aperiogroup

THE BOSTON
CARBON RISK
FORUM
HARVARD LAW SCHOOL
SEPTEMBER 29, 2014

What Happens if you Divest?

Three Harbor Drive, Suite 315
Sausalito, CA 94965
(415) 339-4300
www.aperiogroup.com
v2c.2014

About Aperio Group

- $9b employee-owned firm based in Sausalito, California
- Clients: UHNW families; Endowments & Foundations
- Customized **passively-managed** public equity portfolios in 1700+ separately managed accounts (SMAs)
- Thirteen year track record of successfully tracking benchmarks while delivering on customized mandates
- Aperio & Divestment

Defining the Goal/Motivation

- Match the market?
- Improve risk/return – e.g. stranded assets theory
- Divestment? Penalize the producers
- Lower carbon footprint? Reward the conscientious consumers

Quantifying Impact of Divestment

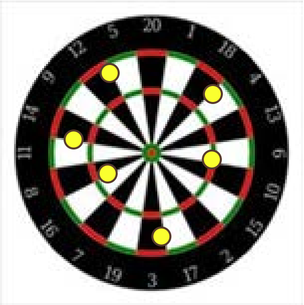
- Assume neutral on returns (values alignment vs. alpha seeking)
- Investors rely on two statistical measures
  - Absolute risk (standard deviation, measures volatility)
  - Tracking error (TE = comparative risk vs. benchmark)
  - The stricter the screening, the higher the TE
- Theory says you should get paid more for bearing more risk
- A note on Beta & Alpha (improving risk/return or match the market)

What Is Tracking Error?

- TE measures variation around a benchmark

Low Tracking Error

High Tracking Error

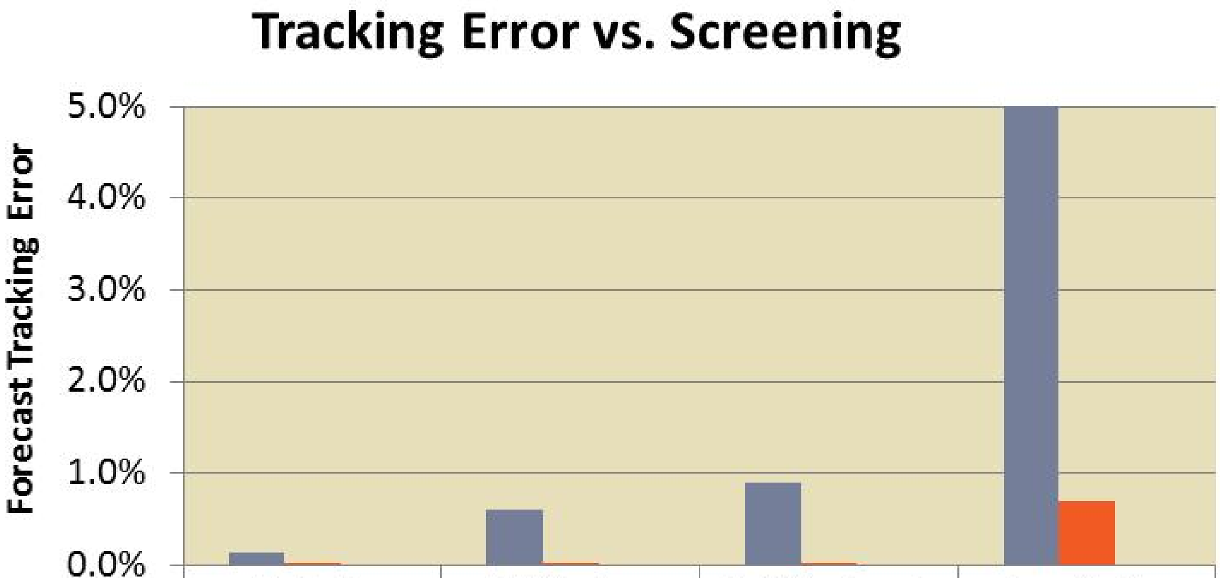


- With an indexing approach, tracking error has an expected value of zero
- Theoretically half the time it will be positive and half the time negative

Options for Divesting

- Definition?
  - Coal
  - Reserves (e.g.) Underground 200™
  - Industry: Oil, Gas & Consumable Fuels
  - Tar sands
  - Frakking
  - Worst carbon footprint
  - Something else?
- Divesting – Passive
  - Unoptimized
  - Optimized
- Divesting – Active
  - Constraining the opportunity set?

Impact of Tracking Error – Passive & Reoptimized



		Exclude "Filthy 15"	Full Carbon Divestment	Full Carbon + Positive	Avg. Active Mgr.*
σ_e	Trkg. Err.	0.140%	0.598%	0.911%	5.000%
σ_p	Incr. Risk	0.001%	0.010%	0.023%	0.694%
	Stocks Excl.	13	134	134	0

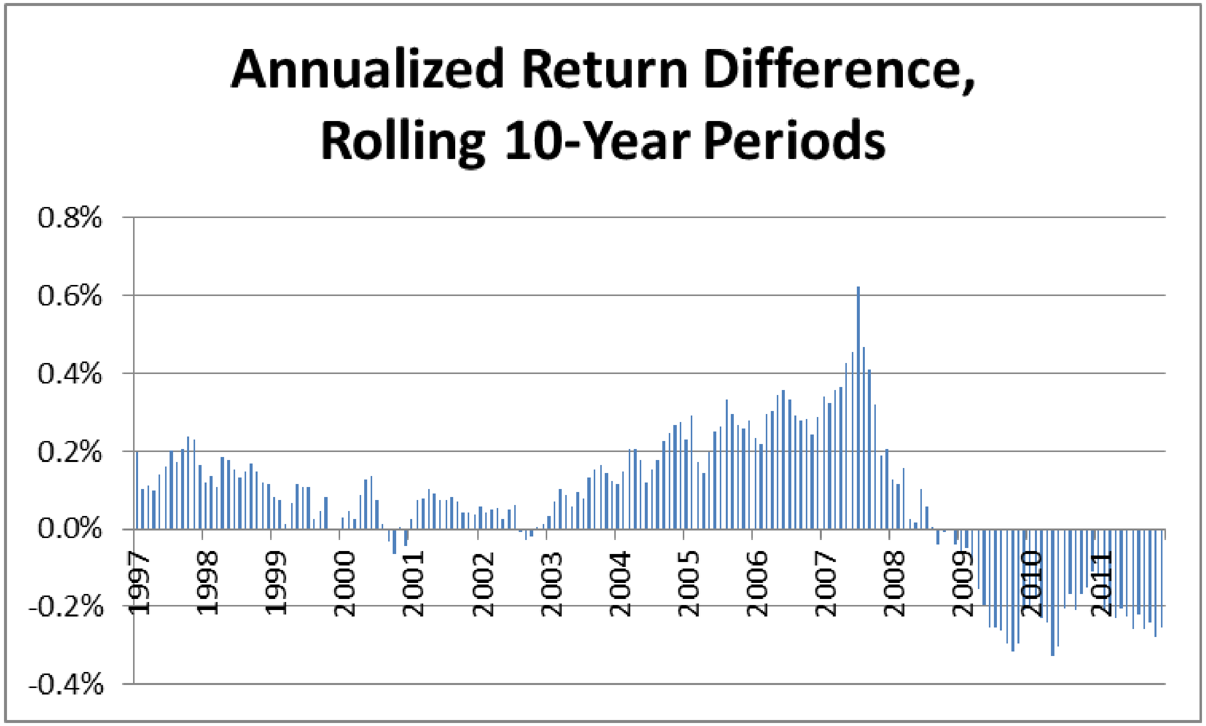
*Source: Based on a survey of Callan Associates, Inc., Mercer Investment Consulting and Watson Wyatt Worldwide. For details see GMO. 2007. White Paper, “What Should You Pay For Alpha?”, https://www.gmo.com/NR/rdonlyres/F8E38661-0CD6-49EB-97DF-8D7B6AC32B43/1007/HowMuchPayForAlpha.pdf.

Incremental risk assumes forecast market risk of 17.67%; tracking error shown vs. Russell 3000. (Source: Barra Aegis.)

How Would Strategies Have Performed in the Past?

- Simulate historical performance using same multi-factor models used to create portfolios
- For U.S. market, slight positive tracking error over past 25 years
- Past performance is no guarantee of future results
  - Particularly true for back-tested data
  - Technical version: take back tests with a grain of salt
  - Danger of cherry-picking

How Would A Divested Strategy Performed?



Return numbers show annualized return difference between Full Carbon Divestment portfolio and Russell 3000 for periods from Jan 1988 to Dec 2012.

Average Annualized 10-year Return Difference	+0.08%
Percentage of Periods Higher than R3000	73%
Percentage of Periods Lower than R3000	27%
Tracking error, current forecast	0.60%
Tracking error, historical simulation	0.78%

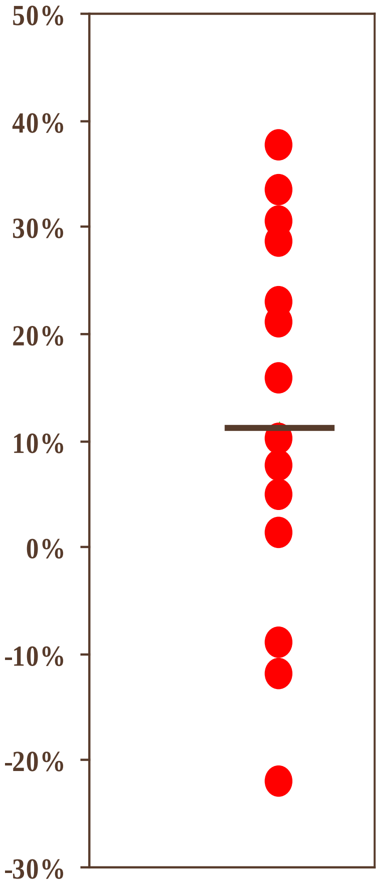
Please see Disclosure slide for details.

Options for Divesting in Public Equities

- Funds
- ETFs
- SMAs

Appendix: Standard Deviation of S&P500

2006	15.79%
2005	4.91%
2004	10.88%
2003	28.69%
2002	-22.10%
2001	-11.89%
2000	-9.10%
1999	21.04%
1998	28.58%
1997	33.36%
1996	22.96%
1995	37.58%
1994	1.32%
1993	10.07%
1992	7.62%
1991	30.47%
1990	-3.10%



Average 12.2%

Std. Dev. 17.3%

Important Note

The information contained within this presentation was carefully compiled from sources Aperio believes to be reliable, but we cannot guarantee accuracy. We provide this information with the understanding that we are not engaged in rendering legal, accounting, or tax services. In particular, none of the examples should be considered advice tailored to the needs of any specific investor. We recommend that all investors seek out the services of competent professionals in any of the aforementioned areas.

With respect to the description of any investment strategies, simulations, or investment recommendations, we cannot provide any assurances that they will perform as expected and as described in our materials. Past performance is not indicative of future results. Every investment program has the potential for loss as well as gain.

Assumptions underlying simulated back test:
Based on Barra Aegis multi-factor risk model
Quarterly rebalancing.
Exclude stocks from Oil Gas & Consumable Fuels industry as defined by MSCI Barra industry for back test.
No transaction costs or management fees included.
Benchmark returns are simulated using underlying holdings to ensure apples-to-apples comparison.

The benchmark for back-test simulation is the Russell 3000 total return index. The simulated portfolios are actively managed, and the structure of the actual portfolios and composites may be at variance to the benchmark index. Index returns reflect reinvestment of dividends but do not reflect fees, brokerage commissions, or other expenses of investing, which can reduce actual returns earned by investors.

Performance results from back tests of particular strategies exclude any trading or management fees that would reduce the return. Furthermore, future returns for any such strategies could be worse than the results shown or the identified benchmark. Back-testing involves simulation of a quantitative investment model by applying all rules, thresholds and strategies to a hypothetical portfolio during a specific market period and measuring the changes in value of the hypothetical portfolio based on the actual market prices of portfolio securities. Investors should be aware of the following: 1) Back-tested performance does not represent actual trading in an account and should not be interpreted as such, 2) back-tested performance does not reflect the impact that material economic and market factors might have had on the manager’s decision-making process if the manager were actually managing client’s assets, 3) the investment strategy that the back-tested results are based on can be changed at any time in order to reflect better back-tested results, and the strategy can continue to be tested and adjusted until the desired results are achieved, and 4) there is no indication that the back-tested performance would have been achieved by the manager had the program been activated during the periods presented above.

Important Note Continued

Aperio's investment advisory fees are described in Part II of its Form ADV. Aperio's investment advisory fees and any other expenses that may be incurred in the management of the account will reduce performance results of Aperio clients. With respect to the description of any investment strategies, simulations, or investment recommendations, we cannot provide any assurances that they will perform as expected and as described in our materials. Past performance is not indicative of future results. Every investment program has the potential for loss as well as gain.