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**Understanding & Applying Behavioral Finance:
Behavioral Biases and the Systematic Mispricing of Securities**

Presentation for

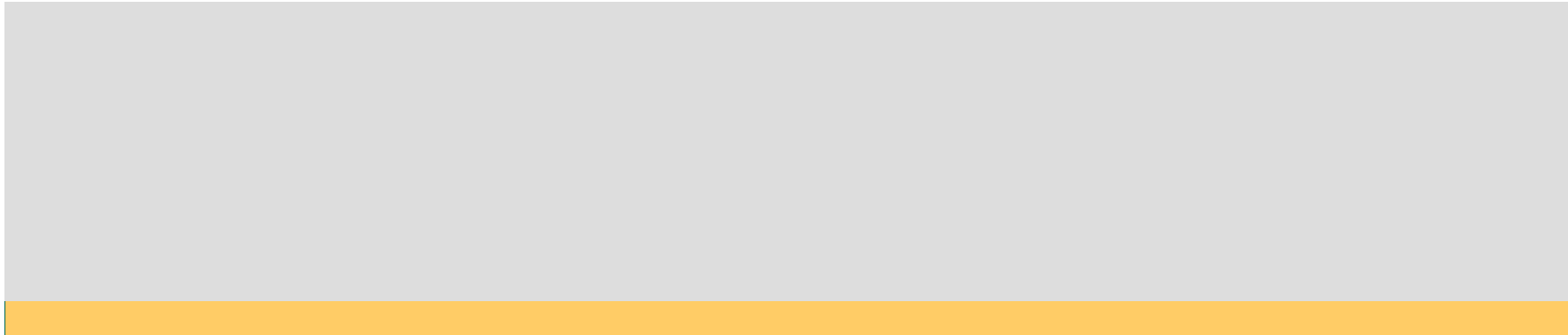
Research for the Practitioner VII:

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Investment Principles

First Principles: Expectations and Preferences Determine Stock Prices

- Stock prices are based on expectations, typically
 - forecasts of the future profitability of a company, or
 - forecasts of the risk associated with company profitability
- **Changes in expectations cause prices to change**
- When forming expectations, people use:
 - Information, and
 - Some procedures to analyze and process the information
- In processing information people may make systematic mental mistakes
- **These mental mistakes are typically due to behavioral biases**

Biased Expectations Cause Stock Mispricing

- Investors can mis-process new information by either **over-reacting** or **under-reacting** to new information
- In either case the market, or consensus, expectation regarding the future is biased

If the consensus expectations regarding a company's future are biased, the stock will be mispriced

Mental Mistakes Made by Investors

- Under-reaction to new information
 - Foundation of our growth process

- Over-reaction to old information
 - Foundation of our value process

Some Causes of Under-reaction

- Anchoring
 - Analysts tied to previous view or opinion
- Overconfidence
 - Investors place too much confidence in existing information and/or knowledge
- Disposition Effect
 - Investors hold losers too long and sell winners too early
 - The latter results in under-reaction

Some Causes of Over-reaction

■ Representativeness

- Based on a few characteristics, people tend to infer that a single observation is representative of the entire population
 - Source of the bias known as stereotyping

■ Saliency

- People tend to over-estimate probability of a low frequency event if they have recently heard such an event has occurred
 - Earthquake
 - Earnings miss

■ Prospect Theory

- Investors may be irrationally risk-averse in domain of losses

Preferences Also Determine Stock Prices

- Preferences affect the discount rate used to discount expected cash flows
- If the discount rate is “too large,” or “too small,” the stock will be mispriced
- Preferences can be affected by emotional factors to the extent that investors can be irrationally risk-averse, or irrationally risk-tolerant
- “Prospect Theory” by Kahneman & Tversky demonstrate how risk preferences can change in predictable ways

Biased Expectations and Biased Preferences

$$P_0 = \sum_{t=1}^n \frac{[E(CF_t)]}{(1+r)^t}$$

(Cognitive Errors)
Biased Expectations
Anchoring
Self-Attribution Bias
Disposition

Affect?

(Emotional Reaction)
Biased Preferences
Over-Confidence
Prospect Theory
Greed & Fear
Regret
Affect

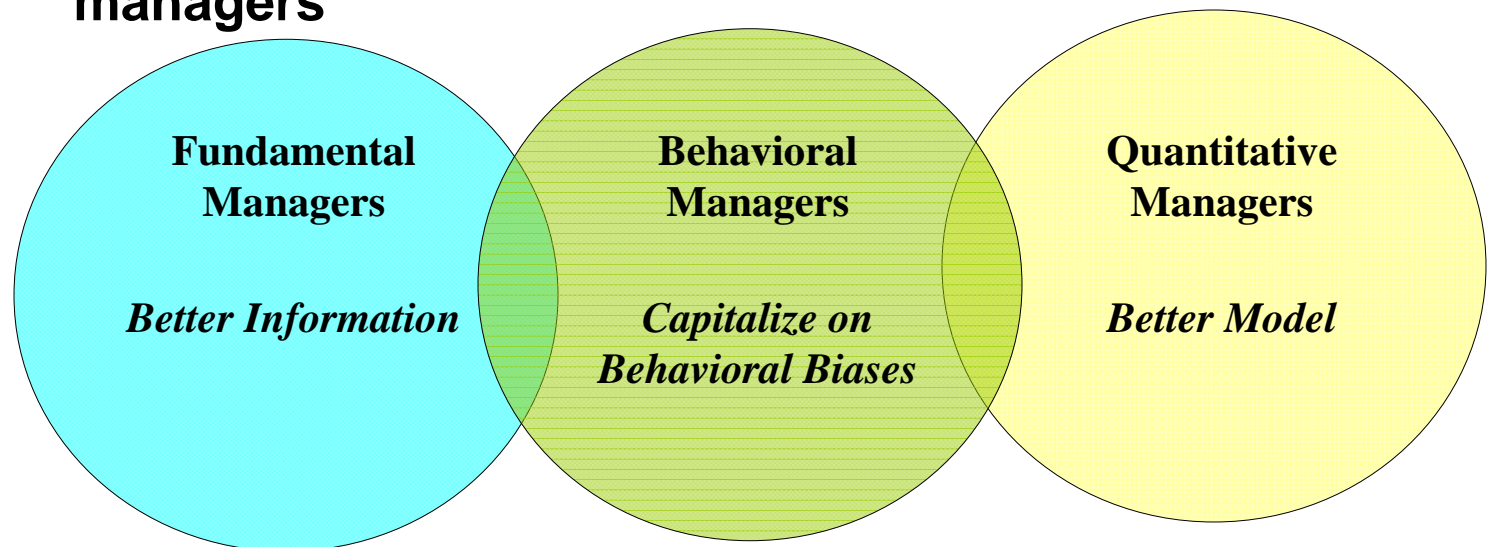
What Is Active Management?

- Active management is the business of trying to predict price changes
- Changes in the consensus expectations regarding the future prospects of a company will cause prices to change
- Changes in risk preferences will also cause prices to change

Therefore, ALL of active management is about predicting changes in expectations and/or risk preferences

The Three Sources of Alpha

- Develop a better information set – e.g., fundamental managers
- Develop a better model for analyzing the information set – e.g., quantitative managers
- Capitalize on behavioral biases (mental mistakes) which cause the market's expectations to be biased – **behavioral managers**



Can Behavioral Finance “Work”?

F&T Domestic Strategies

Strategy	Benchmark	Inception Date	Assets in Strategy ¹	Annualized Excess Return vs. Benchmark ^{1,2} (Net of Fees)
Small/Mid-Cap Growth ²	Russell 2500 Growth	Jan-92	\$687 M	6.63%
Small-Cap Value ²	Russell 2000 Value	Jan-96	\$384 M	3.25%
Small/Mid-Cap Core ²	Russell 2500	Jan-96	\$247 M	3.04%
Micro-Cap Core	Russell 2000/ Russell Micro-cap*	Jan-99	\$169 M	13.78%
Market Neutral	Citigroup 3-Month T-Bill	Feb-00	\$139 M	3.65%

¹As of 12/31/07. Assets in composites provided at end of presentation. ²Since inception. Net-of-Fees returns are estimated composite returns. ³Small/Mid-Cap Core assets are also counted in Small/Mid-Cap Growth & Small-Cap Value. Small-Cap Value strategy comprises of Small-Cap Value and Small-Cap Value Plus composite assets. Small-Cap Value strategy returns are based on Small-Cap Value composite returns. *The Russell 2000 was the benchmark from 1/1/1999 through 6/30/2005 and the Russell Micro-cap thereafter.

Past performance is no guarantee of future results. Please refer to disclosures at end of presentation.



**Investment Process
Growth (Under-Reaction) Strategy**

10 Question Quiz

For each of the following ten items, provide both a low and a high guess such that you are 90 percent sure the correct answer falls within your low-high range. Your challenge is to set a range that is neither too narrow nor too wide. If you successfully meet this challenge the correct answer should fall within your low-high range for nine out of the ten questions:

90 % Confidence Range

Low

High

- | | | |
|--|-------|-------|
| 1. Martin Luther King's age at death. | _____ | _____ |
| 2. Length of the Nile river, in miles. | _____ | _____ |
| 3. Number of countries that are a member of OPEC. | _____ | _____ |
| 4. Number of books in the Old Testament. | _____ | _____ |
| 5. Diameter of the moon, in miles. | _____ | _____ |
| 6. Weight of an empty Boeing 747, in pounds. | _____ | _____ |
| 7. Year in which Wolfgang Amadeus Mozart was born. | _____ | _____ |
| 8. Gestation period of an Asian elephant, in days. | _____ | _____ |
| 9. Air distance from London to Tokyo, in miles. | _____ | _____ |
| 10. Deepest known point in the oceans, in feet. | _____ | _____ |

Attila the Hun and Phone Numbers

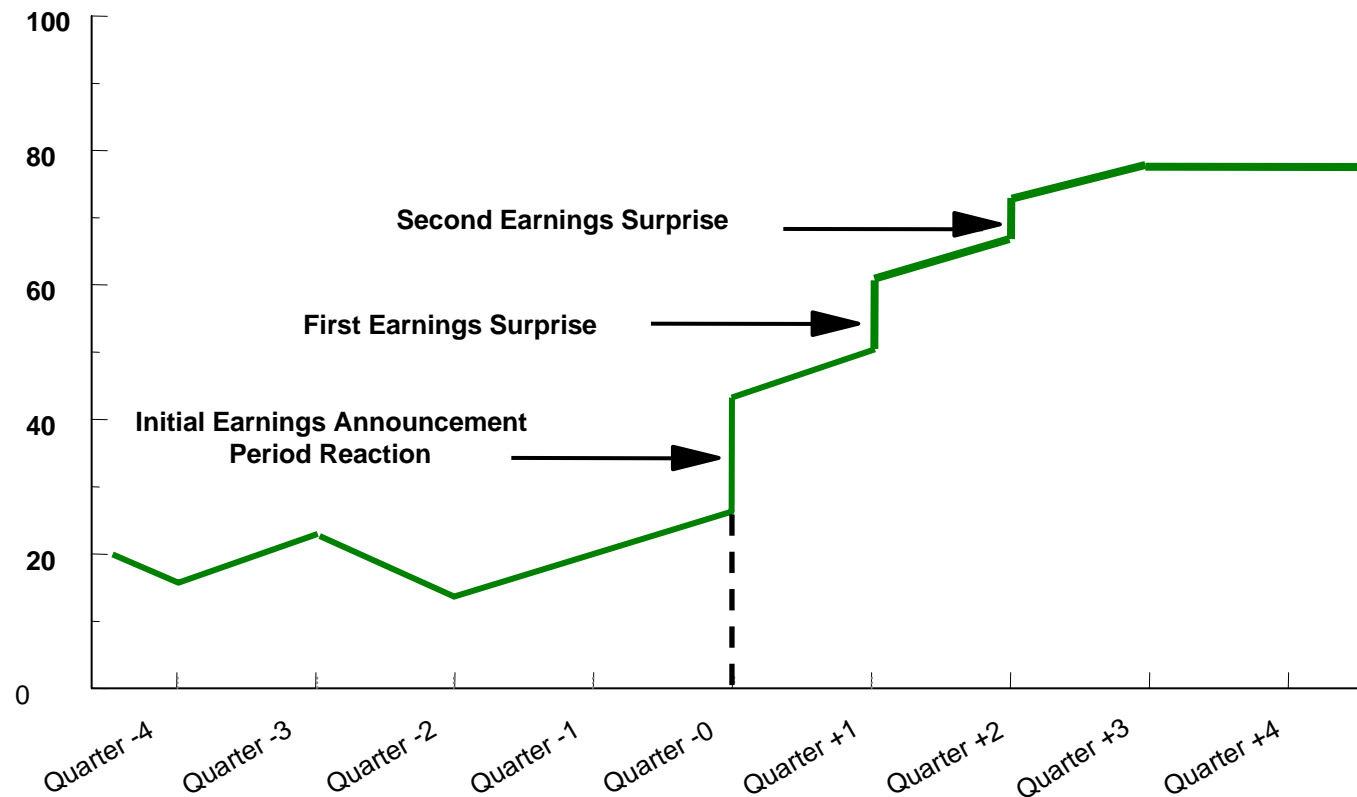
Representative Results:

Anchor	N	Mean answer
200-399	13	426
400-599	14	460
600-799	18	589
800-999	18	665
1000-1199	15	788

Correct Answer: 451 AD

Investment Process

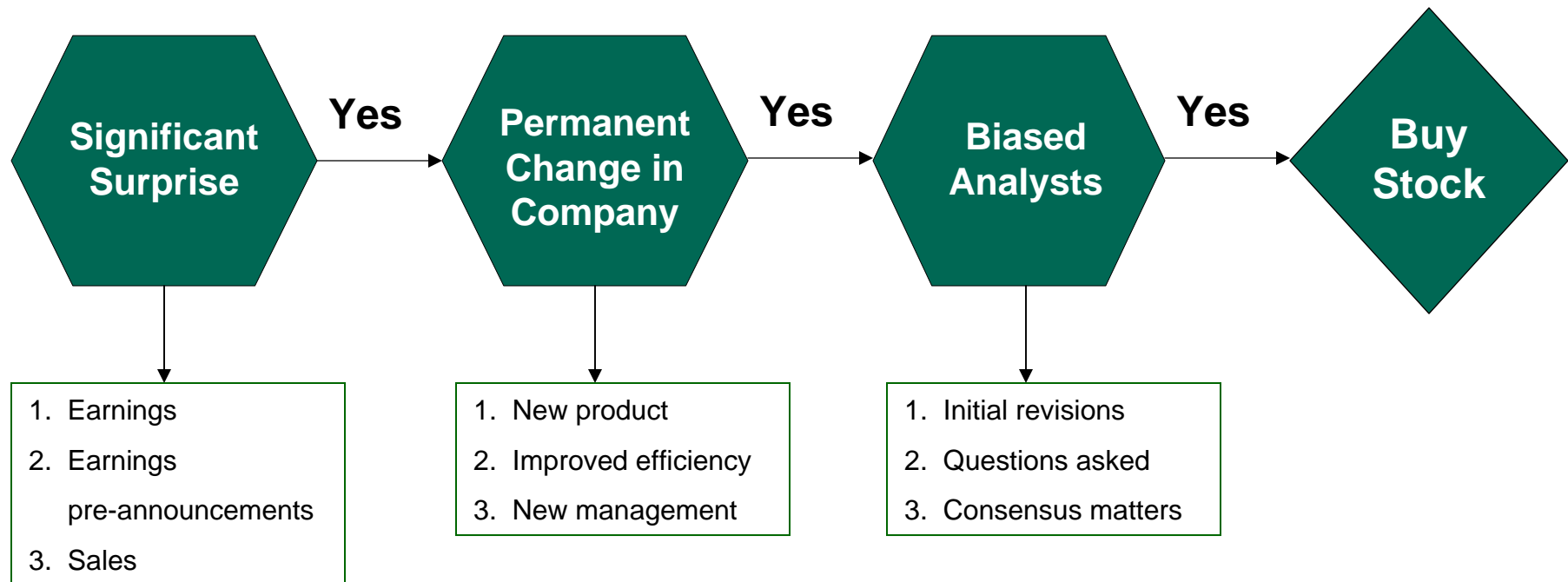
Ideal Growth (Under-Reaction) Stock Purchased (Illustrated Using EPS)



Actual results may vary.

Investment Process

Exploiting Under-reaction

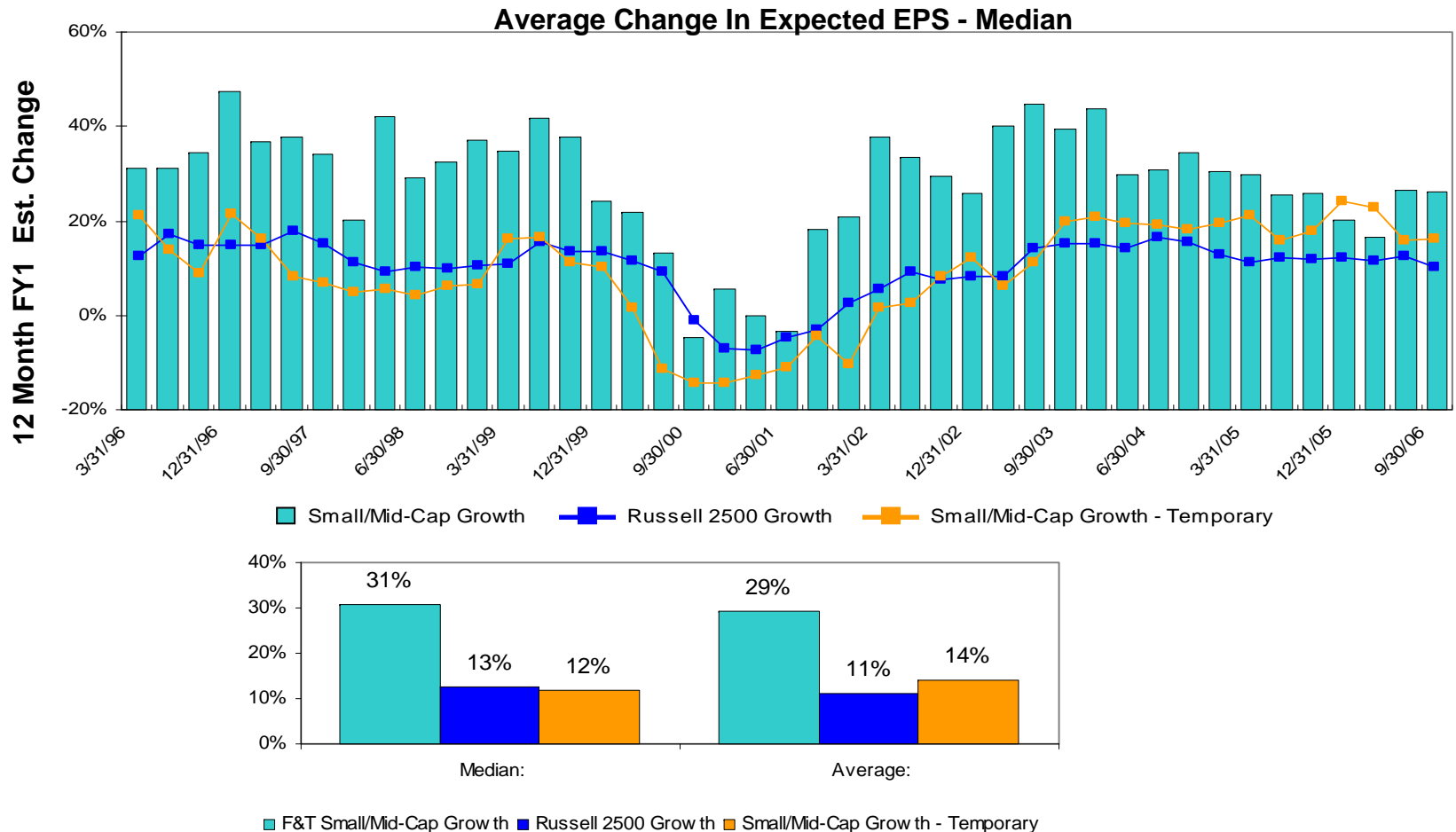


Investment Process

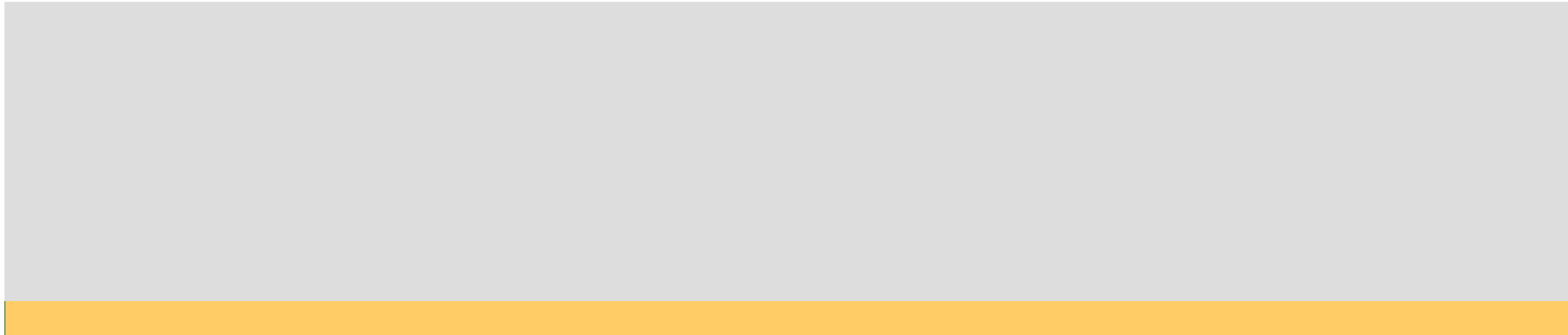
Sell Signals for Growth Strategy

- Earnings increase proves temporary
- Consensus estimates approximate actual earnings
 - No future earnings surprises
 - Negative earnings surprises

Beating the Benchmark: Strategy Generates Higher Subsequent Estimate Revisions



As of 9/30/06. The table shows the median analysts' estimated earnings revisions for securities in F&T Small/Mid-Cap Growth and in the Russell 2500 Growth Index as of the relevant times. Information is based on sources that Fuller & Thaler believes reliable; however, Fuller & Thaler does not guarantee the accuracy of the data from those sources. Please refer to the full disclosure at the end of this presentation.



**Investment Process
Value (Over-Reaction) Strategy**

A Brief Quiz

- You are given the following information:
 - Mary is quiet, studious, and very concerned with social issues. While an undergraduate at Berkeley, she majored in English literature as well as environmental studies.

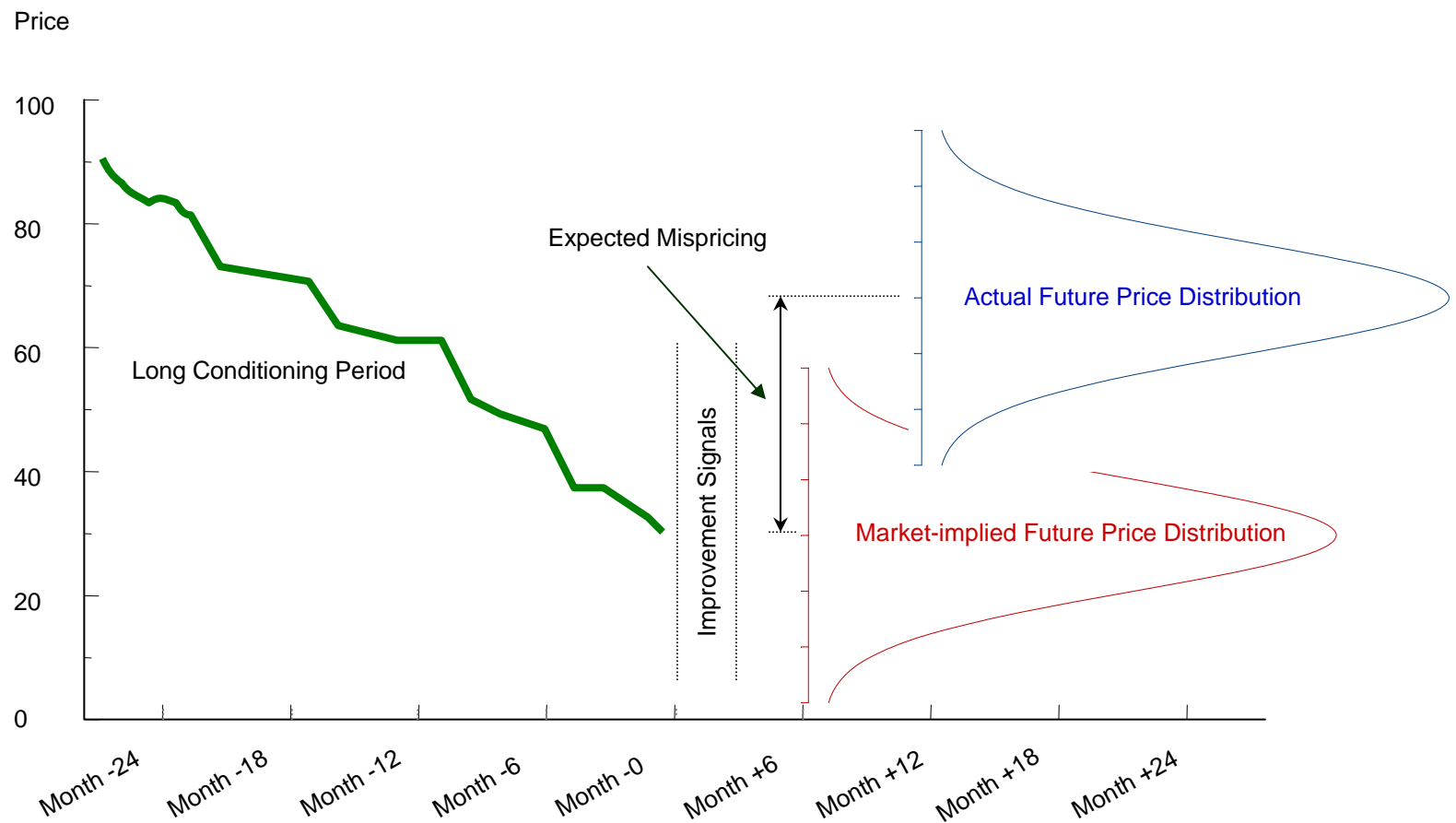
- Given this information, indicate which of the following three cases is most probable.
 - A. Mary is a librarian
 - B. Mary is a librarian and a member of the Sierra Club
 - C. Mary works in the banking industry

The Answer

- The best answer is “C” (Mary works in the banking industry) because there are so many more people employed by banks (even today!) than by libraries.
- If you chose answer “A” (Mary is a librarian) you are probably guilty of using the representativeness heuristic.
- The worst answer is “B.” You made a **pure error in probabilities** because the joint probability of being both a librarian and a member of the Sierra Club has to be smaller than the simple probability of being a librarian. **(This is also the most common answer!)**

Investment Process

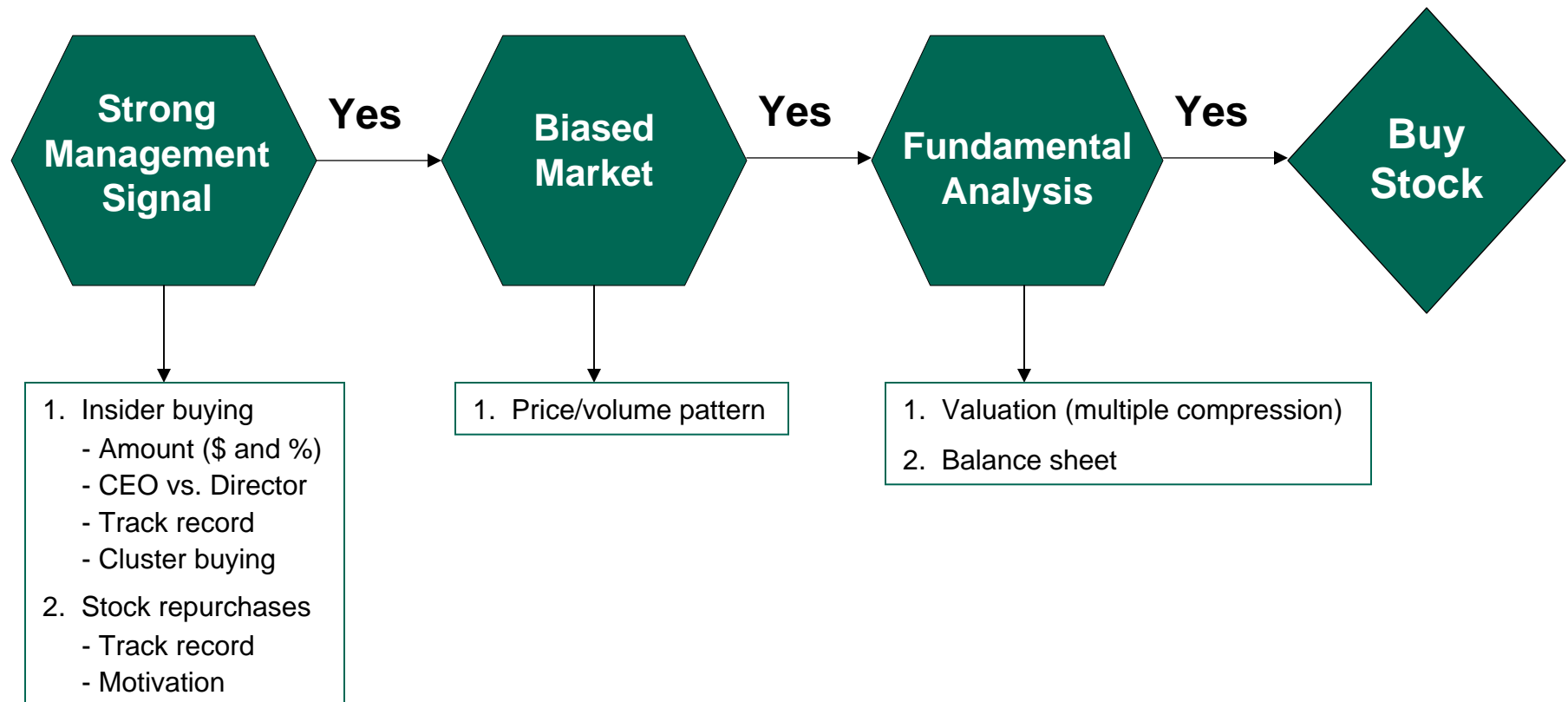
Ideal Value (Over-Reaction) Stock Purchased



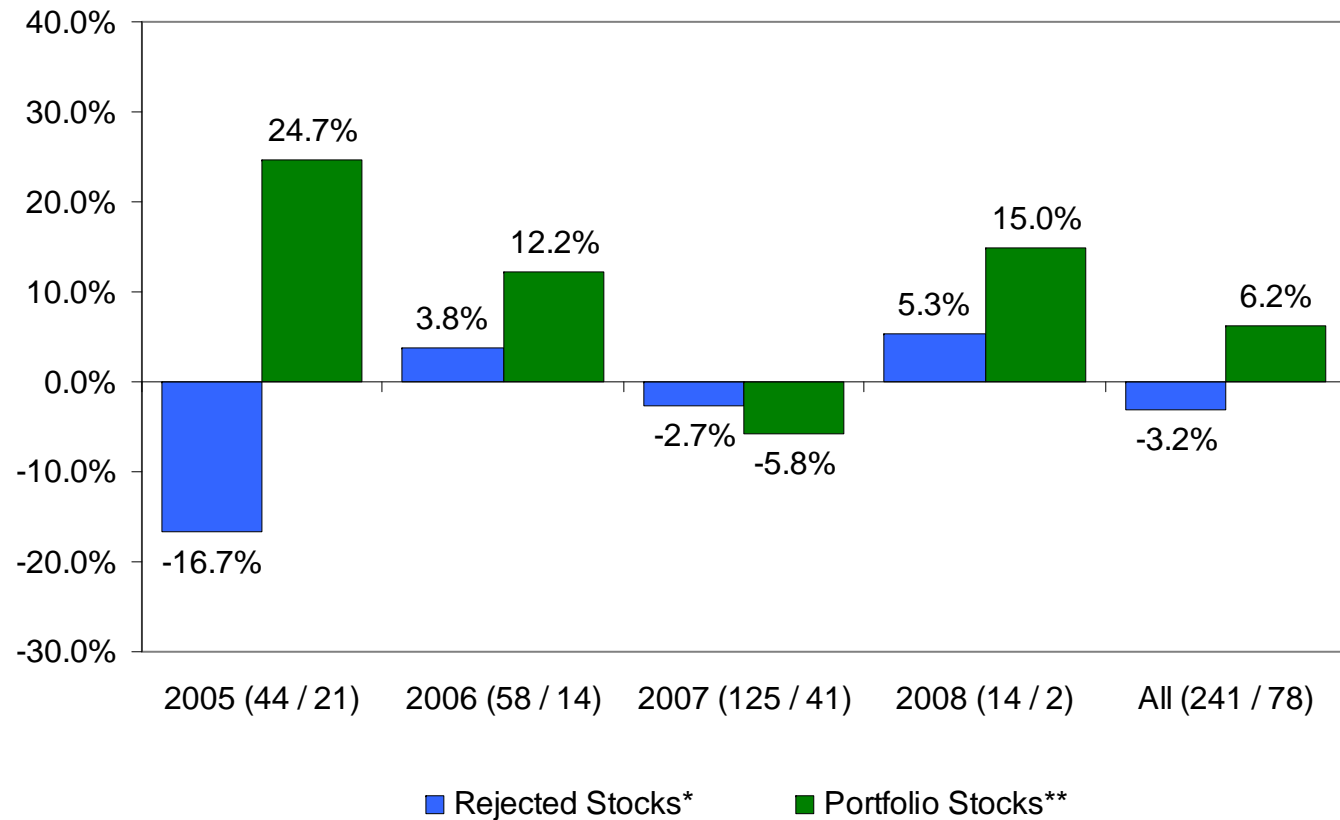
Provided solely for illustrative purposes

Investment Process

Exploiting Over-reaction



Small-Cap Value Insider Buy Excess Returns



*Data as of 2/13/08. Based on actual rejected stocks that passed conditioning period and minimum insider buying requirements. Database started 2/9/05. Excess returns are the unweighted average and are calculated against Russell 2000 Value benchmark at the time of purchase. No sales are assumed.

**Based on all stocks included since 2/9/05 in the Fuller & Thaler Small-Cap Value composite that were based on either pure insider signal or a mix of insider buy and share repurchase. Excess returns are the unweighted average and are calculated against Russell 2000 Value benchmark at the time of purchase. Excess returns are gross of fees.



Understanding the Sub-Prime Mortgage Mess

Understanding the Sub-prime Mortgage Problem

- There are three things you need to know to understand how the sub-prime mortgage problem was created:
 - 1. Asymmetric information
 - 2. Incentives, moral hazard and adverse selection
 - 3. A new innovation: How derivatives (securitization of mortgages in this case) increased #1 & #2 above

Some Definitions

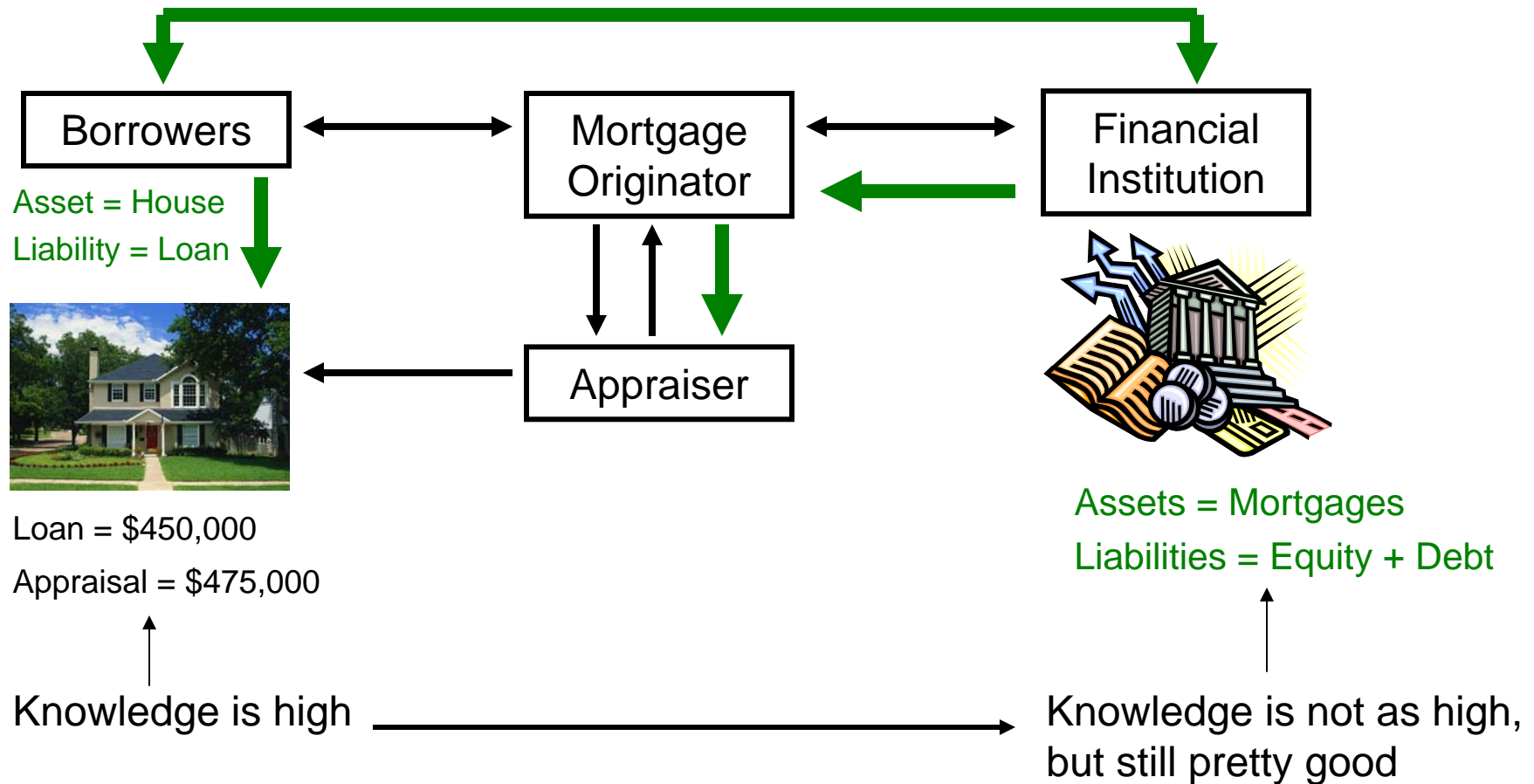
- **Asymmetric information:** One party to a possible transaction (purchase or sale) knows more about the underlying asset and/or liabilities
- **Incentives, Moral Hazard & Adverse Selection:**
 - **Incentives:** If the incentives to the participants in a transaction change, their behavior may change
 - **Moral Hazard:** Participants in a transaction may change their behavior if their incentives change. In particular, if their risk of failure is reduced, they may choose to take more risk; or they may reduce the amount of monitoring of the other party's behavior
 - **Adverse Selection:** If one party knows they are not being monitored, more “cheaters” may participate in the transactions
- **Derivatives:** Securities that are created in such a way that their future value depends upon (is derived from) the value of another “underlying” security

What Caused the Sub-prime Mess?

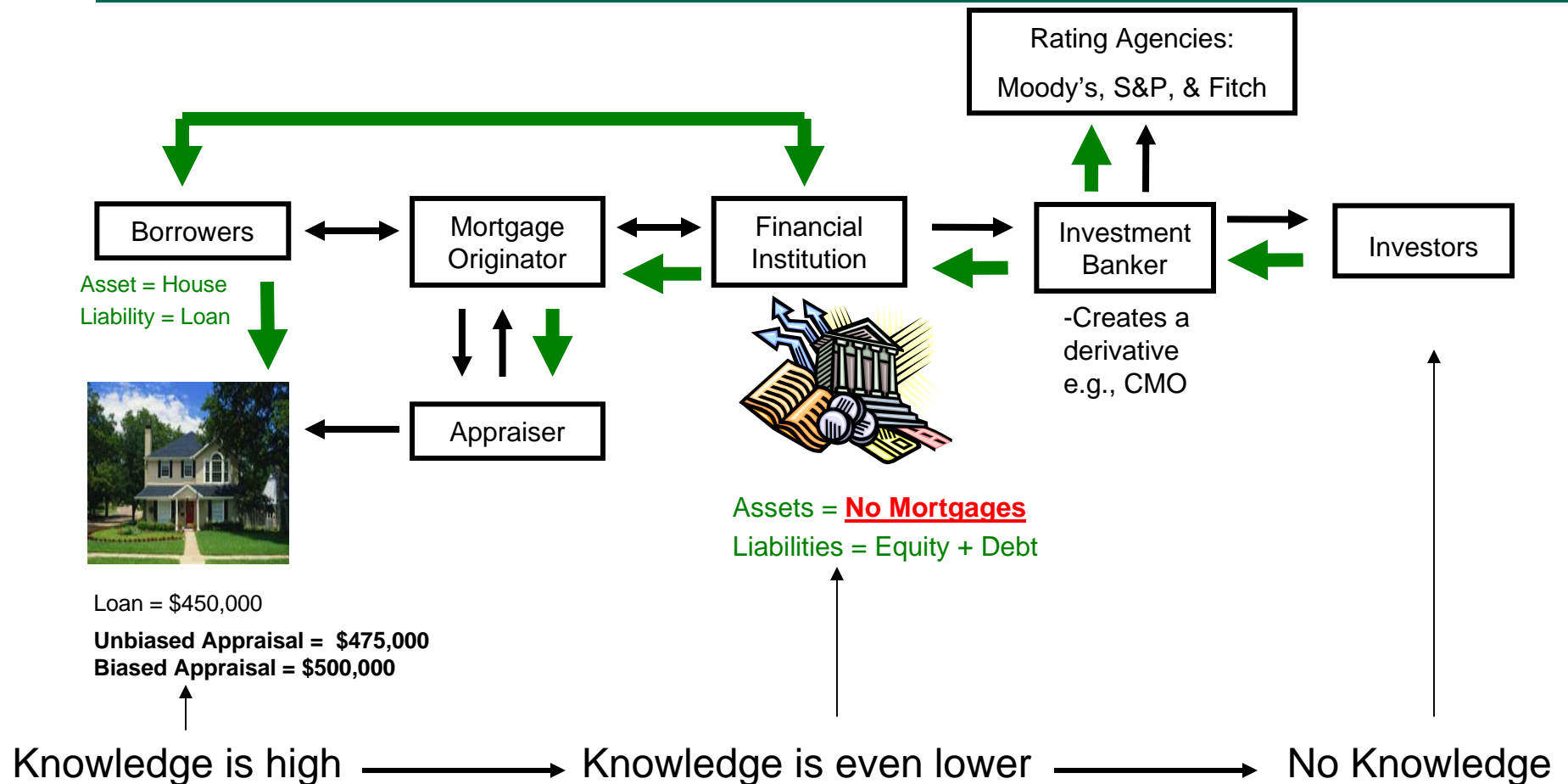
It's Simple: Three Events

1. The innovation of securitizing mortgages
2. A long period of steadily rising housing prices
3. The end of this period of rising (not necessarily falling) housing prices

The Mortgage Market Before Securitization: Asymmetric Information, Incentives & Adverse Selection (Before Securitization, Asymmetric Information is Small)

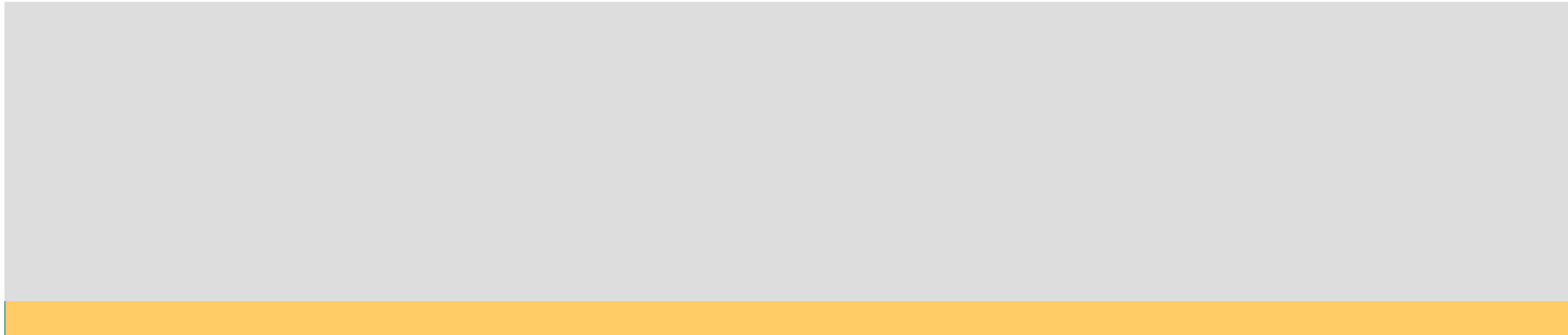


The Mortgage Market with Securitization: Asymmetric Information, Incentives & Adverse Selection (After Securitization, Asymmetric Information is **Large**)



What's Going to Happen?

- Investors who bought MBS are going to lose money
- Many sub-prime borrowers (who should not have bought houses) are going to lose their homes
- The trial lawyers are going to get rich



Appendix

Disclosure Statement

Fuller & Thaler Asset Management, Inc. ("Fuller & Thaler") claims compliance with the Global Investment Performance Standards ("GIPS"). Fuller & Thaler has been verified for the period from January 1, 1992 through September 30, 2007 by Beacon Verification Services, LLC. A copy of the verification report is available upon request.

This information is provided solely for general informational purposes and does not constitute an offer to sell or a solicitation of an offer to buy or sell any product or service to any person or in any jurisdiction where such offer or solicitation would be unlawful. Fuller & Thaler is an independent investment management firm registered with the U.S. Securities and Exchange Commission that manages primarily equity assets for primarily institutional investors. Fuller & Thaler seeks to identify mis-priced securities by exploiting insights from the field of behavioral finance. The firm changed its name from RJF Asset Management, Inc. to Fuller & Thaler on December 14, 1998. The firm was called RJF Asset Management, Inc. as of April 5, 1993 to December 13, 1998. The investment philosophy has remained constant throughout the firm's history.

Composite*	Assets as of 12/31/07 (millions)	Percentage of Firm's Total Assets
Domestic 120/20	\$106	4%
Micro-Cap	\$169	6%
Small-Cap Value	\$71	2%
Small-Cap Value Plus	\$183	6%
Small/Mid-Cap Growth	\$564	20%
Small/Mid-Cap Core	\$247	9%
Small-Cap Active Extension	\$1	0%
Mid-Cap Active Extension	\$1	0%
Mid-Cap Growth	\$1	0%
Mid-Cap Value	\$1	0%
Market Neutral	\$125	4%
Global Small-Cap	\$78	3%
International Long/Short	\$152	5%
International Small-Cap	\$49	2%
International Disciplined	\$1,140	40%

*Assets in a composite may exclude accounts in a strategy that do not comply with the composite's account inclusion criteria.

Small/Mid-Cap Growth Composite (formerly known as the Earnings Heuristics Long Composite) is primarily invested in the equities of growth oriented U.S. companies between \$150 million and \$2 billion in market capitalization and was created in April 1993. The standard advisory fees consist of the following management fees: 0.90% per annum on the first \$20 million and 0.70% per annum on amounts over \$20 million. Composite performance from January 1, 1992 to April 4, 1993 was realized while the founder of Fuller & Thaler was managing Fuller Partners, Ltd. Total firm assets for this period reflect the assets of the growth equity securities component of Fuller Partners, Ltd. Cash returns were calculated based on an assumption of 3.5% cash with a 3-month T-bill return, contrary to the GIPS standards which require the allocation of actual cash returns. For the period January 1, 1996 through February 28, 1997, the composite represents the returns on the growth securities carved-out of the firm's Small/Mid-Cap Core strategy. The methodology used to compute returns on this carve out was to multiply the actual returns by 1 minus the cash percentage and to add this result to the cash percentage times the return on cash. The cash percentage was determined by multiplying the cash percentage of the total portfolio by the percentage that growth companies comprised of all equities in each account.

Disclosure Statement

Small-Cap Value Composite is primarily invested in the equities of value oriented U.S. companies between \$50 million and \$2 billion in market capitalization and was created in January 1996. The standard advisory fees consist of the following management fees: 0.90% per annum on the first \$20 million and 0.70% per annum on amounts over \$20 million. Between January 1, 1996 and July 31, 1998, the Small-Cap Value Composite returns were carved-out of the Small/Mid-Cap Core Composite which consists of growth and value equities. The methodology used to compute returns on this carve-out was to multiply the actual returns by 1 minus the cash percentage and to add this result to the cash percentage times the return on cash. The cash percentage was determined by multiplying the cash percentage of the total portfolio by the percentage that value companies comprised of all equities in each account.

Small-Cap Value Plus Composite is primarily invested in the equities of value oriented U.S. companies between \$500 million and \$5 billion in market capitalization and was created in November 2006. The standard advisory fees consist of the following management fees: 0.90% per annum on the first \$20 million and 0.70% per annum on amounts over \$20 million.

Small/Mid-Cap Core Composite is primarily invested in the equities of U.S. companies between \$50 million and \$2 billion in market capitalization and consists of both growth and value equity components. The composite was created in January 1996. The standard advisory fees consist of the following management fees: 0.90% per annum on the first \$20 million and 0.70% per annum on amounts over \$20 million.

Micro Cap Composite is primarily invested in the equities of U.S. companies between \$50 million and \$400 million in market capitalization and is measured against the more appropriate Russell Micro-cap Index since this benchmark's inception of July 1, 2005. Between January 1, 1999 and December 30, 2005, the composite was measured against the Russell 2000 Index. The composite was created in January 1999. The standard advisory fees consist of a 1.0% per annum management fee.

Market Neutral Composite is primarily invested in the equities of the top 1,500 U.S. companies ranked by market capitalization and liquidity. The composite has a \$10 million account minimum and was created in February 2000. The composite is a long/short strategy managed with minimal net dollar exposure and minimal net beta exposure and is measured against the Citigroup BIG Treasury Bill (3 M) (LOC) Index. The standard advisory fee is a 1.0% per annum management fee and a performance fee of 20% of the profits subject to a "high water mark." For the period February 1, 2000 through April 30, 2000 the composite returns represent the performance for the long and short equities carved-out of a market neutral account passively equitized with S&P 500 futures (S&P 500 futures were purchased and "rolled" on a quarterly basis to maintain a passive exposure to the S&P 500 index). The composite returns were derived by excluding the futures positions from this equitized market neutral account. The carve-out received a 100% cash allocation.

International Long/Short Composite is primarily invested in non-US companies of all market capitalizations in developed markets, utilizes a short-selling strategy to reduce volatility and was created in October 2003. The standard management fee is 1.0% per annum. The standard performance fee is 20% of the profits above the benchmark subject to a "high water mark."

International Small-Cap Composite is primarily invested in the equities of non-U.S. companies between \$50 million and \$2 billion in market capitalization to produce a portfolio with value characteristics and was created in July 2004. The standard advisory fees consist of a 1.0% per annum management fee.

Disclosure Statement

Global Small-Cap Composite is primarily invested in the equities of companies in the 20 developed markets, focusing on small market capitalization companies, and balances reward and risk through disciplined risk management and was created in July 2005. The standard advisory fees consist of a 1.0% per annum management fee.

International Disciplined Composite is primarily invested in the equities of companies in the 20 developed markets, across all market capitalizations, and balances reward and risk through disciplined risk management and was created in September 2005. The standard advisory fees consist of the following management fees: 0.70% per annum on the first \$50 million, 0.60% per annum on the next \$50 million, 0.50% per annum on the next \$100 million, and 0.40% per annum on amounts over \$200 million.

All composites contain actual fee-paying discretionary accounts unless otherwise noted. Actual fees may be different from the standard fees. An account is included in the composite typically as of the first day of the first full month the account becomes eligible but no later than three months from account eligibility. Accounts no longer being managed by Fuller & Thaler remain in composite information to eliminate a survivorship bias. Gross-of-Fees returns reflect deduction of transaction costs and without provision for federal or state income taxes (except ADR's which are net of withholding taxes), advisory fees, custodial or other fees. Net-of-Fees returns are netted down from Gross-of-Fees returns by the actual advisory fees. Both Gross- and Net-of-Fees returns include the reinvestment of all dividend and interest income. Dispersion of annual returns is measured by the standard deviation across equal-weighted portfolios Gross-of-Fees returns represented within the composite for the full year only. The U.S. Dollar is the currency used to express performance. Index returns include the reinvestment of dividend income, but do not reflect the deduction of any transaction costs, advisory fees, custodial or other fees that would be involved in investing in the indices – the effect of these costs and fees would be to lower the index returns by an undetermined amount. In comparing a strategy's performance to any market index, prospective investors should note the following differences: indices are generally more diversified and represent only unmanaged results of long investment; a strategy may not be as diversified, more volatile, is actively managed and may short securities. In comparing a strategy's performance to the U.S. T-bill, prospective investors should note the following differences: U.S. T-bills are fixed-income securities guaranteed by the U.S. government; an investment in a strategy is in equities and does not have such a guarantee by the government. The performance of an investment may vary depending on various factors, including the timing of cash flows. Unless otherwise noted, Fuller & Thaler is the source of all illustrations, performance data, and portfolio characteristics. Information is derived using currently available data from independent research resources that are believed to be accurate. The potential for profit is accompanied by the possibility of loss. Past performance is not indicative of future results.

A complete list and description of Fuller & Thaler's composites, are available upon request in writing at 411 Borel Avenue, Suite 300, San Mateo, CA 94402, or by telephone at (650) 931-1500.