

## Market efficiency in securities fraud cases

### Background

- ❑ US SEC Rule 10b-5 applies to statements made (or not made) in connection with securities trading.
  - Similar rules apply to initial offerings.
- ❑ The SEC can bring charges itself (acting on behalf of the government)
- ❑ Investors also have a *right of private action*.
  - They can sue the company, its officers, and others connected to an alleged fraud.

## The life cycle of a typical case

- ❑ Firm *D* announces that an accounting irregularity affecting past earnings. The stock price drops.
- ❑ A civil law suit is filed against *D*'s management claiming that the previously reported earnings were based on misstatements and omissions (in violation of 10b-5)
- ❑ The *plaintiffs* are all investors (a *class*) who purchased the stock over the *class period* (the time span encompassing the misstatements).
- ❑ In preliminary hearings, *D* argues for summary dismissal.
  - *D* argues that the case is completely without merit.
- ❑ If the dismissal is denied, the case moves on to the *discovery phase*.

- ❑ In discovery the plaintiffs' attorneys get access to *D*'s internal documents and emails.
  - They reconstruct timing of information (who knew what?, when?)
- ❑ Plaintiff proposes a *calculation of damages* based on the stock price reaction.
  - *D* propose alternative calculations.
  - Both sides often employ consultants as experts.
- ❑ The two negotiate a settlement.
  - The settlement amount is typically much smaller than the damages initially claimed.
  - The settlement includes compensation for the plaintiffs' law firm(s)
  - Very few of these cases wind up in a public trial; the settlement is not in the public record.

# Roka Bioscience (filed Dec 24, 2014)

UNITED STATES DISTRICT COURT  
DISTRICT OF NEW JERSEY

WEI DING, INDIVIDUALLY AND ON BEHALF  
OF ALL OTHERS SIMILARLY SITUATED,

Plaintiff,

v.

ROKA BIOSCIENCE, INC., PAUL G. THOMAS,  
AND STEVEN T. SOBIESKI,

Defendants,

Case No.:

**CLASS ACTION COMPLAINT  
FOR VIOLATIONS OF THE  
FEDERAL SECURITIES  
LAWS**

JURY TRIAL DEMANDED

- Note: this discussion is intended to illustrate, solely for educational purposes, various aspects of a typical 10b-5 class action. It does not represent an opinion on the overall merits of this particular case.

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5

## The essential allegations:

26. The Company held a conference call on November 6, 2014 to discuss the third quarter of 2014 financial results. Defendants Thomas and Sobieski were on the call. Defendants acknowledge on the call (i) that “revenue for the third quarter was flat compared to the second quarter of this year” and (ii) installments of the “Atlas Instruments did not increase during the third quarter.”

27. On this adverse news, Roka’s stock price plummeted by \$5.34 or 64%, closing at \$3.00 on November 7, 2014.

28. The Offering Documents were false and misleading because Defendants failed to disclose known trends and uncertainties about the Company’s sales. Defendants were aware of, but failed to disclose, the downward trend of demand for its Atlas System and its poor – or rather non-existent – sales when the Offering Documents were filed with the SEC.

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6

## Fischel's article "Use of modern finance theory..." (1982)

- ❑ Contrasts traditional and modern approaches taken by courts in handling securities fraud cases.
- ❑ In 1982 the US was in a transition.
- ❑ A few court cases had set a new direction.
- ❑ Fischel is arguing that this direction is sensible and desirable.

## A 10b-5 case must satisfy key legal requirements

- ❑ These requirements aren't explicit in the original law; they've arisen in successive judicial interpretations of the law.
- ❑ *Materiality*
  - Would a reasonable investor consider misstated or omitted fact important in making an investment decision?
- ❑ *Reliance*
  - Did the plaintiff actually rely on the misstated fact (or would have relied on the omitted fact) in making the purchase decision?
- ❑ *Causation*
  - Did the misstated/omitted fact cause the economic loss suffered by the plaintiff?
- ❑ *Damages*
  - What are the losses (dollar amounts) that can be attributed to the misstated/omitted fact?
  - In these cases, damages are compensatory, never punitive.

## The “traditional” approach

- ❑ Materiality
  - An expert (accountant or securities analyst) might argue that the misstatement or omission implied a large ( $\pm 10\%$ ?) difference in intrinsic valuation.
- ❑ Reliance had to be *direct*.
  - In the case of misstatement, the plaintiff might demonstrate that analysis and calculation prior to the purchase of the security used.
  - Omission: No argument generally needed.
- ❑ Causation and damages are based on expert calculation.

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9

## Fischel's critique

- ❑ Expert valuation opinions used to assess materiality, causality and damages are imprecise and subjective.
  - Different experts can come up with very different numbers.
- ❑ The burden of showing direct reliance is excessive.
  - Someone who purchased 100 shares would have to demonstrate that they read and understood all the financial statements.
  - And, in the case of a misstatement, that they used the misstated fact in making their purchase decision.

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10

## The “modern” approach

- ❑ Based on market efficiency
  - The price of a security fully reflects the information (and misinformation) available to the market.
- ❑ Efficiency is particularly important for reliance
  - By the principle of market efficiency, the market price reflected the information (including the misstatement).
  - The purchaser “relies generally on the supposition that the market price is validly set and that no unsuspected manipulation has artificially inflated the price, and thus indirectly on the truth of the representations underlying the stock price – whether he is aware of it or not, the price he pays reflects material misrepresentations.”
    - Fischel, quoting from the opinion in *Blackie v. Barrack*.
  - Indirect reliance (via the market price) substitutes for direct reliance.
  - Misstatements or omissions working through the market price constitute “a fraud on the market”

- ❑ Materiality
  - If a misstatement or omission affected the market price, then it is material.
- ❑ Causality
  - If the market price changes right after the corrective disclosure, and if there are no other developments that could account for the change, causation is highly likely.
- ❑ Damages
  - The change in value caused by a corrective disclosure measures the economic harm.

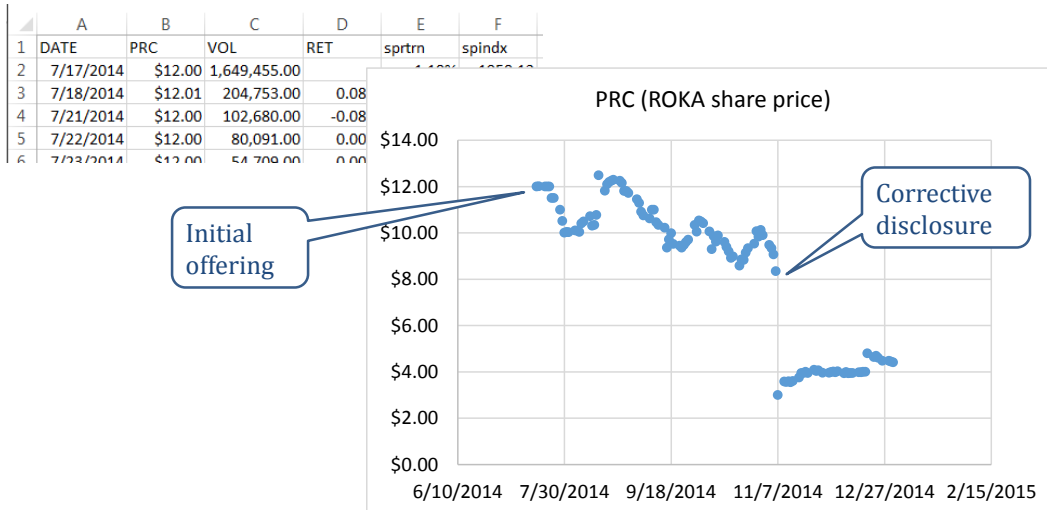
## The logic of the plaintiff's claim in Roka

- ❑ Roka's Nov. 6 conference call is claimed to be a *corrective disclosure*
- ❑ "They previously told us *x*. Now they're telling us *y*. The stock price dropped by \$5.34."
- ❑ So prior to this correction, the value of the stock was improperly inflated by \$5.34.

## Important

- ❑ This discussion describes the logic of the plaintiff's claim, not its overall merits.
- ❑ We won't be analyzing the *offering materials* (like the *prospectus*)
- ❑ For example, if the prospectus contained a statement like, "There is substantial risk that the firm will not be able to sell any additional units," it would be difficult for the plaintiffs to claim that they were misled.
- ❑ There will be extensive argument about whether or not the warnings in the prospectus covered the adverse outcome.

## *dsfSubset.xlsx*, worksheet ROKA



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15

## Analysis

- ❑ What was the class period?
- ❑ What are the damages per share?
- ❑ Who was harmed?
- ❑ What are the total damages?

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16



## Class period

### NATURE OF THE ACTION

1. This is a federal class action brought individually and on behalf of all other persons and entities who purchased or otherwise acquired Roka securities pursuant or traceable to the Company's initial public offering, which commenced on or about July 17, 2014 (the "IPO" or "Offering"), including those who purchased or otherwise acquired Roka common stock between July 17, 2014 and November 6, 2014, inclusive (the "Class Period"); seeking to recover damages

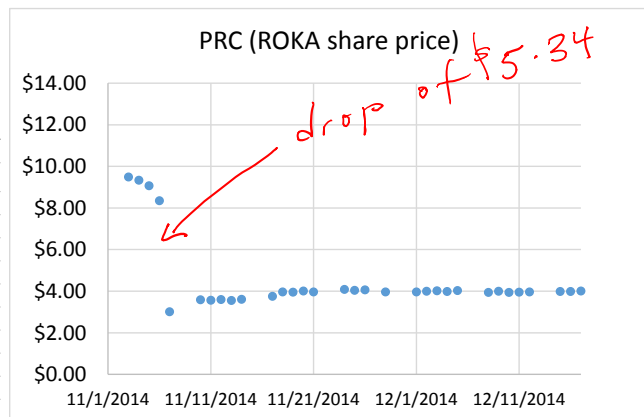
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17

## Damages per share

1	DATE	PRC	VOL	RET	sprtrn	spindx
2	7/17/2014	\$12.00	1,649,455.00		-1.18%	1958.12
78	11/3/2014	\$9.48	8,995	-4.24%	-0.01%	2017.81
79	11/4/2014	\$9.33	5,958	-1.58%	-0.28%	2012.10
80	11/5/2014	\$9.06	11,774	-2.89%	0.57%	2023.57
81	11/6/2014	\$8.34	36,774	-7.95%	0.38%	2031.21
82	11/7/2014	\$3.00	2,469,012	-64.03%	0.03%	2031.92
83	11/10/2014	\$3.58	1,125,866	19.33%	0.31%	2038.26
84	11/11/2014	\$3.56	239,975	-0.56%	0.07%	2039.68
85	11/12/2014	\$3.59	129,438	0.84%	-0.07%	2038.25
86	11/13/2014	\$3.55	130,688	-1.11%	0.05%	2039.33
87	11/14/2014	\$3.60	131,773	1.41%	0.02%	2039.82

$$\begin{array}{r}
 8.34 \\
 - 3.58 \\
 \hline
 \$4.76
 \end{array}$$



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18

## Who is entitled to damages?

- ❑ Class is “those who purchased ... between July 17 and November 6.”
- ❑ What are the damages to .... ?
  - Amy bought at the offering price (\$12) and sold at \$4 on Nov 20.
  - Brian bought at the offering price and sold on Nov 3 at \$9.48.
  - Callie purchased Brian’s shares and sold at \$4 on Nov 20.
  - Dan bought at \$11.50 on July 25, and sold at \$8.85 on Oct 21.

## Identifying the injured parties

- ❑ US Corporations don’t know the ultimate identities of the people who buy, sell, and hold their stock.
  - Most shares of stock are held “in street name”
  - We’ll know the broker or custody bank, but not the individual or institutional investor.
- ❑ In ROKA, the class period includes the entire life of the firm (up to the alleged fraud).
  - Anyone who held the stock at the close of Nov. 6 was harmed. (We can simply look at the number of shares outstanding.)
- ❑ In most cases, there will be many investors who purchased the stock before the fraud and continued to hold it through the period of corrective disclosure.
  - They haven’t suffered a loss caused by the fraud.
- ❑ We need a model of ownership and trading behavior to estimate the number of investors who were actually harmed.

Fischel: possible objections to the “fraud on the market” approach

- *The approach encourages uninformed investors, discourages analysis, and therefore makes the market less efficient.*
  - “I know that if management makes some misstatement of fact that I didn’t read or hear about, I’ll still get compensated.”
- Fischel: Large investors will still engage in analysis to spot and profit from any misvaluations.

- *The approach is unfair to investors who relied on the information and expected higher returns.*
  - Are investors entitled to expectation or benefit of bargain damages?
- Fischel:
  - The courts traditionally a “reasonable man” test.
    - What would have been the loss to a reasonable man who relied on the information?
  - The “so-called reasonable man” in this case *is the market*.

- ❑ *Unfairness to investors who suffer losses unrelated to the alleged wrongful conduct.*
  - ❑ Recall: “Brian” bought ROKA at the offering price (\$12) and sold on Nov 3 at \$9.48.
  - ❑ By the fraud on the market principle, he bought *and* sold during the period of “inflated valuation”, and so was not harmed.
- ❑ Fischel: plaintiffs *shouldn’t* get compensated for losses that aren’t connected to the alleged wrongful conduct.

- ❑ *The approach is not consistent with a recent [pre-1982] trend by the Supreme Court to restrict 10b-5 liability.*
- ❑ Fischel:
  - The standard that the alleged wrongdoing affected the market price sets a clear and high bar.
  - “In all probability, therefore, the effect on the market price approach will decrease the overall amount of litigation under rule 10b-5.”

- ❑ *The approach is not consistent with the principle of optimal deterrence.*
  - “Optimal deterrence:” a penalty should reflect the social cost of the misconduct.
  - Someone who bought at an inflated price has losses, but the seller has equivalent gains. The net social cost is zero.
- ❑ Fischel: The costs of fraud are large.
  - Misstatements lead to a misallocation of resources.
  - Resources must be expended to distinguish fact from fiction.

## Causality

- ❑ The ROKA claim attributes the entire stock price decline subsequent to the disclosure to the disclosure.
- ❑ Was there something else happening that day?
- ❑ ... that might have accounted for the decline or a part of it.
- ❑ We should at least consider what happened in ...
  - The broader stock market.
  - The industry to which Roka belongs.
- ❑ For example, if the S&P 500 was down 10% and an index of scientific equipment producers was down an additional 8%, a substantial portion of ROKA's decline could be attributed to causes *besides* the disclosure.

## Materiality, causation and damages are handled by a statistical model

- Single-index model, also called the market model.
- We have a sample of returns on an individual stock (say, ROKA),  $r_{ROKA,t}$  for some time period,  $t = 1, \dots, T$  days.
- In ROKA's case, we have  $t$  ranging from July 17, 2014 to December 31, 2014.
- We also have the returns on the "market" (the S&P 500),  $r_{M,t}$  over the same time period.
  - Model is: 
$$r_{ROKA,t} = \alpha_{ROKA} + \beta_{ROKA} \times r_{M,t} + e_t$$
  - $\alpha_{ROKA}$  and  $\beta_{ROKA}$  are the intercept and slope of the best fit regression line;  $e_t$  is the regression residual ("prediction error")

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27

## The single-index / market model for stock "i"

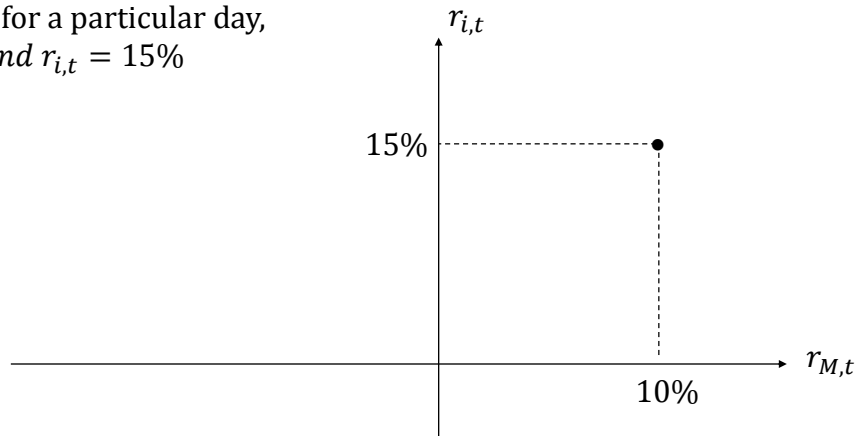
- $r_{i,t} = \alpha_i + \beta_i \times r_{M,t} + e_t$ 
  - $\alpha_i$  (alpha) is the intercept
  - $\beta_i$  (beta) is the slope (of the best fit regression line, also called the security characteristic line)
  - $e_t$  is the regression residual ("prediction error")
- Typical uses
  - We can use the Capital Asset Pricing Model (CAPM) Security Market Line (SML) to obtain the expected (risk-adjusted) return on the stock  $Er_i = r_f + (Er_M - r_f)\beta_i$
  - Beta will also be used to set up hedged portfolios that remove market risk.

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28

## Scatterplot of daily returns, $r_{i,t}$ vs $r_{M,t}$

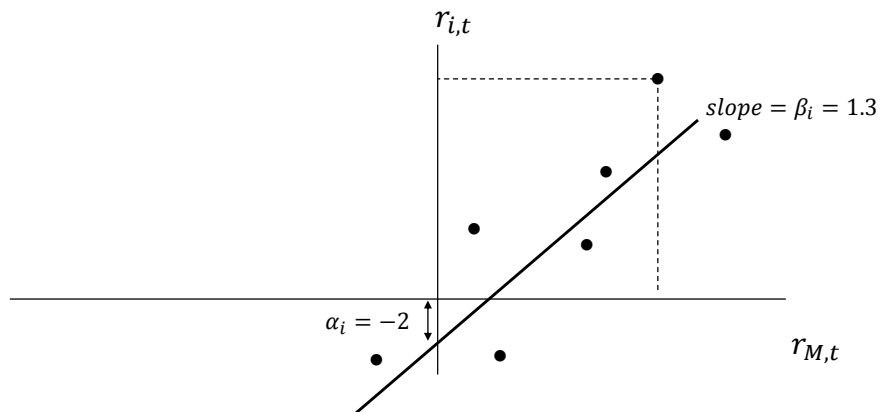
Suppose that for a particular day,  
 $r_{M,t} = 10\%$  and  $r_{i,t} = 15\%$



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29

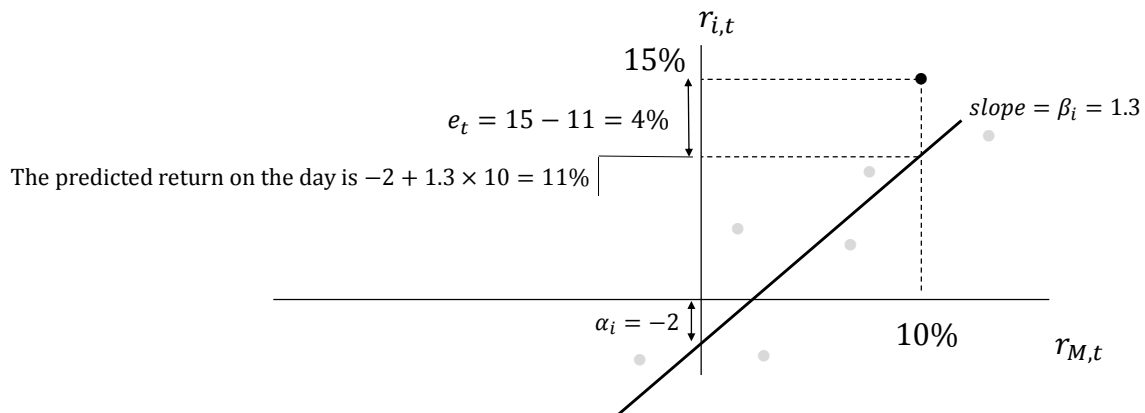
Add more observations and a the best fit line ...



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30

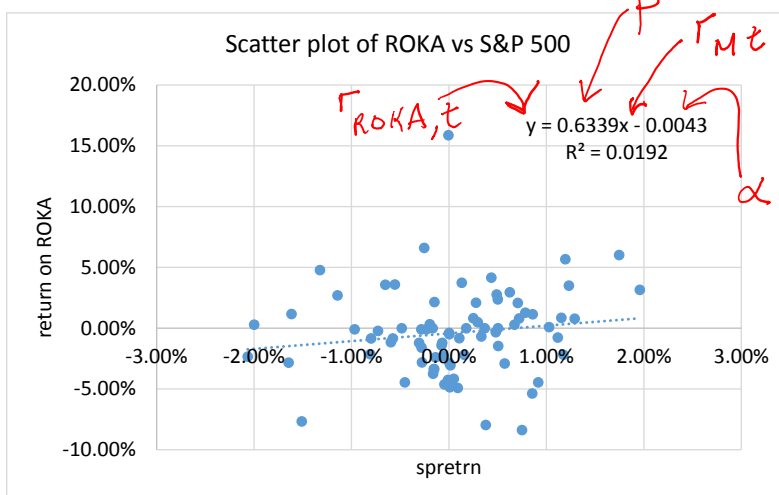
## Interpretation of one observation



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31

## dsfSubset.xlsx, worksheet ROKA (ex Nov 7, 10)



The estimated beta is  $\beta_{ROKA} \approx 0.63$ ,  
But the quality of the fit is poor ( $R^2 \approx 2\%$ ),  
So we conclude that the market doesn't add much explanatory power.

- Note: this is an Excel "X Y (Scatter)" plot. Add a "linear trendline" and add the equation of the trendline.

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32



## Proposed damage calculation

- Recall that the market price dropped by \$5.34 immediately, but then rose by \$0.58 the next day.
- We'll use  $\$5.34 - \$0.58 = \$4.76$  as the cost (per share) of the corrective disclosure.
- ROKA had about 17 million shares outstanding.
- $\$4.76 \times 17 \text{ Million} \approx \$81 \text{ Million}$  is the total value loss associated with the disclosure.

## The case of ChunkyChocolates (ticker symbol CCO).

- Jan 2. CCO stock is trading at \$10 per share.
- Jan 5. The CEO says, "I can confidently look forward to a day when every school child, every day, in every country of the world packs a one-pound ChunkoBar in his or her lunchbox."
  - Most people take this as an empty boast. CCO stock continues trading at \$10 per share.
  - George believes the CEO, and sets up a spreadsheet that forecasts earnings will triple. He thinks the stock is worth \$30 per share. He buys at \$10/share, thinking "Wow. They're really going to sell a lot of chocolates."

- ❑ Jan 10. A harsh warning from the US Dentist General on the effects of excessive chocolate consumption sends CCO down to \$6.
- ❑ Jan 15. The CEO says, “Okay, I exaggerated. Maybe the kids will alternate with an apple or something.”
  - There is no reaction to this announcement: CCO stays at \$6.
- ❑ Jan 20. George sues. “The CEO lied about a material fact. I made earnings forecasts based on the CEO’s initial statement. I thought the stock was worth \$30. With his corrective disclosure, I now think the stock is worth \$3, and I’ve got the spreadsheets to prove it. I’ve lost \$27 per share.”
- ❑ Evaluate reliance, materiality, causality, and damages ...
  - From the “traditional/conventional” perspective
  - From the “modern” efficient markets perspective