

[ Portfolios]  
I've been thinking about...

**... active investing  
in the new reality**

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# **Active Investing in the New Reality Dead or Destabilized? Anomalies in an Age of Automated Arbitrage**

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August 2009

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## What's Changed, and What's Changing?

- The last two years have seen many investment beliefs turned on their head:
  - Stocks for the long run
  - Diversification across risky asset classes
  - Effectiveness and consistency of active management
- Focus on the third

## What's Changed, and What's Changing?

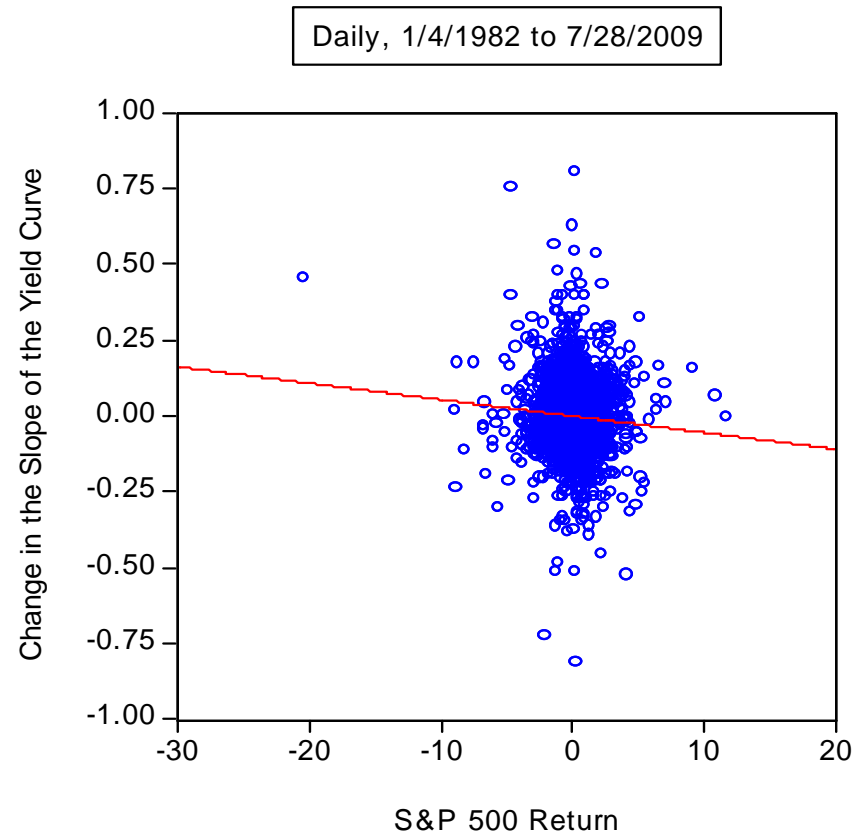
- What *should* be expected to remain constant over time?
- What *should* be expected to change?
- What form should those changes take?

## Efficient Markets Hypothesis

- Profit maximizing investors act on information efficiently as soon as it is released, anticipating immediately even the long-term implications of news.
- As a result, security prices respond contemporaneously to information, but not at a lag.
- Information creates security price volatility, but not opportunities for active managers.

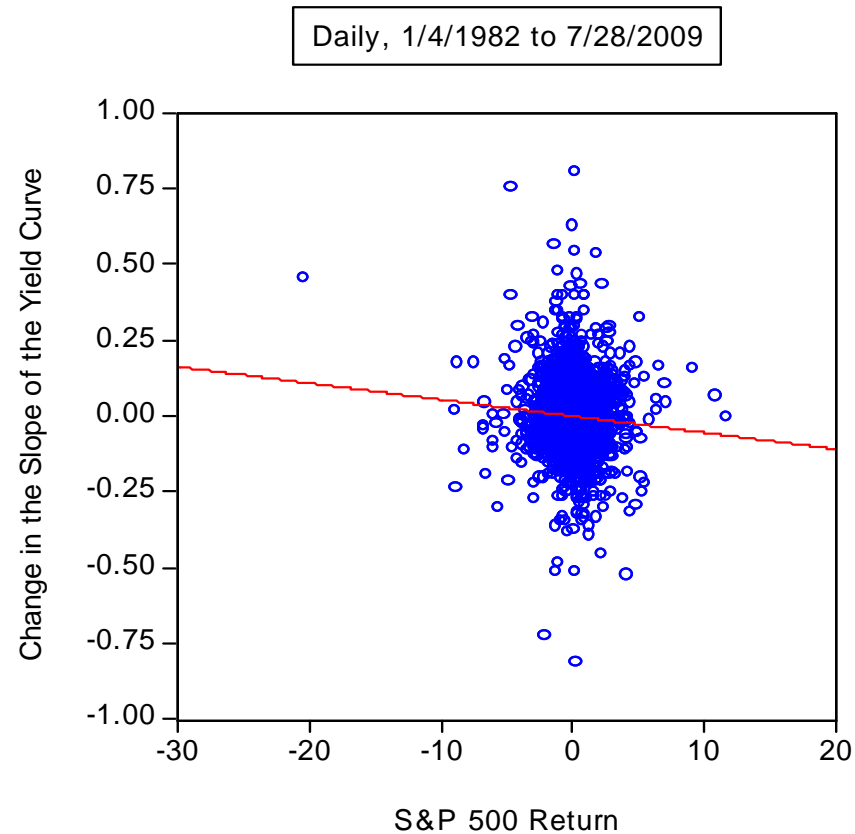
## Efficient Markets Example:

- Consider the impact of changes in the yield curve on the returns of the S&P500 on a daily basis.



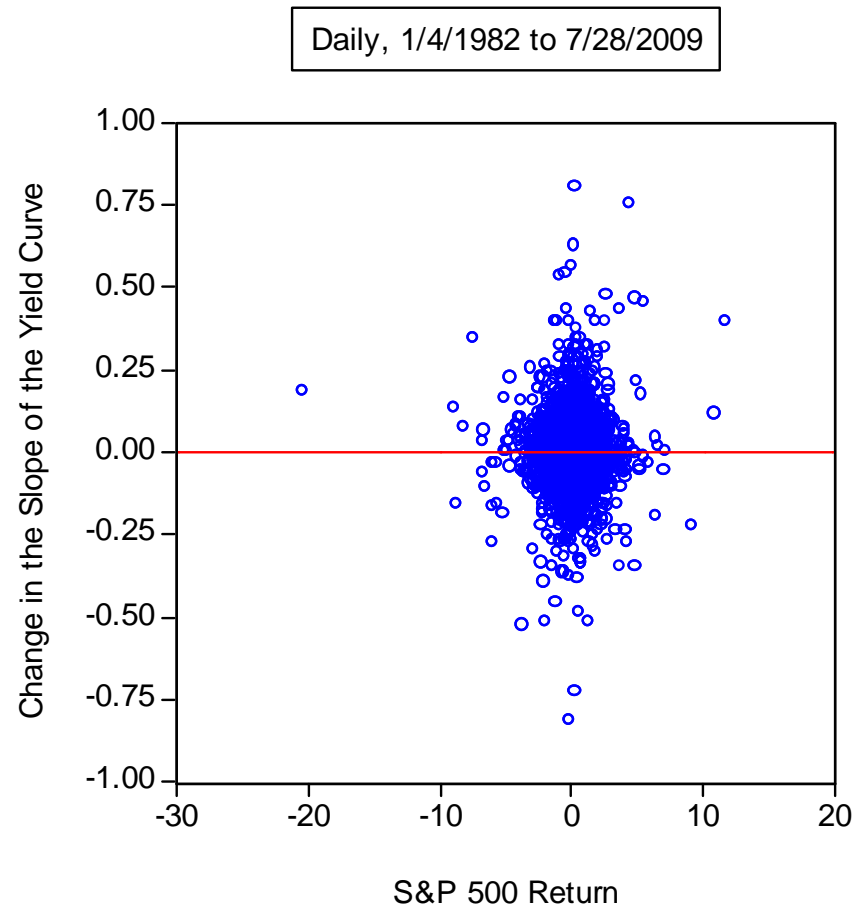
## Efficient Markets Example:

- Even contemporaneously, only a small, but statistically significant, relationship (slope).



## Efficient Markets Example:

- Consider the impact of lagged changes in the yield curve on the returns of the S&P500 on a daily basis.

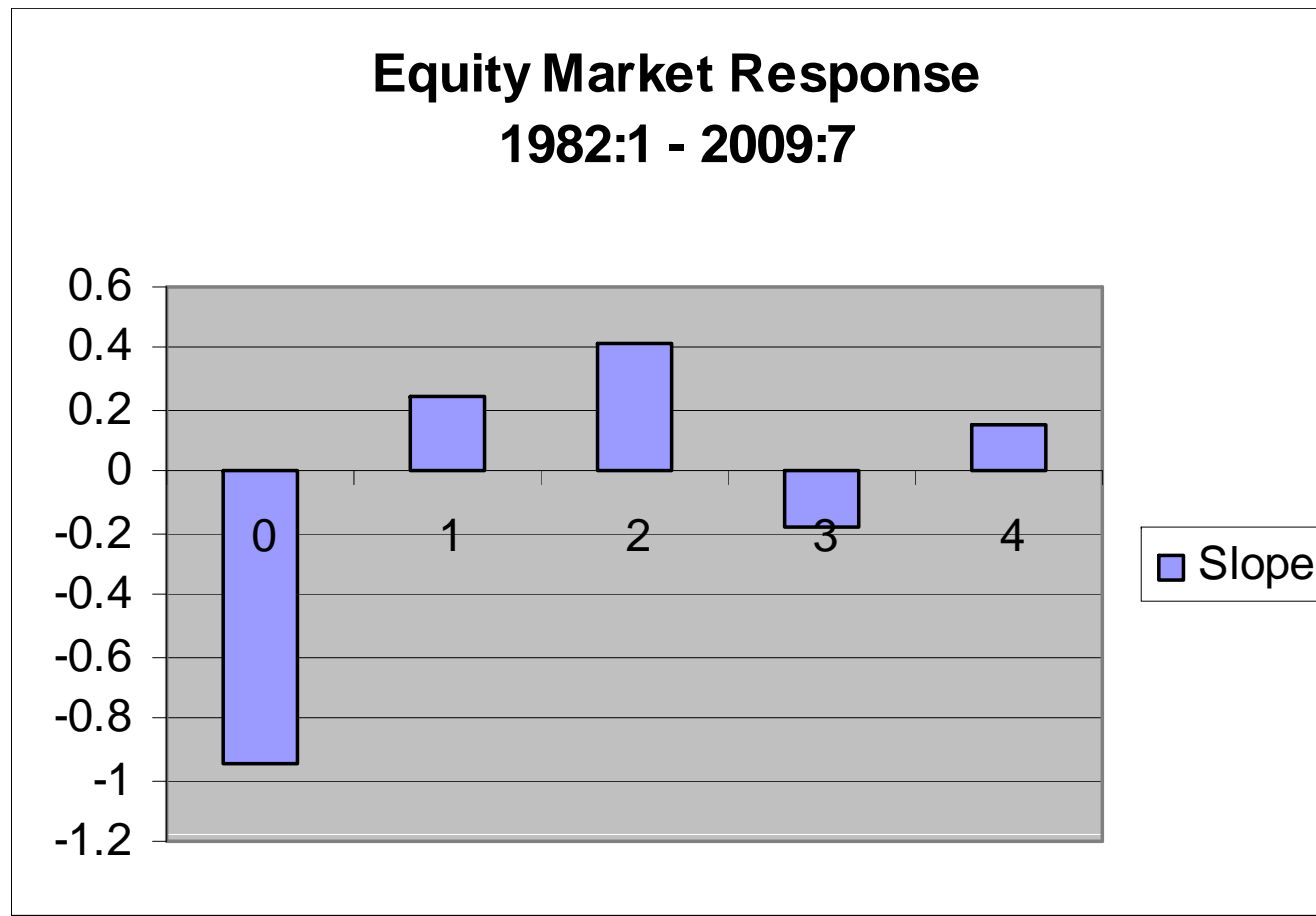


Source: S&P500 and government yield curve data, from Yahoo.



## Efficient Markets Example:

- Almost all of the impact is within a day.



## Anomalies

- Does anything work at a lag?
- Lagged effects are “anomalies” relative to the efficient markets hypothesis.
- Two possible sources of anomalies:
  - Informational: Some signals may work into prices slowly because they are not broadly visible.
  - Behavioral: Some signals may work into prices slowly because, while visible, they stimulate biased responses from investors.

## Anomalies

- Informational:
  - The tendency for investors to respond slowly to certain kinds of information.
  - Example: Earnings revisions
    - Stocks that are being upgraded by the analyst community tend to drift up for some period of time after the actual upgrade.

## Anomalies

- Behavioral:
  - Investors' are subject to psychological impediments to optimal behavior.
  - Example: Value
    - The tendency for stocks whose prices have deviated from their fundamentals to reverse themselves.
  - Other examples: Momentum, Long-term Reversal

## Pitfalls for Active Investors

- What are the pitfalls?
  - Trading costs
    - Positive statistical results may yield negative alpha after realistic transaction costs.
  - Data mined results
    - Seemingly positive phenomena may have resulted from mining the data to see what worked historically, not what will forecast in the future.
  - Confusing risk with return
    - Alpha is not the same as priced risk.
  - Arbitrage
    - Once identified, even a clean result may be affected by the arbitrage activity of other investors.

## Arbitrage and Anomalies

- Arbitrage is a particular concern in the modern era of quantitative investing
  - An automated approach to anomaly-hunting
  - Finding and trading on anomalies is cheaper and more effective than before
  - Combines academic insights with real-world investing expertise
- What does automated arbitrage do to previously identified anomalies?

## Dead or Destabilized?

- Arbitrage “kills” some anomalies, eliminating profits to these strategies
  - Mean return on the anomaly goes to zero
- Arbitrage destabilizes others, causing the profits to become more variable
  - Mean return remains positive, but risk increases

## Dead Anomalies

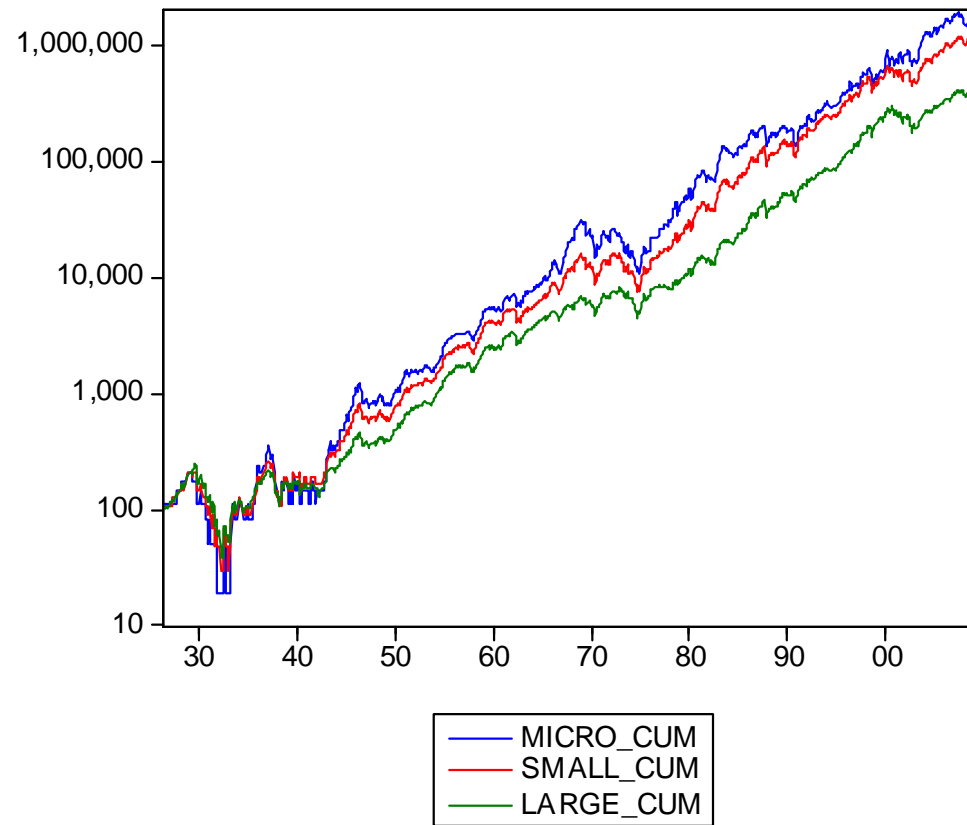
- We should expect an anomaly to die if two conditions are met:
  - There is no behavioral basis for the anomaly, i.e. no large group of investors trading in a manner that requires arbitrage capital to take the other side.
  - Trading on the anomaly immediately causes prices to adjust in a fashion that eliminates the short-term profits.



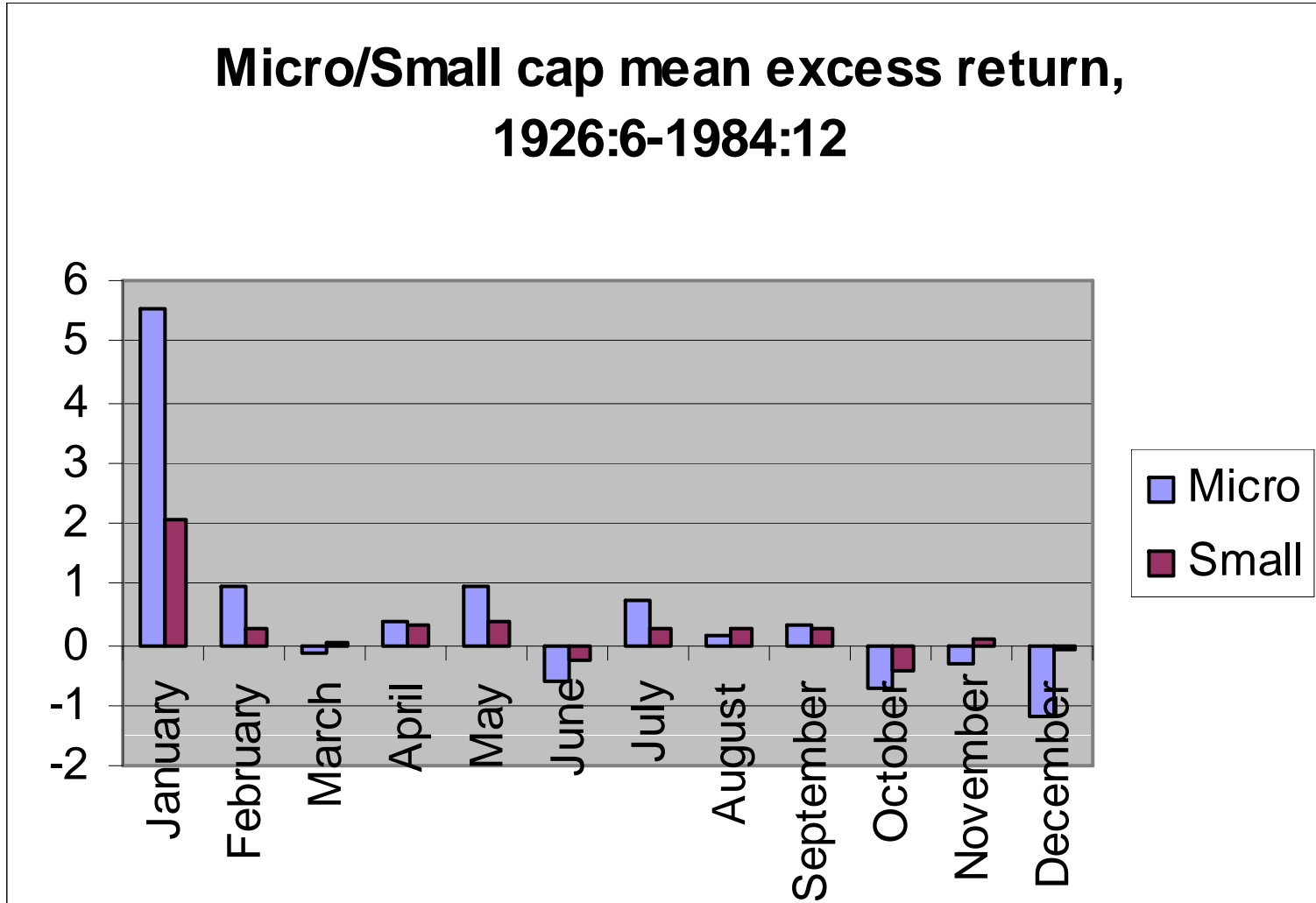
## **A Dead Anomaly: The Small Firm January Effect**

- Small- and micro-cap stocks do better in January.
  - Often understood to reflect tax-loss based selling and portfolio housekeeping.
  - Identified by Keim (1983), who pointed out that the excess return to small firms was concentrated in January.

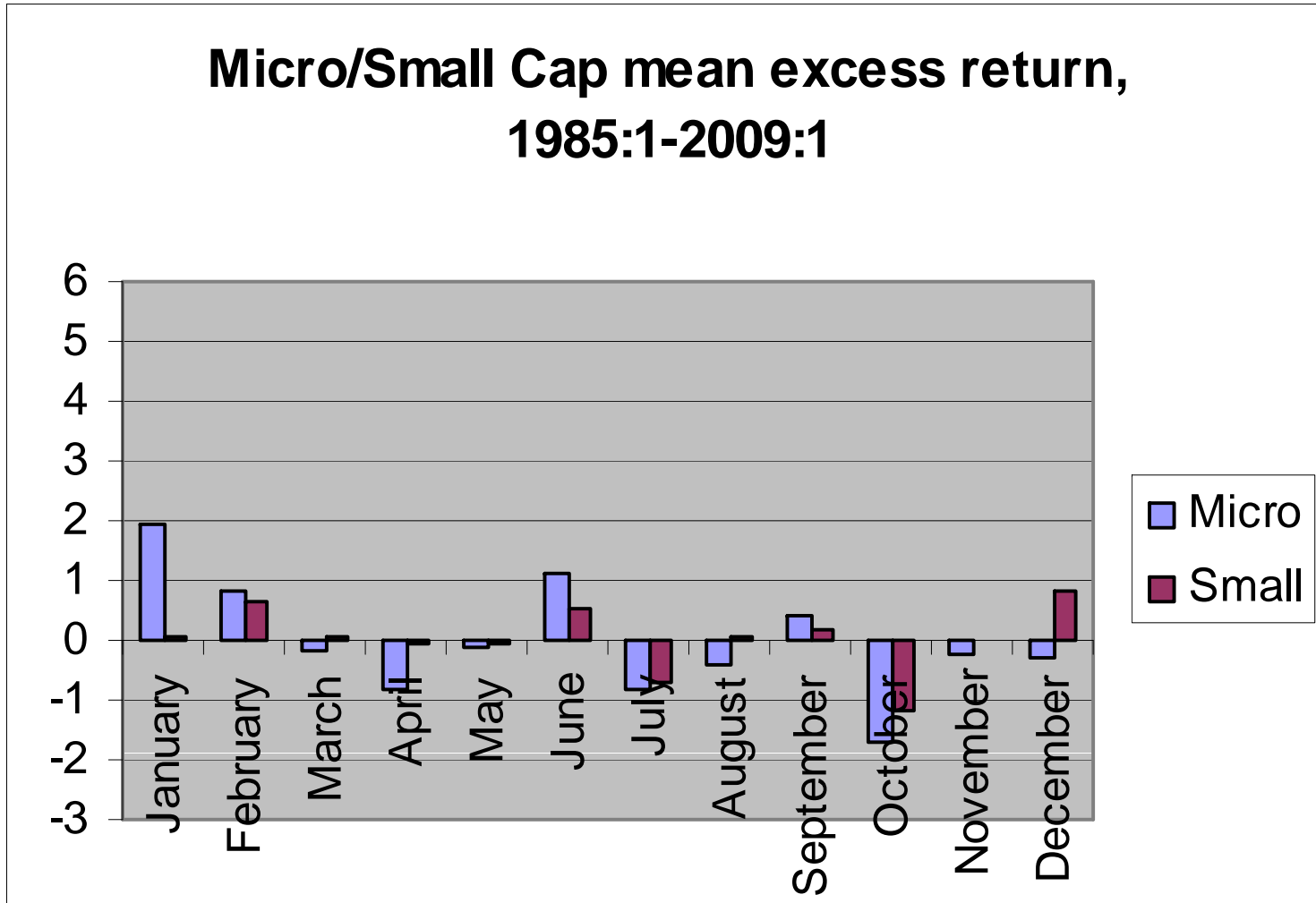
Cumulative Return by Size 1926:6 - 2009:1  
CRSP Data  
(Log Scale)



### Micro/Small cap mean excess return, 1926:6-1984:12



### Micro/Small Cap mean excess return, 1985:1-2009:1



## Destabilized Anomalies

- We should expect an anomaly to survive but become destabilized if two conditions are met:
  - There is a behavioral basis for the anomaly, i.e. a large group of investors trading in a manner that requires arbitrage capital to take the other side
  - Trading on the anomaly moves prices in such a way that in the short run, the returns to anomaly trading increase. This tends to be the case for persistent signals, because new arbitrage investments drive up the prices of stocks held by existing arbitrageurs.

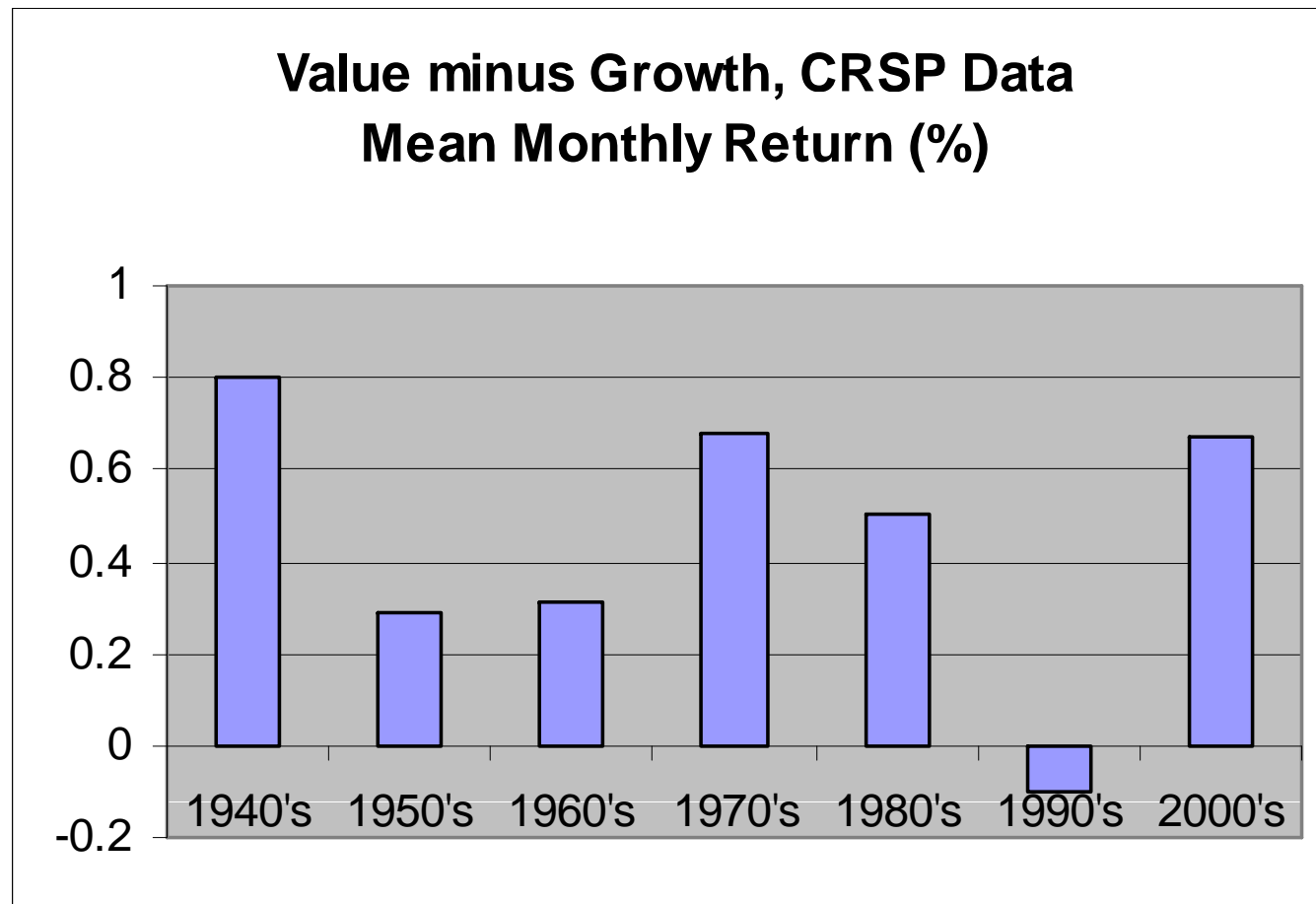
## A Destabilized Anomaly: The Value Effect

- The value effect has been exploited since the late 18<sup>th</sup> Century
  - And while the early funds fixed their investment portfolios, *Concordia Res Parvae Crescunt*, founded in 1779 by Van Ketwich, would invest in “...solid securities and those that based on decline in their price would merit speculation and could be purchased below their intrinsic values, (...) of which one has every reason to expect an important benefit” – a phrasing which suggest that *Concordia Res Parvae Crescunt* may be the grandfather of modern day value funds\*.
- Widely understood in the US since the work of Graham and Dodd in the 1930’s.
- Behavioral basis is that value stocks are uncomfortable investments because they are often badly managed companies in declining industries.

\* The Origins of Value: The Financial Innovations that Created Modern Capital Markets (Hardcover) by William N. Goetzmann (Editor), K. Geert Rouwenhorst (Editor) Oxford University Press, USA

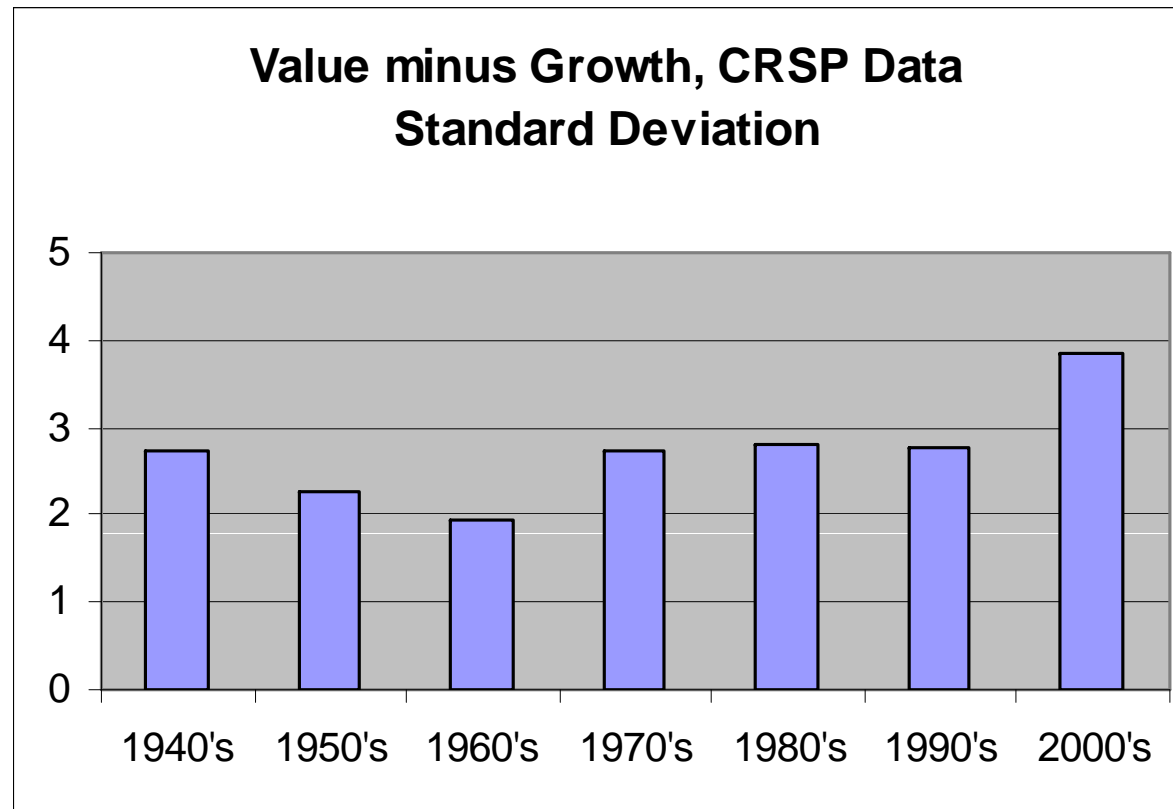
## A Destabilized Anomaly: The Value Effect

- The value effect has certainly not died, even though it has been widely understood for many decades.



## A Destabilized Anomaly: The Value Effect

- But the returns to value have become more volatile during the postwar period, and particularly in the last decade.





## Are Destabilized Anomalies Predictable?

- Anomaly destabilization creates a new opportunity for sophisticated investors
- If anomaly returns can be predicted, sophisticated investors can exploit this effect just as they exploit predictability in the returns to individual stocks
- This is often called “*style timing*”

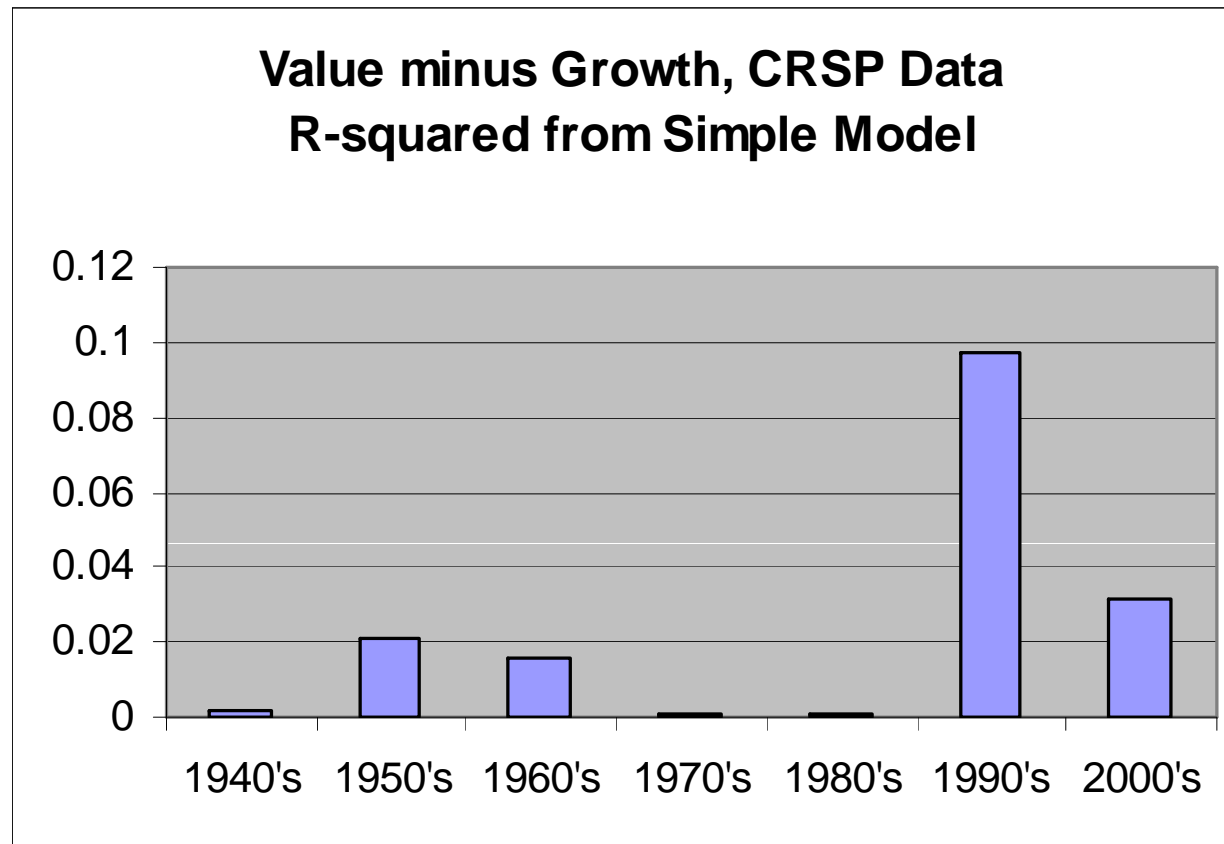
## Predictable Anomalies: The Value Effect

- There is substantial evidence that the returns to a value strategy are predictable from recent past returns (positively) and longer-term past returns (negatively)

Dependent Variable: Value-Growth Return	Coefficient
Constant	.57**
12-Month Momentum of Value-Growth Return	.31*
36-Month Momentum of Value-Growth Return	-.67**
Interval: 1926:7 to 2009:6 (960 observations)	
R-Squared: .01	
* Significant at 90% confidence level, ** Significant at 95% confidence level	

## Predictable Anomalies: The Value Effect

- The predictability is concentrated in the last two decades.
  - This is the same period in which value returns have become destabilized.



## **Predictable Anomalies: The Value Effect**

- Are markets becoming more efficient?
  - No evidence that the effect is going away.
  - Some evidence that automation of value investing has increased risks associated with this investment style.
  - Some of that risk may be predictable (style timing).

## Predictable Anomalies: The Value Effect

- Are markets becoming more efficient?
  - An aside:
    - Should one style time?
    - Probably not: Two problems
      - Higher transaction costs associated with higher turnover may wipe out return pick up.
      - Relationships may be structurally unstable.
  - Long-term reversal concept may be cheaper to exploit and more robust.

## Conclusions

- Critical to understand why information might enter prices *slowly*.
- The world is changing, and has changed.
- Critical to understand
  - Which phenomena are robust
  - Which phenomena are subject to arbitrage
  - Which phenomena are subject to structural change
- No short cut to glory: sound insights, good research, effective trading, limited capital deployed, and low personnel turnover.



**III** portfolio  
construction

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