

BEHAVIORAL FINANCE

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*Maine Bankers
Association
Trust & Wealth
Management Conference*

May 4, 2011

Subfields of Finance

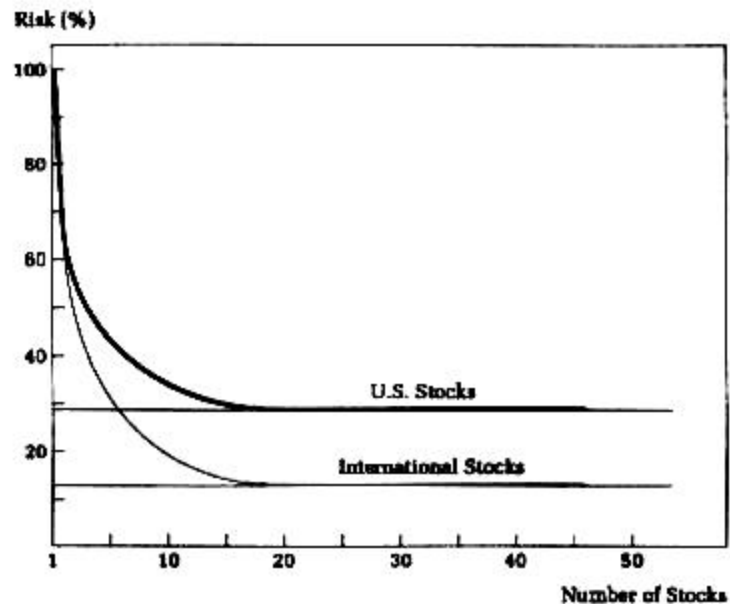
- Theoretical Finance
(*what should be*)

$$C - P = S - \frac{K}{(1+r)^T}$$

Subfields of Finance

- Empirical Finance
(what actually happens)

The Benefits of Diversification



Subfields of Finance

- Behavioral Finance
(our own reality show)

“It is a commonplace of the market that an issue will rise more steadily from 10 to 40 than from 100 to 400.”

Graham and Dodd

Security Analysis, 1962

Basic Valuation

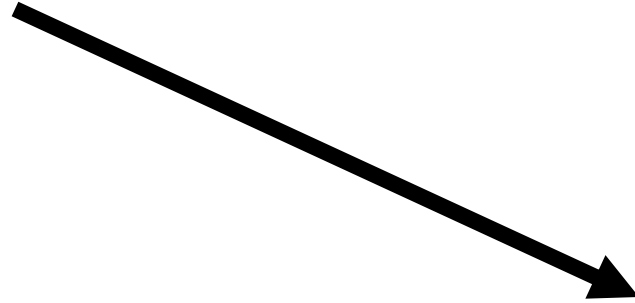
$$P_0 = \frac{E_1(1-r)}{K-g}$$

- P = stock price
- E = after-tax earnings
- R = earnings retention rate
- K = cost of equity
- g = dividend growth rate

In words,

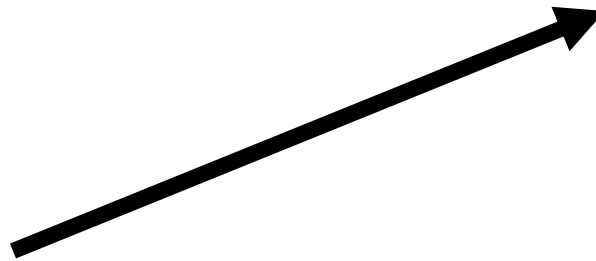
$$\text{Stock Value} = f \left[\frac{\text{future earnings}}{\text{discount factor}} \right]$$

Making something people want and selling it at a profit.



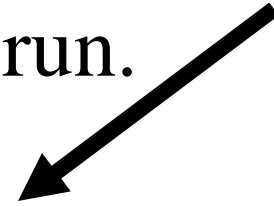
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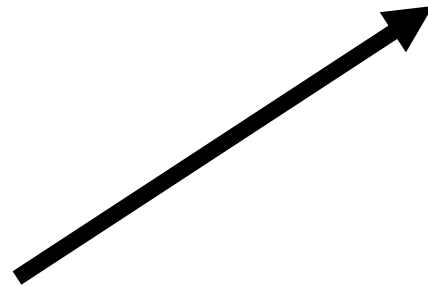


Determined by interest rates and investor psychology.

Most important in the long run.



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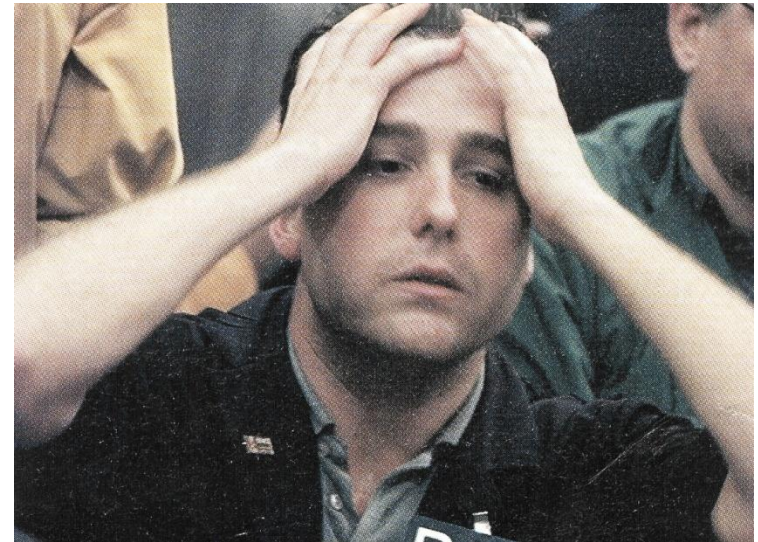


Most important in the short run.

“If the market is going up, people expect it to continue to go up. But if it goes up for, say, six months without a correction, people get nervous. They kind of expect the market will go up over time, but not straight up. They find a correction a relief. So the next time the market gets up to the 8,000 level, people will feel we are on solid ground. We’ve had a correction. The prices are reasonable.”

Meir Statman, after the market
pullback in September 1987

Behavioral finance investigates changes in investor psychology that can affect the denominator and cause prices to change.



PORTFOLIO SELECTION*

HARRY MARKOWITZ
The Rand Corporation

THE PROCESS OF SELECTING a portfolio may be divided into two stages. The first stage starts with observation and experience and ends with beliefs about the future performances of available securities. The second stage starts with the relevant beliefs about future performances and ends with the choice of portfolio. This paper is concerned with the second stage. We first consider the rule that the investor does (or should) maximize discounted expected, or anticipated, returns. This rule is rejected both as a hypothesis to explain, and as a maximum to guide investment behavior. We next consider the rule that the investor does (or should) consider expected return a desirable thing *and* variance of return an undesirable thing. This rule has many sound points, both as a maxim for, and hypothesis about, investment behavior. We illustrate geometrically relations between beliefs and choice of portfolio according to the “expected returns—variance of returns” rule.

One type of rule concerning choice of portfolio is that the investor does (or should) maximize the discounted (or capitalized) value of future returns.¹ Since the future is not known with certainty, it must be “expected” or “anticipated” returns which we discount. Variations of this type of rule can be suggested. Following Hicks, we could let “anticipated” returns include an allowance for risk.² Or, we could let the rate at which we capitalize the returns from particular securities vary with risk.

The hypothesis (or maxim) that the investor does (or should) maximize discounted return must be rejected. If we ignore market imperfections the foregoing rule never implies that there is a diversified portfolio which is preferable to all non-diversified portfolios. Diversification is both observed and sensible; a rule of behavior which does not imply the superiority of diversification must be rejected both as a hypothesis and as a maxim.

* This paper is based on work done by the author while at the Cowles Commission for Research in Economics and with the financial assistance of the Social Science Research Council. It will be reprinted as Cowles Commission Paper, New Series, No. 60.

1. See, for example, J. B. Williams, *The Theory of Investment Value* (Cambridge, Mass.: Harvard University Press, 1938), pp. 55–75.

2. J. R. Hicks, *Value and Capital* (New York: Oxford University Press, 1939), p. 126. Hicks applies the rule to a firm rather than a portfolio.

The notion that observation and experience matter in investment management is not new. Markowitz acknowledged this is step number one!

Behavioral Phenomena

- Mental accounting
- Representativeness heuristic
- Loss aversion
- Framing
- Anchoring
- Availability heuristic
- Illusion of truth
- Overconfidence

Mental Accounting

The tendency of people to separate their money into separate accounts based on subjective criteria (like its source).

You paid \$50 for a theater ticket. When you get to the theater, you discover you have lost the ticket. The seat was not marked, and you cannot recover the ticket.

Would you pay \$50 for another ticket?

46% of people will.

A Slightly Different Situation

You get to the theater and discover you have lost a \$50 bill. Would you pay \$50 for a ticket?

88% of people will.

Our clients are fond of:

- simultaneously having a low-interest savings account and maintaining a credit card balance
- some type of “money jar” for vacations, etc.
- separate accounts for investment and for speculation

Money is fungible. Regardless of its origin (i.e. found money) it is all the same.

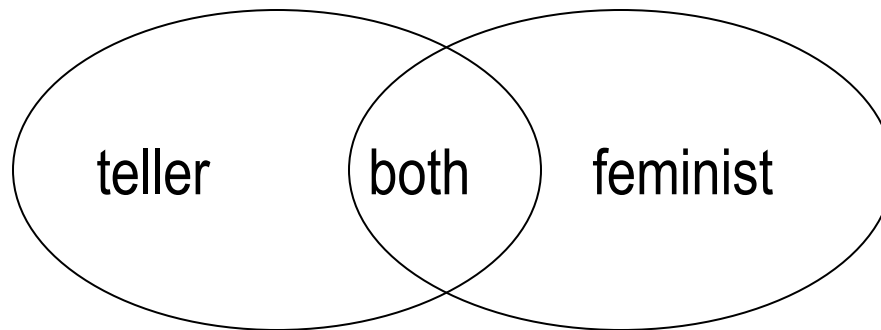
Representativeness Heuristic

Linda is 31 years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice and also participated in antinuclear demonstrations.

Which is more likely:

- 1. Linda is a bank teller.**
- 2. Linda is a bank teller and active in the feminist movement.**

87% of respondents believed that Linda was a teller AND a feminist, which, as a joint event, cannot possibly be more likely than one of the events by itself.



Loss Aversion

Choose between

1. A sure \$85,000
2. An 85% chance of receiving \$100,000 and a 15% chance of receiving nothing.

The majority of people take the sure option despite the fact that the two choices have the same expected outcome: \$85,000

This illustrates *risk aversion*.



Now choose between

1. A sure loss of \$85,000, and
2. An 85% chance of losing \$100,000 and a 15% chance of losing nothing.

Most people take the gamble;
this is *risk seeking* behavior.



Someone bought a stock for \$25;
it now sells for \$15.

- “I can’t sell it now; if I did I would take a loss.”
- “I don’t really have a loss unless I sell it.”
- “It is a good stock; it will go back up.”

This is an example of Loss Aversion

- With gains, we show risk *averse* behavior;
- With losses, we often show risk *seeking* behavior.

We also view unrealized losses as less important than “actual” losses.

Investor Behavior

Most people sell winners too early and ride losers too long. This is explainable by


- Mental accounting and
- Loss aversion

Identify the Phenomenon:

- “We’ve already put \$200,000 into this project. If we quit now the money is wasted.

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- **Mental accounting**
(sunk costs should be viewed as water over the dam)

- 
- “Why did I buy this stock, you ask? I bought it principally because it is a good company. My brother works for them and loves the place.”

- “Why did I buy this stock, you ask? I bought it principally because it is a good company. My brother works for them and loves the place.”

- **Representativeness Heuristic**


(There is a big difference between a good company and a good investment.)

- 
- Nick Leeson, an experienced and seasoned futures trader, brought down Barings Bank by taking uncharacteristically large speculative positions.

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- **Loss aversion**

(He exhibited risk seeking behavior and tried to make his losing positions go away.)

- 
- “I bought the stock at \$45 and it is down to \$30. I can’t afford to sell it now because I would take a loss.”

- “I bought the stock at \$45 and it is down to \$30. I can’t afford to sell it now because I would take a loss.”

- **Mental Accounting**

(The shares are only worth \$30 regardless of whether or not he sells them.)

Risk Aversion & Prospect Theory

- Being risk averse does not mean you won't take a risk.
- It means people only take a risk when there is a good reason to do so.

Your portfolio value is \$260,000; you must choose between:

- \$260,000 for sure
- An even chance of having \$275,000 or \$250,000.

Most people would take the \$260,000 for sure. The chance at an additional \$15,000 does not offset the lost utility from a \$10,000 reduction.

This is *risk averse* behavior.

Consider a different frame of reference:
Your portfolio is worth \$275,000.

- \$260,000 for sure
- An even chance of \$275,000 or \$250,000.

In this scenario, most people take the gamble.

This is *risk seeking* behavior.

Framing

- 600 will die unless:
 - Route A: 200 will be saved
 - Route B: one-third chance that 600 will be saved and two-thirds chance that none will be saved
- 600 will die unless:
 - Route A: 400 will die
 - Route B: one-third chance none will die and two-thirds chance that 600 will die

- A loss is easier to take when it is an increment to a larger loss.

- It is easier to pay \$4,500 for something you thought was going to cost \$4,400 than it is to pay \$100 for something you thought was going to be free.

The monetary loss is the same in both cases.

Anchoring

Retiree to Trust Officer:

“Stock in the company where I used to work is \$80. It was \$160 in 1980. I don’t want to sell now.”

Trust Officer:

“Then why don’t you sell your house? It is worth \$1 million today and you bought it in 1975 for \$48,000, so the real value is only \$48,000.”


The customer is anchored at the \$160 price.

Availability Heuristic

- The contention that things that are easier to remember are thought to be more common.

Question:

In English prose, does the letter “k” typically appear in a word more often as the first letter or as the third?

- 
- *In English prose, does the letter “k” typically appear more often as the first letter or as the third?*
 - It appears in the third spot twice as often as in the first, but we store words in memory by the first letter, so these are easier to recall.

Illusion of Truth

- People tend more readily to believe things that are easier to understand than things that are more complicated.

Investors like stocks with a low P/E ratio because they prefer to buy low-priced stocks with high earnings.

Overconfidence

Almost all people think they are above-average automobile drivers.

Student survey results


		Average	STD	MIN	MAX	MODE
LEAST LIKELY	10. Filing for bankruptcy.	3.72	2.96	1	12	1
	13. Having one of your children sent to jail.	4.14	2.65	1	12	4
	9. Being fired.	4.94	3.07	1	12	1
	3. Getting mugged.	5.47	2.92	1	12	8
	15. Finding a \$100 bill on the ground.	6.17	3.36	1	15	8
	5. Having problems with your gums.	6.64	3.50	2	12	8
	14. Winning a prize in a random drawing.	6.69	2.99	1	11	8
	16. Having a house fire.	7.11	2.38	2	15	8
	1. Choosing the wrong career	7.28	3.61	1	15	5
	8. Being injured in an automobile accident.	7.28	2.51	3	14	8
	7. No nights in the hospital in the next 5 years.	7.72	3.77	1	14	8
	4. Developing cancer	7.81	2.52	2	12	8
	2. Being recognized with an award.	9.25	2.74	3	14	8
	6. Maintaining a constant weight.	9.25	3.89	1	15	8
MOST LIKELY	11. Getting promoted ahead of your contemporaries	9.42	2.10	5	13	8
	12. Being married to the same person forever.	11.11	3.21	3	15	13
		7.13				

Good (green) average = 8.52

Bad (red) average = 6.04

Innumeracy

- Special numbers
- Regression to the mean
- Extrapolation
- Gambler's fallacy
- Illusion of control



**A glass jar is full of marbles
numbered from 1 to 1,000.
Someone reaches in and pulls out
marble # 1,000.**

What are the chances of that?

Is Reward More Effective Than Punishment?

- “I’ve often praised people warmly for beautifully executed maneuvers and the next time they almost always do worse. And I’ve screamed at people for badly executed maneuvers and by and large next time they improve. Don’t tell me that reward works and punishment doesn’t. My experience contradicts it.”

Regression to the Mean

This explains why...

- brilliant wives have slightly duller husbands.
- great movies have disappointing sequels.
- very tall fathers have slightly shorter sons.
- disastrous presidents have better successors.

When flipping a coin, which sequence is more likely?

- A HHHHHHTTTTTTHHHHHH
- B HHTHTHHTHTTHTHTTTH

Using a nonparametric runs test,
sequence A has a Z score of 0.33;
sequence B has a Z score of 1.55

→ A is much more likely

Illusion of Control

- At the casino craps table, it is observable that shooters throw the dice harder if they need to make a higher number.
- Correspondingly, they give a more gentle toss if they want a low number.

Ambiguity Aversion

- Stanford jelly jar experiment
 - 21 varieties: didn't sell
 - Subset of 6 varieties: sold lots

**REDUCE DATA; TAKE STUFF OFF YOUR
COMPUTER SCREEN**

Key Points

- We behave differently when faced with a loss rather than a gain.
- We view certain economically equivalent outcomes as unequal.
- We form opinions based partially on non-financial asset attributes.

Two Fundamental Questions

- What will they pay in the future?
 - What will the other guy do?
-
- Behavioral finance can help us come up with better answers to these two questions.

Questions?

