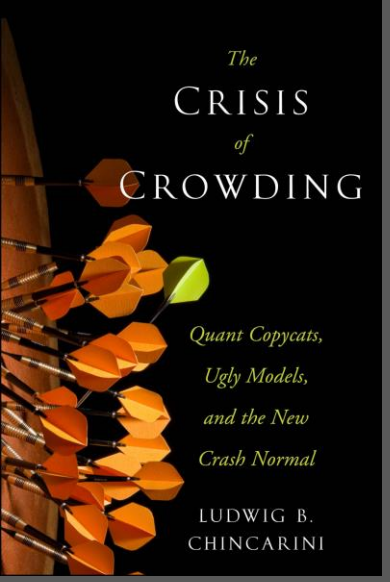

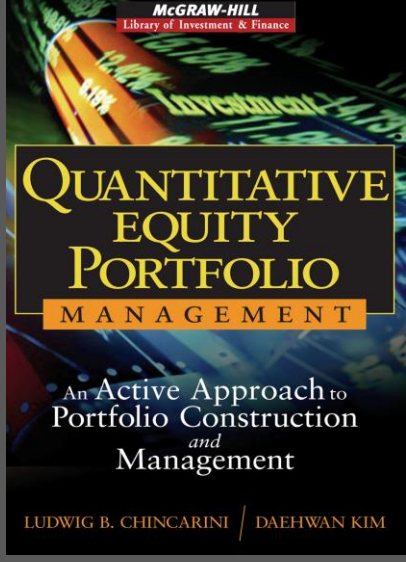

Alternative Weighted Indices

Speaking Notes

April 5, 2016

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University of San Francisco
United States Commodity Funds

CANTOR FITZGERALD – INVESTMENT REVOLUTION: THE FUTURE OF INVESTING AND RISK MANAGEMENT
APRIL 5, 2016

- Thank you for coming. Thanks to Cantor Fitzgerald, David Smith, and United States Commodity Funds.

I. Equal-Weighted Indices – The Beginning of Alternative

Notes

a. *Although around a long time, really kicked off when we built a brokerage firm and then brought over to Rydex and launched EW index and ETF.*

b. *Key: Diversification of industries. However, performance has been higher on average.*
   - *Mean Reversion could be cause*
   - *Random MisPricing*
   - *More value and more small size (anomaly)*

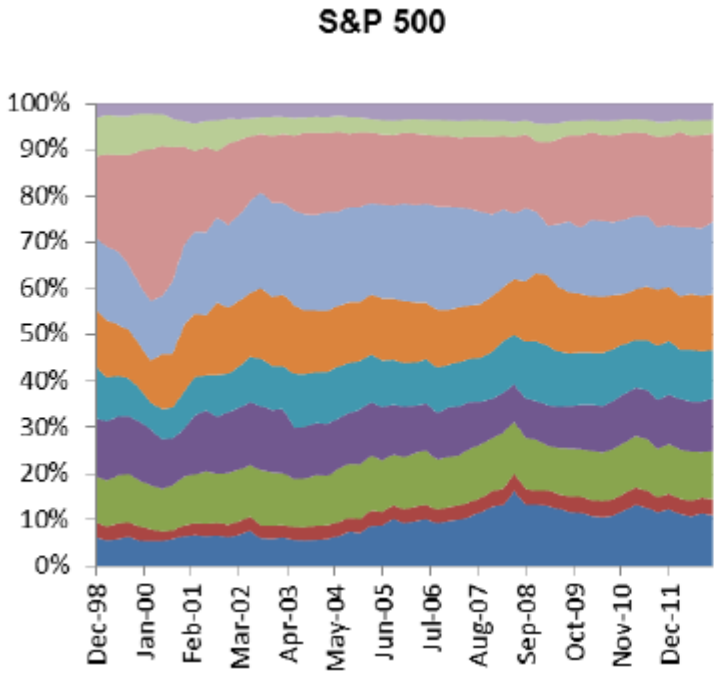
c. *Fees. 40 bps versus 9 bps. Thus, on average needs a 31 bps outperformance.*

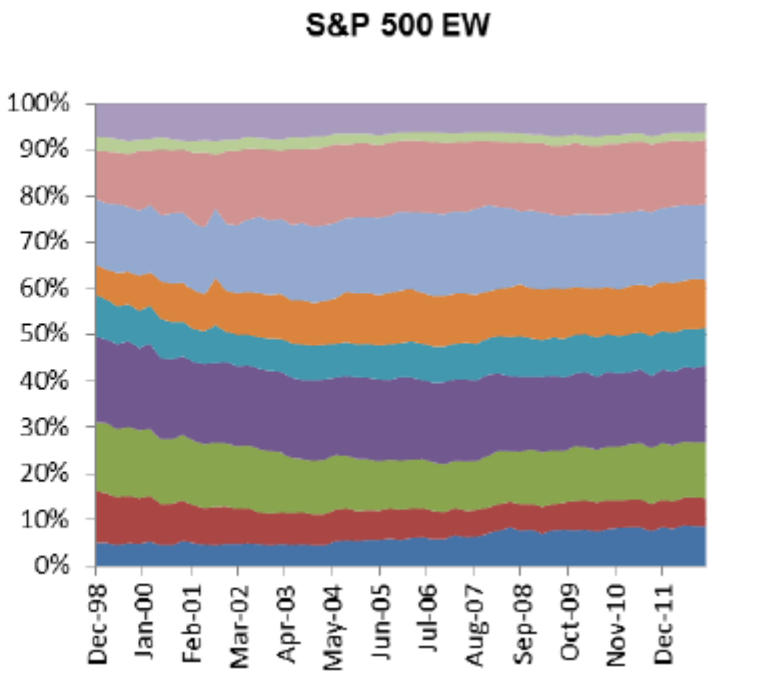
d. *Past versus Future ($9B versus $163B)*

	2015	2014	2013	2012	2011	2010	2003-2015	Flows	Sigma	Sharpe
RSP	-1.76%	14.06%	35.54%	17.16%	-0.66%	21.37%	10.10%	192%	16.5%	0.610
SPY	0.34%	13.46%	32.31%	15.99%	1.89%	15.06%	8.28%	811%	13.9%	0.598

I. Equal-Weighted Indices – The Beginning of Alternative

Notes





II. Rebalancing

Notes

a. *When we created equal-weight index, we compared benefits of deviation from costs of trading, etc.*
b. *There is no correct answer, but we settled on quarterly.*
c. *In theory, it's that balance one is looking for. Costs versus representativeness, performance versus costs, etc.*

Notes:

Quarterly Rebalancing

Standard & Poor's has arrived at a quarterly rebalancing procedure for the S&P EWI. Apart from striking a balance between representation and investability, this procedure has several practical advantages:

- **Consistency with the S&P 500:** The S&P EWI's rebalancing date will coincide with the date when S&P 500 quarterly share changes are made.
- **Consistency with listed derivative cycle:** The usual quarterly share adjustment date for the S&P 500 is the third Friday on the quarter-ending month. This is the triple-witching date, when listed index options, index futures and stock options expire.
- **Creation of structured products and derivatives:** Between two quarterly rebalancing dates, the S&P EWI will give the arithmetic average return for all 500 stocks in the S&P 500. Given the conventional quarterly cycle for most index derivatives, a quarterly rebalancing procedure will also enable the creation of a rich market of structured products and derivatives around the S&P EWI.

Contingent, or band-based, rebalancing was considered, but was not incorporated because of the following reasons:

- Full rebalance gives a pure arithmetic average of the returns of S&P 500 stocks.
- Indices should be simple to understand, with fund managers and traders having the flexibility to make their own decisions for specific situations.
- Bands would leave index funds open to gaming by traders. For example, suppose a 1 basis point band was established. If a stock were shorted down from .1905% to .1895%, a $10 billion fund family would end up with an unanticipated $1 million purchase of stock.

Source:
http://ludwigbc.com/pubs/SPEWIWhitePaper010703.pdf

III. Cap-Weighted has Theory, but Alternative Doesn't

Notes

a. Market cap is wisdom of market and according to CAPM is what everyone should hold.

b. No "real" theory for alternative weighting. However:

- *CAPM has many flawed assumptions.*
- *Beta has problems empirically*
- *Buying just because more people buy?*

c. Some of the alternative weighting schemes are based on sound ideas and also suit certain types of investor preferences (e.g. equal weight and diversification).

Some might be based on data mining.

III. Cap-Weighted has Theory, but Alternative Doesn't

Research on Equal-Weighting

- DeMiguel, Garlappi, and Uppal (2009) show that the return of the equal-weighted portfolio is almost always higher than that of portfolios based on mean-variance optimization (there is a response paper).
- Jacobs, Muller, and Weber (2013) extend this finding to other datasets and asset classes and suggest easy-toimplement allocation guidelines for individual investors.
- Bloomfield, Leftwich, and Long (1977) show that sample-based mean-variance optimal portfolios do not outperform an equally-weighted portfolio.
- Plyakha, Uppal and Vilkov (2014) find that the equal-weighted portfolio outperforms the price- and value-weighted portfolios in terms of average return, four-factor alpha, Sharpe ratio, and certainty-equivalent return. They rebalance the portfolios monthly.

III. Cap-Weighted has Theory, but Alternative Doesn't

Research on Equal-Weighting

- Adame-Garcia, Fernández and Sosvilla (2016) show that in the period 2001-2014 the total return of the equal-weighted IBEX 35 (46.8%) was higher than the return of the value-weighted IBEX 35 (13.21%). They rebalance daily the equal-weighted IBEX 35.
- Ernst, Thompson and Miao (2016) show that the return of the equally weighted S&P 500 portfolio is higher than the return of the market capitalization weighted S&P 500 portfolio. They calculate that $100 invested in the S&P500 in 1958 were worth $5,212 in 2014; while $100 invested in the 'equally weighted S&P 500 portfolio' in 1958 were worth $27,601 in 2014. They rebalance daily the equally weighted S&P 500 portfolio and exclude dividends from all calculations.
- *Brennan and Lo (2010) question whether the CAPM can be consistent with efficient frontiers.*

Research on Equal-Weighting

- Markowitz (2005) *"When one particular, clearly unrealistic CAPM assumption is replaced by a more real-world version, some of the dramatic, practical conclusions of CAPM no longer follow. This result has implications for financial practice, research, and pedagogy".*
- *Example (from Chincarini class notes): Taxes*

$$\bar{r}_j = r_f + \beta_j \left[(\bar{r}_M - r_f) - (\delta_M - r_f)\tau \right] + (\delta_j - r_f)\tau$$

$$\tau = H \cdot \left[\sum_i \frac{(t_{di} - t_{gi})\omega_i}{(1 - t_{gi})\lambda_i} \right] \Big/ \sum \omega_i$$

- complicated function of tax rates.

δ_j = dividend yield on stock j

t_{di} = stockholder i's marginal tax rate on div/interest

t_{gi} = " " on capital gains [no long/short]

IV. Crowding and Alternative Weighting

Notes

a. *Crowding and automation of alt weighting schemes might be causing crowding. Might be why past anomalies are disappearing (e.g. value and size effect).*

b. ***Crowding*** *is a real concern in all investment spaces and we need to measure better.*

(More Info: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2616579)

Table. Performance of "Anomalies" for Different Periods								
	Mkt-RF	SMB	HML	MOM	Mkt-RF	SMB	HML	MOM
1964-2000	6.72%	3.47%	5.47%	12.05%	5.80%	2.38%	3.33%	11.38%
2000-2014	4.77%	5.13%	5.66%	0.20%	2.62%	4.70%	5.00%	-6.65%
2010-2014	16.20%	1.65%	-1.00%	4.75%	15.66%	1.33%	-1.12%	4.72%
1990-2014	8.41%	2.27%	3.07%	6.39%	6.64%	1.60%	2.02%	1.58%

References

1. DeMiguel, V., L. Garlappi, and R. Uppal. 2009. "Optimal versus Naive Diversification: How Inefficient Is the 1/N Portfolio Strategy?" *Review of Financial Studies* 22 (5): 1915–1953. doi:10.1093/rfs/hhm075.
2. Jacobs, H., Müller, S. and M. Weber (2013), "How Should Individual Investors Diversify? An Empirical Evaluation of Alternative Asset Allocation Policies", *Journal of Financial Markets*, 19, 62-85.
3. Bloomfield, T., Leftwich, R. and J. Long (1977), "Portfolio strategies and performance", *Journal of Financial Economics* 5: 201–18.
4. Plyakha, Y., Uppal, R. and G. Vilkov (2014), "Equal or Value Weighting? Implications for Asset-Pricing Tests", Available at SSRN: http://ssrn.com/abstract=1787045.
5. Adame-Garcia, V.M.; Fernández, F. and S. Sosvilla (2016), "Portfolios in the Ibex 35 Index: Alternative Methods to the Traditional Framework, a Comparative with the Naive Diversification in a Pre- and Post- Crisis Context", *Applied Economics*, http://dx.doi.org/10.1080/00036846.2016.1145352

References

6. Ernst, P., J. Thompson and Y. Miao (2016), "Portfolio Selection: The Power of Equal Weight", http://arxiv.org/pdf/1602.00782.pdf
7. Brennan, T. J., and Andrew W. Lo (2010), "Impossible Frontiers." *Management Science* 56 905–923.

Open Discussion

Thank you

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More Information