{i,t} + \beta_{16} BIG4_{i,t} + \beta_{17} RC_{i,t} + \beta_{18} TOP20_{i,t} + \beta_{19} MEET_{i,t} + FIRM_F X + YEAR_F X + \varepsilon_{i,t} \quad (3)$$

Variable definitions are available in the Appendix.

To assess the effect of the extensive fair value measurement disclosure on the value relevance of *CFV* (test of *H4*), we use the following regression equation (4). In equation (4), we include *DISCLOSE* variable and its interaction variable with *CFV* to capture such effect. Hence, *CFV*DISCLOSE* is our focus. We also included *LEVEL3* as an additional control variable as the use of Level 3 inputs in fair value estimates affect the level of fair value measurement disclosure (Ernst and Young, 2013). *H5* is supported if the coefficient on *CFV*DISCLOSE* is significant and negative.

$$COD_{i,t} = \beta_0 + \beta_1 CFV_{i,t} + \beta_2 DISCLOSE_{i,t} + \beta_3 CFV{*}DISCLOSE_{i,t} + \beta_4 LEVEL3_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 WC_{i,t} + \beta_7 CAPINTENSE_{i,t} + \beta_8 LEV_{i,t} + \beta_9 LTV_{i,t} + \beta_{10} DISTRESS_{i,t} + \beta_{11} HEDGE_{i,t} + \beta_{12} INTCOV_{i,t} + \beta_{13} CAPRATE_{i,t} + \beta_{14} OPERATINGRISK_{i,t} + \beta_{15} ROA_{i,t} + \beta_{16} GROWTH_{i,t} + \beta_{17} BIG4_{i,t} + \beta_{18} RC_{i,t} + \beta_{19} TOP20_{i,t} + \beta_{120} MEET_{i,t} + FIRM_F X + YEAR_F X + \varepsilon_{i,t} \quad (4)$$

Variable definitions are available in the Appendix.

### 3.3 Sample selection and descriptive statistics

This study consists of all Australian real estate companies. Data covers from the period 2007 to 2015. The year 2007 is our starting sample period because (AABS) 140 (equivalent to IAS 40) was a mandatory accounting standard in 2007. We manually collected financial statement data (e.g. CFV of investment property, fair value inputs, interest expenses, etc.) and the corporate governance information from the firms' annual reports. Some market-based financial data (e.g. individual firms' market value of equity, etc.) was obtained from the DataStream. The Initial sample included a total of 84 listed companies in the AREI sector with a total of 756 firm-year observations. We then deleted 18 firm-year observations using the historical cost method. Next, we excluded 297 observations with no reported investment property values on their financial reports (e.g. developers who report properties as inventories on financial statements). We further dropped 87 firm-year observations with no required data. The final samples remained 354 observations. Table 1, Panel A, depicts the sample selection procedures.

Table 1, Panels B and C report the descriptive statistics of continuous and discontinuous variables used in tests, respectively. The *CFV* has a mean (median) value of 0.04 (0.03) with a standard deviation of 0.17. On average, 82% of the firm-year observations use Level 3

**Table 1.**
Samples and descriptive statistics

*Panel A: Sample selection*

| | Firm-years observations |
|---|---|
| Original observations | 756 |
| After excluding observations using the historical cost method | 738 |
| After excluding observations without investment property | 441 |
| After excluding observations with a missing value of variables | 354 |

*Panel B: Continuous variables used in tests*

| | Mean | SD | 0.25 | Median | 0.75 | *N* |
|---|---|---|---|---|---|---|
| *CFV* | 0.04 | 0.17 | −0.01 | 0.03 | 0.06 | 354 |
| *SIZE* | 12.60 | 2.04 | 11.01 | 12.49 | 14.00 | 354 |
| *WC* | −0.05 | 0.22 | −0.06 | 0.01 | 0.03 | 354 |
| *CAPINTENSE* | 0.70 | 0.42 | 0.49 | 0.68 | 0.89 | 354 |
| *LEV (%)* | 38.97 | 19.77 | 24.00 | 36.55 | 87.00 | 354 |
| *LTV (%)* | 56.94 | 27.23 | 37.05 | 57.81 | 75.60 | 354 |
| *HEDGE (%)* | 63.24 | 30.95 | 54.00 | 73.80 | 84.00 | 354 |
| *INTCOV* | 7.08 | 24.20 | 0.60 | 2.60 | 5.57 | 354 |
| *CAPRATE (%)* | 7.97 | 1.81 | 6.75 | 7.82 | 9.00 | 354 |
| *OPERATINGRISK* | 9.91 | 1.60 | 8.84 | 9.85 | 10.95 | 354 |
| *ROA* | 0.06 | 0.11 | 0.03 | 0.05 | 0.10 | 354 |
| *GROWTH* | 1.01 | 0.61 | 0.66 | 0.90 | 1.25 | 354 |
| *MEET* | 4.44 | 2.12 | 3.00 | 4.00 | 6.00 | 354 |
| *TOP20 (%)* | 73.65 | 18.63 | 63.16 | 76.85 | 87.71 | 354 |

*Panel C: Non-continuous variables used in tests*

| | Yes = 1 Frequency (%) | No = 0 Frequency (%) | *N* |
|---|---|---|---|
| *LEVEL3* | 291 (82%) | 63 (18%) | 354 |
| *DIR_VAL* | 147 (42%) | 207 (58%) | 354 |
| *DISCLOSE* | 148 (42%) | 206 (58%) | 354 |
| *DISTRESS* | 171 (48%) | 183 (52%) | 354 |
| *BIG4* | 261 (74%) | 93 (26%) | 354 |
| *RC* | 268 (76%) | 86 (24%) | 354 |

**Notes:** We winsorised 1% at the top and the bottom and take natural logarithm to address the normality issues for all continuous variables. See Appendix for variable definitions

Table 2.
Correlation analysis

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *COD* (1) | 1 | | | | | | | | | | | | | | | | | | | | |
| *CFV* (2) | −0.18* | 1 | | | | | | | | | | | | | | | | | | | |
| *LEVEL3* (3) | −0.01 | −0.22* | 1 | | | | | | | | | | | | | | | | | | |
| *DIR_VAL* (4) | *0.09* | 0.02 | 0.08 | 1 | | | | | | | | | | | | | | | | | |
| *DISCLOSE* (5) | −0.01 | −0.01 | 0.04 | 0.03 | 1 | | | | | | | | | | | | | | | | |
| *SIZE* (6) | −0.05 | −0.06 | ***−0.12*** | ***0.11*** | 0.19* | 1 | | | | | | | | | | | | | | | |
| *WC* (7) | *−0.09* | −0.03 | −0.06 | 0.01 | −0.15* | 0.15* | 1 | | | | | | | | | | | | | | |
| *CAPINTENSE* (8) | ***−0.12*** | 0.23* | 0.02 | 0.07 | ***0.13*** | 0.01 | −0.08 | 1 | | | | | | | | | | | | | |
| *LEV* (9) | 0.20* | −0.08 | ***0.11*** | −0.19* | −0.08 | −0.44* | −0.19* | 0.20* | 1 | | | | | | | | | | | | |
| *LTV* (10) | ***0.15*** | ***0.15*** | ***0.12*** | 0.14* | −0.04 | −0.37* | −0.19* | 0.20* | 0.89* | 1 | | | | | | | | | | | |
| *DISTRESS* (11) | ***0.14*** | ***−0.14*** | 0.02 | ***−1.16*** | −0.02 | −0.06 | −0.51* | ***0.11*** | 0.20* | 0.18* | 1 | | | | | | | | | | |
| *HEDGE* (23) | 0.05 | −0.25* | −0.05 | −0.17* | 0.17* | 0.36* | −0.01 | 0.18* | 0.07 | −0.02 | 0.04 | 1 | | | | | | | | | |
| *INTCOV* (13) | −0.26* | 0.17* | 0.05 | 0.14* | −0.04 | ***−0.12*** | *0.09* | −0.04 | −0.23* | −0.21* | −0.15* | −0.17* | 1 | | | | | | | | |
| *CAPRATE* (14) | ***−0.11*** | 0.01 | ***−0.11*** | −0.14* | 0.01 | −0.17* | −0.07 | ***−0.11*** | 0.03 | 0.03 | −0.01 | −0.24* | 0.02 | 1 | | | | | | | |
| *OPERATINGRISK* (15) | 0.08 | 0.07 | *−10* | 0.13 | −0.09 | 0.78* | 0.06 | ***−0.13*** | −0.28* | −0.25* | *0.1* | 0.35* | −0.18* | ***−0.13*** | 1 | | | | | | |
| *ROA* (16) | −0.18* | 0.31* | 0.06 | 0.26* | 0.07 | 0.01 | 0.02 | −0.08 | ***−0.11*** | −0.04 | −0.26* | −0.09 | *0.35** | −0.01 | −0.07 | 1 | | | | | |
| *GROWTH* (17) | −0.01 | 0.26* | 0.01 | 0.14* | 0.22 | 0.25* | 0.06 | −0.07 | ***−0.14*** | *−0.09* | ***−0.12*** | −0.16* | −0.02 | 0.19* | 0.07 | 0.20* | 1 | | | | |
| *BIG4* (18) | ***0.13*** | ***−0.12*** | *−0.09* | −0.08 | *0.25** | 0.44* | −0.02 | 0.14* | −0.01 | 0.01 | 0.02 | 0.46* | −0.18* | −0.08 | 0.36* | −0.08 | 0.01 | 1 | | | |
| *RC* (19) | −0.01 | −0.06 | −0.07 | **−0.01** | ***0.12*** | 0.35* | *0.08* | 0.16* | 0.01 | 0.04 | *−0.09* | *0.16** | −0.6 | *−0.11* | *0.23* | *−0.16** | *−0.09* | *0.43** | 1 | | |
| *TOP20* (20) | *−0.09* | 0.06 | *0.13* | *0.07* | *0.09* | 0.20* | 0.03 | −0.38* | −0.29* | −0.31* | −0.04 | 0.01 | 0.08 | *−0.10* | *0.18* | −0.04 | −0.04 | ***−0.10*** | −0.26* | 1 | |
| *MEET* (21) | −0.01 | ***−0.11*** | *−0.1* | 0.01 | 0.01 | 0.24* | −0.05 | 0.06 | −0.04 | −0.01 | ***0.11*** | *0.19** | ***−0.11*** | −0.03 | ***−0.14*** | ***−0.14*** | *−0.09* | *0.16** | 0.16* | 0.01 | 1 |

**Notes:** *Correlation coefficients are statistically significant at $p < 0.01$. Bold and italicised correlations are significant at $p < 0.05$. The italicised correlations are significant at $p < 0.10$. See Appendix for variable definitions inputs in fair value estimate for investment properties. About 42% of the firm-year observations use the stand-alone director valuation. Approximately 42% of the firm-year observations are categorised as high-quality fair value measurement-related disclosure.

*3.4 Correlation results*

Table 2 demonstrates the Pearson correlations of the variables in tests. The correlation between *COD* and *CFV* are negative and statistically significant. *COD* and *LEVEL3* are not statistically correlated. Correlation analysis further shows *COD* to have a positive and significant association with *DIR_VAL* (coefficient = 0.09, $p < 0.10$). Yet, the association between *COD* and *DISCLOSE* is insignificant. In addition, correlation analysis indicates that *COD* is significantly and positively associated with *LEV, LTV* and DISTRESS (coefficient = 0.20, $p < 0.01$, coefficient = 0.15, $p < 0.05$ and coefficient = 0.15, $p < 0.15$). To address the multi-collinearity issue, we also run the estimated variance inflation factor (VIF) for all fitted models in the main tests. The mean VIFs range from 2.28 to 2.42. Given that mean VIFs are less than 10, multi-collinearity is not a concern [6].

## 4. Results and discussion

Table 3 reports the multiple regression results for the four hypotheses developed in Section 3. We use *COD* as our dependent variable for all the regression models reported in Table 3.

*4.1 Information content of changes in the fair value (hypothesis 1)*

Table 3, Column (1) presents the findings of *H1*, which hypothesises that *CFV* is decision-useful to debtholders. Results indicate that *CFV* is associated with *COD* negatively and significantly (coefficient = −1.736, *t*-stat = −2.34, $p < 0.05$). As for economic significance, findings indicate that a one standard deviation increase in CFV will result in a decrease in the cost of debts by 29% ((−1.736*0.17) * 100) [7]. This suggests that *CFV* is informative about the relative desirability of firms' properties, and hence, alleviate the information –based risk to uninformed debtholders. Overall, *CFV* reveals insightful property value information and is capable of indicating the quality of collateral assets and inherent default risk, as suggested by signalling and information asymmetry assumptions. Therefore, *H1* is statistically supported.

*4.2 The incremental effect of LEVEL3 on the information content of changes in the fair value (hypothesis 2)*

Column (2) of Table 3 reports the findings of *H2* hypothesising that the information content of *CFV* measured with Level 3 inputs is not different from those measured with Level 2 inputs. The coefficient of *CFV*LEVEL3* is insignificant (coefficient = 0.631, *t*-stat = 0.42) suggesting that debtholders do not impose penalty through increasing cost of debt on Level 3 *CFV*, compared to Level 2 *CFV*. This implies that the use of Level 3 inputs does not reduce the information content of *CFV*. The additional *F*-test and likelihood ratio test (LR) test also show consistent inferences with multiple regression tests' results. Therefore, this supports *H2* [8].

*4.3 The incremental effect of DIR_VAL on the information content of changes in the fair value (hypothesis 3)*

Table 3, Column (3) demonstrates the findings of *H3*, which posits that the information content of *CFV* is moderated by the source of valuers. The interaction term: *CFV*DIR_VAL*, is the main variable of interest for the *H3*. The coefficient on *CFV* DIR_VAL* is significantly and positively correlated with *COD* (coefficient = 1.965, *t*-stat = 1.86, $p > 0.10$). The findings suggest that the information usefulness of *CFV* is decreased when fair value

| Variables | Pred. | (1) CFV | (2) Fair value inputs | (3) Valuer's choice | (4) Disclosure quality |
|---|---|---|---|---|---|
| Intercept | | 10.522*** [4.14] | 10.448*** [4.23] | 10.256*** [3.91] | 10.534*** [4.16] |
| *CFV* | – | −1.736** [−2.34] | −1.772* [−1.90] | −1.713** [−2.05] | −1.731* [−1.92] |
| *LEVEL3* | NA | | −0.801 [−1.13] | | −0.902 [−1.043] |
| *CFV*LEVEL3* | NA | | 0.631 [0.42] | | |
| *DIR_VAL* | + | | | 0.566* [1.77] | |
| *CFV* DIR_VAL* | + | | | 1.611* [1.81] | |
| *DISCLOSE* | – | | | | −0.015 [−0.04] |
| *CFV*DISCLOSE* | – | | | | −0.041 [−0.30] |
| *Control variables* | | | | | |
| *SIZE* | – | −0.051 [−0.51] | −0.075 [−0.86] | −0.107 [−0.87] | −0.16 [−1.15] |
| *WC* | – | −1.345** [−2.58] | −1.386*** [−2.65] | −1.269** [−2.46] | −1.317*** [−2.63] |
| *CAPINTENSE* | – | −0.084 [−0.58] | −0.212 [−0.48] | −0.257 [−0.56] | −0.256 [−0.57] |
| *LEV* | + | 0.106*** [3.96] | 0.105*** [3.64] | 0.104*** [4.14] | 0.104*** [3.73] |
| *LTV* | + | 0.101*** [4.17] | 0.105*** [3.93] | 0.104*** [4.30] | 0.102*** [3.95] |
| *DISTRESS* | + | 1.016** [2.39] | 0.966** [2.28] | 1.010** [2.42] | 0.924** [2.19] |
| *HEDGE* | – | −0.016* [−1.93] | −0.018* [−1.96] | −0.017** [−2.10] | −0.017* [−1.90] |
| *INTCOV* | – | −0.025*** [−3.21] | −0.026*** [−3.29] | −0.027*** [−3.50] | −0.025*** [−3.31] |
| *CAPRATE* | – | −0.361** [−2.06] | −0.378** [−2.09] | −0.361** [−2.07] | −0.363** [−2.06] |
| *OPERATINGRISK* | + | 0.470* [1.87] | 0.488* [1.89] | 0.423** [2.31] | 0.477* [1.87] |
| *ROA* | – | −0.851 [−0.47] | −0.472 [−0.25] | −0.502 [−0.28] | −0.643 [−0.35] |
| *GROWTH* | – | 0.406 [1.37] | 0.476 [1.51] | 0.434 [1.38] | 0.494 [1.55] |
| *BIG4* | – | 1.589*** [2.84] | 1.423** [2.43] | 1.401** [2.45] | 1.510** [2.54] |
| *Corporate governance measurements* | | | | | |
| *RC* | – | −0.227 [−0.28] | −0.014 [−0.02] | −0.237 [−0.28] | −0.166 [−0.19] |
| *TOP20* | – | −0.012* [−1.79] | −0.012* [−1.82] | −0.007* [−0.86] | −0.012* [−1.76] |
| *MEET* | – | 0.004 [0.24] | 0.004 [0.00] | 0.005 [0.04] | 0.003 [0.03] |
| Firm fixed effect | | Yes | Yes | Yes | Yes |
| Firm fixed effect | | Yes | Yes | Yes | Yes |
| Robust | | Yes | Yes | Yes | Yes |
| Observations | | 354 | 354 | 354 | 354 |
| Adj. $R^2$ | | 0.276 | 0.26 | 0.276 | 0.264 |
| VIF | | 2.32 | 2.42 | 2.3 | 2.28 |
| *F-test on interaction effects* | | | | | |
| LEVEL3 = 0 | | | 0.14 | | |
| DIR_VAL = 0 | | | | 3.34* | |
| DISCLOSE = 0 | | | | | 0.07 |
| *Compared to the baseline model* | | | | | |
| Incremental *F*-test | | | 0.12 | 2.39* | 0.04 |
| A likelihood ratio test | | | 0.27 | 5.16* | 0.1 |

**Notes:** *t*-statistics are reported in the parenthesis, $***p < 0.01$, $**p < 0.05$, $*p < 0.10$. Variables are defined in Appendix

**Table 3.**
Main results

estimates for investment property are conducted by stand-alone firms' directors. The *F*-test and LR test, further indicate that the decrease in the information content of *CFV* is economically significant ($p < 0.10$). This is in line with the argument that independent valuers are perceived as more reliable, and hence, the valuations conducted by such valuers are perceived as less bias and more useful accordingly, even though directors may possess entity-specific knowledge. Thus, *H3* is statistically supported.

*4.4 The incremental effect of DISCLOSE on the information content of changes in the fair value (hypothesis 4)*

Column (4) of Table 3 presents the findings regarding *H4*, which hypothesises that the CFV is more decision-useful when firms report a high quality of fair value measurement-related disclosure. The coefficient on the interactive variable, CFV*DISCLOSE, which is the variable of

**Table 4.** Robust tests concerning the choice of Capital structure

| Variables | Pred. | (1) CFV | (3) Fair value inputs | (4) Valuer's choice | (5) Disclosure quality |
|---|---|---|---|---|---|
| Intercept | | 11.843*** [3.712] | 11.882*** [5.08] | 11.289*** [4.19] | 11.778*** [4.82] |
| *CFV* | – | −1.656** [−2.22] | −1.613* [−1.75] | −1.833** [−1.96] | −1.609* [−1.72] |
| *LEVEL3* | NA | | −0.839 [−1.17] | | −0.77 [−1.20] |
| *CFV*LEVEL3* | NA | | 0.705 [0.47] | | |
| *DIR_VAL* | + | | | 0.563* [1.91] | |
| *CFV* DIRVAL* | + | | | 1.394* [1.67] | |
| *DISCLOSE* | – | | | | −0.029 [−0.05] |
| *CFV*DISCLOSE* | – | | | | −0.417 [−0.30] |
| *Control variables* | | | | | |
| *SIZE* | – | −0.111 [−0.49] | −0.1 [−0.44] | −0.104 [−0.46] | −0.111 [−0.47] |
| *WC* | – | −1.359*** [−2.57] | −1.430** [−2.72] | −1.278** [−2.45] | −1.419*** [−2.85] |
| *CAPINTENSE* | – | −0.012 [−0.23] | −0.069 [−0.60] | −0.095 [−0.27] | −0.067 [−0.13] |
| *LEV* | + | 0.105*** [3.91] | 0.106*** [3.75] | 0.107*** [4.05] | 0.107*** [3.82] |
| *LTV* | + | 0.103*** [4.15] | 0.106*** [4.09] | 0.103*** [4.26] | 0.105*** [4.09] |
| *DISTRESS* | + | 1.018** [2.41] | 1.063** [2.48] | 1.013** [2.43] | 1.062** [2.48] |
| *HEDGE* | – | −0.016* [−1.91] | −0.017** [−1.93] | −0.017** [−2.10] | −0.017* [−1.89] |
| *INTCOV* | - | −0.026*** [−3.18] | −0.026*** [−3.13] | −0.025*** [−3.06] | −0.027*** [−3.15] |
| *CAPRATE* | – | −0.363** [−2.07] | −0.385** [−2.11] | −0.390** [−2.20] | −0.380** [−2.12] |
| *OPERATIONALRISK* | + | 0.470* [1.86] | 0.491* [1.88] | 0.473* [1.86] | 0.491* [1.87] |
| *ROA* | – | −0.919 [−0.50] | −0.742 [−0.39] | −0.9 [−0.49] | −0.73 [−0.38] |
| *GROWTH* | – | 0.434 [1.28] | 0.421 [1.25] | 0.451 [1.37] | 0.417 [1.23] |
| *BIG4* | – | 1.600*** [2.78] | 1.474** [2.56] | 1.731*** [2.89] | 1.457** [2.32] |
| *IMR* | | −1.21 [−0.10] | −1.87 [−0.23] | −1.92 [−0.10] | −1.543 [−0.19] |
| *Corporate governance measurements* | | | | | |
| *RC* | – | −0.235 [−0.28] | −0.057 [−0.70] | −0.239 [−0.30] | −0.067 [−0.28] |
| *TOP20* | – | −0.006* [−1.87] | −0.011* [−1.75] | −0.012* [−1.79] | −0.010* [−1.66] |
| *MEET* | – | 0.004 [0.26] | 0.025 [0.25] | 0.02 [0.19] | 0.022 [0.22] |
| Firm fixed effect | | Yes | Yes | Yes | Yes |
| Firm fixed effect | | Yes | Yes | Yes | Yes |
| Robust | | Yes | Yes | Yes | Yes |
| Observations | | 354 | 354 | 354 | 354 |
| Adj. $R^2$ | | 0.275 | 0.269 | 0.286 | 0.272 |
| VIF | | 2.3 | 2.4 | 2.28 | 2.38 |
| *F-test on interaction effects* | | | | | |
| LEVEL3 = 0 | | | 0.13 | | |
| DIR_VAL = 0 | | | | 3.32* | |
| DISCLOSE = 0 | | | | | 0.09 |
| *Compared to the baseline model* | | | | | |
| Incremental *F*-test | | | 1.12 | 2.37* | 0.05 |
| A likelihood ratio test | | | 0.26 | 5.14* | 0.11 |

**Notes:** *t-statistics* are reported in the parenthesis, ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$. Variables are defined in Appendix interest of *H4*, is statistically insignificant. Thus, we do not find evidence to support *H4*. Our findings are consistent with Sundgren *et al.* (2018), who report that real estate firms do not benefit from providing additional disclosure under IFRS 13. This is, perhaps, because all real estate companies reveal other key factors (e.g. capitalisation rates, tenants portfolio, etc.) affecting property values. Although firms categorised in low disclosure quality group did not supply the required information (i.e. sensitivity analysis of value changes according to the input used in fair value estimates), debtholders can access other relevant indicators, and hence, can make efficient comparative analysis in assessing default risks.

*4.5 Robust tests*

*4.5.1 Hypotheses tests excluding the effect of the global financial crisis.* According to our sample periods include the onset and culmination of global financial crisis (GFC), we conduct an additional test for a sample that excludes firm-year observation from 2008 and 2009. The findings are not tabulated for the sake of brevity. The results indicate that the GFC period does not drive our results.

*4.5.2 Endogeneity concerning the choice of capital structure.* To alleviate the self-selection effect, ensuring the leverage choice is random, we conduct a robustness test using the Heckman two-stage test (Heckman, 1979). In the first stage probit model, we regress the leverage decision determinants (*LEV_HIGH*, a binary variable coded 1 for firm having *LEV* greater than the median of total samples, 0 otherwise) on *ROA*, *CAPINTENSE*, *SIZE*, *GROWTH*, *OPERATIONRISK* and *TRUST*, following Bwembya (2009). We assigned *TRUST,* which is a dummy variable coded 1 if the real estate firm is a Trust, 0 otherwise [9]. We, therefore, run the regression equations (1) to (5) including the inverse Mills ratio from the first stage as an additional control variable. The results relating endogeneity regarding the leverage decision is reported in Table 4. Findings indicate that firms' leverage decision does not alter the findings of *H1* to *H4*.

## 5. Conclusion

In this study, we examine the information usefulness of CFV of investment property in the real estate industry: an industry that generally lacks an active market. We further test the effect of fair value features (fair value hierarchal inputs, the source of valuers and disclosure quality) on the information content of CFV of investment property. Overall, using hand-collected data from Australian real estate firm covering periods 2007–2015, we report a significant negative relationship between CFV and cost of debts suggesting that CFV is useful for default risk assessment made by debtholders due to the CFV reflects firms' future cash flows generating by real estates. Our findings also indicate that the use of Level 3 inputs in fair value estimates for investment properties does not affect information-usefulness of CFV. We further find that the use of the stand-alone director valuation leads to a higher cost of debts. However, we find no evidence on the effect of the quality of disclosure quality on the cost of debts.

### Notes

1. IAS 40 defined an investment property as a property acquired through construction, purchase or lease by an entity, with the intention to earn rental income, gain from capital appreciation or both.
2. According to IFRS 13, fair value inputs are divided into three levels. The Level 1 inputs are unadjusted prices quoted in active markets for identical assets or liabilities. Level 2 inputs refer to adjusted observable market inputs, while Level 3 inputs are unobservable inputs in active markets. The level of reliability of fair values is somewhat dependent on the level of inputs used in fair value estimates.

3. Real estate companies are defined as companies that majority-own a portfolio of stabilised property and earn a significant majority of their earnings from the rental income generating from their properties (Standard and Poor's, 2018). In general, properties represent about 70% of real estate firm's total assets.
4. The IASB calls for additional evidence for a better understanding of the post-implementation effect of the IFRS 13.
5. We use average of total debt because of new debt issues may only capture incremental cost of debt while it is more appropriate to capture the total cost of debt in our study. For example, each issuance has different terms, and therefore, bear different interest rates depending on the situation. Therefore, average cost of debt might be more appropriate.
6. Marquardt (1970) uses a VIF greater than 10 as a guideline for serious multi-collinearity.
7. The economic significance is obtained by multiplying the coefficient on CFV (−1.736) by the standard deviation of CFV (0.17).
8. We further conduct a robust check of *H2* regarding the sampling timeframe. AASB 13 came into an effect in the beginning of 2013 but our sample period started in 2007. For this additional robustness, we first categorised fair values of investment properties as LEVEL 3 and scored 1 if firms use the stand-alone model estimate with managerial assumptions (MODEL_ONLY) in properties' fair value estimates, and 0 otherwise, following the definition of fair value hierarchy specified by IFRS 13and the work of Vergauwe and Gaeremynck (2018). Next, we reran the regression equation (3). We find that the inferences relating to *H3* are consistent with previous test (coefficient on CFV*MODEL_ONLY is 0.183, and insignificant; the coefficient on MODEL_ONLY is −0.728, and insignificant) (untabulated).
9. In general, Australian Real Estate Investment Trusts (AREITs) have tax benefits by being exempt from taxation as long as they distribute at least 90% of their income to their unitholders (Alcock *et al.*, 2014). As a result, AREITs have high possibility to rais external capital for their properties investment affecting their level of interest expenses.

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## Appendix

| Variables | Definitions |
|---|---|
| *INTRATE* | An interest rate estimated by dividing the reported interest expense by the average of the beginning and ending debt levels |
| *CFV* | The reported changes in fair value of investment property in the statement of comprehensive income, scaled by market value of the accounting year |
| *GAIN* | A dummy variable scored 1 if firms recognised CFV as gain, 0 otherwise |
| *LEVEL3* | A dummy variable coded 1 if firm use Level 3 inputs in fair value estimates for investment properties, 0 otherwise |
| *DIR_VAL* | A dummy variable coded 1 firm's fair value measurement is conducted by directors (the stand-alone internal valuers), 0 otherwise |
| *DISCLOSE* | A dummy variable coded 1 if firms have the sum of disclosure indices lower than the median of total samples, 0 otherwise |
| *SIZE* | The natural logarithm of the market value of equity at the year-end, obtained from DataStream |
| *WC* | Is working capital calculated as current assets minus current liabilities scaled by total assets and gathered from DataStream |
| *CAPINTENSE* | The capital intensity measured as the total values of properties scaled by total assets |
| *LEV* | Firm leverage measured as total interest bearing liabilities scaled by total assets |
| *LTV* | The loan-to-value ratio calculated as the mortgage amount divided by properties' market values |
| *DISTRESS* | The distress/non-distress classification, assigned firms as distressed companies if the firm met one of the following conditions:<br>• Negative working capital in the most recent year<br>• A bottom-line net loss in the most recent year and<br>• Both negative working capital and net loss experienced in the most recent years |
| *HEDGE* | The hedged percentage of the company's interest bearing liabilities |
| *INTCOV* | The interest coverage ratio calculated by dividing firms' earnings before interest and taxes by firms' interest expenses for the same period |
| *CAPRATE* | The capitalisation rate, which is the fundamental rate of return of investment property calculated as net operating income divided by market value of property, and obtained from firm annual reports |
| *OPERATINGRISK* | The natural log of the standard deviation of firms' three-year consecutive operating cash flows |
| *ROA* | The ratio of return on assets calculated as the ratio of net operating income to total value of assets |
| *GROWTH* | The growth opportunities measured as the market capitalisation of the firm divided by the book value of equity |
| *BIG4* | A dummy variable coded 1 for firms using Big 4 audit firm, 0 otherwise |
| *RC* | A dummy variable equal to 1 if firms have a risk management committee, 0 otherwise |
| *TOP20* | The percentage of institutional unitholders |
| *MEET* | Represents the frequency of audit committee meetings |

**Table A1.**
Variable definition

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