

Dimensions of Stock Returns

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Overview

What Are the Dimensions of Stock Returns?

- I. What does theory tell us to expect?
- II. What do we see in the markets?
- III. What are the possible explanations?
- IV. What are the implications for financial planning and asset allocation?

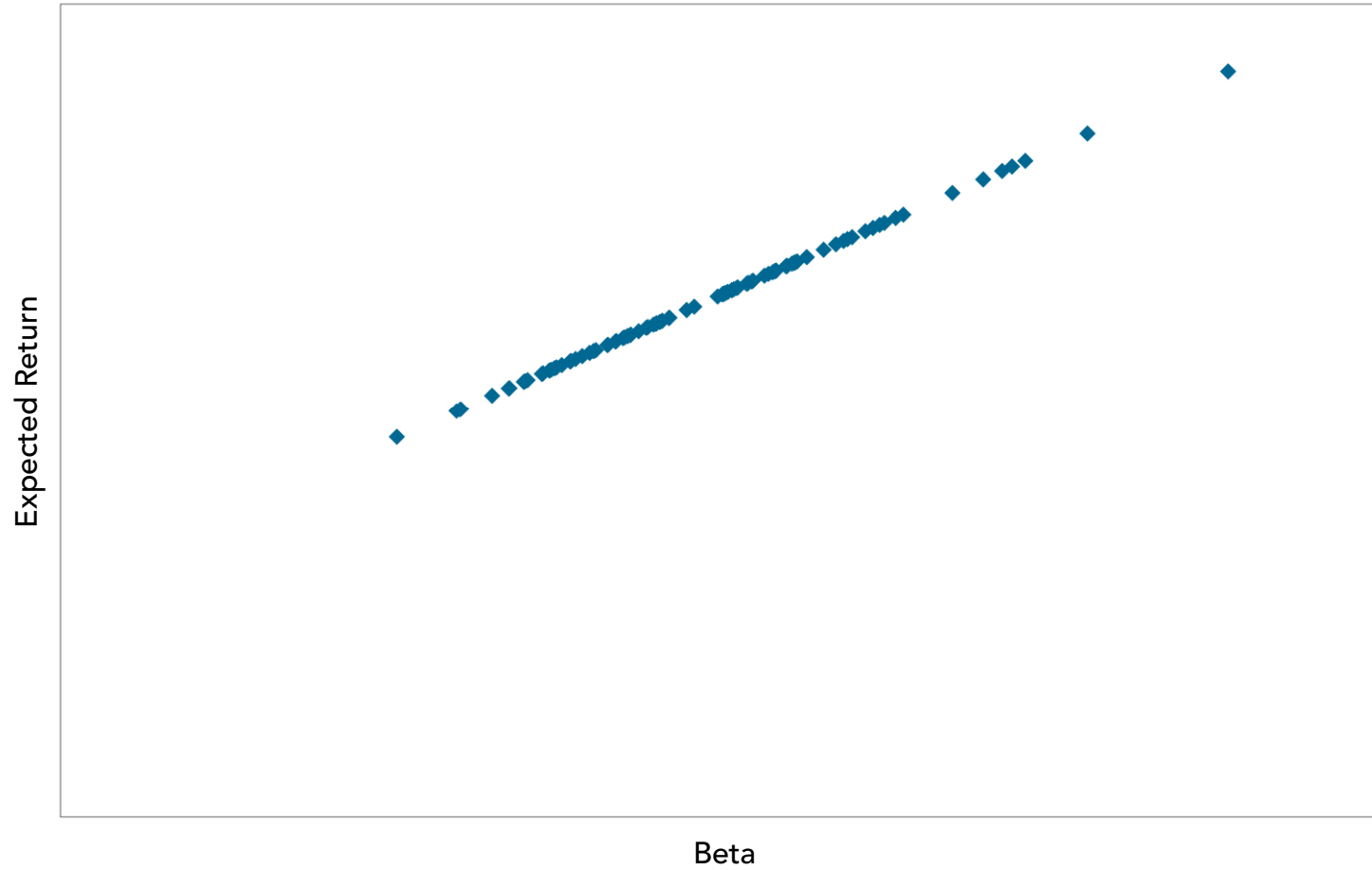
Theory

I. What does theory tell us to expect?

Capital Asset Pricing Model (CAPM)

- Based on a number of simplifying assumptions.
- Covariance with the market portfolio (β) is what matters.
- Implication: nothing other than β should be related to expected returns.

Beta and Expected Return



Theory

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More Recent Models (ICAPM/APT)

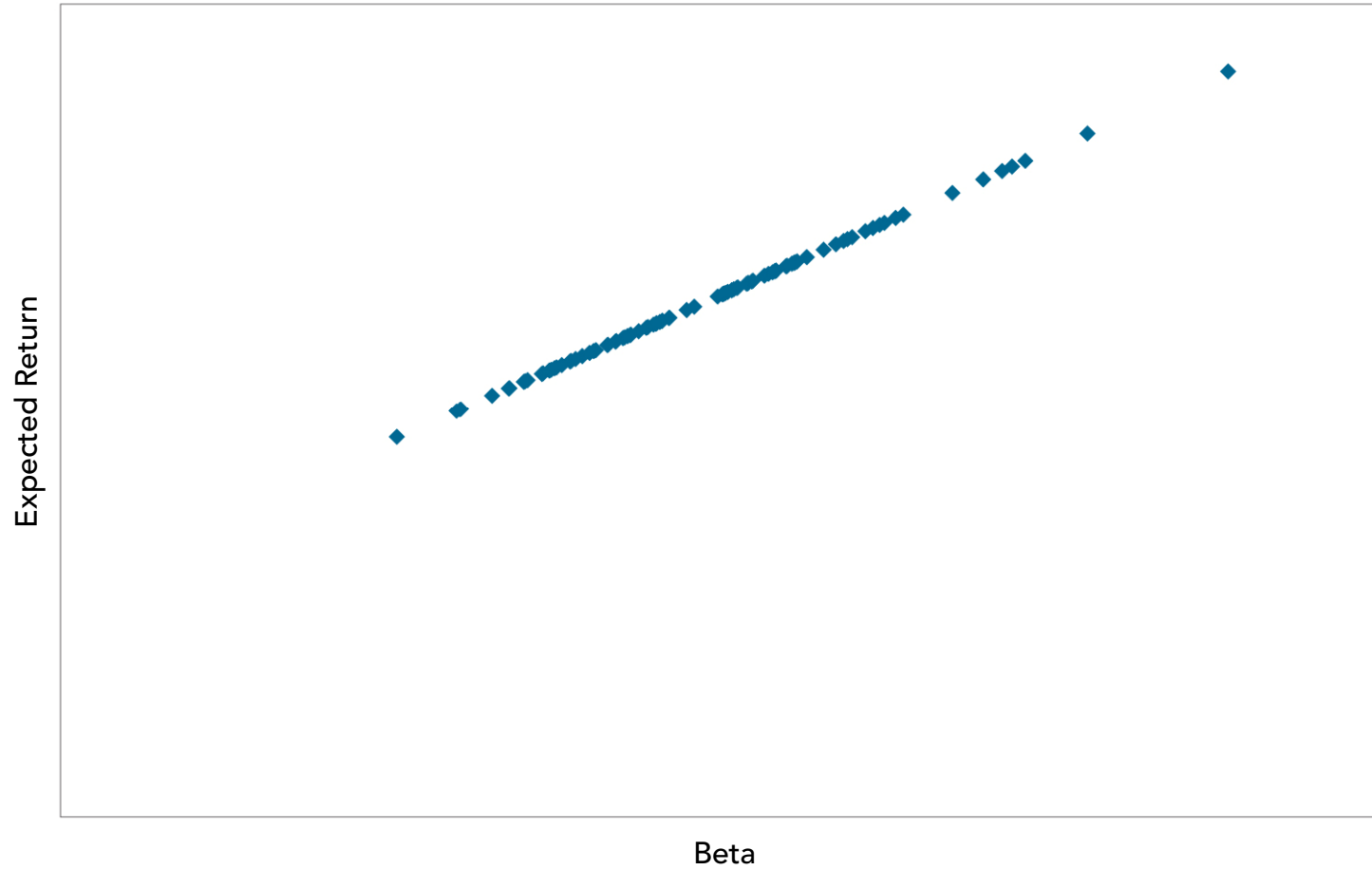
- Relax some of the CAPM assumptions.
- Multiple sources of systematic risk (common or macro factors).
- Assets that hedge these multiple risk factors are valuable.
- Implication: sensitivity to common factors should be related to expected returns.

Empirical Evidence

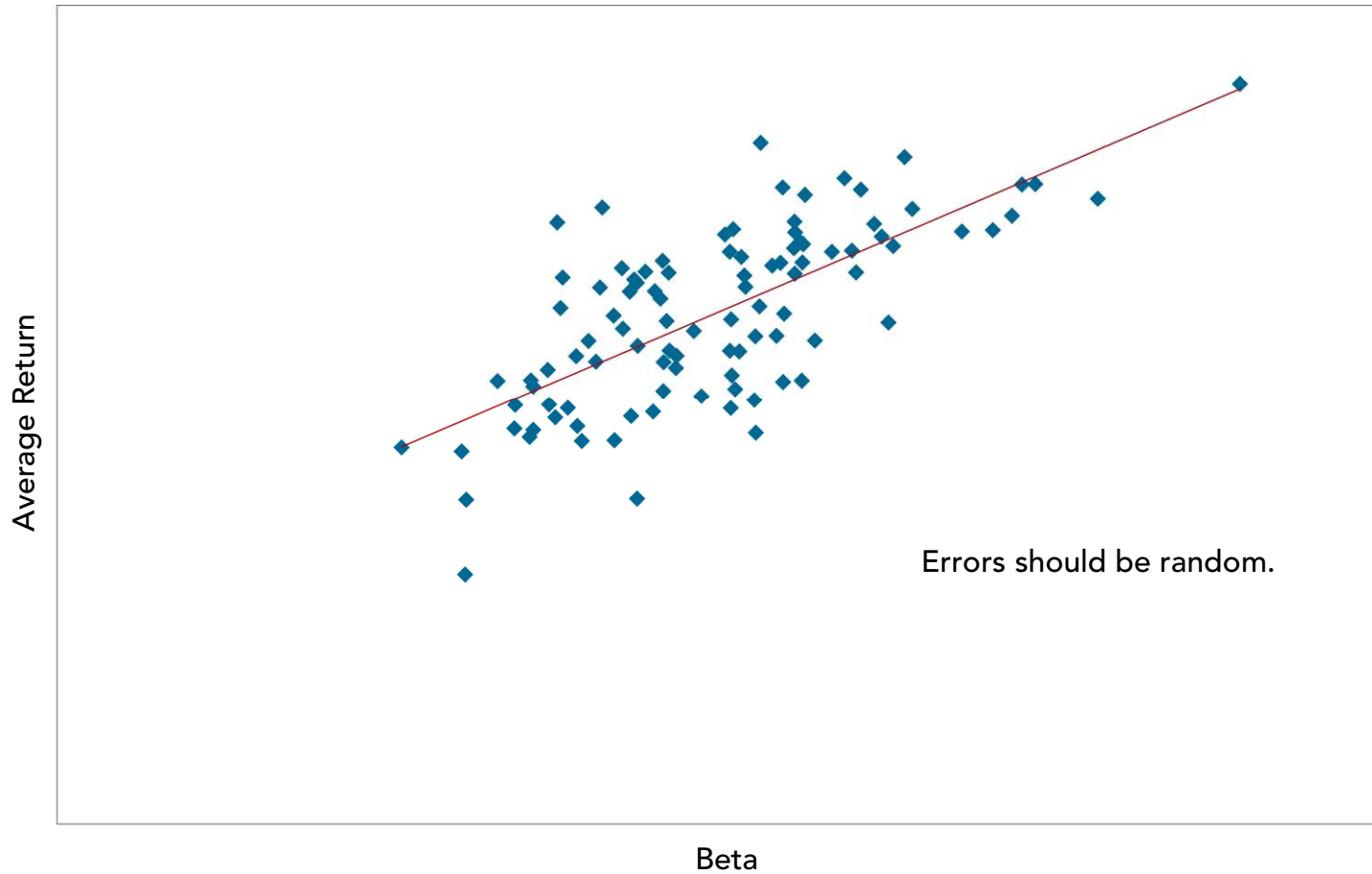
II. What do we see in the markets?

The relationship between β and return is weak.

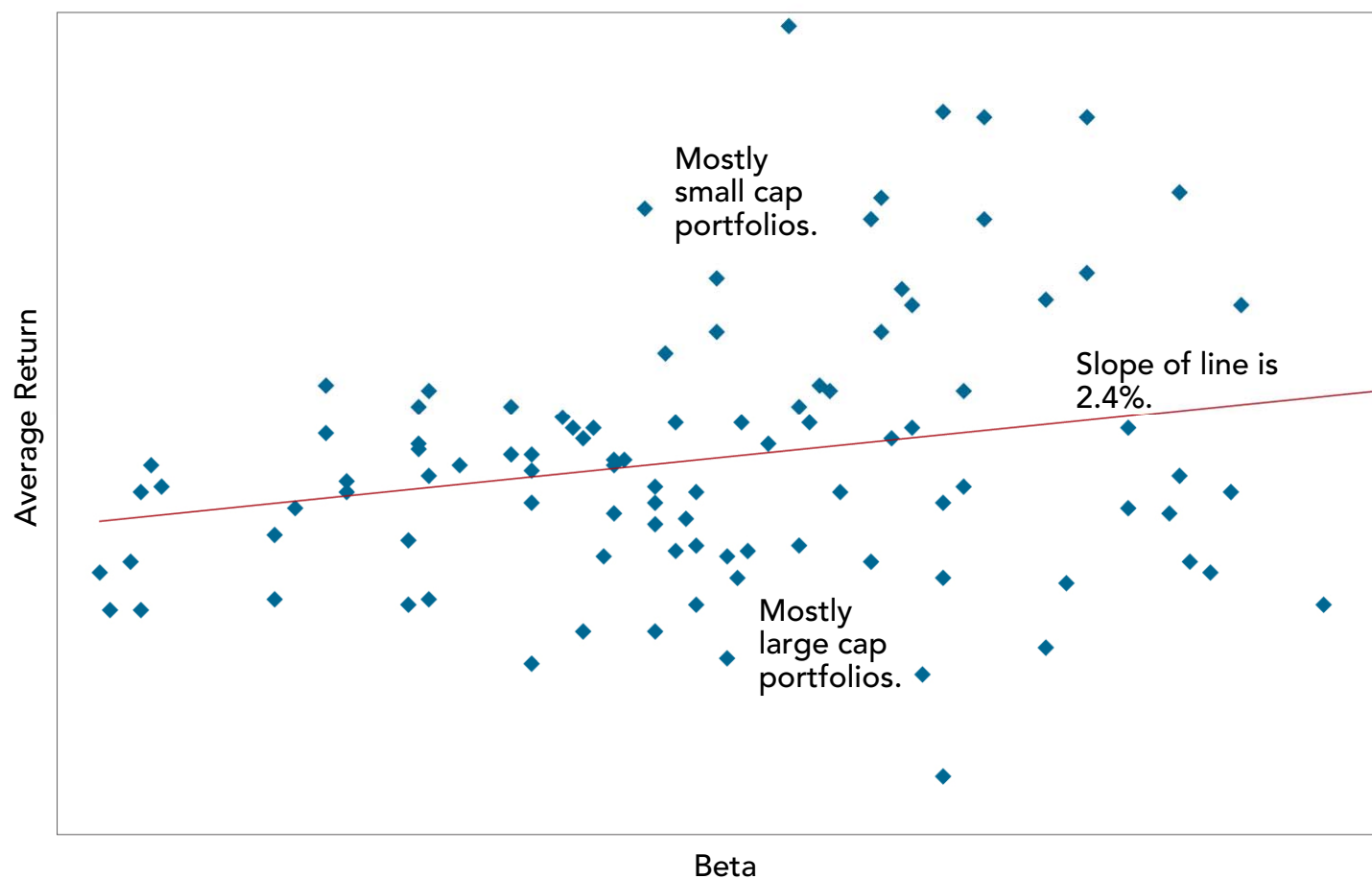
Beta and Expected Return



Beta and Average Return if CAPM Works



Beta and Average Return for Portfolios Formed on Size and Beta



Empirical Evidence

II. What do we see in the markets?

The relationship between β and return is weak.

Several other variables are strongly related to average returns:

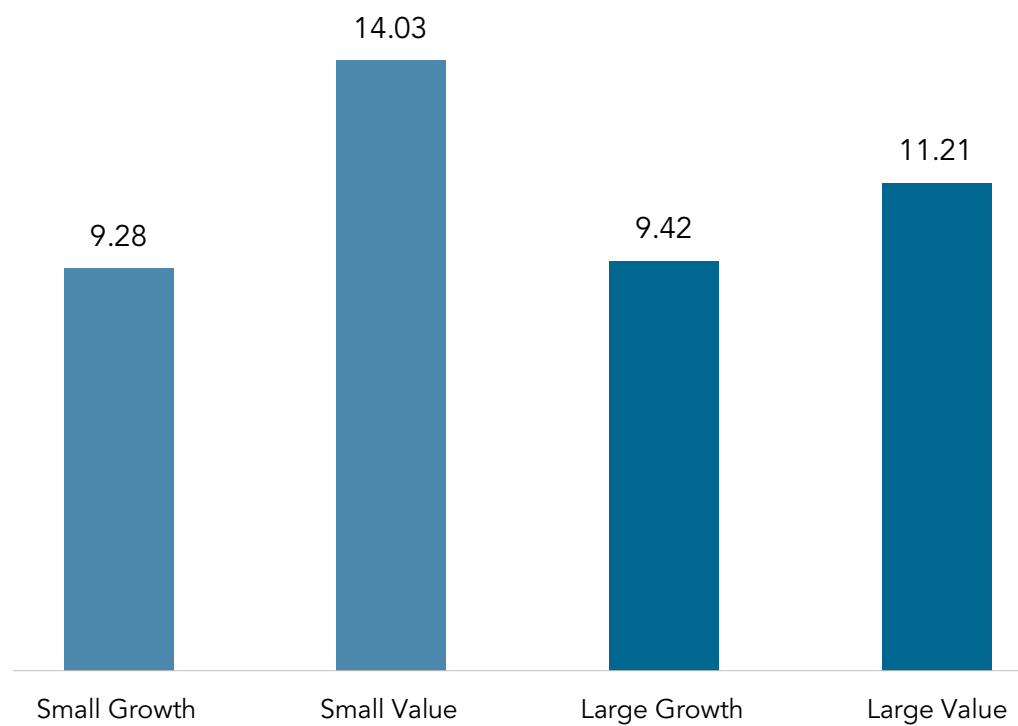
- Book-to-market equity (BtM).
- Financial leverage.
- Earnings/price.
- Cash flow/price.
- Historical sales growth.
- Firm size (market capitalization).
- Past stock returns (momentum/reversals).

Most of the empirical work can be captured by two variables:

- BtM (the “value premium”).
- Firm size.

US Annualized Compound Returns (%)

1927-2007



Explanations

III. What are the possible explanations?

- Risk.
- Inefficiency.
- Data issues: biases and data mining.

Problems for the risk-based story:

- Poor performance of small growth.
- Momentum.
- Firm characteristics vs. sensitivity to macro factors.

Explanations

III. What are the possible explanations? (cont.)

Problems with the inefficiency story:

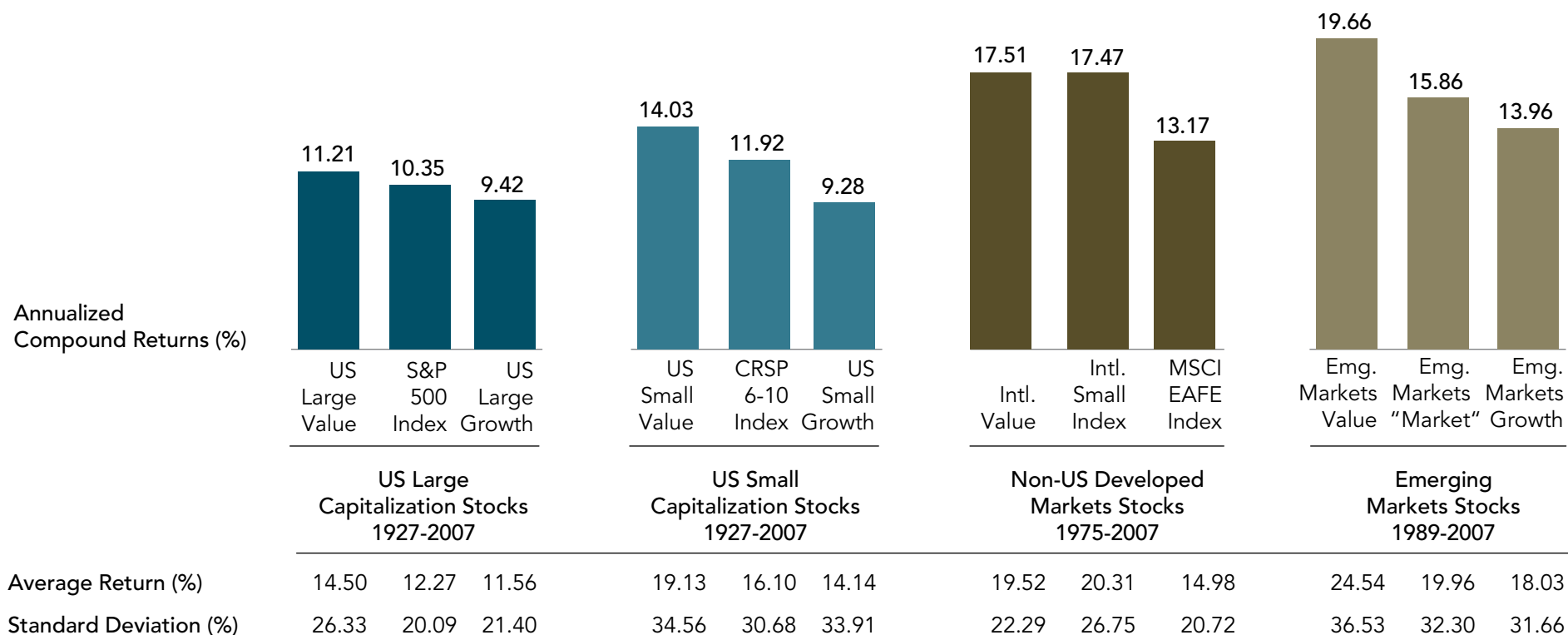
- Eight decades of data and four decades of empirical studies.
- Credit conditions, term spread, default spread, GDP growth.
- Performance studies.

Problems with the data issues story:

- When biases are corrected, results don't change much.
- Out-of-sample data confirms early results:
 - US data 1926-1963.
 - UK data 1955 forward.
 - Other countries.

Size and Value Effects Are Strong around the World

Annual Data



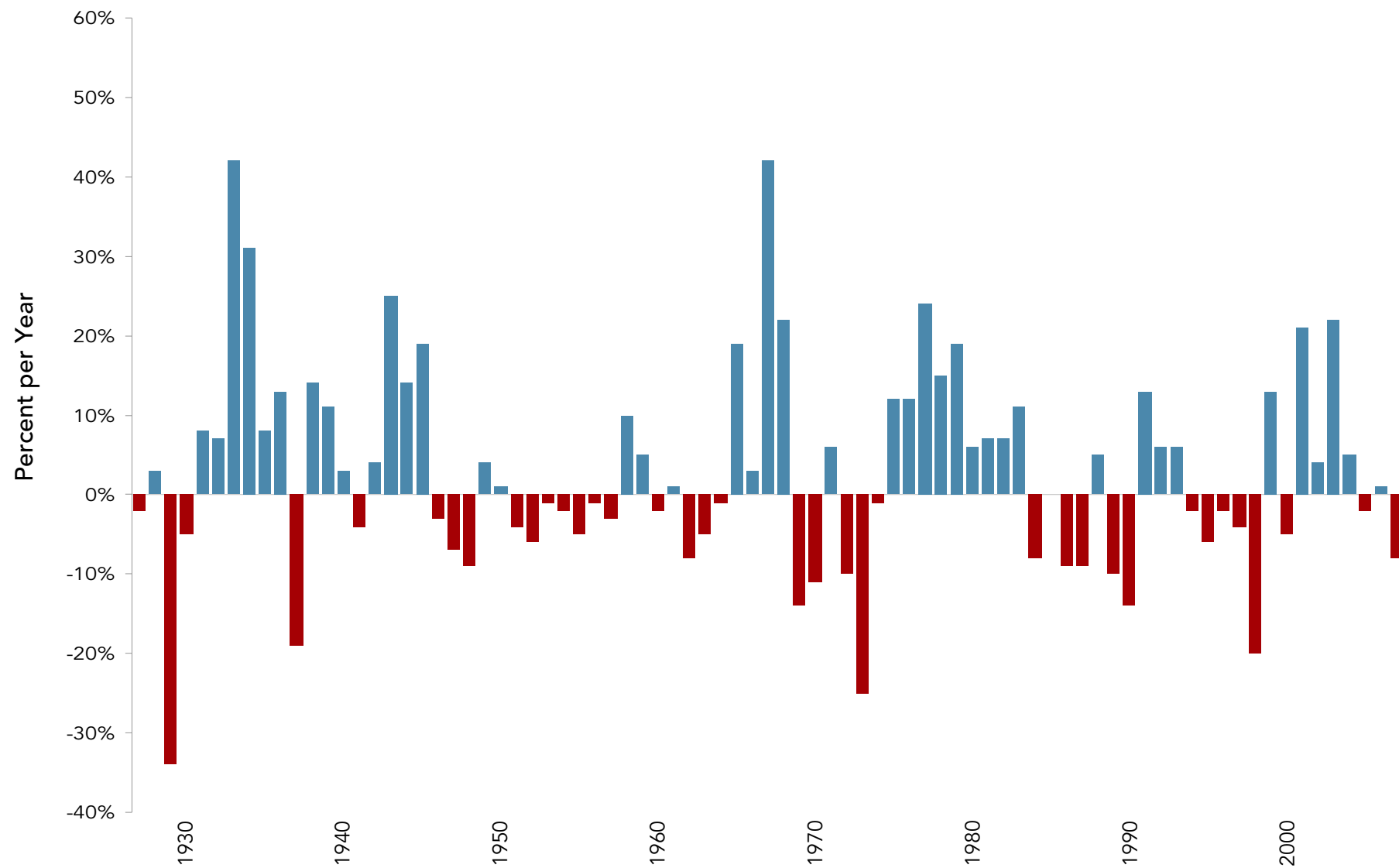
In US dollars.

Developed markets value and growth index data provided by Fama/French (ex utilities). The S&P data are provided by Standard & Poor's Index Services Group. CRSP data provided by the Center for Research in Security Prices, University of Chicago. International Small Index data: 1970-June 1981, 50% UK small cap stocks provided by the London Business School and 50% Japan small cap stocks provided by Nomura Securities; July 1981-present, simulated by Dimensional from StyleResearch securities data; includes securities of MSCI EAFE Index countries, market-capitalization weighted, each country capped at 50%. MSCI data copyright MSCI 2008, all rights reserved. Emerging markets index data simulated by Fama/French from countries in the IFC Investable Universe. Simulations are free-float weighted both within each country and across all countries.

Indexes are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio.

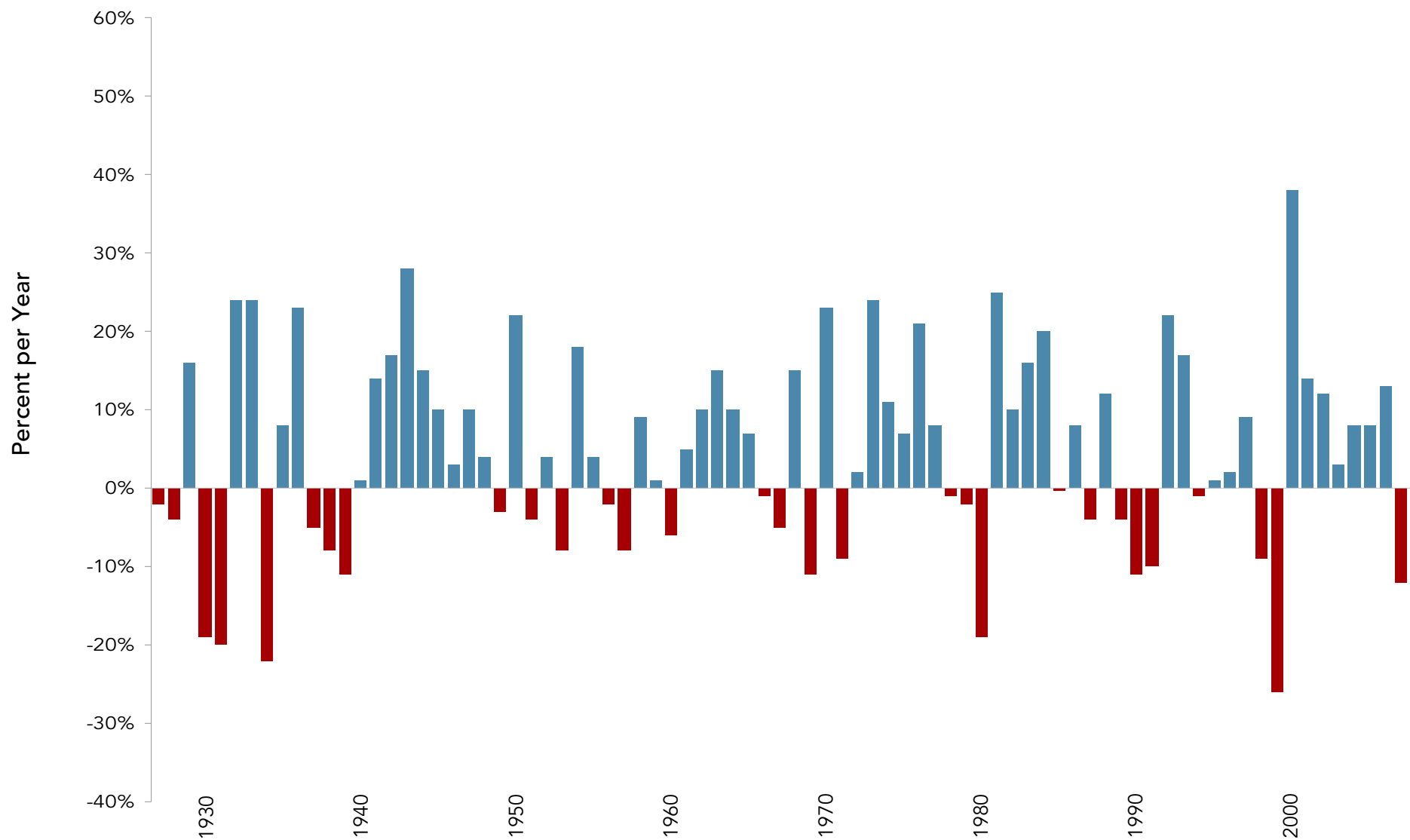
Yearly Observations of SMB

1927-2007



Yearly Observations of HML

1927-2007



Implications

IV. What are the implications for financial planning and asset allocation?

- Do the implications depend on what you believe?
- Asset allocation is more than just debt vs. equity.
- Performance evaluation should take asset allocation into consideration.
- Style drift is not the investor's friend.

$$R_{pt} - R_{ft} = a_p + b_p[R_{mt} - R_{ft}] + s_p \text{SMB}_t + h_p \text{HML}_t + e_{pt}$$

Excess Return for Portfolio	=	Abnormal Return	+	Market Premium	+	Size Premium	+	Value Premium
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