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Asset Manager Selection

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Fund Manager Selection Conference 2013

Risk Shifting and Performance in Equity Portfolios

PPCmetrics AG
Dr. Philippe Rohner, Investment Consultant

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Outline

- Introduction
- What is Risk Shifting?
- Performance Implications
- Implications for Manager Selection
- Conclusion

Introduction

Introduction

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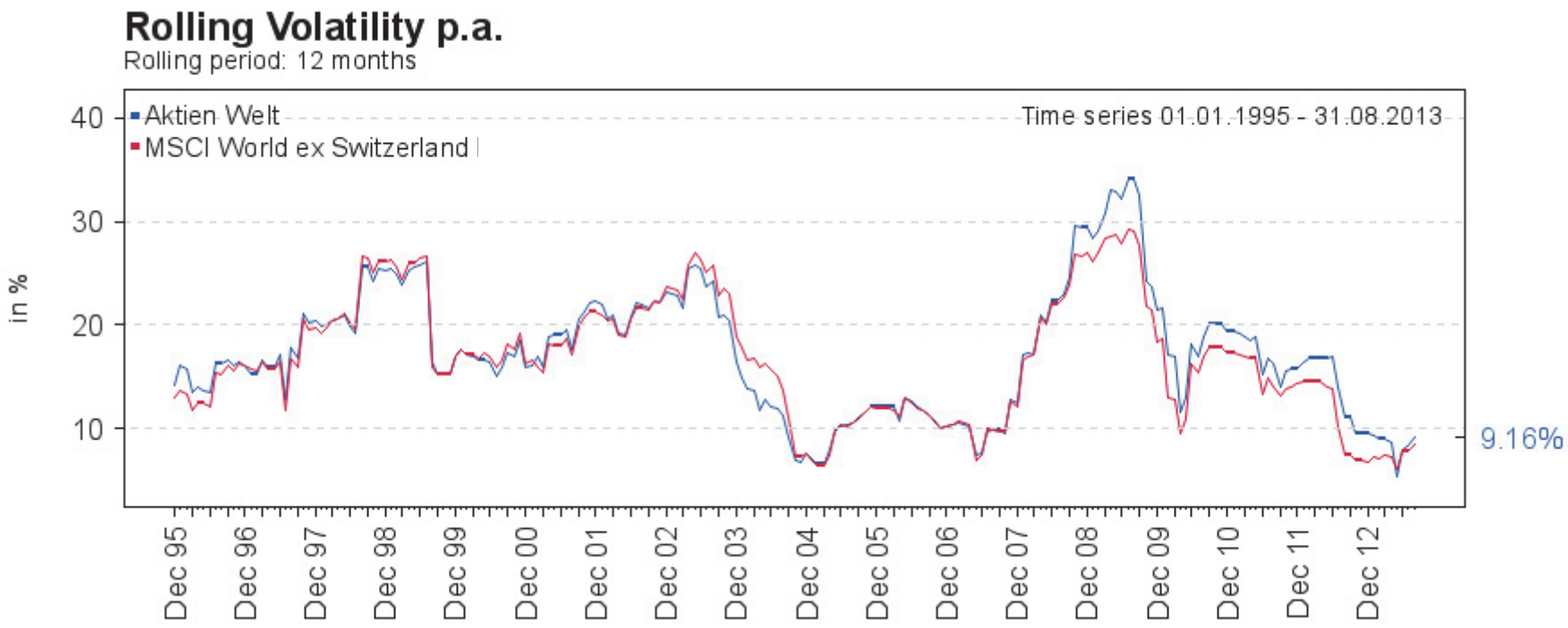
"Climbing is high risk. But for me, there are intrinsic rewards in this risk—an ability to fill the desire for adventure, which we have 7-Elevened out of our life"

- Conrad Anker

Introduction

Dimensions of risk shifting (1)

- Absolute risk: **Volatility**

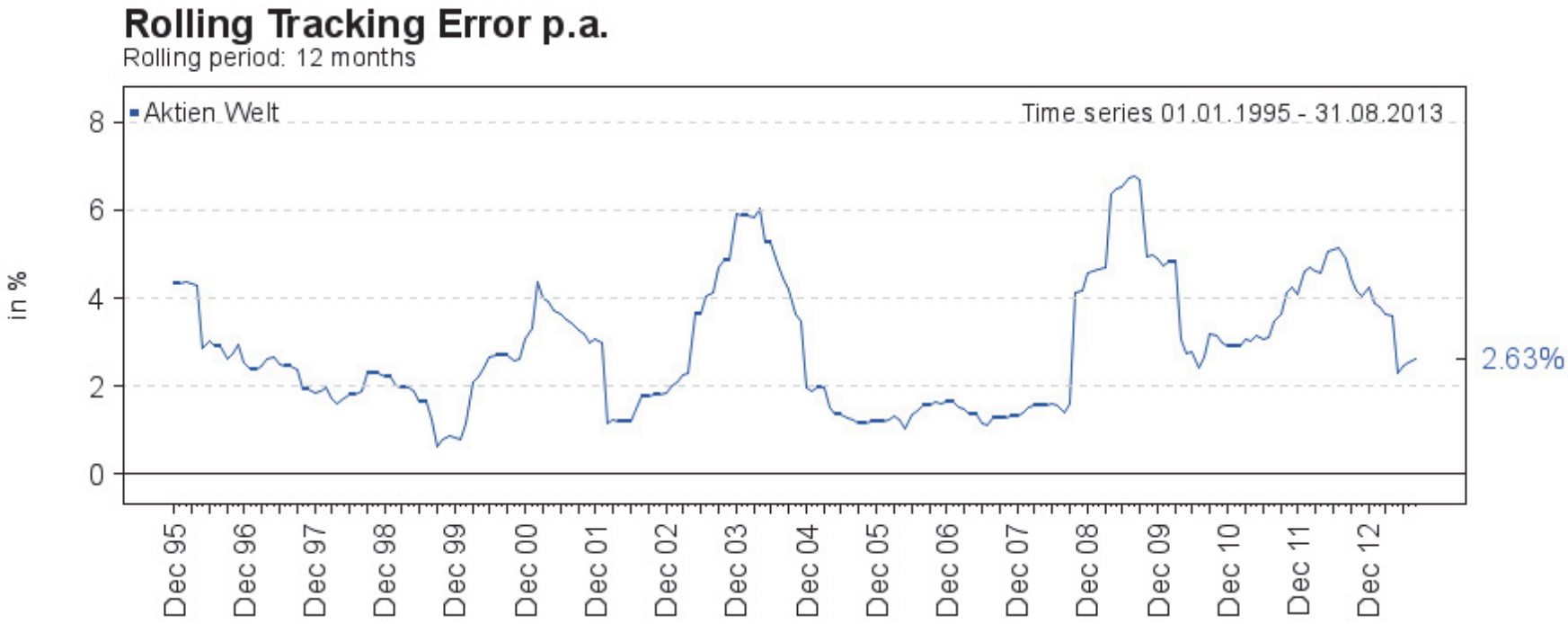


Source: PPCmetrics AG

Introduction

Dimensions of risk shifting (2)

- Relative risk: **Tracking Error**



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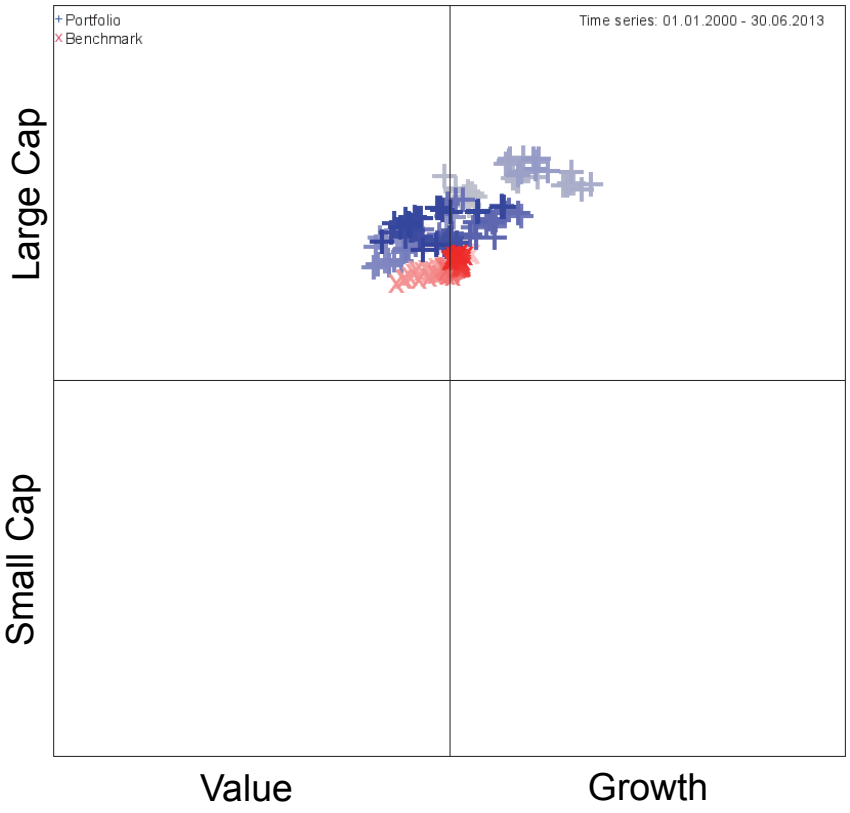
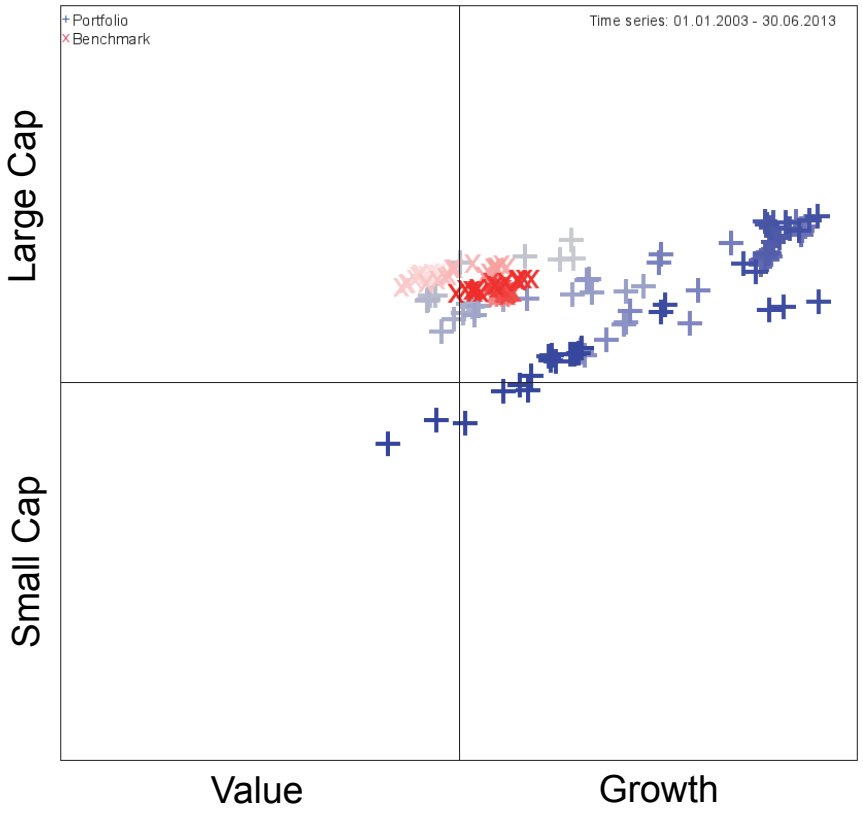
Introduction

Dimensions of risk shifting (3)

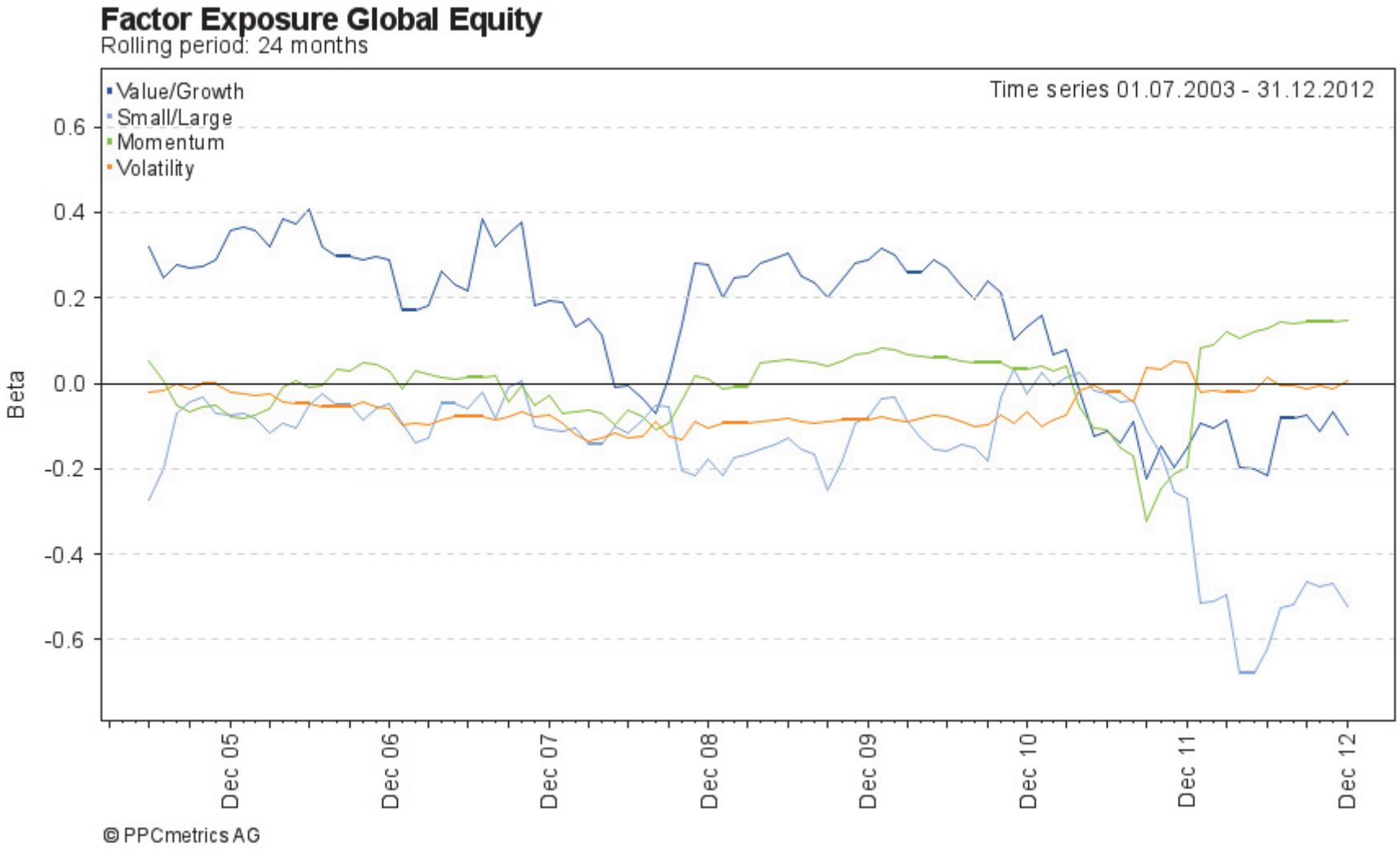
- Style risk: **Style drifts** over time (2000 - 2013)





Source: PPCmetrics AG

Introduction
Dimensions of risk shifting (3)



Introduction

Dimensions of risk shifting (4)

- **Active Share** of Fidelity Magellan fund over time

Introduction

Reasons behind risk shifting (1)

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Case #1: "Tournament Behavior"
Mutual funds compete in annual fund tournaments based on year-end performance rankings.

- Investors have a penchant for perceiving patterns (**"Hot-Hand" fellacy, 1985**)
  - Investors who relied on past information became overly optimistic about stock market winners (Behavioral Finance, DeBondt/Thaler)
  - Investors tend to quickly shift money into funds with stellar performance
- **Tournament Hypothesis**: Mutual funds try to exploit this behavior. While mid-year winner funds tend to decrease risk to lock in performance, mid-year loser funds increase risk.

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Reasons behind risk shifting (2)

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Case #2: Investment Management Skill
Skilled fund managers change absolute or relative risk to exploit market opportunities.

- Managers take advantage of market opportunities by **market timing** and/or **stock selection**.
- If fund managers have superior investment skills, this behavior should benefit fund investors.
- There is evidence that some fund managers have investment ability:
  - funds with higher industry concentration (Kacperczyk et al. 2005)
  - funds that deviate more from the benchmark (Cremers 2009)
  - time-varying fund manager skill (Kacperczyk et al. 2011)

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Reasons behind risk shifting (3)

Case #3: Misaligned Interests
Managers trade to increase portfolio activity and generate transactions. This can result in **conflicts of interest** between investors and managers.

- Mutual funds engage in opportunistic risk shifting, increase portfolio activity and generate trading costs.
- Investment-bank affiliated mutual funds underperform unaffiliated funds (Hao and Yan 2012).

Introduction

Reasons behind risk shifting (4)

Case #4: Style Drifts of Mutual Funds
Divergence of a mutual fund from its stated investment style or objective.

- **Style drifts** occur intentional (factor timing) or unintentional (stocks change their characteristics).
- Style drifts affect fund investors at different areas:
  - Total risk level of fund may change.
  - The fund's diversification potential in the context of the overall portfolio may diminish.
- Style drifts can be the result of **changing investment opportunities**, a **new fund management**, or **increased fund inflows** that force the manager to change the strategy.

Introduction

Issues for fund manager selection

- **Is risk shifting rational intention or by-product of misaligned interests between investor and manager?**
- **What are the implications of risk shifting on investment performance?**
- **What are the economic drivers behind risk shifting?**
- **How can investors avoid negative implications of risk shifting?**

What is Risk Shifting?

What is Risk Shifting?

Mechanics of risk shifting

- A manager can change a fund's risk level along different dimensions.
- Changes in **asset allocation**
  - Reduce/increase cash holdings
- Change of **systematic risk**
  - shifting from low-beta to high beta stocks
  - Change factor exposures of the fund (size, value, growth, momentum)
- Change in **portfolio concentration**
  - Reduce/increase number of stocks
  - Reduce/increase industry, sector or country concentration

What is Risk Shifting?

Risk Shifting Measure

- There exist different risk shifting measures that measure different aspects.
- In order to capture the "pure" impact of a risk shift, the measure must **not be affected by changes in market risk**.
- A general **risk shifting measure** is proposed by Huang et al. (2011).

Risk Shiftung (RS) can be defined as the difference between a fund's **current holdings volatility** (ex ante volatility) and its past **realized volatility:**

$$\textbf{Risk Shifting} = \textbf{Vol}^{\textit{CurrentHoldings}} - \textbf{Vol}^{\textit{Realized}}$$

Quantitative Evaluation of Risk Shifting

Study from Huang, Sialm and Zhang (2011)

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- Sample Selection
  - Study on **actively managed US equity mutual funds**.
  - The study covers the time period from **1980 - 2009**.
  - Sample includes **2'979 mutual funds**. The number of funds ranges from 188 (year 1983) to 1'754 (year 2009).
- Methodology
  - The Risk Shifting Measure is calculated **quarterly** for every fund.
  - Each quarter, all funds are grouped into five buckets according to their risk shifting measure (from **bucket 1 = lowest risk shifting measure** to **bucket 5 = highest risk shifting measure**).
  - To analyze the performance impact of risk shifting, the risk-adjusted performance over the next month is calculated for each risk shifting bucket.

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Asymmetry in Risk Shifting

Historical evidence

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Risk Shifting: lowest – neutral – highest

Risk decrease

Risk increase

RS Portfolio	Risk Shifting Measure	Current Holdings Volatility	Past Realized Volatility
1	-6.3%	15.6%	22.0%
2	-1.6%	15.6%	17.3%
3	0.2%	15.7%	15.6%
4	2.0%	18.3%	16.3%
5	6.4%	24.5%	18.1%

Source: Huang et al. (2011) and PPCmetrics AG

- "Positive" risk shifting funds **temporarily increase their risk** above the average risk level.
- "Negative" risk shifting funds **decrease their risk from elevated levels back to average**.

The «Anatomy» of Risk Shifters

Who is risk shifting? (1)

	RS Portfolio	Risk Shifting (Volatility % p.a.)	Net Assets (USD Mio.)	Age (Years)	Expense Ratio	Portfolio Turn-over	Relative Trade Size
Low	1	-6.3%	621	16.6	1.4%	131.6%	19.0%
	2	-1.6%	912	18.3	1.2%	86.6%	15.0%
Neutral	3	0.2%	1'211	20.1	1.1%	68.7%	12.0%
	4	2.0%	1'011	17.8	1.2%	80.9%	16.0%
High	5	6.4%	695	15.9	1.4%	107.9%	18.0%

Source: Huang et al. (2011) and PPCmetrics AG

- **Risk shifting funds** (both positive and negative) exhibit different characteristics than funds with constant risk levels.
- **"Risk shifters"** tend to be **younger**, **smaller** and **more expensive** funds with **higher portfolio turnover** and **transaction costs**.

The «Anatomy» of Risk Shifters

Who is risk shifting? (2)

RS Portfolio	Non-Equity Holdings	Market Beta	Idiosyncr. Volatility	Size Score	Value Score	Momentum Score	Number of Stocks	Industry Concentration
Panel A: Levels								
1	12%	1.16	3.6%	3.82	2.72	3.33	85	18.6
2	9%	1.02	2.3%	4.03	2.83	3.20	91	13.6
3	8%	0.93	2.0%	4.18	2.91	3.11	100	11.7
4	9%	0.96	2.2%	3.97	2.86	3.17	90	13.3
5	10%	0.97	2.9%	3.74	2.85	3.25	67	21.2
Panel B: Changes								
1	6%	-0.29	-1.2%	0.13	0.06	-0.06	4.6	-1.43
2	1%	-0.10	-0.2%	0.08	0.01	-0.03	4.8	-0.62
3	-1%	0.01	0.0%	0.04	-0.02	-	4.2	-0.35
4	-3%	0.11	0.3%	0.02	-0.03	0.02	2.2	-0.02
5	-5%	0.30	1.2%	-0.04	-0.06	0.03	1.0	1.39

Source: Huang et al. (2011) and PPCmetrics AG

- Levels: Average over the prior 3 years.
- Changes: Difference between the most recent characteristic and the average characteristic.

The «Anatomy» of Risk Shifters

How does risk shifting take place?

- Clear pattern between risk shifting funds and funds with constant risk level.
- Risk shifting funds tend to
  - … hold more cash
  - … exhibit higher systematic and idiosyncratic risk
  - … be less diversified (less stocks, higher industry concentration)
- Risk shifting takes place at different dimensions, by means of
  - … changing cash quota
  - … changing systematic risk (beta, market sensitivity of the portfolio)
  - … changing factor exposures (size, value, momentum)
  - … changing portfolio concentration (country, industry or securities)

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Performance Implications

Performance Implications

Monthly risk-adjusted returns

RS Portfolio	Risk Shifting (Volatility % p.a.)	Active Returns	Risk-adjusted Performance (Alpha)					
			CAPM	Carhart	Holdings-Based CAPM	Holdings-Based Carhart	Dynamic CAPM	Dynamic Carhart
1	-6.3%	-0.09%	-0.09%	-0.06%	-0.01%	0.03%	-0.10%	-0.07%
2	-1.6%	-0.03%	0.00%	-0.02%	-0.01%	-0.01%	-0.03%	-0.05%
3	0.2%	-0.04%	0.00%	-0.05%	-0.03%	-0.04%	0.01%	-0.02%
4	2.0%	-0.05%	-0.05%	-0.08%	**-0.14%**	**-0.10%**	-0.02%	-0.03%
5	6.4%	**-0.26%**	**-0.30%**	**-0.29%**	**-0.37%**	**-0.30%**	**-0.20%**	**-0.16%**

Source: Huang et al. (2011) and PPCmetrics AG

- "Negative" risk shifting has **no performance implications**.
- "Positive" risk shifting leads to statistically significant **negative risk-adjusted performance**.
- The performance pattern is **robust across different performance measures**.

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Performance Implications

Alternative risk shifting measures – monthly returns

Risk Measure	Absolute Risk (Volatility)		Asset Allocation	Systematic / Idiosyncratic			Active Risk
RS Portfolio	**All Holdings**	**Equity Holdings**	**Proportion Non-Equity Positions**	**CAPM Beta**	**Idiosync. Volatility (CAPM)**	**Idiosync. Volatility Carhart)**	**Tracking Error (Market)**
1	-0.06%	-0.03%	-0.05%	**-0.21%**	0.00%	0.06%	0.00%
2	-0.02%	-0.06%	-0.05%	-0.03%	-0.02%	-0.02%	-0.02%
3	-0.05%	-0.04%	-0.05%	-0.04%	-0.04%	-0.04%	-0.03%
4	-0.08%	**-0.13%**	**-0.09%**	-0.04%	**-0.13%**	**-0.11%**	**-0.15%**
5	**-0.29%**	**-0.23%**	**-0.10%**	**-0.13%**	**-0.28%**	**-0.29%**	**-0.45%**

Source: Huang et al. (2011) and PPCmetrics AG

- Underperformance is caused by “negative” risk shifting only.
- This performance pattern is **robust across different risk shifting measures**.

Implications for Manager Selection

Economic Drivers of Risk Shifting

Fund characteristics and performance impact

	RS Portfolio	Prior Year Fund Performance		Active Share		Industry Concentration	
		Low	High	Low	High	Low	High
Probabilities	1	62%	38%	39%	61%	42%	58%
	2	52%	48%	51%	49%	52%	48%
	3	48%	52%	58%	42%	56%	44%
	4	48%	52%	46%	54%	48%	52%
	5	45%	55%	33%	67%	31%	69%
Risk-adjusted Performance	1	-0.06%	0.11%	0.00%	-0.17%	-0.10%	0.01%
	2	-0.06%	0.04%	-0.09%	-0.14%	-0.07%	0.02%
	3	-0.06%	-0.02%	-0.07%	-0.12%	-0.07%	-0.03%
	4	-0.12%	-0.01%	-0.13%	-0.09%	-0.07%	-0.06%
	5	**-0.39%**	-0.08%	0.03%	**-0.29%**	**-0.14%**	**-0.33%**

Source: Huang et al. (2011) and PPCmetrics AG

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Popular Conjectures Revisited

- "Tournament" Hypothesis (e.g. Chevalier und Ellison 1996)
  - No evidence for hypothesis that "loser"-funds increase risk while "winner"-funds decrease risk
  - Risk shifting has only a negative performance impact for funds with inferior performance in the past year.
- More active funds exhibit superior performance (Cremers and Petajisto 2009)
  - Funds with high active share are more affected by negative risk shifting implications
- Funds with high industry concentration exhibit superior performance (Kacperczyk et al. 2005)
  - Funds with high industry concentration are more affected by negative risk shifting implications

Risk Shifting and Manager Selection

Take aways (1)

- On average, risk shifting is associated with a negative performance impact. There is no evidence that changing a fund's risk level in order to exploit market opportunities results in superior performance.
  - **Avoid funds that engage in risk shifting**
- Risk shifting funds are characterized by **high portfolio turnover** and **expense ratio**, two easy observable measures in the selection process.
- The empirical finding that funds with high portfolio turnover and transaction costs are negatively affected by risk shifting also suggests that risk shifting is the result of principal-agent issues.
  - **Select funds with state-of-the-art governance structures**

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Risk Shifting and Manager Selection

Take aways (2)

- Style drifting and risk shifting are closely related. Risk shifting is also done by changing factor exposures.
  - **Select style consistent funds**
- There is no empirical evidence on the long-term performance implications of risk shifting.
- Once a manager is selected, monitor risk and factor exposures, not just performance!

Risk Shifting in Equity Portfolios

Conclusion

- **Risk shifting has a negative performance impact for funds that increase risk but not for funds that decrease risk.**
- **Overall, risk shifting seems to be the result of inferior timing and stock selection abilities as well as misaligned interests between investors and managers.**
- **“Risk shifters” tend to be younger, smaller, more active and expensive funds with higher portfolio turnover and transaction costs.**
- **The real intention behind risk shifting is difficult to capture. However, risk shifting funds have clear characteristics which can be used in the manager selection process.**

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Literature (1)

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Contact

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Financial Consulting, Controlling & Research

PPCmetrics AG
Badenerstrasse 6
Postfach
CH-8021 Zürich

Telefon +41 44 204 31 11
Telefax +41 44 204 31 10
E-Mail ppcmetrics@ppcmetrics.ch
www.ppcmetrics.ch

PPCmetrics SA
23, route de St-Cergue
CH-1260 Nyon

Téléphone +41 22 704 03 11
Fax +41 22 704 03 10
E-mail nyon@ppcmetrics.ch
www.ppcmetrics.ch

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