



Quality of Independent Expert Reports Used in Australian Takeovers

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Abstract

In this article, the authors investigate whether there has been an improvement in the quality of independent expert reports following ASIC's revisions to RG111 and RG112. These revisions include additional disclosures on the valuation methodologies used and explanation if the valuation was materially different from the company's recent trading price. It was expected that these revisions have led to an improvement in report quality where quality is determined by the accuracy of the expert's valuation. Results show that after the 2011 revisions, valuations became more accurate based on updated measures of report quality. However, experts with higher fees did not provide higher quality reports on average. The findings indicate that the independence provisions within the new rules were effective. Furthermore, they warn commissioning firms that higher fees are not necessarily indicative of higher quality reports.

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INTRODUCTION AND RESEARCH QUESTION

Australian companies receiving a takeover offer can commission an independent expert,⁴ either voluntarily or as a requirement of s 640 of the *Corporations Act 2001* (Cth),⁵ to assess if the bidder's⁶ offer is fair and reasonable. An independent expert report (IER) provides the public with an unbiased and credible assessment of the merits of a proposed change of control transaction (Deloitte 2013), thus acting to reduce information asymmetry and protect shareholders from accepting opportunistic takeover offers (Trautwein and Quartullo 2012). The expert's opinion whether the transaction is fair and reasonable,⁷ along with the expert's extensive analysis underlying this opinion, assists target⁸ shareholders make an informed decision whether to accept or reject the proposal.

IER quality and expert independence has attracted considerable regulatory attention in the past two decades. In 2005 the Australian Securities and Investments Commission (ASIC)⁹ released *Consultation Paper 62: Better experts' reports* (CP 62), which sought to improve IER quality. The recommendations of CP 62 led ASIC to amend and consolidate their existing independent expert policy statements and practice notes into two documents in 2007: *Regulatory Guide 111: Content of expert reports* (RG 111) and *Regulatory Guide 112: Independence of experts* (RG 112). In 2010 ASIC released *Consultation Paper 143: Expert reports and independence of experts: Updates to RG 111 and RG 112* (CP 143), which yet again reviewed issues relating to expert independence and IER quality. Consequently, RG 111 and RG 112 were most recently revised on 30 March 2011 (hereafter the '2011 Revisions') to address the concerns over quality and independence. These revisions were motivated by the need for an improvement in the transparency and reliability of company valuations for the benefit of the shareholder.

One of several noteworthy changes stemming from the 2011 Revisions includes the requirement for experts to discuss the weight placed on each valuation methodology used in the report by identifying one valuation methodology as primary and others as cross-checks to the primary valuation used (RG 111.68).¹⁰ Additionally, when the expert's valuation is materially different from the company's price in recent trading (plus a reasonable control premium), the expert's report must comment on the reasons for this disparity. These additional disclosures, along with more stringent independence requirements on the commissioning firm, were designed to improve the quality of expert reports (BDO 2011). However, the effectiveness of the 2011 Revisions in improving IER quality has yet to be empirically substantiated.

This study uses an empirical approach to test whether IER quality improved subsequent to the 2011 Revisions. Two separate proxies for report quality are utilised: (1), the accuracy of the expert's valuation relative to the executed price paid by the successful bidder and (2) the scaled range of the expert's valuation.¹¹ Bugeja, Da Silva Rosa and Walter (2005) used the former as a proxy for IER quality, and suggested future researchers use the latter. The scaled range used

⁴ Throughout this paper 'expert' and 'independent expert' are used interchangeably.

⁵ Unless stated otherwise, sections referred to in this paper relate to the *Corporations Act 2001* (Cth).

⁶ 'Bidder' refers to the person or group who make an offer for a target company (s9).

⁷ An expert is required to express an opinion whether a takeover bid is 'fair and reasonable' (s 640). 'Fair and reasonable' is defined in RG 111.10-111.17.

⁸ 'Target' refers to the company whose securities are to be acquired under the bid (s 9).

⁹ Note that ASIC superseded the Australian Securities Commission (ASC) in 1998, which superseded the National Companies and Securities Commission (NCSC) in 1991.

¹⁰ ASIC uses the phrase 'valuation methodology' to describe company valuation methods, such as discounted cash flow and earnings multiples. When used in this context, the term 'methodology' does not carry its academic implications relating to the ontological and epistemological underpinnings of research.

¹¹ Throughout this study the 'price paid by the successful bidder' and the 'executed price' are used interchangeably.

in this study is defined as the difference of the experts high and low valuation expressed as a percentage of the mid-point of the valuation and has strong justification from the requirements to use ranges by RG 111. The expert's valuation relative to the executed price reflects the takeover market's assessment of IER quality and is theoretically grounded in the competitive acquisition market hypothesis. Utilising both proxies overcomes the key limitations of using each proxy in isolation and allows for more informative conclusions.¹²

Furthermore, ASIC requires the commissioning party to consider more than just fees when selecting an expert¹³. Consequently, the new provisions provide commissioning firms with guidance when selecting from a field of potential experts with different quoted fees. This study also tests whether experts with lower fees produce inferior quality reports containing valuations which are further from the executed price, and have a wider valuation range.

To conduct this study, data from target statements and annual reports were manually collected for all successful cash takeovers of companies listed on the Australian Securities Exchange ("ASX") between 2008 and 2013 (inclusive).¹⁴ Utilising this data, the hypotheses were tested using empirical techniques. The study is presented as follows: the Institutional Framework section introduces the regulatory background and requirements for valuations which is followed by the Literature Review. The section titled Hypotheses Development describes the two hypotheses related to the research question, whilst the section titled Sample and Method covers the method used in the study and the sample selection process and data sources. The Model Development section describes and examines the data using descriptive statistics and develops the multiple regression model. The results are presented, interpreted and analysed in the Results and Discussion section, and finally the Conclusion summarises the results.

INSTITUTIONAL FRAMEWORK

Regulation

ASIC provides regulatory guidance with regard to the contents of IERs and independence of experts through RG 111 and RG 112.¹⁵ Chapter 6 of the Corporations Act deals with takeovers. A company which has received a takeover offer is required to prepare a Target's Statement (s 633), which must include all information that shareholders would reasonably require to make an informed decision whether to accept the offer (s 638 (1)). When commissioned, IERs are included in the Target's Statement lodged with the ASX.

IERs may be legally required or voluntarily commissioned. Section 640 requires target firms to commission an IER in circumstances where the bidder has a superior bargaining position, or where a conflict of interest may exist between the boards of the target and bidder.¹⁶

¹² The key limitations are that the scaled range does not take into account how close the expert's valuation is to the firm's intrinsic price. Whereas, the accuracy of the expert's valuation relative to the executed price does not explicitly measure the width of the expert's valuation range.

¹³ The commissioning party (or commissioning firm) refers to the group who hires the expert to provide an IER.

¹⁴ Only takeovers using 100% cash consideration were included in the sample.

¹⁵ Regulatory Guides provide guidance to regulated entities by:

- Explaining when and how ASIC will exercise specific powers under legislation (primarily the Corporations Act)
- Explaining how ASIC interprets the law
- Describing the principles underlying ASIC's approach
- Giving practical guidance

¹⁶ Specifically, s 640 requires an IER to be prepared in the following circumstances

- The bidder's voting power in the target is 30% or more; or
- For a bidder who is, or includes, an individual – the bidder is a director of the target; or
- For a bidder who is, or includes, a body corporate – a director of the bidder is a director of the target

Alternatively, where no legal obligation exists, a firm may voluntarily commission an IER to ensure shareholders are as informed as possible and to exercise prudent corporate governance (William Buck 2014). An IER must include the expert's opinion whether the takeover is fair and reasonable and provide reasons why that opinion was reached (s 640).¹⁷ "An offer is fair if the value of the offer price or consideration is equal to or greater than the value of the securities, which are the subject of the offer" (RG 111.11).¹⁸ The expert's assessment of fairness is complicated considerably when the bidder provides its own securities as consideration (Eddey 1993). In such circumstances, the expert is also required to value the bidder's shares in order to determine whether the offer is fair (RG 111.30). Synergies specific to a particular bidder (that is, not available to other bidders) should not be considered in determining if an offer is fair (RG 111.11).¹⁹ Instead, synergies available to a specific bidder is considered in the expert's assessment of reasonableness.

An offer is reasonable if it is fair. However, an offer can be reasonable despite being not fair if the expert believes there are reasons why target security holders should accept the offer (RG 111.12). One of many factors that an expert may consider in determining if an offer is reasonable is any special value of the target to the bidder, such as synergies (RG 111.13).²⁰ Synergies are discussed further in the literature review.

Company Valuation Methodologies

Experts must exercise skill and professional judgement in selecting the most appropriate valuation methodology. To assist users to understand the report, the expert must describe, and reasonably justify the selection of the methodologies used in the report. Where possible, experts are encouraged to use more than one valuation methodology and comment on any differences between the methods (RG 111.65). Although experts provide a range of values rather than a single valuation point, the range must be as narrow as possible since "a broad range of values undermines the usefulness of the report" (RG 111.79). This provides strong justification for the use of the scaled range as a proxy of IER quality.

ASIC does not prescribe which valuation methodologies experts should use (RG 111.47), but suggests that it is appropriate for experts to use discounted cashflow (DCF), earnings multiples, realisation of assets, a security's quoted price and alternative genuine offers received by the target (RG 111.69).

Although many valuations use methodologies other than DCF in certain specific target circumstances, and more recent literature on corporate valuation has produced more

¹⁷ Fair and reasonable are two distinct criteria requiring individual consideration. Fair and reasonable is not a compound phrase (RG 111.10).

¹⁸ This comparison should be made assuming an arm's length transaction between informed parties who are willing, but not anxious (RG 111.11).

¹⁹ Synergy from an acquisition is 'defined as the value of the combined firm less the value of the two firms as separate entities' (Ross, Westerfield and Jaffe 2010, p.908).

²⁰ According to RG 111.13, an expert may consider the following in deciding if an offer is reasonable:

- the bidder's pre-existing voting power in securities in the target;
- other significant security holding blocks in the target;
- the liquidity of the market in the target's securities;
- taxation losses, cash flow or other benefits through achieving 100% ownership of the target;
- any special value of the target to the bidder, such as particular technology, the potential to write off outstanding loans from the target, etc;
- the likely market price if the offer is unsuccessful; and
- the value to an alternative bidder and likelihood of an alternative offer being made

sophisticated valuation methodologies, a recent study by Bancel and Mittoo (2014) found that practitioners still prefer to use DCF as a primary methodology. They found that 80% of practitioners used both DCF and Relative Valuation methodologies in corporate valuation. They further state that Free Cash to Equity Model (FCFE), a variant of the DCF model, is the most commonly used in valuation for mergers and acquisitions. Furthermore, this is consistent with Matolcsy (1995), who claims that DCF is superior to other valuation methodologies.

LITERATURE REVIEW

Independent Expert Reports and Valuation Methodologies

Following the introduction of the requirement for IERs in Australian takeovers in 1981, Matolcsy (1982) was the first to publish a paper on IERs.²¹ Matolcsy (1982) argued that, regardless of the stock market's informational efficiency, IERs were unnecessary and unjustified. He contended that IERs do not add value in efficient markets as the most current share price is the best estimate of the company's value. Alternatively, if the market was inefficient due to irrational investors failing to act upon publicly available information, IERs are unlikely to add value as market participants may also ignore the expert's report. Finally, he suggested that if the market was inefficient due to investors and analysts only holding a subset of all available information relevant to estimating a company's value, an IER would not add value since no single expert would have access to all the requisite information to accurately estimate the company's value. The period in which his paper was published was characterised by strong support for free market ideals and reduced regulation (McDonald et al. 2003).

Matolcsy (1982) also criticised the notion that experts have the capacity to determine whether a takeover offer is fair and reasonable, given each investor has unique financial objectives, risk tolerance and return expectations. As such, Matolcsy (1982, p.103) claimed that "the independent expert's advice may determine the economic worth (price) of a company, but not whether the takeover offer price is fair and reasonable." Rather, he contended that each shareholder individually judges what constitutes a fair and reasonable takeover offer with reference to their own specific circumstances. Given this, he argued that it is impossible for experts to make a statement on the fairness and reasonableness of a takeover offer, despite regulators requiring experts to do so. Consequently, Matolcsy (1982, p.104) called for regulatory bodies and/or supporters of IERs to "develop theoretical arguments and/or provide evidence, which demonstrate the net benefit of an independent expert's advice." In the absence of such evidence, Matolcsy (1982) suggested the requirement for IERs in Australian takeovers should be abandoned.

Matolcsy's (1982) criticism of the experts' capacity to determine whether a takeover offer is fair and reasonable was relevant in the 1980s when his paper was published. However, his criticisms bear little relevance in recent times, as the introduction of the *Financial Services Reform Act 2001* (FRSA) distinguished between general and specific financial advice.²² The Financial Services Guide (FSG) which is compulsorily provided with all expert reports specifically states that IERs only provide general financial product advice, not personal financial product advice, and that the IER does not take into account each investor's personal

²¹ Effective from 27 August 1981, s23 of the Commonwealth *Companies (Acquisition of Shares) Act* (now the *Corporations Act 2001*) gave the National Companies and Securities Commission (NCSC) (now ASIC) the authority to require an IER to be commissioned in certain circumstances.

²² *Regulatory Guide 146: Training of financial product advisors* outlines the distinction between general and specific advice in detail.

objectives, financial situation or needs. Therefore, the introduction of the FRSA in 2001 invalidates Matolcsy's (1982) argument, as IERs expressly provide *general* financial advice.

In his second paper on IERs, Matolcsy (1995) claimed there was still a lack of empirical evidence to demonstrate IERs add value. He argued that IERs only add value if two conditions are met. Firstly, the expert uncovers 'private' information which is not available to the market. Secondly, the valuation methodology adopted by the expert reflects the synergistic benefits of the takeover. Although Matolcsy (1995) briefly argues that the latest share price is the best estimate of value, his paper primarily focuses on the adequacy of the valuation methodologies used by experts.

Matolcsy (1995) classified company valuation methodologies into four broad groups: asset-based, capitalised earnings, DCF and other techniques such as share price history, resource-in-the-ground or a combination of these methods. He found the valuation methodologies concluded upon most frequently by experts were variations of asset-based methods (31.1%) and capitalised earnings (26.9%), while other techniques were used 33.6% of the time.²³ Despite Matolcsy's (1995) support for the use of DCF, he found it was the least utilised methodology, only being used in 8.4% of reports.²⁴

Although Matolcsy (1995) found that asset-based valuations and capitalised earnings were the methodologies most utilised, he argued that both methodologies were inherently flawed. He claimed that asset-based methods produce meaningless valuations given the book value of assets often bear little relevance to realisable values, replacement costs or current costs (even when adjusted in an attempt to overcome this problem), and that valuing identifiable intangible assets is fraught with inaccuracy.²⁵ However, Matolcsy's (1995) most significant criticism of asset-based valuations was their failure to incorporate the synergistic benefits attainable by combining the individual companies.

Similarly, he suggested that the capitalised earnings method suffers from several fundamental problems regarding inconsistent market efficiency assumptions. According to Matolcsy (1995), when an expert estimates maintainable earnings, there is an implicit assumption that estimates produced by all other experts and analysts are incorrect and that the market value of the particular company being valued is informationally inefficient. Yet he argues that at the same time there is an implicit assumption that the maintainable earnings for all comparable companies have been correctly estimated and the market for their shares is efficient. As such, Matolcsy (1995, p.5) argues that "the independent experts cannot have it both ways." If experts assume the market is efficient, current market price should be the best estimate of value. Conversely, if experts assume the market is inefficient, "then all inputs into the capitalised earnings model need to be re-estimated" (Matolcsy 1995, p.5).

Independent Expert Reports and Takeover Premiums

The empirical studies of how IERs affect takeover premiums show mixed results. Eddey (1993) suggests that premiums for takeovers with a legally required IER were not significantly different to premiums for takeovers which did not use an IER²⁶. Bugeja (2005a) however found

²³ Matolcsy's (1995) study was based on a sample of 323 expert reports used in Australian takeovers between 1988 and 1993.

²⁴ Furthermore, if one expert who consistently used the DCF methodology had been omitted from Matolcsy's (1995) sample, DCF was used in less than 4% of valuations.

²⁵ Examples of identifiable intangible assets include mastheads, television licences and trademarks (Matolcsy 1995).

²⁶ Eddey's (1993) findings were based on a sample of Australian cash takeover bids between January 1988 and 1991. During that period there were 364 takeover bids which offered cash-based consideration or a cash

that target shareholders receive significantly lower takeover premiums when IERs are legally required.²⁷

In support of the notion that IERs add value, Bugeja (2007) found that voluntarily commissioned IERs increase the likelihood of an upward price revision. Furthermore, Eddey (1993) found that directors almost always recommend bid acceptance when the expert provides a fair and reasonable opinion, which is consistent with findings by Bugeja (2006).²⁸

Expert Independence and Report Quality

To protect against potential collusion between experts and directors, ASIC requires that directors of the commissioning firm should not adopt the expert's recommendations without critically analysing the report (RG 112.61). Common law supports this notion. In *ASIC v Healey* (2011) FCA 717, Judge Middleton of the Federal Court cautioned directors against relying on management and advisors (such as auditors, expert reports and external advisors) without critically evaluating the information put before them. Therefore, the directors' recommendation and the expert's opinion should be independent of one another, but will often agree with one another.

Bugeja (2005b) found the rate at which experts agreed with the recommendations of the target's Board was not influenced by the expert having other business dealings with the target, but the stock market viewed IERs prepared by the target's auditor as non-independent.²⁹ Bugeja, Da Silva Rosa and Walter (2005) found that quality was higher, and that fees were not lower, for reports prepared by experts with other business dealings with the target. They also suggest that their findings support Australia's policy which allows companies to use their audit firm for valuation services, despite this being prohibited in fairness opinions in the United States. Bugeja, Da Silva Rosa and Walter (2005) used the scaled range of the expert's valuation as a proxy of report quality³⁰ and found that reports prepared by experts with other business dealings with the target have significantly narrower average scaled valuation ranges than unrelated experts.³¹ Their regression model was re-run including an indicator variable for reports that used DCF as one of the expert's valuation methodologies, but the coefficient was insignificant which does not support Matolcsy's (1995) endorsement of the DCF methodology.

According to RG 111.79, the scaled range used as the proxy for report quality should be as narrow as possible since a "broad range of values undermines the usefulness of the report." However, the isolated use of the scaled range as a proxy of report quality does not measure the proximity of the expert's valuation to the company's intrinsic value. The usefulness, and thus quality, of an expert report containing a valuation widely divergent from the executed price is questionable. Bugeja, Da Silva Rosa and Walter (2005) recommend future researchers use the

alternative, 170 of which had IERs issued as a requirement of the Corporations law. There were 14 cash bids where IERs were voluntarily commissioned, but these were excluded from Eddey's (1993) sample of IERs.

²⁷ Bugeja's (2005a) results were based on a sample of 191 statutory IERs prepared for Australian takeovers between 1990 and 2000. In this period there were 649 takeovers, approximately 45% of which had IERs prepared. Approximately 65% of the IERs were legally required, however voluntary IER use increased in the later years of the study.

²⁸ The results were based on all 191 legally required IERs prepared between 1990 and 2000.

²⁹ This suggests that although IERs prepared by experts with other business dealings with the target were independent in fact, they were not independent in appearance which reduced their utility (Bugeja 2005b).

³⁰ The scaled range they used was equal to the difference between the expert's high valuation and low valuation expressed as a percentage of the target share price three months prior to the takeover announcement. A lower scaled range is indicative of a higher quality report. Their results were unchanged when they expressed the valuation range as a percentage of the expert's low valuation, and high valuation.

³¹ Bugeja, Da Silva Rosa and Walter's (2005) findings are based on all 191 legally required IERs prepared for Australian takeover bids initiated between 1990 and 2000

accuracy of the expert's valuation relative to the final executed price as a proxy of report quality. However, this does not explicitly consider the range of the expert's valuation. To partially overcome the deficiencies of using each proxy in isolation, this study uses both the scaled range and the accuracy of the expert's valuation relative to the executed price as proxies of IER quality.

HYPOTHESES DEVELOPMENT

Since the introduction of the revisions, experts have been required to discuss the weight placed on each valuation methodology used in the valuation report by identifying one methodology as primary and others as cross-checks to the valuation (RG 111.68). Importantly, if the expert provides a valuation which is materially different from the company's share price (plus a reasonable control premium), the 2011 iteration of RG 111 and RG 112 requires the expert to comment on the underlying reasons for the disparity (RG 111.65). These revisions ensure a greater degree of transparency regarding how the expert's final valuation was determined.

Furthermore, the 2011 Revisions allowed experts to use DCF to value mineral assets at the pre-reserve stage.³² ASIC did not previously allow experts to use DCF to value these assets even though doing so was standard practice in the valuation industry and the alternative was to use opaque 'yardstick' methodologies which potentially undervalued the assets, thus reducing the usefulness of the IER (BDO 2011). Therefore, this expanded use of the DCF methodology is another potential source of improvement to IER quality as a result of the 2011 Revisions. Accordingly, expert firm BDO claims that although Revisions to RG 111 and RG 112 formalise practices already followed by many experts, the revisions will improve "the quality of IERs in general by ensuring that all experts follow the same practices" (BDO 2011, p.1). This leads to Hypothesis 1:

H1: Higher quality IERs are issued after ASIC's 2011 Revisions to RG 111 and RG 112, compared to other IERs

New independence requirements were also imposed on the commissioning firm as a result of the 2011 Revisions. In particular, the onus for determining whether the expert is independent and has the requisite expertise and resources to provide a thorough report rests with the commissioning party (RG 112.39). "The quality of an expert report may be affected if this is not the case" (RG 112.39). ASIC requires the directors of the commissioning firm to demonstrate that they have considered more than just the expert's quoted fee when selecting an expert (BDO 2011). An empirical study by Monroe (1973) has shown that when the quality of product or service is uncertain, consumers often assume that higher prices signify higher quality. When a target firm commissions an independent expert, a high level of uncertainty exists regarding the quality of the expert report. Consequently, commissioning firms may expect that experts with higher fees provide higher quality reports. This leads to Hypothesis 2:

H2: Experts with lower fees provide lower quality valuations, compared to other valuations.

³² Mineral assets at the pre-reserve stage are "estimated to be in the ground", but "may or may not be economically recoverable" (PricewaterhouseCoopers 2011, p.16). If the expert has reasonable grounds to do so, they can use DCF to value projects which are yet to generate cash flows, such as mineral assets (mining or hydrocarbon projects), in the resource stage. However, when DCF is used to value these assets the expert is required to make more extensive disclosures of their assumptions and inputs (BDO 2011).

SAMPLE AND METHOD

Sample

This paper uses the event study method to test whether IER quality improved following the 2011 Revisions. To test the hypotheses, an empirical approach is adopted, using a sample of all ASX listed companies that have been acquired and delisted between 2008 and 2013 (inclusive). More specifically, the sample only includes acquisitions of companies in which the target has commissioned an IER, and the bidder's consideration was 100% cash. The sample of takeovers used in this study includes both legally required and voluntarily commissioned IERs, given that both are subject to the Corporations Act and RG 111 and RG 112. Takeovers using the bidders' scrip as full or partial consideration were excluded from the sample due to the added complication of assessing the quality of the bidder's scrip. Takeovers using bidders' scrip accounted for a small minority of takeovers in the test period and therefore are not considered to materially affect the findings of the study.

Sample Collection Process

This study uses a transparent data collection process, with a sufficiently large sample size of 107 observations following a thorough filtering process to make statistical inferences. First, a list of all ASX listed companies which were successfully acquired and delisted between 2000 and 2013 was compiled using the Factset Mergers and Acquisitions screening function.³³ The Factset data included details about each transaction including transaction value, bid price, announcement date, completion date, competing bidders, method of payment and numerous more fields. Second, the list was filtered to only include takeovers announced between 2008 and 2013. This list was then filtered to only include acquisitions in which the method of payment provided by the bidder was exclusively cash. In the small number of cases where the Factset data left the method of payment blank, research was undertaken to determine the form of consideration used, and the takeover was included or excluded accordingly. Next, the ASX Announcements database was searched for each of the remaining target companies to ascertain whether an IER was commissioned. Where applicable, the IER was most commonly found in the Target Statement or Scheme Booklet released in response to the takeover bid. The final sample comprised 107 successful cash takeovers for ASX listed companies in which an IER was released between 2008 and 2013. Observations were evenly distributed with 53 taken from the pre-revisions period and 54 observations in the post revisions period. For each observation, the requisite data was hand collected from IERs, other relevant ASX announcements and the Securities Institute Research Centre of the Asia-Pacific (SIRCA) database.

Comprehensive List of Data Sources

To ensure its accuracy, the Factset data was verified using the ASX Announcements for each target company. Where necessary, amendments were made to reflect the ASX Announcement data. The required details were collected from each IER, including the expert's opinion, IER release date, the expert's valuation (low and high) and primary valuation methodology, whether the expert has other business dealings with the target, whether the report was legally required or voluntarily commissioned, the expert's fee and the number of pages in the expert report.

Furthermore, the most recent annual report since the release of the IER was obtained for each target company. The annual report was used to collect information regarding the target company's number of subsidiaries, industry segments and the book value of equity.

³³ Factset is a multinational financial data and software company.

Finally, the SIRCA database was utilised to obtain historical share price data of delisted companies to determine the target's market capitalisation (used to calculate the target's market-to-book ratio) and the share price one day prior to the first takeover announcement.

MODEL DEVELOPMENT

Table 1 provides descriptive statistics on the distribution of observations in the sample by year and primary valuation methodology. The data has also been split according to whether the IER was issued before or after the event date (ED) of 30 March 2011 when ASIC issued the revised RG 111 and RG 112:

$$ED = \begin{cases} 0 & \text{if IER issued between 1 January 2008 and 29 March 2011} \\ 1 & \text{if IER issued between 30 March 2011 and 31 December 2013} \end{cases}$$

The final three rows of the last column in Table 1 reveals that there are 107 IERs included in the sample, of which 53 were issued prior to 30 March 2011 (ED=0), and 54 were issued on 30 March or later (ED=1). The timeframes before and after the event date were selected so as to ensure that the number of IERs for ED=0 and ED=1 were approximately equal.

Table 1 also reveals that the four valuation approaches were not equally utilised as primary in the 107 IERs in the sample³⁴. Capitalised earnings was the most 'popular' valuation approach, being used as primary in 47% of the IERs. DCF and asset based approaches were the second and third most utilised primary valuation approaches, accounting for 24% and 16% of the IERs, respectively. Other approaches to valuation were only used as primary in 7% of observations, while 6% of observations did not disclose which method was used as primary. In contrast, Matolcsy's (1995) study of all IERs issued between 1988 and 1993 found the most popular methodologies were asset based approaches (31%) and capitalised earnings (27%), with only 8% of IERs using DCF. Therefore, it appears that expert valuation methodology preferences have changed over time. DCF may have become more popular over time due to its growing acceptance by academics (such as Matolcsy 1995) and regulators (such as ASIC's 2011 Revisions allowing the use of DCF to value mineral assets which was previously prohibited). Furthermore, asset based approaches appear to have lost popularity, and capitalised earnings appears to have gained popularity.

- *Table 1: Australian IERs by Primary Valuation Methodology and Year*

Issue Year	DCF	CAPITALISED EARNINGS	ASSET BASED	OTHER	UNDISCLOSED	TOTAL
2008	1	3	1	0	4	9 (8%)
2009	6	4	2	2	1	15 (14%)
2010	5	14	4	2	0	25 (23%)
2011	8	14	3	3	1	29 (27%)
2012	3	10	4	1	0	18 (17%)
2013	3	5	3	0	0	11 (10%)
Total	26 (24%)	50 (47%)	17 (16%)	8 (7%)	6 (6%)	107 (100%)
ED = 0	12	24	7	5	5	53 (50%)
ED = 1	14	26	10	3	1	54 (50%)
Total	26 (24%)	50 (47%)	17 (16%)	8 (7%)	6 (6%)	107 (100%)

³⁴ Although prior to the 2011 Revisions experts were not required to disclose the primary valuation methodology used in their report, many did so voluntarily.

Table 2 shows the average fees paid for IERs during the test period adjusted for CPI and their standard deviation.

- *Table 2: Expert Fees by Year³⁵ in Australia*

Issue Year	N	MEAN (\$)	SD (\$)	MEAN (CPI ADJUSTED \$)
2008	7	97,857	72,907	111,303
2009	15	149,167	114,032	166,742
2010	25	170,900	174,594	185,650
2011	29	207,879	237,012	218,950
2012	18	143,222	141,683	148,722
2013	11	126,182	110,138	129,676
Total	105	163,710	172,522	174,712
ED=0	51	152,941	140,796	167,971
ED=1	54	173,880	198,711	181,079
Total	105	163,710	172,522	174,712

Table 3 reveals that the 107 IERs in this sample are distributed widely between the expert firms. Of the 107 IERs, 37% were prepared by the corporate finance or advisory functions of 'Big 4' accounting firms. No single firm dominated the provision of IERs. However, specialist valuation practice, Lonergan Edwards (established in 2001 by ex-PwC partners) prepared the most IERs within the sample, accounting for 19%.

- *Table 3: Australian IERs by Expert Firm and Year*

Expert Firm	2008	2009	2010	2011	2012	2013	TOTAL
Lonergan Edwards	3	2	6	5	3	1	20 (19%)
Deloitte	1	5	1	4	1	4	16 (15%)
BDO	0	3	2	6	2	0	13 (12%)
KPMG	2	0	3	6	2	0	13 (12%)
Grant Samuel	1	1	2	3	2	1	10 (9%)
Ernst & Young	0	1	2	1	1	2	7 (7%)
PwC	0	1	2	0	1	0	4 (4%)
Others (7 others)	2	2	7	4	6	3	24 (22%)
Total	9	15	25	29	18	11	107 (100%)
'Big 4' ³⁶	3	7	8	11	5	6	40 (37%)
Non-'Big 4'	6	8	17	18	13	5	67 (63%)
Total	9	15	25	29	18	11	107 (100%)

Table 4 provides some descriptive statistics relating to the IERs in the sample to offer an overview of the takeover market during the period of the study. This includes the range of takeover premiums, expert's fees, complexity of the target given the number of its subsidiaries and industry segments, size of target by way of market capitalisation and market to book ratio, and substance of the report by the length of the report and the number of days it took to produce.

³⁵ CPI adjusted fees were converted to December 2013 dollars using Consumer Price Index (CPI) data released by the Australian Bureau of Statistics. Two IERs prepared by Lonergan Edwards in 2008 were not included in the fees data due to disclosing that the expert firm was paid a reasonable hourly rate rather than stating the dollar amount of their remuneration.

³⁶ 'Big 4' refers to the world's largest global accounting firms, Deloitte, KPMG, PwC and Ernst & Young.

- *Table 4: Descriptive Statistics³⁷ for the Australian Sample*

Variable	N	MEAN	MEDIAN	SD	MIN	MAX
Takeover premium (%)	107	46.30	38.04	41.79	-58.20	226.92
Expert's fee (\$000's)	105	163.71	110.00	172.52	17.50	1,250.00
Number of industry segments	107	1.44	1.00	1.00	1.00	6.00
Number of subsidiaries	107	18.56	9.00	29.01	0.00	163.00
Market capitalisation (\$mil)	107	629.12	123.93	1,662.03	1.29	11,563.29
Market-to-book ratio (times)	107	16.06	1.32	119.60	-74.77	1173.74
Length of expert report (pages)	107	67.84	67.00	23.71	21.00	132.00
Days of report production	107	55.60	40.00	49.58	0.00	359.00

Table 5 presents the breakdown of the coding of dichotomous variables with reference to the event date. The vast majority of takeovers were judged as fair and reasonable by experts (81%), which was expected given the sample only includes successfully executed takeovers. Over half (57%) of the IERs were voluntary where no legal obligation existed for the target firm to commission an IER. In contrast, Bugeja (2007) found that just below a quarter of all IERs issued for takeovers between 1990 and 2000 were voluntarily commissioned. This may suggest that the voluntary use of IERs has increased in popularity since 2000. Indeed there is a growing trend for boards to voluntarily commission IERs to protect not only shareholders, but also the board itself (Maslen-Stannage 2014, ASIC v Healey 2011, FCA 717). Only 20% of the IERs were prepared by an expert who has other business dealings with the target. Despite the increased independence requirements of the 2011 Revisions, a slightly higher proportion of the IER issuing firms in the ED=1 subsample had other business dealings with the target than in the ED=0 subsample. The opposite was expected to be true given the more restrictive independence requirements placed on the commissioning firm. Only the expert opinion shows a significant change in both coded 1 and 0 proportions.

- *Table 5: Dichotomous Variables*

Variable	ED=0	ED=1	TOTAL
Expert Opinion			
Coded 1 (Fair and reasonable)	39	48	87 (81%)
Coded 0 (Not fair and reasonable)	14	6	20 (19%)
Total	53	54	107 (100%)
Voluntary			
Coded 1 (Voluntary)	31	30	61 (57%)
Coded 0 (Not voluntary)	22	24	46 (43%)
Total	53	54	107 (100%)
Other Business Dealings			
Coded 1 (Other business dealing)	9	12	21 (20%)
Coded 0 (No other business dealings)	44	42	86 (80%)
Total	53	54	107 (100%)

³⁷ The variables are defined in the IER Quality Model.

Multiple Regression IER Quality Model

A linear ordinary least squares multiple regression model of IER quality was designed and implemented to test the hypothesis of this study. The multiple regression model of IER quality is as follows:

$$\text{Quality} = \alpha + \beta_1 \ln \text{Mktcap} + \beta_2 \text{Subs} + \beta_3 \text{Ind} + \beta_4 \ln \text{Page} + \beta_5 \text{MB} + \beta_6 \text{Days} + \beta_7 \text{EO} + \beta_8 \text{OBD} + \beta_9 \text{Vol} + \beta_{10} \text{Prem} + \beta_{11} \text{ED} * \ln \text{Fee} + \beta_{12} \text{ED} + \beta_{13} \text{ED} * \text{DCF} + \varepsilon$$

Where Quality is defined as the absolute difference between the expert's valuation and the executed price (hereafter referred to as the 'scaled distance') and scaled range, as defined in Equations 1 to 5; $\ln \text{Mktcap}$ is defined as the natural logarithm of the target firm's market capitalisation as at the financial year-end prior to the takeover announcement; Subs is defined as the number of subsidiaries reported by the target firm as at the financial year-end prior to the takeover announcement; Ind is defined as the number of industry segments reported by the target firm as at the financial year-end prior to the takeover announcement; $\ln \text{Page}$ is defined as the natural logarithm of the number of pages in the expert report; MB is defined as the target firm market-to-book ratio; Days is defined as the number of days between the takeover announcement and release of the expert report; EO is defined as the indicator variable coded as 1 if the expert expresses a fair and reasonable opinion, otherwise coded 0; OBD is defined as the indicator variable coded as 1 if the expert has other business dealings with the firm commissioning the IER, otherwise coded 0; Vol is defined as the indicator variable coded 1 if the expert report is voluntarily commissioned, otherwise coded 0; Prem is defined as the takeover premium equal to the percentage difference between the executed price and the target's market value one day prior to the first bid (on average, our sample prices show no leakage for dates above the 3rd/4th day lag, as well as no significant difference by using either the price a day before versus the price 3 to 4 days before the takeover announcement); $\ln \text{Fee}$ is defined as the natural logarithm of the expert's CPI adjusted fee for producing the report; ED is defined as the indicator variable for the event study event date, coded as 1 if the IER is issued between 30 March 2011 and 31 December 2013, otherwise coded 0 (when IER is released between 1 January 2008 and 29 March 2011); and DCF is defined as the indicator variable coded 1 if DCF is the expert's primary valuation methodology, otherwise coded 0. It also should be noted that measurement of IER quality is inherently problematic and has been estimated in this study using proxies selected and developed based on the support of their use by Bugeja, Da Silva Rosa and Walter (2005).

IER Quality: The Expert's Valuation Relative to the Executed Price

The primary objective in ascertaining quality is to measure the *distance* between the expert's valuation and the executed price, regardless of whether that valuation is above or below the executed price. Therefore, the scaled distance is utilised as a proxy of report quality, which can be expressed as:

$$\text{Scaled Distance} = \left| \frac{\text{Expert's Valuation}}{\text{Executed Price}} - 1 \right|$$

- Equation 1: Scaled Distance

The scaled distance will always be a positive number as it expresses the absolute difference between the expert's valuation and the executed price. An expert report is measured as higher (lower) quality when the absolute distance is closer to (further from) zero. The relationship between the expert's valuation, executed price and scaled distance can be expressed as:

$$\text{Expert's Valuation} = \text{Executed Price} \times (1 \pm \text{Scaled Distance})$$

Given experts provide a range of values rather than a single valuation point, this study uses several different valuation points to express the expert's valuation in the scaled distance formula: the mid-point, low value and high value. Therefore, this study uses the following additional three proxies of report quality:

$$\text{Mid Scaled Distance (MSD)} = \left| \frac{(\text{High Valuation} + \text{Low Valuation})/2}{\text{Executed Price}} - 1 \right|$$

- Equation 2: Mid Scaled Distance (MSD)

$$\text{Low Scaled Distance (LSD)} = \left| \frac{\text{Expert's Low Valuation}}{\text{Executed Price}} - 1 \right|$$

- Equation 3: Low Scaled Distance (LSD)

$$\text{High Scaled Distance (HSD)} = \left| \frac{\text{Expert's High Valuation}}{\text{Executed Price}} - 1 \right|$$

- Equation 4: High Scaled Distance (HSD)

IER Quality: The Scaled Range of the Expert's Valuation

The dependent variable used by Bugeja, Da Silva Rosa and Walter (2005) is the difference between the experts' high and low valuation of the target expressed as a percentage of the target's share price three months prior to the takeover announcement. However, their results were unchanged when the mid-point of the expert's valuation was used as a scalar. Accordingly, as an additional proxy of IER quality, this study defines the scaled range as follows:

$$\text{Scaled Range (SR)} = \frac{\text{Expert's High Valuation} - \text{Expert's Low Valuation}}{\text{Mid Point of Expert's Valuation}}$$

- Equation 5: Scaled Range (SR)

All tests of IER quality were run using each of the four aforementioned proxies of IER quality: *MSD*, *LSD*, *HSD* and *SR*. Using these four proxies will lead to more informative conclusions than if one proxy was used in isolation.

Controls for Factors Influencing the Scaled Distance and Scaled Range

Competition and Synergy

Competition and synergy may influence the accuracy of the expert's valuation relative to the executed price (Mandelker, 1974, Ruback, 1983, Brown and Horin, 1986). Synergies play an important role in determining the price the bidder is willing to pay for the target. Given this, an expert's valuation may diverge from the executed price if the successful bidder can extract significant synergies that are not available to other bidders. Madura and Ngo (2008, p.333) find that "in a competitive market for takeover bids, the takeover premium serves as an effective proxy for the expected synergy." Therefore, the takeover premium is used to control for synergy. This study adopts Madura and Ngo's (2008) definition of takeover premium as the

percentage difference between the executed price and the target's market value one day prior to receipt of the first takeover bid.

Expert's Opinion

The expert's opinion is controlled for given it has the ability to influence the executed price. Eddey (1993) found that a takeover is more likely to succeed, and less likely to result in an increased bid, when the expert expresses a fair and reasonable opinion. Therefore, the expert's opinion impacts the executed price by influencing shareholders' decision to accept the proposal. A bidder may be more likely to revise its offer upwards when the expert provides an opinion other than fair and reasonable.

Valuation Complexity

The inherent level of complexity in valuing the target may influence the accuracy of the expert's valuation relative to the executed price, and thus a control is required. Damodaran (2007) argues that it is more difficult to value companies which are comprised of a larger number of business units and subsidiaries. Deciphering 'economic reality' becomes increasingly opaque, causing estimation of fundamental inputs into valuation models to become less accurate. Bugeja, Da Silva Rosa and Walter (2005) identify a number of factors which affect a valuation. Companies with a high degree of decentralisation (measured by the number of subsidiaries) and diversification (measured by the number of industry segments) are more complex to value. Complexity of valuing the target increases with firm size (measured by market capitalisation), the target firm's reliance on growth options, (measured by the market-to-book ratio) and expert report length (measured by number of pages). Experts with more time to produce their report will provide a more accurate valuation. The period to prepare the IER is controlled for by the number of days between the takeover announcement and the report release (Bugeja, Da Silva Rosa and Walter 2005). Finally, Bugeja (2007) suggests that firms voluntarily commission IERs in circumstances where there is a high level of valuation complexity or as a defensive tactic to evade a hostile takeover (Ross, Westerfield and Jaffe, 2010). As such, a control variable is added for voluntarily commissioned IERs.

IER Quality Model vs Bugeja, Da Silva Rosa and Walter's (2005) Model

While Bugeja, Da Silva Rosa and Walter (2005) use the scaled range of the expert's valuation as a proxy for report quality, they recommend future researchers use the expert's valuation relative to the executed price as a proxy of report quality. However, they do not provide specific details of how to measure this. A contribution of this study is in defining *MSD*, *LSD* and *HSD*. Although the model used in this study adopts six of the control variables used by Bugeja, Da Silva Rosa and Walter (2005), two of their variables have been omitted, and two of their variables were merged into one variable. Given the focus of this study, indicator variables for whether the expert was from a 'Big 6/5' firm or not (ExptB6 and ExptNB6) are omitted from Bugeja, Da Silva Rosa and Walter's (2005) original model.³⁸ Additionally, Bugeja, Da Silva Rosa and Walter (2005) included variables indicating whether the expert was the target's current auditor (Expaud) and whether the expert had other (non-audit) business dealings with the target (Exprel). The IER quality model in this study includes a variable for other business dealings (OBD), which comprises both audit and non-audit dealings. This study also contributes eight variables not included in Bugeja, Da Silva Rosa and Walter's (2005) model.

³⁸ The 'Big 6/5' is an expression used to describe the large international accounting firms during the period in which Bugeja, Da Silva Rosa and Walter's (2005) study took place. Since the collapse of Arthur Andersen, it has been known as the 'Big 4' comprised of KPMG, PwC, Deloitte and Ernst & Young.

Hypotheses tests

Testing H1: Event Study of the 2011 Revisions

As previously mentioned, the data sample was split into the following two groups:

$$ED = \begin{cases} 0 & \text{if IER issued between 1 January 2008 and 29 March 2011} \\ 1 & \text{if IER issued between 30 March 2011 and 31 December 2013} \end{cases}$$

The ED=0 and ED=1 mean and standard deviation are calculated for each proxy of IER quality: *MSD*, *LSD*, *HSD* and *SR*. If the means and standard deviations are lower for ED=1 than ED=0, and the differences are statistically significant, this is indicative of an improvement in average IER quality and a reduction in the variation of IER quality subsequent to the 2011 Revisions. For *MSD*, *LSD*, *HSD* and *ER*, a two-sample *t*-test is carried out to determine if the ED=0 mean and ED=1 means are significantly different from one another at the 0.1, 0.05 and 0.01 levels of significance.³⁹ The *t*-statistic reveals whether the two means are significantly different from one another. Where the *t*-statistic is 1.66 or larger, the difference between the ED=1 and ED=0 means are at least significant at the 0.1 level. Furthermore, the statistical significance of the difference between the means will be examined with reference to *p*-values. If the *p*-value is less than the significance level (0.1, 0.05 or 0.01) the difference between the means is said to be statistically significant to the independent variable (*MSD*, *LSD*, *HSD* and *SR*).

Furthermore, for *MSD*, *LSD*, *HSD* and *SR*, an *F*-test is undertaken to determine if the ED=0 standard deviations are significantly different from that of ED=1 at the 0.1, 0.05 and 0.01 levels of significance.⁴⁰ The *F*-statistic and *p*-value reveal whether the two standard deviations are significantly different from one another. If the *p*-value is less than the significance level (0.1, 0.05 or 0.01) the difference between the ED=1 and ED=0 standard deviations is statistically significant.

Testing H2: Fees and Quality

To determine whether experts with higher fees provide higher quality reports, the betas and *t*-statistics for *lnFee* in the IER quality model are examined for *MSD*, *LSD*, *HSD* and *SR*. A negative beta suggests that there is an improvement in IER quality for a given increase in the expert's fee. A reduction in *MSD*, *LSD*, *HSD* and *SR* is consistent with an improvement in IER quality. On the other hand, if there is a positive beta for fees, it suggests that there is a reduction in IER quality for a given increase in the expert's fees. The *t*-statistics of the *lnFee* coefficients are inspected to determine whether the estimates are statistically significant at the 0.1, 0.05 and 0.01 levels of significance.

³⁹ This is a two tailed test since the null hypothesis is that the ED=0 mean is equal to the ED=1 mean. Therefore, the test determines whether the ED=1 mean is greater than, or less than, the ED=1 mean. A two tailed test allots half of the level of significance, α , to testing the significance in each direction. For example, if $\alpha=0.1$, then 0.05 of the level of significance would be allotted to either tail of the student's *t*-distribution. Given this is a two sample *t*-test, the degrees of freedom is equal to the sum of the number of used observations in the ED=0 and ED=1 subsamples minus 2 (105-2=103). There were 105 observations used (rather than 107) due to the two experts disclosing the expert's fee as 'a reasonable hourly rate' which was not quantified, rather than a total dollar figure.

⁴⁰ This is a one tailed test since the null hypothesis is that the standard deviations of ED=0 and ED=1 are equal. The standard deviation can only take on a positive value. Therefore, the test determines whether the ED=1 standard deviation is greater than the ED=0 standard deviation. A one tailed test allots the entire level of significance, α , to testing the significance in one direction. For example, if $\alpha=0.1$, then 0.1 of the level of significance would be allotted to the right tail of the F distribution.

RESULTS AND DISCUSSION

Test of H1: Event Study of the 2011 Revisions

Table 6 compares the average *MSD*, *LSD*, *HSD* and *SR* for ED=1 with those for ED=0. In support of H1, the results indicate that average *MSD* and *HSD* were significantly lower for ED=1 than ED=0 by almost half. The *MSD* and *HSD* mean decreased from 0.2324 and 0.2827 before the 2011 Revisions to 0.1129 and 0.1230 afterwards, representing a reduction of 11.95% and 15.97% with *t*-statistics of -2.57 and -2.87 respectively. Although the average *LSD* and *SR* were lower for ED=1 than ED=0, the differences were not statistically significant with *t*-statistics of -1.48 and -0.96. The negative coefficient estimates for ED in the IER quality regression model are also consistent with a significant reduction in *MSD* and *HSD*, even in the presence of the control variables.

Furthermore, the results indicate that there was a significant reduction in standard deviation across all proxies of IER quality subsequent to the 2011 Revisions. Consistent with a significant decrease in the volatility of IER quality, the standard deviation for *MSD*, *LSD*, *HSD* and *SR* reduced by 24.01%, 23.63%, 28.80% and 30.94% with *F*-statistics of 4.11, 2.91, 6.25 and 6.50 respectively. This suggests that there was a considerably higher degree of variation in IER quality prior to the 2011 Revisions. The variation in *MSD*, *LSD*, *HSD* and *SR* are discussed further below when the quartiles are analysed.

Overall, the results in Table 6 are indicative of an improvement in IER quality and are consistent with H1: that IER valuations produced subsequent to the 2011 Revisions are more accurate relative to the executed price, and have a smaller scaled range, than IERs produced prior to the 2011 Revisions. Additionally, the significant reduction in the standard deviation of *MSD*, *LSD*, *HSD* and *SR* for ED=1 suggests that there was drastically less variation in the quality of IERs prepared in accordance with the 2011 Revisions.

To reinforce the notion that the change of the regulatory framework has had a positive impact on the quality of IERs in the Australian case, an identical control test was conducted using a sample of valuations from the New Zealand market during a commensurate period where there was no regulatory change. This test comparing two jurisdictions, both under a similar judicial system and operating within similar corporate environments is intended to provide some robustness to the results. The New Zealand control test showed no change to valuation quality during a period of no regulatory change. This control test reinforces the benefits of the Australian regulatory reform in this area.

- Table 6: Primary Event Study of the Australian 2011 Revisions

ED	MID SCALED DISTANCE (MSD)		LOW SCALED DISTANCE (LSD)		HIGH SCALED DISTANCE (HSD)		SCALED RANGE (SR)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
0 (n=53)	0.2324	0.3055	0.2497	0.2889	0.2827	0.3794	0.2780	0.4073
1 (n=54)	0.1129	0.1506	0.1819	0.1694	0.1230	0.1518	0.2202	0.1597
Difference (1 – 0)	-0.1195	-0.2401	-0.0678	-0.2363	-0.1597	-0.2880	-0.0578	-0.3094
t-statistic; F-statistic	** -2.57	*** 4.11	-1.48	*** 2.91	*** 2.87	*** 6.25	-0.96	*** 6.50

*, **, *** denotes statistical significance at the 0.1, 0.05 and 0.01 levels respectively

- Table 7: Quartiles of MSD, LSD, HSD and SR for the Australian Sample

Quartile	MID SCALED DISTANCE (MSD)		LOW SCALED DISTANCE (LSD)		HIGH SCALED DISTANCE (HSD)		SCALED RANGE (SR)	
	ED = 0	ED = 1	ED = 0	ED = 1	ED = 0	ED = 1	ED = 0	ED = 1
Min	0.0000	0.0011	0.0031	0.0000	0.0000	0.0066	0.0000	0.0000
Q1	0.0250	0.0236	0.0609	0.0625	0.0525	0.0472	0.1043	0.1114
Median	0.0824	0.0828	0.1133	0.1290	0.1050	0.0857	0.1431	0.1664
Q3	0.4002	0.1421	0.3292	0.2727	0.3625	0.1515	0.2867	0.2651
Max	1.0575	1.0000	1.0000	1.0000	1.6190	1.0000	2.0000	0.7852

*, **, *** denotes statistical significance at the 0.1, 0.05 and 0.01 levels respectively

Regression Model of IER Quality

Table 8 presents the regression coefficient estimates and *t*-statistics for *MSD*, *LSD*, *HSD* and *SR*. A negative coefficient indicates a reduction in *MSD*, *LSD*, *HSD* and *SR* for a one unit increase in a given variable. Given that a reduction in scaled distance and scaled range is indicative of an improvement in IER quality, a negative coefficient suggests that IER quality improves as the variable increases.

The only variable which is significantly negatively related to *MSD*, *LSD*, *HSD* and *SR* is *lnMktcap*. If *lnMktcap* increases by \$1 then *MSD*, *LSD*, *HSD* and *SR* decrease by approximately 7%, 6%, 8% and 8% respectively. The valuation of firms with a larger *lnMktcap* was assumed to be more complex, and thus a positive coefficient indicative of a reduction in IER quality was expected. However, a potential explanation for the negative coefficient for *lnMktcap* is that larger companies are more likely to be covered by information intermediaries such as equity research analysts and credit rating agencies, which may assist the expert in providing a more informed, higher quality valuation.⁴¹

In addition to the *lnMktcap* coefficients being significant, *EO*, *ED* and *lnPage* had significant coefficients under *MSD* and *HSD*. *DCF* was significant for *HSD* and *SR*. All other variables (*Subs*, *Ind*, *MB*, *Days*, *Revs*, *OBD*, *Vol*, *Prem* and *lnFee*) had a statistically insignificant effect on *MSD*, *LSD*, *HSD* and *SR*.

The results support H1, but do not support H2. In support of H1, that IER quality improved subsequent to the 2011 Revisions, *ED* had significant negative coefficients under *MSD* and *HSD*.⁴² This means that when *ED*=1 (from 30 March onwards – the date the 2011 Revisions were implemented), and all other variables set to zero, *MSD* and *HSD* decrease by approximately 7% and 9%, consistent with an improvement in IER quality. Conversely, H2 is rejected given the *lnFee* coefficients are not significant, suggesting that there is an insignificant relationship between the expert's fee and quality of the report.

The *Days* coefficients were insignificant, indicating that *MSD*, *LSD*, *HSD* and *SR* are not significantly impacted by the number of days between the takeover announcement and release of the expert report. This suggests that IER quality is relatively uniform regardless of how long the expert has to prepare their report. IER quality is also relatively uniform regardless of the target's number of subsidiaries and segments, market-to-book value ratio, or whether the report is voluntarily commissioned as opposed to legally required. Contrary to the findings of Bugeja, Da Silva Rosa and Walter (2005), report quality was not significantly different when the expert had other business dealings with the target.

Similarly, *Prem* had statistically insignificant coefficients for all four proxies of IER quality, suggesting that *MSD*, *LSD*, *HSD* and *SR* are not significantly impacted by the premium paid by the bidder. Assuming *Prem* is an appropriate proxy for synergy effects, the results suggest that IER quality (measured using *MSD*, *LSD*, *HSD* and *SR*) is not significantly impacted by synergies available to the bidder. The *Prem* coefficient of -0.1132 under *SR* shows minimal change with a *t*-statistic of -1.49.

⁴¹ Equity research analysts (the equity research arm of investment banks such as Goldman Sachs, Macquarie Group and JPMorgan) provide 'broker reports' which recommend whether investors should buy (overweight) or sell (underweight) shares in selected publicly listed companies. Credit rating agencies, such as Moody's, Fitch and Standard & Poor's, assess the creditworthiness of corporations by considering the likelihood the company will default on their debt obligations.

⁴² Although the *ED* coefficient was negative for *LSD* and *SR*, they were not statistically significant with *t*-statistics of -0.98 and -0.84.

Multicollinearity was not evident between most variables.⁴³ The following variables have Pearson correlation coefficients above 0.3: *lnFee* with *days* (0.30), *lnMktcap* (0.66), *subs* (0.60) and *lnPage* (0.45); and *subs* with *lnMktcap* (0.33). However, the nature of what each of these variables measure is fundamentally distinct. The units in which they are measured are also different. Given this, these variables were retained in the regression model.

The adjusted R^2 indicates that the model explains approximately 28%, 12%, 4% and 15% of the variation in *MSD*, *LSD*, *HSD* and *SR* respectively. All four models are significant as the *F*-statistics show that *LSD* and *SR* are significant at the <5% level and *MSD* and *HSD* are significant at the <1% level. Although Intercept has significant coefficients across all four proxies of IER quality, it is not meaningful as several of the variables in the model cannot realistically be set to zero, such as *lnPage*, and *lnFee*.

Test of H2: Relationship between Fees and Report Quality

The insignificant coefficients for *lnFee_ED* in Table 8 do not support H2, suggesting that in the presence of the other control variables, experts with higher fees do not provide valuations (1) which are more accurate relative to the executed price, and (2) with a narrower scaled valuation range. Despite having positive coefficients indicative of deterioration in quality for a given increase in *lnFee*, the estimated increases in *MSD*, *LSD*, *HSD* and *SR* are not significantly different from zero as evidenced by their respective *t*-statistics.

The implication of these results is that commissioning firms cannot assume that an expert with higher fees will provide a higher quality report on average. Rather, the findings imply that the commissioning firm should select the expert with the lowest quoted fees. However, in reality, this may not be suitable as the utility of the report may be influenced by other factors. An alternative approach could include forming a shortlist of potential suitable experts, from which the commissioning firm should select the expert with the lowest quoted price. When selecting an expert, commissioning firms are required by ASIC to demonstrate that more factors than just the quoted fee has been considered (BDO 2011). Generally, suitable experts are those which are independent and have sufficient expertise and resources to provide a high quality report. Although Bugeja, Da Silva Rosa and Walter (2005) found that experts with any type of other business dealings with the target charge significantly lower fees, the utility of such reports may be limited due to a perceived lack of independence. In particular, Bugeja (2005b) found reports prepared by the target's auditor were viewed as non-independent by the market. Therefore, although the results of this study suggests that the commissioning firm should select the expert with the lowest fees, it may be prudent to consider other factors such as the actual and perceived independence of the expert.

This section presented, interpreted and discussed the empirical results of the experiments undertaken to test the two hypotheses in this study. Consistent with H1, the results indicate that there was an overall improvement in IER quality subsequent to the 2011 Revisions. Inconsistent with H2, the results indicate that the relationship between expert fees and IER quality (indicated by *MSD*, *LSD*, *HSD* and *SR*) is insignificant.

⁴³ Multicollinearity exists when there is a high degree of correlation between two or more predictor variables in a multiple regression model. The existence of multicollinearity increases the standard errors of the coefficients and can make the coefficient estimates and *t*-statistics highly sensitive to small changes in the model or the data.

- Table 8: Australian IER Quality Regression Model Estimates

Variable	MID SCALED DISTANCE (MSD)		LOW SCALED DISTANCE (LSD)		HIGH SCALED DISTANCE (HSD)		SCALED RANGE (SR)	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Intercept	1.2304	*** 3.49	1.3131	*** 3.49	1.4292	*** 3.72	2.0871	*** 4.05
<i>ln</i> Mktcap	-0.0686	*** -3.72	-0.0638	*** -3.24	-0.0768	*** -3.83	-0.0785	*** -2.96
Subs	-0.0000	-0.04	0.0006	0.58	-0.0003	-0.26	0.0004	0.28
Ind	-0.0040	-0.18	0.0014	0.06	0.0022	0.09	0.0232	0.77
<i>ln</i> Page	0.1169	* 1.75	0.0575	0.80	0.1389	*1.90	-0.1082	-1.17
MB	0.0001	0.78	0.0002	1.11	0.0002	0.83	0.0003	1.13
Days	-0.0001	-0.20	-0.0003	-0.55	-0.0001	-0.14	-0.0005	-0.77
EO	-0.2515	*** -4.32	-0.0971	-1.56	-0.4088	*** -6.44	0.0257	0.32
OBD	-0.0890	-1.64	-0.0956	-1.66	-0.0586	-0.99	-0.1172	-1.57
Vol	-0.0124	-0.28	-0.0369	-0.79	-0.0102	-0.21	-0.0642	-1.07
Prem	-0.0390	-0.72	-0.0371	-0.64	-0.0297	-0.50	-0.1132	-1.49
<i>ln</i> Fee_ED	-0.0000	-0.12	0.0000	0.16	0.0000	0.06	0.0000	1.35
ED	-0.0720	* -1.67	-0.0436	-0.95	-0.0948	** -2.02	-0.0459	-0.76
ED_DCF	-0.0052	-1.07	-0.0103	1.13	-0.0971	*1.63	-0.0711	- 1.32
F-statistic	***3.95		**1.99		***6.35		** 2.2500	
Adjusted R ²	0.2843		0.1178		0.4186		0.1451	
N	105.0000		105.0000		105.0000		104.0000	

*, **, *** denotes statistical significance at the 0.1, 0.05 and 0.01 levels respectively

CONCLUSION

Overall, this study is of interest to several groups, including regulators such as ASIC, firms commissioning IERs, expert firms and investors faced with a takeover offer. It answers several unique questions about the quality, fees and valuation methodologies of IERs in Australian takeovers by applying empirical methods and defining new proxies of report quality. It delivers evidence suggesting that ASIC's 2011 Revisions to their IER regulatory guides, RG 111 and RG 112, were successful in improving report quality. By disproving the notion that expert fees and report quality are positively related, this paper provides commissioning firms with insights when selecting an expert in a market with widely diverging quoted fees. IER quality is inherently subjective and can only be measured through the use of a proxy. The proxies used for IER quality are the expert's valuation (mid, low and high) relative to the executed price, and the scaled range of the expert's valuation. The use of these revised measures for IER quality when combined, constitute a significant contribution of this study.

To further reinforce results and conclude that the change of the regulatory framework has had a positive impact on the Australian case, a control test was conducted by using a sample of valuations from the New Zealand market. The New Zealand control test showed no change to valuation quality during a period of no regulatory change. This control test reinforces the benefits of the Australian regulatory reform in this area.

It is suggested that future researchers continue to scrutinise the most appropriate proxy for IER quality as well as including the speed with which IER quality improved. It would also be of interest to consider takeovers using equity of the acquiring firm as consideration in their bids. Moreover, future research could include IER quality and valuation by industry, as well as the impact of the 2011 Revisions on expert independence. Any pre and post study relating to the introduction of new regulations could also assess the differential impact on valuation quality in failed as well as successful deals. Fees may also differ between successful and failed deals. Data on unsuccessful bids was not available for this study. Further tests could explain whether there are specific reasons that drive the target firm to select voluntary expert reports.

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