From active investing to factor investing
The rise of systematic management
The active share debate
The performance debate

The Active Versus Passive Management Debate
Challenge, Risk & Future

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June 21th, 2018

¹The views and opinions expressed in this presentation are those of the author and are not meant to represent the opinions or official positions of Amundi Asset Management or any other institutions. The active share section is a joint work with Essam N’zoulou and Marielle de Jong. I would like to thank Alexandre Drabowicz, Charles-Albert Lehalle, Bruno Taillardat, the Scientific Council of AMF, and the Board of the AMF for their helpful comments and valuable input.
This presentation is not about the performance difference between active management and passive management\(^a\). This presentation does not promote active or passive management. This presentation does not take the viewpoint of investors or asset managers.

This presentation takes the viewpoint of policy and regulation. This presentation is about the added-value of active management when we consider the efficiency of financial markets\(^b\). This presentation is about the stability of financial markets. The main question is: What is the minimum proportion of active management in order to ensure that financial markets will continue to work properly? Another important question is: What is the future of alpha and does this alpha will tend to be zero?

\(^a\)I think that this debate had been definitively closed.

\(^b\)that is the capital allocation between corporate firms or investment projects.
Active management could rise from the dead (Forbes, October 2016)
The end of active investing? (Financial Times, January 2017)
Active management isn’t dead, it’s evolving (ETF.com, January 2017)
The end of an active-investing era (Barron’s, February 2017)
Is there a future for active management? (Greenwich Associates, February 2017)
Jack (John) Bogle killed active managers. Now he has a plan to save them (CNBC, May 2017).
The death of active management has been greatly exaggerated (Morningstar, June 2017)
Active management is not in a death spiral (Financial Times, September 2017)
GPIF shifts to performance-based fee model for active managers (Asia Asset Management, June 2018)
The long read: Is it the end of the road for active management? (Funds Europe, June 2018)
“The question is when is active management good? The answer is never”

Eugene Fama, Morningstar ETF conference, September 2014

“So people say, ‘I’m not going to try to beat the market. The market is all-knowing.’ But how in the world can the market be all-knowing, if nobody is trying – well, not as many people – are trying to beat it?”

Robert Shiller, CNBC, November 2017
The boundaries of active management have considerably evolved during the past years ⇒ its scope has been dramatically reduced!

The debate “active vs passive management” is now a debate between active management and systematic (or rule-based) management

Like the SB, there is now a shadow asset management

Systematic investment management could pose a systemic risk for the financial system

Active share is an interesting benchmarking measure, but it does not solve the issues of performance and closet indexing

Financial markets need active management in order to exist ⇒ What is the minimum acceptable part of active management?

The debate of the performance (and benchmarking) of active management is a spurious issue and an endogenous puzzle
How to define risk factors?

Risk factors are common factors that explain the cross-section variance of expected returns

- 1964: Market or MKT (or BETA) factor
- 1972: Low beta or BAB factor
- 1981: Size or SMB factor
- 1985: Value or HML factor
- 1991: Low volatility or VOL factor
- 1993: Momentum or WML factor
- 2000: Quality or QMJ factor
Alpha or beta?

At the security level, there is a lot of idiosyncratic risk or alpha²:

<table>
<thead>
<tr>
<th></th>
<th>Common Risk</th>
<th>Idiosyncratic Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOOGLE</td>
<td>47%</td>
<td>53%</td>
</tr>
<tr>
<td>NETFLIX</td>
<td>24%</td>
<td>76%</td>
</tr>
<tr>
<td>MASTERCARD</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>NOKIA</td>
<td>32%</td>
<td>68%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>89%</td>
<td>11%</td>
</tr>
<tr>
<td>AIRBUS</td>
<td>56%</td>
<td>44%</td>
</tr>
</tbody>
</table>

²The linear regression is:

\[ R_i = \alpha_i + \sum_{j=1}^{n\mathcal{F}} \beta_{ij} \mathcal{F}_j + \varepsilon_i \]

In our case, we measure the alpha as \( 1 - R_i^2 \) where:

\[ R_i^2 = 1 - \frac{\sigma^2 (\varepsilon_i)}{\sigma^2 (R_i)} \]

Carhart’s model with 4 factors, 2010-2014
Source: Roncalli (2017)
The concept of alpha

- Jensen (1968) – How to measure the performance of active fund managers?

\[
R_t^F = \alpha + \beta R_t^{MKT} + \varepsilon_t
\]

<table>
<thead>
<tr>
<th>Fund</th>
<th>Return</th>
<th>Rank</th>
<th>Beta</th>
<th>Alpha</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>12%</td>
<td>Best</td>
<td>1.0</td>
<td>−2%</td>
<td>Worst</td>
</tr>
<tr>
<td>B</td>
<td>11%</td>
<td>Worst</td>
<td>0.5</td>
<td>4%</td>
<td>Best</td>
</tr>
</tbody>
</table>

\[\bar{\alpha} = \text{−fees}\]

- It is the beginning of passive management:
  - John McQuown (Wells Fargo Bank, 1971)
  - Rex Sinquefield (American National Bank, 1973)
Hendricks et al. (1993) – Hot Hands in Mutual Funds

\[
\text{cov} (\alpha_t^{\text{Jensen}}, \alpha_{t-1}^{\text{Jensen}}) > 0
\]

where:

\[
\alpha_t^{\text{Jensen}} = R_t^F - \beta_{\text{MKT}} R_t^{\text{MKT}}
\]

⇒ The persistence of the performance of active management is due to the persistence of the alpha
Grinblatt et al. (1995) – *Momentum investors versus Value investors*

"77% of mutual funds are momentum investors"

Carhart (1997):

\[
\begin{align*}
\text{cov} (\alpha_{t}^{\text{Jensen}}, \alpha_{t-1}^{\text{Jensen}}) &> 0 \\
\text{cov} (\alpha_{t}^{\text{Carhart}}, \alpha_{t-1}^{\text{Carhart}}) &= 0
\end{align*}
\]

where:

\[
\alpha_{t}^{\text{Carhart}} = R_{t}^{F} - \beta^{\text{MKT}} R_{t}^{\text{MKT}} - \beta^{\text{SMB}} R_{t}^{\text{SMB}} - \beta^{\text{HML}} R_{t}^{\text{HML}} - \beta^{\text{WML}} R_{t}^{\text{WML}}
\]

⇒ The (short-term) persistence of the performance of active management is due to the (short-term) **persistence of the performance of risk factors**
Diversification and alpha

David Swensen’s rule for effective stock picking

Concentrated portfolio ⇒ No more than 20 bets?

Figure: Carhart’s alpha decreases with the number of holding assets

"If you can identify six wonderful businesses, that is all the diversification you need. And you will make a lot of money. And I can guarantee that going into the seventh one instead of putting more money into your first one is going to be terrible mistake. Very few people have gotten rich on their seventh best idea." (Warren Buffett, University of Florida, 1998).

US equity markets, 2000-2014
Source: Roncalli (2017)
**Figure:** What proportion of return variance is explained by the 4-factor model?

How many bets are there in large portfolios of institutional investors?

- **1986** Less than 10% of institutional portfolio return is explained by security picking and market timing (Brinson et al., 1986)

- **2009** Professors’ Report on the Norwegian GPFG: Risk factors represent 99.1% of the fund return variation (Ang et al., 2009)

Morningstar database, 880 mutual funds, European equities Carhart’s model with 4 factors, 2010-2014 Source: Roncalli (2017)
What lessons can we draw from this?

Idiosyncratic risks and specific bets disappear in (large) diversified portfolios. Performance of institutional investors is then exposed to (common) risk factors.

**Alpha is not scalable, but risk factors are scalable**

⇒ Risk factors are the only bets that are compatible with diversification.
Factor investing in bonds

Conventional bond model (or the ‘equivalent’ CAPM)

The total return $R_i(t)$ of Bond $i$ at time $t$ is equal to:

$$R_i(t) = a(t) - MD_i(t) R^I(t) - DTS_i(t) R^S(t) + LTP_i(t) R^L(t) + u_i(t)$$

where:

- $a(t)$ is the constant/carry/zero intercept
- $MD_i(t)$ is the modified duration
- $DTS_i(t)$ is the duration-times-spread
- $LTP_i(t)$ is the liquidity-time-price
- $u_i(t)$ is the residual

$\Rightarrow R^I(t), R^S(t)$ and $R^L(t)$ are the return components due to interest rate movements, credit spread variation and liquidity dynamics.
Figure: Carhart’s Conventional alpha decreases with the number of holding assets.

- There is less traditional alpha in the bond market than in the stock market.
- What does this result become when introducing alternative risk factors?
- Factor investing in fixed income = new topic in asset management.

EURO IG corporate bonds, 2000-2017
Source: Amundi Research (2018)
In the multi-asset case, we can show that the common risk factors are:
- Traditional risk premia (e.g. equity and bond risk premia)
- Alternative risk premia (e.g. carry and momentum risk premia)

Alternative risk premia explains a significant part of hedge fund returns:
- L/S equity strategies
- CTA strategies
- Relative value strategies

Hedge Fund AUM decrease\(^3\) (convergence between traditional AM and Alternative management)

Alpha strategy (satellite portfolio) \(\Rightarrow\) strategic asset allocation (SAA or core portfolio)

\(^3\)When considering alpha strategies — the growth of HF industry AUM is due to the shift of HFIs to traditional asset management (smart beta, risk parity, factor investing, alternative beta, etc.)
The nature of risk factors

- Discretionary active management ⇒ specific/idiosyncratic risks & rule-based management ⇒ factor investing and systematic risks?
- Are common risk factors exogenous or endogenous?
  - Do risk factors exist without active management?
    - Risk factors first, active management second
    - or
    - Active management first, risk factors second
- Quality vs Low beta, Momentum vs Size
- Factor investing needs active investing
- Imagine a world without active managers, stock pickers, hedge funds, etc.

⇒ Should active management be reduced to alpha management?
Summary 1

- A part of active investing is now packaged as factor investing
- Factor investing = systematic management that captures the common risk factors (≠ passive management)
- Active investing and factor investing are generally opposed. In practice, they aren’t!

Figure: The landscape of asset management
Defining systematic management

1980-2008
- Option hedging
- Portfolio insurance (CPPI, OBPI)
- Index funds
- Quant funds (L/S, statistical arbitrage, etc.)

2009-2018
- Indexation (CW, ETF, AW, etc.)
- Equity factor investing
- Trend-following strategies
- Risk parity portfolios
- Volatility/overlay management (vol control, vol target, vol cap, etc.)
- Volatility investing (short volatility, etc.)
- (Bank) proprietary (strategy) indices
- Robo-advisory

What is the issue?
They may use similar portfolio construction and rule-based mechanisms, and same data, rebalancing frequencies and assets.
The shadow asset management industry

Banks embrace ‘the age of asset management’
(Financial Times, November 30, 2015)

How FinTech is shaping asset and wealth management
(PWC, 2016)

- Investment banking vs asset management
  - Investment bankers sell financial products and asset managers buy them to manage for their clients (www.investopedia.com)
  - Sell-side / buy-side, own-account / third-party, etc.

- According to FSB (2015), asset management is part of the shadow banking industry

- There is also a shadow asset management industry: investment banks, index sponsors, fintech, robo-advisors, etc.

⇒ A significant part of shadow asset management is driven by rule-based and systematic strategies
The risk of systematic management

Asset picking (Securities) $\Rightarrow$ Portfolio allocation (Asset Classes, group of securities)

- Few quantitative models
- Crowding/spillover effects
- High-frequency strategies (intra-day, daily) vs low-frequency strategies (monthly, quarterly, semi-annually)
- Backward-looking ($\neq$ forward-looking)

$\Rightarrow$ Is systematic asset management a source of systemic risk?

See e.g. Black Monday (October 1987), LOR\textsuperscript{4} and the Brady report.

\textsuperscript{4}Company founded by Hayne Leland, John O’Brien and Mark Rubinstein. Leland was named Businessmen of the Year by Fortune in 1987.
Illustration of systemic risk
Financial crises are not necessarily systemic crises

If we consider the S&P 500 index, we obtain:
- 55% of stocks post a negative performance
- 45% of stocks post a positive performance

Maximum drawdown = 49%
Small caps stocks ↑
Value stocks ↑

The GFC crisis (2008)
If we consider the S&P 500 index, we obtain:
- 95% of stocks post a negative performance
- 5% of stocks post a positive performance

Maximum drawdown = 56%
Small caps stocks ↓
Value stocks ↓
Illustration of systemic risk
The specific status of the stock market

The interconnectedness nature of illiquid assets and liquid assets: the example of the Global Financial Crisis

- Subprime crisis ⇔ banks (credit risk)
- Banks ⇔ asset management, e.g. hedge funds (funding & leverage risk)
- Asset management ⇔ equity market (liquidity risk)
- Equity market ⇔ banks (asset-price & collateral risk)

The equity market is the ultimate liquidity provider:
GFC ≪ internet bubble

Remark

1/3 of losses in the stock market might be explained by the liquidity supply

Stocks ≠ bonds (safe asset, low perceived risk)
Examples of network risk

In most models, the origin of a systemic risk is a stress, but...

- August 24, 2015: US ETF Flash Crash
- October 15, 2014: US Treasury Flash Rally
  
  "While no single cause is apparent in the data, the analysis thus far does point to a number of findings which, in aggregate, help explain the conditions that likely contributed to the volatility."

- May 6, 2010: US Stock Market Flash Crash
- August 7-10, 2007: The “Quant Quake” (Andrew Lo)
What happened to the VIX in February 6, 2018?

VIX Index (01/02/2018 - 09/02/2018)

XIV ETN
The crowding question*

- Not an easy question: how to measure crowding effects?
- Crowding of strategies, portfolios or trades?
  - Cross-correlation within a given strategy (⇒ implementation issue)
  - Cross-correlation between strategies (⇒ dependency issue)
  - Temporal correlation between trades (⇒ time-horizon issue)
- Crowding of trades is more problematic than crowding of positions
- Potential temporary synchronization of trades?
- We can think for instance that risk control is more an issue than factor investing for two reasons:
  - time-horizon implementation (daily versus quarterly)
  - the impact of active management

(*) This slide resumes the elements of discussion presented by Charles-Albert Lehalle during the seminar at the AMF.
Bhattacharya and Galpin (2011)⁵:

- If everyone is a passive investor, 100% of trading volume is explained by market capitalization
- The aggregate ratio trading volume/market capitalization is a measure of stock picking

⇒ They estimated that stock picking in the US accounted for 80% of trading volume in the 1960’s, and for just 24% in 2000-2004

⇒ They also think that the stock market remains efficient if stock picking represents more than 10% of the trading volume

How to measure active management?

Key takeways

Summary II

- The frontier between asset management, hedge funds and investment banking is now much more blurred
- The risk of the rise of systematic management

“How the Next Quant Fund Crisis Will Unfold”
(Bloomberg, August 17, 2017)

- Quant funds ⇒ systematic management
- Relationship between systemic risk and network risk: the example of money market funds in 2007 (too big small to fail)
- Volatility market = a potential source of systemic risk
Traditional approaches to measure active management

- Tracking-error volatility
- Beta
- Correlation
- Alpha (or tracking difference)
- Information ratio
Introducing the active share

**Definition**

Let \( b = (b_1, \ldots, b_n) \) be the weights of the benchmark. Let \( x = (x_1, \ldots, x_n) \) be the weights of the portfolio. The active share\(^a\) is defined as one half the sum of absolute deviations between the portfolio weights and the benchmark weights:

\[
\text{AS} (x \mid b) = \frac{1}{2} \sum_{i=1}^{n} |x_i - b_i|
\]

It also corresponds to the one-way turnover assuming that the active portfolio at the previous period is the benchmark index.


⇒ For long-only portfolios, we have:

\[
0 \leq \text{AS} (x \mid b) \leq 1
\]
Introducing the active share

Table: An example with a universe of 6 assets

<table>
<thead>
<tr>
<th>Asset</th>
<th>Benchmark</th>
<th>Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>#1</td>
</tr>
<tr>
<td>#1</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>#2</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>#3</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>#4</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>#5</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>#6</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>AS</td>
<td>0%</td>
<td>20%</td>
</tr>
</tbody>
</table>

⇒ The active share is equal to zero when the portfolio is exactly equal to the benchmark

⇒ The active share is equal to 100% when the portfolio is invested outside the benchmark
“We argue that Active Share is useful for two main reasons. First, it provides information about a fund’s potential for beating its benchmark index – after all, an active manager can only add value relative to the index by deviating from it. Some positive level of Active Share is therefore a necessary (albeit not sufficient) condition for outperforming the benchmark.

Second, while Active Share is a convenient stand-alone measure of active management, it can also be used together with tracking error for a more comprehensive picture of active management, allowing us to distinguish between stock selection and factor timing [...] we can choose tracking error as a reasonable proxy for factor bets and Active Share for stock selection”. (Cremers and Petajisto (2009), pages 3330-3331).
How to use active share?

**Figure:** Styles of fund management

- **Active share (AS)**: The active share (AS) is the percentage of a portfolio's holdings that are not included in the benchmark index.
- **Tracking error (σ)**: Tracking error measures the deviation of the portfolio's return from the benchmark's return.

- **Pure indexing**: Low active share and low tracking error.
- **Closet indexing**: Low active share and high tracking error.
- **Diversified stock picks**: High active share and low tracking error.
- **Concentrated stock picks**: High active share and high tracking error.
- **Factor bets**: High active share and high tracking error.

**Source:** Cremers and Petajisto (2009).
Table: Performance of US equity mutual funds (1990-2003)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>$Q_5 - Q_1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess return wrt to the benchmark</td>
<td>2.55%</td>
</tr>
<tr>
<td>Carhart alpha</td>
<td>2.98%</td>
</tr>
</tbody>
</table>

Source: Cremers and Petajisto (2009).

The fund picking rule of Cremers and Petajisto (2009):
- High active share
- Small fund size
- High past year return

⇒ It has been adopted by some institutional clients (e.g. in Asia)
Active share and performance

Figure: Active share statistics by benchmark

- Active share figures highly depend on the benchmark!
- Dependency to the frequency distribution of market capitalization
- There is a positive relationship between the active share and the small cap characteristic of the benchmark

Source: Frazzini et al. (2016), Figure 1
Active share and performance

Figure: Active share correlation with benchmark type and benchmark alpha

- During the period 1990-2009, small-cap indices underperformed large cap indices
- Large cap indices had positive alpha
- Small cap indices had positive alpha
- The relationship active share/performance is index dependent

Source: Frazzini et al. (2016), Figure 2
Active share and performance

**Figure:** Cumulative abnormal net returns of active share quintile portfolios, 1990-2015

- $Q_5 - Q_1$ is positive from 1990 to 2000
- $Q_5 - Q_1$ is flat since 2001
- US related result?
- The results of Cremers and Petajisto (2009) are mainly explained by the dot.com bubble

Source: Cremers (2017), Figure 2, page 69.
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TE / AS arbitrage
The closet indexing debate

TE / AS arbitrage

Figure: Frequency distribution of US equity mutual funds in 2009

- Active share and tracking error are related
- The arbitrage AS/TE is constrained

Source: Petajisto (2013), Table 1, page 76.
Active share increases during crisis

Active share (and tracking error) is time-dependent and regime-dependent

Risk aversion ⇒ Liquidity issues

Source: Cremers (2017), Figure 1, page 67.
**Figure:** Lower and upper bounds (Eurostoxx 50, 30/12/2016)

- Average correlation = 55%
The arbitrage AS/TE depends on the correlation regime:

- With high correlations, the constraints are less binding.
- With low correlations, the constraints are more binding.
TE / AS arbitrage

**Figure:** The minimum TE portfolio (Eurostoxx 50, 30/12/2016)

- Herfindahl index
  \[ H(x) = \sum_{i=1}^{n} x_i^2 \]
- Number of bets
  \[ N(x) = H(x) \]
- \( Q_5 \) = the 10 smallest stocks
- GAC = (normalized) geometric average capitalization
- The small cap bias of high AS portfolios
- AS = Promoting small cap stocks?
The closet indexing debate

“Closet indexing is an issue which has attracted the attention of investor protection groups and investors alike throughout the European Union and ESMA has played a key role in an EU-wide inquiry to get to the heart of the matter. [...] In partnership with national regulators we are taking a closer look into this issue.” (S. Maijoor, ESMA Chairman, 02/02/2016).

Table: ESMA’s results (2600 equity funds, 2012-2014)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Potential closet indexing funds</th>
<th>Potential actively managed funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>( AS &lt; 60% + TE &lt; 4% )</td>
<td>15%</td>
<td>85%</td>
</tr>
<tr>
<td>( AS &lt; 50% + TE &lt; 3% )</td>
<td>7%</td>
<td>93%</td>
</tr>
<tr>
<td>( AS &lt; 50% + TE &lt; 3% )</td>
<td>5%</td>
<td>95%</td>
</tr>
<tr>
<td>(+R^2 &gt; 95%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Are smart beta portfolios closet indexing?

- Universe = Eurostoxx 50
- Sampling = TE minimization with 25 stocks and 5% max weight
- EW & risk parity
- Minvar = minimum variance portfolio with 30 stocks and 5% max weight
- Smart beta portfolios may be closet indexing!

⇒ Confusion between concentration and active management
The impact of the universe

Figure: MSCI Emu Index

Active share is not related to performance
The impact of the number of stocks

**Figure:** The minimum variance (investable) portfolio

Active share is related to the number of CW components

... and the frequency distribution of CW weights
The impact of the style management

**Figure:** Active share of EW portfolios

- CW index = trend-following
- EW portfolio = mean-reverting/contrarian
- If the CW weight of Asset $i$ increases (decreases), the EW portfolio will sell (buy) the asset at the end of the month
- EW = Anti-CW strategy

⇒ According to AS, mean-reverting strategies are closet indexing!
Active share helps to control the ex-post tracking error

**Figure:** Sampling portfolios (CAC 40 Index)

- CAC 40 Index
- 2007-2017
- Covariance matrix calculated with a one-factor CAPM model
- AS > 50%

What about bond portfolios?  ⇒  AS does not work since weights do not reflect the benchmark structure

- We must include duration or DTS in the AS definition

Source: Amundi Research (2018)
Active share is not a predictor of future performance

The mathematics of active share are not so obvious, since active share depends on the benchmark and the investment universe

The debate on closet indexing is an issue of management fees

The question “Who is Closet Indexing?” is certainly ill-posed, because it is a tricky problem

The question “Who is active?” is easier
It is difficult to beat the market in the long-run

Figure: Cumulative distribution of the number of years where active managers outperform the market (fees = 0)

- $p$ is the annual probability to outperform the market
- We consider a 9-year study period
- Market = the sum of active managers
- Assumption = no skills
- $p = 50\%$ is the theoretical value
It is difficult to beat the market in the long-run

Figure: Impact of management fees on the probability $p$

- We assume that the (equity) risk premium is 8% and the dispersion of active manager returns is 4%.
  - $p = 50\%$ if Fees = 0%
  - $p = 40.1\%$ if Fees = 1%
  - $p = 30.9\%$ if Fees = 2%
It is difficult to beat the market in the long-run

**Figure**: Cumulative distribution of the number of years where active managers outperform the market

- The impact of fees is important
- The probability distribution is shifted to the left if we introduce manager skills
- Why is it shifted to the right in practice? 

\[ p = 50\% \]
\[ p = 40\% \]
\[ p = 30\% \]
It is difficult to beat the market in the long-run

We note $f$ the management fees and $\sigma_D$ the performance dispersion

We have:

$$p = \Phi \left( -\frac{f}{\sigma_D} \right)$$

$p$ is a decreasing function of $f$ and an increasing function of $\sigma_D$

The right quantity of interest is $\frac{f}{\sigma_D}$
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Ranking vs benchmarking
SPIVA (S&P Indices Versus Active, us.spindices.com/spiva)

UNITED STATES
PERCENTAGE OF LARGE-CAP FUNDS THAT UNDERPERFORMED THE S&P 500®
Data as of Dec 20, 2017

**FIVE-YEAR**
84.23%

**THREE-YEAR**
80.56%

**ONE-YEAR**
63.08%

EUROPE
PERCENTAGE OF EUROPE EQUITY FUNDS THAT UNDERPERFORMED THE S&P EUROPE 350
Data as of Dec 20, 2017

**FIVE-YEAR**
73.26%

**THREE-YEAR**
59.21%

**ONE-YEAR**
46.59%

INDIA
PERCENTAGE OF INDIAN EQUITY LARGE-CAP FUNDS THAT UNDERPERFORMED THE S&P BSE 100
Data as of Dec 29, 2017

**FIVE-YEAR**
43.40%

**THREE-YEAR**
53.00%

**ONE-YEAR**
59.38%

JAPAN
PERCENTAGE OF JAPANESE LARGE-CAP FUNDS THAT UNDERPERFORMED THE S&P/TOPX 150
Data as of Dec 29, 2017

**FIVE-YEAR**
44.31%

**THREE-YEAR**
34.04%

**ONE-YEAR**
15.28%
### Report 11: Percentage of Fixed Income Funds Outperformed by Benchmarks

<table>
<thead>
<tr>
<th>FUND CATEGORY</th>
<th>COMPARISON INDEX</th>
<th>1-YEAR (%)</th>
<th>3-YEAR (%)</th>
<th>5-YEAR (%)</th>
<th>10-YEAR (%)</th>
<th>15-YEAR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Long Funds</td>
<td>Barclays US Government Long</td>
<td>96.43</td>
<td>100.00</td>
<td>98.31</td>
<td>95.24</td>
<td>98.00</td>
</tr>
<tr>
<td>Government Intermediate Funds</td>
<td>Barclays US Government Intermediate</td>
<td>57.89</td>
<td>90.91</td>
<td>80.00</td>
<td>78.05</td>
<td>90.49</td>
</tr>
<tr>
<td>Government Short Funds</td>
<td>Barclays US Government (1-3 Year)</td>
<td>47.83</td>
<td>69.23</td>
<td>79.31</td>
<td>76.47</td>
<td>88.24</td>
</tr>
<tr>
<td>Investment-Grade Long Funds</td>
<td>Barclays US Government/Credit Long</td>
<td>96.74</td>
<td>94.63</td>
<td>95.45</td>
<td>95.40</td>
<td>97.73</td>
</tr>
<tr>
<td>Investment-Grade Intermediate Funds</td>
<td>Barclays US Government/Credit Intermediate</td>
<td>31.37</td>
<td>35.53</td>
<td>40.94</td>
<td>51.06</td>
<td>73.53</td>
</tr>
<tr>
<td>Investment-Grade Short Funds</td>
<td>Barclays US Government/Credit (1-3 Year)</td>
<td>22.22</td>
<td>41.67</td>
<td>43.33</td>
<td>57.81</td>
<td>68.89</td>
</tr>
<tr>
<td>High Yield Funds</td>
<td>Barclays US Corporate High Yield</td>
<td>80.95</td>
<td>90.87</td>
<td>93.81</td>
<td>98.37</td>
<td>98.23</td>
</tr>
<tr>
<td>Mortgage-Backed Securities Funds</td>
<td>Barclays US Aggregate Securitized - MBS</td>
<td>67.92</td>
<td>73.08</td>
<td>79.31</td>
<td>81.40</td>
<td>93.88</td>
</tr>
<tr>
<td>Global Income Funds</td>
<td>Barclays Global Aggregate</td>
<td>64.86</td>
<td>60.55</td>
<td>52.59</td>
<td>58.33</td>
<td>69.44</td>
</tr>
<tr>
<td>Emerging Markets Debt Funds</td>
<td>Barclays Emerging Markets</td>
<td>22.58</td>
<td>70.69</td>
<td>86.71</td>
<td>73.68</td>
<td>86.67</td>
</tr>
<tr>
<td>General Municipal Debt Funds</td>
<td>S&amp;P National AMT-Free Municipal Bond</td>
<td>42.86</td>
<td>58.75</td>
<td>47.50</td>
<td>63.29</td>
<td>82.88</td>
</tr>
<tr>
<td>California Municipal Debt Funds</td>
<td>S&amp;P California AMT-Free Municipal Bond</td>
<td>25.71</td>
<td>30.56</td>
<td>37.14</td>
<td>66.67</td>
<td>84.44</td>
</tr>
<tr>
<td>New York Municipal Debt Funds</td>
<td>S&amp;P New York AMT-Free Municipal Bond</td>
<td>33.33</td>
<td>57.14</td>
<td>73.33</td>
<td>85.29</td>
<td>89.47</td>
</tr>
<tr>
<td>Loan Participation Funds</td>
<td>S&amp;P/LSTA U.S. Leveraged Loan 100</td>
<td>52.08</td>
<td>56.25</td>
<td>52.78</td>
<td>100.00</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: S&P Dow Jones Indices LLC. Data as of Dec. 29, 2017. Returns shown are annualized. Past performance is no guarantee of future results. Table is provided for illustrative purposes.
What about multi-asset funds?

- The multi-asset market capitalization portfolio is the true CAPM portfolio (Roll’s critique)
- Consolidation of stock & bond index providers?
The issue of performance is biased

- Previous analysis = all other things being equal
- The battle between active management and passive management is endogenous, because the market portfolio is the aggregation of active management
- The issue of survivorship
  - For academics, survivorship bias is viewed as a positive effect for the active management industry:
    - It implies that performance is underestimated
  - For active managers, survivorship bias is viewed as a negative effect for the active management industry:
    - Only the best active managers survive
    - Talented managers capture new assets

⇒ Active managers don’t only compete with other active managers, but they also compete with themselves
⇒ Endogenous selection increases the probability to underperform in the future
Why will active managers still have a role to play?

Figure: Option-like manager compensation

Figure: Performance dispersion

Source: Baker and Haugen (2012)

What do we need for a market to function properly?

- Backward-looking or forward-looking?
- Low return dispersion or high return dispersion?
- Crowding behavior or contrarian behavior?
- Stop-loss or start-again?
Summary IV

- Performance evaluation: ranking or benchmarking?
- What is the right benchmark of active management?
- More and more benchmarks (cap-weighted, minimum variance, risk factors)
- Benchmarking ⇒ crowning glory of tracking error and relative performance\(^a\) (e.g. the mid-2000s break in equity mutual funds, the investment puzzle of institutions, etc.)

\(^a\)Nobel Prize Richard Thaler: What does the theory become if utility maximization includes the performance of other economic agents?
Conclusion

- Passive/systematic/active management
- The question of systemic risk
- What is the room for active managers?
  - Systematic managers = rule-based active managers?
  - Discretionary active managers = only alpha/specific risk strategies?
- The active management debate is more an issue of dispersion and fees, and less a problem of performance (endogenous problem)
- How to assess the active nature of fund managers?
- The central place of contrarian investors in financial markets
  - Systematic managers: short-term contrarian, long-term trend following?
  - Active managers: short-term trend-following, long-term contrarian?
  - Bull market regime vs bear market regime

Backward-looking vs forward-looking investors

Only forward-looking investors may be contrarian (e.g. March 2009)
Epilogue

- Only active managers participate to capital allocation
- Is it possible to define a benchmark for active management?
- Passive management is efficient only if active management is efficient
  \[ \Rightarrow \text{Passive management needs active management} \]
- Individual (or micro) Pareto optimality \( \neq \) collective (or macro) Pareto optimality
- The volatility puzzle:
  - The growth of passive management decreases the long-term volatility
  - The decline of active management increases volatility shocks
  - The single-active manager puzzle: no volatility, only jumps, only crashes!
- The regulatory challenge for promoting market efficiency: fees or dispersion?
  \[ \Rightarrow \text{The answer is dispersion!} \]
References I


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