

# Empirical Seminar in Accounting

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# 1 Preface

I made these notes to aid my preparation for the empirical comprehensive exam at Duke University.

## 2 Earnings Management

Earnings management is “purposeful intervention in the external reporting process, with the intent of obtaining some private gain” [Schipper, 1989].

### 2.1 Discretionary Accruals

The notes follow Collins, Pungaliya, and Vihj [2011]. Consider a discretionary accruals framework where accruals are partitioned into a discretionary and non-discretionary component:

$$\text{ACC} = \text{NDACC}^* + \text{DACC}^*$$

where asterisks denote the true, but unobservable, accrual components. As  $\text{DACC}^*$  is unobservable, it is typically estimated using a “Jones-type” discretionary accrual model. The estimate of discretionary accruals ( $\widehat{\text{DACC}}$ ) that emerges inevitably measures “true” and unknowable discretionary accruals with error:

$$\widehat{\text{DACC}} = \text{DACC}^* + \eta$$

The test is typically conducted by regressing discretionary accruals on a partitioning variable (PART), where

$$\text{PART} = 1 \cdot [\text{Period(s) in which earnings management is hypothesized to occur}]$$

A theoretical model for testing earnings management follows:

$$\text{DACC}^* = \alpha + \beta \times \text{PART} + \varepsilon$$

The significance of  $\beta$  allows the researcher to infer the presence of earnings management. As a discretionary accruals *proxy* is used instead of the true, unobservable variable, the model can be rewritten as

$$\begin{aligned} \text{DACC} &= \alpha + \gamma \times \text{PART} + \nu \\ &= \left( \beta + \underbrace{\rho_{\text{PART},\eta} \frac{\sigma_\eta}{\sigma_{\text{PART}}}}_{\text{Bias}} \right) \text{PART} + \nu \end{aligned}$$

An unbiased test of earnings management requires that measurement error in the discretionary accruals proxy be uncorrelated with the partitioning variable in the research design:

$$\rho_{\text{PART},\eta} = 0.$$

## 2.2 Jones-type models

The two most popular models for estimating the discretionary component of accruals are the cross-sectional Jones model and modified-Jones model. In the former,

$$\text{Current ACC}_{i,t} = \beta_0 + \text{Quarterly Dummies} + \beta_1 \Delta \text{Sales}_{i,t} + \beta_2 \text{Current ACC}_{i,t-4} + \varepsilon_{i,t}$$

where  $\Delta \text{Sales}_{i,t}$  is the quarterly change in sales measured relative to the previous quarter's sales, and  $\text{Current ACC}_{i,t-4}$  is the current (working capital) accruals from the same fiscal quarter in the preceding year. The regressions are run by calendar quarter for the cross-section of all firms in the same industry as the sample firm (e.g. two-digit SIC), and the discretionary accruals are the residuals from the regression.

Collins et al. [2011] treat all credit sales in the event period and the estimation period as discretionary for both the treatment and control firms included in the regression in their common specification modified-Jones model, “Mod-Jones (C)”:

$$\text{Current ACC}_{i,t} = \lambda_0 + \text{Quarterly Dummies} + \lambda_1(\Delta \text{Sales}_{i,t} - \Delta \text{AR}_{i,t}) + \lambda_2 \text{Current ACC}_{i,t-4} + \xi_{i,t}$$

Mod-Jones (C) assumes nondiscretionary accruals ( $\widehat{\text{Current ACC}}_{i,t}$ ) are related only to cash sales for all sample and benchmark firms included in the regression.

### 3 Earnings Quality

Higher earnings quality provide more information about the feature’s of a firm’s financial performance that are relevant to a specific decision made by a specific decision maker [Dechow, Ge, and Schrand, 2010].

Francis, LaFond, Olsson, and Schipper [2004] describe several accounting-based and market-based attributes of earnings as follows:

1. **Accrual quality.** Earnings that map more closely into cash are more desirable. Francis et al. use the Dechow and Dichev measure of earnings quality captures the mapping of current accruals into last-, current-, and next-period cash flows:
2. **Persistence** captures earnings sustainability; persistent earnings are viewed as desirable because they are recurring. Francis et al. measure earnings persistence as the slope coefficient from a regression of current earnings on lagged earnings.
3. **Predictability** is the ability of earnings to predict itself.
4. **Smoothness** can be a desirable earnings attribute if managers use their private information about future income to smooth out transitory fluctuations and thereby achieve

a more representative reported earnings number. Francis et al. define it as the ratio of income variability to cash flow variability.

5. **Value relevance** measures the ability of earnings to explain variation in returns, with greater explanatory power viewed as more desirable. Francis et al. define it as the explanatory power of earnings level and change for returns.
6. **Timeliness** is the explanatory power of a reverse regression of earnings on returns. **Conservatism** is the ratio of the slope coefficients on negative returns to the slope coefficients on positive returns in a reverse regression of earnings on returns; it differs from timeliness in that it reflects the differential ability of accounting earnings to reflect economic losses versus economic gains.

## 4 Anomalies

### 4.1 Post-earnings Announcement Drift

Post-earnings announcement drift (PEAD) is the tendency for stocks to earn

1. positive average abnormal returns in the three quarters after extreme positive earnings surprises and, more strongly,
2. negative average abnormal returns in the three quarters after extreme negative earnings surprises [Hirshleifer, Myers, Myers, and Teoh, 2008].

## 5 Fama and French's Portfolios

Fama and French [1993] form portfolios meant to mimic the underlying risk factors in returns related to size (i.e. market value of equity, ME) and book-to-market equity (i.e. BE/ME).

Book common equity, BE, is COMPUSTAT book value of stockholders' equity plus balance-sheet deferred taxes and investment tax credit (if available) minus the book value of preferred stock. Depending on availability, Fama and French use redemption, liquidation, or par value to estimate the value of preferred stock. BE/ME is then book common equity for the fiscal year ending in calendar year  $t-1$ , divided by market equity at the end of December of  $t-1$ .

The procedure follows:

1. A firm must have CRSP stock prices for December of year  $t-1$  and June of  $t$ , COMPUSTAT book common equity for year  $t-1$ , and have appeared on COMPUSTAT for at least two years.
2. In June of each year  $t$ , all NYSE stocks on CRSP are ranked on size:

$$\text{Market value of equity} = \text{Price} \times \text{Common shares outstanding}$$

3. The median NYSE size is then used to split NYSE, Amex, and (after 1972) NASDAQ stocks into **two** groups: small and big ( $S$  and  $B$ ).
4. NYSE, Amex, and NASDAQ stocks are broken into **three** book-to-market equity groups based on the breakpoints for the bottom 30% (Low), middle 40% (Medium), and top 30% (High) of the ranked values of BE/ME for NYSE stocks.
5. Six portfolios are constructed from the intersection of the two ME and the three BE/ME groups ( $2 \times 3 = 6$ ).
6. Monthly value-weighted returns on the six portfolios are calculated from July of year  $t$  to June of  $t+1$ , and portfolios are reformed in June of  $t+1$ . Returns are calculated in July of year  $t$  to be sure that book equity for year  $t-1$  is known.

The SMB (small minus big) size portfolio is meant to mimic the risk factor in returns related to size and is the difference, each month, between the arithmetic average of the returns

on the three small stock portfolios and the arithmetic average of the returns on the three big-stock portfolios. Thus, it is the difference between the returns on small- and big-stock portfolios with about the same weighted-average BE/ME.

The HML (high minus low) BE/ME portfolio is meant to mimic the risk factor in returns related to BE/ME and is defined similarly and is the difference, each month, between the arithmetic average of the returns on the two high-BE/ME portfolios and the arithmetic average of the returns on the two low-BE/ME portfolios.

Fama and French also form 25 portfolios on ME and BE/ME. The construction procedure is similar and follows:

1. In June of each year  $t$ , sort NYSE stocks by ME and independently by BE/ME. For the size sort, ME is measured at the end of June. For the BE/ME sort, ME is market equity at the end of December of  $t - 1$ , and BE is book common equity for the fiscal year ending in calendar year  $t - 1$ .
2. Use NYSE breakpoints for ME and BE/ME to allocate NYSE, Amex, and (after 1972) NASDAQ stocks to five size ME quintiles and five BE/ME quintiles.
3. Construct 25 ( $= 5 \times 5$ ) portfolios from their intersection.
4. Calculate value-weighted monthly returns on the portfolios from July of  $t$  to June of  $t + 1$ .

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