

# **MASTER OF BUSINESS**

## **Changes in Value of Investment Opportunity Set and Goodwill Impairment**

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## **ATTESTATION OF AUTHORSHIP**

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where cited), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

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## **ABSTRACT**

The adoption of International Financial Reporting Standards (IFRSs) results in many changes in goodwill impairment accounting regime in IAS 36. This study investigates the relationship between the changes in value of firms' investment opportunities set (IOS) and the amount of goodwill impairment losses for New Zealand (NZ) listed firms since the new goodwill impairment testing regime was introduced. A pooled time-series and cross-sectional analysis is adopted in this study in order to evaluate the changes of results over the examined period. The results support that the changes in value of sample firms' IOS are negatively related to their amount of goodwill impairment losses during the examined period from the financial year 2008 to the financial year 2009.

***Keywords:*** investment opportunities set; goodwill impairment;

## INTRODUCTION

This paper examines the relationship between the changes in value of firms' investment opportunities set (IOS) and the goodwill impairment write-offs under the new goodwill impairment testing regime in New Zealand (NZ) since International Financial Reporting Standards (IFRSs) was adopted in 2007.<sup>1</sup> More specifically, it investigates whether there has been a negative association between the changes in value of NZ firms' IOS and their amount of goodwill impairment losses from the financial year 2008 to the financial year 2009. A pooled cross-sectional analysis is adopted in this study in order to evaluate and compare the mixed results over the examined period.

Goodwill generates from a business combination which is often described as the aggregate of (a) the acquisition-date fair value of the consideration transferred, (b) the amount of any non-controlling interest in the acquire measured, (c) in a business combination achieved in stages, the acquisition-date fair value of the acquirer's previously held equity interest in the acquiree (d) the net of the acquisition-date amounts of the identifiable assets acquired and the liabilities assumed measured (IASB, 2009c, para 32). Goodwill impairment loss arises if its carrying amount is greater than its recoverable amount. The difference between goodwill's carrying amount and its recoverable amount is recognised as an impairment loss (IASB, 2009a, para 6).

At the beginning of 2007, all listed companies in New Zealand were required to fully adopt IFRSs when preparing their financial reports. Likewise, one hundred and thirteen countries world widely either require or permit the use of IFRSs when they prepare their consolidated financial statements for the external financial reporting (IAS, 2010).

As a matter of fact, there is a major change for the approaches in the accounting for impairment in IAS 36. During the pre-IFRSs period in New Zealand, New Zealand Generally Accepted Accounting Principles (NZ GAAP) stated that goodwill needed to be capitalised and amortised over its useful life and the amortising period must not exceed

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<sup>1</sup> NZ allowed voluntary adoption for IFRSs starting from January 1, 2005.

twenty years (Deegan & Samkin, 2004). Meanwhile, there was a reassessment for unamortised amount balance of goodwill every year in order to determine the future economic benefits and internally generated goodwill was not allowed to be recognised as an asset (Deloitte, 2005). Moreover, there was also no specific guidance for impairment test and the goodwill impairment losses are allowed to be reversed in certain conditions. Next, 'value in use' is defined as the present value of the net future cash flows obtainable from an asset's continuing use and ultimate disposal (Deloitte, 2005, p. 16). Equally important, less guidance was provided for goodwill and intangible assets recognised from a business combination (Deegan & Samkin, 2004). In addition, recoverable amount is interpreted as the greater of net market value and value in use (Deloitte, 2005).

On the other hand, IFRSs' requirements in this particular field are different and relatively complicated. Under the IFRSs, it (2009c) requires to separately recognise goodwill and other intangible assets from a business combination; IAS 38 (IASB, 2009b) also states that internal generated goodwill may not be recognised as a asset. Next, goodwill is required to be allocated to cash generating units (CGUs). In details, A CGUs is defined as the smallest identifiable assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets (IASB, 2009a, para 6). In fact, the estimation for a single asset in impairment testing is difficult since the cash flows are generated from many integrated assets. It requires several factors to recognise the CGUs, such as management monitors, daily operation, and management's decision making of the disposition for the assets (Romano, 2008).

Meanwhile, an annual impairment test is required in IAS 36 instead of goodwill amortisation (IASB, 2009a). IFRSs also provide a detailed introduction for evaluating the impairment of an asset. In fact, an annual impairment test should be performed when goodwill acquired in a business combination during the current period and goodwill has been allocated to a group of CGUs (IASB, 2009a). Furthermore, IFRSs also stipulate that the impairment must be recognised by the entity when the carrying amount of assets with CGUs is higher than the recoverable amount (IASB, 2009a). IAS 36 emphasises more on the level of the CGUs with goodwill, internal management monitor process and fair value. More importantly, IFRSs adopt a discounted basis and define that the recoverable amount is

the higher of its fair value less costs to sell and its value in use (IASB, 2009a, para 6). Equally important, it is not allowed to reverse the impairment losses for goodwill under new IFRSs. In addition, IAS 36 (2009a) also requires additional disclosures for a significant impairment loss or a reversal.

According to above discussions, those changes in goodwill impairment accounting from NZ GAAP to IFRSs would have a major effect on the relations between the firms' IOS and their accounting policy choices of goodwill impairment.

Smith and Watts (1992) argue that firm's IOS provides a potential explanation for cross-sectional variation in examining the accounting choice of corporate financing, dividend and compensation policies. However, previous research studying the relationship between the IOS measure and accounting choice including goodwill presents some interesting results (e.g. Skinner (1993); Pincus and Wasley (1994); Gupta (1995); Bradbury et al., (2003) and Godfrey and Koh (2009)). With few exceptions, prior research used to suggest that it is not easy to estimate IOS and their value largely depends on managers' decisions so that the association between IOS and their accounting policy choices is not strong.

For example, Gupta (1995) does not find a strong relationship between firm's IOS and accounting policy choice of income tax allocation. That result is consistent with those of Skinner (1993) and Pincus and Walsey (1994) who suggest the association between the firm's IOS and accounting policy choices is not strong enough or needs better empirical proxies. On the other hand, Bradbury, Godfrey and Koh (2003) study the relationship between the listed firms' IOS and goodwill amortisation attributes in New Zealand before the adoption of IFRSs. The outcome suggests that there is a negative association between the firm's IOS and goodwill amortisation. In addition, Godfrey and Koh (2009) find that there is a strong and negative relationship between US firms' IOS and their goodwill impairment losses under new goodwill impairment accounting regime since the firms have a higher IOS with less goodwill impairment writes-off.

According to the above discussion, it is clear that the relations between firms' investment opportunities and their goodwill impairment have not been tested in NZ since the adoption for IFRSs. According to prior research, the association between the firms' IOS and their

goodwill accounting has been discussed in the studies of Skinner (1993), Bradbury et al., (2003) and Godfrey & Koh (2009). It is important to conduct the research in order to investigate the vital association between firms' various investment opportunities and their amount of goodwill impairment losses in NZ firms under the new goodwill impairment testing regime since 2007.

It is also important to conduct this research in order to evaluate whether new IFRSs goodwill impairment accounting regime would produce same results of the association between NZ firm's IOS and goodwill impairment accounting in the consistent with Bradbury et al., (2003) study. In addition, it is necessary to implement this research in order to determine the potential extent of association between NZ firm's investment opportunities and their goodwill impairment accounting since the associations between IOS and new goodwill impairment can provide useful and pertinent information to improve the firms' future growth opportunities.

There are several differences between this study and prior research. Firstly, this study has been conducted under different goodwill accounting policy in New Zealand from the financial year 2008 to the financial year 2009 (new IFRSs have been adopted in NZ since 2007). Secondly, this study uses the changes in value of NZ firm's investment IOS to conduct the data analysis. The changes in value are described as the value of differences between current year's IOS results and previous year's IOS results of the sample firms. Therefore, the results of the changes in value of IOS are also different from those of prior IOS research since prior research focused on the fixed value in the year of IOS results, such as the studies conducted by Bradbury et al.,(2003) and Godfrey & Koh (2009). Thirdly, this paper uses a combined IOS's proxies from both Gaver and Gaver (1993) and Baber et al. (1996) studies to conduct the IOS data analysis.

There have been some contributions in this paper. Firstly, to be consistent with the results of Bradbury et al., (2003) and Godfrey & Koh (2009). The relatively higher their investment opportunities result in the less firms' goodwill amortisation or impairment write-offs. As a result, the goodwill impairment loss is an indicator of the firms' investment structure and future growth. It is therefore important to investigate whether there is a negative relationship between the changes in value of the firm's IOS and their

amount of goodwill impairment losses under new goodwill impairment testing regime in NZ from the financial year 2008 to the financial year 2009. Secondly, the changes in value of the firm's IOS is emphasised in this study since the changes in value can provide more prudent and consistent information in order to measure the investment opportunities and predict the future financial stability. Thirdly, this study also evaluates the significant changes in the new goodwill impairment regime in IFRSs.

Meanwhile, the findings of this study are useful to the business investors, financial data analysts and academic researchers. In details, the results are useful for business investors and financial data analysts to evaluate the firms' present investment structure and make a possible prediction for their future growth by fully facilitated their both tangible and intangible assets related to their investment measurement. The finding is also available for academic researchers to study and examine the link between the accounting policy choices of goodwill impairment and the firm's investment opportunities measure under new IFRSs continuously. Furthermore, the results also provide an indication of the relationship between NZ listed firms' investment opportunities and goodwill impairment accounting under the tough economic conditions since the global financial crisis started in 2007. In addition, the finding of this study can help firms to better understand and facilitate the critical association between the firms' IOS and their goodwill impairment write-offs. Finally, this study helps to enrich accounting choices by evaluating more relevant factors of the influence on IOS.

The remaining sections are structured in the following way: Section 2 review prior research and develops the hypothesis to be tested; Section 3 discusses the sample selection and measures dependent & independent variables; Section 4 presents and discusses the results and Section 5 concludes.

# **HYPOTHESIS DEVELOPMENT**

## ***2.1 Prior Research***

Previous research of the association between the firms' investment opportunities and accounting policy choices emphasised on some mixed aspects. Watts and Zimmerman (1978, 1990) argue that companies' accounting policy choice of contracting cost is associated with their IOS. Thereafter, more evidences have proved that firm's IOS have an impact on their accounting choices and finance, dividend and compensation policy (Gaver & Gaver, 1993; Smith & Watts, 1992).

Zimmer (1986) is one of the first to conduct a direct test to investigate the relationship between the firms' IOS and accounting choice of interest costing. He studies the Australian real estate developers who capitalise their interest costs and concludes that the cost-plus contracting association between the firms and their customers is frequently link to the interest capitalisation method.

Smith and Watts (1992) suggest that US firms' IOS is likely to be influenced by corporate financing, dividend and compensation policies. Smith and Watts (1992) also argue that the IOS plays an important role in the firm's capital structure, debt contracts, dividend policy, compensation policies since IOS is a vital element of corporate finance.

Skinner (1993) provides evidence that the firms' IOS is associated with their accounting procedures of income-increasing depreciation and goodwill, their size and financial leverage, their debt contracts and management compensation contracts by a large sample of the US firms ranging across multiple industries. Pincus and Wasley (1994) conduct the research for the time-series and cross-sectional patterns in a various and large US sample firms of the voluntary and mandatory accounting policies changes period from 1969 to

1988. The authors (1994) suggest that firms within the same industry by adopting similar IOS is associated with a similar accounting change at about the same time.

Godfrey (1994) examines the relationship between firms' voluntary foreign currency accounting policies and their specificity of assets & investment opportunities. The author argues that unregulated foreign currency accounting policy choice is significantly explained by Australian firms' investment opportunities. Gupta (1995) also investigate the association between partial or comprehensive income tax allocations and the US firms' IOS. He argues that there is only a weak link between the firm's partial or comprehensive income tax allocations and their investment opportunities.

Wong and Wong (2001) determine how the managers in New Zealand handle the cost of firms' investments in subsidiaries and examine the relationship between the firms' IOS and their acquired goodwill. The finding suggests that there is a negative relationship between the acquired goodwill and NZ firms' IOS.

Meanwhile, AlNajjar and Belkaoui (2001) find that the IOS is positively linked to the firms' reputation, size and profitability and it is negatively related to leverage and risk for US multinational firms. Furthermore, Gaver and Gaver (1993) argue that there is also a negative relationship between US firms' financing, dividend & compensation policies and their IOS. In addition, Ben (2006) examines the association between several potentially important economic incentives including IOS and the accounting policy choices. The author (2006) argues that there is a positive relationship between US firm's earning capitalisation and the future above-the-line goodwill impairments.

## ***2.2 Hypothesis Development***

This paper examines the relations between the changes in value of firms' IOS and NZ listed firms' amount of goodwill impairment losses. More importantly, this study concentrates only on the accounting clauses that have a significant impact on the firm's investment opportunities, in this case is goodwill impairment accounting.

The investment opportunities are not only viewed as the total of the value of assets in place, but also the value of the intangible assets in total. In practice, goodwill is not easy to estimate and evaluate the impairment periods. Similarly, it is also difficult for the firm's manager to appropriately measure the investment opportunities for firm's future growth expectations and the future value of the investment opportunities relying significantly on their accurate decisions (Skinner, 1993). When the acquisition happens, the differences between the fair value of the net assets acquired by the company and the actual price paid for the acquisition are regarded as goodwill (IASB, 2009c). Goodwill therefore can be considered as the firm's future growth opportunities under the accounting way (Bradbury, et al., 2003). As a result, the relationship between goodwill accounting and investment opportunities needs to be further observed and examined.

Next, Skinner (1993) indicates that goodwill accounting and the amortisation policy are unlikely to match the firms' high investment opportunities under a relatively less regulated reporting environment. Meanwhile, Bradbury et al., (2003) investigate the connections between the accounting choice of goodwill amortisation and the firms' IOS in New Zealand. The result suggests that firms amortise lower amount of goodwill when the firms have higher investment opportunities. The authors (2003) also argue that the goodwill accounting decision can significantly reflect the firms' IOS than traditional contracting variables.

Since the introduction of the new goodwill impairment testing regime, similar research has been conducted for US firms (Godfrey & Koh, 2009). Their finding supports that the impairment write-offs are oppositely related to US firms' underlying IOS. The results also suggest that new impairment test regime can truly present firms' vital economic attributes.

According to the above discussions, the research question of this study is addressed as: whether there has been a negative association between the changes in value of NZ firms' IOS and their goodwill impairment losses since the new goodwill impairment accounting was adopted in 2007.

The hypothesis is described as *the increase / (decrease) in the changes in value of the investment opportunities set (IOS), results in the decrease / (increase) in value of firms' goodwill impairment write-off.*

## RESEARCH DESIGN

### 3.1 Sample

The data is collected from NZX deep archive. The sample is constructed by collected all listed firms on the New Zealand Stock Exchange (NZX) from the financial year 2008 to the financial year 2009. It is important to collect the data from the financial year 2008 since the IFRSs were fully adopted by NZ firms. A new goodwill accounting policy introduced in IAS 36 since 2007 is also a major reason and condition to conduct this research. Meanwhile, to increase the power of the tests, the firms without any goodwill transactions during the examined period (2008-2009) are eliminated in the sample selection. Furthermore, in order to enhance the consistency and reliability of the tests, three firms that balance by foreign exchange rates have also been excluded from the sample. As a result, the sample procedures identify 51 NZ listed firms to conduct the tests in this study. Those selected firms are more likely to impair goodwill over the periods. Table 1 displays a distribution of sector constituents for the listed firms.

**Table 1: Sample Distribution**

NZSX Industry Code	Number of Sample Firms	Percent
Agriculture & Fishing	5	9.80
Building Materials & Construction	3	5.88
Consumer	6	11.76
Energy Processing	4	7.84
Finance & Other Services	9	17.65
Intermediate & Durables	8	15.69
Investment	4	7.84
Leisure & Tourism	3	5.88
Media & Telecommunications	2	3.92
Ports	2	3.92
Property	1	1.96
Textiles & Apparel	1	1.96
Transport	3	5.88
<b>Total</b>	<b>51</b>	<b>100.00%</b>

### ***3.2 Dependent Variables***

IAS 36 (IASB, 2009a) requires that goodwill acquired in a business combination be tested for impairment annually and allocated to each of CGUs for the purposes of impairment. The group of CGUs to which goodwill is allocated shall represent the lowest level at which it will be monitored and managed and cannot be larger than a segment (IASB, 2009a, para 80). Thus, goodwill impairment loss (GWL) is measured as GWL before tax divided by total assets. GWL emphasises on the portions of the goodwill impairment write-offs within accounting operation of business.

### ***3.3 Independent Variables***

#### ***3.3.1 Measuring Investment Opportunities***

The IOS is an indispensable element of a firm's financial stabilities and performances since the future growth is always the firm's primacy concern. The IOS also has significant impacts on the firm's shareholders, owners, managers, investors and creditors (Kallapur & Trombely, 2001). In fact, the market value of a firm has been divided into two parts: the present value of assets in total and the value of investment opportunities (Myers, 1997 ). Myers (1997 ) also argues that the concept of the investment opportunities comprises the total value of assets of a firm and the value of options to invest in reasonable net present value (NPV) projects in the future. However, it is understandable that the investment opportunities are difficult to measure and the investment opportunities depend significantly on proxy variables and manager's discretion. Therefore, the IOS consists of many firm-specific or industry-specific variables which have a strong influence on financial stability and the potential future growth options for the firms.

Kallapur and Trombely (2001) summarise some types of the firms' IOS. The authors also emphasise on two main types of the IOS's proxies related to majority types of industries. Firstly, the price-based proxies for IOS or market opportunities set (POS) which is described as the firms' growth options related to the fluctuations of their stock prices (Kallapur & Trombely, 2001). Therefore, the POS is viewed as the total value of the measurement of assets in place and the firms' market value. The price-based IOS proxies include:

- Market to book value of assets (MBA): reflects the possible investment opportunities in terms of firms' assets in market (Gaver & Gaver, 1993).
- Market to book value of equity (MBE): measures the present value of all future cash flows to equity holders from both assets and future investment opportunities (Adam & Goyal, 2008).
- Tobin's Q: reflects the replacement value of assets to market value (Skinner, 1993).
- Earning to price (EP): reflects firms' stock market performance. A higher EP ratio indicates that a larger proportion of equity value is contributed to assets for investment opportunities (Smith & Watts, 1992).
- Ratio of property, plant, and equipment to firm value (Skinner, 1993);
- Ratio of depreciation to firm value (Smith & Watts, 1992);

The second type is the investment-based proxies for IOS. A high level of investment activity is expected to be positively associated with the firm's IOS (Kallapur & Trombely, 2001). The investment-based IOS proxies include:

- Investment intensity (Baber, et al., 1996);
- Ratio of capital expenditures to firm value (Smith & Watts, 1992);
- Variance of returns (Gaver & Gaver, 1993);
- Asset betas (Skinner, 1993)

Investment opportunities are one of the most important aspects of the corporate finance (Kallapur & Trombely, 2001). It is necessary to select appropriate variables in order to

meet the firm's higher future investment expectations under the various circumstances. In summary, the IOS plays an important role in corporate finances and it has great impacts on the firm's future investment policies and strategic decisions. Each firm has its unique type of IOS variables. As a result, it is important for the firms' manager to more appropriately select IOS variables.

### ***3.3.2 IOS Variables***

Gaver and Gaver (1993) argue that the investment opportunities contribute to the firm's future values. The authors (1993) also indicate that investment opportunities can be integrated into a set of different forms. However, some IOS variables introduced from Gaver and Gaver (1993) are not commonly available for many firms due to the diversity of industry. On the other hand, Baber, Janakiraman and kang (1996) introduce some other proxies of IOS including investment intensity and argue those variables are truly associated with the firm's investment opportunities.

In this study, a combining approach from Gaver and Gaver (1993) and Baber et al. (1996) is adopted in order to obtain the best possible results. Gaver and Gaver (1993) illustrate six IOS measures in their research including: (1) market-to-book assets, (2) market-to-book equity, (3) the earnings/price ratio, (4) the R&D-to-assets ratio, (5) the variance of the rate of the return on the firm, and (6) the consensus choices of growth-oriented mutual funds. In Baber et al., (1996) study, the authors argue that these seven IOS measures can well represent the firms' IOS. These variables include: (1) investment intensity, (2) geometric mean annual growth rate of market value of assets, (3) market-to-book value of assets, (4) R&D expenditure to total assets, (5) market-to-book value of equity, (6) earnings-to-price ratio, (7) variance of return on market value.

In order to be consistent with the measurement of these IOS variables related to goodwill impairment, this study decides to use the variable of ‘intangible assets to total assets’ instead of the variable of ‘R&D expenditure to total assets’ since goodwill impairment is the main concern in this research. Meanwhile, the variable of ‘earnings-to-price ratio’ is also excluded in this study. The main reason is that the content of this ratio can be explained and evaluated in the variables of ‘market-to-book value of equity’ and ‘variance of return on market value’.

As a result, six variables are selected in this data analysis. They are (a) investment intensity (INVINT) from years  $t-2$  to  $t$ ; (b) geometric growth in the market value of assets (MVAGR) from years  $t-2$  to  $t$ ; (c) market-to-book value of total assets (MKBVTA) at the end of year  $t$ ; (d) intangible assets to total assets (INTAN) at the end of year  $t$ ; (e) market-to-book value of equity (MKBVE) at the end of year  $t$  and (f) variance of return on market value (VAROR) from years  $t-2$  to  $t$ .

**a. Investment intensity (INVINT)**

The use of investment intensity is to gauge the relations between present and future investment opportunities related to the firms’ financial performances. Baber et al. (1996) suggest that the investment intensity (INVINT) is the most valuable and comparable IOS variable since the firms higher current investment is always associated with a greater investment opportunities. In general, there is a positive link between the firms’ current investment options and their future investment opportunities.

**b. Geometric growth in the market value of assets (MVAGR)**

This ratio is to reflect annual growth rate of market value of assets of the firms (Baber, et al., 1996). There is a positive relationship between growth options and the future value of the firms. In addition, the growth option also depends on managerial decisions, fluctuation in the market and political environment.

**c. Market-to-book value of total assets (MKBVTA)**

This ratio is the most commonly used variable for IOS. The book value of assets is a proxy for both tangible and intangible assets of the firms and the market value of assets include tangible & intangible assets and relevant investment opportunities (Adam & Goyal, 2008). In general, there is a positive relationship between MKBVTA ratio and firms' investment opportunities related to both tangible and intangible assets.

**d. Intangible assets to total assets (INTAN)**

This ratio is to estimate the relations between intangible assets of the firms and their total assets. INTAN is also an indicator of the proportion of intangible assets in a firm. Thus, a higher INTAN ratio is frequently following higher amount of the total assets in a firm.

**e. Market-to-book value of equity (MKBVE)**

This ratio is to determine the current value of all future cash flows to shareholders from both tangible & intangible assets and future investment opportunities (Adam & Goyal, 2008). In general, there is a positive relationship between MKBVE ratio and firms' future investment opportunities related to both tangible and intangible assets.

**f. Variance of return on market value (VAROR)**

This ratio is to reflect the association between the investment returns of the firms and their total assets & the investment options (Gaver & Gaver, 1993). Thus, higher investment returns is following higher amount of both tangible and intangible assets of the firms.

Table 2 explains the formula of each IOS variables.

**Table 2 : IOS Variables**

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**a. Investment intensity ( $INVINT_t$ )**

$$\frac{\Delta \text{FIXED ASSETS}_i + \text{DEPRECIATION}_t + \Delta \text{CURRENT ASSETS}_i + \text{ACQUISITION}_i}{\Delta \text{INTANGIBLE}_i + (\text{IMPAIRMENT}_t \text{ or } \text{AMORTISATION}_t)}$$

$i = t-2$  to  $t$ ,

$\Delta = (t - (t-1))$

---

**b. Geometric growth in the market value of assets ( $MVAGR_t$ )**

$$(\text{MVTA}_t / \text{MVTA}_{t-n})^{1/n}$$

$N = \max(1, 2, 3)$ , for which data are available

MVTA= market value of tangible assets

= book value of liabilities + market value of equity - intangible assets

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**c. Market-to-book value of total assets ( $MKBVTA_t$ )**

$$\Delta \text{MVTA} / \Delta \text{BVTA}$$

$\Delta \text{MVTA}$ =change in market value of tangible assets

$\Delta \text{BVTA}$ = change in book value of tangible assets

---

**d. Intangible assets to total assets ( $INTAN_t$ )**

$$\Delta \text{INTANGIBLE} / \Delta \text{BVTA}$$

$\Delta = (t - (t-1))$

---

**e. Market-to-book value of equity ( $MKBVE_t$ )**

$$\Delta \text{MVE} / \Delta \text{BVE}$$

$\Delta \text{MVE}$ = change in market value of equity

$\Delta \text{BVE}$ = change in book value of equity

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**f. Variance of return on market value ( $VAROR_t$ )**

$$\sigma^2 [(\Delta \text{MVE} + \text{COMMON \& PREFERRED DIVIDENDS} + \text{INTEREST EXPENSE})_t / (\text{TOTAL ASSETS} - \text{COMMON EQUITY} + \text{MVE})_{t-1}]$$


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### *3.3.3 Control Variables*

The presence of debt contracts can provide opportunistic accounting decisions for managers to increase income and assets (Bradbury, et al., 2003). The association between the firm's IOS and the firm's dividend, compensation and financing policies has been illustrated in the studies of Gaver and Gaver (1993) and Smith and Watts (1992). In fact, the firm's investment opportunities have also been evaluated to be a reliable determinant of the risk assessment in the firm and a consistent determinant of the firm's link to debt contracts (Kallapur & Trombely, 2001). There are several factors which influence on the relations between the IOS and the debt contracts. It includes the level of firm's leverage, firm's size, dividends, cash flows and the firm's performance measurement. It has been indentified that there is a negative relationship between IOS and the firm's leverage, and a positive association between IOS and cash flows, the firm size and dividend policy (Kallapur & Trombely, 2001). Furthermore, the firm's performance measurement depends largely on accurate accounting data when accounting and agency theory are applied.

However, other accounting policies have a relatively greater impact on debt covenants than goodwill accounting since debt covenants do not include intangibles to measure their net asset backing and leverage ratio (Dichev & Skinner, 2002). According to new goodwill accounting regime, the impairment testing can effectively influence on interest coverage (Godfrey & Koh, 2009). Therefore, it is necessary to include some variables such as firm's leverage, size, return on assets and stock return in order to impact on the firms' debt contracting incentives by controlling the amount of goodwill impairment write-offs in the financial years.

Firm size (SIZE) is to estimate the firm's market value of equity. SIZE is measured as the natural logarithm of the market value of equity. Firm SIZE is expected to be positively associated with GWL. SIZE is also a proxy for political factor in the sample. Equally important, SIZE has a major effect on other factors including management's competence and SIZE is potentially associated with firms' IOS and goodwill impairment (Godfrey & Koh, 2009).

Leverage (LEV) is to measure the ability of an organization for generating the new funds from the capital market and manage the amount of GWL. LEV is estimated as a total debt divided by total assets less goodwill. Leverage is expected to be negatively associated with GWL.

Return on assets (ROA) and Stock return (SRT) are the indication of the returns for investment in terms of book value of firms' assets. Firms' accounting performance always reflects the overall performance of the companies by appropriate accounting policy choices (Skinner, 1993). Therefore, accounting performance has to be controlled and accurately measured since accounting performance is related to the firms' investment opportunities. ROA is measured as income plus GWL divided by total assets less goodwill. SRT is measured as the difference between the firm's stock price  $(t)$  and stock price  $(t-1)$  divided by stock price  $(t-1)$ . ROA and SRT are expected to be negatively associated with GWL.

### ***3.4 Model Specifications***

In order to examine the hypothesis, this study models firms' GWL as a function of their IOS and other independent variables. This model is illustrated as:

$$\text{GWL} = \beta_0 + \beta_1 \Delta \text{IOS} + \beta_2 \Delta \text{SIZE} + \beta_3 \Delta \text{LEV} + \beta_4 \Delta \text{ROA} + \beta_5 \Delta \text{SRT} + \beta_6 \text{YR}_t + \varepsilon \quad (1)$$

The dependent variable, the IOS and other independent variables are defined in table 3

**Table 3: Dependent and Independent Variables**

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<b>a. Goodwill impairment loss (GWL)</b>
Goodwill impairment loss before tax / total assets
<b>b. The changes in value of the investment opportunities set (IOS)</b>
IOS factor is generating from six investment opportunity measures (table 2)
<b>c. Firm size (SIZE)</b>
Log (market value of equity, $\Delta MVE$ )
<b>d. Leverage (LEV)</b>
$\Delta$ Total debt / $\Delta$ (total assets - goodwill)
<b>e. Return on assets (ROA)</b>
$\Delta$ (Profit before extraordinary items + GWL) / $\Delta$ (total assets - goodwill)
<b>f. Stock return (SRT)</b>
(Stock price $_t$ – stock price $_{t-1}$ ) / stock price $_{(t-1)}$

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### ***3.5 IOS Variables Factor Analysis***

A common factor analysis of six measures of six IOS variables for a sample of 51 NZ listed firms in the examined years.

**Table 4: IOS Factor Analysis**

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<b>a. Estimated communalities of six IOS variables</b>						
<b>Pooled</b>	<i>INVINT<sub>t</sub></i>	<i>MVAGR</i>	<i>MKBVTA<sub>t</sub></i>	<i>INTAN<sub>t</sub></i>	<i>MKBVE<sub>t</sub></i>	<i>VAROR<sub>t</sub></i>
	0.259	0.876	0.587	0.332	0.564	0.831

---

**Table 5: IOS Factor Score**

<b>b. Eigenvalues of the reduced correlation matrix of six IOS variables</b>						
<b>Pooled</b>	<i>INVINT<sub>t</sub></i>	<i>MVAGR</i>	<i>MKBVTA<sub>t</sub></i>	<i>INTAN<sub>t</sub></i>	<i>MKBVE<sub>t</sub></i>	<i>VAROR<sub>t</sub></i>
	1.966	1.482	0.952	0.764	0.671	0.164
<b>c. Factor score coefficient matrix of six IOS variables</b>						
<b>Pooled</b>	<i>INVINT<sub>t</sub></i>	<i>MVAGR</i>	<i>MKBVTA<sub>t</sub></i>	<i>INTAN<sub>t</sub></i>	<i>MKBVE<sub>t</sub></i>	<i>VAROR<sub>t</sub></i>
	0.253	0.485	-0.090	0.074	-0.069	0.454

Gaver and Gaver (1993) summarise the method of factor analysis to determine the capacity of the IOS. The factor analysis is an independent method which determines the accurate dimension of a group item representing another correlated group (Hair, Black, Babin, & Anderson, 2009a). Based on the common factor analysis, estimated communalities of six IOS variables and Eigenvalues of the reduced correlation matrix of six IOS are illustrated in the factor analysis. In the factor analysis, each individual variable is integrated into one common factor related to the individual measure of the IOS. Therefore the common factor can be defined as the Eigenvalue of one individual variable which surpass the sum of the other communalities (Gaver & Gaver, 1993). It suggests that this common factor can explain the inter-correlations among the other IOS variables. Thus, Gaver and Gaver (1993) argue that the common factor is the best prediction for the investment opportunities of the firms in the generation of the factor score. As a result, the various sets of forms can be condensed into a single factor for the purpose. The factor score is described as the aggregation of measure of each factor calculated for each subject (Hair, et al., 2009a). The factor score can obtain commonalities among a group of variables. Therefore, the factor score can display a composite of different variables loading on the factor.

Table 4 reported the estimated communalities of the six IOS variables and Table 5 represents the eigenvalues of the reduced correlation matrix of the six variables and the result of the factor score coefficient matrix for the six IOS variables. This study adopts

factor scores constructed from the six IOS variables. As a result, the factor analysis yields one factor (IOS) which explains 97 per cent of the common variance for the six IOS variables. This IOS factor therefore represents the six IOS measures for the regression analysis in next section.

In addition, the factor analysis of six IOS variables reports that KMO measure of sample is 0.522, which is greater than 0.5. Meanwhile, the results of Barlett's test show that the significance is 0.000 in the examined years ( $p < 0.05$ ). As a result, those statistics suggest that the six IOS variables are correlated with each other and data is adequate for the factor analysis. In addition, the Eigenvalues of all components of IOS variables are great than 1.0 so that the group of IOS variables are fully explained by the factor analysis.

# RESULTS

## 4.1 Descriptive Statistics

**Table 6: Descriptive Statistics**

Variables	Pooled (N=78)			2008 (N=40)			2009 (N=38)		
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median
<b>GWL</b>	0.129	0.166	0.045	0.101	0.148	0.000	0.159	0.181	0.111
p-value	(0.000)			(0.000)			(0.000)		
<b>IOS</b>	0.107	0.969	-0.054	0.341	0.814	0.240	-0.140	1.065	-0.290
p-value	(0.333)			(0.012)			(0.129)		
<b>SIZE</b>	7.608	0.133	7.646	7.597	0.142	7.634	7.620	0.123	7.654
p-value	(0.000)			(0.000)			(0.000)		
<b>LEV</b>	7.864	0.007	7.865	7.863	0.006	7.864	7.864	0.007	7.865
p-value	(0.000)			(0.000)			(0.000)		
<b>ROA</b>	7.871	0.053	7.873	7.872	0.005	7.874	7.871	0.005	7.873
p-value	(0.000)			(0.000)			(0.000)		
<b>SRT</b>	-0.185	0.450	-0.226	-0.186	0.411	-0.249	-0.183	0.493	-0.172
p-value	(0.001)			(0.007)			(0.000)		

Variable definitions as described in Table 3

**Table 7: Correlation Matrix**

---

	<b>GWL</b>	<b>IOS</b>	<b>SIZE</b>	<b>LEV</b>	<b>ROA</b>	<b>SRT</b>
<b>GWL</b>	1					
<b>IOS</b>	-0.128	1				
<b>SIZE</b>	0.239*	0.115	1			
<b>LEV</b>	-0.074	-0.149	-0.040	1		
<b>ROA</b>	-0.776**	-0.203	-0.132	0.381**	1	
<b>SRT</b>	-0.060	0.533**	0.053	0.021	-0.248*	1

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\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

Variable definitions as described in Table 3

Table 6 present descriptive statistics for the pooled and yearly results of the sample firms. Table 7 exhibits the Pearson correlation matrix for the pooled sample firms.

In relation to the descriptive results, GWL shows an increasing tendency during the examined period, with a standard deviation (SD) of 0.148 in 2008 and 0.181 in 2009. Meanwhile, the mean reported GWL increased from 0.101 in 2008 to 0.159 in 2009. This around 36 per cent increase in the mean of GWL indicates that sample firms impaired higher amount of goodwill in 2009 than that in 2008. It also argues that there was a larger variation of GWL related to the sample firms' total assets in the examined year of 2009. The potential explanation is that the firms have more conservatively written off their

goodwill since NZ economic conditions were unpredictable from 2008. Equally important, the sample firms chose to more prudently impair their goodwill since new goodwill impairment testing regime was introduced in 2007. Whereas, many firms already amortised or impaired their goodwill before 2007 in order to minimise unexpected expenses for the harmonisation of new IFRSs. In fact, these results argue that sample firms reported a less amount of GWL when their accounting and financial performances were below their expectations.

Next, table 6 shows some mixed results of the changes in value of the firm's IOS. The mean of IOS significantly declined from 0.341 in 2008 to -0.140 in 2009. Whereas, the SD of IOS increased from 0.841 for 2008 to 1.065 for 2009. These mixed results suggest that the sample firms' investment opportunities were largely fluctuated during the examined period. The potential explanation is that the firms' investment opportunities are affected by the changes of the economic conditions and the firms' financial performances since IOS is associated with the firms' capital structures, debt contracts, dividend policy and compensation policies (Smith & Watts, 1992).

There is also evidence that sample firms' size differed during the examined period. The SD of firm's SIZE is 0.142 in 2008, compared to a slight decrease to a SD of 0.123 in 2009. On the other hand, the descriptive results reported that the firms' LEV does not differ during the examined period, with a mean of 7.863.

As the descriptive statistics in relation to SRT illustrate, approximate 18.5 per cent of sample firms were not profitable when they wrote off their GWL in the examined years. In details, around 18.6 per cent of the sample firms reported a loss when they impaired their goodwill in 2008 and 18.3 per cent in 2009. This result argues that the sample firms' earning returns are below their expectations, with a median of -0.226 during the examined period. It indicates that the firms' actual investment returns were significantly affected by financial distress since 2007. Furthermore, the sample firms' ROA exhibits a steady position in the examined years, with the mean of ROA remains at 7.871.

In addition, the highest correlation reported in table 7 is between SRT and the changes in value of the firms' IOS (0.533). This positive correlation between SRT and IOS indicates

that more earning returns are usually related to higher investment opportunities for the sample firms. On the other hand, in relation to the factor analysis, the tolerance level of co-linearity for those five independent variables (IOS, SIZE, LEV, ROA and SRT) is more than 0.1. Meanwhile, VIF statistics suggest that the VIF of these variables is below 10. It therefore concludes that those five independent variables have not been correlated with each other and it also indicates that this is unlikely to lead to co-linearity since the tolerance level is larger than 0.1 and the VIF is less than 10 (Hair, Black, Babin, & Anderson, 2009b).

## 4.2 Multiple Regression Results

Results of the pooled regressing analysis for goodwill impairment loss (GWL) with the firm's changes in value of investment opportunities set (IOS) and other independent variables

$$\text{GWL} = \beta_0 + \beta_1 \Delta \text{IOS} + \beta_2 \Delta \text{SIZE} + \beta_3 \Delta \text{LEV} + \beta_4 \Delta \text{ROA} + \beta_5 \Delta \text{SRT} + \beta_6 \text{YR}_{09} + \varepsilon \quad (1)$$

**Table 8: Pooled Regression Analysis**

<b>Variables</b> <sup>a</sup>	<b>Pooled</b>	<b>T-test</b>
Intercept	180.172	11.861**
<b>IOS</b> <sup>b</sup>	-0.032	-2.899**
<b>SIZE</b> <sup>b</sup>	0.191	2.791**
<b>LEV</b> <sup>b</sup>	6.853	4.578**
<b>ROA</b> <sup>b</sup>	-29.905	-15.505**
<b>SRT</b> <sup>b</sup>	-0.074	-3.028**
<b>Year Fixed Effects</b>	Included	
<b>Adjusted R squared</b>	0.776	
<b>F-statistic</b>	54.224**	
<b>N</b>	78	

a. Dependent Variable: Goodwill impairment loss (GWL)

b. Independent Variable: investment opportunities set (IOS), Size (SIZE), Leverage (LEV), Return on assets (ROA) & Stock return (SRT). Variable definitions as described in Table 3

\*: p-value < 0.05 (two-tailed)

\*\* : p-value < 0.01 (two-tailed)

Table 8 reports the results of the pooled regression analysis. Firstly, as predicted, the increase in value of goodwill impairment of the sample firms (GWL) results in the decrease of the changes in value of their investment opportunity sets (IOS) during the examined period. The coefficients beta of investment opportunity sets (IOS) is at -0.032 ( $p < 0.01$ ). The model yields an acceptable explanatory power of 77.6 per cent. This is consistent with the expectation that the firms usually impair less amount of goodwill when their future investment opportunities increase. Therefore, the firms are able to report more earnings in their balance sheets as a reduction amount of goodwill with an increase of the investment opportunities. However, the sample firms' investment opportunities have been largely affected by the tough economic conditions since global financial crisis started in 2007. This sudden and intense financial turbulence has a considerable impact on the normal pattern of business investment opportunities and goodwill accounting. More importantly, this significant declination of world economy is expected to be prolonged after 2009 (ReserveBank, 2009). Therefore the association between the firms' investment opportunities and goodwill impairment is expected to be continuously fluctuated.

Consistent with expectation, firm size (SIZE) is positively related to goodwill impairment write-off during the examined period, with a coefficients beta of 0.191 ( $p < 0.01$ ). This result is consistent with the expectation that more impairment losses are usually generated by larger firms in order to offset their relatively higher profits (Godfrey & Koh, 2009). Considering the tough economic conditions during the examined period, global financial crisis had a significantly negative impact on NZ listed firms (Bedford, 2008). In fact, NZ's GDP significantly decreased from 3.3% in September 2007 to -1.7% in September 2009 (ReserveBank, 2009). As a result, managers of larger firms have more conservatively avoided over-estimating their assets and earnings in the examined years.

Meanwhile, the positive sign on the firms' leverage (LEV) coefficient during the examined period is interesting. The coefficient on the LEV is consistently positively related to GWL across the examined period, with a coefficient beta of 6.853 ( $p < 0.01$ ). A positive association between GWL and LEV argues that worse and unpredicted financial fluctuation

of the sample firms has played a vital role in managers' decision for both tangible and intangible assets in the examined years.

It also reflects that those two factors have been largely affected by external influences, such as worse conditions of global financial markets and NZ economy. For example, NZ firms have to face a significant challenge for their financial stability since New Zealand is one of most heavily indebted developed countries in the world (Bedford, 2008). These large deficits indicate that New Zealand has experienced an external financial vulnerability since global financial crisis started in 2007. In fact, financial stability report states that more NZ larger firms have to facilitate debt and equity markets in order to resolve their tightened and worse credit conditions since 2007 (ReserveBank, 2009). It suggests that equity market and equity finance are the main investment options for NZ listed firms in the examined years. The managers of NZ listed firms therefore were reluctant to impair higher amount of their goodwill when their financial performances were not impressive. Therefore, the relationship between the firms' leverage and their amount of GWL is significantly driven by their financial performances and economic conditions in the examined years.

Furthermore, firm's return on assets (ROA) and stock return (SRT) are expected to be negatively related to goodwill impair loss (GWL). To be the consistent with expectation, ROA and SRT are negatively associated with GWL in the examined years with a coefficients betas of -29.905 ( $p < 0.01$ ) and -0.074 ( $p < 0.01$ ), respectively. This result points out that the sample firms usually report more GWL when their earning returns are below their expectations. A lower beta of the sample firms' stock return indicates that the sample firms' earning returns are largely influenced by both international and domestic financial turbulences since 2007. This outcome is consistent with that New Zealand is facing a recession even though there is a continuous reduction of the OCR by reserve bank of New Zealand since the year end of 2007 (ReserveBank, 2008). In fact, New Zealand firms have been forced to deal with a strong fluctuation from both international and domestic financial markets since 2007 and NZ's economy also experienced a severe test over the same period (ReserveBank, 2007, 2008). Consequentially, reserve bank of New Zealand (2007, 2008, 2009) had to adjust its official cash rate (OCR) from 8.25 (2007) to 2.50 (2009) in order to cope with those worse economic conditions. Therefore, NZ listed companies had to adjust

their organisational structures and re-assess their financial leverage in order to encounter the financial difficulties and uncertainties. As a result, a massive loss of profits leads to more conservative financial and accounting approaches for the sample firms in the decision-making for their goodwill impairment write-offs.

Finally, the most significant firms' investment opportunity sets (IOS) variable is market-to-book value of total assets ( $MKBVTA_t$ ) based on the IOS factor score analysis (table 5). The market-to-book value of total assets ( $MKBVTA_t$ ) presents the highest and positive coefficient of 0.485 ( $p < 0.05$ ). This outcome is consistent with the expectation that the sample firms impair less amount of goodwill when their market values of total assets are higher and future investment opportunities are promising. Therefore, it argues that the market-to-book value of total assets ( $MKBVTA_t$ ) is the most influential IOS variable related to GWL during the examined period.

In summary, the results support that there is a negative relationship between the changes in value of the sample firms' IOS and their amount of GWL in the examined years. It also provides evidence that the sample firms' investment opportunities are negatively associated with their amount of GWL since the new goodwill impairment testing regime was introduced in 2007. On the other hand, the pooled regression analysis also reports that there are some mixed results of the association between GWL and other independent variables (SIZE, LEV, ROA and SRT). Those findings are consistent with the expectation that the sample firms' financial results were significantly fluctuated during the examined period from financial year 2008 to financial year 2009. As a result, the firms' goodwill impairment discretion was also directly influenced by their financial performances in the examined years.

### 4.3 Multiple Regression Results: Sensitivity Analysis

Results of the yearly regressing analysis for goodwill impairment loss (GWL) with the firm's changes in value of investment opportunities set (IOS) and other independent variables

$$GWL = \beta_0 + \beta_1 \Delta IOS + \beta_2 \Delta SIZE + \beta_3 \Delta LEV + \beta_4 \Delta ROA + \beta_5 \Delta SRT + \beta_6 YR09 + \varepsilon \quad (1)$$

**Table 9: Sensitivity Analysis**

<b>Variables</b> <sup>a</sup>	<b>2008</b>	<b>T-test</b>	<b>2009</b>	<b>T-test</b>
Intercept	165.775	8.234**	189.842	7.845**
<b>IOS</b> <sup>b</sup>	-0.012	-0.591	-0.039	-2.474*
<b>SIZE</b> <sup>b</sup>	0.179	2.087*	0.170	1.441
<b>LEV</b> <sup>b</sup>	6.763	3.161**	7.085	3.191**
<b>ROA</b> <sup>b</sup>	-27.976	-10.453**	-31.345	-10.651**
<b>SRT</b> <sup>b</sup>	-0.073	-1.917	-0.085	-2.454*
<b>Adjusted R squared</b>	0.750		0.768	
<b>F- statistic</b>	24.412**		25.555**	
<b>N</b>	40		38	

a. Dependent Variable: Goodwill impairment loss (GWL)

b. Independent Variable: investment opportunities set (IOS), Size (SIZE), Leverage (LEV), Return on assets (ROA) & Stock return (SRT). Variable definitions as described in Table 3

\*: p-value <0.05 (two-tailed)

\*\* : p-value <0.01 (two-tailed)

On the other hand, a pooled time-series and cross-sectional analysis is also implemented in this study in order to examine and compare the mixed results of the examined years and explore the potential implication of the relationship between the firms' investment opportunities and the goodwill impairment accounting.

Table 9 reports the results of the yearly analysis. Firstly, consistent with expectations, the relationship between the changes in value of the firm's IOS and their amount of GWL is consistently negative across the examined period. It suggests that the increase / (decrease) in the changes in value of the IOS by NZ firms, results in the decrease / (increase) in value of firms' GWL. In details, the coefficient of IOS exhibited a consistent increasing tendency through the examined years, with beta of -0.012 in 2008 ( $p > 0.05$ ) and -0.039 in 2009 ( $p < 0.05$ ). The model yields explanatory power of 75 per cent for year 2008 and 76.8 per cent for year 2009.

It is interesting that the coefficient of IOS in 2009 ( $P < 0.05$ ) is greater than that of IOS in 2008 ( $p > 0.05$ ). This outcome argues that the association between IOS and GWL improved in 2009 because the NZ firms have learned more experiences to deal with the tough economic conditions and more flexibly adopted the new goodwill impairment testing regime. However, the lack of a statistical association between IOS and GWL in 2008 ( $p > 0.05$ ) argues that the link between the sample firms' investment opportunities and their goodwill impairment discretion was largely driven by their worse financial performances since global financial crisis started in 2007.

On the other hand, the relatively lower beta of IOS in the year 2008 illustrates that the sample firms' investment opportunities have been largely affected by their financial performances in the worse financial year of 2008. In addition, the relationship between the firms' investment opportunities and their amount of GWL was also influenced by the adoption for new goodwill impairment testing regimes since 2007. The unexpected expenses for the convergence of new IFRSs are also a major concern for many NZ firms' managers, especially under worse economic conditions.

As yearly regression analysis related to SIZE illustrate, consistent with expectation, firm's size consistently positive across the examined years. The coefficient beta of firms' size decreased from 0.179 in 2008 to 0.170 in 2009. It is also more statistically significant in 2008 ( $p < 0.05$ ) than that in 2009 ( $p > 0.05$ ). This result is consistent with expectation that larger sample firms reported more amount of impairment losses to offset their report earnings since their financial results were below their expectation in the examined years.

This indication is also consistent with the NZ's production based GDP significant declined from 3.9% in December 2007 to 0.5% in December 2009 (ReserveBank, 2009). In fact, NZ firms are largely affected by the fluctuations of global financial market since 2007 (Bedford, 2008) so that many firms reported a large amount of loss during that particular financial period. The recession of New Zealand economy is expected to be prolonged since global financial market is fluctuated continuously (ReserveBank, 2009). Therefore, managers of larger firms have more carefully and prudently measured their assets and earnings in the examined years. In addition, the lack of a statistical association between firm's size and their amount of GWL in 2009 argues that the relationship between two factors is significantly affected by instable and volatile economic conditions in year 2009 ( $p > 0.05$ ).

Next, contrary to expectation, firm's leverage is consistently positive across the examined years. It is interesting that result for 2008 differs from the result for 2009. In details, the coefficient beta of LEV increased from 6.763 in 2008 ( $p < 0.01$ ) to 7.085 in 2009 ( $p < 0.01$ ). These results argue that the firms have impaired less amount of goodwill impairment when their financial performances were below the expectations during the examined period. More importantly, the apparent increase on the coefficient beta of LEV in year 2009 indicates that firms reported lower amount of GWL when their financial results were largely fluctuated in 2009 ( $p < 0.01$ ).

It also indicates that sample firms have adopted a more conservative approach to assess their amount of GWL in the examined years. According to the financial stability report (ReserveBank, 2008, 2009), the OCR has been materially reduced from 8.25 in the beginning of 2008 to 2.50 in the end of 2009 by reserve bank of New Zealand in order to minimise the financial damages derived from the global economic recession. As a result, the normal pattern of association between firm's leverage and the amount of GWL is

significantly affected by their worse financial performances under a deteriorating economic condition.

Furthermore, as predicted, ROA and SRT are consistently negative across the examined years. In details, the coefficient beta of ROA increased from -27.976 in 2008 ( $P < 0.01$ ) to -31.345 in 2009 ( $p < 0.01$ ). There is also an increasing tendency of the coefficient on SRT, with a lower beta of -0.073 in 2008 ( $p > 0.05$ ) and a relatively higher beta of -0.085 in 2009 ( $p < 0.05$ ). These results are consistent with expectation that the firms usually report higher amount of goodwill losses when their earning returns decrease. However, the significant association between SRT and GWL in 2008 is not observed in the sensitivity analysis ( $p > 0.05$ ). This insignificant association between SRT and GWL in 2008 argues that NZ firms' both financial and accounting policies are strongly influenced by the tough economic conditions in the examined year 2008.

These findings are also consistent with the above discussions about a tough economic condition resulted in the firms' worse financial performances during the examined period. It suggests that the managers of the sample firms have more conservatively estimated their both tangible & intangible assets and reported earnings when the global financial crisis had a significant impact on NZ economies in the examined years. In addition, the yearly analysis reports that the coefficient betas on the sample firms' return on assets and stock return have slightly increased during the examined period. It indicates that the sample firms' market returns were unstable and fluctuant since global financial crisis started in 2007.

In summary, the yearly regression analysis provides evidence that NZ firms have impaired higher amount of goodwill when their investment opportunities decreased in the examined years. However, the significant fluctuations of the beta on IOS in the examined years suggests that the association between NZ firms' investment opportunities and accounting policy choices of goodwill impairment was strongly affected by external factors, such as global financial crisis and the adoption for new IFRSs. On the other hand, the yearly analysis also reports that the association between the firms' amount of GWL and other independent variables (SIZE, LEV, ROA and SRT) was largely fluctuated during the examined period. These results are consistent with the expectations that the firms' financial

& accounting performances and NZ economic conditions have significantly changed since 2008.

In addition, there is no evidence that IOS has the most significant impact on the GWL compared to other independent variables. In fact, the independent variable of return on assets is described as the most dominant factor across the examined years. This result is consistent with above arguments that the relationship between the firms' investment opportunities and their amount of GWL was considerably affected by the firms' financial and accounting performances during worse financial period from year 2008 to year 2009. However, the examined period of this study is entirely influenced by global financial crisis. Therefore, this result is required for further investigation under a normal economic condition with a longer period.

## CONCLUSION

This paper investigates the relationship between the changes in value of the IOS and the amount of GWL for NZ listed firms under new goodwill impairment testing regime from the financial year 2008 to the financial year 2009. A pooled time-series and cross-sectional analysis is adopted in this study in order to examine and compare the changes of results over the examined period. This study supports that there is a negative relationship between the changes in value of the sample firms' IOS and their amount of GWL from 2008 to 2009, suggesting that the increase / (decrease) in the value of the IOS, results in the decrease / (increase) in value of firms' GWL. This study also provides evidence that NZ listed firms' investment opportunities are negatively associated with their amount of GWL since the new goodwill impairment testing regime was introduced in 2007.

Meanwhile, the results in this study are consistent with those of Godfrey and Koh (2009) study of US firms under the new goodwill impairment accounting regime and their findings show that the impairment write-offs are oppositely related to US firms' underlying IOS. However, this study does not find the evidence that the sample firms' investment opportunities have a strong impact on the amount of GWL compared to Godfrey and Koh (2009) study.

Furthermore, the  $MKBVTA_t$  has also been described as the most influential IOS variable which has a significant effect on the GWL in this study. This finding is consistent with the expectation that NZ listed firms report higher amount of GWL when both their market value of total assets and future growth options decrease.

This study provides several contributions to goodwill accounting research. Firstly, this paper supports that goodwill impairment accounting is influenced by the firms' investment opportunities. Secondly, the results support that there is a negative relationship between the firms' investment opportunities and their amount of GWL from the financial year 2008 to the financial year 2009 since the IFRSs have been introduced in New Zealand. Thirdly,

the results are useful for business investors and financial data analysts to observe the firms' previous investment opportunities and make a possible prediction for companies' future growth options by fully evaluated the firms' both tangible and intangible assets related to their investment opportunities measurement. The findings are also available for academic researchers to investigate and analyse the relationship between the accounting policy choices of goodwill impairment and the firms' future investment options under new IFRS regime continuously. Finally, the results provide an indication of the association between NZ listed firms' investment opportunities and goodwill impairment accounting under the tough and volatile economic conditions since global financial crisis started in the end of year 2007.

There are also some weaknesses of this study. Firstly, the research period from the financial year 2008 to the financial year 2009 is significantly influenced by the global financial crisis. As a result, the sample firms' financial performances have been materially affected by this inevitable and negative financial influence. The results of this study are therefore significantly influenced by this factor so that the conclusion depends on the period. Secondly, the examined period from the financial year 2008 to the financial year 2009 is relatively short since the new goodwill impairment testing regime was introduced in 2007. Therefore, a larger sample for a larger time period needs to be investigated in order to resolve this issue and obtain more consistent and comparable data. Thirdly, the sample selection of this study excludes firm-observations without any goodwill transactions. As a result, this is also a limitation that a self-selection bias has been introduced by significant number of firm-specific and economy-wide factors instead of a random choice. Finally, the scope of the sample excludes unlisted and non-profit NZ firms. As a result, the finding of this study cannot totally represent the association between the firms' IOS and goodwill impairment accounting regimes for all NZ companies.

In conclusion, the results of this study can help the firms' managers in NZ understand the important and comprehensive link between their investment opportunities and their goodwill impairment accounting. The idea of the integration of business future growth options and goodwill impairment accounting can inspire the managers to explore their future investment opportunities and assess their accounting policy choices in goodwill

impairment. Future research is welcome to study for both listed and unlisted NZ firms during an extended researching period. In addition, other IOS proxies are also recommended in order to investigate the potential mixed association between goodwill impairment accounting and the firms' investment opportunities under a normal economic condition.

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