

# The decline in the earnings-returns relation

- **number of papers document the decline**
  - Francis & Schipper, JAR, 1999
    - period covered 1952-1994
    - $MV_t = a + b.BV_t + c.EARN_t$ 
      - EARN becoming less important
      - but BV more important
    - Knowledge of earnings one year ahead gives lower returns
  - Lev and Zarowin, JAR, 1999
  - period covered 1977-1996
    - decline in  $R^2$  over time
    - due to poor R&D accounting
- **but more needed on why?**
- **Ryan and Zarowin, Accounting Review, 2003**
  - this is the paper to be analysed
  - period covered 1966-2000

- R&Z analyse the return-earnings relation from two viewpoints (two previous papers)
- **Kothari and Sloan, JAE, 1992**
  - how well do current and past returns explain current earnings
- **the R&Z specification of this is**
- **$X_t/MV_{t-1} = a + b_0 \cdot R_t + b_1 \cdot R_{t-1} + b_2 \cdot R_{t-2} + b_3 \cdot R_{t-3}$**
- **where**
  - $X_t$  is earnings during period t
  - $MV_{t-1}$  is market value at the end of period t-1 (ie at the beginning of period t)
  - $R_t$  is the return during period t =  $(MV_t - MV_{t-1}) / MV_{t-1}$
  - $R_{t-1}$  is the return during period t-1, etc...
- **$b_1$  is the info in  $R_{t-1}$  about  $X_t/MV_{t-1}$  etc...**
- **K&S find that returns 3 periods ago have information about current earnings!**
  - ie  $b_3$  is significant

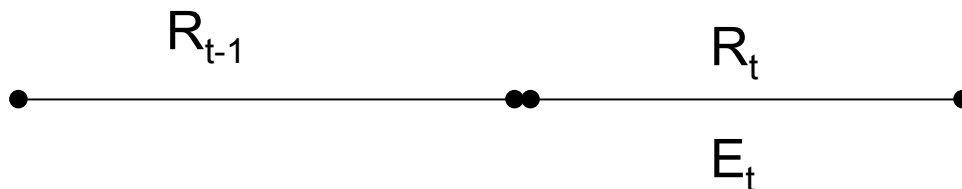
- **Notice that**
- $X_t/MV_{t-1} = a + b_0 \cdot R_t + b_1 \cdot R_{t-1} + b_2 \cdot R_{t-2} + b_3 \cdot R_{t-3}$
- **earnings on LHS, implies that returns cause earnings**
  - but, of course, earnings drive returns
  - called "reverse regression"
- **Explanation**
- **Earnings = permanent + temporary**
  - temporary have smaller impact on returns than permanent
  - temporary, similar to measurement error
- **If earnings on RHS, then "error in variables" problem**
- **when earnings on LHS, the regression error term captures the error**

- **Basu, JAE, 1997**
  - conservatism
  - there is a stronger relationship between current earnings and current returns in bad news situations
- **the R&Z specification of this is**
- $X_t/MV_{t-1} = a_0 + a_1 \cdot DR_t + b_0 \cdot R_t + b_1 \cdot R_t \cdot DR_t$
- **where**
  - $DR_t$  is 1 when  $R_t < 0$
  - $DR_t$  is 0 otherwise
  - =1 when there is bad news in returns in the current period
- **good news equation is**
  - $X_t/MV_{t-1} = a_0 + b_0 \cdot R_t$
- **bad news equation is**
  - $X_t/MV_{t-1} = a_0 + a_1 \cdot 1 + b_0 \cdot R_t + b_1 \cdot R_t \cdot 1$
  - $X_t/MV_{t-1} = (a_0 + a_1) + (b_0 + b_1) \cdot R_t$
- **$a_1$  is the shift in the constant when bad news**
- **$b_1$  is the shift in the slope when bad news**

- **Ryan and Zarowin combine these two models**
- **explain current earnings with current and past returns (K&S component), but**
- **allow all the coefficients to shift when there is bad news in returns (Basu component)**
- **R&Z equation is**
- **$X_t/MV_{t-1} = a + a_0 \cdot DR_t + a_1 \cdot DR_{t-1} + a_2 \cdot DR_{t-2} + a_3 \cdot DR_{t-3}$** 
  - $DR_t$  is 1 when  $R_t < 0$
  - $DR_{t-1}$  is 1 when  $R_{t-1} < 0$  etc
  - $a_0, a_1$  etc are the shifting constants when there is bad news (in returns) in the period
- $+ b_0 \cdot R_t + b_1 \cdot R_{t-1} + b_2 \cdot R_{t-2} + b_3 \cdot R_{t-3}$** 
  - current and past returns explain current earnings
- $+ c_0 \cdot R_t \cdot DR_t + c_1 \cdot R_{t-1} \cdot DR_{t-1} + c_2 \cdot R_{t-2} \cdot DR_{t-2} + c_3 \cdot R_{t-3} \cdot DR_{t-3}$** 
  - $c_0, c_1, c_2, c_3$  etc are the shifting coefficients on returns, when there is bad news (in returns) in the period. Cont ...

- the shifts in the lags

$$c_1 \cdot R_{t-1} \cdot DR_{t-1} + c_2 \cdot R_{t-2} \cdot DR_{t-2} + c_3 \cdot R_{t-3} \cdot DR_{t-3}$$



- $R_t$  is forward looking, and so is  $E_t$  but more so for bad news
- $R_{t-1}$  anticipates  $E_t$ , but less so for bad news, since more chance that it is **first recognised** by  $E_{t-1}$
- therefore if  $E_t$  is conservative, then  $c_1+c_2+c_3$  will be negative

## Ryan & Zarowin Results (their Table 2)

- They first document a declining  $R^2$  over time, as in other studies.
- They run  $X_t/MV_{t-1} = a + b_0 \cdot R_t$

Period	$R^2$	Obs
1996-2000	.05	4379
1991-95	.05	3627
1986-90	.10	3270
1981-85	.13	3018
1976-80	.13	2869
1971-75	.14	2407
1966-70	.13	1483
Time trend for 35 individual years (t)	-.003 (-4.0)	

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- can see a declining relation between current returns and current earnings
- so what is going on?

- $$X_t/MV_{t-1} = a + a_0 \cdot DR_t + a_1 \cdot DR_{t-1} + a_2 \cdot DR_{t-2} + a_3 \cdot DR_{t-3}$$

$$+ b_0 \cdot R_t + b_1 \cdot R_{t-1} + b_2 \cdot R_{t-2} + b_3 \cdot R_{t-3}$$

$$+ c_0 \cdot R_t \cdot DR_t + c_1 \cdot R_{t-1} \cdot DR_{t-1} + c_2 \cdot R_{t-2} \cdot DR_{t-2} + c_3 \cdot R_{t-3} \cdot DR_{t-3}$$

<b>Period</b>	<b>b<sub>0</sub></b>	<b>t</b>
<b>1996-2000</b>	<b>.011</b>	<b>1.4</b>
<b>1991-95</b>	<b>.042</b>	<b>4.6</b>
<b>1986-90</b>	<b>.069</b>	<b>4.6</b>
<b>1981-85</b>	<b>.073</b>	<b>6.6</b>
<b>1976-80</b>	<b>.112</b>	<b>11.5</b>
<b>1971-75</b>	<b>.117</b>	<b>8.2</b>
<b>1966-70</b>	<b>.029</b>	<b>6.4</b>
<b>Time trend for 35 individual years</b>	<b>-.002</b>	<b>-1.8</b>

- see steady decline in b<sub>0</sub>, the link between returns and positive earnings
  - not significant at 5%, but caused by 1966-70
- perhaps the reasons are: (1) earnings capture more temporary components (2) earnings are more temporary

- $$X_t/MV_{t-1} = a + a_0 \cdot DR_t + a_1 \cdot DR_{t-1} + a_2 \cdot DR_{t-2} + a_3 \cdot DR_{t-3} + b_0 \cdot R_t + b_1 \cdot R_{t-1} + b_2 \cdot R_{t-2} + b_3 \cdot R_{t-3} + c_0 \cdot R_t \cdot DR_t + c_1 \cdot R_{t-1} \cdot DR_{t-1} + c_2 \cdot R_{t-2} \cdot DR_{t-2} + c_3 \cdot R_{t-3} \cdot DR_{t-3}$$

<b>Period</b>	<b>c<sub>0</sub></b>	<b>t</b>
<b>1996-2000</b>	<b>.291</b>	<b>14.4</b>
<b>1991-95</b>	<b>.346</b>	<b>11.5</b>
<b>1986-90</b>	<b>.339</b>	<b>11.0</b>
<b>1981-85</b>	<b>.314</b>	<b>10.0</b>
<b>1976-80</b>	<b>.370</b>	<b>8.3</b>
<b>1971-75</b>	<b>.234</b>	<b>6.5</b>
<b>1966-70</b>	<b>.040</b>	<b>2.9</b>
<b>Time trend for 35 individual years</b>	<b>.007</b>	<b>3.4</b>

- c<sub>0</sub> measures shift in the link when returns are negative**
- earnings increasingly captures bad news**
- c<sub>0</sub> much larger than b<sub>0</sub>, so an economically important shift**

- $$X_t/MV_{t-1} = a + a_0 \cdot DR_t + a_1 \cdot DR_{t-1} + a_2 \cdot DR_{t-2} + a_3 \cdot DR_{t-3}$$

$$+ b_0 \cdot R_t + b_1 \cdot R_{t-1} + b_2 \cdot R_{t-2} + b_3 \cdot R_{t-3}$$

$$+ c_0 \cdot R_t \cdot DR_t + c_1 \cdot R_{t-1} \cdot DR_{t-1} + c_2 \cdot R_{t-2} \cdot DR_{t-2} + c_3 \cdot R_{t-3} \cdot DR_{t-3}$$

Period	$b_1+b_2+b_3$	t
1996-2000	.037	1.3
1991-95	.114	2.6
1986-90	.163	3.3
1981-85	.124	2.7
1976-80	.095	1.7
1971-75	.052	0.6
1966-70	-.070	-3.6
Time trend for 35 individual years	.004	2.0

- $b_1+b_2+b_3$  measure the **lags** of returns recognising earnings good news
- increasing over time, although on average 1996-2000 lags are ZERO (not significant)
- negative for 1966-70, implies initial underreaction
  - slightly inconsistent with EMH story used to define bad news ( $R < 0$ )

- $$X_t/MV_{t-1} = a + a_0 \cdot DR_t + a_1 \cdot DR_{t-1} + a_2 \cdot DR_{t-2} + a_3 \cdot DR_{t-3} + b_0 \cdot R_t + b_1 \cdot R_{t-1} + b_2 \cdot R_{t-2} + b_3 \cdot R_{t-3} + c_0 \cdot R_t \cdot DR_t + c_1 \cdot R_{t-1} \cdot DR_{t-1} + c_2 \cdot R_{t-2} \cdot DR_{t-2} + c_3 \cdot R_{t-3} \cdot DR_{t-3}$$

<b>Period</b>	<b><math>c_1+c_2+c_3</math></b>	<b>t</b>
<b>1996-2000</b>	<b>.033</b>	<b>1.0</b>
<b>1991-95</b>	<b>.029</b>	<b>1.0</b>
<b>1986-90</b>	<b>-.023</b>	<b>-0.4</b>
<b>1981-85</b>	<b>.156</b>	<b>3.0</b>
<b>1976-80</b>	<b>.225</b>	<b>3.3</b>
<b>1971-75</b>	<b>.054</b>	<b>1.4</b>
<b>1966-70</b>	<b>.099</b>	<b>2.5</b>
<b>Time trend for 35 individual years</b>	<b>-.004</b>	<b>-1.7</b>

- $c_1+c_2+c_3$  special early recognition in returns of bad news
- overall results little unclear
- but are positive, not negative (1986 on are zero)

- **previous results are for changing sample**
- **similar results for constant sample (their Table 3)**

### **Assumptions and interpretation**

- **assume that R captures what is going on in the company**
  - but there is evidence about underreaction-overreaction, post earnings announcement drift
  - maybe the results say something about returns rather than earnings
    - ie there is a "returns story" and rather than an "earnings story" to be told?

- **if the results demonstrate the property of earnings**
  - is it entirely **an accounting story?**
    - accounting is becoming more conservative
      - making provisions that are not needed (eg full rather than partial provision for deferred tax)
    - accounting measurements do not properly capture the basics of company activity (eg R&D and marketing which are both expensed and valued at cost)
    - earnings do not reflect market expectations about all the future years of performance of the company
      - but perhaps the role of earnings is to measure current performance, and not performance in all future years (see notes on company valuation)

- **if the results demonstrate the property of earnings**
  - or is it partly **an economics story?**
    - company performance is becoming more and more temporary (related to the decline in  $b_0$ )?
      - hence R not so responsive to earnings
    - bad news is becoming more permanent than good news (related to the increase in  $c_0$ )?
      - poor performance relates to poor management and company culture which takes a long time to turnaround
      - good performance is always competed away in an increasingly aggressive and global market
    - operating cycle getting longer, so that time lengthening between the market guessing about the outcome and the realisation captured by earnings (related to the increase in  $b_1 + b_2 + b_3$ )

- R&Z try to disentangle the accounting and economic explanations by running their equation with Cash flows from operations (CFO) instead of Earnings
- $$\begin{aligned} \text{CFO}_t / \text{MV}_{t-1} = & a + a_0 \cdot \text{DR}_t + a_1 \cdot \text{DR}_{t-1} + a_2 \cdot \text{DR}_{t-2} + \\ & a_3 \cdot \text{DR}_{t-3} \\ & + b_0 \cdot R_t + b_1 \cdot R_{t-1} + b_2 \cdot R_{t-2} + b_3 \cdot R_{t-3} \\ & + c_0 \cdot R_t \cdot \text{DR}_t + c_1 \cdot R_{t-1} \cdot \text{DR}_{t-1} + c_2 \cdot R_{t-2} \cdot \text{DR}_{t-2} + \\ & c_3 \cdot R_{t-3} \cdot \text{DR}_{t-3} \end{aligned}$$
- if entirely an accounting story based on the operation of accruals, then non of the effects should be present when CFO is used
- CFO available only from 1987

## **$b_0$ , the link between current returns and current Earnings or CFO**

<b>Period</b>	<b>Earnings</b>	<b>t</b>	<b>CFO</b>	<b>t</b>
<b>1996-2000</b>	<b>.011</b>	<b>1.4</b>	<b>.007</b>	<b>0.7</b>
<b>1991-95</b>	<b>.042</b>	<b>4.6</b>	<b>.022</b>	<b>2.2</b>
<b>1986(87)-90</b>	<b>.069</b>	<b>4.6</b>	<b>.066</b>	<b>3.2</b>

- **both  $b_0$  are decreasing over time**
- **apart from 1991-95, Earnings and CFO are the same!**
  - same in 1986(7)-90
  - not different from 0 in most recent period
- **indicates economic explanation**
- **current company performance is temporary and therefore not much link with returns**

**$c_0$ , the shift in the link between  
(1) current returns,  $R_t$ , and (2) current  
Earnings or CFO when  $R_t < 0$**

<b>Period</b>	<b>Earnings</b>	<b>t</b>	<b>CFO</b>	<b>t</b>
<b>1996-2000</b>	<b>.291</b>	<b>14.4</b>	<b>.135</b>	<b>7.0</b>
<b>1991-95</b>	<b>.346</b>	<b>11.5</b>	<b>.092</b>	<b>3.4</b>
<b>1986(87)-90</b>	<b>.339</b>	<b>11.0</b>	<b>.090</b>	<b>2.8</b>

- **shift is positive and increasing for CFO**
  - so part an economics story
    - bad news is becoming more permanent
- **shift is smaller for CFO than for earnings**
  - there is some conservatism in accruals, but this we know
- **constant (or even decreasing) shift for earnings over the shorter period, 1986-2000 (contrast the full period, 1966-2000) + increasing shift for CFO**
  - the accounting story =
  - looks as if accounting is becoming **less conservative** through the short period

## **$b_1+b_2+b_3$ , the link between lagged returns and current Earnings or CFO**

<b>Period</b>	<b>Earnings</b>	<b>t</b>	<b>CFO</b>	<b>t</b>
<b>1996-2000</b>	<b>.037</b>	<b>1.3</b>	<b>-.147</b>	<b>-4.9</b>
<b>1991-95</b>	<b>.114</b>	<b>2.6</b>	<b>-.181</b>	<b>-5.0</b>
<b>1986(87)-90</b>	<b>.163</b>	<b>3.3</b>	<b>-.127</b>	<b>-2.2</b>

- **lags becoming less important for earnings over the shorter period (contrast the full period)**
- **constant underreaction to CFO**
- **therefore looks as if lags due to accruals are getting smaller over time!**