

Translation Exposure and Firm Value, Evidence from Australian Multinational Corporations

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The purpose of this study is to analyse the economic effect of foreign currency translation adjustments and to investigate the relationship between these adjustments and firm value, for a sample of 181 Australian multinational corporations, with foreign subsidiaries concentrated in three specific geographical regions (Asia, Europe and NAFTA). The study is based on collected data for the five-year period from 2000 to 2004, and uses a two-stage market model methodology, resulting in the implementation of a cross-sectional time series model to test for the affect of translation differences on computed excess returns. The study finds that translation adjustments in income statements and in shareholders' equity are significantly related to excess returns. These results are consistent with accounting exposure being contributory to firm value.

Field of Research: Finance – International Finance

1. Introduction

The aims of this study are to provide an economic analysis of accounting exposure and to investigate the relationship between accounting exposure and firm value. For the purposes of the study, translation (accounting) exposure is regarded as the potential for a firm's consolidated financial statements to be affected by changes in foreign exchange rates between consecutive consolidation dates. As a result of the requirement for a multinational firm to consolidate the financial statements of its overseas subsidiaries with those of the parent company, within a scenario of fluctuating exchange rates, the firm may experience variability in the translated values of foreign currency denominated assets, liabilities and earnings. It is possible, therefore, that the translation of these items to meet accounting guidelines may result in an economic effect, prescribed by an unanticipated impact on the group's assets, liabilities, shareholders' equity, and net income.

Early research studies addressing this issue failed to report any translation exposure impact on firm value, concluding that in efficient capital markets, share prices did not react to historic book value changes, which carried no real cash flow consequences (Giddy, 1977; Logue & Oldfield, 1977; Shapiro, 1977; Cornell, 1980). However, it can

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be argued that accounting exposure could impact on firm value for the following reasons.

Firstly, the inclusion of accounting translation differences on a firm's consolidated income statement and balance sheet may generate indirect cash flows, as a result of taxation implications (Martin et al., 1998). Secondly, investors may use the consolidated financial statements to predict the firm's sales revenue, investment growth opportunities and earnings. To the extent that these predictions are affected by the firm's translation exposure, it can be argued that this exposure also has the potential to affect the firm's share price. Finally, if potential investors use the level of the firm's earnings to predict future dividend levels, then fluctuations in exchange rates, and their impact on the level of reported earnings, have the potential to impact those predicted dividend payout ratios, and firm values (Asquith et al., 1983; Nance, Smith and Smithson, 1993). For these reasons, therefore, measuring the effect of accounting exposure on firm value remains an area of interest to both researchers and investors.

The more recent research studies have produced somewhat mixed results. Most of the studies have, again, failed to provide any evidence of foreign currency translation adjustments being relevant to firm value (e.g., Callaghan & Bazaz, 1992; Soo & Soo, 1994; Paurciau & Schaefer, 1995; Bartov & Bondar, 1995; Bartov, 1997; Dhaliwal et al., 1999). However, several studies have argued for such relevance (Hines, 1996; Godfrey & Yee, 1996; Martin et al., 1999; Louis, 2003; Pinto, 2005). The vast majority of these studies have focused on investigating the U.S. market, and, to the current authors' knowledge, research studies into the influence of translation exposure on the value of Australian firms are limited in number.

Godfrey (1992, 1994) examined, respectively, the importance of reporting the effects of Australian firms' voluntary foreign currency accounting policies on the value of the firms' net assets, and managerial motivation for selecting among alternative, unregulated, Australian foreign currency translation methods. Godfrey and Yee (1996) examined the impact of the prescribed foreign currency translation adjustments of Australian Standards Review Board (ASRB) Statement No. 1012, *Foreign Currency Translation*, on the currency risk management practices of Australian mining firms. The reporting requirements contained in ASRB 1012 had the effect of increasing the accounting exposure of firms to changes in exchange rates. The study found that Australian mining firms decreased the level of long-term foreign debt and increased the level of equity capital in their capital structures, to mitigate the effects of the standard on their contracts. These results suggested that management regarded increased translation exposure as having the potential to affect the market values of the relevant firms.

The main contribution of the current study is the information it provides on the relationship between translation exposure and the market value of Australian multinational corporations, for the period January 2000 to December 2004. Following the methodology of Martin et al. (1998), the study examines the value relevance of accounting exposure through two examples of its measurement: the translated shareholders' equity and the translated operating earnings, from three geographical regions [Asia-Pacific, Europe, and the North Atlantic Free Trade Association NAFTA]. The inclusion of the translated operating earnings from those three regions

reflects the extensive engagement of Australian firms there, via foreign operations and subsidiary companies.

The empirical results of the study reveal that, over the sample period, the cumulative abnormal returns of the sample firms are positively associated with the incremental (decremental) translated foreign operating earnings, as the Australian dollar weakens (strengthens). Further, the cumulated abnormal returns of the sample firms are positively related to the translated gains or losses on assets or liabilities charged against shareholders' equity. These findings are consistent with translation exposure being a relevant factor in explaining firm value.

The remainder of this paper is structured as follows. Section 2 contains a review of the related research literature. Section 3 discusses the data and the research methodology used in the study. The results of the data analysis are reported in Section 4, while the conclusions are drawn in Section 5.

2. Overview of the Accounting and Economic Effects of Foreign Currency Changes

2.1 The Accounting Effect of Foreign Currency Variability

After the collapse of the fixed foreign exchange-rate regime in early 1970s¹, the desirability of harmonising the accounting reporting systems for the consolidated financial statements of multinational firms took on a new impetus. This was because of the potential for fluctuations in foreign exchange rates to affect the reported values of foreign assets, foreign liabilities, and foreign earnings when translated to the parent company's currency. In the course of the harmonisation process, standard setters have been occupied with two major questions: (1) which translation method should be used, and (2) how should any resulting translation differences be reported.

In the years prior to 1975, four foreign currency translation methods had traditionally been used: the temporal method, the current rate method, the current-noncurrent² method and the monetary-nonmonetary³ method. In October 1975, the U.S. Financial Accounting Standards Board (FASB) issued Statement of Financial Accounting Standards (SFAS) No. 8, *Accounting for the Translation of Foreign Currency Transactions and Foreign Currency Financial Statement*, which became effective on 1 January 1976. SFAS No. 8 essentially prescribed the temporal translation method, under which all monetary items, and any other items carried at current value, are translated at the current (i.e., consolidation date) exchange rate. All items carried at historical costs are translated at the relevant historical exchange rates. Most income statement items are translated at the average exchange rate for the reporting period. However items such as the amortisation of intangibles and the depreciation of non-current assets, which can be specifically related to items carried at historical cost, are translated at the relevant historic exchange rates. SFAS No. 8 required that any resultant translation differences be reported as a component of net income. As a result, reported earnings could fluctuate considerably, due solely to fluctuations in currency exchange rates which were outside the control of the firm. This controversial feature of SFAS No. 8 was unpopular with corporate executives, and

the Statement failed to gain widespread acceptance by multinational corporations and the accounting profession.

As a result of the unpopularity of SFAS No. 8, the Financial Accounting Standards Board, in consultation with international bodies, reviewed the situation and, in December 1981, promulgated a replacement Statement, SFAS No. 52, to be effective for accounting periods beginning on or after 15 December 1982. The objectives of SFAS No. 52 were twofold: (1) to provide information which is generally compatible with the expected economic effects of an exchange rate change on the organisation's cash flows and equity, and (2) to consolidate the financial statements of foreign subsidiaries, as measured in their functional currencies, according to generally accepted accounting principles.

Under SFAS No. 52, the particular translation method to be applied depends on the functional currency of the relevant foreign subsidiary whose financial statements are to be consolidated with those of the parent company. The initial decision as to which currency is the functional currency rests with the parent company. If the foreign subsidiary's functional currency is not the same as the reporting currency of the group, all items in the subsidiary's balance sheet, except for shareholders' equity, are translated from the functional currency into the group reporting currency, using the current rate method⁴. All resulting translation gains and losses are not taken to the income statement but are dealt with as an adjustment to equity in the consolidated balance sheet. On the other hand, the temporal rate method of translation is prescribed by SFAS No. 52 in two specific situations: (1) where the functional currency of the subsidiary is the same as the group reporting currency, and (2) where the subsidiary is located in a hyperinflationary economy.⁵

To enhance the prescriptions of SFAS No. 52, the FASB issued Statement of Financial Accounting Standards No. 130 *Reporting Comprehensive Income*, in June 1997. SFAS No. 130 prescribes for the reporting and display of comprehensive income and its components (i.e. revenues, expenses, gains, and losses). The Statement requires all items, recognised as components of comprehensive income, to be reported in a general-purpose financial statement, which is displayed with the same prominence as the other financial statements of the firm. Specifically, firms must report a statistic for "comprehensive income", which is calculated by adding or subtracting "other items of comprehensive income" from net income. One of the three component adjustments of comprehensive income to be reported is the change in the cumulative foreign currency translation adjustments. Thus, although SFAS No. 130 does not change the way in which foreign currency translation adjustments are measured, it does alter the manner in which they are reported in the financial statements.

Standard setters in Australia have been closely involved, for several years, in the foreign currency translation debate, a major development being the issue, in November 2000, of revised standard, AASB No. 1012, *Foreign Currency Translation*. AASB No. 1012, which was based on International Accounting Standards (IAS) No. 21, *The Effects of Changes in Foreign Exchange Rates*, applied to all reporting entities subject to Chapter 2M of the Corporations Act 2001, for annual reporting periods beginning on or after 1 January 2002. With respect to the translation of foreign currency denominated financial reports, the stated purpose of the Standard

was to specify methods which "...reflect the underlying relationships between the entity and its foreign operations"⁶. An additional purpose of the Standard was to "...require the disclosure of information which will enable users to assess the significance to the entity of movements in exchange rates"⁷. To this end, AASB 1012 identified two types of foreign operations, based on the potential of the relationship between the parent and its foreign operation, to expose the entity to exchange differences, resulting from business operations. These were, (1) Integrated Foreign Operations, and (2) Self-Sustaining Foreign Operations.

Integrated Foreign Operations are those which are financially and operationally interdependent with the parent company, and whose day-to-day operations expose the company to foreign exchange gains and losses. AASB No. 1012 specified that the financial statements of integrated operations be translated using the temporal method, and that any resulting translation gains or losses be included as an operating item in the profit and loss account. Self-Sustaining Foreign Operations, on the other hand, are those which are financially and operationally independent of the parent company. Under AASB No. 1012, the financial statements of self-sustaining operations were required to be translated using the current rate method, and translation gains and losses were to be accumulated as part of the shareholders' equity in the balance sheet. This treatment recognises that these translation differences do not affect the profitability of the operation but rather the net equity in the foreign operation and, hence, the consolidated equity of the business.

As a result of the Australian Accounting Standard Board's decision to adopt the Standards of the International Accounting Standards Board, for application to reporting periods beginning on or after 1 January 2005, AASB No. 1012 was superseded by AASB No. 121, *The Effects of Changes in Foreign Exchange Rates*. AASB 121, as amended, is equivalent to IAS 21 *The Effects of Changes in Foreign Exchange Rates*, as issued by the IASB (International Accounting Standards Board), and entities which comply with AASB No. 121, as amended, will simultaneously be in compliance with IAS 21. Under AASB No. 121, Australian entities are no longer required to identify their foreign entities as either self-sustaining or integrated foreign operations. The Standard introduces the concepts of functional and presentation currencies and requires that, where the functional currency of the foreign entity is different from that of the parent company, the current rate method be used for the translation of assets and liabilities, any resultant translation differences being taken to the consolidated balance sheet as a separate component of shareholders' equity. Since the present study investigates the relationship between the accounting exposure and firm value over the period 2000 to 2004 financial years, the requirements of AASB No. 121 are not considered to impact its results and are, therefore, not of direct interest at this time.

As noted above, one of the objectives of the accounting standards is to provide accounting methods for the translation of the financial statements of foreign affiliates whereby information on the effects of exchange rate changes is disclosed to the users of the consolidated financial statements, in such a way that they can assess their significance for the entity as a whole. The potential economic effect of movements in exchange rates is discussed in the next section.

2.2 The Economic Effect of Foreign Currency Variability

From an accounting perspective, the translation of foreign currency denominated assets focuses only on their recorded amounts as assets, per se, and does not specifically address their roles in the production process of the subsidiary in question.

However, from an economic viewpoint, exchange rate changes affect the value of a foreign subsidiary primarily as a result of their effects on its production costs, denominated in its functional currency. For example, a common arrangement within a multinational manufacturing group is for production to be undertaken by the foreign affiliate, and the relevant output to be sold by the parent company in its own domestic markets. Thus, if the local currency of the foreign affiliate depreciates against the group reporting currency, the affiliate's value to the entity as a whole may well rise, due to the increased competitiveness brought about by the exchange rate change induced reduction in production costs (Condon et al., 1990). However, assuming that the foreign affiliate has a positive book net assets balance, and that its local currency is regarded as its functional currency, an accounting translation loss will result on the consolidation of its financial statements under the current rate method. Two important caveats to the above 'conflicting signals' reasoning must be stated. Firstly, the ambiguous signal generated by the consolidated annual report in this situation, will only exist, if the foreign affiliate is treated as a self-sustaining entity, and its local currency regarded as its functional currency.⁸ Secondly, there is an implicit assumption that relative purchasing power parity does not hold over the reporting period, and the effect of the depreciation of the affiliate's functional currency is not offset by relatively higher inflation in the country in which the affiliate is based. The weight of empirical evidence, however, suggests that purchasing power parity is, at best, a long-term relationship, and does not have much validity in the short or medium terms (e.g. Kravis & Lipsey, 1978; Adler & Lehman, 1983; Rogoff, 1996).

The case of 'self-sustaining' foreign affiliates, which buy, sell, borrow and repay in their respective domestic currencies is an interesting one. A depreciation in the value of a local currency is likely to lead to an increased competitiveness for the relevant foreign affiliate, leading, in turn, to increased profit margins and economic value. On the other hand, when an appreciation of the local currency occurs, selling output in an open market will be harder, because the goods of foreign competitors become relatively cheaper (Aggarwal et al. 1981). Thus, to maintain their competitiveness in this situation, foreign affiliates may have to reduce their sales prices. Since the costs of labour are relatively 'sticky' (Gallardo et al., 2000), it is unlikely that they can be reduced by the same measure as selling prices, resulting in decreased profit margins and reduced economic value for the affiliate. Again, assuming that the foreign affiliate has a positive book net assets balance, and that its local currency is regarded as its functional currency, an accounting translation 'gain' will result on the consolidation of its financial statements. Thus, in a globally competitive marketplace, where the demand and supply mechanism determines the real output prices, but, because of barriers to the free movement of labour, local markets determine real labour costs, firms with foreign subsidiaries based in countries with soft currencies, are better off, no matter where they sell their goods (Louis, 2003).

The intention of accounting standards is to devise accounting practices that will produce and disclose translation adjustments which reflect the impact of exchange

rate movements on the group reporting currency value of foreign affiliates (O'Brien, 1997). But, since translation exposure to these exchange rate movements can frequently differ from the corresponding economic exposure, conflicting signals of the resulting changes in the values of foreign affiliates are generated, depending on whether the user takes an accounting or an economic perspective. Whether translation differences are reflected in the values of multinational firms is an empirical question which the current study attempts to address.

3. Related Literature

An early study by Dufey (1972) discussed how the depreciation of a foreign currency against a group's reporting currency could generate the confrontational situation discussed in Section 2 of the present study. Because of accounting translation practices, the depreciation of the reporting currency of a foreign affiliate may reduce the amount of reported earnings of that affiliate which are included in the consolidated results of the group. But, the currency depreciation may actually improve the economic competitiveness, and ultimate financial profitability of the affiliate. Because of the conspicuousness of translation adjustments in consolidated earnings statements, Dufey comments on how potentially profitable direct investment opportunities, in countries with unstable currency histories, might well be foregone.

Another early study by Aggarwal et al. (1978) examined the effect of FASB No. 8 on reported financial statements of U.S. based multinational firms. Aggarwal concluded that the 'procrustean' accounting adjustments required by FASB No. 8 were not likely to reflect the economic reality of the underlying changes in exchange rates. Therefore, reported accounting figures were likely to misrepresent the economic reality of the firm's exposure to exchange rate risk, unless they were supplemented with other detailed information. This view was supported by O'Brien (1997) who asserted that accounting methods might either underestimate or overestimate the true economic exposure, in terms of changes in some microeconomic factors. These factors include such things as the elasticity of exchange rate changes or the responsiveness of firm level operating profits to changes in exchange rate.

In a similar vein, Garlicki et al. (1987) argued, in support of FASB No. 52, that, since a firm's accounting exposure is not necessarily aligned with its economic exposure, reported translation gains or losses are merely 'cosmetic changes,' and not necessarily related to changes in the future cash-flows of the firm. Thus, eliminating these gains or losses may lead to higher quality earnings. However, although SFAS No. 52 may have placated irritated executives of multinational firms, some academic researchers have been critical of the propriety of reporting foreign currency translation gains or losses in shareholders' equity. For example, Beaver and Wolfson (1984) illustrate that accounting translation gains and losses capture, at least, some of the economic factors behind the interplay of interest rates and exchange rates, and, therefore, to exclude those factors from earnings can result in misleading earnings-based performance evaluations of the foreign operations of multinational firms. Beaver and Wolfson also criticise SFAS No. 52 regarding its requirement that items recorded at historical cost in the balance sheets of foreign subsidiaries must be translated at current exchange rates. The authors conclude that this practice

produces accounting numbers which are not interpretable and serves to compound the bias produced by SFAS No. 8 in the translation of long-term monetary items.

As regards the empirical research evidence on the relationship between reported foreign currency translation adjustments and firm value, two distinct groupings have emerged.

The first group of empirical studies either to report significant evidence of a relationship between foreign currency translation adjustments and firm value, or only partial evidence of such a relationship. In a study seeking to further explore the findings of an earlier study (Bartov and Bondar, 1994), Bartov and Bondar (1995) investigate the possibility that the change in reporting requirements from SFAS No. 8 to SFAS No. 52 enhance the market's ability to assess the impact of movements in exchange rates on firm values. As in the case of their 1994 study, Bartov and Bondar (1995) found no evidence of a contemporaneous relationship between exchange rate movements and firm value. However, after controlling for firm size, the study did produce evidence that, in the case of those firms choosing the foreign currency as the functional currency of their overseas subsidiaries, the change in reporting regime resulted in the disappearance of a lagged response of firm value to movement in exchange rates. With specific regard to those firms choosing the foreign currency as the functional currency, the authors interpreted their results as evidence of the translation reporting requirements of FASB No. 52 facilitating prediction by investors of the impact of changes in exchange rates on the market value of U.S. firms with foreign operations.

For a sample of 97 U.S. multinational firms which voluntarily adopted SFAS No. 52 in 1981, Pourciau and Schaefer (1995) examined the market response to the firms' reported earnings. Those firms which 'switched early' to SFAS No. 52 from the previous reporting regime specified by SFAS No. 8, almost invariably reported an increase in earnings. Using a cross-sectional abnormal returns model, the authors found no evidence that the sample firms' income-increasing change in reporting practice, incremental to unexpected earnings from other sources, had a significant effect on their market values. The authors interpreted these results as being consistent with the efficient market hypothesis, whereby security prices will only react to earnings disclosures if these contain information relevant to unexpected changes in the amount and risk of future cash flows of the firm.

Using data from a sample of U.S. multinational firms, Bartov (1997) investigated the value relevance of translation adjustments related to alternative translation methods. Bartov's results indicated that the introduction of SFAS No. 52 resulted in significant enhancement in the valuation relevance of the accounting numbers associated with the restatement of a foreign operation's financial statements. However, this significant enhancement applies only to that group of firms, whose subsidiaries used a foreign currency as a functional currency. For those firms which chose the U.S. dollar as the functional currency for their subsidiaries, no significant association was found between currency translation adjustments and changes in stock price. Bartov's results, regarding the value enhancement being restricted to those firms choosing foreign currencies as the functional currencies, corroborate the findings of earlier studies by Griffin and Castanias (1987) and Collins and Salatka (1993).

Following Dechow (1994), Dhaliwal et al. (1999) employed the return to earnings association approach to examine whether the summary measure of firm performance, the Statement of Income and Comprehensive Income, required under SFAS No. 130 to be included in a firm's primary financial statements, is more strongly associated with returns/market value, or better predicts future cash flows/income than the net income alone. As noted previously, one of the three component adjustments of comprehensive income is the change in the cumulative foreign currency translation adjustments⁹. The study found no evidence that comprehensive income is more strongly associated with returns/market value or is a better predictor of future cash-flows/income than net income. The only component of comprehensive income found to improve the association between income and returns, was the marketable securities adjustment. These results suggest that, as an element of comprehensive income, foreign currency translation adjustments are not value relevant. This conclusion is consistent with Dee (1999).

The second empirical studies group does provide evidence of a relationship between translation adjustments and firm value. Using an amended version of an early model developed by Litzenberger and Rao (1971), which views the market value of a firm as a capitalisation of earnings, adjusted for both systematic risk and growth, Callaghan & Bazaz (1992) tested the hypothesis of whether equity translation adjustments, such as those prescribed in SFAS No. 52, are considered by investors as a component of consolidated income. Although Callaghan and Bazaz's study was not designed as a test of the value relevance of translation adjustments, per se, their results are relevant to the current study since they found evidence, via the capitalisation of reported earnings, consistent with the hypothesis that equity translation adjustments are viewed by investors as a component of income.

Soo and Soo (1994) used an abnormal returns model to examine the effect of accounting exposure on firm value for a sample of 235 multinational U.S. firms, for two seven-year sample periods: 1976 – 1982 and 1981 – 1987. This design allowed the authors to test whether any market valuation of foreign exchange gains and losses was different between the periods covered by SFAS No. 8 and SFAS No. 52. It also allowed for the testing of whether any market reaction to translation adjustments differed from the reaction to transaction adjustments or other earnings. Those firms which exclusively chose the U.S. dollar as the functional currency of their foreign affiliates were excluded from the sample. The results of the study were consistent with the market valuing foreign exchange adjustments reported in income, under both accounting standards. In addition, the results indicated market valuation of the translation adjustments reported under stockholders' equity under SFAS No. 52. However, the sensitivity of firm value to the adjustments reported in stockholders' equity was smaller than the sensitivity to other earnings. This result led the authors to suggest that translation adjustments should be reported separately from other earnings and from transaction gains and losses.

Martin et al. (1998) tested the hypotheses of whether the translated shareholders' equity and the translated earnings figures affected the excess return of the firm. Using a sample of 168 U.S. multinational firms (1,071 sample observations) with foreign operations primarily based in Europe, for the period 1987 – 1993, the authors regressed the monthly stock returns of each individual firm on the returns of both the European and the U.S. stock markets. The saved coefficients from this regression

were then used to calculate the monthly abnormal return for each firm, which, in turn formed the dependent variable in a cross-sectional time series regression, with the independent variables including the translated shareholders' equity and the translated earnings. The results showed evidence of a significant relationship between the values of the firms in the sample, as quantified by excess returns, and: (1) overall operating earnings, (2) translation effect on earnings, (3) translation effect on shareholders' equity. On the basis of these results the authors concluded that accounting exposure had a significant impact on firm value.

Using a sample of U.S. multinational manufacturing companies, Louis (2003) examines the relation between the foreign currency translation adjustments and firm value. The relevant study period is 1985 – 2001, with 4,972 sample observations. A four-factor regression model is implemented to examine the impact of foreign translation adjustment and net income on the firm's actual stock returns. The author includes two control variables in his model: transaction gain/loss and foreign income tax. Based on a prior economic analysis, Louis hypothesised that positive foreign translation adjustments of the manufacturing firms in his sample would be associated with decreases in firm value. The results of the study were consistent with this hypothesis, prompting the author to voice concerns about an 'accounting income computation that recognizes a positive translation adjustment as an increase in value¹⁰.'

Indirect evidence of the value relevance of translation adjustments is provided by the literature investigating the efficacy of hedging foreign exchange exposure. In a survey of 160 Swedish firms over the period 1997 – 2001, designed to provide empirical evidence of the determinants of firm's hedging decisions, Hagelin (2003) found no evidence indicating that translation hedges were used to increase firm value. This suggests that, unlike the situation with transaction exposure, hedging translation exposure is likely to be unacceptable to shareholders, unless managers specifically justify the use of this type of hedging. This suggestion appeared to have some validity, as Hagelin and Pramborg (2005) found evidence supporting a positive relationship between hedging translation exposure and the existence of loan covenants. In another study, Hagelin and Pramborg (2004) found that the Swedish firms in their sample reduced both transaction and translation exposure by the use of financial hedges.

Contending that accounting translation differences are only value relevant to firms if they measure economic exposure to exchange rate movements, Pinto (2005) tests for value relevance using a sample of 109 U.S. multinational firms, with subsidiaries in Mexico and Germany, for the period 1991 to 1996. Rather than using a returns model which investigates a hypothesised reaction of security prices to accounting information, and, therefore, incorporates translation differences at face value, Pinto uses a 'levels' model which searches instead for a correlation between the market prices of securities and accounting variables. Pinto follows Ohlson's (1995) procedure by running a regression between the market value (dependent variable) of equity and both the book value of equity and accounting earnings per share (explanatory variables). Consistent with a suggestion by Lev (1989) that valuation models may be better specified when earnings are decomposed, Pinto adds additional 'interaction terms' to his model which serve as proxies for the theoretical sources of economic exchange rate exposure. These include asset composition,

location of foreign investment, and the timing of exchange rate shocks. The main finding of Pinto's study is that foreign currency translation adjustments are significantly value relevant when parameter estimates are allowed to vary in cross-section. A major implication is that the results of previous studies, which incorporated translation adjustments at face value, should be treated with caution, as their methodologies may have resulted in a masking of the actual sources of exchange rate exposure.

The conflicting results of previous studies have prompted us to investigate the question of the value relevance of translation adjustments in an Australian context. To our knowledge, no empirical work using data for Australian multinational firms, has been published to date

4. Data and Methodology

4.1 Data

Several public sources were accessed to collect the data for the study. Initially, the 500 largest firms listed on the Australian Stock Exchange (ASX) were identified for each fiscal year (the financial year ending on 30 June) for the period, 2000 to 2004. After eliminating delisted and newly listed firms, it was found that 485 firms remain listed over the total period. Those firms were subsequently restricted by the application of specific criteria to select our study sample. Firstly, financial firms were excluded. Because the core businesses of these firms were purely concentrated on financial services, it was assumed that they were prepared to undertake comprehensive strategies to hedge all their exposure positions. The elimination of financial firms reduced the number of eligible firms to 379. Secondly, since the aim of our study is to examine the relationship between accounting exposure and the value of Australian multinational firms, only corporations heavily engaged with foreign operations through foreign subsidiaries are included. Therefore, those firms having no foreign subsidiaries over the study period were excluded from the sample. After manually surveying the geographical segment reports contained in the notes to the financial statements in the annual report of each firm¹¹, 181 such firms were identified, with a total number of 2,489 foreign subsidiaries located in foreign countries and geographical regions.

Our survey of these subsidiaries, for the 2004 fiscal year, indicated that the vast majority of the foreign subsidiaries of the 181 sample firms were heavily dispersed across the following three geographical regions, ranked respectively: Asia-Pacific region (including the Asia Crisis region) (997 subsidiaries); European Region (734 subsidiaries); NAFTA Region (487 subsidiaries)¹². The numbers of subsidiaries so identified is consistent with the findings of a survey conducted by the Australian Bureau of Statistics (ABS, 2004), which reported that the vast majority of Australian foreign subsidiaries in 2002/2003 was spread across the three geographical regions: Asia-Pacific (1,586 subsidiaries); Americas (1,111 subsidiaries); Europe (940 subsidiaries). Another indication of the direction of the foreign involvement of Australian firms, with which our sample data is consistent, is Harcourt (2007). Harcourt reported that the numbers of firms in 2005, with countries in the Asia-Pacific region as specific export destinations, were, respectively: 17,394 firms (New

Zealand), 6,397 firms (Singapore), 4,984 firms (Hong Kong). The number of firms exporting to the U.S. was 9,253 and to the U.K., 5,486. These findings provide confirmation that the vast majority of Australian foreign operations are concentrated in the three geographical regions identified in our study. The present study, therefore, examines the effects of accounting exposure on the value a sample of 181 firms described above, for the period from January 2000 to December 2004.

4.2 Methodology

To examine the relationship between the translated foreign currency gains or losses and firm value, we use a two-pass market model. Consistent with the assumption that market residuals are a function of earnings (Lev, 1989), Martin et al. (1998) incorporated the effect of changes in earnings and shareholders' equity, resulting from accounting translation differences in their model. To detect this effect, they firstly used a two-factor linear regression model, to estimate residual returns as proxy of firm values, by regressing individual firms' on the returns of both the European and U.S. markets for 168 U.S.-based multinational firms, heavily engaged in foreign operations in Europe, over the period 1987 – 1993.

Following the methodology of Martin et al. (1998), the present study was designed to detect the impact of translated gains and losses on the values of the 181 Australian multinational firms in our sample, for the period, 2000 to 2004, with specific reference to the three geographical regions previously identified. In the first pass, a four-factor ordinary least squares linear regression model was used to estimate the abnormal returns. The model regresses the individual stock returns of the sample firms on the stock market returns of the three regions plus the return on the Australian stock market, and is of the form

$$SR_{it} = \delta_{0i} + \delta_{1i} R_{Mt,ASIA} + \delta_{2i} R_{Mt,EURO} + \delta_{3i} R_{Mt,NAF} + \delta_{4i} R_{Mt,AUS} + \varepsilon_{it} \quad (1)$$

In Equation (1), SR_{it} , is the monthly stock return for firm i , at month t . All data relating to each firm's stock prices for the sample period were obtained from database compiled by the Australian Graduate School of Management (AGSM). $R_{Mt,ASIA}$, refers to the monthly return on the Asian market index, at month t , proxied by the 225 NIKKEI Index (N225). $R_{Mt,EURO}$, is the European market index return at month t , proxied by the UK FTSE Index (FTSE 100). $R_{Mt,NAF}$, is the return on the NAFTA market index, at month t , proxied by the U.S. market index (GSPC S&P 500 index). $R_{Mt,AUS}$, is the monthly Australian market return, at month t . The proxy for this return is the All Ordinary Index (AOI) accessed from the database of the Australian Graduate School of Management (AGSM). All these indices are computed on a trade-weighted basis and all the monthly returns are calculated in continuously compounded form, over the entire period. The residual terms, ε_{it} , from Equation (1) were saved, and form the abnormal returns used in the second-pass regression as now described. It was assumed that no collinearity or multicollinearity existed among the explanatory variables.

Once the parameters Equation (1) were estimated, the monthly residual returns were computed by subtracting the estimated returns from the actual returns for each firm, for each month. This process can be expressed as follows:

$$ANR_{it} = \varepsilon_{it} = SR_{it} - (\delta_{0i} + \delta_{1i}R_{Mt,ASIA} + \delta_{2i}R_{Mt,EURO} + \delta_{3i}R_{Mt,NAF} + \delta_{4i}R_{Mt,AUS}) \quad (2)$$

Where: ANR_{it} , is the monthly abnormal returns for firm i , at month t , over the 2000 - 2004 estimation period. The other variables in equation (2) are estimated in equation (1). The monthly abnormal returns for each firm were then accumulated for each calendar year in the sample period, to form the variable, $CANR_{it}$, used in the second-pass regression.

In the second-pass model we use a cross-sectional time series model to test the impact of the translated operating earnings, and the translated shareholders' equity, on these residual returns. For each firm, for each year, the cumulated abnormal returns are regressed on its scaled translated operating earnings from the three geographical regions, its scaled translated total operating earnings, and the scaled value of the total annual translated gains or losses on assets and liabilities charged against its shareholders' equity. Our study, therefore, extends Martin et al.'s model by including extra variables, which are considered as proxies for the effects of the translated operating earnings from the three geographical regions identified earlier.

The model designed to estimate the impact of accounting exposure on firm value, is expressed as follows:

$$CANR_{it} = \beta_0 + \beta_1 EASIA_{it} + \beta_2 EEUR_{it} + \beta_3 ENAF_{it} + \beta_4 TOE_{it} + \beta_5 TEQTY_{it} + \eta_{it} \quad (3)$$

Over the period 2000-2004: $CANR_{it}$, is the cumulated monthly abnormal returns of firm i for year t (total observations: 905); $EASIA_{it}$, is the total annual Asian translated operating earnings for firm i , divided by its total translated operating earnings, for year t ; $EEUR_{it}$, is the total annual European translated operating earnings for firm i , divided by its total operating earnings, for year t ; $ENAF_{it}$, is the total annual NAFTA translated operating earnings for firm i , divided by its total operating earnings for year t ; and TOE_{it} , is the total annual operating earnings for firm i , divided by its total sales for year t . All the operating earnings variables were collected from the geographical profit segment report in the annual report of each firm. $TEQTY_{it}$, is the total annual translated profit (loss) on assets and liabilities charged against shareholders' equity for firm i , scaled by its total shareholders' equity, for year t . These translated profits or losses are sourced from the translated foreign currency gains or losses items included in the reserves section in the balance sheet of each firm; $\beta_0 - \beta_5$, are the relevant regression coefficients and η_{it} , is the error term. An OLS estimation method was used with adjustments for potential econometric problems, such as collinearity or multicollinearity, and heteroskedasticity.

In Equation (3), a significant, β_4 , coefficient would indicate that excess monthly returns are associated with changes in the annual total operating earnings. Similarly, significant, $\beta_1 - \beta_3$, coefficients would indicate a value-influencing role for the translation effects in earnings from the Asia-Pacific, European, and NAFTA regions, while a significant β_5 coefficient would be consistent with a similar role for the translation effects in shareholders' equity.

5. Empirical Results

In the first instance, a univariate analysis was implemented, using both summary statistics and a Pearson correlation coefficients matrix, for the variables contained in the models described above.

Summary statistics for all the variables used in Equation (3) are reported in Table 1.

Table 1

Summary Statistics for All the Variables Used in the Cross-Sectional Regression Model which Assesses the Effects of Accounting Exposure on Residual Returns over the Period, 2000 to 2004						
	EASIA	ENAF	EEUR	TOE	TEQTY	CANR*
Observations	905	905	905	905	905	905
Mean	0.053	0.031	0.821	0.707	-0.006	-0.001
First Quartile	0.000	0.000	0.000	0.299	-0.002	-0.183
Median	0.000	0.000	0.000	0.952	0.000	-0.007
Third Quartile	0.012	0.000	0.044	0.989	0.003	0.177
Standard Deviation	0.247	0.138	0.166	0.391	0.079	0.397
Minimum	-0.666	-0.695	-0.562	-0.989	-0.745	-1.960
Maximum	0.560	0.593	0.666	0.998	0.689	1.711

* CANR is the cumulated monthly residual return for firm i for each calendar year, from January 2000 to December 2004. The monthly residual returns are estimated using trade-weighted market indices.

In addition, a Pearson correlation coefficients matrix was compiled to determine the degree of correlation between all the relevant variables, and to identify any collinearity or multicollinearity problems, which might exist between the explanatory variables of the model specified in Equation 3. This matrix is shown in Table 2.

Table 2

Pearson Correlation Coefficients Matrix of All the Variables Used in the Cross-Sectional Regression Model						
	EASIA	ENAF	EEUR	TOE	TEQTY	CANR
EASIA	1					
ENAF <i>t-statistic</i>	-0.010 (-0.289)	1				
EEUR	0.184*** (5.626)	-0.008 (-0.242)	1			
TOE	-0.014 (-0.406)	-0.003 (-0.089)	0.009 (0.278)	1		
TEQTY	-0.004 (-0.124)	-0.002 (-0.054)	-0.002 (-0.065)	0.033 (0.985)	1	
CANR	0.042 (1.257)	0.050 (1.510)	0.118*** (3.562)	0.041 (1.223)	0.061* (1.824)	1

The number of observations (firms) is 181. Notes: (i) the levels of significance (1%, 5%, 10%) are: ***, **, *, respectively; (ii) A two-tailed t-test statistic is used to test the significance of the correlation coefficients (r). This test is computed as follows: $t = (r\sqrt{n-2}) / (\sqrt{1-r^2})$, where n is the number of observations: 905.

Among the independent variables, the only significant correlation is between the translated operating earnings from the Asia-Pacific region with those from the European region. The pairwise correlation coefficient is 0.184, which is significant at the 1% level (two-tailed test). This significant correlation coefficient indicates that collinearity between those two variables is highly likely to occur. Thus, including these variables in the same model is likely to create a biased estimation of the parameters of model. It was decided that, to eliminate this problem and obtain the Best Linear Unbiased Estimators, the only feasible policies were to omit one of the two highly correlated variables from the model and to create alternative model specifications. A subsequent multivariate analysis of the resulting models found evidence of heteroskedasticity in each case. White's (1980) model was implemented to adjust for the heteroskedasticity problem.

The results of the multivariate analysis are summarised in Table 3. The results indicate that the direction of the relationship between accounting exposure and cumulated abnormal returns is consistent with the results indicated in the univariate analysis (Table 2).

Table 3

The Coefficients Of The Estimated Cross-Sectional Regression Model Which Assesses The Effect Of Accounting Exposure On The 12-Month Cumulated Abnormal Returns Over The Period From 2000 To 2004						
	Model 3a	Model 3b	Model 3c	Model 3d	Model 3e	Model 3f
Intercept <i>t-statistic</i>	-0.033* (-1.880)	-0.025 (-1.405)	-0.022 (-1.271)	-0.030* (-1.721)	-0.026 (-1.477)	-0.032* (-1.792)
EASIA	0.035 (0.938)	0.068* (1.944)			0.069* (1.970)	
ENAF	0.001*** (3.483)		0.001*** (3.418)		0.001*** 3.423	0.001*** 3.483
EEUR	0.328*** (2.792)			0.338*** (2.984)		0.339*** (2.995)
TEARNS	0.024* (1.812)	0.024* (1.858)	0.024* (1.855)	0.023* (1.803)	0.024* (1.862)	0.023* (1.807)
TEQTY	0.078* (1.711)	0.077* (1.732)	0.077* (1.741)	0.077* (1.712)	0.077* (1.733)	0.078* (1.713)
Observations	905	905	905	905	905	905
Adjusted R²	4%	3%	4%	3%	3%	4%
F-statistics	4.055	2.112	5.808	2.326	2.167	4.963
p-value	0.001	0.097	0.001	0.073	0.071	0.001

Notes: (i) t-statistic is used with the levels of significance (1%, 5%, 10%) are: ***, **, *, respectively; (ii) $CANR_{it} = \beta_0 + \beta_1 EASIA_{it} + \beta_2 EEUR_{it} + \beta_3 ENAF_{it} + \beta_4 TOF_{it} + \beta_5 TEQTY_{it} + \eta_{it}$, where: $CANR_{it}$, is the average of the cumulated monthly abnormal returns, over each calendar year for the estimation period 2000 – 2004, for each firm i ; $EASIA_{it}$, the annual Asian translated operating earnings divided by the total operating earnings for firm i over 2000-2004; $EEUR_{it}$, the annual European translated operating earnings divided by the total operating earnings for firm i ; $ENAF_{it}$, the annual NAFTA translated operating earnings divided by the total operating earnings for firm i ; TOE_{it} , is the annual total operating earnings divided by total sales for firm i . $TEQTY_{it}$, is the total annual translated profit (loss) on assets and liabilities against shareholders' equity scaled to the total shareholders' equity for firm i ; $\beta_0 - \beta_5$, are the regression coefficients; η_{it} , is the error term. All the observations of the independent variables are collected over each financial year for the period 2000 – 2004 (905 observations). An OLS is used to estimate the parameters of the model with White's (1980) model to adjust for heteroskedasticity.

The results in Table 3 clearly indicate that all the variables used in models (3a – 3f) are found to be significantly positively associated with cumulative abnormal returns. This suggests that the variables, annual translated operating earnings, annual translated operating earnings from each region, and the translated gain or loss charged annually against shareholders' equity, which serve as proxies for translation exposure, are all viewed by the market as value additive. Positive translation adjustments are associated with increases in market value. This result is consistent with the findings of Martin et al. (1998), but at variance with the findings of several other studies (e.g. Callaghan & Bazaz, 1992; Soo & Soo, 1994; Pourciau & Schaefer, 1995; Bartov, 1997; Dhaliwal et al., 1999).

The full model 3(a) provides estimates of the relevant coefficients, without taking into account the collinearity problem between the translated earnings from Asia and Europe. It was found that, total translated operating earnings, translated operating earnings from three regions, and gains or losses on assets and liabilities charged to shareholders' equity are all related to accounting exposure. These relationships are all significant with the exception of the relationship between accounting exposure and the translated operating earnings from Asia. It was considered that this inconsistency in the results may have been due to the collinearity problem identified earlier, and three alternative models, 3(b), 3(c) and 3(d) were implemented accordingly. The results indicate a significant relationship between all the relevant estimated coefficients of these three models, and accounting exposure.

Again, to deal with the collinearity problem, the final two alternative models to 3(a), i.e. models 3(e) and 3(f), which omit the translated operating earnings from the European and Asia-Pacific regions, respectively, were implemented. When the European translated operating earnings are omitted (model 3e), evidence is found of a significant relationship between all the other variables and accounting exposure. This evidence remains strong when the Asia-Pacific translated operated earnings are omitted (model 3f).

6. Conclusion

As noted in Section 1, the purposes of this study are to provide an economic analysis of accounting exposure and to investigate the relationship between accounting exposure and firm value. Accounting (translation) exposure is regarded as the potential for a firm's consolidated financial statements to be affected by changes in foreign exchange rates between consecutive consolidation dates. While the empirical evidence is mixed, the results of some previous studies are consistent with translation exposure, manifested in an unanticipated impact on a multinational firm's consolidated assets, liabilities, shareholders' equity, and net income, affecting the future cash flow of the firm and, hence, its market value.

While the translation adjustments specified in accounting standards are intended to reflect the impact of exchange rate changes on the reporting currency value of a multinational firm, the magnitude of the firm's economic exposure may be very different from the accounting exposure underlying the translation adjustments. Nevertheless, the results of the current study indicate that firm values are sensitive to

adjustments which are not transaction based, arise essentially from the need to maintain the equality represented by the accounting equation, and involve no expenditure of cash, per se. It can be argued, therefore, that the results are consistent with AASB No. 1012 having achieved its stated objectives of specifying methods reflective of the underlying relationships between the entity and its foreign operations and the disclosure of information allowing the users of financial statements to assess the significance to the firm of movements in exchange rates.

Considered within the context of an efficient securities market, the results would suggest that translation accounting adjustments, at least to some extent, reflect the firm's economic exposure and, therefore, have value to investors. Perhaps the economic value of translation adjustments lies in their ability to help predict the amount and risk of the future cash flows expected to accrue to multinational firms. For example, the translation disclosures may provide information to the market about the impact of future exchange-rate changes on the income earned by foreign subsidiaries, affecting, in turn, the cash flows ultimately available for repatriation to the parent company, and available to pay dividends.

Finally, the results of the study may add to the debate regarding the, not uncommon, corporate policy of hedging translation exposure with, for example, financial derivatives or balance sheet hedges. Such hedging activity is carried out despite the fact that it is almost impossible to hedge transaction exposure and translation exposure, simultaneously, since the reduction of one usually changes the amount of the other. Notwithstanding, some managers implement the highly debatable policy of using hedging techniques, which necessitate cash transactions, to reduce non-cash losses.

Endnotes

¹ The Australian dollar was freely floated in December 1983.

² Under the current/noncurrent method, items are translated according to their maturities. Assets and liabilities recorded in the foreign subsidiary's balance sheet, which have maturities of one year or less (current items), are translated at the current exchange rate, while noncurrent items are translated at the historical exchange rate in effect at the time that these items were first recognised. Thus, a foreign subsidiary with a positive net assets balance will generate a translation gain/loss as the local currency appreciates/depreciates against the currency of the parent company. Most income statement items are translated at the average exchange rate for the accounting period. However, items such as depreciation, which are specifically related to noncurrent items in the balance sheet, are translated at the same rates as the relevant balance sheet items.

³ Under the monetary/non-monetary method, all monetary items (e.g., cash, marketable securities, accounts payable and receivable, notes payable) recorded in the balance sheet of a foreign subsidiary are translated at the current exchange rate. However, all non-monetary balance sheet items are translated at the historical exchange rate in effect at the time at which these items were first recognised. Most income statements items are translated at the average exchange rate for the accounting period. However, income statement items associated with non-monetary items in the balance sheet are translated at the relevant historical exchange rates.

⁴ Under the current rate method income statement items are translated at the rates in effect when the items were recognised, although, for reasons of practicality an appropriately weighted average exchange rate may be used.

⁵ A highly inflationary economy is defined as 'one that has cumulative inflation of approximately 100 percent or more, over a 3-year period.' (FASB No. 52, para. 11)

⁶ AASB No. 1012, para. 4.1(b).

⁷ AASB No. 1012, para. 4.1(b).

⁸ It might be argued that the relationship between affiliate and parent described here would suggest that treating the foreign affiliate as an integrated foreign operation might be more appropriate. If that were the case, the temporal method of translation would be used and the ambiguity argument would not be so readily applicable.

⁹ The other two adjustments required to be disclosed are: (i) the change in the balance of unrealised gains and losses on marketable securities, and (ii) the change in additional minimum pension liability in excess of unrecognised prior service costs.

¹⁰ Louis (2003), p. 1044.

¹¹ The annual reports of all firms are sourced from the Connect4 database, which is a popular and public source of data in Australia. Many research studies have used data from this source, e.g., Nguyen and Faff (2006).

¹² The current study divides the world into eight geographical regions as follows: Asia-Pacific, Other Asian, NAFTA (North America Free Trade Agreement countries, the United States, Canada, and Mexico), European Union, Eastern Europe, South America, Central America and Caribbean, and Africa. The information and tables regarding the number of the foreign subsidiaries across countries and regions for our study are available from the corresponding author on request.

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