Comprehensive Income and Its Relation to Firm Value and Transitory Earnings.

Carol Callaway Dee
Louisiana State University and Agricultural & Mechanical College

Follow this and additional works at: https://digitalcommons.lsu.edu/gradschool_disstheses

Recommended Citation
https://digitalcommons.lsu.edu/gradschool_disstheses/7039

This Dissertation is brought to you for free and open access by the Graduate School at LSU Digital Commons. It has been accepted for inclusion in LSU Historical Dissertations and Theses by an authorized administrator of LSU Digital Commons. For more information, please contact gradetd@lsu.edu.
INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

Bell & Howell Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
COMPREHENSIVE INCOME AND ITS RELATION TO FIRM VALUE AND TRANSITORY EARNINGS

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy in

The Department of Accounting

Carol Callaway Dee
B.S., University of Florida, 1983
December, 1999
# Table of Contents

List of Tables ............................................................................................................. iv

Abstract ...................................................................................................................... v

1. Introduction ..........................................................................................................1
   1.1 Clean versus dirty surplus and the evolution of the comprehensive income standard ........................................... 4

2. Related Literature ...............................................................................................8
   2.1 Comprehensive income ................................................................................. 8
   2.2 The relation between earnings and returns ............................................... 10
      2.2.1 Permanent earnings and earnings persistence .................................... 10
      2.2.2 Simultaneity in the price-earnings relation ....................................... 12

3. The Earnings-Price Relation and Permanent versus Transitory Earnings .............14
   3.1 The relation between returns and expected future dividends ..................... 14
   3.2 The relation between permanent, transitory, and unexpected earnings ....... 18

4. The Relation between Comprehensive Income and Transitory Earnings .............22
   4.1 Implications of efficient capital markets for items of other comprehensive income .................................................. 23
   4.2 Foreign currency adjustments .................................................................... 23
   4.3 Unrealized holding gains and losses ......................................................... 24
   4.4 Pension adjustments .................................................................................. 26
   4.5 Derivatives and hedging .............................................................................. 26
   4.6 Summary and predictions .......................................................................... 27

5. Empirical Model and Data ..................................................................................29
   5.1 Empirical issues .......................................................................................... 29
      5.1.1 Implementation .................................................................................. 29
      5.1.2 Nested versus non-nested models ...................................................... 32
      5.1.3 Power ................................................................................................. 32
   5.2 Data .............................................................................................................. 33
   5.3 Sample selection ......................................................................................... 38

6. Results .................................................................................................................43
   6.1 Descriptive statistics .................................................................................... 43
      6.1.1 Descriptive statistics for pooled data ................................................ 43
      6.1.2 Descriptive statistics: Firm-specific ................................................... 47
   6.2 Pooled model .............................................................................................. 50
   6.3 Coefficients aggregated over time or across firms ....................................... 60
List of Tables

Table 1 (A): Illustration of Alternative Measures of Other Comprehensive Income: Intel Corporation's 1997 Annual Report .................................................................36

Table 1 (B): Illustration of Alternative Measures of Other Comprehensive Income: Raytheon Company and Subsidiaries’ 1996 Annual Report ..................................37

Table 2: Sample Selection Procedure and Distribution of Sample by One-Digit SIC Code ......................................................................................................................41

Table 3: Descriptive Statistics for Selected Variables ................................................45

Table 4: Descriptive Statistics on 126 Time-Series Means .........................................48

Table 5: Descriptive Statistics on Cross-Section of 126 Autocorrelations ...............49

Table 6: Pooled Regressions of Annual Return on Net Income Variables and Other Comprehensive Income Variables .................................................................51

Table 7: Pooled Regressions of Annual Return on Operating Income Variables and Other Comprehensive Income Variables ......................................................56

Table 8: Pooled Regressions of Annual Return on Net Income Components and Other Comprehensive Income Variables .........................................................58

Table 9: Aggregation of T-Statistics for Eleven Cross-Sectional Regressions (by Year) .........................................................................................................................62

Table 10: Aggregation of T-Statistics for 126 Time-Series Regressions (by Firm) .....63

Table 11: Regressions of Annual Returns on Change in Net Income and Other Comprehensive Income: Fixed Effects and Random Effects Models ......................65
Abstract

The distinction between permanent and transitory earnings is important when using accounting earnings to predict future dividends. To the extent that net income includes transitory items, it is less useful in predicting future dividends, and thus, less useful in valuing the firm. If comprehensive income includes more transitory items than net income, it is less useful than net income in valuing the firm.

This study contributes to the literature in two ways. First, a definition of permanent earnings is developed that is based on the relation between earnings and expected future dividends. The study illustrates the relation between permanent, transitory, and unexpected earnings, and demonstrates the consequences of using unexpected earnings instead of the change in permanent earnings when regressing stock returns on an earnings measure. Second, the study provides evidence as to the relative usefulness of net income and comprehensive income in modeling firm value by testing whether items of other comprehensive income (OCI) as defined under SFAS No. 130, Reporting Comprehensive Income, are related to firm value.

Data for the study are hand gathered from 126 firms over 11 years (1986-1996). The results show that items of OCI are not related to firm value, as measured by annual returns. The results are robust to all model specifications and econometric methods used. Further, items of OCI are found to exhibit small positive autocorrelation and have zero mean. This is consistent with the prediction that items of OCI are transitory.
1. Introduction

Accounting earnings are used both to provide information helpful in valuing the firm, and to provide information to owners and debtholders for use in monitoring and evaluating the performance of management. Gjesdal (1981) calls these differing demands for accounting information decision-making demand and stewardship demand. He demonstrates that these demands may not be satisfied by the same financial information. Accounting information that primarily addresses the valuation objective may not be optimal in accomplishing the stewardship objective. Similarly, Paul (1992) shows that effective monitoring of agents requires measuring the value added to the firm by the manager. Thus stock-based compensation can be problematic to the extent it reflects market-based movements out of management’s control.

While the demands for information necessary for decision-making and stewardship can conflict, the distinction between permanent and transitory components of earnings is important to the accomplishment of both these objectives. The relation between changes in accounting earnings and security returns is weakened by the existence of transitory components in earnings.1 Permanent components of earnings are those that are correlated with expected future dividends. Thus, they should be impounded into security prices at a multiple roughly equal to

---
1 Ali and Zarowin (1992) demonstrate that one cause of the low earnings response coefficients typically seen in studies using a random walk model for earnings is the existence of transitory components in earnings.
the inverse of the expected rate of return, or $1/E(r)$. An earnings component that is completely transitory (one that is uncorrelated with expected future dividends), however, will have a coefficient of zero. An earnings component that is partly permanent and partly transitory will have a coefficient somewhere between $1/E(r)$ and zero. Thus, in valuing the firm, it may be optimal to disaggregate accounting earnings into its permanent and transitory components since items with more transitory components have (by definition) less of an effect on firm value.

Accounting earnings are also used as a tool in evaluating the performance of management. Contributions to the bonus pool are typically based on accounting earnings rather than stock returns. Sloan (1993) shows that this is done in part to shield managers’ earnings from market-wide shocks over which they have little or no control. He finds that accounting earnings are more closely aligned with executive compensation than are security returns when “earnings have a less positive (more negative) association with the market-wide movements in equity values” (p. 92). Lambert and Larcker (1987), in an empirical application of Holmstrom (1979), demonstrate that the relative weight placed on accounting based versus market-based performance measures in compensation contracts depends on the magnitude of its signal-to-noise ratio with respect to the agents’ actions. Therefore, the existence of noise (i.e., transitory items) in accounting numbers reduces their usefulness in evaluating the performance of management.

This study focuses on the decision-making (valuation) demand for accounting information, and contributes to the literature in two ways. First, a definition of
permanent earnings is developed that is based on the relation between earnings and expected future dividends. The study illustrates the relation between permanent, transitory, and unexpected earnings, and demonstrates the consequences of using unexpected earnings instead of change in permanent earnings when regressing returns on an earnings measure. Second, the study provides evidence as to the relative usefulness of net income and comprehensive income in modeling firm value by testing whether items of other comprehensive income (OCI) under Statement of Financial Accounting Standards (SFAS) No. 130, *Reporting Comprehensive Income*, are related to firm value. This is important because there is demand from the analyst community for this new standard.

Two hypotheses are developed. The first is that items of OCI are transitory and thus, by definition, unrelated to firm value as measured by annual returns. The second is that the relation between OCI and returns does not improve over time. Results from a sample of 126 firms over 11 years (1,386 firm-years) are consistent with these predictions.

The rest of the paper is organized as follows. Section 1.1 discusses the controversy over clean versus dirty surplus accounting and the development of the comprehensive income standard. Section two reviews existing evidence on the value relevance of comprehensive income, and relevant studies of the earnings-return relation. Section three illustrates the relation between returns and expected future dividends, and develops definitions of permanent earnings and transitory earnings. Section four discusses the relation between comprehensive income and transitory
earnings and the implications of efficient capital markets for items of other comprehensive income. Section five discusses the empirical model, certain data problems and limitations, and sample selection procedures. Section six discusses results of the study and section seven concludes and offers suggestions for future research.

1.1 Clean versus dirty surplus and the evolution of the comprehensive income standard

In 1966, the Accounting Principles Board (APB) issued Opinion No. 9, "Reporting the Results of Operations". This opinion required clean surplus accounting. All items of income except certain prior period adjustments were to flow through the income statement. After APB No. 9, managers no longer had the option to bypass the income statement and record extraordinary items directly to retained earnings. APB No. 30, issued in 1973, further refined the treatment of extraordinary items.

The Financial Accounting Standards Board (FASB) has issued several statements that violate the clean surplus provision of APB No.'s 9 and 30. These statements require items of "other comprehensive income" to bypass the income statement and be reported as a separate component of stockholders' equity. Items of other comprehensive income are:

---

2 After APB No. 9, the treatment of extraordinary items still varied widely among firms. This divergence of practice led to the issuance of APB Opinion No. 30, "Reporting the Results of Operations—Reporting the Effects of Disposal of a Segment of a Business, and Extraordinary, Unusual and Infrequently Occurring Events and Transactions." APB No. 30 prohibits reporting the disposal of a segment as extraordinary, and requires income from discontinued operations to be reported as a separate component of net income.
1. Foreign currency translation adjustments (i.e., those accounted for under the current rate method) under SFAS No. 52 and certain other foreign currency gains and losses;
2. Unrealized holding gains and losses on securities available-for-sale under SFAS No. 115;
3. Excess of additional pension liability to be recorded over unrecognized prior service cost under SFAS No. 87; and
4. Unrealized gains and losses on hedges of forecasted transactions (cash flow hedges) to the extent the hedge is effective under SFAS No. 133, Accounting for Derivative Instruments and Hedging Activities.

These items are largely the result of fair market value accounting for certain balance sheet items.

Some financial statement users have expressed concerns that recording gains and losses directly to stockholders' equity obscures the true earnings of the firm. Some believe that companies are misleading shareholders by recording these items directly to equity rather than having them flow through the income statement. Additionally, investors were concerned that gains and losses related to the new derivatives statement would be buried in the equity section. Acknowledging these concerns, Dennis Beresford, former FASB chairman, along with FASB managers L. Todd Johnson and Cheri Reither, writes:

If more items are taken directly to equity—as is likely without another means of reporting comprehensive income—equity will become a dumpster for an
amorphous and growing mass of important information. Thus, the more different items there are in non-owner changes to equity, the more important it becomes to have a statement that displays them in an organized way on their way to becoming equity (Beresford, Johnson, and Reither 1996).

In contrast, many corporations, particularly financial institutions, argue that recording unrealized gains and losses related to derivatives would cause large fluctuations in their net income. They assert that this confuses shareholders and makes the business appear riskier than it really is.³ Further, some argue that firms may avoid prudent risk management due to concerns over the effect of derivatives gains and losses to their bottom line.

In 1997 the FASB issued SFAS No. 130, Reporting Comprehensive Income. SFAS No. 130 is effective for fiscal years beginning after December 15, 1997. This statement requires firms to “...display comprehensive income and its components in a financial statement that is displayed with the same prominence as other financial statements that constitute a full set of financial statements” (par. 22). The statement “...discusses how to report and display comprehensive income and its components. However, it does not specify when to recognize or how to measure the items that make up comprehensive income” (par. 7). No specific format is required, and even the term “comprehensive income” is not required. Although the FASB encourages entities to display comprehensive income and its components as part of the income

³ This is consistent with an income smoothing argument. Lambert (1984) notes that income smoothing reduces the variability of earnings over time, making it easier to discern the recurring earnings of the firm. Thus for performance measurement, income smoothing by the agent can be beneficial to the principal. It makes it easier for the principal to observe the actions of the agent.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
statement, firms may comply with the standard by reporting these items in a statement of changes in equity.

The FASB defines comprehensive income as “...the change in equity of a business enterprise during a period from transactions and other events and circumstances from nonowner sources. It includes all changes in equity during a period except those resulting from investments by owners and distributions to owners” (FASB Concepts Statement No. 6, par. 70). Thus, comprehensive income as defined by the FASB does not include treasury stock transactions, employee stock ownership plan (ESOP) transactions, or other transactions with owners. Such items still flow directly to equity and are not components of other comprehensive income.

SFAS No. 130 represents a compromise between the clean surplus and dirty surplus approaches. The information required by SFAS No. 130 is not new. It does require showing the changes in items of other comprehensive income for the year in addition to the cumulative totals, but these changes can easily be computed by financial statement users. However, some firms oppose SFAS No. 130 because they view it as “...another step on the path toward mark-to-market, or current-value accounting” (Horvitz 1996). Ketz (1996) writes “...it is instructive to remember the chief criticism put forth a decade ago when comprehensive income, incorporated within the conceptual framework, was seen as a backdoor approach to implementing current value accounting.”
2. Related Literature

Review of the related literature is divided into two sections. Section 2.1 discusses empirical studies of the value relevance of comprehensive income. Section 2.2 reviews pertinent research in the earnings-price area.

2.1 Comprehensive income

There has been little empirical research in the area of comprehensive income. This could be because, although the data needed to calculate “as-if” comprehensive income are publicly available in the equity section of firms’ financial statements, data for items of OCI are not readily available on Compustat. This limitation is discussed further in section 5.2.

Cheng, Cheung, and Gopalakrishnan (1993), using 18 years of annual data for an average of 922 firms per year, examine the relation between abnormal returns and three measures of income: operating income, net income, and comprehensive income. They compare the adjusted $R^2$ for the three models, and conclude that operating income “...weakly dominates net income in terms of information content, and both operating income and net income dominate comprehensive income” (p. 201). The authors note that their findings support one of two conclusions: net income and/or operating income are superior to comprehensive income as a measure of performance, or that investors are “fixated” on net income, thus ignoring comprehensive income.
In an extension of Cheng et al. (1993), Cheng (1998) examines, over intervals ranging from one to 15 years, the relation between raw returns and (1) net income, (2) comprehensive income, and (3) net income disaggregated into twelve components, plus other comprehensive income. The adjusted $R^2$s for the net income regressions are higher than those for the regressions of returns on comprehensive income. Further, she finds that the regression coefficient on other comprehensive income is significant only for intervals of 10 years and greater. She concludes that the insignificance of OCI in explaining one year returns may “indicate an insufficient use of OCI information,” the cause of which may be due to the “poor presentation format prior to SFAS No. 130” (pp. 26-27).

A limitation of both Cheng et al. (1993) and Cheng (1998) involves the calculation of comprehensive income. Each study defines comprehensive income as the change in retained earnings, plus dividends, less net income. No adjustments are made for items which in some cases are reported directly to retained earnings but are not part of comprehensive income. Thus, the OCI variables from these studies are not measured on a basis consistent with SFAS No. 130.

Dhaliwal, Subramanyam, and Trezevant (1999) compare the adjusted $R^2$s for several models of returns on items of other comprehensive income. They calculate comprehensive income in accordance with SFAS No. 130; however, they rely on Compustat for the data to calculate OCI. As discussed in section 5.2, Compustat...
does not consistently report items of OCI. They find that the only component of other comprehensive income that improves the earnings-return relation is the marketable securities adjustment. Further analysis shows that this result is driven by firms in the financial sector. Their study was limited to the years 1994 and 1995 due to Compustat data limitations.

In general, the evidence to date suggests that net income is more closely related to firm value than is comprehensive income. This study predicts that the reason for this is that items of other comprehensive income are unrelated to firm value (are transitory). Thus, adding these items to net income (to calculate comprehensive income) reduces the relation between earnings and returns. The next section discusses the earnings-returns literature.

2.2 The relation between earnings and returns

The earnings-return relation has been examined extensively. This section reviews pertinent research in this area, and is divided into two sections. Section 2.2.1 discusses differing definitions, theories, and evidence related to permanent earnings and earnings persistence. Section 2.2.2 discusses simultaneity in the price-earnings relation.

2.2.1 Permanent earnings and earnings persistence

Beaver (1998, p. 49) defines permanent earnings as “That constant cash flow which if received in perpetuity would have the same present value as that of the remaining cash flows and computed as the present value at the beginning of the period times the interest rate.” As Beaver points out (p. 49), this is a valuation
concept, and "...the relationship between accounting earnings and permanent (economic) earnings is less clear." (p. 50). As an example, however, rental income from a long-term lease may be considered permanent (or "more" permanent) in comparison to a one-time cash inflow from an insurance settlement.

Related to the concept of permanent earnings is persistence. Persistence, as commonly used in the literature, measures the degree to which earnings innovations continue (or, "persist") into the future. Evidence exists that the relation between earnings and returns is affected by the persistence of earnings (Kormendi and Lipe 1987; Collins and Kothari 1989). Ramesh and Thiagarajan (1993), and Ali and Zarowin (1992) both show that transitory components of earnings are one reason for the low earnings response coefficients (ERCs) typically reported in accounting research. This is because transitory earnings components cause the ERCs to be biased downward. The biased coefficients are a combination of both (1) the "true" ERC, and (2) the persistence of the earnings number used in the regression. Ramesh and Thiagarajan (1993) find that earnings aggregated over longer periods proxy reasonably well for permanent earnings.

Permanent earnings can be considered as the portion of earnings that is related to firm value. Beaver, Lambert and Morse (1980) consider earnings, $X_t$, to be a mixture of two processes. The first process, $x_t$, or "ungarbled" earnings, is the part of earnings that affects prices. $^5$ The second process, $e_t$, is the part of earnings that

---

$^5$ Beaver et al. (1980) assume permanent earnings, $x_t$, is an IMA(1,1) process, meaning $x_t = x_{t-1} + a_t - \theta e_{t-1}$, with $E(a_t) = 0$ and $\theta$ being the moving average coefficient. With this process, however, only some of $x_t$ is permanent. $x_t$ will only equal permanent earnings if $\theta = 0$. When $\theta = 1$, none of $x_t$ is permanent.
has no effect on price. Thus, observed earnings, $X_t$, measures $x$, with error because of $\varepsilon_t$. Ramakrishnan and Thomas (1998) consider unexpected earnings to be made up of three components: permanent, transitory, and price-irrelevant shocks. Permanent and transitory shocks are both price-relevant; however, permanent shocks affect earnings in all future periods, whereas transitory shocks affect only the current period’s earnings.

Studies find that permanence may vary among income statement subcomponents. Lipe (1986) finds that certain components of income contain additional information (i.e., can explain more of security returns) above that contained in aggregated earnings alone. He shows that this additional information is related to persistence. Ramesh and Thiagarajan (1993) demonstrate that all income statement components, including gross margin, contain transitory components.

2.2.2 Simultaneity in the price-earnings relation

Research indicates that prices and earnings may be determined jointly rather than independently. Studies in this area focus on using prices to obtain information about future earnings. This idea was introduced by Grossman (1976), and further developed by Grossman and Stiglitz (1976). They assume two types of investors: informed, who gather information at a cost, and uninformed, who do not. They show that noise in prices is necessary to preclude uninformed investors from inverting the price function and learning the information of the informed investors. Otherwise, the informed investors would have no incentive to gather costly information.
Empirical studies show that prices contain information not found in earnings. Beaver, Lambert, and Morse (1980) find that earnings forecast errors are smaller (compared to a random walk with a drift model) for a model that incorporates information in the price-earnings ratio. Both Kothari (1992) and Kothari and Sloan (1992) find that prices "lead" earnings, meaning that prices are based on a richer information set than that contained in past earnings.

Two recent studies have directly modeled the return-earnings relation as a simultaneous system of equations. Using a sample of bank holding companies, Beaver, McAnally and Stinson (1997) find increased earnings response coefficients when the price-earnings relation is jointly estimated. Machuga, Pfeiffer, & Morzuch (1997) report similar results using a broad sample of firms rather than focusing on banks.
3. The Earnings-Price Relation and Permanent versus Transitory Earnings

This section illustrates the relation between returns and expected future dividends, and derives a definition of permanent earnings. Permanent earnings is defined in the context of the relation between earnings and expected future dividends.

3.1 The relation between returns and expected future dividends

This section illustrates the importance of changes in expectations of future dividends in modeling firm value, and is based on Christie (1987), section 2.

The following notation is used throughout:

\[ D_t = \text{Dividend received at time } t \]
\[ S_t = \text{Stock price at time } t \]
\[ E_t = \text{Expectation operator (at time } t) \]

Returns are equal to change in stock price, plus dividends, divided by beginning stock price.

\[
r_{t+1} = \frac{S_{t+1} - S_t + D_{t+1}}{S_t} = \frac{\Delta S_{t+1} + D_{t+1}}{S_t}.
\]

Returns are also equal to expected returns plus unexpected returns:

\[
r_{t-1} = E_t(r_{t-1}) + u_{t+1}.
\]

Expected return is equal to expected capital gain, plus expected dividend, divided by beginning price.
\[ E_t(r_{t+1}) = \frac{E_t(S_{t+1} - S_t) + E_t(D_{t+1})}{S_t} = \frac{E_t(\Delta S_{t+1}) + E_t(D_{t+1})}{S_t} \]  

(3)

Unexpected return is equal to the sum of (1) actual dividend, less expected dividend, divided by beginning price, and (2) actual change in stock value from period \( t \) to period \( t + 1 \), less expected change in stock value from period \( t \) to period \( t + 1 \), divided by price.

\[ u_{t+1} = \frac{D_{t+1} - E_t(D_{t+1})}{S_t} + \frac{(S_{t+1} - S_t) - E_t(S_{t+1} - S_t)}{S_t} \]

\[ = \frac{D_{t+1} - E_t(D_{t+1})}{S_t} + \frac{S_{t+1} - E_t(S_{t+1})}{S_t} \]

(4)

The value of equity at time \( t + 1 \) is equal to the present value of expected future dividends accruing to the existing shareholders from the existing assets of the firm.\(^6\) Assuming that all future discount rates \( E_t(r_{t+j}) \) are known, and assuming no taxes, this relation is written as

\[ S_{t+1} = \sum_{k=2}^{T} E_{t+1}(D_{t+k}) \prod_{r=2}^{k} [1 + E_{t+1}(r_{t+r})]^{-1} \]

(5)

If the firm is a going concern, then \( T \rightarrow \infty \). Noting that \( E_t(E_{t+1}(D_{t+k})) = E_t(D_{t+k}) \), the expectation at time \( t \) of the value of equity at time \( t + 1 \) is


\(^7\) Fama (1977), pp. 19-20; also Christie (1987), p. 234. Note that the future discount rates need not be constant, only known at time \( t \). Further, they can be revised in future periods.
\[ E_t(S_{t+1}) = E_t \left\{ \sum_{k=2}^{\infty} E_{t+1}(D_{t+k}) \prod_{r=2}^{k} [1 + E_{t+1}(r_{t+r})]^{-1} \right\} \]

\[ = \sum_{k=2}^{\infty} E_t(D_{t+k}) \prod_{r=2}^{k} [1 + E_{t+1}(r_{t+r})]^{-1}. \]  

(6)

Subtracting (6) from (5) yields

\[ S_{t+1} - E_t(S_{t+1}) = \sum_{k=2}^{\infty} \Delta E_{t+1}(D_{t+k}) \prod_{r=2}^{k} [1 + E_{t+1}(r_{t+r})]^{-1}, \]  

(7)

where

\[ \Delta E_{t+1}(D_{t+k}) = E_{t+1}(D_{t+k}) - E_t(D_{t+k}). \]

Substituting (7) into (4) yields

\[ u_{t+1} = \frac{D_{t+1} - E_t(D_{t+1})}{S_t} + \sum_{k=2}^{\infty} \frac{\Delta E_{t+1}(D_{t+k}) \prod_{r=2}^{k} [1 + E_{t+1}(r_{t+r})]^{-1}}{S_t}. \]  

(8)

Substituting equations (8) and (3) into (2) yields

\[ \frac{\Delta S_{t+1} + D_{t+1}}{S_t} = E_t(r_{t-1}) + u_{t+1} \]

\[ = \frac{E_t(\Delta S_{t-1}) + E_t(D_{t+1})}{S_t} + \frac{D_{t+1} - E_t(D_{t+1})}{S_t} \]

\[ + \sum_{k=2}^{\infty} \frac{\Delta E_{t+1}(D_{t+k}) \prod_{r=2}^{k} [1 + E_{t+1}(r_{t+r})]^{-1}}{S_t}. \]

This is simplified and expressed in terms of capital gains, rather than total return as
Thus, the capital gain from period $t$ to period $t + 1$ is equal to the expected capital gain, plus the discounted change in expectations of future dividends (or, the unexpected capital gain).

Christie (1987, p. 241) states "The importance of expectations (or changes in expectations) of future cash flow components, and their relations with accounting numbers, cannot be overemphasized. Understanding these relations is central to generating well specified market based accounting studies." This is illustrated by equation (9). Equation (9) is completely general and is not dependent on any particular valuation model. It is literally an identity since it is simply an algebraic manipulation of equations (1) and (5). This illustrates an important point. When regressing returns on an accounting measure, if an item of accounting earnings does not change expectations of future dividends, then it does not belong in the regression. Of course, ex ante, it is not known which items of accounting earnings change expectations of future dividends. For any specific accounting item, this must be tested empirically.

Note that expected future dividends is a vector. In other words, expected future dividends, and thus, changes in expected future dividends, are not necessarily the same for all future periods. In two cases, however, equation (9) can be simplified by factoring $\Delta E_t(D_{t+k})$ out of the summation. The first case is if the change in
expected future dividends is the same for all future periods (that is, if 
\( \Delta E_r(D_{r+k}) = \Delta E_r(D_{r+r}) \), \( \forall j, k \)). The second, more general case is if one interprets
\( \Delta E_r(D_{r+k}) \) as an equivalent annual annuity (that is, with the same present value as
the stream of expected future dividends.)\(^8\) In either of these cases, equation (9) can
be simplified as

\[
\frac{\Delta S_{t+1}}{S_t} = \frac{E_r(\Delta S_{t+1})}{S_t} + \frac{\Delta E_r(D_{t+r}) \sum_{k=2}^{\infty} \prod_{r=2}^{k} (1 + E_{r+1}(r_{t+r}))^{-1}}{S_t}.
\]

3.2 The relation between permanent, transitory, and unexpected earnings

This section relates permanent earnings to expected future dividends and,
thus, to firm value. It also shows the consequences of using unexpected earnings
instead of change in permanent earnings when regressing percentage capital gain on
an earnings measure. The following notation is used throughout.

\[\text{PERM}_t = \text{Permanent earnings for period } t.\]

\[\text{TE}_t = \text{Transitory earnings for period } t.\]

\[X_t = \text{Actual earnings for period } t.\]

Consider two variables \(Y\) and \(Z\) that are jointly continuously distributed.
Cramér (1946, section 21.5) shows that the function \(f(Z)\) that minimizes
\(E(\varepsilon^2) = E\{[Y - f(Z)]^2\}\) is the conditional mean of \(Y\), or \(E(Y|Z)\). Further, it can be
shown that \(\varepsilon\) and \(Z\) are uncorrelated. This means that for any two variables \(Y\) and \(Z\)
that are jointly continuously distributed, one can always partition \(Y\) as \(Y = f(Z) + \varepsilon\)

\(^8\)This is similar to the concept of equivalent annual cost (Brealey and Myers 1996, pp. 127-128).
such that $\varepsilon$ and $Z$ are uncorrelated.\(^9\) Using this fact, if actual earnings, $X_t$, and expected future dividends, $E(D_{t+1})$, are jointly continuous, then $X_t$ can be written as

$$X_t = f[E_t(D_{t+1})] + \varepsilon_t,$$

where $E_t(D_{t+1})$ and $X_t$ are positively correlated, and $E_t(D_{t+1})$ and $\varepsilon_t$ are uncorrelated. Therefore, earnings is composed of two parts. The first part, $f[E_t(D_{t+1})]$, is the portion of earnings that is correlated with expected future dividends. This part is defined as permanent earnings. The second part, $\varepsilon_t$, is uncorrelated with expected future dividends, and is called transitory earnings. Thus,

$$PERM_t = f[E_t(D_{t+1})], TE_t = \varepsilon_t,$$

and

$$X_t = PERM_t + TE_t.$$ (12)

The conditional mean of $Y$, or $f(Z)$, need not be linear in $Z$ for Cramér's (1946) result to hold. However, among the class of linear, unbiased estimators, the $f(Z)$ that minimizes the sum of squared errors for $Y = f(Z) + \varepsilon$ is simply $f(Z) = \gamma_0 + \gamma_1 Z$, where $\gamma_1 = \text{cov}(Y,Z)/\text{var}(Z)$, and $\gamma_0 = E(Y) - \gamma_1 E(Z)$.\(^10\) Using this result, among the class of linear, unbiased estimators, the value of $f[E_t(D_{t+1})]$ (or $PERM_t$) that minimizes the sum of squared errors for equation (11) is

$$PERM = \gamma_0 + \gamma_1 E(D).$$

Without loss of generality, let $\gamma_1 = 1$. Thus, $PERM_t = \gamma_0 + E_t(D_{t+1})$, $\Delta PERM_t = \Delta E_t(D_{t+1})$, and equation (10) becomes

---

9 Continuity is a sufficient but not necessary condition, and such a partition also works with jointly discrete distributions. Note also that $Z$ can be a vector.

10 Cramér (1946) p. 273.
Permanent earnings as defined in (11) is equivalent to conditioning on all publicly available information, not just past earnings. Then, by definition, unexpected earnings is actual earnings for period $t + 1$ minus the expectation of earnings for period $t + 1$, conditioned on all publicly available information at time $t$. That is, unexpected earnings is actual earnings for period $t + 1$ less permanent earnings for the prior period (period $t$).

Therefore, by definition,

$$UE_{t+1} = X_{t+1} - E_t(X_{t+1} | \text{all publicly available information at time } t)$$

$$= X_{t+1} - PERM_t.$$  

Since $TE_{t+1} = X_{t+1} - PERM_{t+1}$, this may be written as

$$UE_{t+1} = (PERM_{t+1} - PERM_t) + (X_{t+1} - PERM_{t+1})$$

$$= \Delta PERM_{t+1} + TE_{t+1}$$ \hspace{1cm} (14)$$

or, unexpected earnings is equal to the change in permanent earnings plus transitory earnings.

To illustrate the importance of equation (14), suppose that unexpected earnings is substituted in the model rather than the change in permanent earnings. Using equations (13) and (14), this results in
\[
\frac{\Delta S_{t+1}}{S_t} = \frac{E_t(\Delta S_{t+1})}{S_t} + \frac{[UE_{t+1}] \sum_{k=2}^{\infty} \prod_{r=2}^{k} [1 + E_{t+1}(r_{t+r})]^{-1}}{S_t}
\]

Studies of the relation between earnings and returns typically assume that the "true" explanatory variable for unexpected returns is unexpected earnings. Authors then acknowledge that unexpected earnings is mismeasured when expectations of future earnings are conditioned only on past earnings. The point of the analysis leading to equation (15) is that the "true" explanatory variable is change in permanent earnings, not unexpected earnings. Empirically, using unexpected earnings in the model results in measurement error from two sources: including transitory components of earnings, and mismeasuring the change in permanent earnings by conditioning expectations only on past earnings. Simultaneous equations models discussed in section 2.2.2 can be interpreted as an attempt to condition on both earnings and price when predicting future dividends, in the spirit of Grossman (1976) and Grossman and Stiglitz (1976).
4. The Relation between Comprehensive Income and Transitory Earnings

Comprehensive income is equal to net income plus items of other comprehensive income (OCI). Currently, items of OCI (as defined under SFAS No. 130 and SFAS No. 133) are:

1. Foreign currency translation adjustments (i.e., those accounted for under the current rate method) under SFAS No. 52 and certain other foreign currency gains and losses;
2. Unrealized holding gains and losses on securities available-for-sale under SFAS No. 115;
3. Excess of additional pension liability to be recorded over unrecognized prior service cost under SFAS No. 87; and
4. Unrealized gains and losses on hedges of forecasted transactions (cash flow hedges) to the extent the hedge is effective under SFAS No. 133, Accounting for Derivative Instruments and Hedging Activities.

Section 3.2 defines transitory earnings as those that are uncorrelated with expected future dividends and therefore have no effect on firm value. Thus, by definition, if net income includes fewer transitory items than does comprehensive income, it is a better measure of firm performance than comprehensive income. This study predicts that items of OCI are transitory since they are primarily the result of

Note that OCI represents the change in the cumulative total adjustments (as defined by SFAS No. 130) reported on two successive balance sheets. Further, OCI does not include transactions with owners such as treasury stock or ESOP transactions.
fair market value accounting for certain items on the balance sheet. This hypothesis is developed in sections 4.1 through 4.6.

4.1 Implications of efficient capital markets for items of other comprehensive income

Fama (1970) delineates three forms of market efficiency: weak, semi-strong, and strong. The predictions developed in this paper assume that the market is semi-strong form efficient. Under this assumption, stock prices fully reflect all publicly available information. This means that unexpected stock returns are uncorrelated through time. Unless expected returns exhibit a strong time trend, raw stock returns will also be uncorrelated through time. If stock returns are uncorrelated through time, then past returns are poor predictors of future returns.

The items of OCI outlined above primarily result from recording certain balance sheet items at fair market value. The related unrealized gain or loss is a component of OCI. If markets are efficient, these unrealized holding gains and losses resulting from market fluctuations are uncorrelated through time. Thus, they are poor predictors of future gains and losses. That is, they are transitory. Sections 4.2 through 4.5 discuss this in more detail for each item of OCI.

4.2 Foreign currency adjustments

In translating foreign financial statements, the current rate method requires that the current exchange rate be used to translate assets and liabilities, and historical

---

12 There is an ongoing debate in the finance community as to whether or not markets are efficient. For a summary of this debate and related literature, see Megginson (1996, pp. 130-150); also, Cochrane (1999).

13 See Fama (1976), pp. 149-151, for an extended discussion of this point; also, Fama and French (1996; 1989).
rates be used to translate stockholders' equity accounts. Any resulting gain or loss depends on changes in exchange rates and is reported directly to stockholders' equity. In an efficient market, changes in exchange rates are uncorrelated through time. Thus, this study predicts that these adjustments are transitory, since they fluctuate with exchange rates.

Additionally, until (or unless) the firm disposes of its foreign division, these gains and losses will never be realized. Huefner, Largay, and Hamlen (1998) illustrate this point:

Translation gains and losses may have little economic significance. For example, suppose the London branch of a U.S. company purchases merchandise from a U.K. supplier on credit. The resulting payable will be liquidated with 10,000 pounds sterling (£) generated from business in the United Kingdom. Assuming the direct exchange ($/£) increases by $.05, the dollar equivalent of the payable rises by $500, but the quantity of pounds required to discharge it does not change. Has the U.S. firm incurred a loss when this happens? Probably not. (Huefner, Largay, and Hamlen, 1998, p. 9-11, emphasis in original.)

4.3 Unrealized holding gains and losses

SFAS No. 115 requires that unrealized holding gains and losses on securities that are classified as available-for-sale be reported directly to stockholders' equity. Under SFAS No. 130, these gains and losses are a component of OCI. This study predicts that these adjustments are transitory and not useful in predicting future

14 Gains and losses related to hedges of forecasted foreign currency transactions are also components of OCI if they meet certain criteria. Further, gains and losses related to hedges of net investments in a foreign entity are also components of OCI. See Huefner, Largey, and Hamlen (1998, chapters 9 and 10) for a discussion of foreign currency accounting.

15 Also included in OCI are "A change in the market value of a futures contract that qualifies as a hedge of an asset reported at fair value pursuant to Statement 115" and "Unrealized holding gains and
dividends. That is, when markets are efficient, past holding gains and losses are poor predictors of future holding gains and losses.

For example, consider a company with a year end of December 31 that purchases a zero coupon treasury bill at 95 on July 1. The company has classified this investment as available-for-sale under SFAS No. 115. The treasury bill matures in one year (at 100). Thus, if the company holds the investment to maturity, it will realize a return of 5.3%. However, if interest rates rise, the value of the treasury bill will fall. If the value of the treasury bill is 93 at December 31, the company will have an unrealized holding loss under SFAS No. 115 of 4.2%16. This unrealized loss is a poor predictor of the expected gain from the investment, since the company will actually realize a gain of 5.3% by holding the treasury bill another six months to maturity.

As a further illustration, consider a hypothetical company whose assets consists 100% of marketable securities. The best way to value such a company would be at its liquidation value: simply add up the market value of its holdings.17 However, the fact that those values are useful in valuing the company does not imply that the changes in those values from year to year are useful. And, in practice, the only time an operating firm is valued in such a way is when it is in (or near) bankruptcy (i.e., when the going concern assumption is no longer valid.)

---

16 \( \frac{(95-93)}{95} \times 6 \) months.

17 An implicit assumption is that there is no value added by simply holding the securities in such a portfolio.
4.4 Pension adjustments

Under SFAS No. 87, any excess pension liability to be recorded that exceeds the unrecognized prior service cost is reported as a reduction to stockholders’ equity, and, thus, is a component of OCI under SFAS No. 130. In other words, an intangible asset may be recognized to offset the additional liability, but only up to the amount of the unrecognized prior service cost. Thus, the excess liability represents “... a net loss not yet recognized as net periodic pension cost” (SFAS No. 87, par. 37). The amount recorded to stockholders’ equity may be reversed out in later years, if the liability is reduced. To the extent that the additional liability to be recorded results from changes in the fair value of the plan assets and liabilities, the additional liability will fluctuate with market-wide movements.18 Thus, it is also predicted to have no effect on firm value.

4.5 Derivatives and hedging

SFAS No. 133 requires that, to the extent the hedge is effective, unrealized gains and losses on hedges of forecasted transactions (i.e., cash flow hedges) be reported as an item of OCI until the forecasted transaction is recognized in earnings.19 The ineffective portion of the hedge is recognized in earnings immediately.20 If a forecasted transaction is perfectly hedged, the gains and losses on

---

18 This assumes that the plan’s actuaries have rational expectations: i.e., at any point in time, their assessments of the value of plan assets and liabilities are not systematically high or low.
19 SFAS No. 133 is effective for fiscal years beginning after June 15, 2000. Therefore, this paper does not include unrealized gains and losses due to firms’ hedging activities as part of OCI because the data are not available.
20 Determining hedge effectiveness can be complex if the terms and/or basis of the underlying hedged item and the hedging instrument are different. For example, hedge ineffectiveness may result from “... a Deutsche mark-based hedging instrument and Dutch guilder-based hedged item to the extent that those bases do not move in tandem” (SFAS No. 133, par. 66).
the hedging instrument should exactly offset the gains and losses on the forecasted transaction.

The unrealized gains and losses on an effective hedge are predicted to have no effect on firm value for two reasons. First, the unrealized gains and losses of the hedging instrument are based upon the changing price of the underlying commodity, foreign exchange rate, etc. Thus, market efficiency suggests that changes in these market prices are poor predictors of future gains and losses. Second, only the effective portion of the hedge is reported as a component of OCI. Therefore, by definition, any unrealized gain or loss on the hedging contract will be offset by a corresponding unrealized gain or loss on the hedged transaction.

4.6 Summary and predictions

Sections 4.1 through 4.5 predict that items of OCI have no effect on firm value. In summary, items of OCI primarily result from recording certain balance sheet items at fair market value. The related unrealized gain or loss is a component of OCI. If markets are efficient, these unrealized holding gains and losses resulting from market fluctuations are uncorrelated through time. Thus, items of OCI are predicted to be transitory primarily because, in an efficient market, past returns are poor predictors of future returns. This prediction is tested two ways: by examining the autocorrelation of OCI over time, and by examining the relation between OCI and stock returns. Results of these tests are presented in section 6.

A second prediction is that the relation between OCI and stock returns does not improve over time. In other words, knowledge of the mean value of OCI is not
relevant for valuation purposes. This prediction is tested by examining the relation between mean values of OCI and stock returns over time. Results of this test are presented in section 6.
5. Empirical Model and Data

This section develops the empirical model used to test the prediction that items of OCI are unrelated to stock returns. It also outlines the sample selection procedure and discusses data limitations.

5.1 Empirical issues

A number of empirical issues arise in testing the prediction that OCI is unrelated to returns. These are discussed in the following two sections. Sections 5.1.1 and 5.1.2 discuss issues related to implementation of the empirical model. Section 5.1.3 discusses the power limitations of the model.

5.1.1 Implementation

To test the prediction that OCI is unrelated to returns, an empirical model is developed from equation (13).

\[
\frac{\Delta S_{t+1}}{S_t} = \frac{E_t(\Delta S_{t+1})}{S_t} + \frac{\Delta PERM_{t+1}}{S_t} \prod_{r=2}^{k} \prod_{r=2}^{k} [1 + E_{r+1}(r_{r+1})]^{-1}.
\]  

When \( E_{t+1}(r_{t+1}) \) is the same for all future periods, the present value factor \( \prod_{k-2}^{k} [1 + E_{r+1}(r_{r+1})]^{-1} \) in equation (13) collapses to \( 1/E(r) \). Then (13) reduces to

\[
\frac{\Delta S_{t+1}}{S_t} = \frac{E_t(\Delta S_{t+1})}{S_t} + \frac{1}{E(r)} \left[ \frac{\Delta PERM_{t+1}}{S_t} \right].
\]  

If one estimates the following regression,
\[
\frac{\Delta S_{t+1}}{S_t} = \frac{E_t(\Delta S_{t+1})}{S_t} + \theta_2 \left[ \frac{\Delta PERM_{t+1}}{S_t} \right] + \theta_3 \left[ \frac{TE_{t+1}}{S_t} \right] + \epsilon, \tag{17}
\]

then, using equation (16), by definition \(\theta_2\) will equal \(1/E(r)\), and \(\theta_3\) will equal zero.

As a practical matter, it is impossible to perfectly divide net income into transitory and permanent components (Beaver, 1970, 1998; Ball and Watts, 1972). Given equation (17), an empirical model must be derived. One possibility is

\[
\frac{\Delta S_{t+1}}{S_t} = \frac{E_t(\Delta S_{t+1})}{S_t} + \theta_2 \left[ \frac{\Delta NI_{t+1}}{S_t} \right] + \theta_3 \left[ \frac{OCI_{t+1}}{S_t} \right], \tag{18}
\]

where \(NI_{t+1}\) equals net income for period \(t+1\), and \(\Delta NI_{t+1}\) equals \(NI_{t+1} - NI_t\). If \(\Delta NI_{t+1}\) contains transitory components, and thus does not equal \(\Delta PERM_{t+1}\), measurement error is introduced into the regression.

When the earnings process follows a random walk, then \(\Delta NI_{t+1}\) equals \(\Delta PERM_{t+1}\), and \(TE_{t+1}\) equals zero. However, Ramesh and Thiagarajan (1993) find that most components of net income, including gross margin and operating expenses, contain some transitory components. Thus, it is likely that \(\Delta NI_{t+1}\) measures \(\Delta PERM_{t+1}\) with error. However, if \(\Delta NI_{t+1}\) and \(OCI_{t+1}\) are uncorrelated, then measurement error in one does not affect the coefficient estimate of the other variable.

As discussed further in section 5.3, the OCI data for this study are gathered by hand when Compustat data is not complete. Thus, OCI, although predicted to be transitory, is measured without error. As long as \(\Delta NI_{t+1}\) is uncorrelated with \(OCI_{t+1}\),

\[30\]
then the coefficient estimate of $OCI_{t+1}$ will be unaffected by measurement error in $\Delta NI_{t+1}$. The data in this study show a correlation between $\Delta NI_{t+1}$ and $OCI_{t+1}$ of 0.06. Thus, any measurement error in $\Delta NI_{t+1}$ is not likely to affect the coefficient estimate on OCI.

The first term on the right hand side of equation (18), $[E_t(\Delta S_{t+1})]/S_t$, is the expected percentage capital gain. This variable can be approached in one of two ways. First, one can treat this as a parameter to be estimated. This imposes the constraint that the expected capital gain is a cross-sectional constant. This decision involves making a trade-off between bias and efficiency. Imposing a restriction when it is not true results in a biased estimator. However, imposing the constraint always reduces the variance of the estimator and thus increases efficiency. Therefore, imposing the constraint may be worthwhile if the resulting bias is offset by increased efficiency (Judge et al., 1985, pp. 859-860). Second, one can apply the market model to capital gains and estimate the expected percentage capital gain by using $E(C|C_m) = \alpha + \beta C_m$, where $C_m$ is the capital gain on the market portfolio. This is implicitly the approach taken in studies that have unexpected returns as the dependent variable.

This study uses both approaches. Results of tests for both firm-specific and time-specific effects are presented in section 6.4. The models are estimated both with and without the return on the market portfolio excluding dividends ($C_m$) included as an explanatory variable. As discussed further in section 6.4, using these models has little effect on the coefficient estimates.
5.1.2 Nested versus non-nested models

The approach taken in this study to examine comprehensive income differs from that of Dhaliwal et al. (1999). Dhaliwal et al. examine net income and comprehensive income separately to see which has the closer relation to stock returns, i.e., which regression model has the larger adjusted $R^2$. The significance of the difference (if any) in $R^2$ is measured using the Vuong (1989) test. This method treats net income and comprehensive income as mutually exclusive, or non-nested models.

Unlike Dhaliwal et al. (1999), this study specifically examines the properties of OCI, and the incremental effect, if any, that it has on the relation between earnings and returns. Thus, this study does not use non-nested statistical models. Non-nested models arise when “…one model cannot be obtained from the other by simply imposing constraints on the parameters” (Judge et al., 1988, p. 851). An example would be comparing a linear versus a log-linear model. However, when OCI is equal to zero, comprehensive income is equal to net income. Thus, the two models are not mutually exclusive, and it is unnecessary to treat the two models as non-nested.

5.1.3 Power

Section 3 defines transitory earnings as those that are uncorrelated with expected future dividends and thus unrelated to firm value. Section 4 develops the hypothesis that items of OCI are transitory. The theory is therefore one of “no effect”; items of OCI are unrelated to firm value. In such a case, one is forced to treat what theory predicts (“no effect”) as the null hypothesis, and what the analyst
community predicts (OCI is positively related to returns) as the alternative hypothesis. Therefore, tests of “no effect” theories are of low power. At the 5% level, there is a 95% probability that one will not reject the null.

Watts and Zimmerman (1986, p. 86) discuss test power when theory predicts no effect:

Clearly, there are an infinite number of alternative hypotheses to the null hypothesis of no stock price changes associated with an accounting change. We cannot test all of them. It is reasonable to accept the null after investigating the most obvious and plausible alternatives. However, failure to reject the null in investigations of one hypothesis...is a dangerous basis for acceptance of the null.

5.2 Data

Cheng, Cheung, and Gopalakrishnan (1993), and Cheng (1998), calculate OCI as the change in retained earnings, less net income (or plus net loss), plus dividends. (Hereafter this method is referred to as the “gross change” method.) However, this approach will misstate OCI if other items that are not part of OCI are recorded directly to retained earnings. There are a number of such items which, in many cases, are large. For example, many treasury stock transactions are reported directly to retained earnings. When treasury stock is accounted for under the par value method, “Any excess cost per share remaining over the par or stated value per share and the amount per share originally credited to additional paid-in capital is charged to retained earnings.”(Williams and Miller 1993, p. 38.06). Further, when

33

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
treasury stock is purchased with the intent of retiring it, all of the amount paid over par value may be reported directly to retained earnings.\textsuperscript{21}

Many significant transactions affecting retained earnings are not available from Compustat. The cumulative translation adjustment (Compustat item no. 259) is available beginning in 1985.\textsuperscript{22} However, analysis to date finds that Compustat reports this number when the company discloses the total amount of the cumulative translation adjustment on the face of the balance sheet. If a company reports a total for retained earnings on the face of the balance sheet, and discloses the cumulative translation adjustment in a statement of stockholders’ equity or footnote, Compustat does not consistently report it. The same is true of the marketable securities adjustment (Compustat item no. 238). Thus, if Compustat reports a zero for either item 238 or 259, it may simply be because the company does not report the number on the face of the balance sheet. The pension adjustment number is not available on Compustat.

Table 1 (A) illustrates the magnitude of this problem, using data from Intel Corporation’s annual report. For 1997, the correct number for OCI is a debit of $64 million. Since Intel Corporation does not report this number on the face of the balance sheet, Compustat does not include it in data item no. 238 (marketable securities adjustment). Thus, using Compustat would give an OCI number of zero,

\textsuperscript{21} Other examples of transactions that affect retained earnings include a quasi-reorganization; certain adjustments related to stock-based compensation; mergers accounted for under the pooling of interests method; stock dividends, including a “stock split-up effected in the form of a dividend” (Kieso & Weygandt 1998, p. 809); prior period adjustments and certain changes in accounting principles.

\textsuperscript{22} Note that Compustat reports the \textit{cumulative total} shown on the balance sheet as a component of retained earnings. For example, the foreign currency translation adjustment is calculated as the \textit{change} in Compustat item no. 259. See footnote 11.
resulting in measurement error of $64 million, which is 0.9% of net income and 100% of the correct number. Calculating OCI using the gross change method results in measurement error of $4.684 billion, or 67.4% of net income and 7,320% of the true number.

In general, it is impossible to reconcile beginning retained earnings to ending retained earnings using Compustat data items. There are too many items reported directly to retained earnings that Compustat does not record. For example, the 1997 stockholders' equity statement for Intel Corporation (see Table 1) reports an adjustment to retained earnings of $1.622 billion (debit) for "net reclassification of put warrant obligations," a debit of $3.061 billion for retirement of treasury stock, and an unrealized loss on marketable securities of $64 million. None of these items is reported on Compustat; only the latter is an item of OCI.

Similar results are shown for Raytheon Company and Subsidiaries in Table 1 (B). In 1996, Raytheon had a marketable securities adjustment to retained earnings of a debit of $15.045 million. Compustat, however, does not report this number in item no. 238, because it did not appear on the face of the balance sheet, but instead was shown in the equity section of the balance sheet as "other equity adjustments". Additionally, the pension adjustment number is not available from Compustat. Thus, for Raytheon, calculating OCI from Compustat results in measurement error for 1996 of $13.966 million, or 1.8% of net income and 82.0% of the true number. Using the gross change method results in an even larger error of $292.797 million, or 38.5% of net income and 1,718.6% of the true number.
### Table 1 (A): Illustration of Alternative Measures of Other Comprehensive Income: Intel Corporation’s 1997 Annual Report

In millions (except percentages), as reported in stockholders’ equity statement

<table>
<thead>
<tr>
<th></th>
<th>12/30/95</th>
<th>12/28/96</th>
<th>12/27/97</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retained earnings, beginning</td>
<td>6,961</td>
<td>9,557</td>
<td>13,975</td>
</tr>
<tr>
<td>Reclassification of put warrants</td>
<td>(42)</td>
<td>272</td>
<td>(1,622)</td>
</tr>
<tr>
<td>Repurchase and retirement of common stock</td>
<td>(855)</td>
<td>(925)</td>
<td>(3,061)</td>
</tr>
<tr>
<td>Cash dividends</td>
<td>(124)</td>
<td>(156)</td>
<td>(188)</td>
</tr>
<tr>
<td>Unrealized gain (loss)</td>
<td>51</td>
<td>70</td>
<td>(64)</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>(1)</td>
</tr>
<tr>
<td>Net income</td>
<td>3,566</td>
<td>5,157</td>
<td>6,945</td>
</tr>
<tr>
<td>Retained earnings, ending</td>
<td>9,557</td>
<td>13,975</td>
<td>15,984</td>
</tr>
</tbody>
</table>

**OCI**, as calculated by existing studies:

<table>
<thead>
<tr>
<th></th>
<th>12/30/95</th>
<th>12/28/96</th>
<th>12/27/97</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCI, as Compustat data items report</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Actual OCI</td>
<td>51</td>
<td>70</td>
<td>(64)</td>
</tr>
<tr>
<td>Measurement error (</td>
<td>measured - actual</td>
<td>)</td>
<td>51</td>
</tr>
<tr>
<td>Measurement error/Net income</td>
<td>1.4 %</td>
<td>1.4 %</td>
<td>0.9 %</td>
</tr>
<tr>
<td>Measurement error/Actual OCI</td>
<td>100 %</td>
<td>100 %</td>
<td>100 %</td>
</tr>
</tbody>
</table>

**OCI**, calculated under the gross change method (change in retained earnings, plus dividends, less net income)

<table>
<thead>
<tr>
<th></th>
<th>12/30/95</th>
<th>12/28/96</th>
<th>12/27/97</th>
</tr>
</thead>
<tbody>
<tr>
<td>(846)</td>
<td>(583)</td>
<td>(4,748)</td>
<td></td>
</tr>
<tr>
<td>Actual OCI</td>
<td>51</td>
<td>70</td>
<td>(64)</td>
</tr>
<tr>
<td>Measurement error (</td>
<td>measured - actual</td>
<td>)</td>
<td>897</td>
</tr>
<tr>
<td>Measurement error/Net income</td>
<td>25.2 %</td>
<td>12.7%</td>
<td>67.4 %</td>
</tr>
<tr>
<td>Measurement error/Actual OCI</td>
<td>1,758.8 %</td>
<td>932.9 %</td>
<td>7,319.8 %</td>
</tr>
</tbody>
</table>

OCI stands for “other comprehensive income” as defined in SFAS No. 130. It includes certain unrealized gains and losses that bypass the income statement and are reported directly to stockholders’ equity.
Table 1 (B): Illustration of Alternative Measures of Other Comprehensive Income: Raytheon Company and Subsidiaries’ 1996 Annual Report

In thousands (except percentages), as reported in stockholders’ equity statement

<table>
<thead>
<tr>
<th></th>
<th>12/31/94</th>
<th>12/31/95</th>
<th>12/31/96</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retained earnings, beginning</td>
<td>3,834,157</td>
<td>3,472,056</td>
<td>3,792,566</td>
</tr>
<tr>
<td>Net income</td>
<td>596,876</td>
<td>792,488</td>
<td>761,151</td>
</tr>
<tr>
<td>Dividends</td>
<td>(192,681)</td>
<td>(182,487)</td>
<td>(189,574)</td>
</tr>
<tr>
<td>Treasury shares purchased</td>
<td>(758,933)</td>
<td>(304,025)</td>
<td>(292,797)</td>
</tr>
<tr>
<td>Foreign exchange translation adjustments</td>
<td>(3,613)</td>
<td>10,374</td>
<td>(3,071)</td>
</tr>
<tr>
<td>FAS No. 115 unrealized valuation adjustment</td>
<td>0</td>
<td>2,973</td>
<td>(15,045)</td>
</tr>
<tr>
<td>FAS No. 87 pension adjustment</td>
<td>(3,750)</td>
<td>1,187</td>
<td>1,079</td>
</tr>
<tr>
<td>Retained earnings, ending</td>
<td>3,472,056</td>
<td>3,792,566</td>
<td>4,054,309</td>
</tr>
</tbody>
</table>

OCI¹, as calculated by existing studies:

<table>
<thead>
<tr>
<th></th>
<th>12/31/94</th>
<th>12/31/95</th>
<th>12/31/96</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCI, as Compustat data items report</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative translation adj. (Δ in item no. 259)</td>
<td>(3,614)</td>
<td>10,374</td>
<td>(3,071)</td>
</tr>
<tr>
<td>Marketable securities adj. (Δ in item no. 238)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Measured OCI</td>
<td>(3,614)</td>
<td>10,374</td>
<td>(3,071)</td>
</tr>
<tr>
<td>Actual OCI</td>
<td>(7,363)</td>
<td>14,534</td>
<td>(17,037)</td>
</tr>
<tr>
<td>Measurement error (</td>
<td>measured - actual</td>
<td>) 3,749</td>
<td>4,160</td>
</tr>
<tr>
<td>Measurement error/Net income</td>
<td>0.6 %</td>
<td>0.5 %</td>
<td>1.8 %</td>
</tr>
<tr>
<td>Measurement error/Actual OCI</td>
<td>50.9 %</td>
<td>28.6 %</td>
<td>82.0 %</td>
</tr>
</tbody>
</table>

OCI, calculated under the gross change method
(change in retained earnings, plus dividends, less net income)

<table>
<thead>
<tr>
<th></th>
<th>12/31/94</th>
<th>12/31/95</th>
<th>12/31/96</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual OCI</td>
<td>(7,363)</td>
<td>14,534</td>
<td>(17,037)</td>
</tr>
<tr>
<td>Measurement error (</td>
<td>measured - actual</td>
<td>) 758,933</td>
<td>304,025</td>
</tr>
<tr>
<td>Measurement error/Net income</td>
<td>127.2 %</td>
<td>38.4 %</td>
<td>38.5 %</td>
</tr>
<tr>
<td>Measurement error/Actual OCI</td>
<td>10,307.4 %</td>
<td>2,091.8 %</td>
<td>1,718.6 %</td>
</tr>
</tbody>
</table>

¹OCI stands for “other comprehensive income” as defined in SFAS No. 130. It includes certain unrealized gains and losses that bypass the income statement and are reported directly to stockholders’ equity.
The examples in Tables 1(A) and 1(B) provide anecdotal evidence of the measurement error possible when calculating OCI using the gross change method. Section 6 discusses the effects that occur if gross change OCI is used in the analysis in this study rather than actual OCI.

In summary, the gross change approach introduces potentially large measurement error in calculating OCI. Compustat does not report all changes to retained earnings, and the items of OCI that it purports to provide are not reliable. The method of Dhaliwal, Subramanyam, and Trezevant (1998) is an improvement over the gross change method, although it too can introduce measurement error. For example, as noted in Table 1(A), using this method to calculate OCI for Intel would result in measurement error of $64 million in 1997.\textsuperscript{23} For these reasons, data for this study are gathered by hand from firms' annual reports in order to calculate OCI in accordance with SFAS No. 130. The method used is discussed in the next section.

5.3 Sample selection

Due to problems illustrated in the previous section, this study does not use the gross change method to calculate OCI. In order to get a clean sample, the items of OCI are gathered (1) from Compustat, when available, and (2) directly from annual reports, when Compustat data are not available or are otherwise inadequate. The annual reports are downloaded from the Academic Universe database. Annual reports are available from Academic Universe for the years 1987 through 1997. For each

\textsuperscript{23} Dhaliwal, Subramanyam, and Trezevant (1998) perform their analyses two ways: treating zero values for OCI as zeros, and as missing. They report that the results were substantially the same under either method.
reporting year, firms are required to file comparative balance sheets, and income
statements for the previous two years. Thus, the 1987 annual report contains balance
sheets for the years 1986 and 1987, and income statements and statements of retained
earnings for the years 1985, 1986, and 1987. Therefore, this study covers the years
1986 through 1996 for each firm in the sample.

Panel A of Table 2 outlines the sample selection procedure. The initial
sample is all companies included in the S&P 500 index as of December 31, 1996.24
This sample makes up a large percentage of the U.S. economy, while still keeping the
number of firms to a manageable level. Firms in the financial sector are excluded
(primary SIC codes 6000-6999) because they have special regulatory requirements
which may affect the results. Firms that are not on a calendar year for each year in
the sample are excluded as well. Excluding these firms facilitates matching returns
data from the Center for Research in Securities Prices database (CRSP). This
reduces the sample to 304 firms.

In order to expedite gathering a clean sample, the sample of 304 firms is
filtered as follows:

1. Analysis to date indicates that when Compustat reports a number for the
cumulative translation adjustment, it is correct. The problem is that
Compustat may omit the number for those firms not reporting it on the
face of the balance sheet. Thus, the sample of 304 firms is filtered to

---

24 Note that Compustat lists some firms more than once. For example, some firms provide pro-forma
data using pre-SFAS No. 94 accounting rules. Compustat lists the company twice: Once, using current
data, and again using pre-SFAS No. 94 data. The additional listing is assigned a special ticker
exclude those for which Compustat does not report a cumulative translation adjustment for at least one year between 1986 and 1996. As shown in Panel A of Table 2, this reduces the sample to 139 firms. Note that the remaining 165 firms may also have items of OCI. However, since Compustat does not report OCI for these firms, the only way to determine whether they have OCI or not is to examine their annual reports for each year from 1986 to 1996.

2. Next, OCI is calculated under the gross change method (equal to ending retained earnings, plus dividends, less net income, less beginning retained earnings) for each year from 1986 to 1996.

3. OCI calculated under the gross change method is compared to change in the cumulative translation adjustment provided from Compustat. If they are equal, then the OCI number provided by Compustat is complete, and no further work is needed to gather the data.

4. If OCI calculated under the gross change method does not agree with the change in the cumulative translation adjustment provided by Compustat, then other adjustments must have been recorded by the company to retained earnings. These firm-years are “out-of-balance”. In that case, the annual report for the company is examined to determine whether or not the reconciling items are part of OCI.

---

symbol. There are other examples. Thus, care must be taken to avoid including a firm more than once. (See Standard & Poor's Compustat 1998, chapter 2.)

40
Table 2: Sample Selection Procedure and Distribution of Sample by One-Digit SIC Code

Panel A: Sample selection procedure

Initial sample: S&P 500 firms as of December 31, 1996 | 500
Less: Financial institutions and firms with year-ends other than December | (196)
Less: Firms for which Compustat does not report a cumulative translation adjustment for at least one year between 1986 and 1996 | (165)
Firms which do not have data available for all years from 1986 to 1996 | 139
Final sample size | 126

Summary of sample selection procedure:
1. OCI is calculated under the gross change method (equal to ending retained earnings, plus dividends, less net income, less beginning retained earnings) for each year from 1986 to 1996.
2. OCI calculated under the gross change method is compared to change in the cumulative translation adjustment provided from Compustat. If they are equal, then the OCI number provided by Compustat is complete, and no further work is needed to gather the data.
3. If OCI calculated under the gross change method does not agree with the change in the cumulative translation adjustment provided by Compustat, then other adjustments must have been recorded by the company to retained earnings. These firm-years are “out-of-balance”. In that case, the annual report for the company is examined to determine whether or not the reconciling items are part of OCI.
4. Using this procedure, the final sample includes 126 firms for 11 years, or 1,386 firm-years.
5. Note that the 165 firms for which Compustat does not report a cumulative translation adjustment may have OCI. However, since Compustat does not report OCI for these firms, the only way to determine whether or not they have OCI is to examine their annual reports for 1986 to 1996.

Panel B: Sample distribution by one-digit SIC code

<table>
<thead>
<tr>
<th>SIC Code</th>
<th>Industry</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Primary</td>
<td>8</td>
<td>6.3</td>
</tr>
<tr>
<td>2</td>
<td>Manufacturing (non-durable goods)</td>
<td>51</td>
<td>40.5</td>
</tr>
<tr>
<td>3</td>
<td>Manufacturing (durable goods)</td>
<td>49</td>
<td>38.9</td>
</tr>
<tr>
<td>4</td>
<td>Transportation</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>5</td>
<td>Wholesalers and retailers</td>
<td>8</td>
<td>6.3</td>
</tr>
<tr>
<td>6</td>
<td>Financial services</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>7</td>
<td>Business services</td>
<td>7</td>
<td>5.6</td>
</tr>
<tr>
<td>8</td>
<td>Consumer services</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>126</td>
<td>100.0</td>
</tr>
</tbody>
</table>
18 firms are eliminated from the sample because either the data were not available on *Academic Universe* or the data were not sufficient to determine whether reconciling items were part of OCI. This reduces the final sample to 126 firms with 11 years of data each, or 1,386 firm-years.
6. Results

Section 3 defines transitory earnings as those that are uncorrelated with expected future dividends. This section reports results from tests of the prediction that items of OCI are transitory. The sample used is 126 firms for 11 years, or 1,386 firm-years.

Since the data are cross-sectional time-series, or panel data, several models are run to determine whether panel data techniques are appropriate. Based on these specification tests, a pooled model is found most appropriate. Thus, the primary analysis is done on the pooled model. Section 6.1 reports descriptive statistics. Section 6.2 reports results of the pooled model. Section 6.3 presents results for models that aggregate coefficients over time or across firms. Section 6.4 reports the results of the specification tests to determine which model is appropriate.

6.1 Descriptive statistics

Descriptive statistics are presented in the following two sections. Section 6.1.1 presents descriptive statistics for the pooled data (1,386 firm years). Section 6.1.2 presents descriptive statistics for the time-series means (by firm), and autocorrelation values.

6.1.1 Descriptive statistics for pooled data

Panel B of Table 2 presents the sample distribution by one-digit SIC code. The majority of the sample, 79.4%, are in the manufacturing industry (40.5% in non-durable goods, 38.9% in durable goods).
Table 3 provides descriptive statistics for selected variables in the study. The market value of equity for firm-years in the study ranges from $130.7 million to $128.4 billion, with a mean of $7.3 billion and a median of $3.1 billion. The distribution of the market value of equity is, thus, right-skewed, and the mean and median reflect the large firm bias of the study. Annual returns are calculated from CRSP monthly returns, excluding dividends. Annual return (excluding dividends) ranges from a low of -0.687 to a high of 2.844, with mean and median of 0.115 and 0.091, respectively. These amounts are reasonable given the time frame of the study.

Net income (unscaled) ranges from -$12.5 billion to $7.5 billion, with a mean of $408.0 million and median of $172.1 million. As with the market value of equity, net income also reflects the large-firm bias and is right-skewed. However, the range of both market value of equity and net income is large.

Table 3 shows that other comprehensive income (OCI), unscaled is not trivial for firm-years in the sample, as it ranges from -$2.8 billion to $2.2 billion, with a mean of $1.5 million and median of zero. Thus OCI is economically significant for these sample firms. However, one cannot reject the null hypothesis that the mean value of OCI is zero. OCI measured using the gross change method is significant at the 1% level, both scaled and unscaled.

Out of 1,386 firm-years, 1,260 have a change in the cumulative translation adjustment. However, only 147 have a change in the pension liability adjustment, and only 136 have a change in the marketable securities adjustment. For this sample,
### Table 3: Descriptive Statistics for Selected Variables

Total observations: 126 firms over 11 years (1986-1996), for a total of 1,386 firm-years.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non-zero values</th>
<th>Minimum</th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Market value and returns</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total market value at beginning of return period (MV)</td>
<td>1,386</td>
<td>130.7</td>
<td>7325.4 **</td>
<td>3110.8</td>
<td>128,430.2</td>
<td>12,382.8</td>
</tr>
<tr>
<td>Annual return, excluding dividends</td>
<td>1,386</td>
<td>-0.687</td>
<td>0.115 **</td>
<td>0.091</td>
<td>2.844</td>
<td>0.254</td>
</tr>
<tr>
<td>Market return, excluding dividends</td>
<td>11 years</td>
<td>-0.122</td>
<td>0.103 **</td>
<td>0.120</td>
<td>0.284</td>
<td>0.101</td>
</tr>
<tr>
<td><strong>Income variables, in millions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net income</td>
<td>1,386</td>
<td>-23,497.6</td>
<td>408.0 **</td>
<td>172.1</td>
<td>7,510.0</td>
<td>1,190.7</td>
</tr>
<tr>
<td>Change in net income</td>
<td>1,386</td>
<td>-19,044.8</td>
<td>43.05</td>
<td>17.11</td>
<td>25,963.4</td>
<td>1,073.3</td>
</tr>
<tr>
<td>Operating income</td>
<td>1,386</td>
<td>-271.2</td>
<td>972.3 **</td>
<td>364.8</td>
<td>16,264.0</td>
<td>1,817.6</td>
</tr>
<tr>
<td>Change in operating income</td>
<td>1,385</td>
<td>-4,810.6</td>
<td>62.929</td>
<td>28.56</td>
<td>9,641.47</td>
<td>601.715</td>
</tr>
<tr>
<td><strong>Other comprehensive income variables, in millions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other comprehensive income</td>
<td>1,271</td>
<td>-2,801.7</td>
<td>1.5</td>
<td>0</td>
<td>2,235.6</td>
<td>203.4</td>
</tr>
<tr>
<td>Other comprehensive income: gross change method</td>
<td>1,386</td>
<td>-6,970</td>
<td>-42.023 **</td>
<td>-0.117</td>
<td>2,235.6</td>
<td>365.60</td>
</tr>
<tr>
<td>Change in cumulative translation adjustment</td>
<td>1,260</td>
<td>-2,251.0</td>
<td>4.159</td>
<td>0</td>
<td>1,946.0</td>
<td>142.199</td>
</tr>
<tr>
<td>Change in pension liability adjustment</td>
<td>147</td>
<td>-2,385.9</td>
<td>-3.877</td>
<td>0</td>
<td>1,762.8</td>
<td>114.949</td>
</tr>
<tr>
<td>Change in marketable securities adjustment</td>
<td>136</td>
<td>-1,658.0</td>
<td>1.242</td>
<td>0</td>
<td>1,810.0</td>
<td>73.341</td>
</tr>
</tbody>
</table>
(table continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non-zero values</th>
<th>Minimum</th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Income variables, scaled by IV</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net income</td>
<td>1,386</td>
<td>-2.0880</td>
<td>0.0451 **</td>
<td>0.0606</td>
<td>0.3761</td>
<td>0.1206</td>
</tr>
<tr>
<td>Change in net income</td>
<td>1,386</td>
<td>-1.4335</td>
<td>0.0054</td>
<td>0.0074</td>
<td>1.4969</td>
<td>0.1356</td>
</tr>
<tr>
<td>Operating income</td>
<td>1,386</td>
<td>-0.6060</td>
<td>0.1305 **</td>
<td>0.1135</td>
<td>0.6673</td>
<td>0.0894</td>
</tr>
<tr>
<td>Change in operating income</td>
<td>1,385</td>
<td>-0.6269</td>
<td>0.0084 **</td>
<td>0.0105</td>
<td>0.8924</td>
<td>0.0724</td>
</tr>
<tr>
<td><strong>Other comprehensive income variables, scaled by MV</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other comprehensive income</td>
<td>1,271</td>
<td>-0.1381</td>
<td>0.0006</td>
<td>0</td>
<td>0.0794</td>
<td>0.0148</td>
</tr>
<tr>
<td>Other comprehensive income: gross change method</td>
<td>1,386</td>
<td>-1.3627</td>
<td>-0.0073 **</td>
<td>0</td>
<td>0.2224</td>
<td>0.0555</td>
</tr>
<tr>
<td>Change in cumulative translation</td>
<td>1,260</td>
<td>-0.1259</td>
<td>0.0100 **</td>
<td>0</td>
<td>0.0847</td>
<td>0.0127</td>
</tr>
<tr>
<td>Change in pension liability adjustment</td>
<td>147</td>
<td>-0.1381</td>
<td>-0.004 *</td>
<td>0</td>
<td>0.0616</td>
<td>0.0067</td>
</tr>
<tr>
<td>Change in marketable securities adjustment</td>
<td>136</td>
<td>-0.0427</td>
<td>0.00007</td>
<td>0</td>
<td>0.0657</td>
<td>0.0031</td>
</tr>
</tbody>
</table>

* significantly different from zero at the 5% level (two-tailed).
** significantly different from zero at the 1% level (two-tailed).
therefore, OCI is largely comprised of the change in the cumulative translation adjustment.

6.1.2 Descriptive statistics: Firm-specific

Descriptive statistics in Table 3 are for 1,386 pooled observations. Table 4 presents descriptive statistics for the distribution of mean values (over 11 years) by firm. The mean value of OCI is not significantly different from zero overall, and significantly different from zero at the 10% level for only one firm in the study. For OCI scaled by market value at the beginning of the return period, mean OCI is significant at the 5% level. Scaled OCI is significant for one firm at the 5% level and one firm at the 10% level. However, the mean value of gross change OCI is significant overall at the 5% level.

Note that the variance on gross change OCI is over 19 times that of OCI $\left(\frac{(0.0171/0.0039)^2}{19.22}\right)$. This is consistent with the illustrations of measurement error presented in Tables 1(A) and 1(B). The implications of this measurement error on the regression equations is discussed in the next section.

Table 5 reports autocorrelation estimates for change in net income, OCI, and gross change OCI. Each variable is scaled by market value of equity at the beginning of the return period. OCI is slightly positively autocorrelated (0.0456), while gross change OCI is slightly negatively autocorrelated (-0.0372).

While the autocorrelation of OCI is statistically significant at the 5% level, economically it is very close to zero. Thus, OCI is essentially uncorrelated through time. As discussed in section 4, items of OCI primarily result from recording certain
Table 4: Descriptive Statistics on 126 Time-Series Means

<table>
<thead>
<tr>
<th>Variable</th>
<th>Minimum</th>
<th>Mean</th>
<th>Maximum</th>
<th>Standard Deviation</th>
<th>Firms with mean ≠ 0 P ≤ .05</th>
<th>Firms with mean ≠ 0 .05 &lt; P ≤ .10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unscaled variables (millions, except annual return)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual return</td>
<td>-0.0585</td>
<td>0.1152 *</td>
<td>0.4033</td>
<td>0.0761</td>
<td>42</td>
<td>15</td>
</tr>
<tr>
<td>Change in net income</td>
<td>-58.3636</td>
<td>43.0508 *</td>
<td>458.9091</td>
<td>79.9218</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Other comprehensive income</td>
<td>-239.5455</td>
<td>1.5242</td>
<td>206.8182</td>
<td>35.5792</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Other comprehensive income: gross change method</td>
<td>-801.2727</td>
<td>-42.0230 *</td>
<td>235.0044</td>
<td>115.1424</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td><strong>Scaled by MV at beginning of return period</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in net income</td>
<td>-0.0449</td>
<td>0.0054 *</td>
<td>0.5413</td>
<td>0.0134</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Other comprehensive income</td>
<td>-0.0159</td>
<td>0.0006 *</td>
<td>0.0132</td>
<td>0.0039</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Other comprehensive income: gross change method</td>
<td>-0.1232</td>
<td>-0.0072 *</td>
<td>0.3457</td>
<td>0.0171</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

This table reports descriptive statistics on the distribution of the 126 firms' time series means. For example, the smallest mean change in net income for a firm over the eleven years in the study is $-58.3 million.

* significantly different from zero at the 5% level (two-tailed).
Table 5: Descriptive Statistics on Cross-Section of 126 Autocorrelations

Statistics are for 1-lag autocorrelations calculated for 126 firms, each over 11 years. All variables are deflated by MV as of the beginning of the return period.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Minimum</th>
<th>Mean</th>
<th>Maximum</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in net income</td>
<td>-0.8629</td>
<td>-0.2522 **</td>
<td>0.5664</td>
<td>0.2914</td>
</tr>
<tr>
<td>Other comprehensive income</td>
<td>-0.7032</td>
<td>0.0456 *</td>
<td>0.6019</td>
<td>0.2415</td>
</tr>
<tr>
<td>Other comprehensive income: gross change method</td>
<td>-0.6990</td>
<td>-0.0372 *</td>
<td>0.6496</td>
<td>0.1985</td>
</tr>
</tbody>
</table>

This table reports descriptive statistics on the distribution of autocorrelations of 126 firms' time series observations. For example, the autocorrelation of other comprehensive income ranges from -0.6496 to 0.6990, with a mean of 0.0372.

* significant at the 5% level.

** significant at less than the 1% level.
balance sheet items at fair market value. The related unrealized gain or loss is a component of OCI. If markets are efficient, these unrealized holding gains and losses resulting from market fluctuations are uncorrelated through time. The small autocorrelation in OCI is consistent with the prediction that items of OCI are transitory. Sections 6.2 through 6.4 report results from tests that examine whether OCI is related to market returns.

6.2 Pooled model

Table 6 shows results of pooled regressions of annual return on net income variables, other comprehensive income variables, and market returns. Market returns are calculated from CRSP value weighted monthly market returns, excluding dividends. Both annual returns and market returns exclude dividends, and are calculated from April through March of the following year. For example, for the calendar year 1992, returns are calculated from April 1992 through March 1993. This is because the annual report is typically available three months after year-end. All independent variables are scaled by market value of equity as of the beginning of the return period. The largest condition number for any of the regressions is 3.9. This indicates that collinearity is not a problem (Judge et al., 1985, p. 902).

---

25 Public companies are required to file their annual reports with the SEC within 90 days of their year-end. Beaver, Christie, and Griffin (1980) find that 82 percent of the firms in their sample filed SEC form 10-K in the last week of March.
Table 6: Pooled Regressions of Annual Return on Net Income Variables and Other Comprehensive Income Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>[pred. sign]</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td></td>
<td>0.035</td>
<td>0.035</td>
<td>0.114</td>
<td>0.035</td>
<td>0.037</td>
<td>0.035</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>C_m</td>
<td>(+)</td>
<td>0.768</td>
<td>0.765</td>
<td>0.743</td>
<td>0.759</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔNI</td>
<td>(+)</td>
<td>0.248</td>
<td>0.250</td>
<td>0.221</td>
<td>0.249</td>
<td>0.248</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td></td>
</tr>
<tr>
<td>NI</td>
<td>(+)</td>
<td>0.081</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.074)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCI</td>
<td>(+)</td>
<td>-0.213</td>
<td>-0.557</td>
<td>-0.161</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.685)</td>
<td>(0.887)</td>
<td>(0.634)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROSS_OCI</td>
<td>(+)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.488)</td>
</tr>
<tr>
<td>FORCUR</td>
<td>(+)</td>
<td></td>
<td></td>
<td></td>
<td>-0.503</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.834)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MARKSEC</td>
<td>(+)</td>
<td></td>
<td></td>
<td></td>
<td>0.623</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.385)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PENS</td>
<td>(+)</td>
<td></td>
<td></td>
<td></td>
<td>0.612</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.266)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adj R²</td>
<td></td>
<td>0.097</td>
<td>0.096</td>
<td>0.013</td>
<td>0.080</td>
<td>0.096</td>
<td>0.098</td>
</tr>
<tr>
<td>Prob F</td>
<td></td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

P-values (in parentheses) are one-tailed, except the intercept.
This study predicts that items of OCI are unrelated to returns. The theory is therefore one of "no effect". The one-tailed p-value reflects analysts' prediction that the coefficient is positive. See section 5.1.3.
All independent variables, except $C_m$, are scaled by the market value of equity as of the beginning of the return period.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>NI</td>
<td>Net income, measured as Compustat data item #172.</td>
</tr>
<tr>
<td>ΔANI</td>
<td>Change in net income, calculated as the change in Compustat data item # 172.</td>
</tr>
<tr>
<td>OCI</td>
<td>Other comprehensive income, equal FORCUR plus MARKSEC plus PENS.</td>
</tr>
<tr>
<td>$C_m$</td>
<td>Market return, excluding dividends. Aggregated from CRSP monthly returns, excluding dividends.</td>
</tr>
<tr>
<td>FORCUR</td>
<td>Change in cumulative translation adjustment, measured at the change in Compustat data item # 230. Verified by data hand gathered from annual reports.</td>
</tr>
<tr>
<td>MARKSEC</td>
<td>Change in marketable securities adjustment, measured as the change in Compustat data item # 238. Verified by data hand gathered from annual reports.</td>
</tr>
<tr>
<td>PENS</td>
<td>Change in additional minimum pension liability. Hand gathered from annual reports.</td>
</tr>
</tbody>
</table>
The coefficients on $C_m$ represent an estimate of beta\textsuperscript{26} for the firms in the study. In the pooled regressions, beta is restricted to be a cross-sectional constant. (This restriction is relaxed in the time-series regressions presented in Table 10.) For each regression, the coefficients on $C_m$ are highly significant, and change relatively little across equations. Coefficients on $\Delta$NI are also highly significant and change relatively little across the five regression equations. The coefficient on OCI is not significant in any of the regressions. The coefficient on OCI changes from -0.213 to -0.557 when $C_m$ is removed from the regression equation (from equation 2 to 3). When OCI is broken into its components (equation 5), none of the coefficients on the individual components is significant.

The intercept term is approximately 0.03 in all equations when $C_m$ is included. When $C_m$ is excluded (equation 3), the intercept term is 0.114. When $C_m$ is excluded from the regression equation, the intercept reflects the expected capital gain. The intercept parameter of 0.114 is consistent with the mean value for annual return in the sample of 0.115 (Table 3).

The variable GROSS\_OCI is OCI calculated using the gross change method (ending retained earnings, less beginning retained earnings, less net income, plus cash dividends.) As discussed in section 5.2, this method introduces measurement error in calculating OCI. The coefficient on GROSS\_OCI is very small (0.004), insignificant, and of opposite sign from OCI. However, the F-test does not reject that

\textsuperscript{26} Beta is the covariance of the asset's return with the return to the market portfolio of risky assets, divided by the variance of the market return.
the coefficients on GROSS_OCI and OCI are equal (F-statistic 0.2251; p-value 0.635).

As noted in the previous section, the variance of OCI calculated under the gross change method is more than 19 times larger than the variance of the true OCI 

\[
\left(\frac{0.0171}{0.0039}\right)^2 = 19.22
\]

Since the variance of GROSS_OCI is reflected in the diagonal of \((X'X)^{-1}\), this has the effect of biasing downward both the estimate of the coefficient on GROSS_OCI, \((X'X)^{-1}X'Y\), and its variance, \(\sigma^2(X'X)^{-1}\). Consistent with this, the variance of the coefficient estimate on OCI in equation 3 is 0.1947, compared to 0.0137 for the variance of the coefficient estimate of GROSS_OCI in equation 6. Thus, the variance of the mismeasured OCI coefficient is biased downward, equal to roughly 1/14th \(0.0137/0.1947\) of the variance estimated when using the true OCI number.

The analysis in Table 7 is similar to that in Table 6, except that operating income is used as a proxy for the change in permanent earnings rather than net income. Operating income is expected to be more permanent than net income, because net income includes gains and losses that are more likely to be transitory such as extraordinary items and special items.

The results in Table 7 support this conclusion. The coefficient on change in operating income (\(\Delta\text{OPINC}\)) is highly significant and approximately the same (0.67) across all equations. Further, the coefficient on \(\Delta\text{OPINC}\) is higher than those on \(\Delta\text{NI}\) in Table 6 (0.67 versus 0.25), reflecting a higher association with returns. As in
Table 6, the coefficient on C_m is highly significant and approximately the same across all equations, whereas the coefficient on OCI is not significant in any of the regressions. Equation 4 shows that none of the coefficients on the individual components of OCI (FORCUR, MARKSEC, and PENS) are significant.

Table 8 provides additional analysis on the different relation to returns for change in net income and change in operating income. The variable ΔINC_DIF is equal to the change in net income minus the change in operating income (ΔNI - ΔOPINC). Thus, its coefficient captures the different market reaction between ΔNI and ΔOPINC. The coefficient on ΔINC_DIF is 0.10 in equation 2 and 0.066 in equation 3. This is much smaller than the coefficient on ΔOPINC, and suggests that these items are less permanent than operating income. As in the previous tables, the coefficients on C_m, ΔNI, and ΔOPINC are roughly the same across equations (approximately 0.75, 0.25, and 0.67, respectively) and each is highly significant. As in the prior tables, the coefficients on OCI and its components are not significant in any of the regression equations.

POS OCI is a slope dummy. It equals OCI when OCI is greater than zero, and zero when OCI is less than or equal to zero. Thus it measures whether the relation of OCI with returns is different for positive versus negative values of OCI. In both equations 4 and 5, the coefficient on POS OCI is not significant, indicating no difference for positive versus negative values of OCI.
Table 7: Pooled Regressions of Annual Return on Operating Income Variables and Other Comprehensive Income Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.033</td>
<td>0.033</td>
<td>0.004</td>
<td>0.034</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>$C_m$</td>
<td>0.746</td>
<td>0.744</td>
<td>0.731</td>
<td>0.739</td>
</tr>
<tr>
<td>[+]</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>$\Delta OPINC$</td>
<td>0.668</td>
<td>0.669</td>
<td>0.665</td>
<td></td>
</tr>
<tr>
<td>[+]</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td></td>
<td>(0.001)</td>
</tr>
<tr>
<td>OPINC</td>
<td></td>
<td>0.279</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[+]</td>
<td></td>
<td>(0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCI</td>
<td>-0.158</td>
<td>-0.082</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[+]</td>
<td>(0.642)</td>
<td>(0.574)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FORCUR</td>
<td></td>
<td></td>
<td>-0.316</td>
<td></td>
</tr>
<tr>
<td>[+]</td>
<td></td>
<td></td>
<td>(0.732)</td>
<td></td>
</tr>
<tr>
<td>MARKSEC</td>
<td></td>
<td></td>
<td>2.008</td>
<td></td>
</tr>
<tr>
<td>[+]</td>
<td></td>
<td></td>
<td>(0.166)</td>
<td></td>
</tr>
<tr>
<td>PENS</td>
<td></td>
<td></td>
<td>0.028</td>
<td></td>
</tr>
<tr>
<td>[+]</td>
<td></td>
<td></td>
<td>(0.489)</td>
<td></td>
</tr>
<tr>
<td>Adj R²</td>
<td>0.116</td>
<td>0.115</td>
<td>0.088</td>
<td>0.115</td>
</tr>
<tr>
<td>Prob F</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

P-values (in parentheses) are one-tailed, except the intercept. This study predicts that items of OCI are unrelated to returns. The theory is therefore one of “no effect”. The one-tailed p-value reflects analysts’ prediction that the coefficient is positive. See section 5.1.3.
All independent variables, except $C_m$, are scaled by the market value of equity as of the beginning of the return period.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition and measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPINC</td>
<td>Operating income, equal to Compustat data item #178.</td>
</tr>
<tr>
<td>$\Delta$ OPINC</td>
<td>Change in operating income, equal to the change in Compustat data item # 178.</td>
</tr>
<tr>
<td>OCI</td>
<td>Other comprehensive income, calculated as FORCUR plus MARKSEC plus PENS.</td>
</tr>
<tr>
<td>$C_m$</td>
<td>Market return, excluding dividends. Aggregated from CRSP monthly returns, excluding dividends.</td>
</tr>
<tr>
<td>FORCUR</td>
<td>Change in cumulative translation adjustment, measured as change in Compustat data item # 230. Verified by data hand gathered from annual reports.</td>
</tr>
<tr>
<td>MARKSEC</td>
<td>Change in marketable securities adjustment, measured as change in Compustat data item # 238. Verified by data hand gathered from annual reports.</td>
</tr>
<tr>
<td>PENS</td>
<td>Change in additional minimum pension liability. Hand gathered from annual reports.</td>
</tr>
</tbody>
</table>
Table 8: Pooled Regressions of Annual Return on Net Income Components and Other Comprehensive Income Variables

Dependent variable = Annual return, excluding dividends

<table>
<thead>
<tr>
<th>Variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.035</td>
<td>0.033</td>
<td>0.110</td>
<td>0.037</td>
<td>0.035</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>$C_m$</td>
<td>0.768</td>
<td>0.752</td>
<td>0.762</td>
<td>0.742</td>
<td></td>
</tr>
<tr>
<td>[+ ]</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta NI$</td>
<td>0.248</td>
<td></td>
<td>0.249</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[+ ]</td>
<td>(0.001)</td>
<td></td>
<td>(0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta OPINC$</td>
<td></td>
<td>0.682</td>
<td>0.683</td>
<td>0.668</td>
<td></td>
</tr>
<tr>
<td>[+ ]</td>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td></td>
</tr>
<tr>
<td>$\Delta INC_DIF$</td>
<td>0.104</td>
<td>0.666</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[+ ]</td>
<td>(0.027)</td>
<td>(0.121)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCI</td>
<td>-0.224</td>
<td>-0.562</td>
<td>-0.031</td>
<td>-0.017</td>
<td></td>
</tr>
<tr>
<td>[+ ]</td>
<td>(0.696)</td>
<td>(0.892)</td>
<td>(0.519)</td>
<td>(0.511)</td>
<td></td>
</tr>
<tr>
<td>POS_OCI</td>
<td>-0.409</td>
<td>-0.318</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[+ ]</td>
<td>(0.652)</td>
<td>(0.621)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adj R$^2$</td>
<td>0.097</td>
<td>0.117</td>
<td>0.036</td>
<td>0.096</td>
<td>0.115</td>
</tr>
<tr>
<td>Prob F</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

P-values (in parentheses) are one-tailed, except the intercept. This study predicts that items of OCI are unrelated to returns. The theory is therefore one of "no effect". The one-tailed p-value reflects analysts' prediction that the coefficient is positive. See section 5.1.3.
All independent variables, except $C_m$, are scaled by the market value of equity as of the beginning of the return period.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition and measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta NI$</td>
<td>Change in net income, measured as change in Compustat data item # 172.</td>
</tr>
<tr>
<td>$\Delta OPINC$</td>
<td>Change in operating income, measured as change in Compustat data item # 178.</td>
</tr>
<tr>
<td>$\Delta INC_DIF$</td>
<td>Change in net income, minus change in operating income ($\Delta NI - \Delta OPINC$.)</td>
</tr>
<tr>
<td>OCI</td>
<td>Other comprehensive income, measured as FORCUR plus MARKSEC plus PENS.</td>
</tr>
<tr>
<td>POS_OCI</td>
<td>Equal to OCI if OCI is positive, and equal to zero otherwise.</td>
</tr>
<tr>
<td>$C_m$</td>
<td>Market return, excluding dividends. Aggregated from CRSP monthly returns, excluding dividends.</td>
</tr>
<tr>
<td>FORCUR</td>
<td>Change in cumulative translation adjustment, equal to change in Compustat data item # 230. Verified by data hand gathered from annual reports.</td>
</tr>
<tr>
<td>MARKSEC</td>
<td>Change in marketable securities adjustment, measured as change in Compustat data item # 238. Verified by data hand gathered from annual reports.</td>
</tr>
<tr>
<td>PENS</td>
<td>Change in additional minimum pension liability. Hand gathered from annual reports.</td>
</tr>
</tbody>
</table>
6.3 Coefficients aggregated over time or across firms

Panel A of Table 9 presents the results of 11 cross-sectional regressions on 126 firms. The resulting coefficient estimates and t-statistics are then aggregated over time. This analysis relaxes the constraint that the parameter estimates are the same for each time period. C_m is omitted from the model since it is the same for each firm cross-sectionally. In the aggregate, the coefficient on the change in net income is highly significant. The coefficient on change in net income is larger for this model than the previous pooled models (0.348 versus approximately 0.25 for the pooled model in Table 6.) As in the previous models, the coefficient on OCI is not significant.

Since each cross-sectional regression has only 126 observations, consideration is given to the presence of influential observations. For the coefficient on OCI, the four T-statistics that are largest in absolute value are for the years 1991, 1992, 1993, and 1994. The regressions for these years are re-run after deleting influential observations (measured by their effect on R^2). This reduces the absolute value of each T-statistic on OCI for these years. However, the signs on OCI do not change. Note that since C_m is a cross-sectional constant, it is excluded from each regression, and the results presented in Tables 6 and 8 show that excluding C_m affects the coefficient on OCI.

The second prediction of this study is that the relation between OCI and returns does not improve over time. Since OCI exhibits evidence consistent with a mean-reverting process, the best predictor of future OCI is its mean value. Thus, the
second prediction of this study is equivalent to hypothesizing that knowledge of the mean value of OCI is irrelevant in predicting future returns. Panel B of Table 9 presents results of testing this hypothesis. It shows results of one cross-sectional regression using mean values of observations for each firm over eleven years. As in previous models, the coefficient on change in net income is highly significant, and the coefficient on OCI is not significant. Thus, the relation between OCI and stock returns does not improve when using the mean values of OCI and returns. In other words, knowledge of the mean value of OCI is not relevant for valuation purposes, in support of the second prediction of this study.

Table 10 reports results for aggregation of 126 time series regressions of annual returns on change in net income plus OCI. This analysis relaxes the constraint that the parameter estimates are the same for each firm. Each of the 126 regressions includes 11 observations, one for each year from 1986 to 1996. As in all previous models, the coefficients on $C_m$ and change in net income are highly significant, while the coefficient on OCI is not significant. Further, the coefficient on change in net income is much larger than in the pooled model (1.533 versus 0.25). This result is consistent with Teets and Wasley (1996), who show that earnings response coefficients are systematically smaller for pooled time-series cross-sectional models than for time-series models that are estimated by firm.

6.4 Specification tests

Since this study uses time series cross-sectional data (panel data), consideration is given to both the dummy variable (fixed effects) model, and the
Table 9: Aggregation of T-Statistics for Eleven Cross-Sectional Regressions (by Year)

<table>
<thead>
<tr>
<th>Year</th>
<th>Intercept Coefficient</th>
<th>t-stat</th>
<th>Change in net income Coefficient</th>
<th>t-stat</th>
<th>OCI Coefficient</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>0.271</td>
<td>10.648 ***</td>
<td>0.136</td>
<td>0.745</td>
<td>-1.166</td>
<td>-0.788</td>
</tr>
<tr>
<td>1987</td>
<td>-0.079</td>
<td>-3.573 ***</td>
<td>0.180</td>
<td>1.186</td>
<td>1.550</td>
<td>1.205</td>
</tr>
<tr>
<td>1988</td>
<td>0.086</td>
<td>4.946 ***</td>
<td>0.431</td>
<td>2.159 **</td>
<td>-0.369</td>
<td>-0.176</td>
</tr>
<tr>
<td>1989</td>
<td>0.137</td>
<td>6.260 ***</td>
<td>0.798</td>
<td>3.453 ***</td>
<td>1.409</td>
<td>0.496</td>
</tr>
<tr>
<td>1990</td>
<td>0.147</td>
<td>3.405 ***</td>
<td>0.430</td>
<td>1.295 *</td>
<td>-2.774</td>
<td>-1.111</td>
</tr>
<tr>
<td>1991</td>
<td>0.137</td>
<td>5.823 ***</td>
<td>0.075</td>
<td>0.487</td>
<td>-8.387</td>
<td>3.844</td>
</tr>
<tr>
<td>1992</td>
<td>0.119</td>
<td>5.115 ***</td>
<td>0.104</td>
<td>0.972</td>
<td>1.936</td>
<td>1.840 **</td>
</tr>
<tr>
<td>1993</td>
<td>0.022</td>
<td>1.102</td>
<td>0.577</td>
<td>6.043 ***</td>
<td>1.414</td>
<td>1.377 *</td>
</tr>
<tr>
<td>1994</td>
<td>0.113</td>
<td>5.957 ***</td>
<td>0.451</td>
<td>3.944 ***</td>
<td>-2.791</td>
<td>-1.888</td>
</tr>
<tr>
<td>1995</td>
<td>0.217</td>
<td>10.647 ***</td>
<td>0.418</td>
<td>1.378 *</td>
<td>-1.138</td>
<td>-0.531</td>
</tr>
<tr>
<td>1996</td>
<td>0.097</td>
<td>5.632 ***</td>
<td>0.225</td>
<td>1.136</td>
<td>-0.133</td>
<td>-0.071</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>0.115</td>
<td></td>
<td>0.348</td>
<td>2.073</td>
<td>-0.950</td>
</tr>
<tr>
<td></td>
<td>Mean Z-stat. (Yule-Walker)</td>
<td>28.03 ***</td>
<td></td>
<td>9.64 **</td>
<td>-2.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean Z-stat. (Independence)</td>
<td>16.87 ***</td>
<td></td>
<td>6.87 **</td>
<td>-1.05</td>
<td></td>
</tr>
</tbody>
</table>

Panel B; One cross-sectional regression using 11-year time-series mean values of observations

<table>
<thead>
<tr>
<th>Intercept Coefficient</th>
<th>t-stat</th>
<th>Change in net income Coefficient</th>
<th>t-stat</th>
<th>OCI Coefficient</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.107</td>
<td>15.068 ***</td>
<td>1.362</td>
<td>2.628 ***</td>
<td>1.263</td>
<td>0.700</td>
</tr>
</tbody>
</table>

Results are for 126 firms over 11 years. All independent variables are scaled by MV at beginning of return period.
Z-statistics calculated using Yule-Walker standard errors are adjusted for autocorrelation in the residuals. Otherwise, Z-statistics assume independence over time. P-values are one-tailed except for the intercept. This study predicts that items of OCI are unrelated to returns. The theory is therefore one of "no effect". The one-tailed p-value reflects analysts' prediction that the coefficient is positive. See section 5.1.3.

* Significant at the .10 level. ** Significant at the .05 level. *** Significant at the .01 level.
Table 10: Aggregation of T-Statistics for 126 Time-Series Regressions (by Firm)

Dependent variable = Annual return, excluding dividends

<table>
<thead>
<tr>
<th>Variable</th>
<th>Minimum</th>
<th>Mean</th>
<th>Maximum</th>
<th>Aggregate Z-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient</td>
<td>-0.167</td>
<td>0.012</td>
<td>0.314</td>
<td></td>
</tr>
<tr>
<td>t-statistic</td>
<td>-3.900</td>
<td>0.057</td>
<td>2.552</td>
<td>0.54</td>
</tr>
<tr>
<td>$C_m$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient</td>
<td>-0.828</td>
<td>0.860</td>
<td>3.226</td>
<td></td>
</tr>
<tr>
<td>t-statistic</td>
<td>-1.084</td>
<td>1.506</td>
<td>5.964</td>
<td>14.28 **</td>
</tr>
<tr>
<td>Change in net</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient</td>
<td>-9.323</td>
<td>1.533</td>
<td>21.796</td>
<td></td>
</tr>
<tr>
<td>t-statistic</td>
<td>-1.845</td>
<td>0.837</td>
<td>5.069</td>
<td>7.94 **</td>
</tr>
<tr>
<td>OCI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient</td>
<td>-232.007</td>
<td>1.672</td>
<td>264.618</td>
<td></td>
</tr>
<tr>
<td>t-statistic</td>
<td>-3.284</td>
<td>0.054</td>
<td>4.463</td>
<td>0.51</td>
</tr>
</tbody>
</table>

** significant at less than 1% level.
error components (random effects) models. Each of these models incorporates firm
and/or time specific differences to obtain more efficient estimators. In both the fixed
effects and random effects models, the slope coefficients are considered fixed over
time and across firms. In the one-way fixed effects (FE1) model, firm-specific
differences are assumed to be fixed parameters that are estimated for each firm. In
the two-way fixed effects (FE2) model, both firm-specific and time-specific
differences are considered fixed parameters and estimated as part of the intercept
term.

In the one-way random effects (RE1) model, firm-specific differences are
considered random and thus the intercept is considered random (Judge et al., 1985, p.
522). In the two-way random effects (RE2) model, both firm- and time-specific
effects are considered random. A major assumption of both the RE1 and RE2
models is that the error term is uncorrelated with each of the explanatory variables.

Table 11 presents results of estimating the FE1, FE2, RE1, and RE2
models. Each model regresses annual return on change in net income, plus OCI.
Each model except FE2 is estimated both with and without $C_m$. $C_m$ is excluded from
the FE2 model, since it is the same for each time period for each firm and thus the
model is not of full rank. The coefficient estimates for $\Delta NI$ are roughly the same for
the FE1, FE2, RE1, and RE2 models as they are for the pooled models presented
earlier (ranging from 0.210 to 0.263), and each is highly significant. Similarly, the
coefficients on $C_m$ are similar to those for the pooled model (approximately 0.76).
Table 11: Regressions of Annual Returns on Change in Net Income and Other Comprehensive Income: Fixed Effects and Random Effects Models

<table>
<thead>
<tr>
<th>Variable [pred. sign]</th>
<th>FE 1 w/o C_m</th>
<th>FE 1 with C_m</th>
<th>FE 2 w/o C_m</th>
<th>FE 2 with C_m</th>
<th>RE 1 w/o C_m</th>
<th>RE 1 with C_m</th>
<th>RE 2 w/o C_m</th>
<th>RE 2 with C_m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.402</td>
<td>0.323</td>
<td>0.383</td>
<td>0.114</td>
<td>0.035</td>
<td>0.114</td>
<td>0.036</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td></td>
</tr>
<tr>
<td>ANI</td>
<td>0.210</td>
<td>0.239</td>
<td>0.256</td>
<td>0.221</td>
<td>0.249</td>
<td>0.263</td>
<td>0.262</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td></td>
</tr>
<tr>
<td>OCI</td>
<td>-0.766</td>
<td>-0.397</td>
<td>-1.178</td>
<td>-0.557</td>
<td>-0.226</td>
<td>-0.877</td>
<td>-0.719</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.946)</td>
<td>(0.808)</td>
<td>(0.989)</td>
<td>(0.227)</td>
<td>(0.696)</td>
<td>(0.963)</td>
<td>(0.134)</td>
<td></td>
</tr>
<tr>
<td>F-test for fixed</td>
<td>0.990</td>
<td>1.082</td>
<td>2.302</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.516)</td>
<td>(0.262)</td>
<td>(0.001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hausman test for</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>random effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FE 1: One-way fixed effects model.
FE 2: Two-way fixed effects model.
RE 1: One-way random effects model.
RE 2: Two-way random effects model.
(table continued)

All independent variables, except $C_m$, are scaled by the market value of equity as of the beginning of the return period.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta NI$</td>
<td>Change in net income, measured as the change in Compustat data item #172.</td>
</tr>
<tr>
<td>OCI</td>
<td>Other comprehensive income, measured as the sum of the change in the cumulative translation adjustment, the marketable securities adjustment, and the additional pension liability adjustment.</td>
</tr>
<tr>
<td>$C_m$</td>
<td>Market return, excluding dividends. Aggregated from CRSP monthly returns, excluding dividends.</td>
</tr>
</tbody>
</table>

P-values (in parentheses) are one-tailed, except the intercept. This study predicts that items of OCI are unrelated to returns. The theory is therefore one of “no effect”. The one-tailed p-value reflects analysts’ prediction that the coefficient is positive. See section 5.1.3.
The Hausman test for random effects rejects at the 10% level for the RE1 model with $C_m$ and the RE2 model without $C_m$, and rejects at the 5% level for the remaining random effects models. This suggests that the error term is correlated with the explanatory variables, and thus the RE1 and RE2 models are not appropriate since they will result in biased estimators (Judge et al., 1988, p. 490).

The fixed effects models are considered next. The F-test for fixed effects does not reject for the FE1 models, suggesting firm-specific fixed effects are not present and that pooling the data is appropriate. The F-test for the FE2 model does reject, indicating time-specific effects. However, the FE2 model excludes $C_m$, which should account for time-specific effects. Thus, as noted earlier, the primary analysis in the study is done using pooled data and including $C_m$ as an explanatory variable.
7. Summary and Future Research

This study develops a definition of permanent earnings that is based on the relation between earnings and expected future dividends. The study illustrates the relation between permanent, transitory, and unexpected earnings, and demonstrates the consequences of using unexpected earnings instead of change in permanent earnings when regressing returns on an earnings measure. Using the definition of permanent earnings and implications of the efficient markets hypothesis, the study predicts that items of other comprehensive income as defined by the FASB in SFAS No. 130 are transitory and thus, by definition, have no relation to firm value as measured by annual returns. A second prediction is that the relation between OCI and returns does not improve over time.

Results from a sample of 126 firms over 11 years (1,386 firm-years) are consistent with these predictions. OCI is not a significant explanatory variable for returns, whereas both change in net income and market returns are. This result is robust to all model specifications and econometric methods used. Further, OCI exhibits little autocorrelation over time, and has zero mean. This also suggests that items of OCI are transitory and poor predictors of future value, supporting the first prediction.

The second prediction of this study is that the relation between OCI and returns does not improve over time. Since OCI exhibits evidence consistent with a mean-reverting process, the best predictor of future OCI is its mean value. Thus, the
second prediction of this study is equivalent to hypothesizing that knowledge of the mean value of OCI is irrelevant in predicting future returns. Results of one cross-sectional regression using mean values of observations for each firm over eleven years are consistent with this prediction. Thus, the relation between OCI and stock returns does not improve when using the mean values of OCI and returns. In other words, knowledge of the mean value of OCI is not relevant for valuation purposes, in support of the second prediction of this study.

The results of this paper demonstrate that the unrealized gains and losses that make up OCI are unrelated to firm value. Thus, they are not useful for decision-making as defined by Gjesdal (1981). Paul (1992) shows that effective monitoring of agents requires measuring the value added to the firm by managers. Thus, items of OCI are not likely to be useful in evaluating the performance of managers, since these items result primarily from market-based movements outside of managers’ control. This is consistent with Gaver and Gaver (1998), who find that executive compensation is “shielded” from extraordinary losses (although extraordinary gains flow through to compensation).

Several avenues remain for future research. First, this study excludes financial institutions. Financial institutions are a rich environment for examining the relation, if any, between the change in the marketable securities adjustment (which is a component of OCI) and returns. Second, this study excludes firms for which Compustat does not report a cumulative translation adjustment. Preliminary analysis suggests that Compustat does not consistently report items of OCI. Thus, it is
possible that some of these firms do have OCI, and should be included in a future study. Third, this study only includes firms with calendar year-ends. Firms with year-ends other than December may differ from the firms in this study. Finally, this study focuses on the relation between firm value, as measured by returns, and OCI. Future research will examine whether or not OCI is important for performance evaluation.
References


and their explanatory power for returns. Working paper, University of Houston (February).


Vita

Carol Dee received the degree Bachelor of Science in Accounting from the University of Florida in 1983. She has been a Certified Public Accountant licensed to practice in Florida since 1984, and has experience in audit, tax, and industry. She entered the doctoral program in accounting at Louisiana State University in 1995. While at Louisiana State University, Ms. Dee taught courses in financial accounting. Her studies have focused on financial accounting research, with a minor in finance and economics as a specialty area. Ms. Dee has accepted a position as Assistant Professor in the Department of Accounting at Florida State University beginning in August, 1999.
DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Carol Callaway Dee

Major Field: Accounting

Title of Dissertation: Comprehensive Income and Its Relation to Firm Value and Transitory Earnings

Approved:

Andrew A. Christie
Major Professor and Chairman

Jean M. Laporte
Dean of the Graduate School

EXAMINING COMMITTEE:

Mary C. Stange

Deborah A. Ortinau
(Co-Chair)

Don Dee

Hector C. Espada

Charlene Hendrick

Date of Examination:

July 27, 1999