THE RELEVANCE OF THE FOREIGN TRANSLATION ADJUSTMENT
AND THE EFFECTS OF DIRTY SURPLUS ITEMS ON NET INCOME

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy
in the Graduate School of The Ohio State University

By

Henock LOUIS

******

Ohio State University
2001

Dissertation Committee:
Professor Douglas A. Schroeder, Advisor
Professor Anil Arya
Professor Jinhan Pae
Professor Richard Young

Approved by

[Signature]
Advisor
Department of Accounting and Management Information Systems
ABSTRACT

Users of financial statements may be perplexed by differences in net income and comprehensive income. The proponents of comprehensive income maintain that comprehensive income is a better summary statistic of a firm's performance because it identifies all the sources of value added. However, the economics of the foreign translation adjustment suggests otherwise. When the foreign currency depreciates, U.S. producers benefit because it becomes cheaper to produce in the host country due to the increase in the purchasing power of the U.S. dollar. However, under the current rate method, the depreciation of the local currency translates not into an adjustment gain but into a loss because net assets are translated at a lower rate. Consistent with the economic rationale, I find that the foreign translation adjustment is negatively associated with firm value. This implies that the translation adjustment is value relevant, but not in the direction indicated by the adjustment. I also find evidence suggesting that the dirty surplus items in general and the translation adjustment in particular negatively affects the value relevance of the income number.
To my wife, Dr. Marilyne Leonard Louis
ACKNOWLEDGMENTS

I would like to thank the members of my dissertation committee, Douglas Schroeder (chair), Anil Arya, Jinhan Pae and Richard Young for helpful comments and discussions. I gratefully acknowledge the help of Douglas Schroeder in programming the non-parametric regression. I also thank participants in the weekly workshop at Ohio State University. Finally, I thank my wife, Marilyne and my sons, Henock jr. and Marc-Elie, for their love, their moral support and their patience.
VITA

Education

1987..............................................B.A.—Theology, Adventist University of Haiti
1988..............................................BBA, Adventist University of Haiti
1992..............................................MBA, Andrews University
1998..............................................M.S.-Accounting, University of Mississippi
1998..............................................Ph.D.—Finance, University of Mississippi

Publications


FIELDS OF STUDIES

Major Field: Accounting and Management Information Systems

Minor Fields: Finance and Statistics
TABLE OF CONTENTS

ABSTRACT.................................................................................................ii
DEDICATION...............................................................................................iii
ACKNOWLEDGEMENTS..............................................................................iv
VITA.............................................................................................................v
LIST OF TABLES..........................................................................................vi

CHAPTER

1. INTRODUCTION......................................................................................1

2. BACKGROUND.......................................................................................8
   2.1 The Issue...........................................................................................8
   2.2 Discussion of Prior Studies...............................................................11

3. THE ECONOMICS OF THE TRANSLATION ADJUSTMENT
   AND HYPOTHESIS DEVELOPMENT....................................................17

4. RESEARCH DESIGN.............................................................................21
   4.1 Sample Selection.............................................................................21
   4.2 Methodology..................................................................................24

5. RESULTS................................................................................................38
   5.1 Descriptive Statistics........................................................................38
   5.2 Association between Future Firm Performance
   and the Translation Adjustment.........................................................39
   5.3 Association between Return and the Translation Adjustment........39
   5.4 Self-Sustained versus Integrated Foreign Operations.................41
5.5 The Effect of the Translation Adjustment and the Other Dirty Items on Net Income.......................... 44

6. SUMMARY AND CONCLUSION .................................................. 50
REFERENCES.................................................................................. 52
APPENDIX 2: Tables........................................................................... 61
LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Distribution of the Sample by SIC Codes and Functional Currencies</td>
<td>62</td>
</tr>
<tr>
<td>2. Descriptive Statistics</td>
<td>63</td>
</tr>
<tr>
<td>3. Pearson Correlations</td>
<td>64</td>
</tr>
<tr>
<td>4. Association between the Translation Adjustment and Next Period Production Earnings</td>
<td>65</td>
</tr>
<tr>
<td>5. Association between Translation Adjustment and Change in Firm Value</td>
<td>66</td>
</tr>
<tr>
<td>6. Association between Translation Adjustment and Change in Firm</td>
<td></td>
</tr>
<tr>
<td>Value: Diagnostic Tests</td>
<td>67</td>
</tr>
<tr>
<td>7. Association between Translation Adjustment and Change in Firm</td>
<td></td>
</tr>
<tr>
<td>Value: Controlling for the choice of the Functional Currencies</td>
<td>68</td>
</tr>
<tr>
<td>8. Comparison of the Persistence of Alternative Earnings Measures</td>
<td>69</td>
</tr>
<tr>
<td>9. Comparison of the Explanatory Power of Alternative Earnings</td>
<td></td>
</tr>
<tr>
<td>Measures: Pooled Regressions</td>
<td>71</td>
</tr>
<tr>
<td>10. Comparison of the Explanatory Power of Alternative Earnings</td>
<td></td>
</tr>
<tr>
<td>Measures: Time-Series of Cross-Sectional Regressions</td>
<td>73</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

Translation of assets denominated in foreign currencies into U.S. dollars is a very controversial accounting issue. How these assets should be translated and whether changes in asset values resulting from the translation process should be recognized as income are the two real points of contention. The issue is becoming more and more important as the volume of American investments overseas increases. In June 1997, the Financial Accounting Standard Board (FASB) issued Statement of Financial Accounting Standard (SFAS) # 130 (Reporting Comprehensive Income). This statement requires that both net income and comprehensive income be reported. Comprehensive income includes net income and 'other comprehensive income'. Other comprehensive income includes, among other items, the translation adjustment.

Proponents of comprehensive income maintain that "[c]omprehensive income accounting identifies all (recognized) sources of value created in one number as a measure of value added" (cf. Linsmeier et al. (1997)).¹ However, an analysis of the foreign translation

---

1. SFAS 130 received strong endorsements from both the academic and the investment communities. The position of the Association for Investment Management and Research is expressed in Financial Reporting in the 1990s and Beyond, (1993). The advantages of reporting comprehensive income are detailed by the American Accounting Association’s Financial Accounting Standards Committee in Linsmeier et al. (1997).
adjustment suggests that this is not necessarily the case. For firms in the manufacturing sector, the foreign translation adjustment does not reflect value added. It is instead negatively related to the economic value of the foreign plants. When the foreign currency depreciates, U.S. producers benefit because it becomes cheaper to produce in the host country due to the increase in the purchasing power of the U.S. dollar. However, under the current rate method, the depreciation of the local currency translates not into an adjustment gain but into a loss because net assets are translated at a lower rate. This is expected to result in a negative association between the translation adjustment and the change in the value of the firm. Thus, if we are in search of the best summary statistic of the performance of a manufacturing firm, it appears counter-intuitive to add the adjustment to net income. We would not want to associate the translation adjustment with a decrease in value when it is instead associated with an increase in value.


3. The counter-argument is that the translation adjustment represents value created in the firm because it reflects the change in the liquidating value of the assets. This argument however does not stand from either the accounting or the economic standpoints. First, it does not reflect the way we do accounting. A firm is typically treated as a going concern and the assets’ values are recorded at historical costs. Actually, any change in the physical value of the plants and equipment may never materialize because these assets are not generally available for sale. If it does materialize, it is likely to be at an indefinite time horizon so that the present value of the change will generally be very small. Second, many of the assets are likely to be imported into the host countries so that they are not quoted in the local currencies and, thus, their physical value is not much affected by fluctuations in the local currency. What the market really values is not the change in the translation value of the assets but the firm’s future performance. Finally, even if we wanted to adjust the value of some assets for the effects of exchange rates fluctuations,
The expected negative correlation between the translation adjustment and the change in firm value will certainly hold for manufacturing operations that are integrated with their parents if management elects to treat them as independent operations and uses some foreign currencies as the functional currencies. But the negative correlation should hold even if the operations of the subsidiaries are indeed self-sustained. Consider two firms selling in Mexico, for instance. One is producing in Mexico (a self-sustained subsidiary) and the other producing elsewhere (it may or may not be a self-sustained subsidiary). If it becomes cheaper to produce in Mexico, the firm producing in Mexico clearly has a net relative advantage. Every thing else equal, the effect of the movement in the peso on the revenues of the two firms will be the same. These subsidiaries may even sell their products to various markets around the globe. Ceteris paribus, the subsidiary producing in the cheapest place will be better off.

The extant literature focuses more on the stock market reaction to the adjustment gains or losses under SFAS 52 as opposed to SFAS 8 (Collins and Salatka (1993); Soo and Soo (1994); Bartov (1997)). Recently, Dhaliwal, Subramanyam, and Trezevant (1999) compare comprehensive income and net income in terms of their associations with return.

The translation adjustment would not be the appropriate measure because it does not take into account the counterbalancing change in inflation that is associated with the change in exchange rate.

4. Because the FASB does not provide precise rules or any formula to determine the functional currency, a firm has significant discretion in selecting a functional currency. There are six questions that can help management in the determination of the functional currency. If the answers to these questions are yes in general, the U.S. dollar should be used as the functional currency. However, whether the answers are yes or not depends on managerial judgment. More importantly, there is not a rule that determines how many positive answers are required to make the U.S. dollar the functional currency.

5. See section 5.4 of the paper for more details on this issue.
They find no evidence that comprehensive income is more highly associated with return than net income. Moreover, the inclusion of the translation adjustment in earnings does not improve the return/earnings association. However, their study covers only 1994 and 1995. In addition, as Soo and Soo (1994) suggest, net income is much larger than the foreign translation adjustment; fluctuations in net income may overshadow the market impact associated with the translation adjustment.

The present study covers the period 1985 to 1999. It contributes to the foreign translation debate by providing evidence on two related questions: 1) How is the currency translation adjustment associated with firm value? 2) Is net income more value relevant than net income adjusted for dirty surplus items in general and for the foreign translation adjustment in particular? I recognize that accounting reports serve multiple purposes and that valuation is only one of these purposes. Though the study may have policy implications, this is not its primary objective. The way we do the accounting is taken as a given. The issues addressed relate more to the way we interpret and use the translation adjustment.

First, I estimate the correlation between return and the translation adjustment (current rate method) conditional on the levels of net income, the transaction gain or loss (temporal rate method), and foreign exposure for a sample of manufacturing firms. I consider the translation adjustment value relevant if it is conditionally associated with change in firm value. Besides the mere association between the translation adjustment and the change in value, I am particularly interested in the sign of the correlation because it indicates whether a positive adjustment is associated with an increase or a decrease in value.
I hypothesize that the foreign translation adjustment would be positively associated with subsequent production costs and, thus, negatively correlated with subsequent earnings and contemporaneous change in firm value. Under the alternative hypothesis, a positive correlation would be expected between the translation adjustment and firm value. This would be the case if, as postulated by the American Accounting Association’s Financial Accounting Standards Committee, the components of comprehensive income, including the foreign translation adjustment, represent value added.6

The results support my hypotheses. I find that the translation adjustment is negatively correlated with change in firm value, conditional on the levels of net income, the transaction gain or loss, and foreign exposure. Specification checks, including accommodation of potential non-linearity in the control variables, heteroskedasticity and cross-sectional correlation, do not alter the conclusion of the paper. The study suggests that the translation adjustment is value relevant, but not in the direction indicated by the adjustment. A positive adjustment is associated with a loss of value instead of a creation of value.

Second, I analyze the effects of the dirty surplus items and the translation adjustment, in particular, on earnings quality. The reporting of both net income and comprehensive income begs the question of what earnings number is more value relevant. The American

6. The committee argues that comprehensive income is a better summary of firm performance than net income because it “identifies all (recognized) sources of value created in one number as a measure of value added” (cf. Linsmeier et al. (1997)). The committee also writes that “the determination of equity price can be complete only if based on all sources of valued-added. An analyst’s forecast can be used to value a stock only if it is a forecast of comprehensive income, and a price/earnings ration has a precise interpretation if the earnings are comprehensive.” It also adds: “for reported income to be most useful in equity price valuation, it must be comprehensive.”
Accounting Association Financial Accounting Standard Committee, for instance, postulates that “[a]n analyst’s forecast can be used to value a stock only if it is a forecast of comprehensive income, and a price/earnings ratio only has a precise interpretation if the earnings are comprehensive” (cf. Linsmeier et al. (1997)). The committee also states that “for reported income to be most useful in equity price valuation, it must be comprehensive.”

My definition of earnings quality is grounded in the conceptual framework provided by the Financial Accounting Standard Board (FASB). The conceptual framework states that, to be useful, information must be relevant. Information is deemed relevant if it has predictive value. I measure the predictive value of earnings, or its ability to predict future income, by its persistence and its association with change in firm value to the extent that that change in firm value reflects the market’s expectation of future earnings.

Arguably, one would expect earnings persistence to be decreasing in the comprehensiveness of net income; that should impact the value relevance of earnings. However, there is no agreement on which earnings number is more relevant. Linsmeier et al. (1997) argue in favor of comprehensive income. DST (1999) find no difference in the quality of the alternative earnings measures. They measure earnings quality in terms of its association with return. I revisit the issue. In analyzing the association between return and alternative earnings measures, this study differs from Dhaliwal, Subramanyam, and Trezevant (1999) by (1) covering a much longer time period, (2) including the change in earnings in the return/earnings regression and (3) focusing on multinational manufacturing firms.
Based on the two criteria that I consider, I find that the reported net income is superior to both net income plus the foreign translation adjustment and comprehensive income, in general, for summarizing current firm performance and predicting future performance. The persistence coefficient on net income is significantly higher than the persistence coefficient on net income adjusted for the foreign translation gain or loss. The difference between the persistence coefficient on net income and the persistence coefficient on comprehensive income is surprisingly huge. The mean of the persistence coefficients on net income is between 3.77 and 21.35 times as large as the mean of the persistence coefficients on comprehensive income, depending on the model specification and the sample restrictions. As expected, the association between return and net income is significantly stronger than the association between return and net income adjusted for foreign translation gains or losses. The association between return and net income is much stronger when compared with the association between return and comprehensive income.

The balance of the study is organized as follows. The next section presents a background of the foreign translation issue and discusses the extant literature. Section 3 presents an overview of the economics of the translation adjustment and formulates the testing hypotheses. Section 4 describes the research design. The results are reported in section 5. The study ends in section 6 with some concluding remarks.
CHAPTER 2

BACKGROUND

2.1 The Issue
At the end of World War II, a new international payment system was set up at Bretton Woods to replace the gold standard system that broke down during the great depression. One practical implication of the Bretton Woods agreement was that most currencies were pegged to the U.S. dollar. In 1973, the Bretton Woods agreement collapsed as the major European countries and Japan let their currencies float. As foreign currencies were allowed to freely float vis-à-vis the U.S. dollar and the flow of international trade and investment was increasing, many multinational firms faced the daunting task of translating the financial statements of their subsidiaries into U.S. dollars for consolidation purposes. As each firm was choosing its own translation process, the comparability of the financial statements suffered. In October 1975, the Financial Accounting Standard Board (FASB) responded by issuing Statement of Financial Accounting Standard (SFAS) No. 8 (Accounting for the Translation of Foreign Currency Transactions and Foreign Currency Financial Statements).

SFAS 8 prescribed the temporal rate method. The objective of this method is to measure a subsidiary transaction as if the transaction had been made by the parent. Under the
temporal rate method, monetary items are remeasured at the current exchange rate and non-monetary items are remeasured at historical rates. Amortization of intangibles, cost of goods sold, deferred charges, and depreciation are remeasured at historical rates. Because these expenses are the results of shifting amounts recorded as asset to expenses, they are remeasured at the same rate as the assets. In general, other expenses and revenue are remeasured at the average exchange rate. Because the accounts are remeasured at different rates, in general the basic accounting identity no longer holds. An adjustment gain or loss account was designed to reestablish the equilibrium of the basic accounting equation. Under SFAS 8, any adjustment gain or loss is posted to net income.7

SFAS 8 was severely criticized by market participants and managers. They claimed that treating the foreign exchange gain or loss as a component of net income distorted operating results. The inclusion of the foreign exchange gain or loss in net income artificially increased the volatility of the earnings number due to short-term fluctuations in exchange rates. FASB responded to these criticisms by issuing SFAS 52 (Accounting for Foreign Currency Translation) in December 1981. SFAS 52 supersedes SFAS 8.

The stock market in general seemed to have sanctioned the new standard. Ziebart and Kim (1987), for instance, examine the different market reactions associated with specific events in the promulgation process leading up to the issuance of SFAS 8 and SFAS 52. They compute the average standardized cumulative abnormal returns for the following

7. Translation adjustment and translation gain and loss are used interchangeably throughout the paper. In general, I will use translation adjustment to refer to the adjustment gain or loss that bypasses net income (under the current method) and transaction gain or loss to refer to the adjustment gain or loss that is posted to net income (under the temporal method) and other currency transaction gains or losses (due to delays in foreign transaction settlements for instance).
events: exposure draft of SFAS 8; issuance of SFAS 8; vote to not reconsider SFAS 8; FASB announcement of its interest in research regarding SFAS 8; proposal of a technical change in SFAS 8; solicitation of comments regarding SFAS 8; vote to reconsider SFAS 8; release of an announcement of tentative change; and SFAS 52 exposure draft. They find an overall negative reaction to SFAS 8 and a positive reaction to SFAS 52.

In general, the new pronouncement mandates the use of the current rate method and the exclusion of translation adjustments from income when a foreign subsidiary uses a foreign currency as its functional currency. Under the current rate method, all assets and liabilities are translated at the current rate and owners’ equity at historical rates. Income statement items are translated at the rate in effect at the time the item was recognized. But as a practical matter, the average exchange rate can be used for all expense and revenue items. The temporal rate method is still required by SFAS 52 in the case where a subsidiary maintains its books and records in a currency other than the functional currency, and in the case where the subsidiary is located in an hyperinflationary economy. An economy is deemed hyperinflationary if the three-year inflation rate is greater than 100 percent. The functional currency is the currency in which the subsidiary generally operates. However, the parent company has significant discretion in deciding which currency is the functional one.

The new standard would supposedly generate more stable earnings and make asset valuation easier (Seidler and McConnell (1982)). However, SFAS 52 is not without its detractors. Many accountants believe that the adoption of SFAS 52 has not solved the translation problem. Some argue that excluding the transaction adjustments from earnings creates an artificial smoothing of the earnings numbers that affects the quality of
these numbers. It is also argued that, by translating fixed assets at current exchange rates, SFAS 52 violates the historical cost principle (Beaver and Wolfson (1984)). SFAS 52 is also criticized for allowing the choice of alternative accounting methods. Firms can decide whether to use the temporal rate method or the current rate method based on their assessment as to which currency is the functional currency. Some critics argue that this option negatively affects the comparability of the financial statements.

In June 1997, the FASB issued SFAS 130. This statement requires that both net income and comprehensive income be reported. Comprehensive income includes net income and ‘other comprehensive income’. ‘Other comprehensive income’ includes items such as unrealized gains or losses from available for sale securities, translation adjustment gains or losses, and minimum pension liability adjustments.

As of today, the issues of the appropriate foreign translation process and treatment of the translation adjustment is still open. A review of the extant literature follows.

2.2 Discussion of Prior Studies
Collins and Salatka (1993) hypothesize that the perceived noise created by the inclusion of the currency adjustment gain or loss in net income would be inversely related to the earnings response coefficient (ERC). They compare the relative quality of earnings under SFAS 8 and SFAS 52. Their sample consists of 27 multinational firms and 27 non-multinational firms matched on sales volume and industry.

The prediction error from a market model cumulated over the two days ending with the quarterly earnings announcement day is regressed on (1) the unexpected earnings and (2)
interactive variables controlling for (2a) whether the quarterly announcement is in SFAS 8 time frame or SFAS 52 time frame, (2b) whether the multinational firm uses the local currency as the functional currency or not, and (2c) whether the multinational firm uses both the local currency and the dollar as functional currencies or not. All the independent variables including the intercept are deflated by the trading price two days before the announcement. The model is estimated as a pooled cross-sectional time-series regression. The ERCs are summed up. The indicator variables are used to differentiate between the SFAS 8 time frame and the SFAS 52 time frame, and between the multinational firms and the control firms.

Collins and Salatka find that the total ERC for the multinational firms is lower than the total ERC of the control firms under SFAS 8, though the difference is significant only at a 0.114 level. The difference for the two groups is very significant under SFAS 52; the p-value is 0.003. They find that the multinational firms that use both the local currency and the U.S. dollar as functional currencies have a significantly lower ERC than those that use only the local currency as their functional currency. They also find that the multinational firms that use only the local currency as their functional currency have a much higher ERC under SFAS 52 than under SFAS 8. The study concludes that the earnings measurements produced under SFAS 52 would be perceived by market participants to be of higher quality (less noisy) than those produced under SFAS 8.

Collins and Salatka sum up the ERC on the different earnings variables. Soo and Soo (1994) argue that because non-foreign currency earnings is much larger than the foreign currency gain or loss, fluctuations in the non-foreign currency earnings may overshadow the market effect of the translation gain or loss. Therefore they examine the effect of the
translation gain or loss in isolation from the other earnings effects. They also examine whether the market reaction to the translation gain or loss is significantly different from the reaction to the other components of accounting earnings. In addition, they analyze whether the market's valuation of foreign exchange gain or loss differed between the periods covered by SFAS 8 and SFAS 52.

Soo and Soo use a sample of 235 firms affected by both SFAS 8 and SFAS 52, and two different regression models. In the first one, they regress the three-day cumulative abnormal return around the annual earnings announcement date on (1) the unexpected earnings, (2) the foreign exchange gain or loss reported in the income statement, and (3) the change in cumulative translation adjustment reported in the stockholders' equity. The independent variables are deflated by price. The last two variables are proxies for the unexpected changes in these variables. The assumption is that the expected translation and transaction adjustments are 0. In the second model, the foreign exchange adjustment variables are replaced by the changes in these variables. The implicit assumption is that on the day before the fourth quarter earnings announcement, the market still expects the adjustment gain or loss to be what it was last year.

Soo and Soo conclude that the market incorporates the information contained in both the foreign exchange gain or loss reported in income and the foreign translation gain or loss that bypasses net income in valuing firms' equity. However, the methodology used in this study has some drawbacks that seriously affect the validity or at least the interpretation of the results. The main weakness of the paper lies in the assumption that the adjustment variables or change in these variables are proxies for unexpected change in these variables the day before the earnings announcement. By the time earnings are
announced the market knows exactly the percentage change in the different exchange rates over the previous year and can then form expectations about the translation gain or loss. A depreciation of the U.S. dollar will generally translate into a positive translation gain or loss, and vice versa. So, the assumption that even after the year is over the market expects the adjustment to be 0 or the same as last year is certainly not sound.

Bartov (1997) revisits the question of whether the earnings measurements produced under SFAS 52 are more value relevant than those reported under SFAS 8. He uses rank regression of the sum of the cumulative daily abnormal return calculated from the second quarter of year t through the first quarter of year t+1 on (1) change in earnings before the foreign transaction adjustment and (2) the foreign transaction adjustment reported in earnings for a sample of multinational firms during the SFAS 8 time frame. For the firms reporting under SFAS 52, he runs the same regression with the foreign translation gain or loss as a third variable. All the independent variables are scaled by beginning price.

The coefficient on the foreign transaction adjustment (reported under net income) is insignificant under both regimes and for all the models considered. The coefficient on the translation variable under SFAS 52 is significant in some cases. Bartov concludes that "collectively, the results suggest that the rules in SFAS 8 produced a poor accounting measure for valuing US multinational firms, and the introduction of SFAS 52 has resulted in a significant improvement in the valuation relevance of the accounting numbers associated with the restatement of a foreign operation's financial statement. However this improvement applies only to a subset of firms that designated a foreign currency as their functional currency".
Bartov (1997) and Soo and Soo (1994) study the market reaction to the foreign adjustments. But measures of the market's expectation for these adjustments are not readily available. These studies use unexpected returns and unexpected earnings but they have no measure of the expected adjustments. In such a case, an earnings/return association study appears to be more appropriate. This is indeed what Dhaliwal, Subramanyam, and Trezevant (1999) do. They study whether net income or comprehensive income is more associated with return. They also study whether the individual components of 'other comprehensive income', which include the foreign translation adjustment, increase the association of earnings with return. Return is regressed on net income deflated by price. They fit two other regression models where earnings is replaced by two different measures of comprehensive income. The regressions are estimated for all 1994 and 1995 firm-years that have the necessary data.

The authors find no evidence that comprehensive income is more associated with return than net income. They run three other regressions where net income is adjusted by each of the different components of other comprehensive income. Except for the unrealized holding gain on marketable securities, the adjustments do not affect the association between return and earnings. Adding the translation adjustment to net income leaves both the coefficient on net income and the adjusted R-squared unchanged. The t-value for the coefficient is also almost exactly the same.

The results of Dhaliwal, Subramanyam, and Trezevant (1999) may not be generalizable because the study covers only two years. They may reflect some effects that are specific to these years. Also, as Soo and Soo (1994) argue, non-foreign currency earnings is
much larger than the foreign currency gain or loss, fluctuations in the non-foreign
currency earnings may overshadow the market effect of the translation adjustment. In
addition, the market is likely to value these two components of earnings very differently.
CHAPTER 3

THE ECONOMICS OF THE TRANSLATION ADJUSTMENT
AND HYPOTHESIS DEVELOPMENT

Exchange rate and inflation are two very interrelated economic phenomena. Under current accounting rules, the book value of a plant in Thailand, for instance, would have significantly depreciated in 1997 because of the depreciation of the Thailand baht. However, the depreciation of the baht was not an isolated economic event. It was accompanied by a rate of inflation in Thailand that was significantly higher than the rate of inflation in the U.S. Due to inflation, the change in the value of the plant resulting from the depreciation of the local currency would tend to be compensated by a change in the opposite direction. The tradeoff between movements in exchange rate and relative inflation implies that a depreciation of the local currency does not necessarily translate into a loss of value. The change in the liquidating value of the foreign assets depends on movements in real exchange rates instead of nominal exchange rates.

8. The inflation effect is largely discussed in the economic literature under the purchasing power parity (PPP) theorem (Isard (1977); Adler and Dumas (1983); Shapiro (1983); Abuaf and Jorion (1990)). The empirical evidence shows that PPP does not hold exactly in any of its forms, whether it is the law of one price, the absolute PPP or the relative PPP. However, it is clear that the counterbalancing effect between exchange rate and inflation rate does exist. In fact, PPP is widely used by policymakers, particularly central bankers in setting par values for their currencies.
In addition, prior studies suggest that the value of an offshore manufacturing plant is negatively related to the strength of the foreign currency. In general, when the local currency depreciates, the cost of production will fall because the rate of cost inflation will not match the rate of depreciation of the local currency. One reason is that wages, a major component of the production cost, tend to be sticky or at least to lag overall price increase due to factors such as long-term employment contracts and government response lags in passing new legislation. Barriers to the free movement of labor also prevent wages from fully adjusting to changes in exchange rate. Therefore, when the foreign currency depreciates, U.S. producers benefit because it becomes cheaper to produce in the host country due to the increase in the purchasing power of the U.S. dollar. However, a firm has to report under the current rate method if it chooses a foreign currency as its functional currency, unless it is functioning in a hyperinflationary environment. Under the current rate method, the depreciation of the local currency translates not into a currency adjustment gain but into a loss because fixed assets are translated at a lower


10. The inflation effect is largely discussed in the economic literature under the purchasing power parity (PPP) theorem (Isard (1977); Adler and Dumas (1983); Shapiro (1983); Abuaf and Jorion (1990)). The empirical evidence shows that PPP does not hold exactly in any of its forms, whether it is the law of one price, the absolute PPP or the relative PPP. Discussions and evidence on the relative inertia of nominal wage in foreign markets can be found in Condon, Corbo and De Melo (1990), Corbo (1985), Le Fort (1988), Mazumdar (1993), van Wijnbergen (1985), and Stolper and Samuelson (1941). Absence of rigidity in real wage and other non-internationally traded goods is the primary reason advanced to explain why the pass-through from exchange rate to inflation is not complete.
rate. Based on the premise that the production costs of foreign operations are negatively related to the change in the value of the U.S. dollar, I formulate the following hypotheses:

**Hypothesis 1:** The current period translation adjustment is positively correlated with next period production costs.

**Hypothesis 2:** The current period translation adjustment is negatively correlated with next period earnings.

**Hypothesis 3:** The translation adjustment and stock return are negatively correlated.

As explained above, the expected negative association between the translation adjustment and return is due to the direct relation between the adjustment and the change in the value of the U.S. dollar. One counter-argument to the rationale for a negative association between return and the translation adjustment is that the market may not pay much attention to short-term fluctuations in exchange rates as they may be mean reverting.\(^{11}\) This argument suggests that return and the translation adjustment should be uncorrelated; and any documented negative correlation between them would vanish as the holding horizon is extended. However, the evidence suggests that, though exchange rates are unstable, they show no tendency toward mean reversion. Instead, changes in both nominal and real exchange rates have strong permanent components.\(^{12}\) Thus, instead of dampening over longer windows, the relation between return and the translation

---

\(^{11}\) Notice that the suggestion that the market will not pay attention to fluctuations in exchange rates is in itself a strong argument for not adding the translation adjustment to net income (cf. Seidler and McConnell (1982)).

adjustment may even increase. This leads me to hypothesize, as a corollary to the third hypothesis, that:

**Hypothesis 4: The negative association between the translation adjustment and return persists over horizons longer than one year.**

Linsmeier et al. (1997) advocate the view that comprehensive income enhances the usefulness of accounting income for valuing equity. This position relies in part on the assumption that "comprehensive income accounting identifies all (recognized) sources of value created in one number as a measure of value added." Therefore, the value relevance of comprehensive income will depend on the extent to which it really identifies value creation. If a positive translation adjustment is associated not with value creation but with a loss in value (and vice versa), adding the adjustment to net income is simply counter-intuitive and can only negatively affect the relevance of the earnings number. Measuring the value relevance of earnings in terms of its predictive value and its association with change in firm value, I hypothesize:

**Hypothesis 5: Net Income is more persistent than the adjusted earnings numbers (earnings plus the translation adjustment, and comprehensive income).**

**Hypothesis 6: Net income is more highly associated with return than the adjusted earnings numbers (earnings plus the translation adjustment, and comprehensive income).**
CHAPTER 4

RESEARCH DESIGN

4.1 Sample Selection

The study covers the period 1985 to 1999. The different samples used include all multinational manufacturing firms [SIC codes: 2000–3999] that have the necessary data on Compustat and CRSP to conduct the empirical tests. A multinational firm is defined for the purpose of this study as a firm that has a non-zero cumulative adjustment in a given year.

In testing hypothesis 1, I require that a firm have observations on cost of goods sold (Compustat item 41), lag cost of goods sold, work in process inventory (Compustat item 77), lag work in process inventory, second lag work in process inventory, finished goods inventory (Compustat item 78), lag finished goods inventory, second lag finished goods inventory, foreign income tax (Compustat item 64), lag transaction gain or loss (Compustat item 150), cumulative translation adjustment (Compustat item 230), lag cumulative translation adjustment, and second lag cumulative translation adjustment.
This yields 3,039 firm-years. In testing hypothesis 2, I require that the firms have observations on earnings (Compustat item 18) instead of cost of goods sold, work in process inventories and finished goods inventories. The total number of observations is 4,648 firm-years.

Testing hypothesis 3 requires that a firm have return information on CRSP. I also require that the firms have the same fiscal yearend over the sample period. In addition, the firm must report the cumulative translation adjustment, the lag cumulative translation adjustment, the transaction gain or loss, net income and the foreign income tax. The same information is necessary to test hypothesis 4, except that the observations are computed over longer horizons, two and five years. For instance, the fifth lag cumulative adjustment is needed instead of the first lag for the five-year horizon. The transaction gain or loss, net income and the foreign income tax are accumulated over the respective horizons. The numbers of non-overlapping observations are 4,636, 2,127 and 545 for the one-year, two-year and five-year horizons, respectively. The numbers of overlapping observations are 3,741 and 2,287 for the two-year and five-year horizons, respectively.  

Table 1 presents the distribution of the sample by industry groupings and the choice of translation method. There are 4,636 firm-years. The quasi-totality of them, 97.86

13. For the two-year horizon, I obtain the non-overlapping observations by limiting the sample to odd years, from 1985 to 1999. For the five-year horizon, I limit the sample to 1989, 1994 and 1999.

14. The tables are in appendix B.
percent, reports both a translation adjustment and a transaction gain or loss. The remaining 2.14 percent or 99 firm-years report a translation adjustment but no transaction gain or loss.15

The sample used to measure earnings persistence includes all manufacturing firms [SIC code 2000 – 3999] that have complete observations in Compustat on net income (item 172), lag net income, net income before extraordinary items (item 18), lag net income before extraordinary items, cumulative translation adjustment (item 230), lag cumulative adjustment, second lag cumulative adjustment, purchase of common and preferred stock (item 115), lag of purchase common and preferred stock, sale of common and preferred stock (item 108), lag sale of common and preferred stock, dividends (item 21), lag dividend, book value (item 60), lag book value and second lag book value from 1985 to 1999. There is a total of 169 firms that satisfy the selection criteria.

Finally, to test hypothesis 6, I obtain a sample of multinational manufacturing firms that have data on net income before extraordinary items (item 18), lag net income before extraordinary items, cumulative translation adjustment (item 230), lag cumulative adjustment, second lag cumulative adjustment, book value (item 60), lag book value, second lag book value, purchase of common and preferred stock (item 115), lag of purchase common and preferred stock, sale of common and preferred stock (item 108),

15. Some of the firms I consider to have used the temporal rate method may instead simply have gains or losses from foreign currency transactions. In either case, they would report a transaction gain or loss.
lag sale of common and preferred stock, dividends (item 21) and lag dividend on Compustat, and data on CRPS to compute return. The selection process yields a total of 6,142 firm-years.

4.2 Methodology

4.2.1 Testing Hypotheses 1 and 2

To test the hypothesis that the current period translation adjustment is positively correlated with next period production cost, I use the following regression model:

\[ PC_{i,t} = \beta_0 + \beta_1 PC_{i,t-1} + \beta_2 CHSALES_{i,t} + \beta_3 FTAX_{i,t} + \beta_4 TADJ_{i,t-1} + \beta_5 ADJ_{i,t-1} + e_{i,t} \]  

(1)

where

PC is the production cost (cost of goods sold (Compustat item 41) plus change in finished goods (Compustat item 78) plus change work in process (Compustat item 77));

CHSALES is the change in sales (Compustat item 12);

FTAX is the foreign income tax (Compustat item 64);

TADJ is the transaction gain or loss (Compustat item 150);

ADJ is the translation adjustment (change in Compustat item 230).

Similarly, to test whether the current period translation adjustment is negatively correlated with next period earnings, I use the following regression model:

\[ NI_{i,t} = \beta_0 + \beta_1 NI_{i,t-1}^{*} + \beta_2 CHSALES_{i,t} + \beta_3 FTAX_{i,t} + \beta_4 TADJ_{i,t-1} + \beta_5 ADJ_{i,t-1} + e_{i,t} \]  

(2)
where

$NI_{it}$ is net income (item 18) for year t; and

$NI^*_{it-1}$ is net income for year t-1 minus the transaction gain or loss (temporal method: item 150) for year t-1.

The inclusion of the lag dependent variables and the change in sales variable in the regressions is motivated by DeChow, Kothari and Watts (1998) (DKW, hereafter). Given DKW’s assumptions that all expenses are variable and that sales and earnings follow a random walk, sales shocks are the key determinants of earnings shocks. Hence, net income is modeled as: $NI_t = NI_{t-1} + \beta \cdot CHSALES_t$. I estimate a less restrictive model by allowing for an intercept, a slope coefficient on $NI_{t-1}$ and an error term. If the above assumptions hold, the intercept would be 0 and the coefficient on lag earnings would be 1. But these restrictions may not necessarily hold. Particularly, I do not expect the intercept to be 0 given that all expenses are not actually variable.

Management has some discretion in deciding whether to report under the temporal or the current rate method. Under the temporal rate method, the effect of the change in exchange rate goes into the transaction gain or loss account instead of the translation adjustment account. The discretion is largely limited to the initial determination of the functional currency. However, the long-term effect may be significant. To mitigate the potential self-selection bias created by management’s discretion in deciding whether to
report under the temporal or the current method, I include the transaction gain or loss obtained under the temporal method in the regressions. There is obviously not a one-to-one trade-off between the translation adjustment (current rate method) and the transaction gain or loss (temporal rate method). But if a firm decides to report under the temporal rate method instead of the current rate method, the adjustment that would have resulted under the current method will in general be reflected to a large extent in the transaction gain or loss.

It is often conjectured that a firm's operating profit is increasing in its level of foreign operations (cf. Eiteman and Stonehill (1979); Henning, Piggot and Scott, (1978); and Ragazzi (1973)). The main contention is that a firm will increase its foreign involvement only if the marginal profit from the foreign operations is large enough to compensate for the extra costs, such as bonding and monitoring costs. The inclusion of the transaction gain or loss in the models should, to a large extent, control for the potential impact of the firms' levels of foreign operations on their performance. To further control for the effect of the firms' levels of foreign involvement, I include foreign income tax in the model. The assumption is that foreign income tax is an increasing function of a firm's degree of foreign operations.16

16. I also attempted to control for inventory valuation method. However, I find few firms that use exclusively only one inventory method in a given year. For most of the sample, the choice between FIFO and LIFO is not clear cut.
All the variables in models (1) and (2), including the intercepts, are deflated by ending market value at year t-1.\textsuperscript{17} To mitigate the effects of outliers and potential errors in the data, I winsorize the top and bottom one-percentiles of the explanatory variables.

4.2.2 Testing Hypotheses 3 and 4

Dhaliwal, Subramanyam, and Trezevant (1999) compare the explanatory power of the following regression models:

\begin{align*}
R_{i,t} &= \beta_0 + \beta_1 NI_{i,t} + e_{i,t} \quad (3a) \\
R_{i,t} &= \beta_0 + \beta_1 NI^{**}_{i,t} + e_{i,t} \quad (3b)
\end{align*}

where

$R_{i,t}$ is the twelve-month return;

$NI_{i,t}$ is the reported net income; and

$NI^{**}_{i,t}$ is net income plus the translation adjustment.

\textsuperscript{17} Deflation is necessary because the various variables (dependent and independent) are related to the sizes of the firms, which would create spurious correlations between the dependent and the explanatory variables (cf. Brown, Lo and Lys (1999), Christie (1987) and Easton (1998)). There is also a potential heteroskedasticity problem, as the error term tends to increase in the size of the firm. The choice of the appropriate deflator is arguable, but the consensus is to use a deflator that proxies for the sizes of the firms. In the case at hand, sales and market value seem to be the two competing alternatives. But since I have already controlled for change in sales, market value becomes the natural choice.
As Soo and Soo (1994) note, the translation adjustment is much smaller than net income. Fluctuations in earnings may overshadow the market effect of the translation adjustment. Thus, a test based on the comparison of regressions 3a and 3b may lack power to capture the effect of the translation adjustment.

In this study, I isolate the effect of the translation adjustment by allowing separate slopes on earnings and the translation adjustment. Regressions 3a and 3b collapse into the following regression model:

$$R_{i,t} = \beta_0 + \beta_1 NI_{i,t} + \beta_2 ADJ_{i,t} + e_{i,t}$$ (4)

where $ADJ_{i,t}$ is the translation adjustment.

As in regressions (1) and (2), to control for the effect of management’s selection bias, I include the transaction gains or losses in the model. In addition, I allow for different slopes on the translation adjustment for firms that choose to report under both the current rate method and the temporal rate method and those that report only under the current method. Then I test for the extent to which the slope on the translation adjustment is different across the two groups.

There is some concern that the translation adjustment may simply capture the firms’ foreign exposure. First, I expect that the inclusion of the transaction gain or loss in the model will partly alleviate this concern. To further mitigate the problem, I include foreign income tax in the model. Because firms use various financial instruments to manage
their foreign exposure, the most appropriate surrogate for the firms' foreign risk should capture only their total net exposure. However, since data on the firms' hedging activities are not readily available, foreign income tax remains the best available proxy for a firm's foreign exposure.\(^\text{18}\) Thus, regression (4) is extended as follows:\(^\text{19}\)

\[
R_{i,t} = \beta_0 + \beta_1 N_{i,t}^* + \beta_2 FTA_{X,i,t} + \beta_3 TADJ_{i,t} + \beta_4 ADJ_{i,t} + e_{i,t} \tag{5}
\]

All the right-hand side variables, including the intercept, are deflated by beginning market value. This yields a regression of cum dividend change in firm value on net income, foreign income tax, transaction gains or losses (temporal rate method) and translation adjustment (current rate method), with both sides of the regression scaled by beginning market value. To mitigate the effects of outliers and potential errors in the data, I winsorize the top and bottom one-percentiles of the independent variables.

Regression (5) is first estimated by OLS over one-year, two-year, and five-year horizon periods.\(^\text{20}\) Given the prediction of a negative association between return and the

---

18. The foreign income tax is arguably not a linear function of the firm's foreign exposure. I address the non-linearity issue later in the paper.

19. Easton and Harris (1991) find that change in earnings has incremental explanatory power. However, including different alternative measures for the change in earnings in the regression did not qualitatively affect the results.

20. Return is compounded over the respective horizon. The translation adjustment and earnings are cumulated over each horizon period. The cumulated earnings numbers should be adjusted for dividend since dividend is factored in the return measurement. But as a practical matter, this adjustment is generally not carried out. One reason is that
translation adjustment, a negative sign is expected on the coefficient of ADJ. This test first appears to be a test of pooling restrictions. But the question that I am addressing goes beyond the pooling issue. In pooling the components of earnings, a fundamental assumption is that these components measure value added in the firms. The argument in this study is that the translation adjustment does not meet even the basic criteria of value-added to be qualified as a component of earnings. The hypothesis is that the translation adjustment is negatively associated with value.

Basu (1997), Des and Lev (1994), Freeman and Tse (1992), Hayn (1995), Lyon and Schroeder (1992) and many others cast doubt on the appropriateness of OLS in estimating the return/earnings regression. Given that in regression (5), the translation adjustment variable (ADJ) is the variable of interest, the parametric restrictions imposed on the control variables by OLS may unnecessarily result in inconsistent estimates of the coefficient on ADJ.

To check for the robustness of the OLS results, I use the partial linear procedure proposed by Robinson (1988). This two-step process estimates the coefficient on ADJ by OLS while relaxing the parametric restrictions on the control variables. In the regression of R on NI, FTAX, TADJ and ADJ, the first step consists of non-parametrically regressing both R and ADJ on NI, FTAX and TADJ. The residuals from the two regressions are there may not be a proper way to do it. In addition, Easton, Harris and Ohlson (1992) report that adjusting earnings for dividend has no impact on their results.
obtained, R-E(R|NI, FTAX, TADJ) and ADJ-E(ADJ|NI, FTAX, TADJ). A large (small) residual means that the dependent variable (R or ADJ) is large (small) after controlling for net income, the foreign income tax and the transaction gain or loss. The second step consists of estimating a no-intercept OLS regression of the conditional mean differenced return on the conditional mean differenced translation adjustment. Robinson shows that such a procedure results in consistent and asymptotically normal coefficient estimates on the test variable, in this case, ADJ.

Other potential problems include cross-sectional heteroskedasticity\textsuperscript{22} and cross-sectional correlation. To assess the impact of these potential violations of the classical regression assumptions, I use a procedure similar to the Freedman and Peters' (1984) bootstrapping regression procedure.\textsuperscript{23}

\textsuperscript{21} The non-parametric regression procedure used follows Hardle (1990). The bandwidth is chosen by generalized cross-validation (Craven and Wahba (1979)) to minimize the mean square errors of the non-parametric regression estimates. Refer to Lyon and Schroeder (1992) for a detailed discussion on the non-parametric regression procedure.

\textsuperscript{22} I also adjusted the standard errors according to White (1980). The use of the heteroskedasticity consistent standard errors did not change the conclusion of the paper.

\textsuperscript{23} The procedure is described in appendix A. A prior application of the bootstrap procedure in the accounting literature can be found in Kross, Ro and Schroeder (1990).
4.2.3 Testing Hypothesis 5

To measure the impact of the dirty surplus items in general and the foreign translation adjustment, in particular, on earnings persistence, I use the following model:

\[ NI_t = \beta_0 + \beta_1 NI_{t-1} + \beta_2 DIV_{t-1} + \epsilon_t \]  \hspace{1cm} (6)

where

NI is earnings;

DIV (item 115 + item 21 – item 108) is net capital distribution; and

\( \beta_1 \) is the persistence parameter.

Earnings is defined alternatively as net income (Compustat item 172), net income plus the foreign translation adjustment (change in Compustat item 230), net income before extraordinary items (Compustat item 18), net income before extraordinary items plus the foreign translation adjustment, and comprehensive income. Comprehensive income is the change in book value (Compustat item 60) plus net capital distribution.

Regression (6) is estimated for each firm over the period 1985 to 1999. There are 169 firms that have the complete series of variables. In the spirit of Fama and MacBeth (1973), I use the cross-sectional standard deviation of the coefficient on the lag earnings variable to compute the standard error of the average coefficient on that variable. One
advantage of this procedure is that the variation in the firm-by-firm coefficient reflects the time-series correlations in the error terms. I use a t-test and the Wilcoxon signed-rank test to compare the persistence coefficients of the alternative income measures.

I include the lag net capital distribution in the model because capital distribution decreases the asset base of the firm and, as a result, its subsequent earnings. The coefficient on the capital distribution variable should approximate the negative of the cost of capital. However, recent evidence by Fama and French (1998) and Hand and Landsman (2000) suggests that capital distribution is associated with an increase in firm value. This is the result of the signaling effect of a dividend dominating the dividend displacement expected in a Miller and Modigliani (1958, 1961) world without information asymmetry. If a firm increases its dividend when it has an indication that its performance will increase, and since the dividend decreases the firm's asset base, next period earnings is not a linear function of the dividend. Because in regression (6), lag earnings is the variable of interest, the parametric restrictions imposed on lag dividend by OLS may unnecessarily result in inconsistent estimates of persistence parameters. I test for the adequacy of the OLS results by using the estimation procedure proposed by Robinson (1988). I estimate the persistence coefficients by OLS while relaxing the parametric restrictions on dividends.24

24. Refer to section 4.2.2 for more details on this procedure.
4.2.4 Testing Hypothesis 6

To capture the effect of the translation adjustment and the other dirty surplus items on net income, DST (1999) compare the explanatory powers of the following regression models for the period 1994-1995:

\[ R_{i,t} = \beta_0 + \beta_1 NI_{i,t} + e_{i,t} \]  \hspace{1cm} (7a)

\[ R_{i,t} = \alpha_0 + \alpha_1 NI^*_{i,t} + e_{i,t} \]  \hspace{1cm} (7b)

where \( R \) is the twelve-month return;
NI is the reported net income; and
NI* is net income plus the dirty surplus items.

DST have essentially conducted a model selection search. If earnings adjusted for dirty surplus items is more relevant than the reported earnings number, model 7a is expected to have the higher explanatory power, and vice versa.

Because of concerns about possible specification problems with models 7a and 7b, DST (1999) also use, among other models, the following price-level equations:

\[ P_{i,t} = \beta_1 NI_{i,t} + \beta_2 BV_{i,t} \]  \hspace{1cm} (8a)

\[ P_{i,t} = \alpha_1 NI^*_{i,t} + \alpha_2 BV_{i,t} \]  \hspace{1cm} (8b)
where

\( P_{i,t} \) is the market value of firm \( i \) at time \( t \);

\( \text{NI}_{i,t} \) is net income for the period ending at time \( t \);

\( \text{NI}^* \) is net income adjusted for the dirty surplus items for the period ending at time \( t \); and

\( \text{BV}_{i,t} \) is the book value of the equity of firm \( i \) at time \( t \).

I slightly modify the specification used in equation (8a). If the hypothesis is that the dirty surplus items do not reflect value-added, equation (8a) could be written as:

\[
P_{i,t} = \beta_1 \text{NI}_{i,t} + \beta_2 \text{BV}^*_{i,t}
\]  

(9a)

where \( \text{BV}^* \) is book value minus the dirty surplus items.

If instead the dirty surplus items are deemed to reflect value-added, equation (8b) was appropriately expressed as:

\[
P_{i,t} = \beta_1 \text{NI}^*_{i,t} + \beta_2 \text{BV}_{i,t}
\]  

(9b)

There are however some concerns about the potential effects of scale on the level regression. Brown, Lo and Lys (1999) and Easton (1998) suggest that deflating the level regression would mitigate the scale effect. Hence, the following steps are taken to transform equations 9a and 9b from level regressions into returns/earnings regressions.
Taking first difference, applying clean surplus, deflating through by beginning price and allowing for an intercept and an error term to control for potential uncorrelated missing variables yields the following return/earnings regressions:\(^{25}\)

\[ R_{it} = \lambda_0 + \lambda_1(\Delta NI_{it} / P_{it-1}) + \lambda_2(NI_{it} / P_{it-1}) + e_{it} \quad (10a) \]

Equation (10a) is indeed the Easton and Harris (1991) return/earnings regression. If the dirty surplus items do not reflect value-added, equation (10a) would be the appropriate form of the return/earnings relation. If they reflect value-added, the appropriate form of the return/earnings relation would be:

\[ R_{it} = \delta_0 + \delta_1(\Delta NI^{*}_{it} / P_{it-1}) + \delta_2(NI^{*}_{it} / P_{it-1}) + e_{it} \quad (10b) \]

where \(NI^{*}\) represents the alternative comprehensive income measures. The derivation of models (10a) and (10b) does not depend on the book value measure used as long as clean surplus holds.

---

25. The derivation allows for different coefficients on net income and dividend, and assumes a one-to-one relation between dividend and change in price.
Under the null hypothesis that the two models have the same explanatory power, the ratio of the adjusted $R^2$s from the models is expected to be 1. First, following DST (1999), I use pooled regressions and utilize Vuong’s (1989) $Z$-test to compare the power of the models.\textsuperscript{26}

\textsuperscript{26} Vuong’s (1989) $Z$-test is a likelihood ratio test for comparing the explanatory power of non-nested models. It is asymptotically normal. A detailed discussion of the test can be found in Dechow (1994).
CHAPTER 5

RESULTS

5.1 Descriptive Statistics

Table 2 reports descriptive statistics for the most relevant variables. The median (mean) return for the sample is 11.13 (18.39) percent and the median (mean) earnings deflated by beginning price is 0.0599 (0.0315). Both the foreign transaction gain or loss and the foreign translation adjustment have negative medians. Their deflated medians (means) are \(-0.0004\) (-0.0010) and \(-0.0001\) (0.0004), respectively. The Pearson correlations among the various variables are reported in Table 3. The translation adjustment is positively correlated with next period production cost and negatively correlated with return. It is positively correlated with the foreign income tax and negatively correlated with the transaction gain or loss.
5.2 Association Between Future Firm’s Performance and the Translation Adjustment

I estimate the correlation between the cost of goods manufactured and last period translation adjustment, conditional on last period cost of goods manufactured, change in sales, foreign income tax, and last period transaction gain or loss (temporal method adjustment). The results are reported in Table 4. The coefficient on the translation adjustment is significantly positive. The results support the hypothesis that the translation adjustment is positively associated with the cost of production.

I also estimate the correlation between net income and last period translation adjustment, conditional on last period net income, change in sales, foreign income tax, and last period transaction gain or loss (temporal method adjustment). The results are also reported in Table 4. The coefficient on the translation adjustment is significantly negative.

5.3 Association Between Return and the Translation Adjustment

Table 5 reports the results of the regressions of return on the translation adjustment for the one-year, two-year and five-year horizons, using both overlapping and non-overlapping data. The adjusted $R^2$ from the OLS regression increases from 13.65 percent for the one-year measurement window to 26.90 percent and 41.79 percent, respectively, for the two-year and five-year windows, using non-overlapping data. The adjusted $R^2$ are
28.28 and 48.07 for the two-year and five-year horizons, using overlapping data. As hypothesized, the coefficient on the translation adjustment is negative and very significant for all the measurement windows.

The standard errors of the coefficients on the translation adjustment variables (not reported) are very large compared to the standard errors of the coefficients on the earnings variables for all the measurement horizons. These results suggest that, even though the translation adjustment is significantly associated with return, it is very noisy compared to the reported net income. This observation is valid not only for the translation adjustment but also for the foreign income tax and particularly for the transaction gain or loss.

To check for the robustness of the OLS results, I use the estimation procedure proposed by Robinson (1988). The results of the semi-parametric regressions are reported in Table 6. They all are consistent with the predictions. The coefficients are all negative and significant.  

27. The optimal bandwidths are 4.17, 1.89, and 1.30 for the one-year, two-year and five-year horizons, respectively, in the regression of return on net income, the foreign income tax and the transaction gain or loss using non-overlapping data. They are 3.82 and 0.90 for the two-year and five-year horizons, respectively, using overlapping data. They are 25.30, 0.60, and 0.33 for the one-year, two-year and five-year horizons in the regression of the translation adjustment regression using non-overlapping data, and 2.36 and 0.62 for two-year and five-year horizons using overlapping data.
To assess the influence of cross-sectional heteroskedasticity and cross-sectional correlation on the OLS results, I use a procedure similar to the Freedman and Peters (1984) bootstrapping regression procedure. The results are reported in Table 6. The mean (median) of the bootstrap coefficient estimates are -1.5313 (-1.5158), -1.1458 (-1.1706), and -1.5379 (-1.5669), respectively, for the one-year, two-year and five-year horizon windows using non-overlapping data. The mean (median) coefficient estimates are -1.1859 (-1.1959), and -3.0779 (-3.0359) for the two-year and five-year horizons using overlapping data. The OLS coefficient estimates are in general slightly higher than the bootstrapped estimates. At the same time, except for the five-year horizon with non-overlapping data, the bootstrapped standard errors are higher than the OLS standard errors. Overall the OLS t-statistics are upward biased. However, the bias does not seem to be driving the inferences. T-statistics computed on the basis of the bootstrapped estimates would still be below the conventional critical values.

5.4 Self-Sustained versus Integrated Foreign Operations

The level of integration between the foreign subsidiaries and their parents may have some impact on the analysis. Some firms are more independent than others in their relations

28. In addition to the pooled regression, I estimated time-series regressions for each of the 36 firms that have complete observations from 1985 to 1999. The mean coefficient on the foreign translation adjustment is -4.2926 with a p-value of 0.0285. I also adjusted the standard errors according to White (1980). The use of the heteroskedasticity consistent standard errors did not change the conclusion of the paper.

29. The procedure is described in appendix A. A prior application of the bootstrap procedure in the accounting literature can be found in Kross, Ro and Schroeder (1990).
with the parent companies. Depending on the degree of integration between the subsidiaries and the parents, subsidiaries are classified as either integrated or self-sustained. Self-sustained subsidiaries tend to borrow, repay and sell in foreign currencies. Therefore, they tend to use foreign currencies as their functional currencies while the integrated firms tend to use the U.S. dollar as their functional currency.

Initial speculation may be that the value of a self-sustained foreign manufacturing subsidiary is not increasing in the weakness of the local currency. If a subsidiary is both producing and selling in the host country, a weaker local currency would result into not only lower production costs but also lower revenue when translated into U.S. dollars. Therefore, the lower revenue will more than offset the lower cost advantage for a profitable foreign subsidiary. However, as I explain below, a self-sustained foreign manufacturing subsidiary will still have a net advantage over its competitors when the local currency depreciates.

Assume that two identical firms (Firm U and Firm M) serve the Mexican market. Further assume that Firm U completes half of its manufacturing process in Mexico and Firm M manufactures its goods entirely in Mexico. This assures that, following depreciation of the Mexican peso, Firm M will have a lower (more negative) translation adjustment than Firm U. But Firm M will be better off because, while the effect on sales is the same for both firms, the cost of production will be lower for Firm M.
Even the revenue effect of the depreciation of the Mexican peso would tend to favor the self-sustained subsidiary. If the firms are selling goods that are internationally traded, as is usually the case, it is easier and more common to adjust sales prices than to adjust wages (a non-internationally traded commodity) to compensate for changes in the value of the local currency.\(^\text{30}\) This is related to the fact that inflation is generally slower to be impounded in wages than in sales price.

More importantly, depreciation of the local currency translates into lower production costs and lower sales prices in dollar terms in the host country. However, it also becomes more expensive to import the goods into the local market. That may give local manufacturers a net advantage over importers. Depending on the price elasticity of the merchandises, the local manufacturers can take advantage of their lower production costs to increase their market share and sales volume. The opposite is true when the local currency appreciates. This explanation holds as long as depreciation of the local currency is not associated with a general deterioration of the local economy. Actually, the fact that these firms are not operating in hyperinflationary environments is an indication that the local economies are not in crisis.

\(^{30}\) See Condon, Corbo and De Melo (1990), Corbo (1985), Le Fort (1988), Mazumdar (1993), Stolper and Samuelson (1941) and van Wijnbergen (1985)).
There are 99 firms-years in the sample for which the transaction gain or loss is 0. For these firm-years, all the foreign operations are self-sustained.31 I condition the regression of return on the translation adjustment on the choice of translation method. The results are reported in Table 7. The negative correlation between the translation adjustment and change in firm value holds for both groups of firms, those that report only translation adjustments and those that report both translation adjustments and transaction gains or losses. The regression coefficient on the translation adjustment is very large for those firms that report only translation adjustments. But the coefficient standard error and p-value are much larger than the standard error and the p-value of the coefficient on the translation adjustment for the firms that report both translation adjustments and transaction gains or losses. The F-statistic comparing the slope coefficients on the translation adjustment for the two groups of firms is marginally significant, below the 10 percent level.

5.5 The Effect of the Translation Adjustment on Net Income

5.5.1 Earnings Persistence

To determine which earnings number, the reported net income or the alternative adjusted net income, is more indicative of future firm accounting performance, I compare the persistence of the various earnings numbers after controlling for net capital distributions. The results are presented in Panel A of Table 8. The table reports the cross-sectional

31. This assumes that the functional currencies are selected in harmony with the spirit of SFAS 52.
mean and median persistence and the test statistics comparing the persistence across the alternative earnings numbers. As expected, the mean and median persistence coefficients are higher for net income before extraordinary items than for net income. Also, consistent with my expectations, the foreign translation adjustment negatively affects earnings persistence for both net income and net income before extraordinary items. The more surprising result is the magnitude of the difference between the persistence of net income and the persistence comprehensive income. The mean (median) persistence coefficient decreases from 0.5165 (0.5163) for core earnings to 0.1332 (0.1227) for comprehensive income.

Since the inclusion of the dirty surplus items in net income dampens the earnings persistence coefficient so drastically, I subject the results to various robustness checks to ensure that the results are not driven by data errors or misspecifications. These tests, however, do not alter the conclusion. The persistence coefficient on net income remains significantly higher than the persistence coefficient on net income adjusted for the foreign translation gain or loss. Particularly, the gap between the persistence coefficient on net income and the persistence coefficient on comprehensive income remains surprisingly huge.

As a first adequacy test, I use a semi-parametric model to control for possible non-linearity in the capital contribution variable. The results are reported in Panel B of Table
8.32 The earnings persistence increases significantly. But the partial linear model leads to the same conclusion as the OLS model. The persistence of earnings before extraordinary items is the highest, 0.9747 on average, and the persistence of comprehensive income is considerably lower, 0.1719 on average.

Second, to increase the sample size, missing observations on purchase of common and preferred stock, sale of common and preferred stock, and dividends are set to 0. To assess the effect of that choice on the results, I deleted missing observations on purchase of common and preferred stock, sale of common and preferred stock, and dividends. The sample size fell to 114 firms. But the discrepancy between the persistence of net income and the persistence of comprehensive income remained. For instance, the mean (median) persistence coefficients were 0.5415 (0.4264) and 0.0964 (0.1088) for core earnings and comprehensive income, respectively.

I further deleted the net capital contribution variable from the persistence regression. The mean (median) autoregression coefficients became 0.5230 (0.5567) and 0.0245 (0.0233) for net income and comprehensive income, respectively. Neither the mean nor the median

32. The optimal bandwidths are 0.32, 1.07 and 0.32 in the nonparametric regressions of net income on lag dividend, net income before extraordinary items on lag dividend, and comprehensive income on lag dividend, respectively. They are 0.11, 0.30 and 0.52 in the regressions of lag net income on lag dividend, lag net income before extraordinary items on lag dividend, and lag comprehensive income on lag dividend. When earnings is adjusted for the translation gain or loss, the optimal bandwidths are 0.20 and 0.28 in the regressions of net income on lag dividend, and net income before extraordinary items on
autoregression coefficient of comprehensive income is significantly different from 0. Finally, I deflated through by average market value. I obtained mean (median) persistence coefficients of 0.4147 (0.4264) and 0.0964 (0.1088) for net income and comprehensive income, respectively, from a sample size of 166 firms.33

5.5.2 Return/Earnings Association

DST (1999) find that earnings adjusted for translation gains or losses and other dirty surplus items is not more highly correlated with return than reported earnings. Their sample covers 1994 and 1995. I extend the sample period to 1985-1999 and modify the model to include change in earnings. The results are reported in Table 9. The coefficients on both earnings and change in earnings as well as the adjusted $R^2$ decrease as the dirty surplus items are added to earnings. The adjusted $R^2$ from the regression of return on the level of and the change in net income is 22.17 percent higher than the adjusted $R^2$ from the regression of return on the level of and the change in net income adjusted for the translation gain or loss. Similarly, the adjusted $R^2$ from the regression of return on the level of and the change in core earnings is 23.69 percent higher than the adjusted $R^2$ from the regression of return on the level of and the change in core earnings adjusted for the translation gain or loss.

lag dividend. They are 0.23 and 0.25 in the regressions of lag net income on lag dividend, and lag net income before extraordinary items on lag dividend.
The Vuong Z statistic is used to compare the power of the alternative earnings and change in earnings measures to explain return. The Z statistic is 7.05 when the adjusted $R^2$ from the regression of return on the level of and the change in net income is compared with the adjusted $R^2$ from the regression of return on the level of and the change in net income adjusted for the translation gain or loss. The Z statistic increases to 7.58 when the adjusted $R^2$ from the regression of return on the level of and the change in core earnings is compared with the adjusted $R^2$ from the regression of return on the level of and the change in core earnings adjusted for the translation gain or loss. These results support the hypothesis that the reported net income has a stronger association with return than the adjusted net income.

Consistent with the results from the earnings persistence analysis, the difference between the adjusted $R^2$ from the regression of return on the level of and the change in net income and the adjusted $R^2$ from the regression of return on the level of and the change in comprehensive income is unexpectedly high. The adjusted $R^2$ from the regression of return on the level of and the change in core earnings is 73.24 percent higher than the adjusted $R^2$ from the regression of return on the level of and the change in comprehensive income. The Vuong Z statistic is 6.90.

33. I also deflated by beginning market value and by contemporaneous market value (net income by market value, and lag net income and lag dividend by lag market value). The persistence coefficients changed; but the gap remained.
I report results from the year-by-year cross-sectional regressions in Table 10. Again, consistent with my predictions, of the 15 years covered by the study, the adjusted $R^2$ from the regression on earnings is higher than the adjusted $R^2$ from the regression on adjusted earnings in every year but 1985, 1988 and 1991. It is also higher than the adjusted $R^2$ from the regression on comprehensive income in every year but 1987 and 1998. The t-test and the Wilcoxon signed rank test to determine whether the $R^2$s are different are very significant in spite of the small sample size.34

34. The sample includes all fiscal year-end firms. Limiting the sample to 12/31 fiscal year firms did not change the results in any significant way.
CHAPTER 6

CONCLUSION

The purpose of the study was to determine whether and how the foreign translation adjustment is related to value for firms in the manufacturing sector, and whether earnings adjusted for dirty surplus items is superior to net income as a measure of firm performance. I have approached the issue from different angles. All the tests applied lead to the unanimous conclusion that the earnings number reported under current accounting standards is more value relevant than the adjusted net income measures.

I find that the foreign translation adjustment is positively associated with next period production costs, and negatively correlated with next period earnings and current period return. The negative correlation is robust to the choice of the functional currencies and various specification checks. This implies that the translation adjustment is value relevant, but not in the direction generally assumed. A positive adjustment is associated with a loss of value instead of an increase in value. Recognizing the translation adjustment as a source of value added when it is actually not can only dampen the persistence and the value relevance of the earnings number, and obscure the meaning of the comprehensive earnings number. Actually, the study provides strong evidence that,
on the basis of earnings persistence and earnings association with return, the reported net income is superior to both comprehensive income and net income adjusted for the foreign translation adjustment in summarizing current firm performance and predicting future performance.
REFERENCES


52


APPENDIX A


1. The OLS residuals from regression (5) are obtained.

\[ R_{i,t} = \beta_0 + \beta_1 NI_{i,t} + \beta_2 TADJ_{i,t} + \beta_3 FTAX_{i,t} + \beta_4 ADJ_{i,t} + e_{i,t} \]  (5)

where \( R, NI^*, TADJ, FTAX \) and \( ADJ \) are, respectively, return, net income minus the transaction gain or loss, transaction gain or loss, foreign income tax and translation adjustment.

2. The residuals are sorted into \( T \) sub-samples of \( n \) firms. \( T \) is the number of years in the sample. The residuals are randomly selected by using \( T \) draws made with replacement from the \( T \) n-vectors. This step is designed to preserve the cross-sectional structure of the data. As Freedman and Peters (1984) explain: “Some stochastic structure was imposed on the stochastic disturbance terms [...]. The key idea is to resample the residuals, preserving this stochastic structure, so the standard errors are generated using the model’s own assumptions (p. 98, emphasis supplied).”
3. Pseudo-returns are generated by the following equation:

$$R_{i,t} = b_0 + b_1NI_{i,t}^* + b_2TADJ_{i,t} + b_3FTAX_{i,t} + b_4ADJ_{i,t} + \varepsilon_{i,t}$$

(6)

where $R$ is a vector of pseudo-returns; $NI^*$, $TADJ$, $FTAX$ and $ADJ$ are the original net income, transaction gain or loss, foreign income tax and translation adjustment; $\varepsilon$ is a randomly selected vector of residuals; and $b_0$, $b_1$, $b_2$ are the OLS estimates from regression (5).

Not all the firms have a complete time-series. I treat each firm as if it had a complete time series by coding missing years as missing observations. When I make a draw, from the $T$ years, if a firm's data is missing for the selected year it is dropped from the regression (as missing). For instance, if year 10 error is added (by chance) to year 2 to form the pseudo-random return and year 10 or year 2 is missing, that firm-observation is dropped. Consequently, the number of observations employed in the regressions is random (along with the randomization of errors) while the cross-sectional structure of the errors is preserved.

4. The pseudo-returns are regressed on the original explanatory variables to obtain the bootstrap estimates of the regression coefficients.
5. The procedure is repeated 1,000 times to generate 1,000 estimates for each coefficient. The bootstrap standard errors of the estimates are obtained by computing the sample standard deviations of the estimates. The effect of cross-correlation is assessed by comparing the bootstrapped standard errors and t-statistics with the unadjusted OLS standard errors and t-statistics.

The mean (median) of the bootstrap coefficient estimates are $-1.5313 (-1.5158), -1.1458 (-1.1706)$, and $-1.5379 (-1.5669)$, respectively, for the one-year, two-year and five-year horizon windows using non-overlapping data. The mean (median) coefficient estimates are $-1.1859 (-1.1959)$, and $-3.0779 (-3.0359)$ for the two-year and five-year horizons using overlapping data. The OLS coefficient estimates are in general slightly higher than the bootstrapped estimates. At the same time, except for the five-year horizon with non-overlapping data, the bootstrapped standard errors are higher than the OLS standard errors. The 99th percentile of the bootstrap coefficient estimates on the translations adjustment is $-0.5380$ for the one-year horizons. For the two-year horizon, the 95th percentile is $-0.2473$ using overlapping data, and the 90th percentile is $-0.1430$ using non-overlapping data. The maximum coefficient estimates for the five-year horizon are negative for the overlapping and the non-overlapping data, $-2.2637$ and $-0.1614$, respectively.
APPENDIX B

Tables
<table>
<thead>
<tr>
<th>SIC Code</th>
<th>Industry Grouping</th>
<th>Functional Currency</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Current only</td>
<td>Current &amp; Temporal(^1)</td>
<td>Total # (%)</td>
</tr>
<tr>
<td>2000 - 2099</td>
<td>Food and kindred products</td>
<td>0</td>
<td>122</td>
<td>122 (2.63)</td>
</tr>
<tr>
<td>2100 - 2199</td>
<td>Tobacco manufactures</td>
<td>0</td>
<td>0</td>
<td>0 (0.00)</td>
</tr>
<tr>
<td>2200 - 2299</td>
<td>Textile mill products</td>
<td>3</td>
<td>38</td>
<td>41 (0.82)</td>
</tr>
<tr>
<td>2300 - 2399</td>
<td>Apparel and other textile products</td>
<td>0</td>
<td>33</td>
<td>33 (0.71)</td>
</tr>
<tr>
<td>2400 - 2499</td>
<td>Lumber and wood products</td>
<td>0</td>
<td>4</td>
<td>4 (0.09)</td>
</tr>
<tr>
<td>2500 - 2599</td>
<td>Furniture and fixtures</td>
<td>1</td>
<td>61</td>
<td>62 (1.32)</td>
</tr>
<tr>
<td>2600 - 2699</td>
<td>Paper and allied products</td>
<td>2</td>
<td>125</td>
<td>127 (2.70)</td>
</tr>
<tr>
<td>2700 - 2799</td>
<td>Printing and publishing</td>
<td>1</td>
<td>59</td>
<td>60 (1.27)</td>
</tr>
<tr>
<td>2800 - 2899</td>
<td>Chemicals and allied products</td>
<td>22</td>
<td>782</td>
<td>804 (16.87)</td>
</tr>
<tr>
<td>2900 - 2999</td>
<td>Petroleum and coal products</td>
<td>3</td>
<td>131</td>
<td>134 (2.83)</td>
</tr>
<tr>
<td>3000 - 3099</td>
<td>Rubber and plastics products</td>
<td>4</td>
<td>165</td>
<td>169 (3.56)</td>
</tr>
<tr>
<td>3100 - 3199</td>
<td>Leather and leather products</td>
<td>0</td>
<td>6</td>
<td>6 (0.13)</td>
</tr>
<tr>
<td>3200 - 3299</td>
<td>Stone, clay, glass, and concrete products</td>
<td>2</td>
<td>66</td>
<td>68 (1.42)</td>
</tr>
<tr>
<td>3300 - 3399</td>
<td>Primary metal industries</td>
<td>0</td>
<td>107</td>
<td>107 (2.31)</td>
</tr>
<tr>
<td>3400 - 3499</td>
<td>Fabricated metal products</td>
<td>2</td>
<td>245</td>
<td>247 (5.28)</td>
</tr>
<tr>
<td>3500 - 3599</td>
<td>Industrial machinery and equipment</td>
<td>20</td>
<td>989</td>
<td>1009 (21.33)</td>
</tr>
<tr>
<td>3600 - 3699</td>
<td>Electrical and electronic equipment</td>
<td>20</td>
<td>630</td>
<td>650 (13.59)</td>
</tr>
<tr>
<td>3700 - 3799</td>
<td>Transportation equipment</td>
<td>1</td>
<td>204</td>
<td>205 (4.40)</td>
</tr>
<tr>
<td>3800 - 3899</td>
<td>Instruments and related products</td>
<td>15</td>
<td>678</td>
<td>693 (14.62)</td>
</tr>
<tr>
<td>3900 - 3999</td>
<td>Miscellaneous manufacturing industries</td>
<td>3</td>
<td>92</td>
<td>95 (1.98)</td>
</tr>
</tbody>
</table>

**Table 1: Distribution of the Sample by SIC Codes and Translation Method**

\(^1\)Some of the firms I consider to have used the temporal method may instead simply have gains or losses from foreign currency transactions. In either case, they would report a transaction gain or loss.
Table 2

Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Std Dev</th>
<th>1st Percentile</th>
<th>99th Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>RETURN</td>
<td>4636</td>
<td>0.1839</td>
<td>0.1113</td>
<td>0.6024</td>
<td>-0.7431</td>
<td>2.5926</td>
</tr>
<tr>
<td>NI*</td>
<td>4636</td>
<td>0.0315</td>
<td>0.0599</td>
<td>0.1304</td>
<td>-0.9658</td>
<td>0.3098</td>
</tr>
<tr>
<td>FTAX</td>
<td>4636</td>
<td>0.0140</td>
<td>0.0089</td>
<td>0.0164</td>
<td>-0.0114</td>
<td>0.1046</td>
</tr>
<tr>
<td>TADJ</td>
<td>4636</td>
<td>-0.0010</td>
<td>-0.0004</td>
<td>0.0075</td>
<td>-0.0449</td>
<td>0.0407</td>
</tr>
<tr>
<td>ADJ</td>
<td>4636</td>
<td>0.0004</td>
<td>-0.0001</td>
<td>0.0202</td>
<td>-0.1080</td>
<td>0.1037</td>
</tr>
<tr>
<td>PC</td>
<td>3039</td>
<td>0.0287</td>
<td>0.0050</td>
<td>0.1099</td>
<td>-0.0000</td>
<td>1.6221</td>
</tr>
<tr>
<td>CHSALES</td>
<td>3039</td>
<td>0.0114</td>
<td>0.0056</td>
<td>0.0546</td>
<td>-0.4407</td>
<td>0.4055</td>
</tr>
</tbody>
</table>

Table 2: Descriptive Statistics

Notes to Table 2:

RETURN: twelve-month fiscal year return.

NI*: NI minus TADJ.

NI: net income before extraordinary items (Compustat item 18)

TADJ: transaction gain or loss (temporal method: Compustat item 150).

ADJ: change in the cumulative translation adjustment (change in Compustat item 230).

FTAX: foreign income tax (Compustat item 64).

PC: production cost = cost of goods sold (compustat item 41) plus change in finish goods (Compustat item 78) plus change work in process (compustat item 77).

CHSALES: change in sales (Compustat item 12).

All the variables, except return, are deflated by beginning market value. The mean, median and standard deviations are computed after winzorizing the top and bottom one-percentiles of the independent variables used in the regressions.
<table>
<thead>
<tr>
<th></th>
<th>CHSALES</th>
<th>FTAX</th>
<th>LTADJ</th>
<th>LADJ</th>
<th>PC</th>
</tr>
</thead>
<tbody>
<tr>
<td>NI</td>
<td>0.0113</td>
<td>-</td>
<td>0.1459</td>
<td>-0.0789</td>
<td>0.0435</td>
</tr>
<tr>
<td></td>
<td>(0.2303)</td>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0102)</td>
</tr>
<tr>
<td>TADJ</td>
<td>-0.0091</td>
<td>-0.0198</td>
<td>-</td>
<td>0.0192</td>
<td>0.0726</td>
</tr>
<tr>
<td></td>
<td>(0.2749)</td>
<td>0.0972</td>
<td></td>
<td>0.1529</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>FTAX</td>
<td>0.0663</td>
<td>0.1734</td>
<td>-0.1084</td>
<td>-</td>
<td>-0.0353</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td></td>
<td>(0.0301)</td>
</tr>
<tr>
<td>RETURN</td>
<td>-0.0463</td>
<td>0.2343</td>
<td>-0.0144</td>
<td>0.0909</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.0012)</td>
<td>(0.0000)</td>
<td>(0.1734)</td>
<td>(0.0000)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Pearson Correlations

Notes to Table 3:

The variables are defined as in Table 3. LADJ is the lag of ADJ and LTADJ is the lag of TADJ. The correlations among PC, CHSALES, FTAX, LTADJ and LADJ are presented above the diagonal. There are 3039 observations in the sample. The correlations among RETURN, NI, FTAX, TADJ and ADJ are presented below the diagonal. There are 4636 observations in the sample. I winzorize the top and bottom one-percentiles of all the variables, except for PC and RETURN. One-tail p-values are reported in parentheses.
## Table 4

**Association between the Translation Adjustment and Next Period Costs of Production and Earnings**

**Model 1:** \( PC_{i,t} = \beta_0 + \beta_1 PC_{i,t-1} + \beta_2 CHSALES_{i,t} + \beta_3 FTAX_{i,t} + \beta_4 TADJ_{i,t-1} + \beta_5 ADJ_{i,t-1} + \epsilon_{i,t} \)

**Model 2:** \( NI_{i,t} = \beta_0 + \beta_1 NI_{i,t-1}^* + \beta_2 CHSALES_{i,t} + \beta_3 FTAX_{i,t} + \beta_4 TADJ_{i,t-1} + \beta_5 ADJ_{i,t-1} + \epsilon_{i,t} \)

<table>
<thead>
<tr>
<th></th>
<th>Model 1 (N=3039)</th>
<th>Model 2 (N=4648)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AdjR²</td>
<td>89.96</td>
<td>53.28</td>
</tr>
<tr>
<td>( \beta_0 )</td>
<td>1.8729 (0.0000)</td>
<td>-0.8373 (0.0000)</td>
</tr>
<tr>
<td>( \beta_1 )</td>
<td>0.8758 (0.0000)</td>
<td>0.6513 (0.0000)</td>
</tr>
<tr>
<td>( \beta_2 )</td>
<td>0.0568 (0.0000)</td>
<td>0.2460 (0.0000)</td>
</tr>
<tr>
<td>( \beta_3 )</td>
<td>-1.1309 (0.0004)</td>
<td>-0.1113 (0.3400)</td>
</tr>
<tr>
<td>( \beta_4 )</td>
<td>0.6673 (0.0036)</td>
<td>3.0729 (0.0000)</td>
</tr>
<tr>
<td>( \beta_5 )</td>
<td>1.9328 (0.0000)</td>
<td>-0.4229 (0.0238)</td>
</tr>
</tbody>
</table>

## Notes to Table 4:

The variables are defined in Table 2. All the variables, including the intercepts, are deflated by beginning market value. I winsorize the top and bottom one-percentiles of the explanatory variables. One-tail p-values are reported in parentheses.
Table 5

Association between the Translation Adjustment and Change in Firm Value

\[ R_{it} = \beta_0 + \beta_1 NF_{it} + \beta_2 FTAX_{it} + \beta_3 TADJ_{it} + \beta_4 ADJ_{it} + e_{it} \]

<table>
<thead>
<tr>
<th>AdjR²</th>
<th>(1) YEAR (N=4636)</th>
<th>(2) YEARS (N=3741)</th>
<th>(5) YEARS (N=2287)</th>
<th>(5) YEARS (N=501)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overlapping</td>
<td>Non-Overlapping</td>
<td>Overlapping</td>
<td>Non-Overlapping</td>
</tr>
<tr>
<td></td>
<td>(N=3741)</td>
<td>(N=1961)</td>
<td>(N=2287)</td>
<td>(N=501)</td>
</tr>
<tr>
<td>(\beta_0)</td>
<td>2.8092</td>
<td>3.8598</td>
<td>4.4524</td>
<td>7.6360</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>(\beta_1)</td>
<td>1.2360</td>
<td>1.5888</td>
<td>1.5582</td>
<td>2.1443</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>(\beta_2)</td>
<td>4.3196</td>
<td>3.1409</td>
<td>3.0888</td>
<td>1.7899</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>(\beta_3)</td>
<td>-1.3293</td>
<td>-0.69417</td>
<td>-1.0344</td>
<td>0.6099</td>
</tr>
<tr>
<td></td>
<td>(0.1328)</td>
<td>(0.2300)</td>
<td>(0.2302)</td>
<td>(0.2682)</td>
</tr>
<tr>
<td>(\beta_4)</td>
<td>-1.6618</td>
<td>-1.1845</td>
<td>-1.1812</td>
<td>-3.2010</td>
</tr>
<tr>
<td></td>
<td>(0.0001)</td>
<td>(0.0014)</td>
<td>(0.0177)</td>
<td>(0.0008)</td>
</tr>
</tbody>
</table>

Table 5: Association between the Translation Adjustment and Next Period Earnings

Notes to Table 5:

R is the fiscal year return. The other variables are defined in Table 2. The horizons indicate the periods over which the variables are measured. For the two-year and five-year horizons, I use both overlapping and non-overlapping observations. For the two-year horizon, I obtain the non-overlapping observations by limiting the sample to odd years, from 1985 to 1999. For the five-year horizon, I limit the sample to 1989, 1994 and 1999. The right-hand side variables, including the intercept, are deflated by beginning market value. This yields a regression of cum dividend change in firm value on net income, foreign income tax, transaction gains or losses (temporal rate method) and translation adjustment (current rate method), with both sides of the regression scaled by beginning market value. To mitigate the effects of outliers and potential errors in the data, I winsorize the top and bottom one-percentiles of the independent variables. One-tail p-values are reported in parentheses.
Table 6

Association between the Translation Adjustment and Change in Firm Value
Diagnostic Tests

\[ R_{it} = \beta_0 + \beta_1 NI_{it} + \beta_2 FTAX_{it} + \beta_3 TADJ_{it} + \beta_4 ADJ_{it} + e_{it} \]

<table>
<thead>
<tr>
<th></th>
<th>1 YEAR (N=4636)</th>
<th>2 YEARS</th>
<th>5 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overlapping (N=3741)</td>
<td>Non-Overlapping (N=1961)</td>
<td>Overlapping (N=2287)</td>
</tr>
<tr>
<td>OLS ( \beta_4 )</td>
<td>-1.6618* (0.4447)</td>
<td>-1.1845* (0.3974)</td>
<td>-1.1812** (0.5609)</td>
</tr>
<tr>
<td>Bootstrap ( \beta_4 )</td>
<td>-1.5313* (0.4649)</td>
<td>-1.1859** (0.5658)</td>
<td>-1.1458** (0.6965)</td>
</tr>
<tr>
<td>Partial Linear Model ( \beta_4 )</td>
<td>-1.0253* (0.4405)</td>
<td>-0.8096** (0.4235)</td>
<td>-1.4400* (0.5153)</td>
</tr>
</tbody>
</table>

Table 6: Association between the Translation Adjustment and Change in Firm Value: Diagnostic Tests

Notes to Table 6:

R is the fiscal year return. The other variables are defined in Table 2. The right hand-side variables, including the intercept, are deflated by beginning market value. This yields a regression of cum dividend change in firm value on net income, foreign income tax, transaction gains or losses (temporal rate method) and translation adjustment (current rate method), with both sides of the regression scaled by beginning market value. I winsorize the top and bottom one-percentiles of the independent variables. One-tail p-values are reported in parentheses. The bootstrap estimates are the means of the coefficients from 1000 replications as described in Appendix A. Standard errors are provided in parentheses. They are the standard deviations of the coefficients from the replications. The 99th percentile of the bootstrap coefficient estimates on the translations adjustment is -0.5380 for the one-year horizons. For the two-year horizon, the 95th percentile is -0.2473 using overlapping data, and the 90th percentile is -0.1430 using non-overlapping data. The maximum coefficient estimates for the five-year horizon are negative for the overlapping and the non-overlapping samples, -2.2637 and -0.1614, respectively. The partial linear model refers to the semi-parametric regression model proposed by Robinson (1988). * and ** stand for significant below the 1 percent and the 5 percent levels, respectively, in a one-tail test.

67
Table 7

Association between the Translation Adjustment and Change in Firm Value
Controlling for the Choice of Translation Method

\[ R_{it} = \beta_0 + \beta_1 N_{it} + \beta_2 FTAX_{it} + \beta_3 TADJ_{it} + \beta_4 DADJ1_{it} + \beta_5 DADJ2_{it} + e_{it} \]

<table>
<thead>
<tr>
<th>Coefficient Estimate</th>
<th>Standard Error</th>
<th>One-tail P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \beta_0 )</td>
<td>2.8127</td>
<td>0.2899</td>
</tr>
<tr>
<td>( \beta_1 )</td>
<td>1.2342</td>
<td>0.0710</td>
</tr>
<tr>
<td>( \beta_2 )</td>
<td>4.3229</td>
<td>0.4597</td>
</tr>
<tr>
<td>( \beta_3 )</td>
<td>-1.3314</td>
<td>1.1935</td>
</tr>
<tr>
<td>( \beta_4 )</td>
<td>-1.5454</td>
<td>0.4481</td>
</tr>
<tr>
<td>( \beta_5 )</td>
<td>-7.6864</td>
<td>3.2161</td>
</tr>
</tbody>
</table>

\( F\)-Statistic (\( B_1=B_2 \): 3.58***  
Adj\( R^2 \): 13.70

Table 7: Association between the Translation Adjustment and Change in Firm Value: Partitioning Based on Translation Method

Notes to Table 7:

\( DADJ1 = D1 \times ADJ \) and \( DADJ2 = D2 \times ADJ \). \( D1 \) is a binary variable taking the value 0 if TADJ equals 0 and 1 otherwise. \( D2 \) is a dummy variable taking the value 1 if TADJ equal 0 and 0 otherwise. \( R \) is the fiscal year return. The other variables are defined in Table 2. The sample has 5437 firm-years that report under the temporal rate method and the current rate method. There are 99 firm-years that report only under the current rate method. Some of the firms I consider to have used the temporal method may instead simply have gains or losses from foreign currency transactions. In either case they would report a transaction gain or loss. There is no way to disentangle the effect of the currency transactions from the effect of the currency translations under the temporal method.

The right-hand side variables, including the intercept, are deflated by beginning market value. This yields a regression of cum dividend change in firm value on net income, foreign income tax, transaction gains or losses (temporal rate method) and translation adjustment (current rate method), with both sides of the regression scaled by beginning market value. To mitigate the effects of outliers and potential errors in the data, I winsorize the top and bottom one-percentiles of the independent variables. *** indicates significant below the 10 percent level in a two-tail test.
Table 8

Comparison of the Persistence of Alternative Earnings Measures

\[ N_{it} = \beta_0 + \beta_1 N_{i,t-1} + \beta_2 \text{DIV}_{t-1} + \epsilon_t \]

Panel A: OLS

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.5165</td>
<td>0.2849</td>
<td>0.4424</td>
<td>0.2440</td>
<td>0.1332</td>
</tr>
<tr>
<td>[Std Dev]</td>
<td>[0.4779]</td>
<td>[0.4270]</td>
<td>[0.4736]</td>
<td>[0.4140]</td>
<td>[0.4891]</td>
</tr>
<tr>
<td>Median</td>
<td>0.5163</td>
<td>0.2645</td>
<td>0.4343</td>
<td>0.2125</td>
<td>0.1227</td>
</tr>
</tbody>
</table>

(t-test p-value)

M2 vs M1: (0.0000)  
M3 vs M1: (0.0000)  
M4 vs M3: (0.0000)  
M5 vs M1: (0.0000)

[Signed-Rank p-value]

[0.0000]  [0.0000]  [0.0000]  [0.0000]

Panel B: Partial Linear Model

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.9747</td>
<td>0.5985</td>
<td>0.8674</td>
<td>0.5294</td>
<td>0.1719</td>
</tr>
<tr>
<td>[Std Dev]</td>
<td>[0.3538]</td>
<td>[0.3699]</td>
<td>[0.3965]</td>
<td>[0.3775]</td>
<td>[0.3707]</td>
</tr>
<tr>
<td>Median</td>
<td>1.0476</td>
<td>0.5485</td>
<td>0.9226</td>
<td>0.4796</td>
<td>0.1572</td>
</tr>
</tbody>
</table>

(t-test p-value)

M2 vs M1: (0.0000)  
M3 vs M1: (0.0000)  
M4 vs M3: (0.0000)  
M5 vs M1: (0.0000)

[Signed-Rank p-value]

[0.0000]  [0.0025]  [0.0000]  [0.0000]

Table 8: Comparison of the Persistence of Alternative Earnings Measures

Notes to Table 8 on next page
Notes to Table 8:

M1: NI is net income before extraordinary items (Compustat item 18).
M2: NI is net income before extraordinary items (Compustat item 18) plus foreign translation adjustment (change in Compustat item 230).
M3: NI is net income (Compustat item 172).
M4: NI is net income (Compustat item 172) plus foreign translation adjustment (change in Compustat item 230).
M5: NI is comprehensive income.

Comprehensive income = change in book value (Compustat item 60) + net capital contribution.

Net capital contribution = dividend (Compustat item 21) + purchase of common and preferred stock (Compustat item 115) – sales of common and preferred stock (Compustat item 108).

The table summarizes the statistics for the earnings persistence coefficient. The sample period covers 1985 to 1999. There are 169 firms that have the complete time-series data. The partial linear model refers to the semi-parametric regression model proposed by Robinson (1988). The optimal bandwidths are 0.91, 0.98 and 2.12 in the regressions of net income on lag dividend, net income before extraordinary items on lag dividend, and comprehensive income on lag dividend, respectively. They are 0.58, 0.65 and 2.07 in the regressions of lag net income on lag dividend, lag net income before extraordinary items on lag dividend, and lag comprehensive income on lag dividend. When earnings is adjusted for the translation gain or loss, the optimal bandwidths are 0.66 and 0.84 in the regressions of net income on lag dividend, and net income before extraordinary items on lag dividend. They are 0.38 and 0.59 in the regressions of lag net income on lag dividend, and lag net income before extraordinary items on lag dividend.
Table 9
Comparison of the Explanatory Powers of Alternative Earnings Measures
Pooled Regressions

\[ R_{i,t} = \beta_0 + \beta_1 NI_{i,t} + \beta_2 \Delta NI_{i,t} + \epsilon_{i,t} \]

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\beta_0)</td>
<td>0.0210</td>
<td>0.0306</td>
<td>0.0496</td>
<td>0.0577</td>
<td>0.0589</td>
</tr>
<tr>
<td></td>
<td>(0.0089)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>(\beta_1)</td>
<td>2.0361</td>
<td>1.8916</td>
<td>1.6612</td>
<td>1.5279</td>
<td>1.4300</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>(\beta_2)</td>
<td>0.7308</td>
<td>0.4173</td>
<td>0.4064</td>
<td>0.2200</td>
<td>-0.0333</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0154)</td>
<td>(0.6492)</td>
</tr>
<tr>
<td>Adj. (R^2)</td>
<td>13.21</td>
<td>10.68</td>
<td>9.81</td>
<td>8.03</td>
<td>7.37</td>
</tr>
</tbody>
</table>

Vuong \(Z\)

<table>
<thead>
<tr>
<th></th>
<th>M2 vs M1</th>
<th>M3 vs M1</th>
<th>M4 vs M3</th>
<th>M5 vs M1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.58</td>
<td>7.30</td>
<td>7.05</td>
<td>6.90</td>
</tr>
</tbody>
</table>

Table 9: Comparison of the Explanatory Powers of Alternative Earnings Measures: Pooled Regressions

Notes to Table 9:

M1: NI is net income before extraordinary items (Compustat item 18).
M2: NI is net income before extraordinary items (Compustat item 18) plus foreign translation adjustment (change in Compustat item 230).
M3: NI is net income (Compustat item 172).
M4: NI is net income (Compustat item 172) plus foreign translation adjustment (change in Compustat item 230).
M5: NI is comprehensive income.

Comprehensive income = change in book value (Compustat item 60) + net capital contribution.

Net capital contribution = dividend (Compustat item 21) + purchase of common and preferred stock (Compustat item 115) – sales of common and preferred stock (Compustat item 108).

Notes to Table 9 continued on next page
Notes to Table 9 (continuation):

The table reports the results of regressions of $R_{it}$ (twelve-month fiscal year return) on alternative earnings measures and change in earnings. $\Delta$ indicates first difference. The explanatory variables are deflated by beginning market value. The top percentile of the absolute value of various earnings measurements are deleted. The Vuong (1989) test is used to statistically determine which model performs better. This statistic is asymptotically standard normal. The sample size is 6,142.
Table 10
Comparison of the Explanatory Powers of Alternative Earnings Measures
Time-Series of Cross-Sectional Regressions

\[ R_{it} = \beta_0 + \beta_1 NI_{it} + \beta_2 \Delta NI_{it} + \epsilon_{it} \]

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
<th>Adjusted R^2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M1</td>
</tr>
<tr>
<td>1985</td>
<td>414</td>
<td>0.2037</td>
</tr>
<tr>
<td>1986</td>
<td>409</td>
<td>0.2404</td>
</tr>
<tr>
<td>1987</td>
<td>394</td>
<td>0.1029</td>
</tr>
<tr>
<td>1988</td>
<td>394</td>
<td>0.2556</td>
</tr>
<tr>
<td>1989</td>
<td>397</td>
<td>0.1971</td>
</tr>
<tr>
<td>1990</td>
<td>400</td>
<td>0.1870</td>
</tr>
<tr>
<td>1991</td>
<td>408</td>
<td>0.1632</td>
</tr>
<tr>
<td>1992</td>
<td>435</td>
<td>0.1927</td>
</tr>
<tr>
<td>1993</td>
<td>431</td>
<td>0.1966</td>
</tr>
<tr>
<td>1994</td>
<td>448</td>
<td>0.1548</td>
</tr>
<tr>
<td>1995</td>
<td>447</td>
<td>0.1799</td>
</tr>
<tr>
<td>1996</td>
<td>448</td>
<td>0.2014</td>
</tr>
<tr>
<td>1997</td>
<td>447</td>
<td>0.1348</td>
</tr>
<tr>
<td>1998</td>
<td>390</td>
<td>0.0787</td>
</tr>
<tr>
<td>1999</td>
<td>280</td>
<td>0.0718</td>
</tr>
<tr>
<td>Median</td>
<td>18.70</td>
<td>16.58</td>
</tr>
</tbody>
</table>

| (t-test p-value) | M1 vs M2 | (Signed-Rank p-value) | M1 vs M3 |
| (0.0105) | M1 vs M3 | (0.0006) |
| {0.0084} | {0.0004} |

Table 10: Comparison of the Explanatory Powers of Alternative Earnings Measures: Time-Series of Cross-Sectional Regressions

Notes to Table 10 on next page
Notes to Table 10 (continuation):

M1: NI is net income before extraordinary item (Compustat item 18).
M2: NI is net income before extraordinary item (Compustat item 18) plus foreign translation adjustment (change in Compustat item 230).
M3: NI is comprehensive income.

Comprehensive income = change in book value (Compustat item 60) + net capital contribution.

Net capital contribution = dividend (Compustat item 21) + purchase of common and preferred stock (Compustat item 115) – sales of common and preferred stock Compustat item 108).

The table reports the adjusted R²s of year-by-year regressions of R_{i,t} (twelve-month fiscal year return) on alternative earnings measures and change in earnings. Δ indicates first difference. The explanatory variables are deflated by beginning market value. A t-test and a signed rank test are conducted to determine whether the adjusted R²s from the different models are significantly different.