

2004 Auditing Doctoral Consortium

Experimental Economics Research in Auditing

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Outline of my talk

1. What is experimental economics?
2. How can we use it in auditing research?
3. The feedback loop

1. What is experimental economics?

- Economics is a **social science**
- Economists construct a setup that is **simpler** than the real world, yet retains the **fundamental** characteristic of the phenomenon they wish to understand
- Experimental economics uses a **controlled** environment to **test** the predictions of an economic model

2. How can we use it in auditing research?

An example:

Independence in Appearance and in Fact: An Experimental Investigation

Dopuch, King, Schwartz

Research Questions

Does the **appearance** of independence affect investors' **perceptions** of independence in **fact**?

Can investors “**see through**” a misleading appearance?

Market design

- At the beginning of each period the value of a share is drawn from a uniform distribution
- Investors receive an audit report estimating the value of the share
- Trade occur
- That value is revealed at the end of the trading period

Manipulation

- **Independence in Fact**

The audit report is biased, or not

- **Independence in Appearance**

Investors are informed that the auditor provides consulting services, or not

Manipulating Bias in the Reports

Period	1	2	3	4	5	6	7	8	9	10	11
No Bias	-5	+10	+0	-10	+5	+10	-10	+0	-5	+5	+0
Bias	-5	+10	+0	+15	+5	+10	+15	+0	-5	+5	+0

Report, History, and Perceptions

Experimental Market Screen

Your Opinion Please

Auditor's Report Day

Please answer the following questions.
Remember part of your payment depends on the accuracy of your answers.

What type of error do you think is in the auditor's report?
 Error without bias
 Error with bias

How confident are you in your answer to the above question?
 Very Confident
 Somewhat Confident
 Not Confident

My best estimate of the share value is:

News
News The auditor is providing other services to the venture capitalist. Such an auditor is commonly perceived to have a high likelihood of issuing reports with bias.

Today's Auditor's Report
The auditor reports the share's value as 183

Past Reports and Share Values

Day	Report	Value	Day	Report	Value
3	126	106			
2	132	122			
1	156	146			

Investors' Perceptions

Experimental Market Screen

Your Opinion Please

Auditor's Report Day Week

Please answer the following questions

What type of error do you think is in the auditor's report?

- Error without bias
- Error with bias

How confident are you in your answer to the above question?

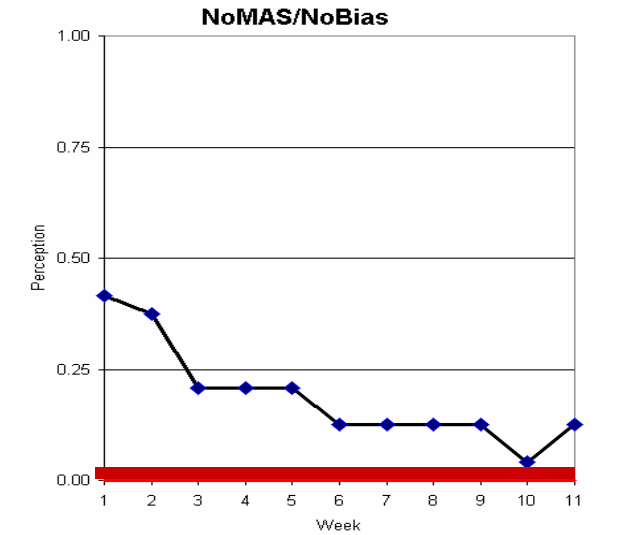
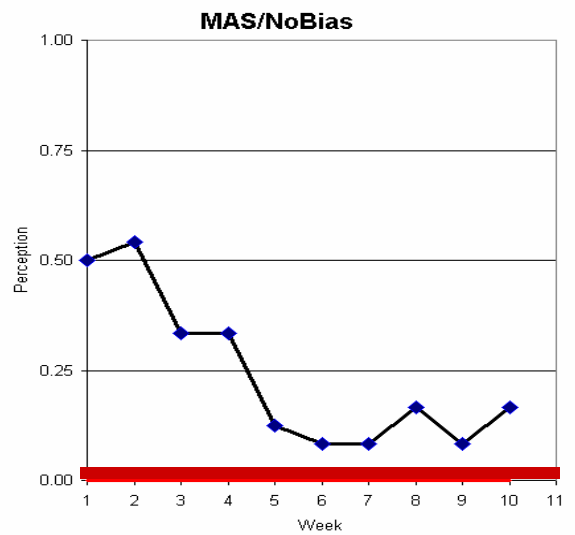
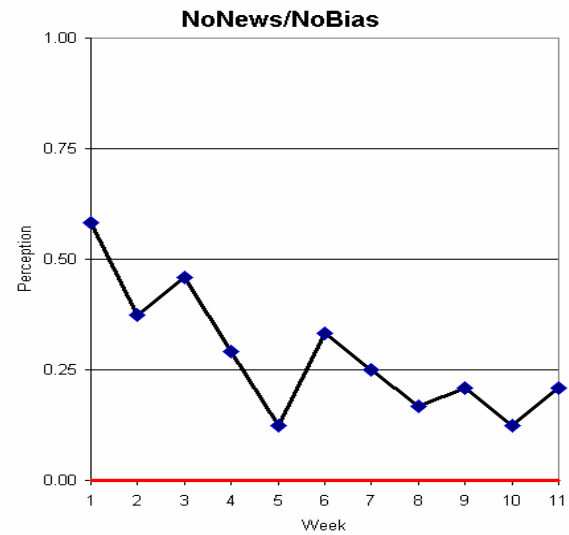
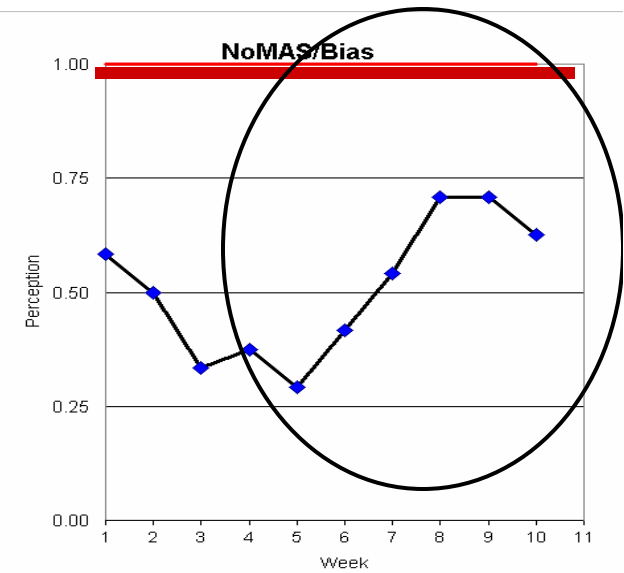
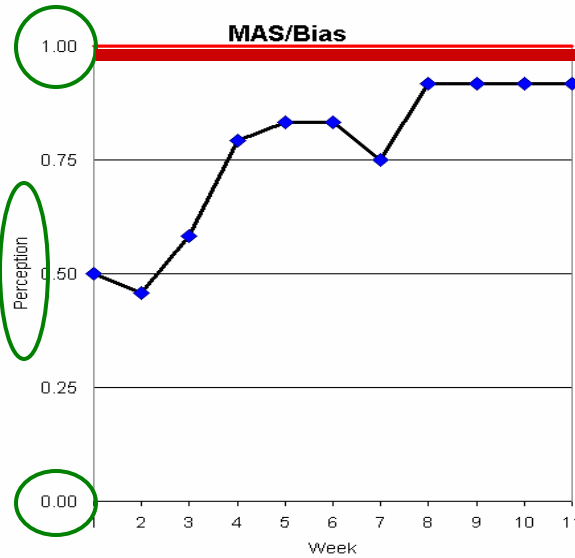
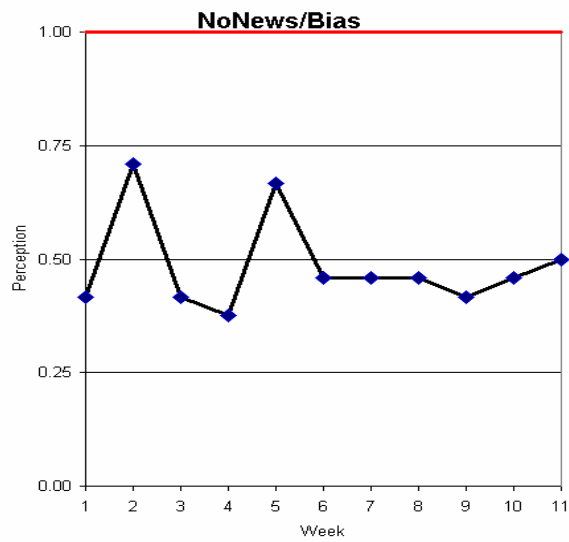
- Very Confident
- Somewhat Confident
- Not Confident

My best estimate of the share value is:

The SEC disapproves of auditors providing consulting services. Nevertheless, the VC hired this auditor to provide consulting services.

The auditor reports the share's value as 141

Results: Investors' Perceptions of Bias



Trading Screen

The screenshot shows an 'Experimental Market Screen' with the following components:

- Trading Panel (Green):** Action: Buy (selected) / Sell. Confirm button. Quantity: 4. Price: 170.
- Open Orders (Orange):** Double Click Order To Delete. Sell 4 @ 180.
- Your Transactions (last 10) (Pink):** Sold 6 @ 174 4/0:57.
- Account (Light Blue):** Shares: 2, Yesterday's Gain: 848, Cash: 3044, Bank: 2992.
- Timer (Yellow):** Day 4, 0:36.
- News (Light Purple):**

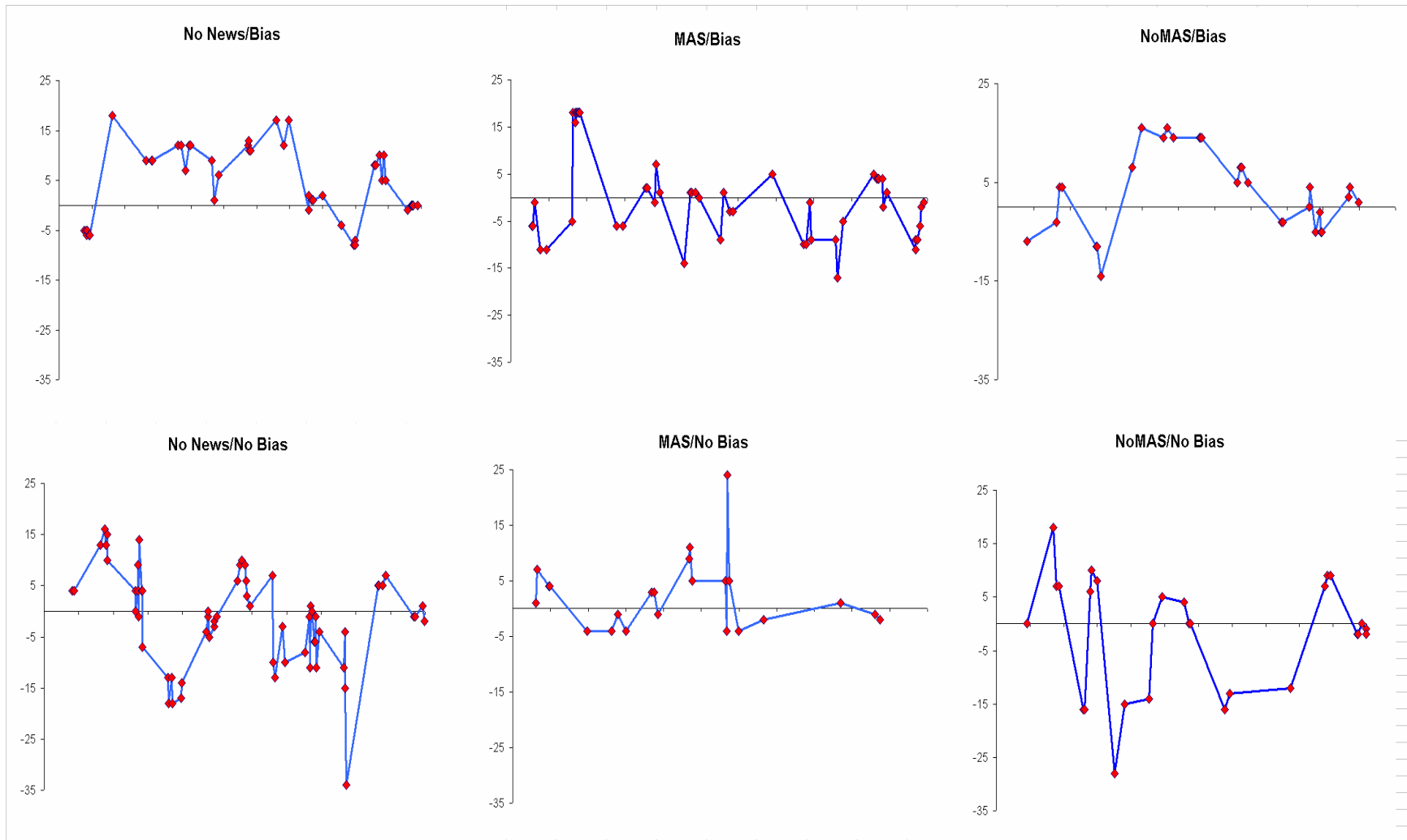
News
The auditor is providing other services to the venture capitalist. Such an auditor is commonly perceived to have a high likelihood of issuing reports with bias.

Today's Auditor's Report
The auditor reports the share's value as 183.

Past Reports and Share Values

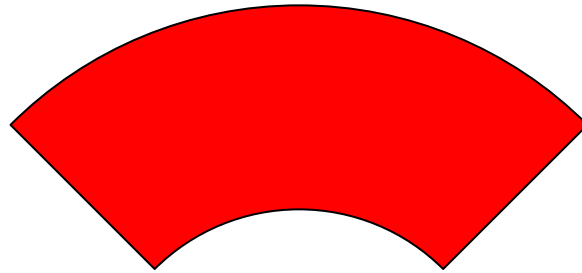
Day	Report	Value	Day	Report	Value
3	126	106			
2	132	122			
1	156	146			
- Quotes (Yellow):** Last Sale: 6 @ 174. BID/ASKED table with buttons to click for sell/buy at specific prices.

Results: Trading Prices



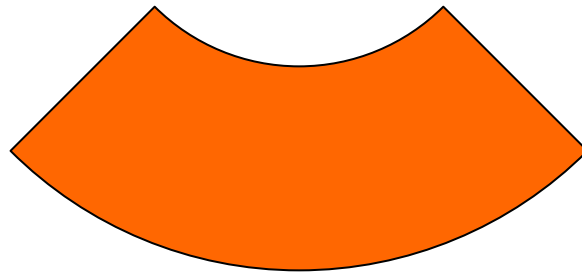


The feedback loop



Model

Experiment



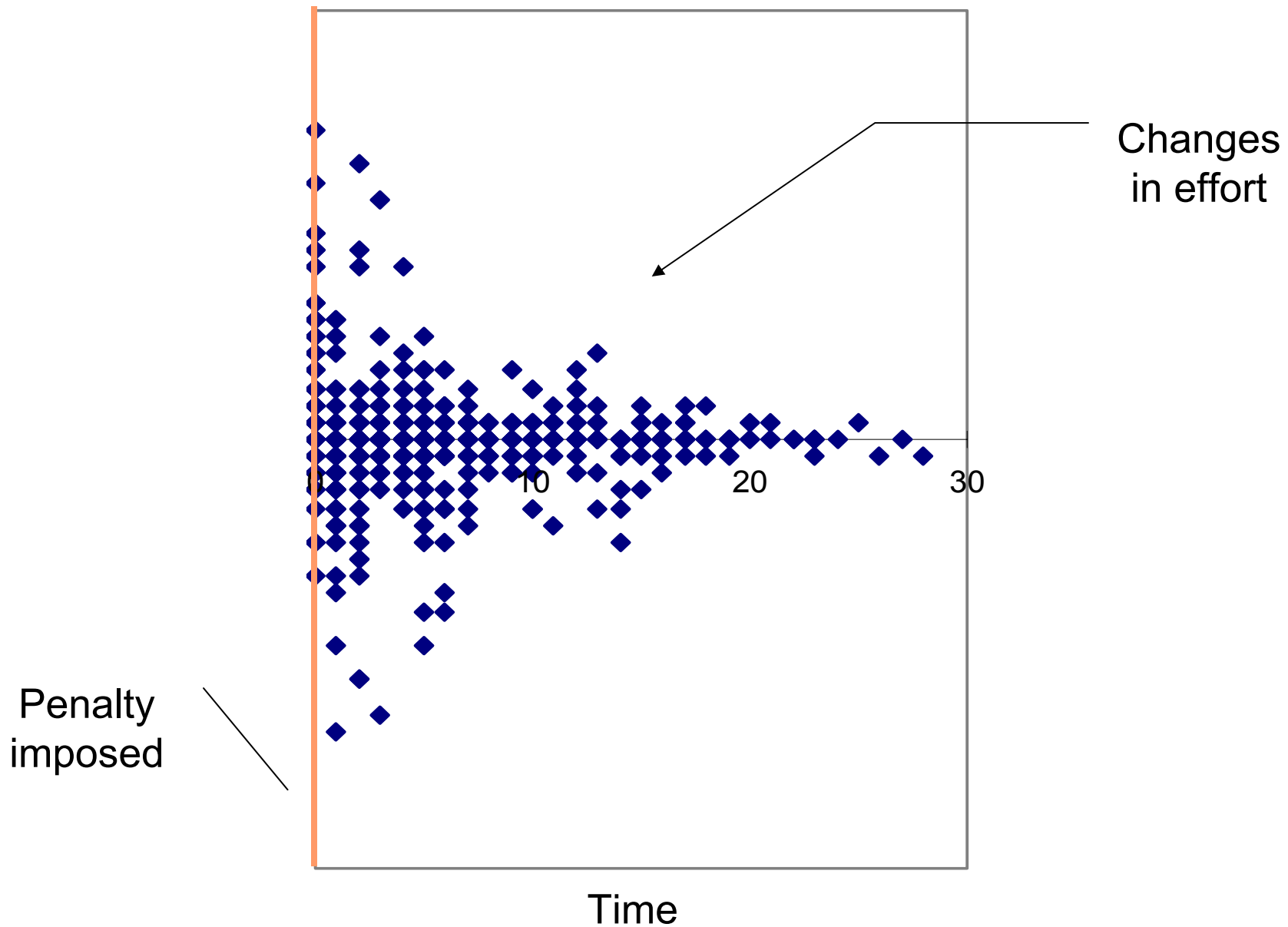
From an experiment to a model

**Learning legal regimes: an
experimental investigation**

King, Schwartz

- The research question was whether some legal regimes were easier/faster to learn than others
- We hypothesized that understanding more complex regimes would require more practice
- We did not anticipate any particular form of convergence

Results: The effect of penalty on effort



**Now fast forward to the restatements of
2000, 2001**

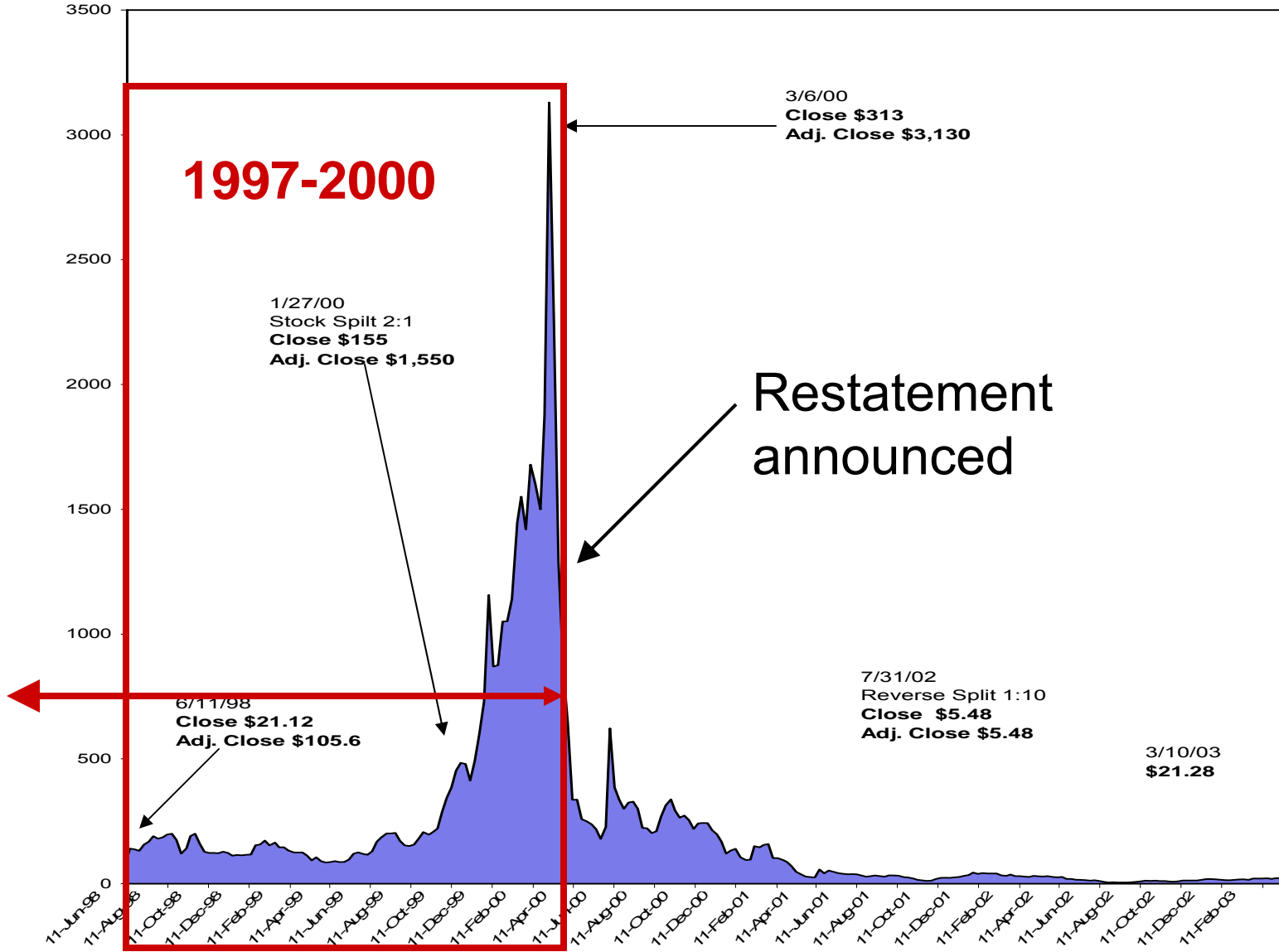
Microstrategy restates 1997-2000

Table 15: Selected Financial Data, 1997-1999

(Dollars in thousands)

Affected financial data	Fiscal year 1997	Fiscal year 1998	Fiscal year 1999
Net income, as reported	\$121	\$6,178	\$12,620
Net income (loss), as restated	(885)	(2,255)	(33,743)

MicroStrategy Adjusted Closing Price
(Adjusted for 2:1 Split on 1/27/00 and 1:10 Reverse Split on 7/31/02)
June 11 1998 - March 10 2003



Xerox Restates 1997-2000

Dollars in millions				
Affected financial data	Fiscal years			
	1997	1998	1999	2000
Revenue, as reported	\$18,225	\$19,593	\$19,567	\$18,701
Revenue, as restated	17,457	18,777	18,995	18,751
Net income (loss), as reported	1,359	273	1,339	(257)
Net income (loss), as restated	893	(167)	844	(273)

The static model cannot explain cyclical variations

$$q^* = \operatorname{argmin} C(q) + (1 - q) \cdot L$$

- $q_t^* = \operatorname{argmin} C(q_t) + (1 - q_t) \cdot L$

Dynamic Updating of expectations

- $q_t^* = \operatorname{argmin} C(q_t) + (1 - q_t) \cdot L_t$

Expected liability for time t:

$$L_t^e = \alpha_{t-1} \cdot L_{t-1} + \alpha_{t-2} \cdot L_{t-2} + \dots + \alpha_0 \cdot L_0$$

Final thoughts:

- **Most Important**

Work on research questions that you find exciting!

- **Helpful**

Work on questions that others might find interesting

- **Useful**

Work on a timely issues