Estimating earnings management

Focus on accruals

TA_t = total accruals
= $DA_t + NDA_t$

DA_t = discretionary accruals (eg stock write down)

NDA_t = non discretionary accruals (eg an increase in debtors due to increased trading)

DA_t are associated with earnings management

Early models

Degeorge, Patel & Zeckhauser, JB, 1999

Looks at the distribution of
E_t
$E_t - E_{t-1}$
$E_t - F_t$
for any lack of smoothness in the distribution around 0.

Strong on incentives. Companies like to:
make a profit;
grow;
meet analysts' forecast

But why should distribution be smooth?
Other reasons why not smooth
Holland, WP, 2004

Later models

Concentrate on modelling

Healy, JAE,1985.

NDA_t = the average of TA_{t-j} (j=1 .. n)
= the average of total accruals during the previous periods.

Deviations from prior average is potential earnings management

DeAngelo, AR, 1986

NDA_t = TA_{t-1}
= total accruals for the previous period.

a special case of the Healy model with j =1

Jones, JAR 1991

Estimation of parameters

$$\frac{TA_{t-j}}{A_{t-j-1}} = \alpha_0 + \frac{\alpha_1}{A_{t-j-1}} + \beta.\frac{\Delta \mathrm{Re}v_{t-j}}{A_{t-j-1}} + \gamma\frac{FA_{t-j}}{A_{t-j-1}} + u_{t-j}$$

j=1 .. n, the prior e-m period

Scaled to minimise heteroscedasticity.

A is assets
FA is fixed assets
ΔRev is change in revenue

Use parameters to estimate NDA

Standard Jones Model

$$\frac{\hat{NDA}_t}{A_{t-1}} = \hat{\alpha}_0 + \frac{\hat{\alpha}_1}{A_{t-1}} + \hat{\beta}.\frac{\Delta \mathrm{Re}v_t}{A_{t-1}} + \hat{\gamma}\frac{FA_t}{A_{t-1}}$$

$$\frac{\hat{DA}_t}{A_{t-1}} = \frac{TA_t}{A_{t-1}} - \frac{\hat{NDA}_t}{A_{t-1}}$$

Discretionary accruals = total accruals less estimated non discretionary

OR because debtors may be managed in year t, Modified Jones model

$$\frac{\hat{TA}_t}{A_{t-1}} = \hat{\alpha}_0 + \frac{\hat{\alpha}_1}{A_{t-1}} + \hat{\beta}.\frac{(\Delta \mathrm{Re}v_t - \Delta Drs_t)}{A_{t-1}} + \hat{\gamma}\frac{FA_t}{A_{t-1}}$$

Cross sectional Jones

Problem with the original Jones approach is the lack of time series observations.

Hence cross section work.

Typical early paper using cross section

Peasnell, Pope, Young, ABR, 2000 (PPY), the margin model

Later papers

Ibrahim, JBFA, 2009

Does SEC accuse the right companies of earnings management?

Caramanis, Lennox, JAE45(1), March 2008

Does audit effort affect earnings management?

Bharath, Sunder, Sunder, AR 83(1), Jan 2008

Used as a measure of accounting quality which affects whether to issue private or public debt.

Standard cross section approach

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_0 + \frac{\alpha_1}{A_{i,t-1}} + \beta.\frac{\Delta \mathrm{Re}v_{i,t}}{A_{i,t-1}} + \gamma\frac{FA_{i,t}}{A_{i,t-1}} + e_{i,t}$$

is estimated over i = 1, 2, 3, ... N observations

Residual is the estimate of earnings management.

What can't be explained is discretionary.

or

Modified cross section approach

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_0 + \frac{\alpha_1}{A_{i,t-1}} + \beta.\frac{(\Delta \mathrm{Re}v_{i,t} - \Delta Drs)}{A_{i,t-1}} + \gamma\frac{FA_{i,t}}{A_{i,t-1}} + e_{i,t}$$

This assumes that ΔDrs is always a manipulation for all companies.

Comment

The residual is composed of:
(i) specification error (u); and
(ii) earnings management (EM)

$e_i = EM_i + u_i$

We know that in OLS regression the residuals are constructed to have zero mean.

$AVG(e_i) = AVG(EM_i) + AVG(u_i) = 0.$

This imposes a constraint on the earnings management.

Either

- the average earnings management is the same size to (but opposite sign to) average specification error

Not clear for the intuition behind this

or

- both are zero

This means that the companies that are manipulating upwards are exactly balanced by those manipulating downwards.

Not easy to see, especially when estimations are done at the industry level:

Peasnell, Pope, Young, (2000, p317);
Athanasakou, Strong, Walker, ABR, 39(1), 2009.

BUT

Simulations show that power to capture earnings management is quite good.

CONCLUSION

1. Might be a reasonable empirical assumption

2. Some muddled thoughts, in two dimensions.

Let’s look more carefully at the simulations:
Ibrahim, JBFA 2009;
PPY, 200

Insert accruals as a % of lagged fixed assets
PPY, p318
Ibrahim, p1105 (not lagged)

Effectively inserting a fixed amount to the LHS of equation.

Inserted at random across the sample

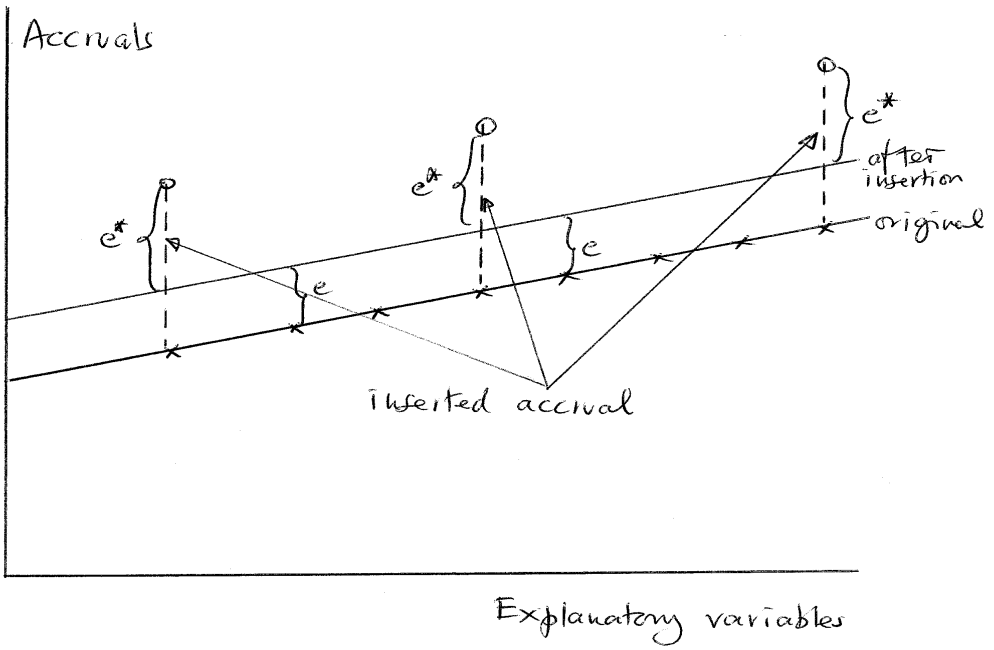
PART = 1 if observation contains the insertion, =0 otherwise

Run the accruals regression
Then run

DA (residual from accruals regression) = a + b.PART + e

Find that b is significant

Suppose that before accruals added the model is perfect fit, observations “x” along the original regression line



Accruals added randomly will be scattered throughout the sample.
New regression will shift parallel to old.
“e*” is smaller than insertion, but unaffected obs will now have error, “e”, and e* will exceed “e” by the inserted amount.