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THE VALUE RELEVANCE OF FAIR VALUE DISCLOSURES IN AUSTRALIAN FIRMS IN THE EXTRACTIVE INDUSTRIES

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ABSTRACT

We investigate whether fair value information is value relevant within Australian firms in the extractive industries. The Australian accounting standard on financial instruments AASB 139 Financial Instruments: Recognition and Measurement requires measurement of financial instruments based on fair values. This study provides evidence that net fair value information is value relevant. However, the significance of net fair value is limited to the recognised financial instruments and some settings. Further analysis provides evidence that the explanatory power of net fair value and the unrealised gain or loss beyond the book value and earnings valued at historical costs is very low.

Keywords: fair value, financial instruments, value relevance, incremental value, extractive industries

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INTRODUCTION

In this paper we investigate the value relevance of fair value information in the extractive industries. While there are many value relevance studies, limited studies have been documented in Australia particularly in the extractive industries. According to Deegan (2005), extractive industries refer to firms which engage in the search for natural substances of commercial value such as minerals, oil and natural gas. Sample firms for the current study include all firms in these industries. This industry has played a major role in the Australian economy where it generated exports worth more than A$30 billion between 2000 to 2002. The industry also represents approximately 25% of the listed companies on the Australian Stock Exchange (ASX). Prior studies have indicated that firms in the extractive industries extensively use derivative instruments for hedging purposes (Berkman, Bradbury, Hancock & Innes, 1997) as compared to other industries, because of the significant exploration and production risks inherent in the extractive industries. Also derivatives are used by extractive firms to underwrite and protect revenue. Prior studies do indicate the need to consider industry specific factors that may affect inferences regarding value relevance of accounting information (Simko, 1999).

Since the 1990s, studies in the United States (US) on fair value information have indicated, in general, that fair values of financial instruments and derivative financial instruments are associated with market values. The Australian accounting standard, Australian Accounting Standard Board (AASB) 1033 *Presentation and Disclosure of Financial Instruments*, defines a financial instrument as any contract that gives rise to both a financial asset of one entity and a financial liability or equity instrument of another entity. Receivables, payables, investments and convertible preference shares are examples of financial instruments. These instruments are primary instruments, which are on-balance-sheet items (Johnson & Swieringa, 1996). However, the more complex financial instruments also available are based on a contract that requires either no initial outlay or a small initial outlay from both parties to the contract (Johnson & Swieringa, 1996). These instruments are known as derivative financial instruments[1], which are not recognised on the balance sheet. However, information related to these instruments is disclosed in the notes to the financial statements. This information includes fair value information, which is also available for some of the financial instruments such as investments. The issue of reliability of fair values in decision making is one of the reasons why studies on the value relevance of fair values have been conducted.

[1] Futures contracts, swap contracts and option contracts are derivative financial instruments.

The value relevance of financial instruments has been examined extensively in the US, focusing on the use of fair value under different accounting standards. Barth (1994), Eccher, Ramesh and Thiagarajan (1996), Barth, Beaver and Landsman (1996), and M. S. Park, T. Park and Ro (1999) provide evidence on the value relevance of banks' fair value disclosures under Statement of Financial Accounting Standard (SFAS) 107 *Disclosures about Fair Value of Financial Instruments*. Simko (1999) extends this research to non-financial firms and Venkatachalam (1996) examines the implications of fair value disclosures under SFAS 119 *Disclosure about Derivative Financial Instruments and Fair Value of Financial Instruments*. The recent US study by Khurana and Kim (2003) extends the above studies by examining the validity of the hypothesis that fair value is more informative than historical cost. However, many of these studies are based on samples from the banking industry in the US and thus the findings may not be representative of other industries and jurisdictions. Therefore, research on the value relevance of financial instruments, in particular the fair value disclosures in the context of the extractive industries in Australia, provides useful information on this complex area for both Australian and international standard setters.

The purpose of this study is to determine whether fair value related financial instruments including derivative financial instruments has a higher association with equity market values of firms in the extractive industries. The findings of this study should be useful to standard setting bodies since they provide evidence on the effect of fair value on investors' decisions. In the following sections we discuss the background, the literature review and research question. Then we discuss the methodology adopted in this study, the empirical analysis and the results of the study. Finally we conclude the paper and provide some avenues for future research.

BACKGROUND

Extractive industries are defined by the International Accounting Standard Committee (IASC)[2] as: "those industries involved in finding and removing wasting natural resources located in or near the earth's crust".

These industries are involved in finding and removing natural resources that cannot be replaced such as sand, coal, oil, natural gas, sulphur, etc. The definition limits the activities by excluding extraction of minerals from seawater or from the air (IASC Steering Committee on Extractive Industries, 2000, para. 1.5).

[2] IASC released an "Issues Paper" on the extractive industries for comment in 2000.

Firms involved in the extractive industries may be involved in upstream activities, downstream activities, or both. In upstream activities, firms are exploring, finding, acquiring and developing resources (mineral reserves) up to the point the reserves are capable of being sold or used. Firms involved in refining, processing, marketing and distributing of petroleum, natural gas or mined mineral are classified as being engaged in downstream activities. However, in certain cases firms may be involved in both activities. These firms are referred to as integrated enterprises.

The uniqueness of the extractive industries, compared to other industries, comes from the exposure to potential exploration and production risks, and this is especially so for upstream activities. Firms in the extractive industries are faced with exploration risks when funds are spent to acquire the resources (mineral reserves) which may result in no commercially recoverable reserves. At the same time, these firms are exposed to the high risks of production. Production risk is the risk that the quantities produced may be different to those estimated. Beside these risks, extractive firms are also exposed to the volatility of commodity prices. These risks can cause earning volatility, which leads firms to engage in risk management.

Firms may enter into hedging transactions to fix the selling price of their resources and to protect against price fluctuations. This may take place before the resource is produced. The three most commonly used hedging instruments are forward sales, options and gold loans (IASC Steering Committee of Extractive Industries, 2000). In forward sales, firms have to commit to deliver a fixed quantity of a commodity at a fixed price on a specific date. Options allow firms to purchase a put or sell a call to establish a minimum price while retaining the ability to participate if prices rise. Firms may borrow gold and subsequently repay the loan in ounces of gold from future production.

Two studies that examine risk management practices in the extractive industries are documented in Tufano (1996) and Pincus and Rajgopal (2002). Tufano (1996) examines risk management practices in the gold mining industry. He documents that firms whose managers own more stock options managed less gold price risks, and those firms whose managers have more wealth invested in common stock manage more gold risk. Further, Tufano documents that firm risk management levels appear to be higher for firms with smaller outside block holdings and lower cash balances, and whose senior financial managers have shorter job tenures. However, the study concludes that the initial prediction of the shareholder maximisation hypothesis is not well supported by the data.

Pincus and Rajgopal (2002) examine the relation between hedging with derivatives and discretionary accrual choices, and with income smoothing within

oil and gas firms. They identify two types of industry-specific risks that affect the volatility of earnings. The risks are fluctuation in oil prices and the firm's drilling success, which require different risk management policies. Their study examines whether discretionary accrual choices and hedging with derivative instruments are used as substitute mechanisms to mitigate the impact of oil price and exploration risks on earnings volatility. They report that the extent of smoothing with abnormal accruals is not a significant determinant of the amount of hedging. However, the extent of hedging is a significant determinant of the extent of smoothing with abnormal accruals. This indicates that the more managers hedge with derivatives the less they smooth earnings with abnormal accruals.

Both studies provide evidence the significance of financial instruments, especially derivatives to the industry. Therefore, it is relevant to examine the value relevance of fair value disclosure in the industry.

Accounting Standards

The relevant accounting standard relating to financial instruments in Australia at the time of this study was AASB 1033 *Presentation and Disclosure of Financial Instruments.* The international accounting standard on financial instruments was adopted in Australia from 1 January 2005 as *AASB 139 Financial Instruments: Recognition and Measurement*.[3] This standard was issued in 1996[4] and subsequently amended in 1999 to achieve greater harmonization with the international standard, the International Accounting Standard (IAS) 32 *Financial Instruments: Disclosure and Presentation.*[5] It followed the withdrawal of an exposure draft, ED59, which attempted to introduce recognition and measurement rules for financial instruments in addition to disclosure requirements. As a result of extensive lobbying against this exposure draft, the Australian standard setters decided to defer the recognition and measurement issue until an equivalent international standard was issued.

Many derivative financial instruments are not recognised as assets and liabilities in the balance sheet and the unrealised gain or loss on these instruments is not recorded in the income statement. Therefore, firms are required to disclose information related to the instruments. This includes the objectives of holding or issuing derivative financial instruments (AASB 1033, para. 5.3). The disclosure is

[3] Several amendments to this standard have been made, with a revised standard becoming effective for reporting periods ending after 1 January 2007.

[4] The standard was based on ED65 *Presentation and Disclosure of Financial Instruments,* which was issued in 1995.

[5] Since AASB 1033 does not differ significantly from IAS 32, we refer to the relevant paragraphs of the former standard as this was current at the time of our study and formed the basis of our disclosure index.

expected to help users to understand why entities use derivatives (by explaining the risks attached to the entity), and what they plan to achieve by the use of the derivatives. In addition, firms are required to disclose information about hedge activities, if they use financial instruments to manage risk associated with anticipated future transactions.[6]

AASB 1033 paragraph 5.6 requires firms to disclose the net fair value of financial assets and liabilities, including unrecognised derivative financial instruments. The methods adopted and any significant assumptions made in determining net fair value must also be disclosed. Paragraph 5.7 requires more information when one or more financial assets are recognised at an amount in excess of their net fair value including the reasons for not reducing the carrying amount.

In addition to the above, firms are also required to disclose terms, conditions, and accounting policies adopted (paragraph 5.2), interest rate risk (paragraph 5.4), credit risk (paragraph 5.5), and commodity contracts which are regarded as financial instruments (paragraph 5.9).

LITERATURE REVIEW

Fair Value Accounting

Fair value accounting[7] has become the preferred option of accounting for financial instruments as opposed to historical cost. The major reasons for this preference are: (a) cost is not relevant or understandable, (b) measuring financial instruments at fair value is practical, (c) fair value eliminates issues which arise from using the cost method, (d) fair value is not overly different to the current practice, and (e) the benefits of fair value are obtainable at a reasonable cost (Hancock, 1996). This has led the Financial Accounting Standard Board (FASB) in the US to issue SFAS 107 *Disclosures about Fair Value of Financial Instruments* which requires firms to disclose the fair value of financial instruments. A move to fair value appears to be due to the belief that market-based information is the most relevant financial data for financial statement users.

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[6] AASB 1033 paragraph 5.8 requires firms to disclose a description of the anticipated transactions and the hedging instruments used plus the amount of any deferred or unrecognised gain or loss and the expected timing of revenue or expense recognition.

[7] AASB 1033 defines fair value as the amount for which an asset could be exchanged, or liability settled, between knowledgeable, willing parties in an arm's length transaction. The term 'fair value' is used interchangeably with mark-to-market, market value-based and market value accounting. AASB 1033, however, requires firms to provide net fair value. Throughout this paper, we use fair value and net fair value interchangeably.

The standard was amended by SFAS 119 *Disclosure about Derivative Financial Instruments and Fair Value of Financial Instruments*. However, these standards failed to provide adequate fair value information and the disclosure about derivatives has not been uniform (Feay & Abdullah, 2001). Therefore, FASB 133 was issued to overcome these problems. The disclosure of fair value information is expected to provide more useful information for users to assess the effects of derivative transactions (Rasch & Wilson, 1998).

However, critics of fair value accounting are concerned that fair value may be less reliable than historical costs since managers may use their discretion to manipulate the information (Ahmad, 2000). As a result, investors could be reluctant to base valuation decisions on these subjective estimates (Barth, 1994). Another concern is that fair values may increase the volatility of income as compared to historical costs (Barth, Landsman & Wahlen, 1995; Feay & Abdullah, 2001). For example, in Australia, ED 59 *Financial Instruments* was criticised by the banking industry which opposed market value measurement method. The banks were concerned that market value may increase the volatility of earnings (Hancock, 1996).

Both the FASB in the US and the International Accounting Standard Board (IASB) have required firms to measure financial instruments based on fair value earlier than the AASB (Chalmers & Godfrey, 2000). The net fair value[8] disclosures required by the previous AASB 1033 *Presentation and Disclosure of Financial Instruments* reduced the gap between the Australian and international jurisdictions at the time of this study. AASB 1033 allowed management to use their discretion in the assumptions made in determining the valuation method as described in paragraph 5.6. Hence, the reliability of net fair value remains questionable.

Australian firms have accepted the requirement to make quantitative disclosures concerning the fair values of derivative instruments. However, the quality of these disclosures is less than satisfactory. Based on their study of the accounting practices among Australia's largest 500 firms, Chalmers and Godfrey (2000) report that the major weaknesses are the lack of accounting policy disclosures relating to specific types of instruments and incompleteness in fair value disclosures. These hinder the understandability, comparability and consistency of derivative instruments information.

[8] Para. 7 of AASB 1033 defines net fair value as the fair value of asset (liability) after deducting (adding) costs expected to be incurred were the asset (liability) to be exchanged (settled).

Studies on Value Relevance of Fair Value Disclosures

In contrast to the limited number of value relevance studies in Australia[9], many studies on the value relevance of accounting information have been conducted in the US over the last decade.[10] Most of the studies address the empirical relation between accounting numbers and share market values either with or without drawing standard-setting inferences.

Barth (1994) investigates how disclosed fair value estimates of banks' investment securities, and securities gains and losses (based on those estimates) are reflected in share prices in comparison with historical costs. Barth reports that fair value estimates of investment securities provide significant explanatory power beyond that provided by historical costs. Nelson (1996) and Eccher et al. (1996) examine the value relevance of fair value data disclosed under SFAS 107 *Disclosures about Fair Value of Financial Instruments* by banks[11] for the years 1992 and 1993. However, both studies provide mixed findings. Nelson (1996) provides evidence that fair value disclosures have no incremental power relative to book value, with the exception of investment securities in 1992. Eccher et al. (1996), on the other hand, report that fair value of investment securities has significant incremental explanatory power. They also report that, in limited settings, the off-balance sheet instruments are also value relevant.

The value relevance of banks' fair value disclosures under SFAS 107 is examined by Barth et al. (1996). Additional variables, to those used by Eccher et al. (1996) and Nelson (1996), such as non-performing loans and interest sensitive assets and liabilities, are included. The study is conducted on a sample of 136 banks over the period 1992 and 1993. The results indicated that fair value estimates of loans, securities and long-term debt provide significant explanatory power for bank share prices beyond that provided by book values. The finding is stronger when additional variables are included.

Unlike prior studies under SFAS 107 that combined all securities into one class, Park et al. (1999) examine whether the intent-based fair value disclosures by security type under SFAS 115 *Accounting for Certain Investments in Debt and Equity Securities* explain the value relevance of bank equity. Their

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[9] Research on financial instruments in Australia is still at an early stage and much of it normative. Hancock (1994), Berkman et al. (1997), Chalmers and Godfrey (2000) and Chalmers (2001) are such examples.

[10] See Holthausen and Watts (2001) for a comprehensive summary of this research.

[11] SFAS 107 *Disclosures about Fair Value of Financial Instruments* requires banks to disclose fair value estimates for all financial instruments, both recognised (such as banks' loan portfolios, deposits, and borrowings) and off-balance sheet items (such as interest rate swaps, commitments, and derivative contracts).

findings are consistent with the hypotheses and with the view of SFAS 115 on the relevance and usefulness of the fair value disclosures to investors.

Venkatachalam (1996) extends research on SFAS 107 by examining the implications of fair value disclosures under SFAS 119 *Disclosure about Derivative Financial Instruments and Fair Value of Financial Instruments*. Findings of this research suggest that the fair value estimates for derivatives help explain cross-sectional variation in bank share prices. Further, the fair values have incremental explanatory power over and above the notional amounts of derivatives.

The US study by Wong (2000) investigates whether the quantitative disclosures about notional amount and fair value of foreign exchange derivatives are associated with the information used by investors to assess the sensitivity of equity returns to currency fluctuations. The results are mixed and only weakly consistent with predictions for both the association and usefulness tests. The evidence suggests that neither aggregated nor disaggregated fair value disclosures complement notional amount in assessing currency risk exposure. The study also indicates that the usefulness of accounting disclosures for assessing firms' overall currency exposures is limited and additional disclosures are potentially useful.

While these studies examine the value relevance of fair value for banks and financial institutions, Simko (1999) examines the fair value of financial instruments of non-financial firms under SFAS 107. He concludes that SFAS 107 liability disclosures for 1993 and 1995 are significantly associated with equity values. However, financial instrument assets and related derivatives do not have incremental explanatory power. This is due to the lack of economic significance of fair value and book value differences typical in the case of non-financial firms.

In contrast to prior studies that examine the incremental explanatory power of fair value, Khurana and Kim (2003) test for the relative information content of fair value and historical cost. They find that fair value disclosures are likely to be more informative than historical cost for large bank holding companies than small bank holding companies. They conclude that the results are consistent with the notion that fair value is more value relevant when fair value measures are available.

RESEARCH QUESTION

Fair value accounting has become the preferred option of accounting for financial instruments as opposed to historical cost. A move to fair value is believed to be due to the belief that market-based information is the most relevant financial data

for financial statement users. The disclosure of fair value information is expected to provide more useful information for users to assess the effects of derivative transactions (Rasch & Wilson, 1998).

Prior research examined the usefulness of fair value information based on the relevance and reliability of the information. The information was recognised and disclosed in the financial statements as required by the accounting standards. Barth (1994) and Barth et al. (1996) provide evidence that the fair value estimates provide significant explanatory power beyond the historical costs. However, Eccher et al. (1996) reject the hypotheses on the incremental explanatory power of fair value. Similar results were reported in Simko (1999) for the non-financial firms. Therefore, our research question is:

> Are the net fair value disclosures value relevant and do they provide incremental information over book values for firms in the extractive industries?

METHODOLOGY

Data

The main source of information for this study is the annual reports of all listed companies in the extractive industries. All extractive industries firms (354 firms) listed on the ASX for the years from 1998 to 2001 were initially selected. Firms were contacted and asked to provide annual reports for each year. However, in some cases the annual reports were downloaded from corporate websites or the Annual Report Collection (Connect 4). Eighty-nine firms were excluded because they did not respond to the request and their annual reports were not available from Connect 4. Further, the data size was reduced to 149 firms by excluding: (a) foreign listed firms,[12] (b) newly listed/de-listed firms, (c) mining servicing firms, (d) firms that have been dormant/under receivership, etc. and (e) firms with missing data. Twelve firms were eliminated for regression analysis purposes because of the unavailability of share price data. We eliminated a further 72 firms because they are non-users of derivative instruments or of unknown status. Therefore, the number of firms available for this study is 65.[13] A summary of data selection is presented in Table 1.

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[12] These firms are excluded since they may have to follow their own country's GAAP (Generally Accepted Accounting Principles). This might affect the results for the current study since our objective is to investigate the value relevance of fair value information as required by the AASB 1033.

[13] We use panel data since time series results might not produce reliable conclusions for this study.

TABLE 1
SUMMARY OF DATA SELECTION PROCEDURE

Selection criteria	No. of firm
No. of listed firms in the extractive industries	**354**
• Firms that did not respond and are not on Connect 4	89
• Foreign firms	19
• Newly listed/delisted firms	43
• Mining servicing/investment firms	6
• Dormant/under receivership	2
• Missing information	46
• Missing share price data	12
Usable annual reports	**137**
• Non users and unknown status	72
Users	**65**

Models

Two models were developed based on Ohlson (1995) to estimate the value relevance of fair value information. Equation 1 is used to estimate the importance and the explanatory power of net fair value information. A significant value for coefficients α_4, α_5 and α_6 will indicate the value relevance of net fair value information in this model. A positive coefficient being significantly different from zero would provide evidence of the incremental explanatory power of AASB 1033 net fair value conditional on other included explanatory variables (Barth, 1994; Venkatachalam, 1996; Simko, 1999).

$$P_{it} = \alpha_0 + \alpha_1 BVNFI_{it} + \alpha_2 E_{it} + \alpha_3 TBFI_{it} + \alpha_4 TFFI_{it} + \alpha_5 OBDI_{it} + \alpha_6 CI_{NFV,it} + \varepsilon_{it} \quad (1)$$

Variable definitions:

P	=	natural log market value of firms' common equity measured three months following the financial year
BVNFI	=	book value of non-financial instruments
E	=	earnings for year *t* available to firm *i*'s common shareholders
TBFI	=	total book value of financial instruments
TFFI	=	net fair value of financial instruments
OBDI	=	off-balance sheet derivative financial instruments

CI_{NFV} = component score of net fair value[14]
T = time
I = firm

Multicollinearity could be a problem when estimating equation 1 since TBFI and TFFI[15] are correlated (Barth, 1994). Therefore, TBFI is dropped from the equation so that the explanatory power of TFFI without such effects can be estimated.[16] The following model is used to estimate the explanatory power of net fair value and OBDI incremental to the book value of non-financial instruments and earnings:

$$P_{it} = \alpha_0 + \alpha_1 BVNFI_{it} + \alpha_2 E_{it} + \alpha_3 TFFI_{it} + \alpha_4 OBDI_{it} + \alpha_5 CI_{NFV,it} + \varepsilon_{it} \quad (2)$$

As discussed above, TBFI and TFFI might be correlated since TFFI is equal to TBFI plus the unrealised gain or loss (URGL).[17] Therefore, an alternative model is developed which focuses on the URGL on financial instruments, which is a continuous variable. To investigate the value relevance and the explanatory power of the URGL, the URGL of financial instruments, TBFI, BVNFI and earnings (E) are included in the model. Following Simko (1999), the URGL is separated into broad class of financial instruments: URGL of financial assets (DIFFA), URGL of financial liabilities (DIFFL) and OBDI. This is specified in equation (3). A significant value for α_4, α_5 and α_6 indicates the value relevance of the URGL. A coefficient significantly different from zero would provide evidence of incremental explanatory power of URGL conditional on other included explanatory variables (Barth, 1994; Venkatachalam, 1996; Simko, 1999).

$$P_{it} = \alpha_0 + \alpha_1 BVNFI_{it} + \alpha_2 E_{it} + \alpha_3 TBFI + \alpha_4 DIFFA_{it} + \alpha_5 DIFFL_{it} + \alpha_6 OBDI_{it} + \alpha_7 CI_{NFV,it} + \varepsilon_{it} \quad (3)$$

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[14] CI_{NFV} is measured based on the requirements of paragraphs 5.6 and 5.7 of AASB 1033 disclosure requirements (seven pieces of information are required by the standard). A score of one is given for each item disclosed based on the detailed information provided, both qualitative and quantitative. A score of zero is allocated if firms failed to provide any information required. The score is measured by dividing the total score for each firm by the total possible score for that firm (7). The firms are not penalised in the case of information that is not relevant. The component of CI_{NFV} is presented in Appendix A.

[15] TFFI equals to TBFI plus the URGL. According to Barth (1994), equation 1 is econometrically equivalent to $P_{it} = \alpha_0 + \alpha_1 BVNFI_{it} + \alpha_2 E_{it} + \gamma_3 TBFI_{it} + \alpha_4 URGL_{it} + \alpha_5 OBDI_{it} + \alpha_6 CI_{NFV,it} + \alpha_7 FVTFFI_{it} + \alpha_8 FVOBDI_{it} + \varepsilon_{it}$, *where* $\gamma_3 = \alpha_3 + \alpha_4$ [in equation (1)].

[16] Table 3 reports that the pairwise correlation between TBFI and TFFI is 0.9985. This indicates that the variables are highly correlated. Similar relationship was reported in Khurana and Kim (2003).

[17] Please refer to Barth (1994) and footnote 9 for further explanations.

Analogous to equation (2), TBFI is excluded from the model to examine the explanatory power of the URGL on financial instruments beyond the book value of non-financial instruments and earnings[18]. Any positive significance of α_3, α_4 and α_5 will indicate the explanatory power of URGL beyond other variables. This is specified in equation (4).

$$P_{it} = \alpha_0 + \alpha_1 BVNFI_{it} + \alpha_2 E_{it} + \alpha_3 DIFFA_{it} + \alpha_4 DIFFL_{it} + \alpha_5 OBDI_{it} + \alpha_6 CI_{NFV,it} + \varepsilon_{it} \quad (4)$$

Variable definitions

DIFFA = difference between net fair value of financial assets and book value of financial assets (URGL).
DIFFL = difference between net fair value of financial liabilities and book value of financial liabilities (URGL).

Other variables are as defined above.

RESULTS

Descriptive Statistics

Table 2 reports descriptive statistics on the dependent and independent variables. The average market value of the models is 17.9448 with the standard deviation of 1.8908. On average, firms in the extractive industries possess more financial liabilities than financial assets where the total book value of financial instruments is equal to –$136,000,000. On average, the book value of financial assets is $1,783,592 more than the net fair value of financial assets (DIFFA). This reflects the fact that extractive firms incurred unrealised losses during the period. Nevertheless, financial liabilities exhibit an unrealised gain (DIFFL) by $2,045,112. The average value of OBDI is –$7,756,216 indicating that firms hold more derivatives classified as liabilities than as assets.

Table 3 presents a correlation matrix among the variables used in estimating the value relevance of net fair value. Table 3 indicates that multicollinearity is likely to be a problem for equations (1) and (3). Table 3 also shows that the strongest correlation is between TBFI and TFFI (0.9985). This is followed by the correlation between BVNFI and TBFI (0.9576) and correlation between BVNFI and TFFI (0.9560). Similar correlations were reported in Khurana and Kim (2003) and Ahmad (2000). These indicate that the historical

[18] Table 4 reports that TBFI is highly correlated with BVNFI.

cost variables and the fair value variables are almost identical, suggesting that historical cost and fair value measures have almost equal relative informativeness (Khurana & Kim, 2003).

TABLE 2
DESCRIPTIVE STATISTICS: VALUE RELEVANCE OF HEDGE TRANSACTION, NET FAIR VALUE AND URGL ON FINANCIAL INSTRUMENTS (N = 253)

	Mean	Std. Dev.	Median	Minimum	Maximum
LMV	17.9448	1.8908	17.5642	13.0165	23.0104
BVNFI	3.82E+08	9.09E+08	49358000	–25295000	5.37E+09
E	21075002	1.08E+08	1258389	–2.82E+08	9.67E+08
CI_{NFV}	0.1982	0.0447	0.1982	0.1000	0.3333
OBDI	–7756216	1.13E+08	0.0000	–9.11E+08	6.69E+08
TBFI	–1.36E+08	4.14E+08	–2627925	–2.56E+09	3.08E+08
TFFI	–1.36E+08	4.16E+08	–2627925	–2.56E+09	3.08E+08
DIFFA	–1783592	18739352	0.0000	–2.12E+08	–1.53E+08
DIFFL	–2045112	17539292	0.0000	–1.53E+08	1.07E+08

TABLE 3
CORRELATION COEFFICIENTS BETWEEN VARIABLES

	LMV	BVNFI	E	CI_{NFV}	OBDI	TBFI	DIFFA	DIFFL	TFFI
LMV	1.0000								
BVNFI	0.6641***	1.0000							
E	0.4631***	0.5419***	1.0000						
CI_{NFV}	–0.1165*	–0.0303	0.0505	1.0000					
OBDI	–0.0383	–0.0128	0.0986	–0.0792	1.0000				
TBFI	–0.5669***	–0.9576***	–0.3929***	0.0056	0.0736	1.0000			
DIFFA	–0.2553***	–0.3130***	–0.4285***	–0.0356	–0.0811	0.1891***	1.0000		
DIFFL	–0.2251***	–0.2752***	–0.2635***	0.0702	–0.1999***	0.1350**	0.2287***	1.0000	
TFFI	–0.5665***	–0.9560***	–0.3995***	0.0010	0.0780	0.9985***	0.2238***	0.1023	1.0000

***, ** and * indicates significance at $p < 0.01$, $p < 0.05$ and $p < 0.10$, respectively.

Multiple Regression Results

Value Relevance of Fair Value

Given that net fair value information is relevant for decision-making, the models were developed in such a way as to provide evidence on the association between the market value of the firm and net fair value information. The models are also expected to provide evidence on the incremental explanatory power of net fair value beyond that of book value. To explore this issue, the component score of net fair value information is included in the Ohlson model as in equation (1).

Panel A of Table 4 provides evidence on the association between net fair value and the market value of the firm based on the expanded Ohlson model. Panel A indicates that the book value of non-financial instruments is positive and significantly related to market value at $p < 0.001$. Also significant is the component score of net fair value, $CI_{NFV.}$

Since there is collinearity between TBFI and TFFI, the book value of financial instruments was excluded from the model. Panel B indicates that dropping *TBFI results in TFFI* being positive and significant at $p < 0.001$. CI_{NFV} is also significant at $p < 0.05$. The positive value of the net fair value of financial instruments indicates that the incremental explanatory power of net fair value of financial instruments is beyond that of the other independent variables included in the model (Barth, 1994; Venkatachalam, 1996; Simko, 1999). Results for equation 2 indicate that the book value of non-financial instruments and net fair value of financial instruments are significant at $p < 0.01$. Also significant at $p < 0.05$ is CI_{NFV}. However, OBDI is not significant. Users may be sceptical of the usefulness of net fair value in assessing the effects of derivatives**.** This may be due to the nature of the instruments not being recognised in the balance sheet. This finding is contrary to the argument made by Rasch and Wilson (1998). Further, fair value may be less reliable than historical cost as managers use their discretion in determining fair value (Ahmad, 2000).

TABLE 4
THE ASSOCIATION BETWEEN NET FAIR VALUE AND MARKET VALUE[19] (N = 253)

Variables	Coefficient	Std Error	T-statistics	Prob
Panel A: $P_{it} = \alpha_0 + \alpha_1 BVNFI_{it} + \alpha_2 E_{it} + \alpha_3 TBFI_{it} + \alpha_4 TFFI_{it} + \alpha_5 OBDI_{it} + \alpha_6 CI_{NFV,it} + \varepsilon_{it}$ (1)				
BVNFI	**3.06E-09**	**4.82E-10**	**6.3477**	**0.0000*****
E	2.29-10	1.01E-09	0.2267	0.8208
TBFI	4.85E-09	4.47E-09	1.0859	0.2786
TFFI	–9.44E-10	4.45E-09	–0.2124	0.8320
OBDI	–1.49E-09	9.69E-10	–1.5412	0.1246
CI_{NFV}	**–3.6069**	**1.7956**	**–2.0087**	**0.0457****
Constant	18.0064	0.3775	47.7049	0.0000***
Adj R^2 = 0.5004	F-statistics = 43.0727	Durbin Watson = 2.0004	Prob = 0.0000	
Panel B: $P_{it} = \alpha_0 + \alpha_1 BVNFI_{it} + \alpha_2 E_{it} + \alpha_3 TFFI_{it} + \alpha_4 OBDI_{it} + \alpha_5 CI_{NFV,it} + \varepsilon_{it}$ (2)				
BVNFI	**2.90E-09**	**5.32E-10**	**5.4539**	**0.0000*****
E	6.23E-10	9.44E-10	0.6597	0.5101
TFFI	**3.59E-09**	**1.08E-09**	**3.3055**	**0.0011*****
OBDI	–1.54E-09	9.45E-10	–1.6290	0.1046
CI_{NFV}	**–3.5531**	**1.7927**	**–1.9820**	**0.0486****
Constant	18.0032	0.3774	47.7061	0.0000
Adj R^2 = 0.4995	F-statistics = 51.2980	Durbin Watson = 2.0149	Prob 0.0000	

***, ** and * indicate significance at $p < 0.01$, $p < 0.05$ and $p < 0.10$, respectively.

[19] Results are based on White's Heteroscedasticity Corrected Regression.

Value Relevance of the Unrealised Gain or Loss of Financial Instruments

Table 5 presents the multiple regression results on the association between the URGL on financial assets, financial liabilities, derivative instruments and the market value of the firm. Panel A of Table 5 indicates that BVNFI and TBFI are positively and significantly related to market value at $p < 0.001$. The primary interest of this study is the URGL on financial assets (DIFFA), financial liabilities (DIFFL) and OBDI. Panel A indicates that none of these variables are significant. Nevertheless, CI_{NFV} is significant at $p < 0.10$. The results indicate that the URGL on financial instruments is not regarded as value relevant.

Excluding TBFI from equation (3) [as specified in equation (4)] resulted in earnings being significant at $p < 0.01$ and CI_{NFV} significant at $p < 0.05$ (Panel B Table 5)[20]. These results indicate that the URGL on financial assets and financial liabilities is not value relevant and does not provide incremental explanatory power beyond other including variables (Barth, 1994; Venkatachalam, 1996; Simko, 1999).

TABLE 5
THE ASSOCIATION BETWEEN THE MARKET VALUE OF FIRMS AND THE DIFFERENCE BETWEEN NET FAIR VALUE AND BOOK VALUE OF FINANCIAL INSTRUMENTS
(N = 253)[+]

Variables	Coefficient	Std Error	T-statistics	Prob
Panel A: $P_{it} = \alpha_0 + \alpha_1 BVNFI_{it} + \alpha_2 E_{it} + \alpha_3 TBFI + \alpha_4 DIFFA_{it} + \alpha_5 DIFFL_{it} + \alpha_6 OBDI_{it} + \alpha_7 CI_{NFV,it} + \varepsilon_{it}$				(3)
BVNFI	**3.53E-09**	**6.52E-10**	**5.4103**	**0.0000*****
E	2.14E-10	1.05E-09	0.2031	0.8392
TBFI	**4.79E-09**	**1.28E-09**	**3.7287**	**0.0002*****
DIFFA	5.54E-09	5.53E-09	1.0018	0.3174
DIFFL	8.69E-09	5.75E-09	1.5107	0.1322
CI_{NFV}	**–3.4493**	**1.7926**	**–1.9242**	**0.0555***
OBDI	–1.35E-09	1.02E-09	–1.3273	0.1856
Constant	17.9450	0.3816	47.0317	0.0000
Adj R^2 = 0.5051	F-statistics = 37.7401	Durbin Watson = 1.9996	Prob = 0.0000	
Panel B: $P_{it} = \alpha_0 + \alpha_1 BVNFI_{it} + \alpha_2 E_{it} + \alpha_3 DIFFA_{it} + \alpha_4 DIFFL_{it} + \alpha_5 OBDI_{it} + \alpha_6 CI_{NFV,it} + \varepsilon_{it}$				(4)
BVNFI	**1.17E-09**	**1.77E-10**	**6.6101**	**0.0000*****
E	**2.74E-09**	**1.04E-09**	**2.6360**	**0.0089****
DIFFA	–1.47E-09	3.71E-09	–0.3959	0.6925
DIFFL	–3.31E-09	5.11E-09	–0.6478	0.5177
CI_{NFV}	**–4.6758**	**1.8685**	**–2.5025**	**0.0130****
OBDI	–1.04E-09	1.03E-09	–1.0098	0.3136
Constant	18.3498	0.3852	47.6335	0.0000
Adj R^2 = 0.4716	F-statistics = 36.5872	Durbin Watson = 1.9483	Prob = 0.0000	

***, ** and * indicate significance at $p < 0.01$, $p < 0.05$ and $p < 0.10$, respectively.

[+] Results are based on White's Heteroscedasticity-Corrected Regression.

[20] In re-estimating the equation in Panel B by replacing BVNFI with TBFI, the results indicate that earnings, TBFI and CI_{NFV} are significant at $p < 0.01$. Also significant at $p < 0.10$ is DIFFL. However, the adjusted R^2 is, 40.44%, which is lower than the adjusted R^2 presented in Panel B of Table 5.

Alternative Approach for Incremental Explanatory Power

Collins, Maydew and Weiss (1997), Graham and King (2000) and Li-Chin, Chao-Shin and Pyung-Sik (2001) examine the incremental explanatory power of variables by comparing the adjusted R^2 of equations with and without certain variables. Following their studies, we compare the adjusted R^2 of equations 1 and 3 with the adjusted R^2 of equations without the net fair value and the unrealised gain or loss on financial instruments and the component score of net fair value information. The procedure permits assessing whether the net fair value and the URGL of financial assets, financial liabilities, or OBDI are value relevant and provide explanatory power in explaining firm share price beyond the book value of financial and non-financial instruments and earnings valued at historical cost.

Results for this approach (not reported) indicate that the incremental explanatory power of net fair value above the book value of non-financial instruments and earnings ($AdjR^2_{nfv/h}$) is very low (0.80%), compared to the incremental explanatory power of book value of non-financial instruments and earnings valued at historical cost beyond the net fair value, ($AdjR^2_{h/nfv}$) which is 17.41%. The incremental explanatory power of the URGL of financial instruments beyond the book value of non-financial instruments and earnings valued at historical cost ($AdjR^2_{urgl/h}$) is also very low (1.26%) compared to the incremental explanatory power of the book value of non-financial instruments and earnings valued at historical cost (40.19%).

Our study provides evidence that net fair value is value relevant. However, the significance of net fair value is limited to the recognised financial instruments and to some settings. Perhaps the low incremental explanatory power of net fair value is due to the fact that firms tend to provide net fair values as the carrying value or book value of the instruments. Therefore, the disclosures of net fair value and URGL on financial instruments do not provide additional information beyond book value for decision making.

CONCLUSIONS

In this paper we investigate whether fair value information is value relevant for the Australian firms within the extractive industries. AASB 139 requires measurement of financial instruments based on fair values. The existing value relevance studies focus on the effect of accounting numbers on the value of banks and financial institutions. Results from the finance industry may not be relevant to other industries and therefore, this study extends this research to firms in the extractive industries. This study provides evidence that the net fair value of financial instruments is value relevant in some settings.

The study is subject to several limitations. The findings could be biased as the sample is based on those companies included in the Connect 4 Annual Report Collection Database or those responding to a request for annual reports. Further, the sample of firms using derivatives is relatively small and this may have limited the power of statistical tests. The study looks specifically at derivative disclosures by firms in the extractive industries which limit the generalisability of the results of this study to a broad class of information and cross-section of firms.

This study should be extended to other industries to provide regulators with a clear picture of how Australian firms react to the AASB 1033 disclosure requirements and how these requirements help investors in decisions-making. This will assist them to overcome issues related to measurement and recognition of derivative instruments. Further, results presented by prior non-Australian studies may not be applicable to Australian firms as the industries operate in a different institutional environment. Future research may extend the current study using different research methods. The capital markets research approach may not provide the actual reactions of those involved with these particular issues. Interviewing managers, investors and auditors may help us further understand the level of acceptance of net fair value information.

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APPENDIX A

Component Score of Net Fair Value

Net Fair Value Information		
• (a) The aggregate net fair value as at the reporting date, (b) Showing separately the aggregate net fair value of those financial assets or financial liabilities which are not readily traded on organized markets in standardized form.	Para 5.6 (a)	2*
• The method or methods adopted in determining net fair value.	Para 5.6 (b)	1
• Any significant assumptions made in determining net fair value.	Para 5.6 (c)	1
• The carrying amount and the net fair value of either the individual asset or appropriate groupings of those individual assets.	Para 5.7 (a)	1
• (a) The reasons for not reducing the carrying amount, (b) Including the nature of the evidence that provides the basis for management's belief that the carrying amount will be recovered.	Para 5.7 (b)	2*
Total possible score		**7**

* A score of one is allocated for each item discloses in the notes to the financial statements.

$$CI_{NFV} = \frac{\text{Firm's total score}}{\text{Total possible score}}$$