

***Analyzing the Returns Behavior of
Timber-Oriented Securities vs.
Private Timberland Funds***

Chris Zinkhan

Blake Stansell

Thresa Henderson

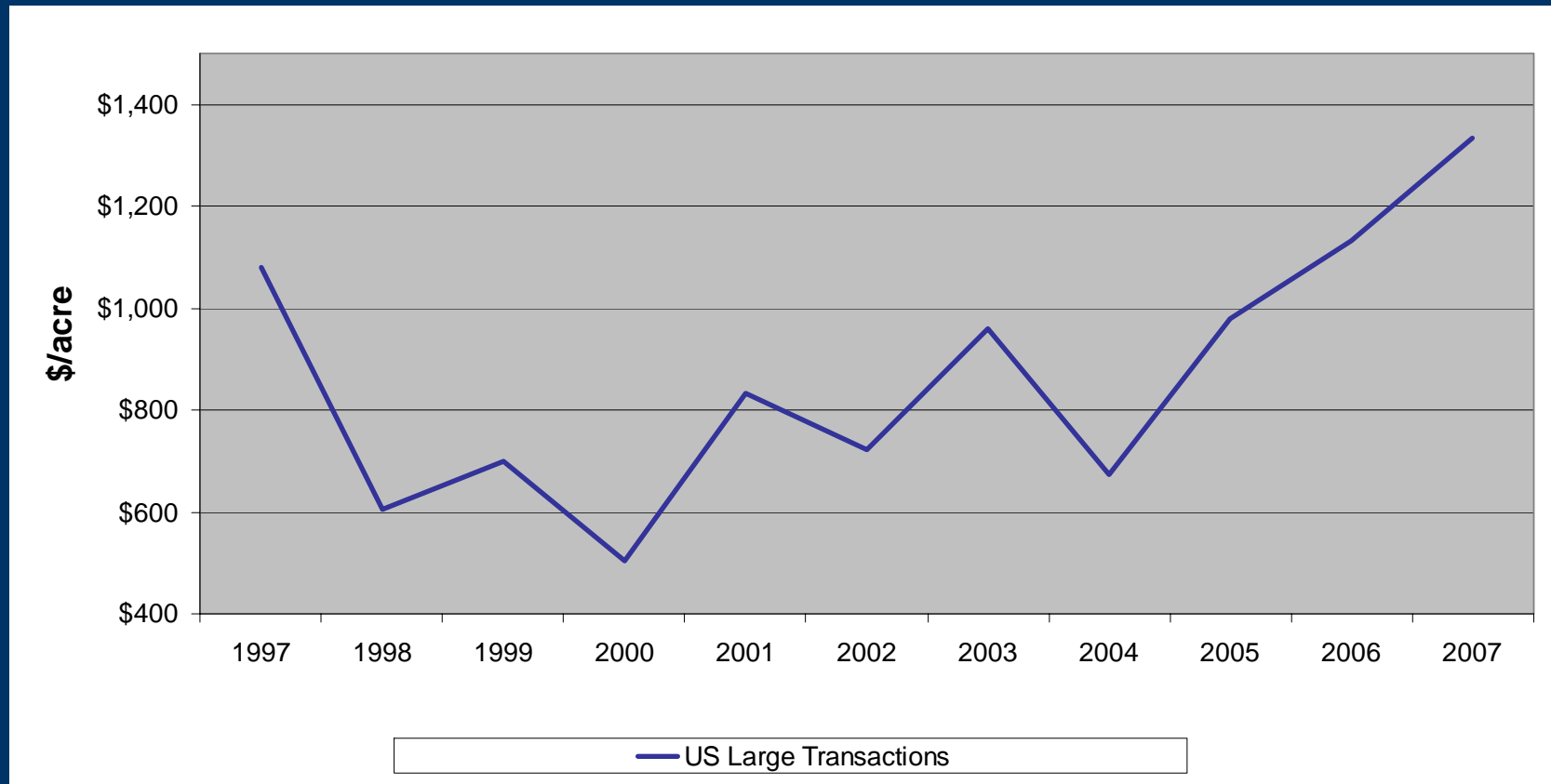
Sam Radcliffe

Dramatic Growth of Institutional Investor Activity within Timberland Sector

- In 1995, there were only six TIMOs; today, there are approximately 25.
- TIMO assets under management have grown from about \$1 billion in 1990 to about \$30 billion today.
- Investor base has expanded beyond an early focus on pension plans and public retirement systems to also include university endowments, foundations, family offices, and others.

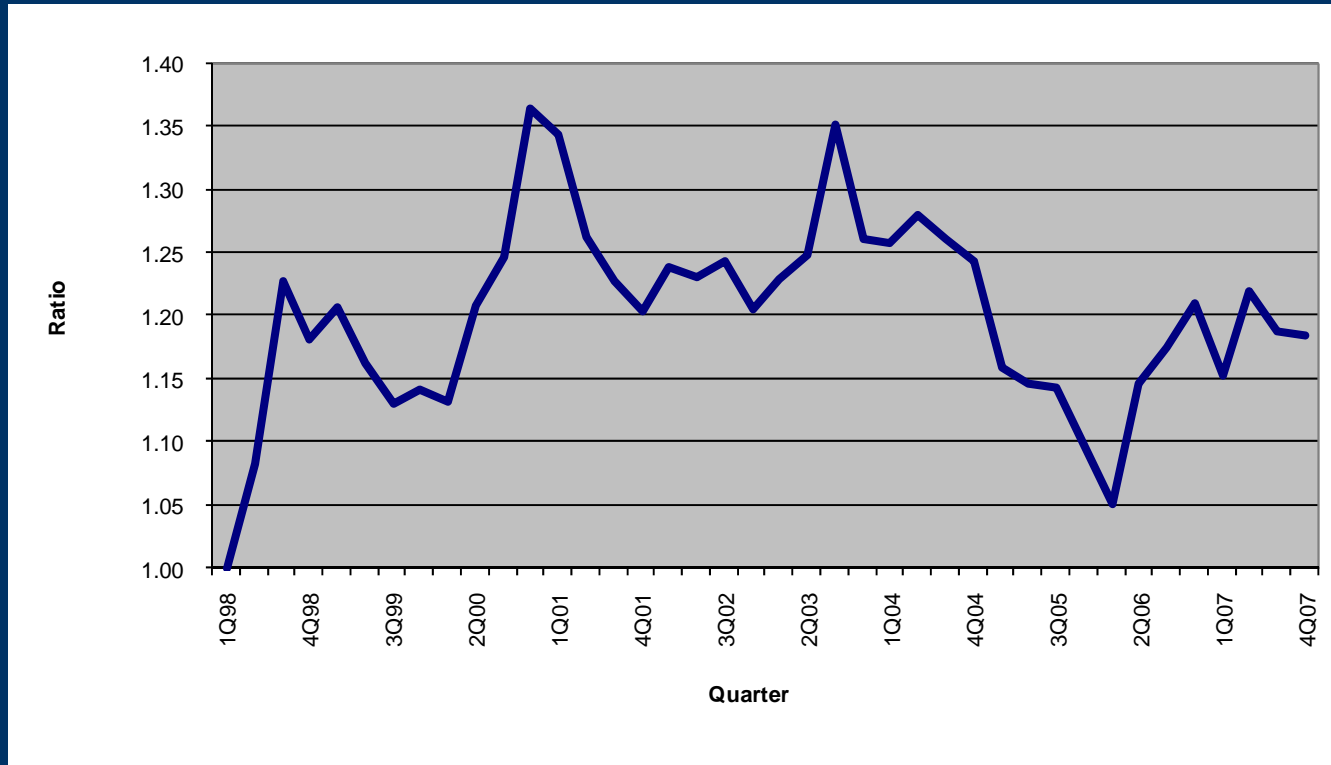
Can Retail Investors Participate?

US Large-Tract Timberland Transactions--\$/Acre 1997–2007



Diversifying across Timber Types Can Smooth Volatility: Role for Securities?

Ratio of Volume-Weighted Hardwood Sawtimber Index over TMS Pine Sawtimber Index, 1998-2007



Alpha vs. Barriers/Frictions

- Investors are attracted to timberland by such attributes as:
 - Improvement in a portfolio's alpha.
 - Low correlations with financial assets.
 - Historical returns which have been competitive vs. equities.
- But, there are barriers to entry and investment frictions:
 - High minimum investments.
 - Significant time lags to change exposure levels.
 - Material annual expenses and fees.

Going Global

- North America accounts for 17% of the world's forest area. However, the U.S. South alone has about 20% of the world's industrial wood plantations.
- U.S. has the largest share of global industrial roundwood at 25%; Canada is second with 12%.
- A passive approach for participating in global timber sector--S&P Global Timber & Forestry Index: Only 41.3% of the market cap is U.S. entities (as of 12/31/07).

Timber and Timberland Derivatives

- Lumber futures contracts represent a fuzzy cross-hedge instrument for timber and timberland applications.
- For example, lumber futures eliminated less than 6% of the variance of a timberland investment index for the decade ending in 1992 (Zinkhan 1995).
- Therefore, customized private contracts have been proposed for hedging near-term price risk, active timber market timing, speculation, and portfolio asset allocation adjustments (e.g., Zinkhan 1995; 1996).

Synthetic Timberland

- Mimic the “real thing” with private derivatives contracts and/or securities.
- Utilization of a customized timber-price derivatives contract plus T bills to mimic timberland returns (Zinkhan 1995).
- Applications: Passive allocations to timberland with modest fees/expenses and rapid changes to timberland allocations.

Replicating Timberland with Securities Indexes: Why?

- Provides retail investors with access to a timber-like vehicle.
- Greater marketability than the “real thing.”
- Lower fees and expenses.
- Enables investors to quickly change exposure levels; in contrast, there are significant time delays associated with building or selling a timberland portfolio—sometimes years.
- Diversification benefits vis-à-vis an actual timberland portfolio?
- In summary, investing in the securities underlying an index has less friction than the “real thing.”

Replicating Timberland with Securities Indexes: How?

- Matching the holdings and weightings of an index based on timber-rich, publicly traded securities with periodic rebalancing (e.g., S&P Global Timber & Forestry Index).
- Purchase an Exchange Traded Fund (“ETF”) based on a timber-rich securities index (e.g., the Claymore/Clear Global Timber Index ETF which tracks the Clear Global Timber Index).

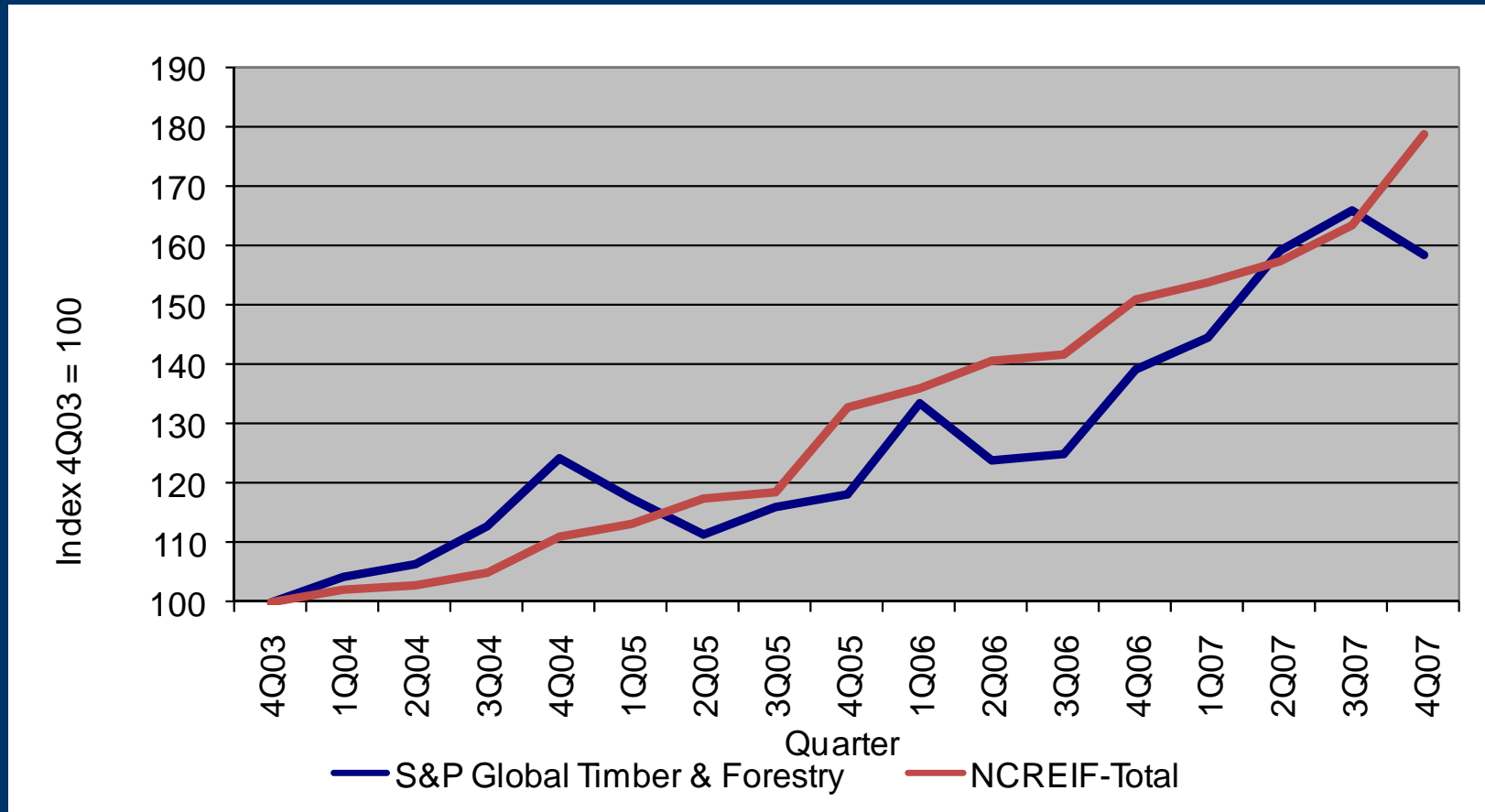
S&P Global Timber & Forestry Index (“S&P Timber Index”)

- 25 Companies—3 largest: Plum Creek, Rayonier, and Weyerhaeuser.
- 10 Countries—5 heaviest weightings (12/31/07): US (41.3%), Canada (18.5%), Sweden (7.7%), Finland (7.5%), and Brazil (7.4%).
- Index follows a modified market cap weighted scheme.

Question 1: Is the S&P Timber Index a Substitute for Timberland?

- Tracking history?
- Similar returns?
- Similar volatility?

S&P Timber Index vs. NCREIF Timberland Index-Total 2004 – 2007

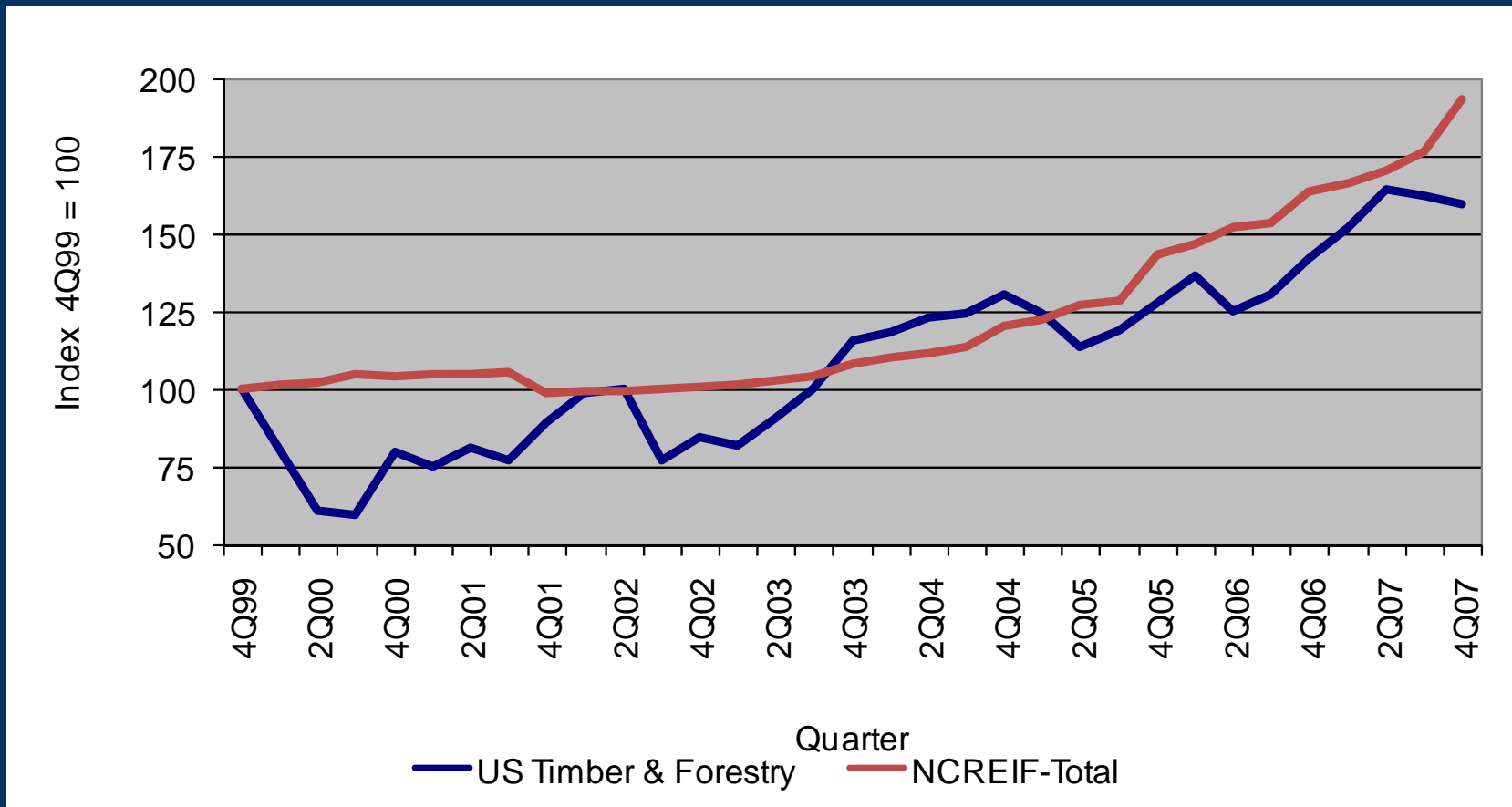


S&P Timber Index vs. NCREIF Timberland Index-Total, 2004-2007

	<u>Annual Return</u>	<u>Std Dev</u>
S&P Timber	12.2%	12.6%
NCREIF-Total	15.6%	6.4%

Correlation: -0.06

S&P Timber Index (US constituents only) vs. NCREIF Timberland Index-Total 2000 – 2007



**S&P Timber Index (US constituents only)
vs. NCREIF Timberland Index-Total,
2000-2007**

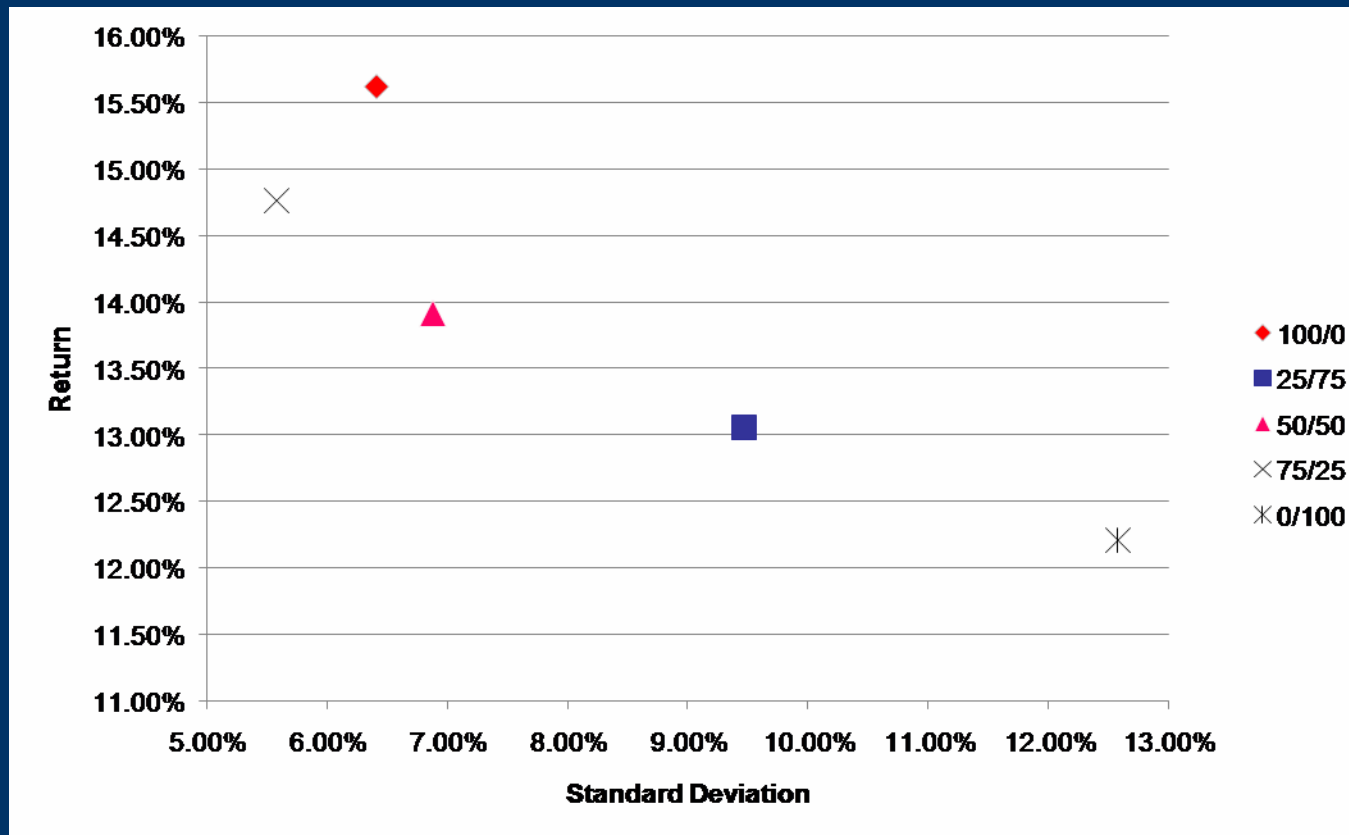
	<u>Annual Return</u>	<u>Std Dev</u>
S&P Timber	6.1%	23.3%
NCREIF-Total	8.6%	6.0%

Correlation: -0.08

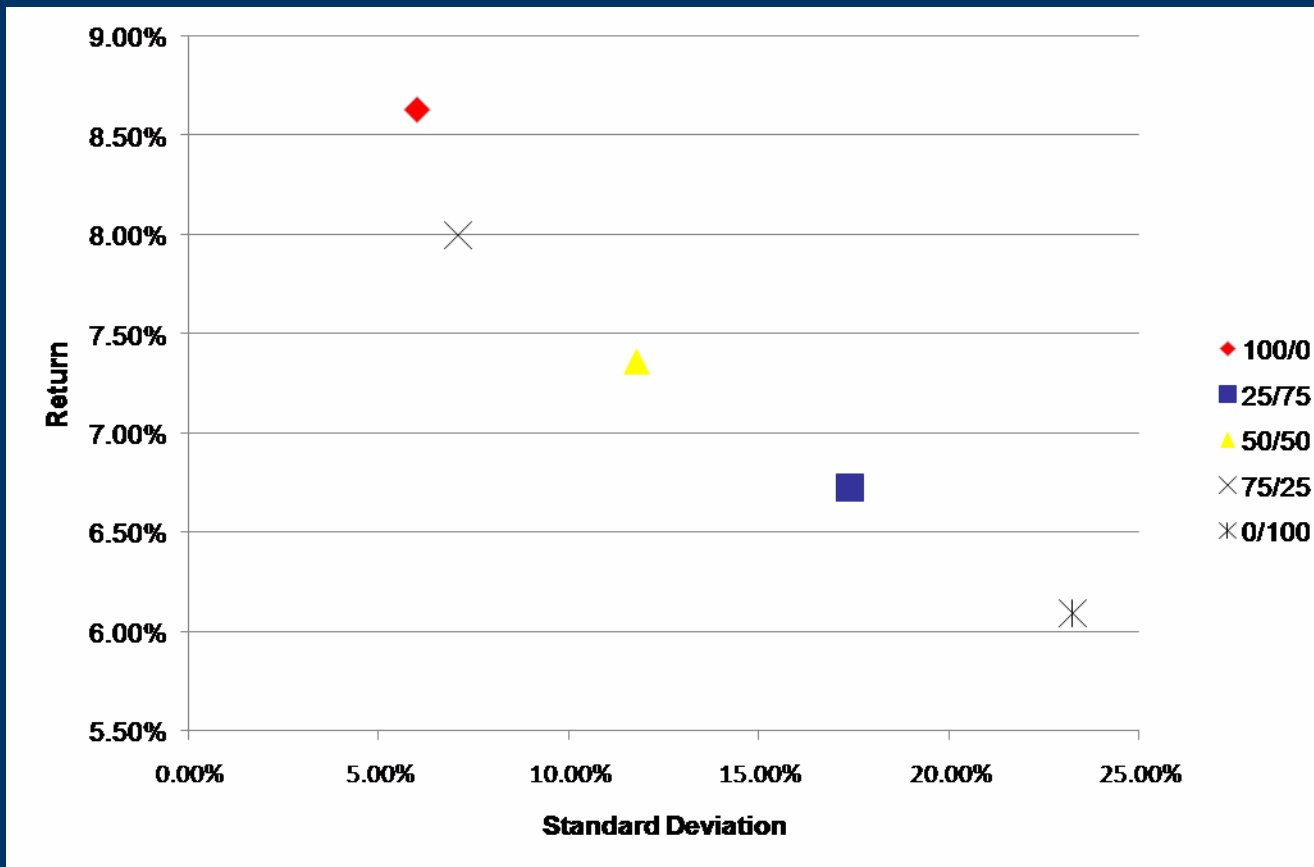
Question 2: Can the S&P Timber Index Improve Portfolio Efficiency?

- Comparing alternative mixes of Timberland and the S&P Timber Index relative to portfolio efficiency (i.e., in ex post risk-return space).

Risk-Return Performance of Alternative NCREIF-Total/S&P Timber Mixes (2004-2007)



Risk-Return Performance of Alternative NCREIF- Total/S&P Timber (US constituents only) (2000- 2007)



Potential Reasons for Imperfect Tracking

- Different timber/processing sector exposure.
- Different geographic exposure.
- Financial vs. real-asset markets.
- Different managerial groups.
- Different levels of active management.

Future Research

- Extend time horizons of empirical research.
- Compare relative tracking of alternative securities indexes/ETFs vs. timberland.
- Survey institutional investors regarding perceptions of potential applications.
- Include impact of management fees in analysis.

Conclusions

- Based on a very brief history, S&P Timber Index is not a perfect substitute for Timberland (as measured by the NCREIF Timberland Indexes).
- Based on a very brief history, S&P Timber Index offers some diversification potential—but at a cost (lower returns) vis-à-vis Timberland.