





# Defensive and Dynamic Equity Strategies and Russell's Stability Indexes

*The Third Dimension of Style™*

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**A presentation to San Francisco QWAFEFW  
January 26, 2011**

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**Barry Feldman, Ph.D., CFA  
Senior Research Analyst  
Russell Indexes**

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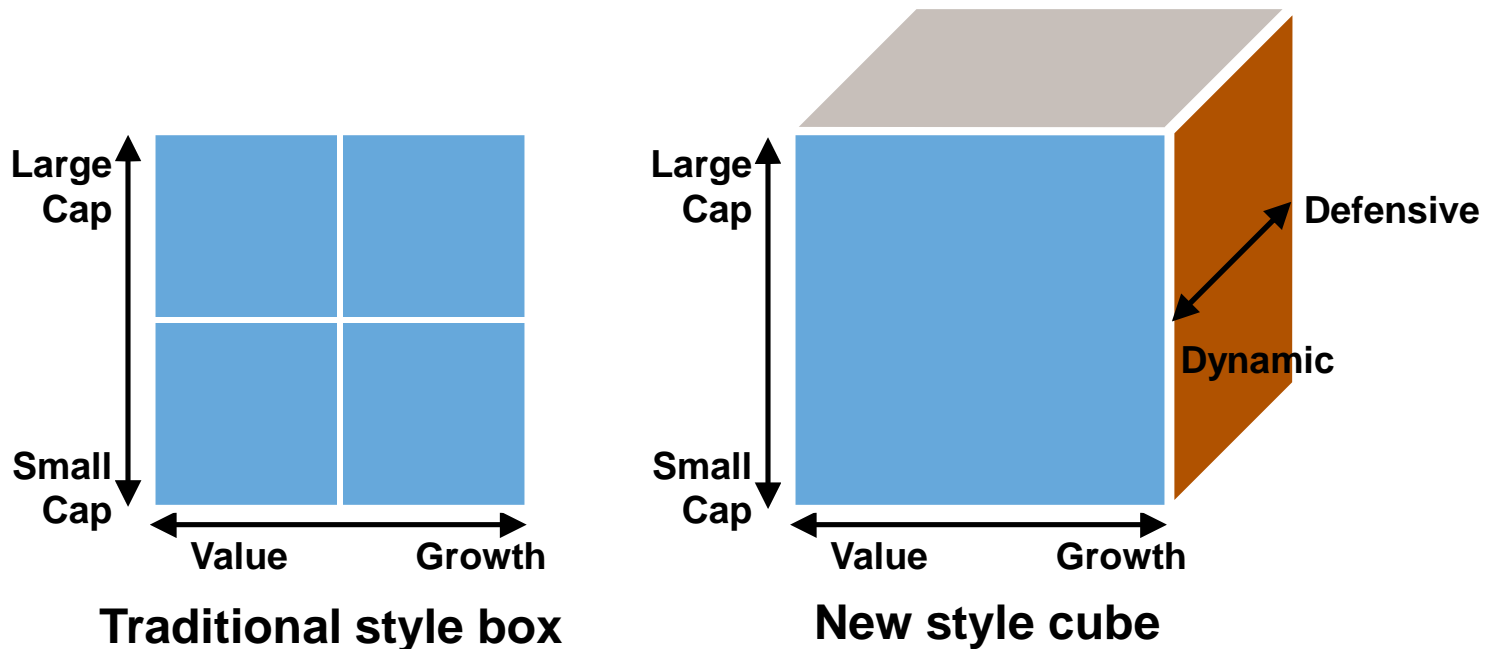
# Outline of presentation

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- **Introducing the Russell Stability Indexes™**
- **Comparing Stability and Valuation**
- **The low volatility anomaly and the BBW hypothesis**
- **If there is time and interest:**
  - **Analytic demonstration of the BBW hypothesis**

# Stability: Continuing Russell's thought leadership in style indexes

- Russell's Investment Division's observations led to a growing awareness of the importance of stability variables in explaining market behavior and investment manager returns
- Adding this third dimension transforms the traditional style box into the style cube
- The stability style dimension includes risk factors that are separate from traditional growth/value and cap criteria commonly utilized for benchmark specification



# Russell's Manager Research observations of equity markets and manager behavior

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- **Certain money managers persistently seek alpha by selecting stocks of dynamic companies**
- **Other money managers emphasize preservation of capital by selecting among stable companies**
- **Both categories of managers exist in Growth, Value, and Market-Oriented universes**

# Russell Stability Indexes:

## Defensive and Dynamic

Companies	Defensive	Dynamic
Sensitivity to economic cycles, credit cycles, and market volatility	Less	More
<b>Measures</b>		
Return on Assets	Higher	Lower
Debt to Equity Ratio	Lower	Higher
EPS Variability	Lower	Higher
Historical total return volatility	Lower	Higher

# Russell Stability Indexes

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- **Russell Stability Indexes are indexes that offer unique detail and specificity for investors, independent from other definitions of style (i.e. growth and value)**
- **Russell Stability Indexes measure a portion of the market based on the sensitivity to economic cycles, credit cycles, and market volatility, referred to as stability**
- **These indexes are designed to be highly diversified, cap-weighted, fully transparent, low-turnover benchmarks that will be useful tools to help active and passive managers meet client needs and demonstrate that they are doing so effectively**



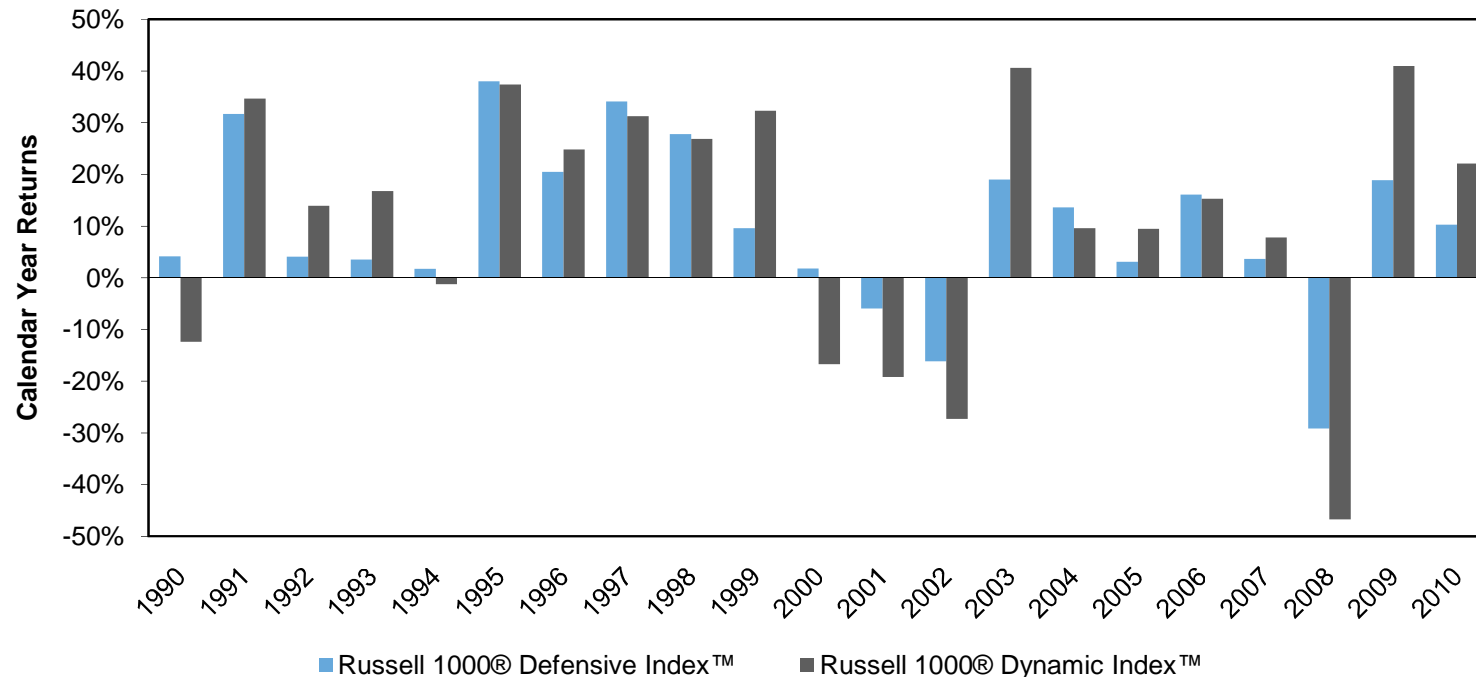
# Defensive is not “Deep Value” and Dynamic is not “Aggressive Growth”

- **In 2010, more companies were pure Value-Dynamic or Growth-Defensive than pure Value-Defensive or Growth-Dynamic**
  - Based on research data through 6/30/2010, there were **61 companies** in the Russell 1000 Index designated as **100% growth and 100% defensive**, including companies such as: **3M, IBM, McDonalds, and Nike**,
  - While there were **214 companies** in the Russell 1000 Index designated as **100% value and 100% dynamic**, including companies such as: **Xerox, Motorola, and Wells Fargo**
- **The long term correlation of excess returns between Stability and Valuation (the Growth-Value style) is only 44% for the 25-year period ended 12/31/2010**

Source: Russell Indexes. Data based on the Russell 1000 Index. Returns for the Stability Indexes prior to July 2006 were constructed for research purposes. Historical returns were calculated using the same Russell methodology; however, application to the performance calculation may vary due to data sources, corporate actions, and the availability of historical data with respect to certain securities.

# Relative performance of Defensive and Dynamic stocks (as of December 31, 2010)

- Over the past 20 years, Defensive and Dynamic stocks have outperformed each other in different economic and market cycles to varying degrees
- Notably, Defensive stocks held up better in downturns (2000, 2001, 2002, and 2008), whereas Dynamic stocks rose more quickly in years in which stocks turned around quickly (1999, 2003, 2009)

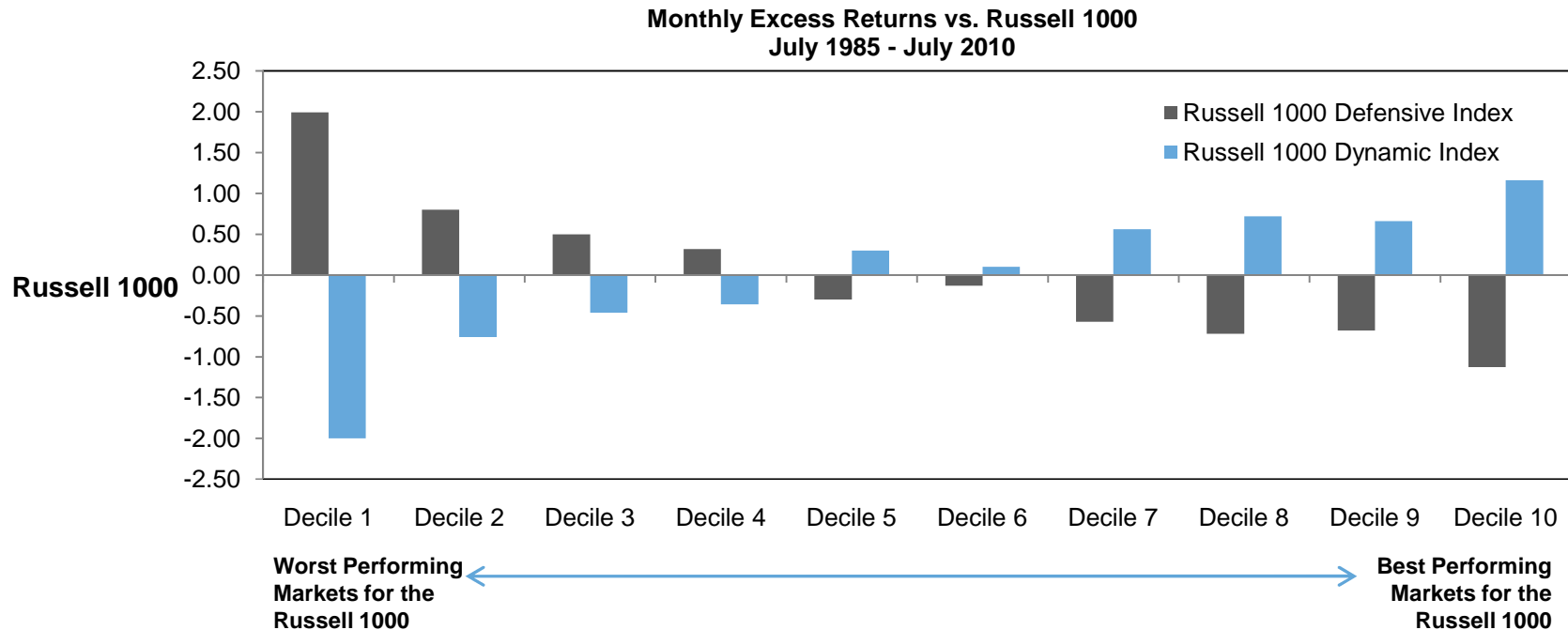


Data based on the Russell 1000 Index. Source: Russell Indexes.

Indexes are unmanaged and can not be invested in directly. Returns represent past performance, are not a guarantee of future performance, and are not indicative of any specific investment. Returns for the Stability Indexes prior to July 2006 were constructed for research purposes. Historical returns were calculated using the same Russell methodology; however, application to the performance calculation may vary due to data sources, corporate actions, and the availability of historical data with respect to certain securities.

# Performance of Defensive and Dynamic stocks varies in extreme market conditions

- In extreme parts of the markets, with Decile 1 representing the worst performing periods of the Russell 1000 Index, Defensive stocks outperformed the Russell 1000 Index, while Dynamic stocks underperformed
- In contrast, in the top performing markets (Decile 10) of the Russell 1000 Index, Dynamic stocks outperformed the Russell 1000 Index, while Defensive stocks underperformed



Data based on the Russell 1000 Index. Source: Russell Indexes.

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# Stability and Valuation

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Dynamic / Defensive and Growth / Value – What's the Difference?

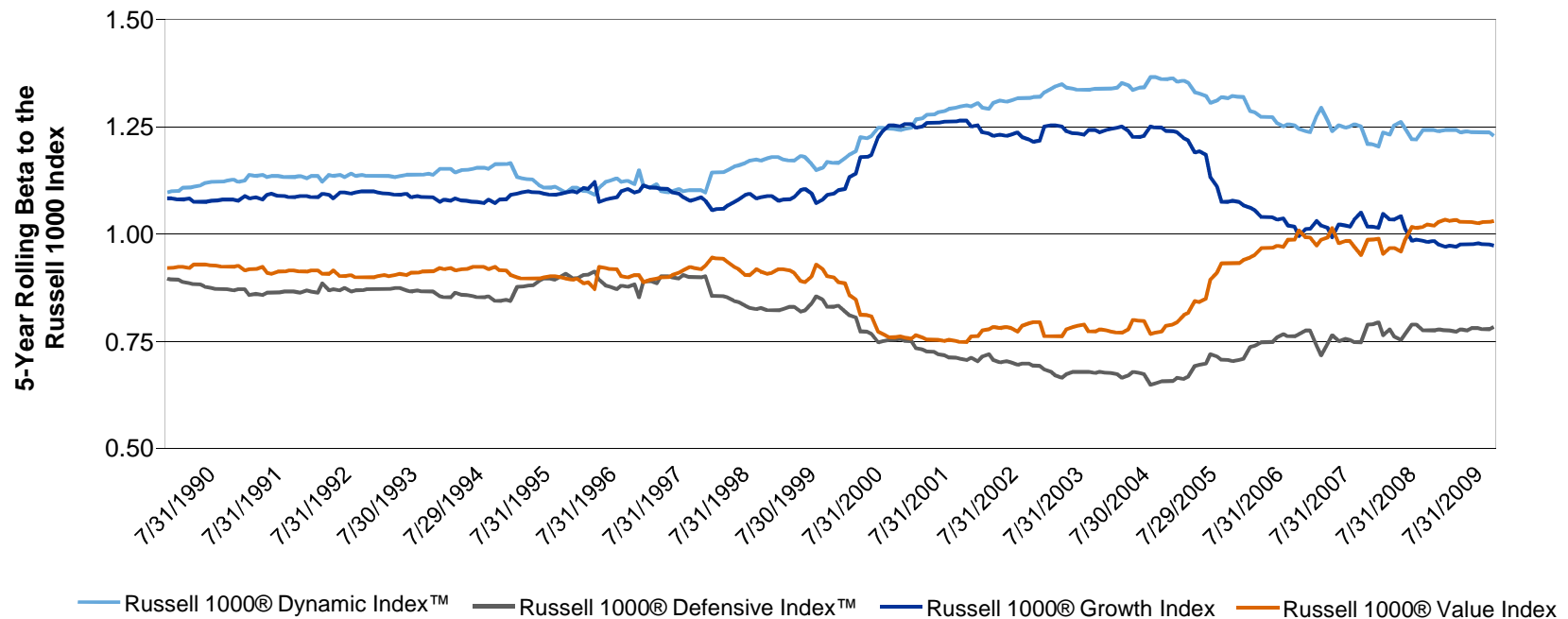
# Stability complements traditional styles

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- **Stability complements traditional styles**
- **Stability can serve as an overlay to existing investment approaches – i.e. Growth and Value, Cap Size**
- **Growth and Value use valuation metrics to identify securities that are undervalued or are growth opportunities – Stability uses quality and volatility metrics to identify risk**
- **With increasing concerns around risk management, a money manager may need to explain their investment in a high growth stock or deep value stock perceived to be risky – with Stability, a manager may be able to address a client’s concern regarding industry dynamics that make it possible for this company to gain market share**

# Style Betas

## 25-Years of 5-Year Rolling Betas to the Russell 1000 Index



Betas are computed from research index returns. Reported performance is based on data for the period June 30, 1985 to July 31, 2010.

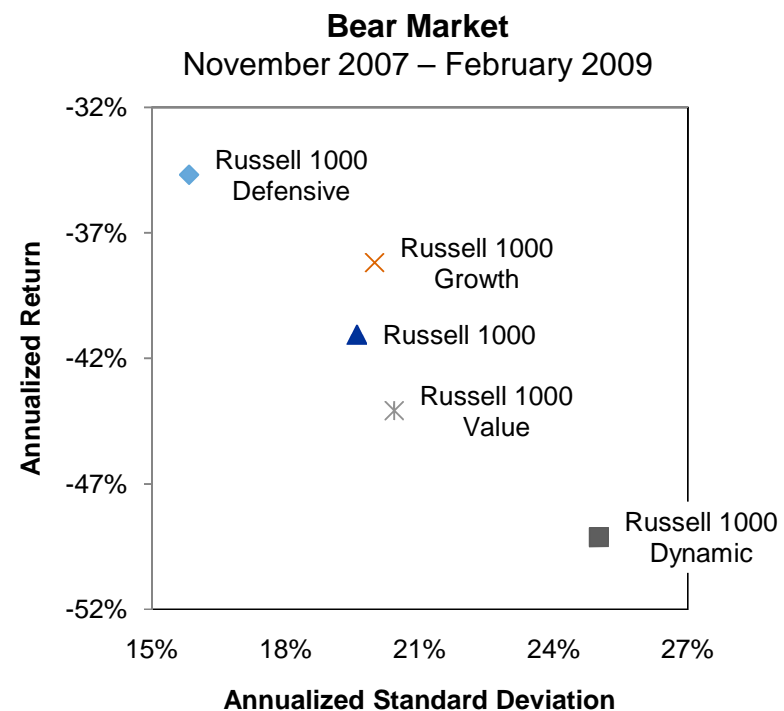
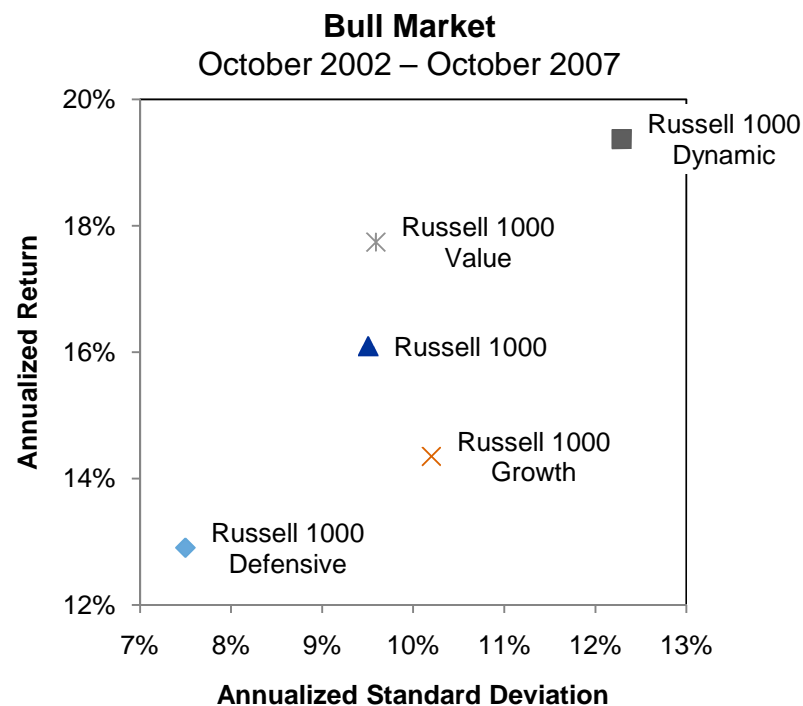
Data based on the Russell 1000 Index. Source: Russell Indexes.

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# Risk/reward in bull and bear markets\*

- Each Style offers a different risk/reward profile in bull and bear markets
- With regards to Stability, Defensive stocks offered a better risk/reward profile in a recent bear market, while Dynamic stocks offered a higher reward (albeit at greater risk) in a recent bull market



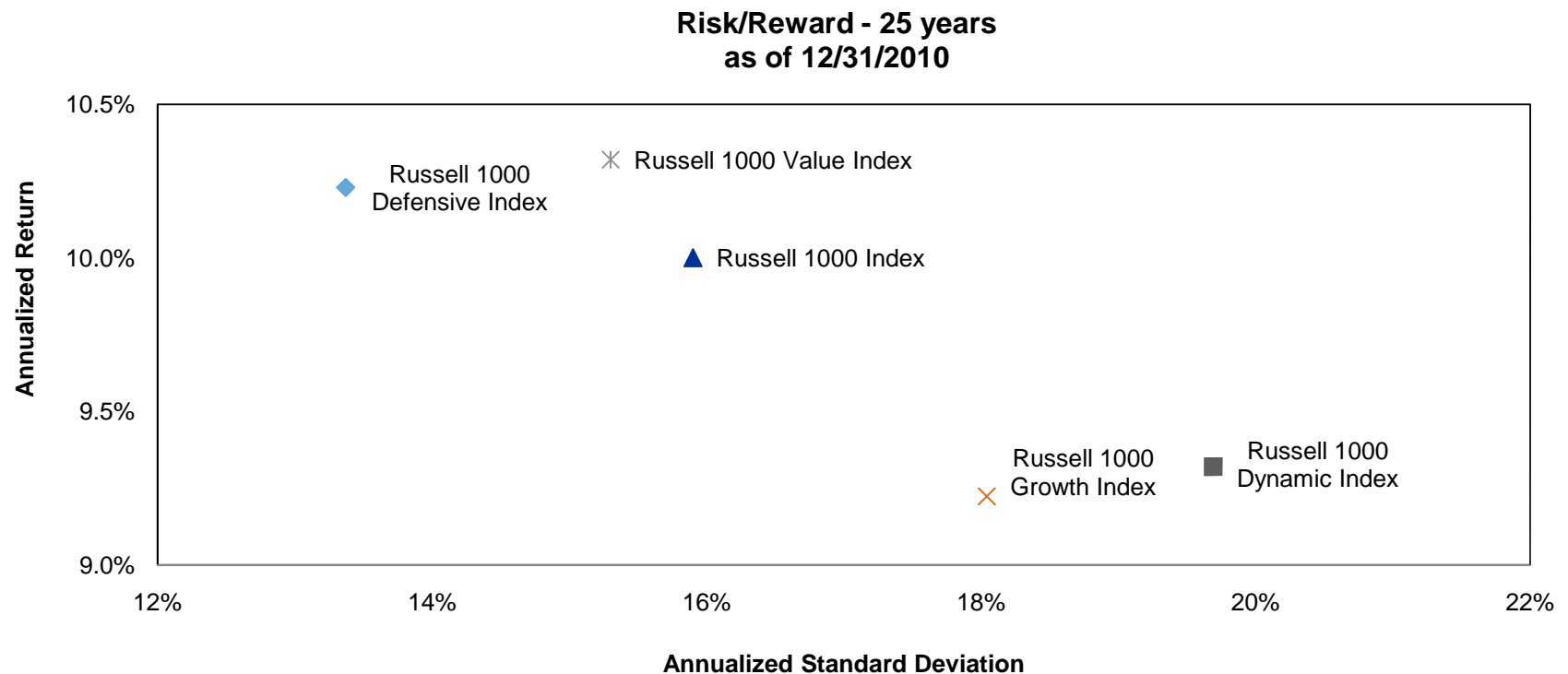
\* Bull market beginning and end based on a 15% reversal from the previous market cycle, based on the Russell 3000.

Data based on the Russell 1000 Index. Source: Russell Indexes.

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# Risk/reward profiles

- For longer-term investors, Defensive stocks have historically provided higher return and lower risk
- However, for shorter-term investors or for those with fewer risk constraints, Dynamic stocks may offer opportunities to add alpha



Data based on the Russell 1000 Index. Source: Russell Indexes.

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# The Low Volatility Anomaly

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What drives the low volatility anomaly?

# Low Volatility Anomaly

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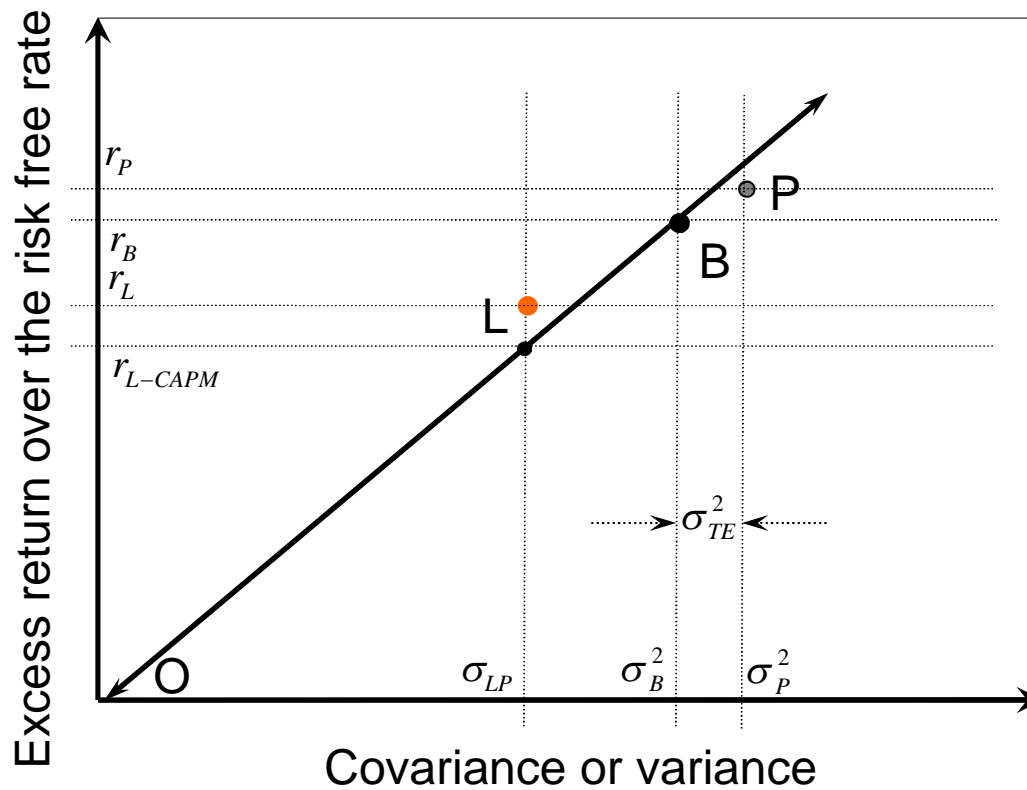
- **Observed since Haugen and Heins (1975)**
  - Low volatility stocks perform better than predicted by CAPM
- **Blitz and Van Vliet (2007)**
  - U.S. and Global results
- **Related to minimum variance strategies**
  - e.g. Clarke, de Silva and Thorley (2006)

# Baker, Bradley, and Wurgler (2011)

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- **Benchmarked managers have insufficient incentive to invest in low vol securities and insufficient incentive to sell high vol securities**
- **Builds on partial equilibrium model of Brennan (1993)**
- **Brennan shows that delegated managers benchmarked by information ratio will underinvest in low volatility securities**
- **BBW argue that tracking error reduction is a second-order consideration and that managers seeking to maximize their information ratios will not invest in securities with expected return lower than their portfolio**
- **As a result behavioral biases of “O’Dean” type investors such as the low volatility anomaly are not arbitrated away by institutional long-only asset managers**

# The Decision to Buy a Low Volatility Security



- L: Lower volatility stock
- B: Benchmark
- P: Manager Portfolio

# Sharpe ratio marginal analysis

$$P^* = (1 - \delta) P + \delta L$$

$$\sigma_{P^*}^2 = (1 - \delta)^2 \sigma_P^2 + \delta^2 \sigma_L^2 + 2\delta(1 - \delta)\sigma_{PL}$$

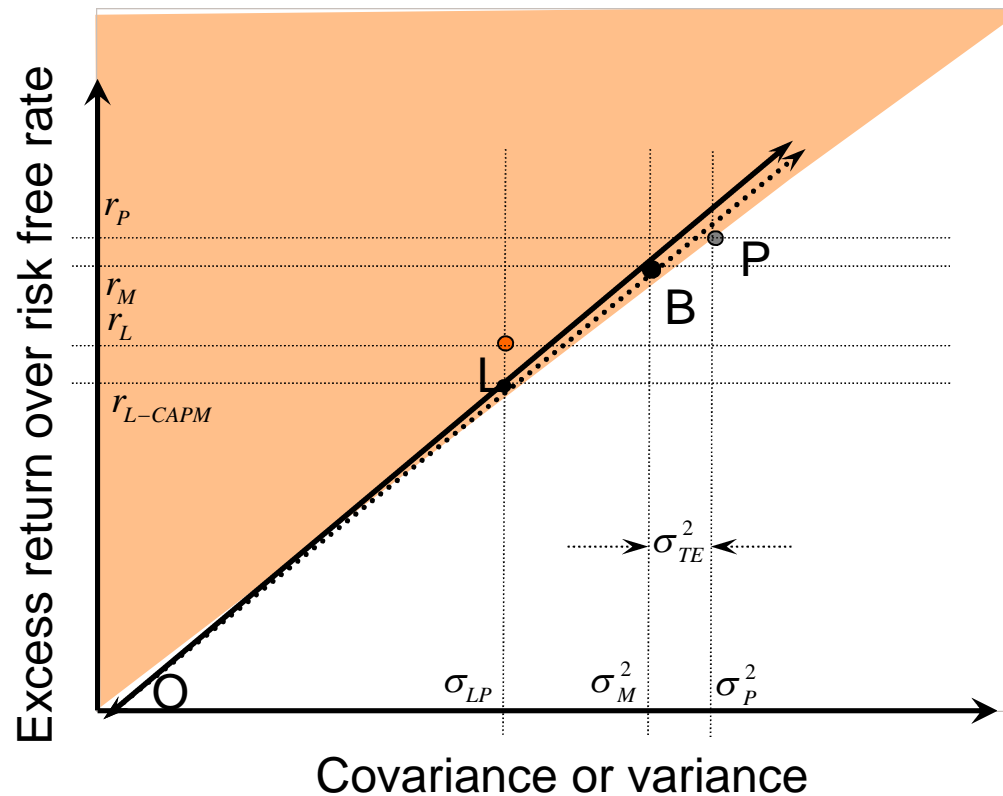
$$Sh(P^*) = \frac{(1 - \delta)r_P + \delta r_L}{\sigma_{P^*}}$$

**When  $\delta$  is close to zero:**

$$\frac{\partial Sh(P^*)}{\partial \delta} \approx \frac{1}{\sigma_{P^*}^2} \left[ r_L \sigma_{P^*} - r_P \frac{\sigma_{PL}}{\sigma_{P^*}} \right]$$

$$\frac{\partial Sh(P^*)}{\partial \delta} > \approx 0 \quad \text{when} \quad \frac{r_L}{\sigma_{PL}} > \frac{r_P}{\sigma_{P^*}^2}$$

# Benchmarking by Sharpe Ratio Buy Condition



L: Lower volatility stock  
 B: Benchmark  
 P: Manager Portfolio

- Manager will buy securities in orange region
- As advertised in Finance 101

# Information ratio marginal analysis for a $\beta=1$ manager

$$IR(P^*) = \frac{r_{P^*} - r_B}{\sigma_{P^*-B}}$$

$$\sigma_{P^*-B}^2 = (1-\delta)^2 [\sigma_B^2 + \sigma_I^2] + \delta^2 \sigma_L^2 + 2\delta(1-\delta) [\sigma_{BL} + \sigma_{LI}] + \sigma_B^2 - 2\sigma_{BP^*}$$

Risk:  $B \equiv$  Benchmark  $L \equiv$  Low vol stock  $I \equiv$  Manager idiosyncratic

$$\frac{\partial \sigma_{P^*-B}^2}{\partial \delta} = 2\delta \sigma_B^2 - 2(1-\delta) \sigma_I^2 + 2\delta \sigma_L^2 + (4\delta - 2) \sigma_{BI} + (2 - 4\delta) \sigma_{LI} - 4\delta \sigma_{BL}$$

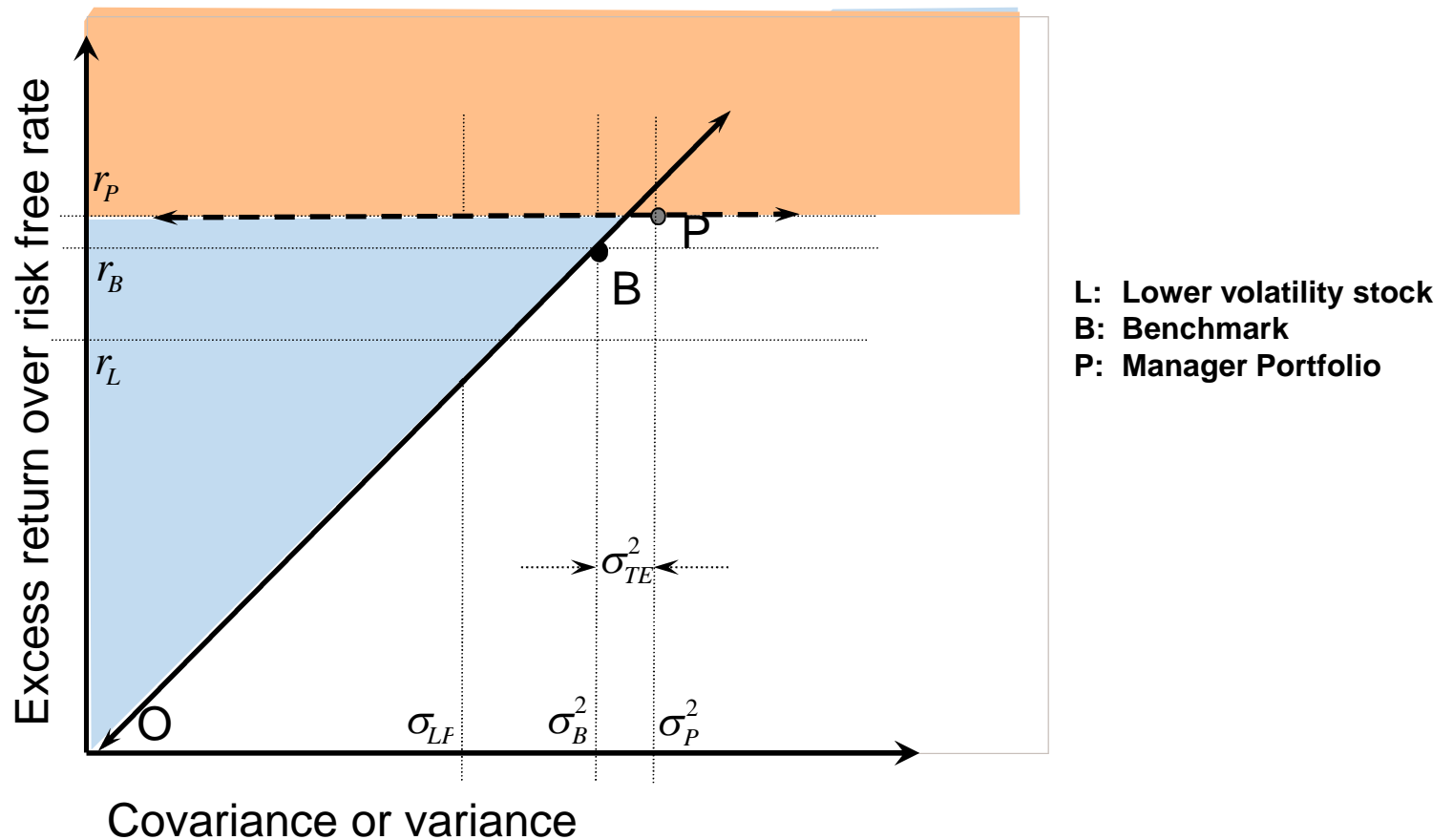
$$\frac{\partial IR(P^*)}{\partial \delta} = \frac{1}{\sigma_{P^*-B}^2} \left[ (r_L - r_P) \sigma_{P^*-B} - \frac{r_P - r_B}{2\sigma_{P^*-B}^2} \frac{\partial \sigma_{P^*-B}^2}{\partial \delta} \right]$$

When  $\delta$  is close to zero and  $\sigma_{MI} = 0$ :

$$\frac{\partial IR(P^*)}{\partial \delta} \approx \frac{1}{\sigma_{P^*-B}^2} \left[ (r_L - r_P) \sigma_{P^*-B} - \frac{1}{\sigma_{P^*-B}} (r_P - r_B) [\sigma_{LI} - \sigma_I^2] \right]$$

$$\frac{\partial IR(P^*)}{\partial \delta} > \approx 0 \quad \text{when} \quad \frac{r_L - r_P}{\sigma_{LI} - \sigma_I^2} \geq \frac{r_P - r_B}{\sigma_{P^*-B}^2} \quad \text{or} \quad \frac{r_L - r_P}{r_P - r_B} \geq \frac{\sigma_{LI}}{\sigma_{P^*-B}^2} - 1 \quad \text{or} \quad r_L > \approx r_B$$

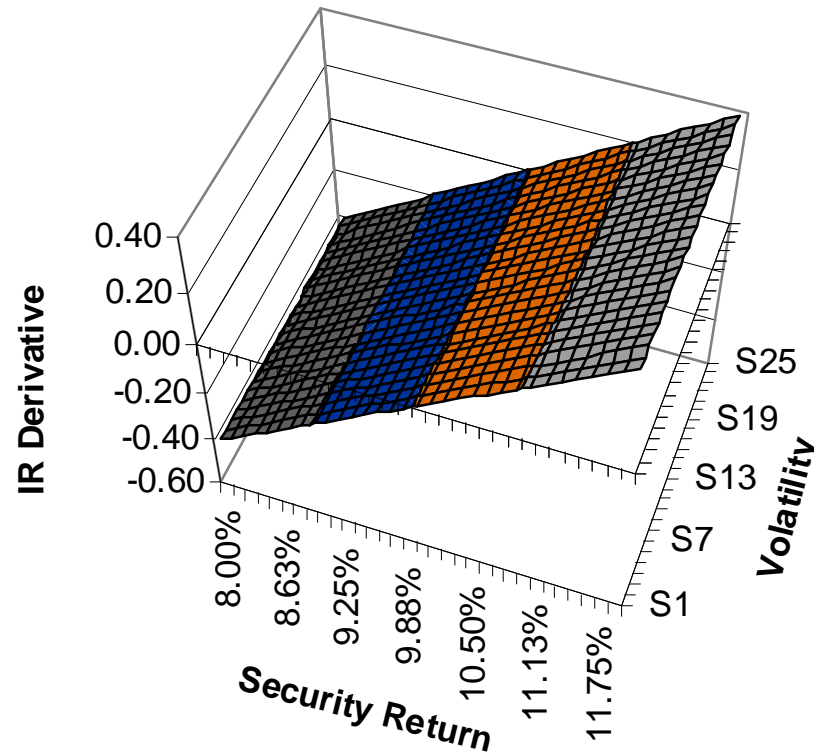
# Approximate IR Buy Condition for a $\beta=1$ Manager



- **Manager will buy securities in orange region**
- **Great apparent incentive for market inefficiency**

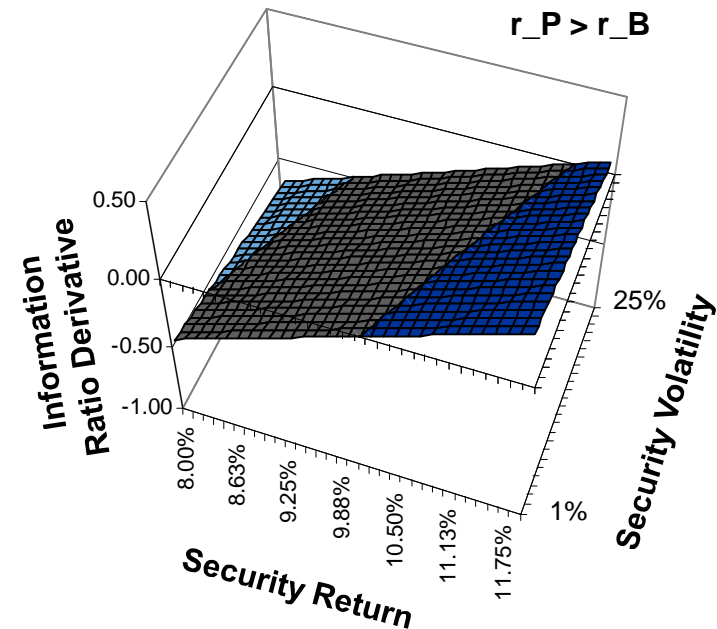
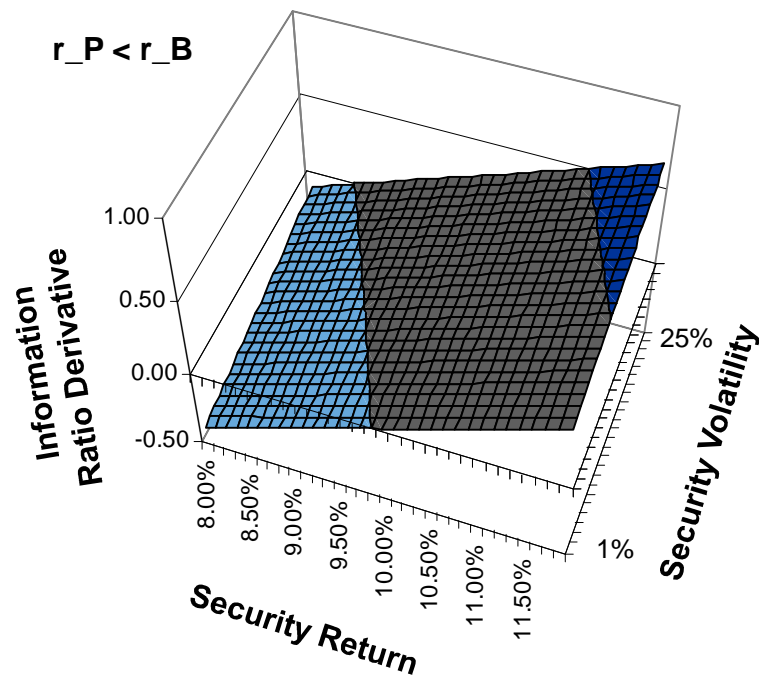


# Exact Analytic Results When $\rho_{LI} = 0$



- Close agreement with approximation
- Strong incentive for inefficiency

# Exact Analytic Results when $\rho_{LI} = 60\%$



- Security return lower than the benchmark always leads to reduction in information ratio, as with approximation
- Bias to higher vol when portfolio return is less than benchmark

# Low Beta, Low Volatility and Minimum Variance

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- Evidence that idiosyncratic risk is penalized (e.g. Ang, et al. 2006) argues against low beta
- Scherer (2010) finds that minimum variance adds no “optimization alpha” over embedded systematic and idiosyncratic risk
- Pure low volatility does not add information to the Russell Indexes family

# References

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# Questions?

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